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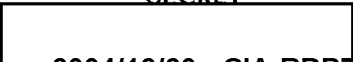
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The PI Story

THE CUBAN MISSILE CRISIS—PHASE I

Dino A. Brugioni

For history, if it is to reflect the past accurately, must first and foremost be a record of not only the acts but of the thoughts and feelings— the source and explanation of those acts—of the living men and women who peopled the world at the time the historian is describing.

Sir Arthur Bryant

Much has been written about the Cuban Missile Crisis of October 1962, especially about the events that took place after the discovery of Soviet missiles in Cuba and the decision-making process at the presidential level. Little has been written about the men whose discovery of the missiles touched off the crisis or the way the discovery was made.

This brief account is an attempt to record those events, and the names of some of the officers who participated, before memories fade and while the participants and documents are still available. It presents an account of the fateful photographic reconnaissance mission that resulted in discovery of the missiles, including pertinent background information. It chronicles events at the National Photographic Interpretation Center (NPIC) which culminated in the information being taken to the President at the White House by General Marshall Carter, Deputy Director of Central Intelligence; Ray S. Cline, Deputy Director for Intelligence; Arthur C. Lundahl, Director of NPIC; and Sidney Graybeal, Chief of the Offensive Missile Division, Office of Scientific Intelligence.

The materials for this study have been drawn from the recollections of the people in the intelligence community involved in the events, from the records at NPIC and elsewhere, and in some cases from published accounts of the missile crisis.*

*The author is indebted to the many intelligence officers who took considerable time from busy schedules to relate their experiences during the Cuban Missile Crisis and who provided invaluable documents and records.

I am also indebted to Urban Linehan, Tom Henley, and Doris Taylor for their editorial review and suggestions, and to the CIA librarians.

Background To The Crisis

The chain of events leading to the Cuban Missile Crisis of 1962 is normally traced back to the visit of Soviet First Deputy Premier Anastas Mikoyan to Cuba in February 1960. For the National Photographic Interpretation Center (NPIC), the story began with the first U-2 mission over the island on 27 October 1960.

In early 1960, reports which could not be evaluated began warning of missile sites in Cuba. From January to March 1960, the FBI and covert sources reported persistent rumors in Cuba and in the Cuban refugee community in the United States that the Russians were constructing a missile site in the Zapata swamps. Photography of the area failed to reveal any activity or equipment related to missiles.

As the stream of refugees from Cuba increased in the early sixties, so did the number of reports about Cuba. Many refugees gave valuable information; others gave unreliable reports or misinformation, some unintentionally, others with the hope of inducing the United States to strike or invade Cuba. Some information, too, was probably planted by Castro's agents.

No central interrogation or processing facility existed at the time. The information came from covert sources, the military services, the FBI, press and broadcast accounts, friendly foreign sources, and businessmen. Many well-intentioned people wrote letters giving information to officials from the President on down. These reports were sent to NPIC for photographic confirmation.

The Director of Central Intelligence ordered NPIC to check every report that could be checked of possible weapons in Cuba against U-2 photography, and to report its findings. Beginning in May 1962 and continuing throughout the crisis, the Center published a *Photographic Evaluation of Information on Cuba* series, which attempted to do this.

The range of interesting topics was wide, including, for example, missile sightings; rumors of missile or rocket launching bases, loading and unloading activities, property seizures, evacuation of families, presence of tents, movements of military convoys, digging of trenches, emplacements, and tunnels, road construction and many more. In addition, all reports of fires and sabotage, and reported closings of U.S.- and foreign-owned plants were carefully checked. The reported closings of sugar mills and other industrial installations due to shortages of spare parts or equipment breakdowns were investigated. Reports of newly constructed resorts and hotels were scrutinized. All reports of Soviet-constructed plants and aid projects were investigated.

A special chapter on the photographic surveillance of Cuba could be written about the photographic coverage of ship movements. As it became evident that Soviet supplies and arms were flowing into Cuba in increasing numbers, Soviet merchant shipping to Cuba came under close scrutiny.

In late 1961, the Center requested and began receiving all photographs taken of ships going to Cuba. Taken under a variety of circumstances—from the shore, from other ships, and from aircraft flying at low, intermediate, and high altitudes—and with a variety of cameras and focal lengths, this material came to the Center in many sizes and formats.

The surveillance began when ships moving through the Bosphorus were photographed by both short and long focal length cameras by the Navy, CIA, and Turkish elements. Ships transitting at night were later photographed by the U.S. 6th Fleet and by photographic squadrons stationed in Sicily and Spain.

Once ships passed Gibraltar or left the Baltic, they were photographed by reconnaissance planes operating out of Kindley Naval Air Station in Bermuda and the Naval Air Station at Jacksonville, Florida. As the ships approached Cuba, they were photographed again by the Marine photo squadron based at Guantanamo, Cuba, and by Coast Guard planes from Miami.

Ships were photographed if they were declared to be of "special interest" by the Office of Naval Intelligence. To be of special interest, a ship had to meet one or more of the following criteria:

- a. It was a known arms carrier.
- b. It passed through the Bosphorus at night.
- c. It reported tonnage well below its capacity and rode high in the water a normal indication of military cargoes.
- d. It made a false declaration about its port of destination.
- e. It had suspicious deck cargo.
- f. It declared for Cuba.
- g. It was the subject of pertinent COMINT information.

Military equipment and crates were frequently observed on the decks of Soviet ships (Figure 1). Many photo interpreters worked on identifying the equipment and crates. Bill Crimmins, a PI aircraft specialist, worked closely with several analysts from the Office of Research and Reports and especially with Thaxter Goodell¹ in the new art of "cratology." Cratology was to become a well-known term as a result of studies begun at this time. It is basically the technique

¹ Thaxter L. Goodell, "Cratology Pays Off," *Studies in Intelligence*, Vol. 8, No. 4, Fall 64, pp. 1-10 (SECRET)

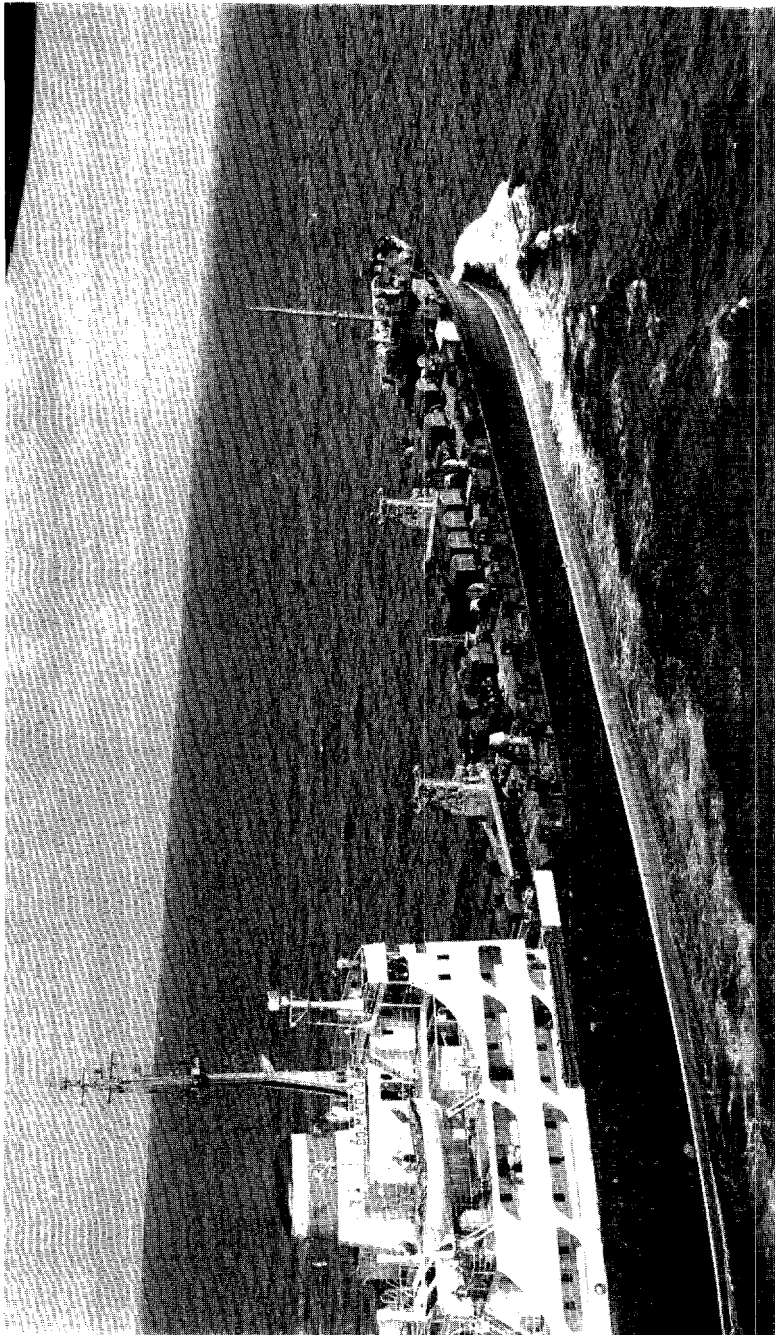


Figure 1. Soviet Merchantship DOLMATOVO Carrying Military Cargo to Cuba.

of identifying military hardware by carefully studying and measuring shipping crates. NPIC had been involved in this effort since the first U-2 photography. Most aircraft shipping crates were delivered to selected airfields and periodic photography over these fields made it possible to observe the uncrating and removal of various aircraft sections.

Most aircraft were assembled in open and therefore observable areas. Aerial photos—notably those made by the Royal Air Force of selected ports and airfields in the Middle East—along with ground photos permitted the identification of numerous military crates we were seeing on the way to Cuba.

The First SAM Sites

Between the first U-2 mission over Cuba in October 1960 and Mission 3088 on 29 August 1962, 56 flights had been flown. NPIC photo interpreters had reported on these missions as they were received in Washington. They also continued to back these “readouts” by checking other photography and the numerous reports on activity in Cuba.

Mission 3088 was to be a milestone in the Cuban missile crisis. Although the flight covered the entire island (Figure 2), clouds obscured most of the eastern portion. The areas that were clear provided information which was to bring the intelligence community to a fast boil. As one analyst stated after the mission, “The sirens were on and the red lights were flashing.”

Within minutes after the film was placed on the light tables, a PI on a mission scan team shouted, “I’ve got a SAM site.” Excitement spread and other PIs gathered about to look at the find. Before the day was over, eight SAM sites in various stages of construction were found in western Cuba.² The Cuban situation had entered a new phase.

The SAM sites were located along Cuba’s northern coast at Bahia Honda, Havana, LaColoma, Mariel, Matanzas, San Julian, Cienfuegos, Santa Lucia, and Santa Cruz del Norte. A SAM assembly area was discovered near Santiago de Las Vegas. The geographic placement of these sites strongly suggested an area defense of the island as a whole rather than maximum protection of key military targets or areas.

The Cuban SA-2 launch sites had the usual six launch positions encircling a central guidance area. In most cases, they were joined by a road network of the “Star of David” pattern. Photo and mensuration analysis, along with electronic radiation later intercepted from

² A ninth site, Cienfuegos, was discovered the following day.

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Missile Crisis

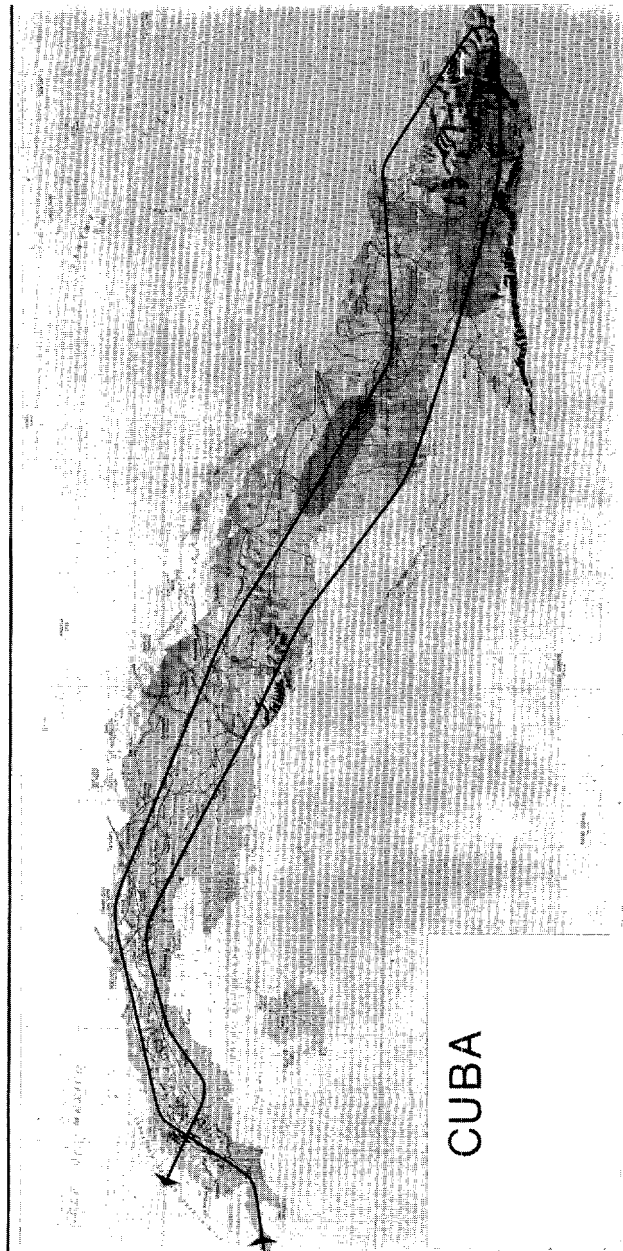


Figure 2. Flight Track of Mission 3088, 29 August 1962.

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Cuba, indicated that the Fruit Set radar (model "C"), the latest guidance radar, was being used.

The discovery of the SAM sites brought the USIB organization into play the Air Defense Working Group of the Guided Missile and Aeronautics Intelligence Committee. In addition to noting the locations and types of sites, the working group checked collateral information against confirmed sites and postulated where new ones might be found.

This recheck of the collateral on the area of SAM deployment in the light of the photography enabled us to evaluate much reporting of tents, construction activity, military vehicles, land expropriation, and the like. Many of these reports had stated that Soviet military personnel were present at the sites. It was now possible for officers like Ronald Lee Russell, the SAM expert in the Office of Scientific Intelligence, to make the rounds each morning at CIA headquarters collecting the latest cabled interrogation reports and other pertinent information for verification by the PIs.

In short, it was now abundantly clear that something extraordinary was happening which involved an exceptionally large amount of Soviet military hardware and manpower and that more SA-2s would be found on subsequent missions.

At higher echelons, the SAMs were immediately regarded as a threat to our U-2 reconnaissance aircraft. The transfer of U-2 flights from CIA to the military was considered. The Powers U-2 flight was fresh in memory, and obviously the administration wanted no repetition.

John McCone, the Director of Central Intelligence, commented to several of his ranking officers that the SAMs might well indicate that Soviet offensive missiles were intended for Cuba. He demanded and received assurances from Arthur Lundahl that everything possible was being done to identify any surface-to-surface missiles.

Mission 3088 also confirmed the presence of KOMAR-class guided-missile boats in Cuba. The "readout" from the 29 August mission on Mariel Naval Port stated that 13 PT boats were moored north and south of the airfield. Seven of the 13 were KOMARs, and another was probably being converted. Previous photographic analysis of unique deck crates aboard Soviet ships indicated that the crates probably contained KOMARs (Figure 3). The *Divinoles* and the *Severoles* had delivered two KOMARs each, and the *Sovetskaya Gavan* had delivered four KOMARs. The first sighting of a KOMAR boat at sea was reported by the Navy in the vicinity of Mariel on 29 August.



Figure 3. Soviet Merchantship SOVETSKAYA GAVAN Carrying Four KOMAR Crates.

Ray Cline, the Deputy Director of Intelligence, was briefed on the mission finds. He, in turn, asked that Bill Harvey, the chief of Task Force "W", be briefed so that covert collection personnel would be aware of and concentrate on collecting information on the newly identified sites. Lundahl and Bill Tidwell, an assistant to the Deputy Director of Intelligence for planning, briefed Harvey, who responded immediately that the White House should be informed.

A White House spokesman said that the President would not be available that afternoon but that Attorney General Robert Kennedy would be. The President was to fly to Quonset Naval Air Station in Rhode Island to meet his family on their return from Italy.

On 31 August at 1600, Tidwell, Harvey, and Lundahl waited outside the Attorney General's office.

After the group was ushered into Kennedy's office, Harvey made a brief introductory statement and turned the briefing over to Lundahl and Tidwell. Lundahl, laying the photographs and maps on the desk, summarized the developments in Cuba. He particularly emphasized the new SAM sites and KOMAR boats.

Kennedy was extremely interested. He asked many questions, said he wanted to be kept up-to-date, and promised that the intelligence would be conveyed to the President that night. He made it clear that he or the President wanted to see any further evidence of a military buildup. The briefing lasted about an hour. Lundahl and Tidwell left a resume of the information with the Attorney General.

This was Lundahl's first detailed briefing of the Attorney General, and he remembers him as:

"... a very sharp fellow, very perceptive, full of good questions. He didn't like long, involved answers. He cut through any wandering conversation and got right to the things he wanted to know. However, when you had something worthwhile to say, he was a very good listener. In other words, when he heard the things he wanted to hear, he soaked it up like a blotter. But when you wandered off, he would jerk you back quickly to the subject in which he was interested."³

Kennedy asked Nicholas Katzenbach, Deputy Attorney General, to draft a warning statement to be issued by the White House making it unequivocally clear that the United States would not tolerate the introduction of offensive surface-to-surface missiles, or offensive weapons of any kind, into Cuba.⁴

³ Interview with Arthur C. Lundahl, 18 March 1970, Secret. NPIC Historical Collection, p. 3.

⁴ Robert Kennedy, *Thirteen Days*, New York, New York, W.W. Norton Co., Inc, 1969, p. 26, 27.

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According to historian Arthur Schlesinger, when the Attorney General saw the draft he recommended:

... stiffening it with an explicit statement that we would not tolerate the import of offensive weapons. The draft as revised read that while we had no evidence of significant offensive capability either in Cuban hands or under Soviet direction, should it be otherwise, the gravest issues would arise.⁵

On 4 September, Pierre Salinger, the White House Press Secretary, read to news correspondents the following final version of the statement by President Kennedy on Cuba:

All Americans, as well as all of our friends in this Hemisphere, have been concerned over the recent moves of the Soviet Union to bolster the military power of the Castro regime in Cuba. Information has reached this Government in the last four days from a variety of sources which establishes without a doubt that the Soviets have provided the Cuban Government with a number of anti-aircraft defense missiles with a slant range of twenty-five miles which are similar to early models of our Nike. Along with these missiles, the Soviets are apparently providing the extensive radar and other electronic equipment which is required for their operation. We can also confirm the presence of several Soviet-made motor torpedo boats carrying ship-to-ship guided missiles having a range of fifteen miles. The number of Soviet military technicians now known to be in Cuba or en route approximately 3,500 -- is consistent with assistance in setting up and learning to use this equipment. As I stated last week, we shall continue to make information available as fast as it is obtained and properly verified.

There is no evidence of any organized combat force in Cuba from any Soviet bloc country; of military bases provided in Russia; of a violation of the 1934 treaty relating to Guantanamo; of the presence of offensive ground to ground missiles; or of other significant offensive capability either in Cuban hands or under Soviet direction and guidance. Were it to be otherwise the gravest issues would arise.

The Cuban question must be considered as a part of the worldwide challenge posed by Communist threats to the peace. It must be dealt with as a part of that larger issue as well as in the context of the special relationships which have long characterized the inter-American system.

It continues to be the policy of the United States that the Castro regime will not be allowed to export its aggressive purposes by force or the threat of force. It will be prevented by whatever means may be necessary from taking action against any part of the Western Hemisphere. The United States, in conjunction with other Hemisphere countries, will make sure that while increased Cuban armaments will be a heavy burden to the unhappy people of Cuba themselves, they will be nothing more.⁶

⁵ Arthur M. Schlesinger, Jr., *A Thousand Days*, Boston, Houghton, Mifflin, 1965, p. 665.

⁶ U.S. Department of State, Bulletin, Volume XLVII, No. 1213 (September 24, 1962), p. 450.

The Cruise-Missile Site at Banes

The SAM sites and the KOMARs were not the only significant finds on Mission 3088. But it was not until 7 September that the President learned of another startling discovery. The reason for the delay was that a new site discovered near Banes did not closely resemble the familiar SAM installations. Its identification as a cruise-missile site required several days of analysis. To explain this, it might be well to describe some of the techniques NPIC photo interpreters use in identifying a new and unusual site.

The identification of the Banes site was based primarily on work then under way on a Chinese site photographed just a few weeks before. By design, NPIC receives, exploits, and stores photography of strategic geographic areas in the world. Through experience and computer data, the PIs are able to relate intelligence finds in one area to fresh evidence discovered in another. On 11 August 1962, a U-2 piloted by a Chinese Nationalist photographed a unique installation near Lien-shan, China. The installation appeared to be missile-associated. Its location suggested that it was designed to protect the approaches to the strategic Po Hai Gulf off Communist China's northeastern coast. It was reported as follows:

4 nm SE of Chin-hsi. This installation is considered possibly missile-associated. An area 2 x 4 nm contains at least 6 radar-equipped vans, a possible launch position, 9 possible missile transporters, 5 underground bunkers, 5 drive-through buildings, FAGOT/FRESCO aircraft, at least 2 motor pools, approximately 75 structures consisting of warehouses, and maintenance, administrative, and barracks-type buildings. Area is served by a wide-radius turn road network and rail.⁷

Now the new area east-northeast of Banes seen on the 29 August Cuban mission was reported initially as follows:

Banes Area, SAM Equipment 2058N 07538W.
5 nm ENE of Banes at 20 58-50N 075-38-10W. SAM launch and radar equipment stored in open area adjacent to probable electronics facility.
Equipment—8 missile transporters with canvas-covered trailers, 7 electronics vans, and 20 miscellaneous vehicles.⁸

Later analysis showed that the site configuration and equipment were not compatible with known surface-to-air missile systems. A team of photo interpreters—Zane Meixner, Tom Hardy, Jim Holmes, John Rooney, and Dale Heintzelman—was assembled to study the

⁷ NPIC MCI Mission GRC 125, 11 Aug. 1962, Secret Noforn, NPIC/R-1038/62, Sep. 1962, pp. 3-4.

⁸ NPIC, Situation Summary, Par. 763-62, 5 Sept. 1962 SECRET NOFORN.

site. When they compared the Banes installation with the site at Lien-shan, certain similarities were obvious. Both sites and launch positions were similar in size and configuration. Both commanded a view of the sea. Both sites had Whiff-type radars and inclined launchers. At both sites, it appeared that missiles would be offloaded from the rear of the transporter. The Banes site, however, appeared to be field-deployed, while the Lien-shan site was a permanent facility. Moreover, what appeared to be a FAGOT/FRESCO aircraft was at the Lien-shan facility.

The launch positions at Banes and Lien-shan were also compared to those at SA-2 sites. They were different in configuration and arrangement. The SA-2 revetment is a drive-through revetment; those at Banes and Lien-shan were not. To place a missile on the launcher at Banes, the transporter would have to be backed up to the launcher.

The length of the missile transporters at Banes was about the same as that for the SA-2, but otherwise the transporters were not similar. The Banes transporter trailer was a "low-boy" type with a unique humpback canvas cover rather than the sleek horizontal box of the SA-2. The launcher was also different from that of the SA-2. It was slightly longer—35 feet instead of 28. The support or rectangular box effect seen under the SA-2 was not present at the Banes site. The flame deflector was trapezoidal, not rectangular as in the SA-2. The launcher consisted of two launching rails set 2.4 feet apart and mounted, by an unseen support, on an elongated base. The base was supported by two axles (four wheels), and an outrigger was at about the midpoint at each side.

A coastal defense role was logical for the Banes site. The site was situated on a hill with a commanding view of beaches and ports suitable for large-scale amphibious operations. From existing charts, the hilltop location was estimated to be 250 to 330 feet above the sea.

NPIC photogrammetrists were asked to compute the straight line of sight of the Banes installation for the above sea elevations of 250, 300, and 330 feet. They found that for 250 feet, the line of sight range would be 20.87 miles; for 300 feet, the range would be 22.86 miles; and for 330 feet, the range would be 23.98 miles.

The possibility that the FAGOT/FRESCO aircraft might be used as a missile launched from such a site, as suggested by the Lien-shan site, sent analysts scurrying for their background files. They had noted previously the similarity of the MIG-15 to the KENNEL AS-1 air-to-surface missile.

There were some differences, however. The KENNEL had a radome housing the receiving antenna on top of the vertical stabilizer and a

radome on the nose. It, of course, had no canopy. The overall length of the KENNEL was 27 feet as compared to 33.4 feet for the MIG. The KENNEL's wing span was about 15.5 as compared to 33.2 feet for the MIG, with a leading edge sweepback for the KENNEL of about 60 degrees against the MIG's 36 degrees. The stall fence arrangement—two fences on each side—was seemingly the same for both.

The KENNEL had not been seen before in a coastal defense role. It was not until the 3 January 1963 parade in Havana that intelligence analysts saw the surface-to-surface version of the KENNEL. The development of the KENNEL was initially reported in the late 1940s by German scientific returnees who worked on a beam rider guidance system called KOMET. The missile was developed originally to be used on the BULL; it was later adapted for the BADGER. The KENNEL was first shown to the Western world at the Leningrad Travel Air Show in July 1961. Launched from the BADGER, it had ranges from 35 to about 55 nautical miles.

Two "ground" photographs of the KENNEL were used extensively at the Center. The first, taken by attaches, showed it carried by a BADGER; the second, a Soviet source photo, showed it prepared for loading on a BADGER (Figure 4).

The PIs concluded that the Banes site was a probable coastal defense cruise-missile site. This judgment was generally accepted by the intelligence analysts. But the analysts also considered three other possibilities for the installation: the SS-N-1—a destroyer-launched cruise anti-ship homing missile, launched from 30-foot inclined rails; the SS-N-2—a KOMAR-class patrol craft-launched cruise anti-ship homing missile, launched from inclined rails 25 to 30 feet long; and the SS-C-1—the "missile-in-a-bottle" first shown in the 7 November 1961 Moscow parade. This missile would be launched from an inclined ramp within a tube mounted on a large four-axle truck.

Although none of the known Soviet cruise-missile systems precisely fit the facility at Banes, the analysts believed that the site was for a short-range 20- to 40-nautical-mile missile system. The WHIFF-type radar seen at the site had not been noted with known cruise-missile systems but could be used for target acquisition or guidance. Analysts noted that if the missile had an inertial guidance system and a means of target acquisition, the range of the missile at the Banes site could be extended to as far as 130 nautical miles.

NPIC was under considerable pressure from the Defense Department to publish information on the Banes site. Because the President and his brother had shown such interest in new developments in Cuba,

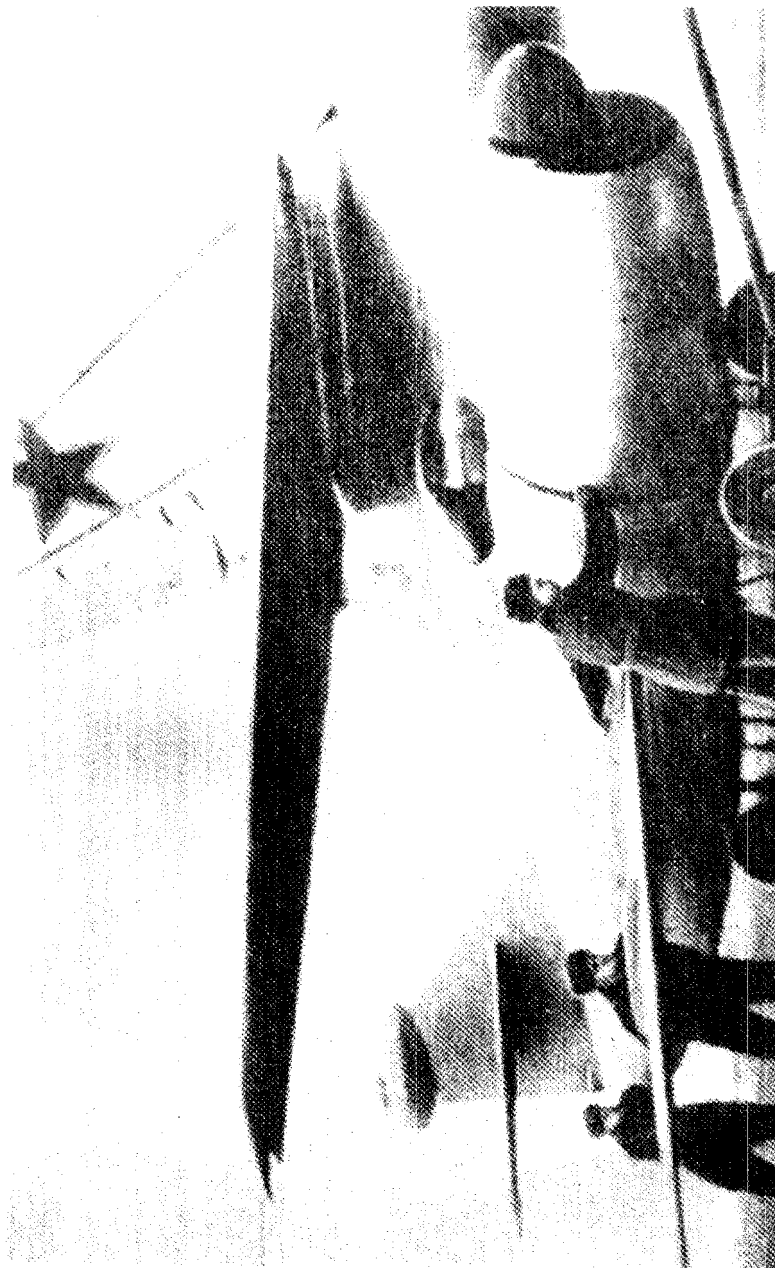


Figure 4. KENNEL Missile Being Installed on BADGER Aircraft.

Cline asked that the new information not be released until after the President had seen it.

After the PI reports were made and the analysts had been consulted, the information was ready to be given to the President. A meeting was set for 7 September. At 1550 hours, Secretary of State Rusk, Secretary of Defense McNamara, Carter, Cline, Lundahl of the Central Intelligence Agency, and John McLauchlin of the Defense Intelligence Agency were ushered into the Oval Room of the White House. The Secretary of Defense had asked John Hughes, a special assistant to the Director, DIA, to attend, but Hughes was unavailable. His deputy, John McLauchlin, was then asked to represent the DIA. McLauchlin laughs when he recalls how a GS-12 represented the DIA at a White House meeting. He felt ill at ease when he saw the nation's leaders and felt their inquiring glances directed at him. He is sure they were wondering, "Who the hell is he?"

The President was seated in his rocking chair. McGeorge Bundy stood at the President's left.

Carter told the President that detailed analysis of the 28 August U-2 photography over Cuba—in addition to providing data on the SA-2 and KOMAR—had revealed surface-to-surface missiles in Cuba intended for coastal defense. He said that Mr. Cline and Mr. Lundahl would provide all the necessary details. Cline read a short prepared statement. He said that we knew little about such a system, but felt that it was a defensive missile system that would be employed to repel an amphibious landing. He then asked Lundahl to describe the site.

Lundahl removed a briefing board labeled "Possible Tactical SSM Launch Site under Construction near Banes, Cuba" from a leather case and handed it to the President. He looked over the top of the briefing board while explaining it.

Lundahl said the site was near the town of Banes in eastern Cuba along the northern coast. It was three nautical miles inland but could cover the seaward approaches to many of the beaches suitable for large-scale amphibious landings. Describing the site in detail, he said it contained revetted, inclined launchers with associated, possible control revetments; canvas-covered missile transporters; WHIFF-type radars; numerous vehicles and pieces of equipment; a tent area; and open storage areas. Lundahl said that the site resembled the missile site near Lien-shan, China. He added that we would probably see refinements at the site. The President asked, "What, for example?" Lundahl replied, "Revetting of the major pieces of equipment," and added that the site could now be operational with all the equipment present and properly emplaced. "Although we do

not see missiles at this site, we presume it will fire something like a drone aircraft," he said.

The President obviously was primarily concerned with whether the newly discovered site was defensive or offensive. Only three days earlier he had informed the nation "the gravest issues would arise" if offensive weapons were introduced in Cuba. His anxiety was revealed as he began to question Lundahl and Cline on this possibility.

"How far will this thing shoot?" he asked. "From 20 to 40 nautical miles," Cline replied. The President seemed perturbed at such a wide divergence in range. Cline explained that based on an assessment of the radar's capability, a maximum range of 40 miles was estimated. He said that the range was a function of the altitude of the site and the height of the surface target and the missile's radar.

The President was not satisfied. Lundahl explained that a key feature of the system was the target illumination radar which was not yet identified. Subsequent missions could refine the estimate. The President then asked if it could hit our ships at sea. Cline replied it could if they came within range. The President said, "That would make it an offensive weapon." Cline again explained that the site seemed designed to defend possible landing beaches. "Yes," the President snapped, "you've explained that before." Lundahl said that we had previously seen several missile systems in the USSR and China and that we would rescan and reanalyze the photography of their coasts in hopes of discovering more information that would help to explain the purpose and capability of the Cuban sites. Cline added that CIA's Office of Scientific Intelligence (OSI) was conducting a similar search for information and was seeking advice among the technical experts employed by the Department of Defense. Cline hoped to provide the President with more information at a later date.

The President listened impatiently. His brows were furrowed at a sharp angle above his nose; his face reddened. He was becoming visibly angry. His voice began to rise. "How sure are you that this is not an offensive weapon designed to strike targets in Florida?" he asked. Lundahl said that the site was located in the eastern area of Cuba with the launchers oriented eastward, away from the United States. "What do you know about the weapons?" the President asked.

Somewhat embarrassed, Cline admitted that we didn't know everything about the system but felt that we had to report it. The President stated he wanted no reporting until the missile system was completely evaluated.

At that moment, Secretary McNamara said that there was little need for speed of reporting, and that he would convey this feeling to DoD officials.

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The President asked how widely the information would be circulated. Lundahl replied that the NPIC's cables and reports were disseminated to a rather large number of intelligence organizations and military commands. Cline also indicated that multiple copies of the film had been made and sent to military commands.

Obviously still angry, the President handed the briefing board back to Lundahl. Speaking to Carter and Cline, he said, "We have to be very careful about any evidence of offensive weapons in Cuba. If such evidence should be found, it must be kept very restricted and I want to be one of the first to know about it."

The President also made it very clear that if offensive missiles were found in Cuba, special security systems must be invoked to ensure against any intelligence leaks or premature disclosures. He stated that this must be an ironclad system. Only those who must know should have access to such intelligence.

The President was determined to chart the course of events rather than be dragged along in their wake. He wanted the time and freedom to examine alternatives before deciding policy. He was especially aware of political pressures, inside and outside his party, that could inhibit or encumber his decisions if there were a premature disclosure.

Still agitated, the President began to herd the group toward the door. General Carter hurried and said, "Mr. President, we clearly understand your wishes in the matter. But just to make sure that we're all on the same wave length, may I say you do want us to know exactly what these things are so that we can report to you accurately?" The President, considerably toned down, said, "By all means." Carter said, "Then in order to arrive at these conclusions, it certainly wouldn't be contrary to your wishes, or to your order, that we, the analysts, talk back and forth with each other to compare our knowledge and winnow out our conclusions, and to reject that which is inconsistent." The President said, "Most certainly not; that's exactly what I want to happen."

Carter continued, "I thought that's what you wanted, but others might have felt that each of us was to stay in isolation and try independently to arrive at a collectively agreed upon conclusion, which would have been hard to do." The President then said, "No. Those people who need to know—those specialists, those experts who can talk to the photo interpreters, and with whom those photo interpreters can talk—can collectively arrive at a decision. That's what I want to happen."

The meeting broke up, and the group left the White House at about 1700 hours. Driving back to Langley headquarters in the CIA limousine, Carter rather ruefully said that it seemed every time

SECRET

McCone went out of town some flap caught him on the bridge. Lundahl recalls, "Each of the group was rather grimly convinced that we were dealing with a very serious situation and that it was going to take our very best efforts not only to satisfy the President but to satisfy the rest of the leadership in terms of what was really there."

A great paradox existed in Washington. While there was no hard intelligence confirming the introduction of offensive missiles—and intelligence officers were confident that the Soviets would not be that irrational—most analysts were sensitive to the possibility that such missiles might be introduced. Extraordinary precautions, therefore, were taken to assure the secrecy of such information should it be found. When Carter returned to Langley he called Huntington Sheldon, the Assistant Deputy Director for Intelligence, into his office. Sheldon recalls these events:

"Carter told me that as a result of a presidential directive, a security system was to be established which would absolutely safeguard the dissemination of highly sensitive information derived from Cuban overflights. He left it to me to determine how this should be accomplished. And with that very broad and general outline I proceeded to return to my office to formulate the kind of system I thought would meet General Carter's specifications. I could see that an additional codeword was needed which would override all other codewords and which should be so closely held as to require in most cases monolithic dissemination."

Having decided this Sheldon called Henry Thomas in the Office of Security and asked him to send over a list of available code names so that he might select a proper name for this particular system. Thomas soon brought a list of names and Sheldon chose the word "PSALM."

"I told the responsible people that this word would be used for a particularly sensitive operation. It was not difficult to set the parameters for such a system since I was instructed to devise one which was extremely tight. The only question which had to be decided was who would have access and who would clear individuals for receipt of Psalm material."

Sheldon later discussed with Carter a memorandum he had prepared which could be used as a basis for launching the system through USIB channels.

"As usual when a system this rigid is adopted, there is always a series of complaints from various people who feel they were short changed. But by placing the system under USIB and stating the President's determination to keep such information tightly compartmented, the system was readily accepted by the Community."⁹

⁹ Interview with Huntington D. Sheldon, 9 June 1970, Secret. NPIC Historical Collection, pp. 1-3.

Over the weekend, most of the Agency's senior officers reflected on the Banes briefing and the President's reaction. An additional concern that weekend was a Chinese broadcast on 9 September that revealed that a Chinese Nationalist U-2 had been shot down over eastern China. The broadcast left unanswered how and where the plane was shot down and the fate of the pilot. There was speculation in Washington that the Chinese Communists had brought the aircraft down with an SA-2 missile. Now the safety of the U-2s flying over Cuba would surely have to be reassessed.

On 13 September, the President was told that the Banes site was evaluated as a defensive short-range cruise-missile system with a range of 25 to 30 nautical miles. The President was pleased. Later that day, at his press conference, the President read a preliminary statement on Cuba. He restated his warning:

Ever since Communism moved on to Cuba in 1958, Soviet technical and military personnel have moved steadily onto the island in increasing numbers at the invitation of the Cuban Government.

Now that movement has been increased. It is under our most careful surveillance.

But I will repeat the conclusion that I reported last week, that those new shipments do not constitute a serious threat to any part of this hemisphere.

He added:

But let me make this clear once again. If at any time the Communist buildup in Cuba were to endanger or interfere with our security in any way, including our base at Guantanamo, our passage to the Panama Canal, our missile and space activities in Cape Canaveral, or the lives of American citizens in this country, or if Cuba should ever attempt to export its aggressive purposes by force or the threat of force against any nation in this hemisphere or become an offensive military base of significant capacity for the Soviet Union, then this country will do whatever must be done to protect its own security and that of its allies.¹⁰

An entirely different kind of reception was given to General Carter and Arthur Lundahl the next time they appeared at the White House. This came about through a briefing of General Dwight D. Eisenhower and the President that took place a few days later.

Early on 10 September, General Carter called Lundahl and said that the President would like a current briefing on photographic systems for himself and General Eisenhower.

General Eisenhower had recently returned from a six-week trip to Western Europe and had been invited to lunch by President Kennedy

¹⁰ Transcript of the President's News Conference on Foreign and Domestic Matters, New York Times, Sept. 14, 1962, p. 12.

to discuss his trip impressions and to be briefed, in turn, on the latest advances in photography and the recent photography of Cuba.

Carter said he would meet Lundahl at the White House at 1000 hours, but the precise time of the briefing was not set. President Kennedy had several things on the agenda for General Eisenhower, including a short tour of the White House to show him Mrs. Kennedy's latest acquisitions of furniture and art.

The President was in a happy mood. He enjoyed playing host to General Eisenhower. He had admired the General's role in World War II and all that he had done for his country. And now, as master of the grand mansion, he had the opportunity to play host to its previous occupant. President Kennedy had a warm smile and was making sweeping motions with his arms as he walked about the White House talking with General Eisenhower. Lundahl could not remember when he had seen the President in a better mood. This was in complete contrast to his mood of the previous Friday.

After lunching at the White House, Carter, Col. Davis S. Parker, the Deputy Director of NPIC, and Lundahl set up their briefing materials on an easel in the Oval Room. Just before 1400 hours, President Kennedy and General Eisenhower entered the room. The President said to General Eisenhower, "You must certainly know these gentlemen." General Eisenhower said that he did, shook hands with the briefers, and sat down at the President's right.

Carter made a few introductory remarks and then turned to Lundahl who presented 15 substantive and technical briefing boards.

Lundahl had briefed President Kennedy many times and knew he liked opening remarks that gave him an immediate option on the presentation. When the President was pleased with a presentation, he would nod and smile. When he thoroughly enjoyed a presentation, he would often light a big, black cigar.

Lundahl showed, through photographic enlargements, the improvements that had been made to the various camera systems. General Eisenhower asked many questions about photographic systems in the research and development stage. He especially wanted to hear details on that "very, very high speed and high flying aircraft" (the SR-71). Carter gave the latest information on the progress of this program.

The President, too, asked numerous questions. During the briefing he lit a black cigar. He seemed delighted with the General's questions and the answers given by the participants. The briefing lasted approximately 30 minutes. Both President Kennedy and General Eisenhower expressed their thanks and departed.

All agreed that the briefing was a success. Carter especially felt relieved and jokingly remarked, "At last, I can report some good news from the White House to Mr. McCone."

On the 26 September U-2 coverage of the site, a 26-foot-long cruise-missile with a wing span of 15 feet was identified on one of the Banes launchers. The tie with the KENNEL-type missile was now complete.

The 14 October Mission

A CIA U-2 rolled down a runway at Edwards Air Force Base in California on 14 October 1962. It gathered speed and began to rise. The Strategic Air Command pilot, Maj. Richard S. Heyser, recorded the take-off time as 0700Z (Greenwich Mean Time or 0200 Eastern Standard Time). This was the 63rd U-2 mission flown over Cuba since the program began on 27 October 1960. The mission number was G3101; the code name was "Victor." The pilot set his course for Cuba and settled back for a five-hour flight.

Mission G3101 employed the "B" camera system, a high-resolution, 36-inch focal length, large-format, general coverage, reconnaissance camera designed to provide detailed information over an extremely large area (potentially one million square nautical miles per mission). The camera was loaded with two rolls of film, each 9 inches wide and about 6,000 feet long. The rolls of film were placed parallel to the focal plane of the camera so that both rolls were exposed during each action of the shutter. The combined film size was 18 by 18 inches.

The cameras provided for horizon-to-horizon coverage in the seven-position mode (73.5°L, 49.0°L, 24.5°L, 0° or vertical, 24.5°R, 49.0°R and 73.5°R). The supply of film in the camera made it possible to receive about 4,000 paired aerial pictures—i.e., to photograph a route of about 3,500 kilometers. The high-sensitivity film in the U-2 ensured aerial photography throughout the day. It was SO 1188 (special order 1188), designed for photographic reconnaissance of military, industrial, and topographic objects and for aerial surveys from high altitudes. The definition of the film was remarkable for the day. It recorded photography with an approximate 3-foot resolution at the nadir from altitudes of 65,000 to 70,000 feet.

Approaching the Isle of Pines, Heyser made the following notation on his chart: "On course 351°." And he noted the time as he flew over Cape Frances on the Isle of Pines as being 1231Z. When he made land fall on the Island of Cuba, he noted his time again as being 1237Z. He also recorded the altitude as being an average of 72,500 feet. The

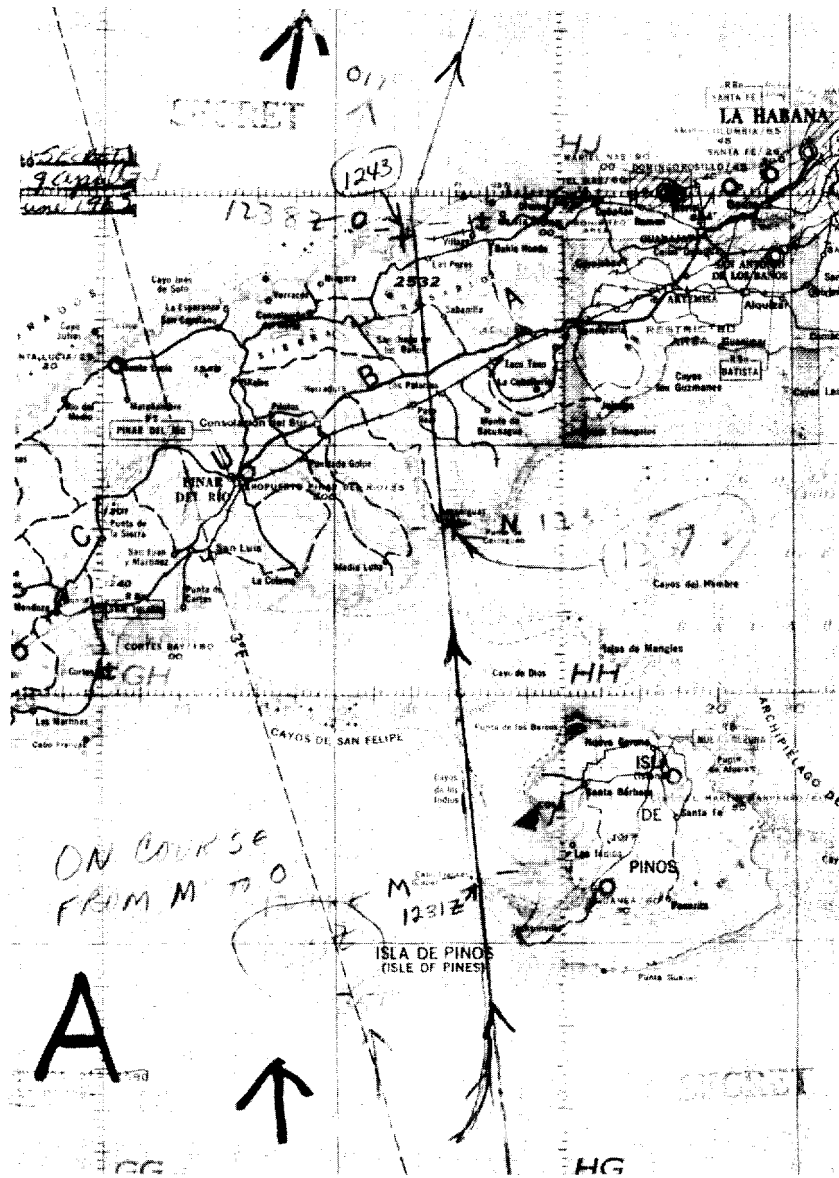


Figure 5. Pilot's Chart for Mission 3101, 14 October 1962.

course line of 351° took him over Davaniguas, Los Palacios, San Diego de Los Banos, and Los Pozos. The names Los Palacios and San Diego de Los Banos would have fleeting moments of notoriety. At 1243Z, he left the island and made a new course correction to 017° (Figure 5).

The resolution of the U-2 cameras was often exaggerated, probably through confusion with the low-altitude systems later deployed in Cuba. Even Roger Hilsman, Director of Intelligence and Research in the State Department, stated that:

“At heights well over seventy thousand feet—almost fourteen miles—pictures were taken with a resolution of only two inches on a side, which means that the painted lines of a parking lot could be distinguished, for example, or the muzzle of a new kind of cannon peeping out of the wing of an airplane. In the hands of skilled photographic interpreters, these pictures could produce an unbelievable amount of extremely accurate information.”¹¹

When Heyser's U-2 touched down at McCoy Air Force Base at Orlando, Florida, the two large rolls of film were removed, placed in special shipping containers, and rushed to a waiting aircraft that took the film to the Naval Photographic Interpretation Center (NAVPIC) at Suitland, Maryland, for processing. The film was developed under established quality and security controls by personnel carefully selected for ability and security. The film was edited and titled, and the duplicate positive off the processors rushed to NPIC. The NPIC operations officer, Hans F. Scheufele, maintained constant contact with the collection and processing site so that scheduling information would be available to Center components and exploitation teams would know the arrival time of the film. He maintained this information on a large blackboard on his office wall. He also issued daily bulletins, such as “Proposed Staffing and Time Completion Estimates,” which listed the people who would exploit the mission and noted the arrival time of the film.

The Missile Sites

In Washington, 15 October began in routine fashion. The NPIC director had scheduled an 0930 meeting with his division chiefs to discuss training (Figure 6). As he prepared for his meeting, Lundahl glanced out his window overlooking 5th Street. With some annoyance, he noted that a U.S. Navy truck parked in front of the building entrance was blocking traffic. Two armed Marines had dismounted and taken positions immediately behind the truck. An armed Navy officer and an enlisted man entered the truck from the rear, lifted a box from the truck, and entered the building. Every effort had been

¹¹ *To Move a Nation*, Garden City N.Y., Doubleday & Co., Inc., 1967, p. 168.

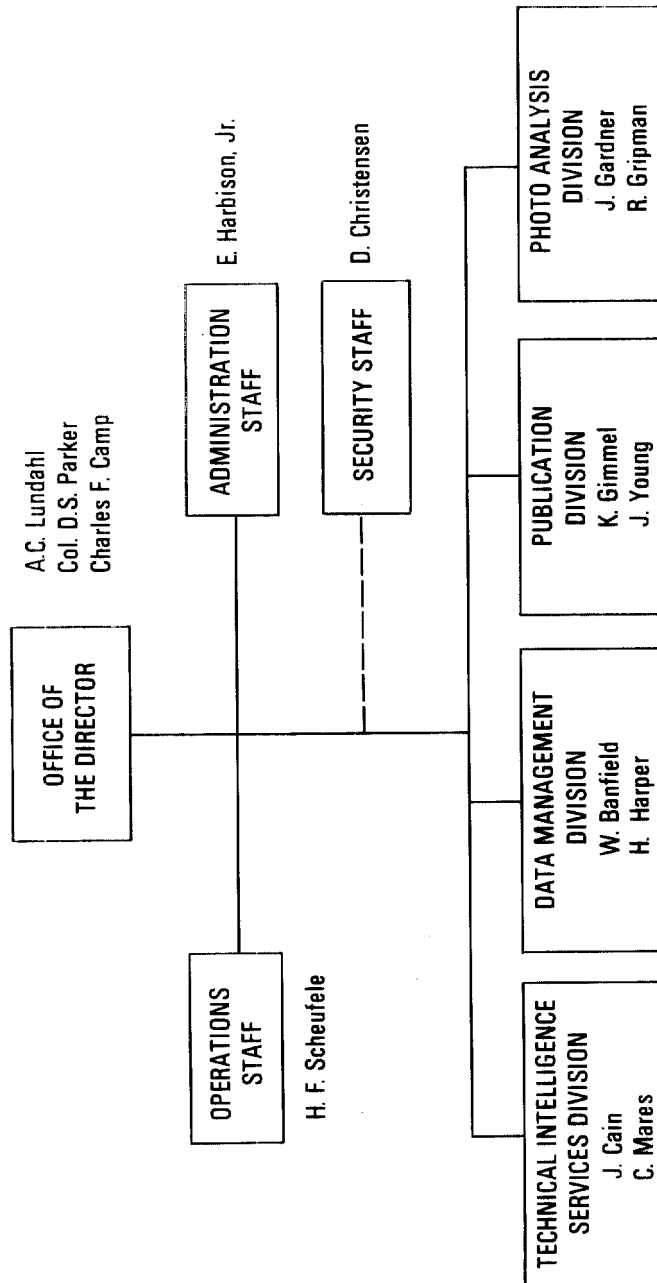


Figure 6. NPIC Organization at Time of Cuban Missile Crisis.

made to keep the premises looking as innocuous as possible. Yet the regulations for transporting U-2 film specified that its movement had to be under armed guard. The Navy was following the rules to the letter. But in doing so, it was revealing that personnel in the Steuart Building at 5th and K, N.W., were engaged in some extremely sensitive work (Figure 7).

Robert Kithcart, a businesslike reserve paratroop captain, who was in charge of all the film and files in the building, received the box of film from Mission 3101 in Room 402. Eight cans of film—464 frames for each camera—were in the box. Kithcart duly recorded the receipt time in the log: 0955. He checked the manifest, signed a copy to be returned to the Naval Photographic Interpretation Center, and assigned and affixed film library control numbers 11476 through 11483 to the cans of film. He then placed the film in a wire basket to be delivered to Earl Shoemaker, the coordinator for this mission.

After being notified that Mission 3101 had been successfully flown over Cuba, NPIC had been preparing to exploit the photography and to report the findings in a "SITSUM" (situation summary for the mission), which, when completed, would be cabled to watch offices throughout the intelligence community. Somewhat later it would be disseminated by courier in hard-copy form to a larger number of intelligence analysts.

Several tasks had to be carried out before the film arrived. The targets covered on the photography had to be anticipated. The PIs had to be informed of the reporting requirement for each target. They also had to be provided with a work sheet with the target identifiers (installation name, location, geographic coordinates, target numbers, and various sorting codes); a target brief (a computer printout of previous photographic coverages and readouts of the targets, as well as a summary of the requirement and related collateral intelligence); and a packet of collateral support materials for each target, including a map, photo chips, and intelligence documents. These preparatory steps required speed and the use of a computer.

Marvin Michell, the collateral support specialist for the mission, had performed these preparatory tasks for many missions. He began by plotting the mission flight track on a World Aeronautical Chart. He noted all the targets that should be covered on the photography. He then requested a "machine run," and the IBM 1401 computer began printing out the work sheets and target briefs. Knowing what support materials would be required, he selected reference materials on what might be seen: missiles, aircraft, airfields, ports, and industries. Then he assembled the paper printouts from the computer with

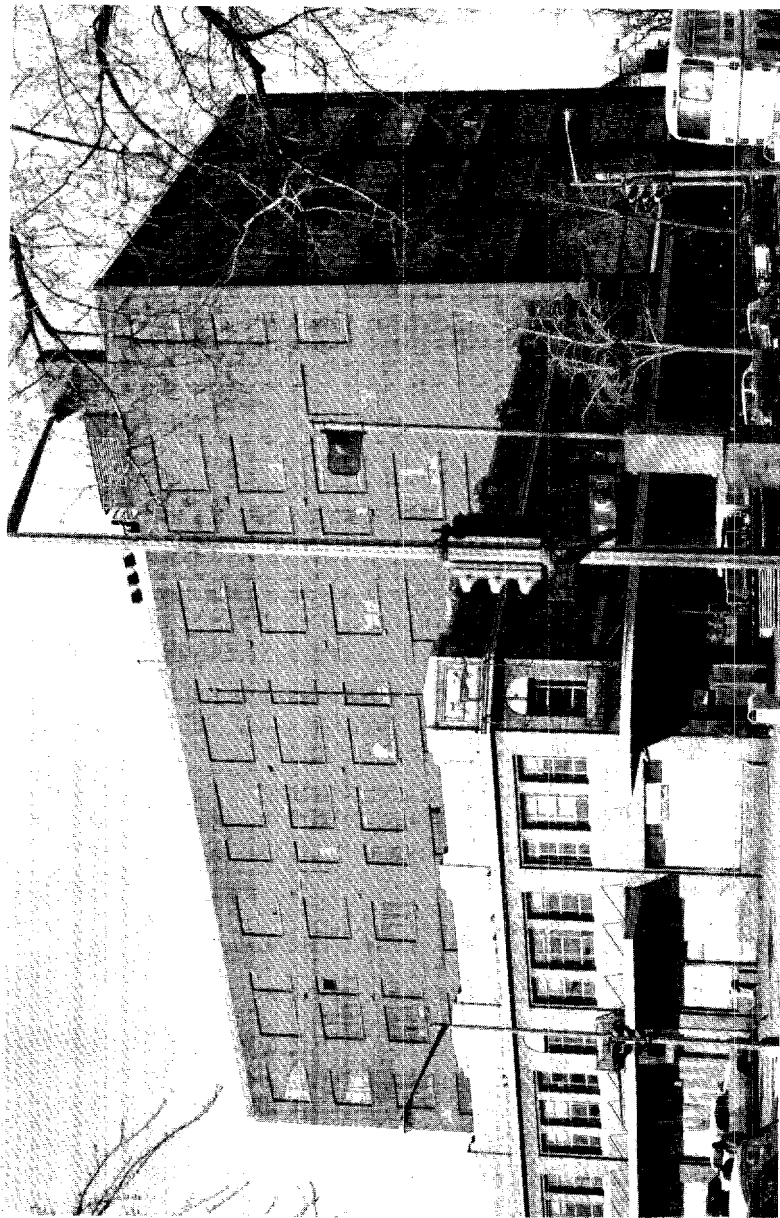


Figure 7. Stewart Building.

the target packets and sorted them according to the assigned teams of photo interpreters. When word came that the film had arrived in the building, Marv wheeled his library cart of materials to Room 704 where the PIs were waiting.

Earl Shoemaker had his photo interpretation teams ready. He had checked the flight track; this would have been a short mission. The film cans arrived and were distributed among the teams. The PIs began cranking the film onto the light tables.

Normally, six PI stations scanned Cuban photography. But since Mission 3101 was a short mission, with just eight cans of film, only three stations were used. The three stations were manned by six PIs—three teams of two interpreters representing the CIA, Army, Air Force, and Navy. Backup or special teams of photo interpreters would be provided as needed. (Figure 8.)

Various types of photographic viewing equipment were used—hand-held tube magnifiers ranging in magnification from 7 to 13 power, fixed stereoscopes with magnification of 2.4 or 7 power, zoom stereo microscopes with magnification ranging from 10 to 60 power, and roll film viewing tables with a built-in light source. Most of the equipment had been designed and built for the Center to exploit U-2 photography.

As they examined the film, the PIs wrote their observations on the worksheets and passed the sheets to their team leaders for review. An editor then checked the sheets for style and completeness and handed the edited sheets to the mission coordinator for approval. From him, the worksheets flowed to a keypunch operator. One IBM card was punched for each line of text. The cards were then fed to the computer. Normally, after the last card, the computer printed out a proof run in subject order (missiles, airfields, etc.). A corrected proof would then be run, and the final version of the SITSUM would be ready to be transmitted by cable and reproduced in hard-copy form. The SITSUM for Mission 3101, however, was destined not to leave NPIC for several days.

The two cans of film of the San Cristobal area were given to the scan team of Gene Lydon, a CIA PI, and Jim Holmes, an Air Force PI. Scanning the countryside, they spotted military vehicles and tents. The equipment and tents along the fence rows were reminiscent of preparatory work for developing SA-2 sites. The two PIs searched for the Fruit Set guidance radar and the missile launchers to identify another SAM site. None was found. Because cruise-missile sites recently had been identified along Cuba's northern coast, their attention shifted for cruise-missile launchers and attendant guidance radars. Again, none was found.

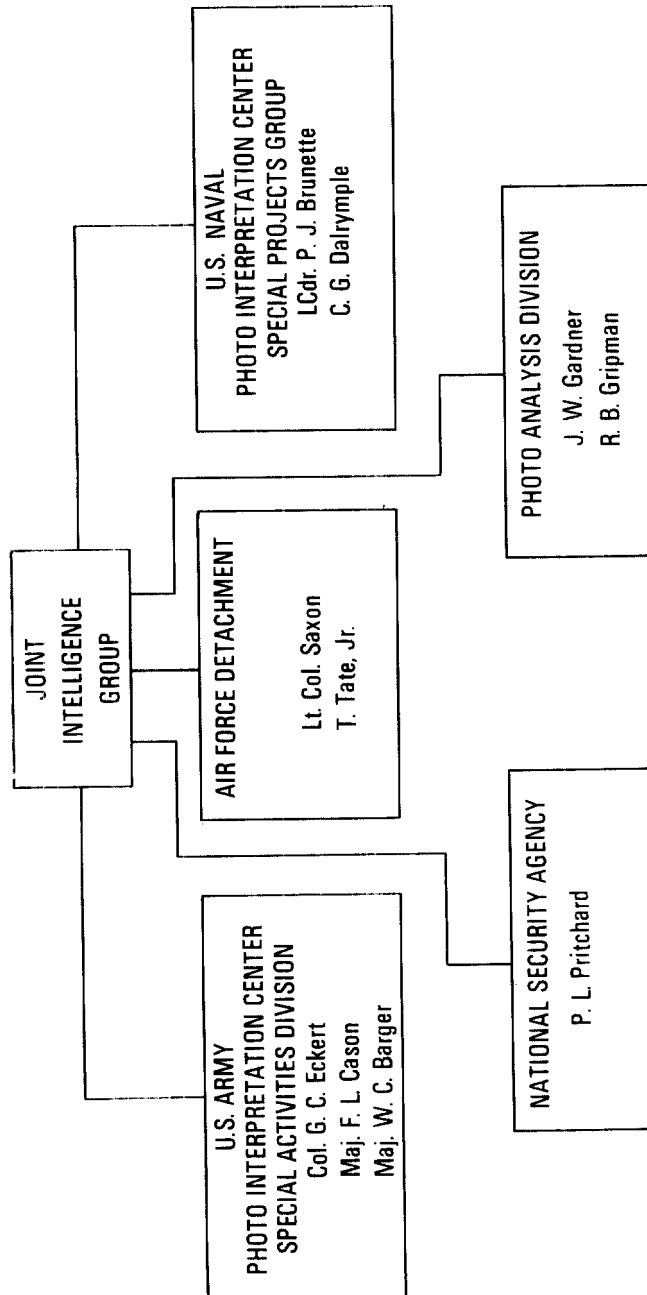


Figure 8. Composition of NPC at Time of Cuban Missile Crisis.

Then the PIs spotted six long canvas-covered objects. Lydon and Holmes roughly measured the objects several times. Each time the measurements were more than 60 feet long. It was then about noon, and both men paused for lunch.

After lunch they resumed their efforts but still could not positively identify what they saw. The equipment appeared to be missile associated, so the film was labeled "possibly missile-associated installations" and handed to Shoemaker. Shoemaker gave the film to the missile back-up team, which consisted of four men representing the Air Force, Army, Navy, and CIA (Figure 9).

Jim Holmes, a civilian Air Force representative, was a soft spoken, yet tough minded and intense, photo interpreter. A native of Pittsburgh, he was only 29 but a veteran of 12 years of government service. He began his government career at 17 as a GS-2 cartographic technician at the Army Map Service where his aunt was a training officer. She made sure his training was especially thorough. This thoroughness and his meticulous eye for detail were to pay off that day. His training in map compilation work also made him aware of unnatural features on aerial photography. An Army veteran, he was also a night student at American University.

Twenty-two-year-old 2nd Lt. Richard Rininger was the Army member of the team. Born in Laramie, Wyoming, he had a B.A. in history from the University of Wyoming. He had graduated from the U.S. Army Photo Interpretation School at Ft. Holabird in June, 1961, and was assigned to the missile back-up team at the Center the following May. Rininger was a tall, erect, and slender young man with a stern face. He was affable but generally quiet. He had a no-nonsense approach to problems and was painstaking at detail. The subtle differences in the various models of Soviet equipment had been stressed heavily at Ft. Holabird. Dick was an expert on military hardware and knew most of the equipment basic to Soviet line divisions.

A native of Maine, Joe Sullivan, a civilian Navy representative, was a puckish, attractive Irishman. At 50, he was the senior member of the team, with 19 years experience with the stereoscope. He was reserved, thoughtful, and extremely courteous. He was especially appreciated for his sense of humor. Joe had served in World War II as an aerial photo-topographer both in photo-reconnaissance squadrons and in engineering topographic companies in the Army Air Corps. This background, combined with subsequent experience at the Army Map Service and with the Navy, made him thoroughly familiar with topography and mapping.



Figure 9. Left to right, Lt. Richard Rininger, Army; Joe Sullivan, Navy; Jim Holmes, Air Force; and Vince DiRenzo, CIA.

Vince DiRenzo was the CIA representative on the team. From Shenandoah, Pennsylvania, he was 32 and a former marine. He joined the Agency in 1956 fresh from the Graduate School of Geography at Clark University. His abilities were as bright as the shine he constantly maintained on his shoes. He was affable and possessed a good sense of humor. Joe Sullivan made constant fun of Vince's Crooks and Marsh Wheeling cigars. Vince, too, was meticulous. He and his branch chief, Bob Boyd, had performed detailed support for covert operations. Vince had also reviewed Berlin corridor photography and had carefully categorized and prepared an excellent file of stereo pairs of all SA 2 support equipment and of the other pieces of military hardware observed there.

Earl Shoemaker gave the duplicate positives to DiRenzo, the team leader. After scanning the photography, DiRenzo determined that several tasks had to be completed before the function of the site could be identified. The location had to be established, the canvas-covered objects measured and identified, the support equipment counted and categorized, and a negation date established to determine when the equipment was not present.

The team began a systematic analysis of the photography. Rininger measured the canvas-covered objects, DiRenzo and Holmes identified the support equipment, and Sullivan determined the site location and negation date. After analyzing and completely checking all information, the PIs determined that the six objects were missile transporters. The measurements, computed manually by all members of the team, kept coming up in the 65- to 70-foot range.

Scanning the target area, DiRenzo identified 11 trucks and 15 tents in the immediate vicinity of the missile transporters and 28 other trucks scattered throughout the area. Entering the area was a convoy of ten trucks, two trucks with trailers, and eight unidentified vehicles.

Sullivan announced that the site was situated in the Sierra del Rosario mountains, about 50 nautical miles west-southwest of Havana, and Los Palacios was the nearest town. He also confirmed that this was an area of new activity; nothing had been seen or reported here before.

DiRenzo reexamined the equipment. None appeared to be related to an SA 2 missile. The SA 2 had been first seen in the Moscow Parade in November 1957. Numerous photos of the missile in a traveling mode had been obtained from this and subsequent parades. U 2 photography over the Soviet Union in 1959-60 had revealed patterns of deployment. DiRenzo, the Center's SA-2 specialist, had made stereograms of the missile, transporter, launcher, radars and

communication equipment, shipping containers, ground support equipment, assembly carts, checkout vans, cranes, propellant transporters and servicing vehicles, forklifts, water washdown trucks, etc.

No SA 2 equipment could be identified. The equipment at this site appeared much larger than that at the SA 2 sites. The team's skepticism bordered on the incredulous. How long had the equipment been there? Its position and size did not correspond to anything seen before. Was it real, or was it some sort of decoy? The support equipment indicated little. The PIs had to concentrate completely on the transporters.

It was tempting to conclude that they were looking at defensive missiles, not MRBMs. The group checked its work again, searching for something that might have been missed, some clue which might better explain this apparently extraordinary find.

DiRenzo called Jay Quantrill, a collateral support specialist, who had read all that was published on SAMs and MRBMs and had distilled all pertinent information into loose leaf volumes. Photographs taken at the Moscow parades and from Soviet handbooks were in the MRBM and IRBM books. Jay flipped through the pages and settled on a full side view of a missile (Figure 10). Vince said that looked like it. It was a photo of an SS-4. The photograph corroborated the team's findings. The team considered numerous possibilities and tried different approaches, but all avenues kept returning to surface-to-surface missiles, about 65 to 70 feet long.

DiRenzo was assured and straightforward when he contacted his chief, Bob Boyd, and announced "We've got MRBMs in Cuba." Boyd asked that the analysis be rechecked. It would have been easy to retreat and report the findings as unidentified missiles. But DiRenzo returned to the scope, and the team again went over the evidence.

At 1600, DiRenzo approached Shoemaker and said, "We've got big missiles in Cuba." Shoemaker's immediate question was, "How big?" So many previous reports of missiles had turned out to be SAMs that Shoemaker had memorized the standard SAM length of 35 feet. When DiRenzo said, "About 70 feet," Shoemaker asked, "What does that make them?" DiRenzo replied, "The SS-4 or the SS-3."

After reviewing the evidence on sizes and shapes with Rininger, Shoemaker said, "We've got to let Mr. Lundahl know about this before he goes home."

Shoemaker went to see his chief, Jack Gardner, and the intelligence production officer, Gordon Duvall. They, too, reviewed all the

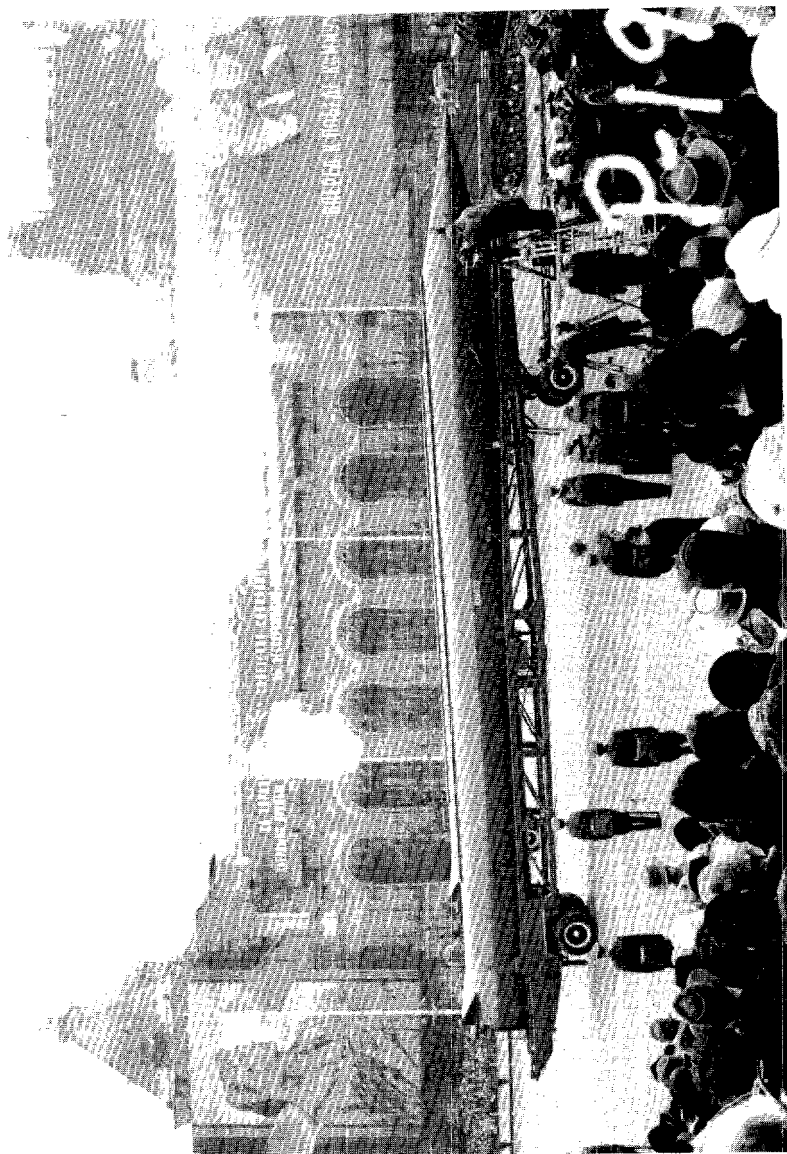


Figure 10. SS-4 In Moscow Military Parade.

information and decided that these indeed were surface-to-surface missile transporters.

By then it was obvious that work had to continue on into the night. At that point, it was also decided that each team member should notify his "service chief", Col. Robert Saxon and Ted Tate, for the Air Force, Col. G. C. Eckert, Army, and Lt. Comdr. Pete Brunette, Navy.

Gordon Duvall escorted Arthur Lundahl into the room where the back-up team was working. "I understand you have found a beauty," he said as he approached.

The men nodded agreement almost in unison. They escorted the director to the light table they had set up with the missile photos. DiRenzo pointed out the missiles on the frame. Lundahl swung the microstereoscope over the stereo pairs and carefully adjusted it.

"There are six of them," he said and began to examine the area. "It looks like a field expedient," he added.

DiRenzo agreed and pointed out the convoy. He said that the picture was taken at the right time since the equipment apparently was just arriving at the time of exposure.

Lundahl rose from the light table and sat on a drafting stool. He was grave as he listened. Rininger said that the mensuration indicated the missile transporters were approximately 65 feet long. The SS-3 was 54 feet long and the SS-4 was 74 feet long. Comparison with collateral photos taken in the Moscow parades led him to believe it was the SS-4. DiRenzo agreed.

After the discussion, Lundahl rose and walked a short distance. His hands were clasped behind his back. He and the team members remained silent.

"If there was ever a time I want to be right in my life, this is it," Lundahl said.

He asked if anything had been committed to paper. He was shown a few notes which related to the site location and the size and number of missile trailers.

Again seated on the drafting stool, Lundahl pointed to each member of the team. He addressed each by name and asked if he agreed. Each reply was affirmative. He then asked if there were any other possibilities. DiRenzo mentioned what is always considered at such a time -- the possibility that these objects were dummies. However, all signs pointed to their being genuine missiles.

There had been talk that the Center had a tendency to exaggerate rather than underrate a photographic find. But Lundahl well knew the implications of this one. He did not delay. He looked at each

member of the team. "Gentlemen, I am convinced. Because of the grave responsibility of this find, I want personally to sign the cable."

Lundahl asked who knew about the find. Jack Gardner, chief of the Photo Analysis Division, said that the "service chiefs" had been informed but had been told not to divulge the information until the analysis was complete. Lundahl then asked Gardner to invoke the codeword PSALM.

Lundahl asked if any photographic enlargements had been produced. Sullivan replied in the negative. He added that they had only the duplicate positive and it would take several hours to make photographic prints. Besides, they needed the duplicate positive to complete their analysis. Lundahl understood, and said that he would call Ray Cline.

A few minutes later, Lundahl identified himself on a secure line and said, "Ray, our worst fears are coming to pass in Cuba, because it looks like something more than defensive missilery is being deployed. In fact, we are convinced and ready to publish at your command an indication of the insertion of what seems to be medium-range missiles into Cuba. We don't know the full extent of their distribution, but we have found six missile transporters in a place called Los Palacios, about 50 nautical miles west-southwest of Havana. I have a team working the rest of the night, and by tomorrow we'll have a better fix on the situation. As you know, we have never seen this particular missile system field deployed in the Soviet Union. Therefore, we have to go very cautiously because it is new ground that we are breaking. But the dimensions, at least as they are coming out so far, the supporting equipment, as far as we can detect it, and the associations on the ground all seem to be clearly vectoring in on the conclusion that there are MRBM missiles in Cuba."

Cline was incredulous. He paused and asked, "Are you fellows sure?"

Lundahl replied "Yes. I am sorry to have to maintain it, but we are sure."

Lundahl added that Center personnel had been working on the material since noon, and within the last half hour they had reached a point where they felt sufficiently sure to tell him. Lundahl said that he had given the order to work through the night. The men were to make excuses to their car pools about not going home. Lundahl indicated that precise mensuration, full interpretation of the sites, and photo lab enlargements would not be complete until much later that night.

"Are they ready to fire?" Cline asked.

Lundahl answered that he didn't think so, since the equipment was dispersed and no pads or erectors were evident.

"How many transporters?" Cline asked.

Lundahl said that we could clearly count six.

Cline said, "Well, we've got to get on this one right away. I'll get hold of Carter."

Returning to Lundahl, he added, "I'll rely on you, of course, to keep me posted. But in the absence of any other contacts, I want you to plan to be in my office with the evidence by seven-thirty tomorrow morning."

Lundahl agreed.

The call had been made. Lundahl recollected his thoughts. A lot of questions would certainly be asked tomorrow and he should have answers or explanations for as many as possible. Lundahl wondered why the Soviets had left the missiles and support equipment exposed in an open field in such a manner that they would surely draw a photo interpreter's attention. He reasoned that the Soviets must certainly have ample evidence of the advanced quality of U.S. reconnaissance and interpretation---enough so that they should know that such sites would not escape detection.

Lundahl remembered that a number of U.S. balloon cameras had fallen into Soviet hands in 1956 and that the Soviets had thoroughly studied their optics and film qualities. He concentrated on the events of Powers' U-2 flight. He remembered Khrushchev's saying in a speech on May 7, 1960, that a "competent expert commission" had been established to examine the plane and its equipment.¹² He remembered Khrushchev had grudgingly admitted that, "The camera used is not bad; the photographs are very clear."

Professor Gleb Istomin's description of the "B" camera and its film at Powers' trial was so detailed and accurate that it was almost like reading pages from the contractor's tech manual.¹³ Istomin also said that compared with the film used in the "spy balloons," the film in the U-2 had been improved "... for a number of specifications essential for high altitude aerial reconnaissance of military, industrial, and topographic objects."¹⁴ This admission could be regarded as proof that the Soviets were keeping abreast of U.S. advances in aerial reconnaissance.

Lundahl remembered the remarks of his old friend Amron Katz of the Rand Corporation. While participating in the December 1960 Pugwash meeting in Moscow, Katz was asked by a prominent Soviet

¹² *No Return for U-2*, Foreign Language Publishing House, Moscow, 1960.

¹³ *The Trial of the U-2*, Translation World Publishers, Chicago, 1960.

¹⁴ *The Trial of the U-2*, Translation World Publishers, Chicago, 1960.

scientist about the kind of film used in the U-2. When Katz asked the reason for the question, the Soviet scientist responded, "They were damn good pictures."¹⁵

Lundahl thought of President Eisenhower's speech following the Powers' U-2 incident and the photo of the San Diego Naval Air Station the President had used on a nationwide telecast. Maybe the photograph was not an "average" one, but the Russians were surely aware that if we could observe parking lot lines about six inches wide, we could resolve images in the two foot range.

As past president of the American Society of Photogrammetry and a yearly visitor to its annual Washington convention, Lundahl remembered seeing the Russians visit the displays many times picking up all the free literature on cameras and exploitation equipment from the research and development organizations, the armed forces, and commercial firms. This convention alone gave a valuable insight into the state of the art of U.S. aerial reconnaissance. Lundahl also considered all the information published in journals, company publications, and the armed services throughout the years, some of which he knew the Soviets subscribed to.

He also remembered the many Russian books that NPIC librarians had sent him on photogrammetry, mapping and charting, and photo interpretation. He had a number of Russian articles translated. They indicated that the Russians were well aware of western advances in optical and film technology.

Lundahl then tried a different tack. Why didn't the Soviets camouflage or conceal? They must have known that Cuba was being subjected to aerial reconnaissance. Cuba was protesting at regular intervals the number of U.S. violations of its air space. On several occasions, Cuban fighter pilots saw the U-2 aircraft. And several times in September, Cuban radars had tracked the U-2.

Lundahl then recalled that the Soviets knew the U-2 had been flying over their territory for four years. In fact, Khrushchev knew the exact day of the first flight and had chastised General Nathan Twining who had recently visited the Soviet Union. After General Nathan Twining's visit, Khrushchev said, Twining had ordered a spy plane to fly over the USSR.¹⁶ Yet Lundahl couldn't recall a

¹⁵ Amron Katz, *The Soviets and the U-2 Photos—A Heuristic Argument*, Rand Corporation, Memorandum RM-3584-PR, March 1963.

¹⁶ Twining left the Soviet Union July 2, 1956. Khrushchev was to later say "I shall say further when Twining, the then Chief of Staff of the Air Force, arrived here we welcomed him as guest and entertained him. He left our country by air and the next

single incident when the Soviets had used camouflage, deception, or concealment on their missile R&D, production, deployed facilities, or on any program or site for that matter.

Why would the Soviets deploy their missiles at this time of year? Lundahl recalled questioning me about the weather during October in Cuba. I had replied that it could be categorized into wet and dry seasons. The wet season extended from May into October. This time of year (October) was characterized also by strong winds, torrential rains, and thunderstorm activity. Cloudiness would be relatively uniform over the island. Maybe the Soviets had planned to move in and set up under this weather umbrella. But this would be risky since there would be days of clear weather when reconnaissance flights would be extensive.

Lundahl checked his calendar for any appointments which would conflict with the next day's briefing. He wrote "crash" and "MRBM" on the page for 15 October. He looked at the page for 14 October, on which he had jotted "Mission No. 3101." Printed to the right of the date was "Dwight D. Eisenhower Born 1890." He thought how ironical it was that on the former President's birthday, the reconnaissance vehicle that Eisenhower had sponsored and which was to give him so much good intelligence—and also the heartache of the Powers flight—was to deliver the critical evidence that the Russians had deployed missiles in Cuba.

At CIA headquarters, General Carter had planned an informal reception for the Commonwealth conferees in the Executive Dining Room. Although Cline was the conference host, he delayed his arrival until 1815 hours to study the impact of the new intelligence find. Cline called Carter aside and indicated to him that it would take several hours to wrap up a definitive report with a fully considered analysis. They discussed the task of alerting the intelligence community. Carter said that he was going to have dinner with General Maxwell Taylor, Chairman of the Joint Chiefs of Staff, and General Joseph Carroll, the Director of the Defense Intelligence Agency, and would let them know.

At around 2100, Cline called McGeorge Bundy at his home and, in doubletalk, gave him the information in broad terms. Bundy immediately grasped the import of the new find. Cline re-emphasized that NPIC was working on the photo materials and that substantive

day sent a plane flying at great altitude over our country." He added, "only an animal might act like Twining, eating at one place, might do its unpleasant business there."

Text of Krushchev's Speech Warning Nations with Bases used by Spy Planes, New York Times, May 10, 1960.

intelligence officers were assessing their significance. Cline promised to have the evidence and assessment for Bundy the first thing the next morning.

Much has been said about the fact that McGeorge Bundy did not immediately call and brief the President. Later, when the President asked why, Bundy responded with a memorandum "For your memoirs":

(In the memorandum he said, in part) Its validity would need to be demonstrated clearly to you and others before action could be taken. The (photographic) blowups and other elements of such a presentation would not be ready before morning. . . . (To) remain a secret. . . . everything should go on as nearly normal as possible. In particular there should be no hastily summoned meeting Monday night. (Bundy, Rusk, McNamara, and others were all at different dinner parties where reporters, foreign diplomats, and other guests might become suspicious.) This was not something that could be dealt with on the phone. . . . What help would it be to you to give you this piece of news and then tell you nothing could be done about it till morning? . . . You were tired (from) a strenuous campaign weekend, returning . . . at 1:40 Monday morning. So I decided that a quiet evening and a night of sleep were the best preparation you could have. . . .¹⁷

Cline next called Roger Hilsman of the State Department and conveyed the same information to him. This time he had more difficulty indicating over the unsecure phone that he meant MRBMs ("mediums"), rather than aircraft ("medium bombers"). Hilsman immediately alerted the Secretary of State.

Dave Parker, the Deputy Director of NPIC, called John Hughes, a special assistant to the director of DIA, and asked him to come to the Center as soon as possible because of an important discovery. Hughes and John McLauchlin arrived at 1900 hours.

John Hughes reviewed the duplicate positives, talked to the photo interpreters and to Sid Graybeal, and carefully jotted the salient facts on a small pad. Convinced that these were offensive missiles, he and McLauchlin proceeded to General Carroll's Bolling Field home. Carroll was dressing for a dinner he would attend with Carter at General Taylor's residence. After hearing the evidence, Carroll called Roswell Gilpatric, Deputy Secretary of Defense, and said that John Hughes was coming over to fill him in on some new and very important intelligence on Cuba.

They arrived at Gilpatric's apartment as he finished dressing for dinner. Hughes presented the facts from notes and then said that the photographic prints and laboratory work would not be ready until the next day.

¹⁷ Theodore C. Sorensen, *Kennedy*, Harper & Row, New York, 1965, p. 673.

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Gilpatric asked Hughes to be ready to brief the Secretary of Defense the first thing the next morning. McNamara was then at Robert Kennedy's home attending a self-improvement seminar.

Hughes, an able briefer, returned to the Center and began to prepare for the next morning's presentation. Four months later, on 6 February 1963, Hughes, with the Secretary of Defense, would appear on national television and give a detailed photographic review of the introduction of Soviet military personnel and equipment in Cuba, emphasizing the introduction and removal of missiles.

At 1830 hours, Norm Smith, chief of the Non-Soviet Weapons Branch, Offensive Missiles Division of the Office of Scientific Intelligence, called Sid Graybeal, his division chief. Norm said that NPIC had found something hot and that Graybeal should go to the Center as soon as possible. Graybeal arrived approximately one hour later. He was shown the photographs and given a description of the find. He agreed that these had to be offensive missiles.

Sid told the team that he did not wish to disturb them, but that he would like to remain, listen to their conversations, and jot down all pertinent details. At 2030, Sid called Cline and stated that the information was hard and that there was no doubt in his mind that these were offensive missiles. Cline asked Sid to be in his office the next morning to help write an appraisal.

In retrospect, one of the remarkable events in that long day of events—and one that spelled confidence in Arthur Lundahl and the Center—was that the government had been alerted by word of mouth. Not a single word in cable or printed form about the Cuban situation left the Center that night.

The problem of assessing the type of missile—SS-2, SS-3, or SS-4—depended on the overall configuration. The 65-foot dimension derived so far was that of a missile—less nosecone.

Cline's immediate concern was about what would be said at the White House. Graybeal reviewed the sizes of the SS-3 and SS-4 and agreed that the missiles appeared to be SS-4s. But the evidence was not conclusive. The main question was why the Soviets would send over the advanced SS-4 rather than the older SS-2, of which they apparently had a surplus. Graybeal, therefore, did not completely discount the SS-2. But he did favor the SS-3 or SS-4.

The dimensions of the transporters suggested that either the SS-3 or the SS-4 ballistic missile system was involved. Both systems were road-mobile and could be deployed with no heavy construction necessary for launch pads and support buildings. Both the SS-3 and SS-4 were single-stage missiles and would carry a 3,000-pound warhead

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to maximum ranges of 700 nautical miles and 1,100 nautical miles respectively, with CEP (circle error probability) estimated in the 1 to 1.5 nautical-mile range. The SS-3 required liquid oxygen as an oxidant, while the SS-4 employed storable propellants. From logistical and operational standpoints, the SS-4 would be more advantageous in Cuba.

A quick search of shipping photography turned up no evidence of missile shipments, and other information did not definitely indicate when the missile units arrived in Cuba. The personnel and equipment evidently had been shipped from the USSR as an integrated road-mobile unit suitable for field deployment. The time required to reach operational readiness, therefore, could be quite short. Assuming that the necessary fueling and handling equipment were available, that communication equipment was being installed, and that warheads were in Cuba or enroute, an operational capability could exist within the next few weeks. No facilities to store nuclear warheads at the installations could be found.

Ranges of the missiles were plotted. From their sites in Cuba, the 700-nautical-mile missiles could reach such eastern U.S. targets as Savannah and New Orleans, including seven SAC bomber and tanker bases and one important naval base. The 1,100-nautical-mile missiles could reach 18 SAC bomber and tanker bases, an ICBM base, three major naval bases—and Washington, D.C. Both systems had enough range to reach many U.S. population and industrial centers and atomic energy and space installations. The Panama Canal and U.S. bases as far east as Puerto Rico were also vulnerable.

Photo laboratory personnel had waited since 1700 hours for the photo interpreters to relinquish the duplicate positives so that they might make the necessary prints and enlargements. Jimmy Allen, a photo lab section chief, had much experience waiting for imagery from PIs. He contentedly puffed a cigar. Jack Davis, the new chief of the photo lab, waited nervously.

At 2030, Earl Shoemaker brought the duplicate positives to the lab. Within a few minutes the order specifying the number of enlargements and contact prints to be made changed several times. Normally, control codewords are given to priority or special laboratory work. When Allen asked what codeword he should apply to the Cuban material, Davis replied, "This is all so confused, a good term might be mass confusion." All the photographic lab work done that night and during the rest of the missile crisis received priority treatment if it bore the title "Mass Confusion."

At 2030, Gardner wanted the missiles measured precisely. Leon Coggin was listed as the standby photogrammetrist. He had just moved into a new home and the telephone had not yet been installed. But he had left word that if he had to be reached his nearest co-worker, Eugene Ricci, should be called. Gardner called Ricci who drove three miles to inform Coggin.

Soon there would be an around-the-clock atmosphere of sleeplessness and anxiety as the interpretation of each mission unfolded significant events. But now it was 2045 hours, and most of the men took time out for dinner.

Joe Sullivan, who had his bag lunch from home, remained in the Steuart Building and reviewed what had to be done. The precise location of the missile site had not been established. Sullivan concentrated on this task. The landscape—particularly around the loaf-like hills north of the sites—resembled that seen on picture postcards. And the fields in the area looked alike. Sullivan began precisely locating (to degrees, minutes, and seconds) the missile encampment. He selected the best maps of the area (AMS Series E 723, sheets 3584111 and 35831V, scale 1:50,000). Ironically, the maps bore in bold red letters the caveat “FOR OFFICIAL USE OF GOVERNMENTS OF CUBA AND UNITED STATES ONLY.” The agreement to produce these charts had been made under the Batista regime. Now the charts were being used against the Castro regime.

Sullivan examined the pertinent frames of photography. In order to pinpoint the particular farm field where the missiles were encamped, he tried to locate prominent landmarks in the vicinity of Los Palacios. As he scanned the photography, large objects at a second military encampment caught his attention.

He called out, “I’ve got something new.”

Gardner, seated nearby, came to the station. “What do you have?”

Sullivan said, “I don’t know.”

Gardner then asked “What does it look like?”

Far from vividly describing the objects, Sullivan said, “They look like boats.”

“Boats?”

“Yes, boats.”

“That’s a funny place for a boat—in the middle of an island.” Gardner was a reserve naval officer, and it occurred to him that the objects could be pontoon boats or other boats used by engineering units. He asked, “What kind of a boat?”

“Like a big whale boat,” Sullivan replied.

Rininger then took his turn at the scope to confirm Sullivan's observation. He confirmed Sullivan's two "boats" and, searching the area, he added, "Here's another one just like the other two. And here's a fourth."

Holmes took his turn at the scope, and Sullivan asked him to check out what appeared to be lines extending from each "boat." Holmes said, "I think those are cables."

Then it was DiRenzo's turn. He traced the cables. The meaning of the picture appeared with sudden clarity. The boat-like objects were the launcher erectors. And nearby were the missiles. Beyond question, the installation was a field-deployed MRBM site.

The course of events changed dramatically after the finding of the second site. But the PIs were acutely aware that the coverage on this mission was extremely limited. The gnawing question in all their minds was how many sites were in areas not covered on the photography.

As the search continued, a third area 4.2 nautical miles west of San Cristobal came under close scrutiny. The area contained 35 vehicles, 15 large tents, and seven new buildings. It had the same characteristics as the other two sites but contained no missiles. The PIs labelled it a military encampment and ordered up an enlargement for further study. A few days later, it bore the name of San Cristobal MRBM Site No. 3.

Coggin, the photogrammetrist, arrived at the Steuart Building at 2145 and reported to Gardner on the seventh floor. Gardner told him what objects he wanted measured and said he would ask Rininger to help him. Coggin went to Room 607 which contained the precise photogrammetric gear and turned on the Mann Model 621 comparator and the ALWAC 111E computer. While the electronic components were warming up, he computed the altitude of the U-2 and the pitch and roll of the camera.

At approximately 2230 hours, Coggin placed the film on the Mann comparator (Figure 11) and began measuring the missiles. The measuring mark, or crosshair, was placed on the extremities of the object being measured. The comparator then automatically recorded on paper tape the X and Y coordinates of each position. Each measurement was made several times in order to obtain an average value. Rininger assisted Coggin in identifying the objects and equipment to be measured. The operation took about an hour.

At 2230, Coggin entered the coordinates and appropriate computer programs into the ALWAC computer. Tests were designed to check the computer's performance. After the first test, line voltage prob-

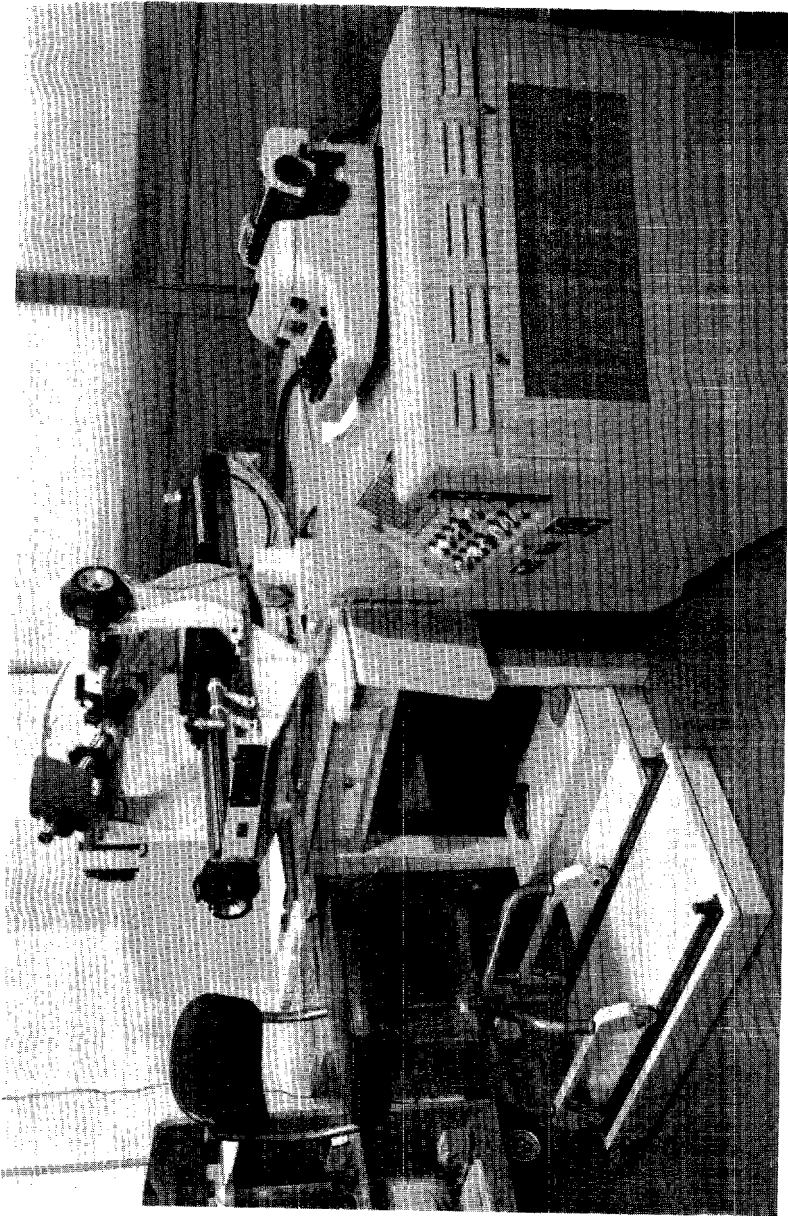


Figure 11. MANN Comparator.

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lems began to develop, causing the computer to drop bits (digits) in the test routines. Few people were as skilled with computers as John Wyman, the regular computer operator, so Coggin phoned him at home. Wyman asked for the voltage reading at the power supply cabinet which supplied the various computer components, then told Coggin to vary some of the voltages and try the test routines again. Coggin followed his instruction, got the desired results, and started the computations. The computer malfunctioned three times, and each time Coggin called Wyman. Finally, the tests were clear and Coggin began to process the tapes from the Mann comparator. The length of the transporters consistently came out at 67 feet and the width at 9 feet.

The Sandal (SS-4) MRBM missiles observed in Moscow parades were very close to 67 feet long, less the nosecone. The Shyster (SS-3) MRBM also observed in the parades measured only 54 feet, less the nosecone. Shyster was, therefore, unlike the missiles observed in Cuba.

At 0145, Gardner asked for measurement of the missiles at the second site. The computer was now operating properly, and Coggin found that all dimensions approximated those at the first site.

At 0300, Gardner phoned Dean Frazier, graphics duty officer, to round up a graphics crew and come to work immediately. Several briefing boards had to be prepared for Mr. Lundahl before 0700 hours. Dean's crew—graphics analysis officer Dan McDevitt, illustrator Glenn Farmer, and headliner (typesetting) operator Loretta Huggins—arrived at the Steuart Building at about 0430 and found the annotated photographic prints ready. Frazier and McDevitt began preparing the briefing boards and Farmer the vugraphs. Miss Huggins prepared the type for both. Frazier and McDevitt finished first. They logged the titles of the briefing boards and their GAB (Graphic Analysis Branch) number.

Three briefing boards and three vugraphs were prepared:

1. San Cristobal military encampment (Figure 12)
2. Los Palacios military encampment (missile)
3. San Diego de Los Banos MRBM Launch Site

Lundahl arrived at the Steuart Building at 0600 on 16 October, and carefully reviewed the packet of briefing boards and background notes Shoemaker had assembled. Somehow the boards imparted an extraordinary feeling. They depicted a frozen moment in history. The effect was one of total, devastating loneliness. Lundahl examined several Moscow parade photos of the SS-4 and asked that they be placed in his packet. He jotted down several notes about the range and per-

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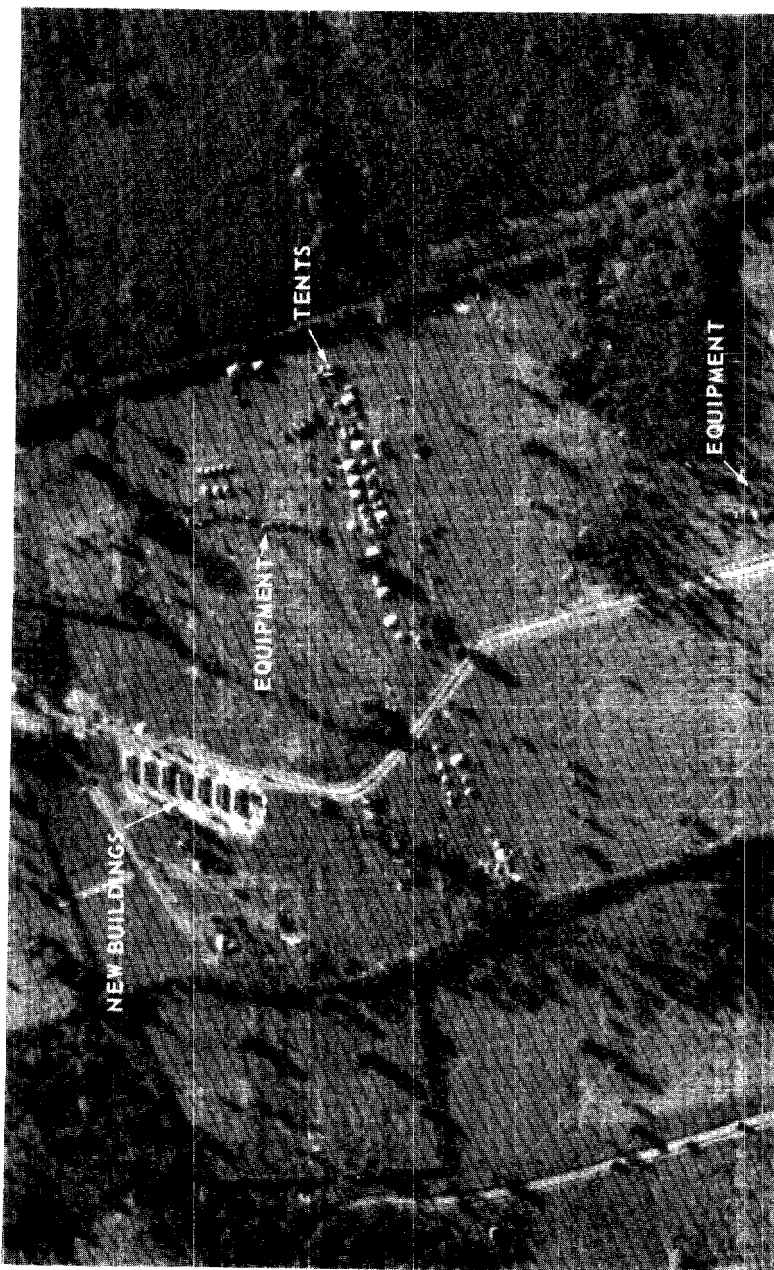


Figure 1.2. San Cristobal Military Encampment.

formance of the SS-4 from missile reference manuals. He would study these and the background briefing notes on his way to Langley.

Frank Beck, the courier, was waiting. Lundahl closed the black briefing case and said, "Let's go." He asked Shoemaker to thank all the people who had worked that night and asked that they go home and get some sleep. It was then 0700.

Lundahl arrived at Cline's office half an hour later. Personnel from the substantive intelligence offices jammed the office. Lundahl displayed the photographic evidence, pointing out the salient features. When he finished briefing, Lundahl stepped back so that those gathered around could review the photography.

Ed Proctor, chief of the Military-Economic Division, was contemplative as he looked at the photographs. He tapped his pipe against his teeth. Soon he would spend many sleepless hours in the Steuart Building reviewing the intelligence from new missions and writing evaluations. But that day, at 1100 hours, he would address the Second Conference on Intelligence Methods on "Problems in Determining the Cost of Soviet Weapons Systems."

Cline, Lundahl, Graybeal, and the courier, Beck, left CIA headquarters shortly before 0800 and arrived at the White House a few minutes after 8. They went straight to McGeorge Bundy's office in the White House basement. They waited only a few minutes in his outer office before Bundy came out. Cline summarized the intelligence and asked Lundahl to show the briefing boards.

Lundahl spread the three briefing boards on a table and described the locations of the sites, the number and sizes of the missiles, and the extent of photographic coverage. Graybeal answered several questions about the type and range of the missiles.

Bundy asked the men to wait. He returned to his office, made a call, and then took the elevator to the Kennedy living quarters. He returned a few minutes later and informed Cline that the President had called an extraordinary meeting, in the strictest secrecy, for 1145 that morning. Bundy asked the three officers to remain in his office until the meeting.

At approximately 0900, Robert Kennedy came into Bundy's office and asked to see the information. Cline repeated his assessment and Lundahl pointed out the 14 missiles. Kennedy looked at the photos. His reaction was unprintable.

Lundahl later described Robert Kennedy's postures after the briefing as being like those of a prize fighter. He walked several times about the room smacking the palm of one hand with his fist. He may have been thinking of his recent conversation with a high-ranking official from

the Soviet Embassy, who—just back from Moscow—brought the Attorney General a personal message from Khrushchev to deliver to President Kennedy. Khrushchev wanted the President to be assured that under no circumstances would surface-to-surface missiles be sent to Cuba. And Kennedy may have recalled, as he expressed in his book, that “On September 11, Moscow publicly disclaimed any intention of taking such action and stated that there was no need for nuclear missiles to be transferred to any country outside the Soviet Union, including Cuba.”¹⁸

Kennedy now saw that it was obvious that the Russians were putting missiles in Cuba. In fact, they had been shipping them there and beginning the construction of the sites at the same time those assurances were being forwarded by Chairman Khrushchev to President Kennedy.

Kennedy came back to the area where Lundahl, Cline, and Graybeal stood. The seriousness of the moment was broken when Kennedy asked, “Will those damn things reach Oxford, Mississippi?” Before Lundahl could catch himself, he replied, “Sir, well beyond Oxford.” He then looked up to catch a slight gleam in Kennedy’s eyes and a wry smile on his face. Kennedy thanked the three intelligence officers and said he was going up to see the President.

After that day, all maps depicting the ranges of the Cuban missiles showed such sites as St. Louis, Atlanta, and, in the same bold type, Oxford, Mississippi (Figure 13).

At 0930, the President welcomed the astronaut, Walter Shirra, Jr., Mrs. Shirra, and their two children. On 3 October, Commander Shirra, the fifth American in space, had completed nearly six orbits in space in Sigma 7 before landing in the Pacific, 275 miles northeast of Midway. While the President was showing the Shirras the White House grounds and Caroline’s pony, Macaroni, high ranking officials began arriving. Douglas Dillon, the Secretary of the Treasury, went to Bundy’s office and asked to see the evidence. Again the briefings were repeated and photos shown.

By 0930, General Carter had arrived. Cline felt that Carter, as the acting DCI, should conduct the briefing. Carter agreed, and Cline advised him that Lundahl and Graybeal could provide complete analytical backup support. Cline suggested that he should return to his office and inform the DCI, then on the West Coast, of what was happening at the White House. He said he would also continue the

¹⁸ Robert F. Kennedy, *Thirteen Days*, W. W. Norton & Company, Inc., New York, 1969, p. 27.



Figure 13. Ranges of Various Missiles from Cuba.

research analysis and would prepare an assessment of the missile find. General Carter concurred with his plan.

Robert McNamara then arrived. He, along with his deputy, Roswell Gilpatric, had been briefed that morning by General Carroll and John Hughes.

The group assembled at a table in the Cabinet Room. The mood was tense and somber. Promptly at 1145, the President arrived.

The President came in through the door from his office. Everyone stood and said, "Good morning, Mr. President." He replied, "Good morning," and walked to the table. He was just sitting down when the door burst open and Caroline came half-way into the room and

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said, "Daddy, daddy," and something to the effect that "they" wouldn't let her friend in. The President smiled, excused himself, and, putting an arm around Caroline, walked her out of the room. He was gone no more than 30 seconds. When he re-entered, his expression changed immediately to one of seriousness. He said, "Let's get on with the business at hand," and asked General Carter to proceed.

Carter read a prepared statement and asked if the President wanted to look at the hard photographic evidence. The President indicated he did, and Lundahl asked permission to move in between the President and the Secretary of Defense to show the photographs. The President said, "By all means."

Lundahl proceeded with his briefing, giving the locations of the sites and the number and sizes of the missiles. The President asked numerous questions. Among them was, "Are you sure these are missiles?"

When the President began asking questions about the system, Lundahl stated that Mr. Graybeal was the Agency's missile expert and would comment. Graybeal moved in beside Lundahl. He discussed the SS-4 missile and what was known about its operational readiness status. He passed on the opinion that because the system had been transported from overseas by ship, there would undoubtedly be some problems in getting it back into an operational status. He added that there was no way of knowing exactly how long it would be before the missiles were operational, but it was more likely to be a matter of days than of hours.

McNamara asked where the nuclear warheads for these missiles were. The photographs had revealed no signs of nuclear warheads stored in the area. The Agency representatives did not doubt that they were either stored somewhere in Cuba or would soon be sent there. Graybeal said it was normal Soviet practice to transport the warheads with the missiles but that there was no evidence whether these warheads were or were not there. McNamara told the President that it was very important to learn the location of the nuclear warheads. Questions continued about the missiles—what was known about them, what payloads they could carry, how long before they were operational, and so on. Lundahl and Graybeal tried very carefully to point out what was known and what was unknown. The discussion then centered between the President and McNamara and, to a lesser extent, Rusk. The question-and-answer period lasted for ten minutes.

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At the conclusion of the presentation, the President turned to General Carter and said he wanted to express the nation's gratitude to the men who had collected these remarkable photographs and to the photo analysts for finding and analyzing the missiles. Carter graciously accepted the compliment and motioned to Lundahl and Graybeal to remove the material and prepare to leave the room.

The Cuban missile crisis was on.

*On the importance of contacts,
influence, and judgment*

ASSIGNMENT: SKYJACKER

Thomas Polgar

On 2 July 1971, Braniff Flight 14, a Boeing 707, left Acapulco for Mexico City, San Antonio, Dallas, Washington and New York. It was hijacked over the U.S.-Mexican border by a man and a woman, both carrying pistols.

The hijackers ordered the pilot to land in Monterey, Mexico, where Braniff paid a ransom of 100,000 U.S. dollars to free the passengers and all but five of the crew. The plane then proceeded to Lima, Peru where it was refueled. Also, the tired original crew was replaced with a fresh and volunteer crew consisting of four men (three pilots and a flight engineer) and two Peruvian stewardesses. The Peruvian authorities made no effort to impede the hijacker, a U.S. citizen named Robert Lee Jackson, and were tolerant enough to permit the airport doctor to provide Jackson with the pep-pills he requested.

The hijacker intended to take the plane to Algeria, where the government reportedly agreed to provide asylum. The Boeing 707, however, did not have sufficient range for a non-stop flight from Lima to Algiers. Accordingly, it was decided by Braniff that the plane would refuel in Rio de Janeiro prior to the long over-water hop to Africa. As the plane landed in Rio the Brazilian authorities, without consulting with Braniff, undertook to prevent the takeoff through the firing of smoke bombs. Unfortunately, these Brazilian measures were taken while the plane still had full engine power, and the hijacker drew the obvious inferences: he ordered the plane to take off, which was accomplished with less than half of the takeoff strip free.

At this point, the big jet had fuel for less than four hours' flight, sufficient within safety margins to reach only three capitals: Asuncion, Paraguay, Montevideo, Uruguay and Buenos Aires, Argentina. In only one of these cities was there both a Braniff station and an Algerian representation: in Buenos Aires. Therefore Braniff, which was still anxious to get the plane and the crew safely to Algiers, suggested to the hijacker that Buenos Aires would be the logical place both to service the plane and to obtain safe-conduct from the Algerian

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Ambassador. Jackson agreed to this, and the plane landed at Buenos Aires Ezeiza International Airport shortly after 1 P.M. on Saturday, 3 July. It had travelled about 7,500 miles, an all-time record for long distance hijacking, about 600 miles more than the previous record of Marine Corporal Rafael Minichiello, who took a TWA 707 from San Francisco to Rome.

The following is an account of what happened in Buenos Aires in connection with this hijacking.

Mission Assigned

At approximately 1300 hours on 3 July 1971 Mr. Barall, the Deputy Chief of Mission, asked me to proceed to the airport to assume responsibility for liaison with the Argentine authorities in connection with the hijacked Braniff Boeing 707. Mr. Barall said my primary mission was to ensure that the Argentine authorities not take any measures with respect to the airplane or its occupants without consultation and coordination with the U.S. Embassy.

I arrived at Ezeiza Airport a few minutes before 2:00 P.M., by which time the hijacked Braniff airliner was on the ground. Mr. John Wachter, Legal Attaché, and his assistant Mr. Robert W. Scherrer were already on the scene, established in the office of Mr. Harry Marples, Braniff Director.

I found the situation as follows: Mr. Marples had obtained informal agreement of the Argentine Air Force, Buenos Aires Area Command, represented by Air Force Brigadier General Roberto Donato Bordot, and confirmed by telephone conversation with Lt. General Alberto Rey, Commander-in-Chief of the Argentine Air Force, to refuel the hijacked Boeing 707, which was expected to depart for Algiers as soon as possible. Mr. Marples was also in continuing contact with the Ambassador of Algeria in Buenos Aires, Mohamed Messaoud Kellou, who indicated a willingness to provide safe conduct, provided that the Ambassadors of the United States and of Mexico concurred in such step and would support his efforts with the Argentine Foreign Ministry.

I was informed by Mr. Marples and his associates that there was tremendous pressure from Braniff headquarters in Dallas to provide safe conduct for the plane, that it was felt that prompt refueling and takeoff for Algeria would best safeguard the lives of the crew, and that the situation on board the aircraft was "ugly." Mr. Wachter and I took turns to relay this information to Mr. Barall and to the Duty Officer at the Embassy, Miss Josephine Ferguson.

Command Confusion

At approximately 1435 hours 3 July, refueling of the plane was halted by orders of the Federal Police, which also moved trucks into position to prevent a possible takeoff by the Boeing 707. This move came as complete surprise to the Argentine Air Force representatives on the scene, including Brigadier General Bordot. A few minutes later Major General Jorge Caceres Monie, Chief of Federal Police, arrived in Braniff operations and in my presence issued instructions to Brigadier Bordot that he—Caceres Monie—was in full charge, that he was receiving his orders directly from the President, General Lanusse, and that his orders were to prevent the takeoff of the aircraft. After checking with Lt. General Rey, Brigadier Bordot subordinated himself to General Caceres Monie (and played no significant role in subsequent proceedings).

General Caceres Monie was accompanied by Alberto Villar, Inspector General in charge of Criminal Investigations; Jorge Colotto, Chief of the Guardia de Infanteria (Combat Police); Alberto Caceres, Chief of Federal Security (Intelligence); Colonel Alberto Vallejos, chief of his personal staff, and other senior officers. Initially he set up his office in Braniff operations but subsequently took over the Pepsi Cola VIP lounge as his command post.

Our immediate problem with Caceres Monie was to talk him out of storming the plane, which he had the firm intention of doing. He had developed several plans, including putting nauseating gas into the plane through the air-conditioning system, introducing police dressed as mechanics and policewomen dressed as stewardesses into the plane, and straight physical assault. Eventually we prevailed on Caceres Monie to take it easy, and he agreed to undertake no action unless specifically instructed by the President. He was adamant in not permitting the plane to refuel or to receive any other type of ground support, and it took all the persuasive ability of Mr. Marples and myself to talk the General into continuing the supply of electricity to the plane, essential for communications as well as for cabin comfort.

A specific proposition from which we dissuaded Caceres Monie was to broadcast to the hijacker a statement that if any member of the crew were harmed, the hijacker would be put to death through slow torture.

While all this was going on, Mr. Wachter, Mr. Scherrer and I took turns communicating with Mr. Barall, with Political Counsellor Sowash, who by this time was in the Embassy on an open line with State Department, and with the Ambassador. In the meanwhile

Senor Jose Alvarez Tovar, Braniff Flight Supervisor, was in constant radio dialogue with the hijacker and succeeded in establishing a rapport with him which turned out to be of immense value in subsequent developments.

By this time—about 1700 hours—the hijacker was getting increasingly irritated and concerned about the delay of refueling and the display of police around the aircraft. He demanded to speak with Braniff manager Marples, who boarded the plane and returned about one-half hour later convinced that the hijacker meant business and that the only way out was to obtain the Argentine Government's concurrence for the takeoff of the hijacked Boeing 707. Marples at this point again talked with Lt. General Rey, Commander-in-Chief of the Argentine Air Force, who stated that the matter must be handled through regular diplomatic channels, that the Foreign Minister was in his residence awaiting contact from the U.S. Ambassador, and that a diplomatic note reflecting the views of the U.S. Government should be delivered without delay. A few minutes later I was called by Ambassador Guillermo de la Plaza, Director of Political Affairs of the Argentine Foreign Ministry, who conveyed suggestions as to the wording of the note and the manner of its delivery. This information was then telephoned to the Embassy where the Political Counsellor and the Duty Officer were maintaining an open line to Washington, to the Ambassador and to Mr. Barall. In the meanwhile Mr. Marples and his staff were maintaining an open line with Braniff in Dallas, Texas, which was being kept informed of all developments.

The next few hours were spent in a climate of intense expectation, waiting for the note to be signed, to be delivered and to be answered by the GOA. The hijacker, Bob Jackson, still appeared to be determined, in full control of his faculties, insistent on having his demands complied with, and demanding the presence of the Ambassador of Algeria. Throughout this period, from the Braniff office, and through the dedicated services of Jose Alvarez Tovar and the chief mechanic, Oswald Madonia, Jackson was being kept occupied with conversations about the conditions of the plane, the flight plan to Algiers, comparison of the characteristics of the Boeing 707 with a possibly available DC 8 and so forth. (These talks were monitored by the press and by the police and—apart from their news value—provided us with valuable information about Jackson's actual state of mind and psychology.)

The minutes and the hours were passing, and tension was building. Braniff was proceeding on the assumption that once the note was delivered to the Argentine authorities, the takeoff would only be a

question of refueling and technical preparation. Therefore, in addition to consultations and examination of the possibilities concerning the long over-water flight of the 707 to Algiers, an alternate DC 8 was being readied, and a special crew was being flown in from Rio de Janeiro, inasmuch as no Braniff relief crew was available in Buenos Aires. While Braniff was proceeding in good faith with plans for a possible change of aircraft, the police authorities were planning measures to capture or kill Jackson during the process of transfer from one aircraft to another. (Although he made no statements to the effect, General Caceres Monie was obviously anticipating a negative decision by the GOA on the U.S. request to permit the plane to proceed.)

At about 1930, Braniff notified General Caceres Monie that the ground generator supplying power to the plane was about to run out of gasoline and requested authority to change generators. Caceres Monie first denied this request, but upon hearing arguments from Mr. Marples and from me—to the effect that providing another generator would simply maintain the status quo, but that the discontinuation of electric power would unnecessarily provoke Jackson and might also limit our future options—he agreed. To effect the change in generator connections, Mr. Robert Williams, Flight Engineer, descended from the plane, was interrogated by Braniff and by the police and subsequently talked on the telephone with Ambassador Lodge, who by that time was at the Presidential Residence in Olivos.

Request from the plane to empty the chemical toilets was refused by General Caceres Monie.

At around 2145 the scheduled Braniff non-stop to New York was cancelled to have the plane available for a possible flight to Algiers.

At around midnight Braniff communications passed several messages to the hijacker originating with his family in the United States. Jackson appeared to be moved by the content of these messages and requested written confirmation.

The Governments Disagree

Word was beginning to spread that President Lanusse had decided not to comply with the request in the U.S. note, but official word was not received until about 0100 on 4 July that the Argentine Government demanded the unconditional surrender of the hijacker. (Although not stated, this implied definitively that the takeoff for Algiers would not be authorized. Accordingly, the stand-by crew was sent to bed, and the DC 8 was reserviced for a passenger flight to New York.)

A dramatic turn in the events came at around 0300 hours, when Captain Schroeder of the hijacked 707 was permitted by Jackson to leave the aircraft to mediate between the hijacker and the authorities. Schroeder said that Jackson appeared to be nearing the end of his resources and had concluded from the long delay that the plane would not be permitted to take off. Jackson was ready to negotiate. Schroeder urged that we send "Joe" Alvarez—the Braniff flight supervisor—to discuss personally Jackson's demands, but this suggestion was rejected by General Caceres Monie, who repeated the Argentine demand for unconditional surrender. The general also rejected suggestions that he negotiate directly with the hijacker because of the "no negotiations" policy of the GOA, but agreed to put to President Lanusse the possibility that a non-Argentine personality talk to the hijacker face to face.

At about 0335 General Caceres Monie asked to speak to me alone. The general said that President Lanusse agreed that a non-Argentine should negotiate with Jackson with a view to bring about his surrender and that Lanusse had asked that I undertake that mission. I said that I would be pleased to do so, but would have to check with my embassy. I telephoned Mr. Sowash, explained the circumstances and obtained his authorization to board the plane.

(In the meanwhile, the Braniff Security Officer, Mr. Pfizer, took an adamant position that Captain Schroeder should not return to the plane and invoked the authority of Dallas, which also ordered Schroeder not to return. Schroeder took the position that he gave his word of honor that he would return, that he wanted to be with his crew and that his refusal to return, i.e., violation of his word of honor, could not but prejudice my mission. After Marples and I supported Schroeder's position, Commissioner Inspector Colotto of the Federal Police overruled the objections of Mr. Pfizer.)

Through Braniff communications, Jackson was notified that Schroeder accompanied by an Embassy official would return to the plane. Jackson said he did not wish any traps, that he first wished to talk with Schroeder alone and that the Embassy officer should board the plane exactly five minutes after Schroeder.

Chat With a Skyjacker

Shortly before 0400 hours, 4 July, I boarded the aircraft, in accordance with the time specifications made by Jackson. I found Jackson in the co-pilot seat and Schroeder in the pilot's seat. I sat directly behind Schroeder and talked with Jackson, who turned around in his chair for the purpose. (Jackson already consumed some

of the beer which Captain Schroeder took on board. We obtained clearance for the beer from General Caceres Monie after explaining to him that the beer should not be considered as support to Jackson, but, on the contrary, a weapon which would help to defeat him. This was stated on basis of medical advice received from Braniff, Dallas, that beer on top of pep pills would act as a depressive agent.)

I opened discussion with Jackson by stating that he could take it from me, if he had not already so concluded from the long delay, that the plane would not be allowed to take off. I assured him that, on the basis of my knowledge of the Argentine generals' psychology, it would be unrealistic to expect a reversal of that position; that while his position was unfavorable in that sense, it was relatively favorable in another sense, i.e., he had not yet committed any major crimes under the jurisdiction of Argentina; and, while he should certainly expect to be tried and sentenced, I could guarantee that his life would be saved. I said that I could not offer him any deal but I wanted to hear his side of the story; I would relay his proposals to the appropriate authorities, and I was prepared to provide counsel to him, both personally on the spot, and legal counsel to assist him with the Argentine authorities. I said that while what he had done was not right, it could have been far worse, that I knew that he had treated the crew decently, that we all rejoiced that so far no lives had been lost, and that the time had come to start acting reasonably.

The above remarks started a long discussion with Jackson, which need not be reproduced in detail. He was coherent enough but with an astonishing lack of logic and an obvious failure to realize the gravity of his deeds or the consequences thereof. He did show great susceptibility to flattery, a certain warmth of personality and a sense of humor, perhaps exaggerated by his many hours of wakefulness and the effect of pep pills. Our conversation resulted in Jackson putting down on paper the following points and/or requests on which he wanted clarification:

- a. A copy of the extradition treaty between Argentina and the United States;
- b. The nature of the charges which he would have to face in Argentina;
- c. The bail system in Argentina;
- d. The future of his children; specifically, in exchange for the safety of the crew, he wished to have his children brought to Argentina;
- e. Safe conduct from Argentina for his girl friend, Ligia Lucrecia Sanchez, to whatever place she wished to go from Argentina;
- f. Co-determination with Braniff on the disposal of the \$100,000 which he obtained in Monterey. He did not expect to keep that sum, but wished that part of the sum be used for his legal defense, for the transportation and

maintenance of his children in Argentina, and the rest he wished to donate to a suitable charity, such as a children's home. He said he disliked the word "orphanage."

g. If and when he decided to surrender, he wished to do this to the senior officer present, without newspaper representatives witnessing the act, and he asked not to have handcuffs put on him.

I explained to Jackson the broad outlines of the extradition treaty between Argentina and the United States, dated 1898, on which I had previously been briefed by Mr. Wachter. The most important feature of this treaty—from Jackson's point of view—was that it contained no provisions for hijacking, there being no planes in 1898. Jackson insisted on seeing a copy of the treaty. I said it would take at least two hours to obtain it from the Embassy, assuming we could locate it at this time on a Sunday morning. He said he had plenty of time.

I explained the Argentine bail system to him, but added that this was a matter for judicial decision. We discussed all the other points, but I stated that these were all within the jurisdiction of the Argentine authorities and/or Braniff, and I could not speak on their behalf. I would, however, relay his words faithfully. I said that I acted in good faith in coming to see him alone and unarmed at this hour and in a pouring rain; that he had inconvenienced a great many people and that it was time for him to show some good faith by releasing the crew members, particularly the two Peruvian stewardesses. Jackson said that he was willing to release the crew, except the Captain. He accepted that the plane was not going to take off and that he did not need a crew at this point, but he wished to keep a hostage to prevent the plane being rushed by the police. However, the crew could not go until I gave him a binding answer on points "a" and "b" above. As for the stewardesses, they were now asleep. There was no point in waking them to go out in the driving rain in the dark. When they woke up, they would be free to go. I then asked for a car to come pick me up, which was accomplished at 0450. I had spent about 50 minutes talking with Jackson.

Back at the terminal, I reported my findings to General Caceres Monie. I said that in my opinion Jackson was ready to surrender, the only real question was the timing. We should not push him too much at this point but keep him busy talking details until we could obtain a copy of the extradition treaty, at which time I would go back to talk with Jackson again. This was accepted by the general, who wrote out in long hand the charges which Jackson would have to face in Argentina: deprivation of liberty, illegal entry, and illegal

carrying of weapon. He asked me to read these to Jackson over the radio, which I did from the Braniff communications room.

Back to the Plane

In the meanwhile Mr. Wachter took steps to obtain from the Embassy the text of the Extradition Treaty of 1898 and have it sent to the airport. After being assured by Mr. Sowash, Political Counsellor, who was at the Embassy, that the treaty was on its way, I contacted Jackson on the radio again at around 0600 hours to advise him that the treaty should be available in a matter of minutes. He then permitted the stewardesses and all the crew except Captain Al Schroeder to get off. With the Extradition Treaty and a can of beer in my hands I again boarded the plane around 0700 hours. I told Jackson that I was prepared to spend all the time necessary with him in reviewing the treaty and to discuss his personal problems, but I wanted to start out by suggesting that he let Captain Schroeder off the plane. I was as good a hostage as Schroeder, the Captain was not a young man, he was dead tired, needed to go to the toilet but all toilets were overflowing (true!), and his presence now served no useful purpose. Jackson agreed and Captain Schroeder left. I was now on board alone with Jackson and his girl friend. I said we did not need her either, and we called for another car to pick her up. She started to pack her two suitcases and took off as soon as the car came. I was left alone with Jackson in the plane with an unexpected emergency on our hands. After the Captain left, there was nobody to open the plane door for Miss Sanchez except Jackson. He did so, and he had to open it wide to permit her passage with the suitcases. After that he could not get the door closed and struggled with it to no avail. (He tried to wrench the door free with both hands, giving a perfect target with his chest against the metal door to all the police below. They showed commendable discipline by not opening fire.) It was cold outside and rain, driven by the high wind, started to pour into the plane and Jackson started to worry about the carpeting of the plane as well as about the drop of temperature for which he was not dressed. So we had to call for a mechanic to come to fix the door.

With the door securely closed, I went over the details of the extradition treaty with Jackson, who by this time was getting visibly more tired and submissive. To make a long story short, after about 40 minutes of discussion he said that he agreed, in principle, to surrender to the highest-ranking officer at the airport, Major General Caceres Monie, but that he needed a little more time to think over his situation. He said the general would also feel better after some

breakfast and he, Jackson, wanted to drink his last can of beer in peace. He said to tell the general that he wanted to keep his pistol as a souvenir, without the bullets, of course.

I returned to the terminal in the car of the chief mechanic, who had waited for me at plane-side after fixing the door. I told Caceres Monie that the affair was about to end and to give Mr. Jackson maybe another hour, beyond which I did not think he could last. I said that for the first time he was really alone in the plane and while this would seem an ideal opportunity to commit suicide, I was certain that Jackson had no such intentions as he was very concerned with the fate of his children. Caceres Monie agreed with this reasoning, which I then repeated for the benefit of a police psychiatrist.

In the meanwhile Mr. Wachter kept the Embassy informed of developments and followed proceedings from the Braniff communications room, where Mr. Pfizer, the Braniff Security Officer, was getting increasingly restless, aggressive and generally objectionable, insisting that the plane now should be taken by force. He was finally told by Colonel Alberto Vallejos, Chief of Federal Police, to desist from interfering with the proceedings or he would be ejected from the premises.

At a few minutes before 0900 hours I again contacted Jackson on the plane via Braniff radio and advised him that General Caceres Monie had an important family engagement, that he could not wait much longer, and that unless Jackson wished to surrender immediately he would have to surrender later to a lower-ranking officer. We got no immediate answer to this message, giving rise to thought that Jackson might have fallen asleep or, according to the pessimists, even committed suicide. However, a few minutes later Jackson came on the air, acknowledged the message, and said that he wished to change his clothes for the surrender ceremony. I then went to General Caceres Monie to advise him that the time was ripe. The general asked that I accompany him to interpret during the act of surrender. We set off in the general's car at about 0905 and were met at the foot of the stairs of the plane by Jackson, already in the custody of Inspector General Alberto Villar and Commissioner Jorge Colotto. General Caceres Monie and I got out of the car into the pouring rain and faced the hijacker, now subdued. I introduced the general to Jackson; the general bowed stiffly from the waist, we shook hands all around, and the show was over.

With Jackson being driven off in one car, the general and I proceeded to the Airport Detachment of the Federal Police, from where General Caceres Monie telephoned the President (with me at

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his side) to report that the mission was completed with full success. Mr. Wachter then took over the U.S. representation at the police station, and I left Ezeiza Airport at 1000 hours, just about 20 hours after arriving on the scene.

*The puzzle five years
long.*

RAVELLING RUSSIA'S REACTORS

Henry S. Lowenhaupt

The U-2 flight in late August 1957 to Russia's second uranium isotope separation plant north of Tomsk in Central Siberia¹ had surprised us by disclosing a plutonium producing reactor area, and a plutonium chemical separation facility in mid-construction phase, all in addition to the U-235 plant. It faced us with the problem of how to unravel a foreign technology with which we were quite unfamiliar. It demanded that we do our learning in the atomic energy field, a discipline so fraught with secrecy in Stalin's Russia that almost no scientific papers on practical aspects of atomic subjects had been published between 1943 and 1955.

This is the story of how the reactor area at Tomsk was analyzed and explains how an initial answer was derived in five months of concentrated work, and why the more definitive analysis took five years. It highlights the very great impact of the 1958 pictures of the Siberian Nuclear Power Plant released at the Second Geneva Conference on the Peaceful Uses of Atomic Energy, and it notes in passing how we used heavily censored Russian scientific and technical literature in this endeavor.

Experts with considerable experience in the atomic field were brought in as consultants almost immediately after our receipt of the U-2 photography. Their reactions varied; some felt the reactors at the Tomsk Site were large production reactors; others, that they could only be research reactors. Their statements were subjective and not especially helpful. We needed some way of presenting the data to them in balanced form, highlighting the pertinent features—a photointerpretation, in fact, emphasizing engineering factors presumed likely to be useful in further analysis.

Richard Kroeck, of what is now the National Photographic Interpretation Center (NPIC), was given the task of producing a full photointerpretation of the site. This he did by working at forced draft for the five months between late August 1957 and the

¹ See "Mission to Birch Woods." *Studies*, Vol. XII/4.

publication of his work in February 1958 for a special consultants' meeting sponsored by the Joint Atomic Energy Intelligence Committee (JAEIC). Wallace F. Howard of CIA's Office of Scientific Intelligence was given the task of organizing the engineering analysis, which was to proceed in conjunction with photointerpretation, and as fast as Dick Kroeck could uncover relevant facts. Charles V. Reeves² assisted him in unravelling the facts on electric power production and distribution at the Tomsk Site, for it soon became apparent that understanding electric power was a key to understanding the site.

As Kroeck's photointerpretation finally emerged, the Tomsk Reactor area contained in August 1957 one complete plutonium production reactor building with associated stack and irradiated fuel handling structure on its south side. A reactor building and associated turbine hall containing a dual purpose reactor designed to produce both plutonium and electric power was under construction on the northern side. The foundation hole for a second dual purpose reactor site was being dug at the extreme north end. Also in the area were water treatment facilities, fuel rod assembly facilities, a transformer sub-station, and many smaller unidentified structures.

Both Howard and Reeves were familiar with the U.S. AEC's Hanford Engineering Works near Richland on the Columbia River in the state of Washington, where the U.S. had constructed a number of graphite-moderated, water-cooled plutonium production reactors. In the fall of 1957, they both revisited Hanford to refresh their memories on those engineering factors useful in the estimation of detailed function and output at plutonium production reactors. From correlation of what they knew about Hanford with what they saw at Tomsk, they came to realize that the second key to the Tomsk site was the water works there. Indeed, if they could determine both the water flow through the plutonium production reactor and the temperature rise of that water in going through the reactor, they would learn the power output of the reactor in megawatts—and its production in kilograms of plutonium per year.

Water for the whole Tomsk site was drawn from the Tom River through a large intake structure designed to operate successfully even at 40° below zero. From this structure, located a mile or so southwest of the reactor area, water was lift-pumped into a canal which terminated in a weir near the gaseous diffusion uranium-235 isotope separation plant. Here the water was divided, part flowing

² See "The Decryption of a Picture." *Studies*, Vol. XI/3.

directly to the coal-fired, large electric power plant, the remainder to two pump houses by canal. One pumphouse served the U-235 plant, the other pumped water half a mile or so through six underground pipes to a water treatment building 800 feet long in the reactor area.

Three of the six underground pipes had been laid recently and were obviously not yet in use. There was evidence in the form of visible pipes and underground pipe traces that half the water from the associated pumphouse still went to the U-235 plant. The long water treatment building also was visibly half-new. At right angles to it were duplicate structures 360 feet long and 50 feet high. These were believed to contain water storage tanks.

Because the first two reactor buildings were essentially identical and the water treatment facilities for the first reactor had been almost exactly duplicated for the second reactor installation, it was assumed that the initial design called for the second reactor to be a duplicate of the first. The addition of the turbine hall and other visible features necessary to make a dual purpose reactor out of the second one was believed to have occurred as a modification of the original plans. The explanation for the difference between the two high-pressure pumphouses located between the water storage and the reactor buildings was that the dual purpose reactor had a capability for recirculating hot water under pressure, a function not required in the first reactor. Indeed, an underground pipeline trace had been observed from the below-grade steam generator bays next to the turbine hall of the dual purpose reactor back to the associated pumphouse, while no evidence for a recirculating system was apparent at the first reactor. Thus, all the evidence pointed toward a marked similarity between the first and second reactors.

Both reactors had effluent lines to a covered concrete trench that ran from the reactor area around to the north of the U-235 plant to a long narrow pond that had been formed by damming a small stream. The pond emptied via the old stream bed into the Tom River after passing to the north of the electric power plant. The power plant cooling water effluent reached the Tom River through a separate channel dug parallel to the old stream. The reactor effluent discharge system thus had many of the characteristics of reactor hold-up basins or cooling ponds, so-called because they were designed to allow radioactive cooling of short-lived radioisotopes present in the thermally hot water discharged from the reactor.

A bypass line to a separately fenced mud lake in a swamp several miles to the north of the reactor area, near a large plutonium chemical

separation building then under construction, suggested that the mud lake was a disposal area for high-order radioactivity should there be a failure.

The existence of radioactive holdup basins in reactor cooling water effluent channels is characteristic of Hanford-type graphite-moderated reactors, where the cooling water is first treated to make it as pure as possible, then pumped through the interior of the reactor. Other types of reactors, such as those moderated by heavy water at our Savannah River plant, where the cooling water cools a radioactive primary loop in a heat exchanger, do not have radioactivity in their effluent water and do not need holdup basins.

To everyone's amazement, Howard and Reeves were able to reach some judgments on the probable amount of water flowing through the first reactor. Their reasoning was as follows: the effluent channel for cooling water from the U-235 separation plant was the same width as that for the other reactor, and emptied into the cooling water feed channel to the thermal power plant. Thus, the system was designed so that under appropriate circumstances, presumably on hottest days, the U-235 Separation Plant cooling water would just equal that needed by the electric power plant for its cooling. Reeves had calculated from Russian specifications that the 400 MW power plant, with its eight 50 MW turbines, would require a maximum of 350,000 gallons per minute of cooling water under the worst conditions. Since the two pumphouses appeared to feed three pipes to the reactor area and the equivalent of six pipes to the U-235 plant as of August 1957, then 175,000 gallons per minute would be sent through the original three pipes from the second pumphouse to the reactor area. One pipe and one set of pumps were allowed for standby for either the reactor area or the U-235 Plant, a design feature consistent with the single-failure-proof design of the whole Tomsk site. Allotting 10 percent for filter backwash water, total flow would be about 100,000 gallons per minute through the reactor.

A short, exposed length of one of the six pipelines to the water treatment plant was estimated to be 4 to 5 feet in diameter. This rough measurement, consistent with water flows of from 15,000 to 60,000 gallons per minute per pipe, seemed to confirm the preceding estimate.

Assuming input and output water temperature values we had achieved at Hanford in the wintertime, a maximum likely output of the reactor of 1660 MW was calculated. The reactor was not in operation at the time of photography, and indeed must have been under-

going repairs for the exit water flume was dry,³ so no estimate could be made from visual evidence (such as steam visible on the holdup pond) of the actual effluent water temperatures achieved. A minimum estimate of 850 MW was arrived at, assuming early Hanford input-output water temperatures.

It must not be assumed that because the explanation is now so glib that the late 1957-early 1958 work of Howard, Kroeck and Reeves came all that easy. No one had ever before tried to estimate plant water flows from aerial photography, and especially aerial photography of super-secret Russian atomic installations in the middle of Siberia. Simple questions might go completely unanswered, or be answered only after a week's intermittent work. For instance, how does one prove Howard's question: are there really large pipes in the visible traces from the possible pumphouse to the long building of some kind in the reactor area? The answer was for both Howard and Kroeck to keep staring at the U-2 photography in stereo until Dick Kroeck realized that those funny little regularly spaced dots along the traces were little concrete valve houses whose outlines one could see amongst the brush—once one knew what to look for.

The pitfalls and false leads were many. I remember once helping out. It was about 8 P.M., and we had been at it for hours. Charlie Reeves simply could not make his check calculations on water flow come out. A 20 percent difference kept showing up. Then the answer dawned: the values for Russian power plant water flows were in cubic meters per hour. U.S. data on pumphouses, U-235 plant water flows, flow in channels, etc., were in gallons per minute. Charlie had looked up the conversion factor to go from cubic meters per hour to gallons per minute in a Russian book, and the Russians had chosen to use 5-quart Imperial gallons while the U.S. data was in 4-quart U.S. gallons!

I remember that the JAEIC Consultants' Meeting held in February 1958 seemed anticlimatic. Actually they (and others) had done the real work piecemeal by answering the myriad questions posed by Howard, Kroeck and Reeves (and myself for that matter) during the long analysis. The consultants generally agreed with Kroeck's photo-interpretative report and Howard's analysis based thereon, but their comments tended to sharpen both detail and conclusions. They pointed out specifically that the temporary construction shed and enclosed

³ A sign that all the uranium fuel had been removed from the reactor. Normal refueling is done with only part of the total fuel reloaded at any one time, and the remaining partially burned fuel must continue to be water-cooled or it would melt from the heat of its own radioactivity.

walkway to the east of the dual-purpose reactor in August 1957 was markedly similar to temporary sheds connected with the graphite reactors at Hanford during their construction phase. Sheds at Hanford had a controlled atmosphere and were used for machining and fitting the graphite prior to its being stacked in the reactors themselves. The consultants felt this added needed confirmation to the conclusion that the Tomsk reactors were graphite-moderated.

The formal estimate at the end of the Consultants' Meeting gave the first reactor likely power levels between 850 and 1650 MW, with a probable value of around 1400 MW.

Recognizing that this analysis did not use a single bit of data on Russian reactor technology, although the Russians had started to publish scientific and technical papers in this discipline starting with the Moscow Conference on the Peaceful Uses of Atomic Energy in 1955, the Office of Scientific Intelligence contracted with a reactor engineering firm for a survey of the published Russian data for information bearing on plutonium production reactors. Simultaneously, the JAEIC levied requirements on our representatives for the forthcoming Second Geneva Conference on the Peaceful Uses of Atomic Energy to emphasize the collection of data on all those kinds of Russian reactors the Russians seemed willing to talk about.

Both programs had an almost immediate payoff at the September 1958 Geneva Conference. Engineers from the reactor engineering firm took photographs during the running of the Russians' movie about their new Siberian atomic power plant. Francis J. McKeon, an OSI analyst who had been a wartime procurement expediter in the Manhattan District for the Hanford reactor establishment, was given the task of continuing the analysis of the Tomsk reactor area in the light of the photographs and other data from the Geneva Conference.

McKeon, who was basically an engineer and who understood pumps, instrumentation, engineering layouts, etc., chose a two-pronged attack. One course of action was to study the pictures from Geneva and to lay out in engineering fashion the graphite-moderated Siberian dual purpose power reactor in the Reactor Building 2 at Tomsk. This he accomplished, as has been told elsewhere.⁴

His other course of action was to review the analytic work previously done by Howard and Reeves. He soon came to realize that the only "solid" number was the one derived from maximum power plant cooling water flow. All the elaborate logic was good and made good

⁴ See "Somewhere in Siberia." *Studies*, Vol. XV/1.

engineering sense, but it depended on this one figure corroborated only by a virtual guess about the diameter of a poorly seen pipe and on estimates for flows along canals. We desperately needed sizing data on Russian river-side water intakes, "standard" canals, pumps, pumphouses, pipes, water treatment plants and cooling towers. The real problem Frank faced was how to find such data in thousands of Russian technical books and journals in the stacks of the Library of Congress and other repositories of technical journals—and get them into English which he could read.

Once he had settled on what needed doing and had reduced it to a human problem, Frank's wartime experience as an equipment expediter stood him in good stead. He went to his old friends at one of the great sanitation engineering firms in the U.S. They did indeed have a sanitation engineer who was fluent in Russian, and they were quite willing to undertake on a contractual basis to locate the required data in American libraries. With Frank's guidance, the Russian-speaking engineer produced some six inches of reports entitled "Industrial Water Supply in the USSR" by the end of 1961.

The wisdom of Frank's choice to obtain data on all the water handling steps can be seen in retrospect: Photointerpreters usually work with positive paper prints or positive transparencies. The original negative is sacrosanct; only the photolaboratory may handle it. Thus the photointerpreter is at the mercy of the state of photolaboratory techniques when it comes to small or poorly seen objects. Three years ago new transparencies of the Tomsk site were made using modern duplicating films and modern enlarging equipment. Lo, two of the 50 MW turbogenerators became 25 MW thermification turbines putting out both heating steam and electricity. Total 1957 electric power generation capacity dropped from 400 MW to 350 MW. Specifications in Gersimov's "Thermal Engineering Handbook," Moscow 1957 and in Zhilin's "Components of Thermoelectric Stations," Moscow 1961 for cooling water requirements for the correct turbines indicated the power plant would, in summer, require 254,000 gallons per minute compared to the 355,000 gallons per minute originally estimated. Clearly the early 1958 estimates of possible reactor power levels for the first reactor must have been high by 40 percent based on the revised data.

In late 1961 Jack Lundin,⁵ a physical chemist with reactor physics training who had been the responsible officer in handling the contract initiated in 1958 with the reactor engineering firm, assumed total

⁵ See "Red Nautilus Under Way," *Studies*, Vol. XI/2.

responsibility for the Tomsk Reactor Area. Frank McKeon was transferred to the growing atomic energy problem in China. Jack proceeded to study systematically the capacities of each section of the water supply system item by item from the Tom River intake to the reactor effluent channel. Leaving aside the tremendous complications to his analysis caused by the fact that in 1957 the whole site and all its water works were in the early phases of being more than doubled, he found in "Industrial Water Supply in the USSR," a reference to a 1957 book by N. S. Makerov on the "Construction and Operation of Water Intake Installations on Siberian Rivers" in which there was a cross sectional diagram of the Tom River at Beloborodovo, the name of an ancient village just south of the atomic site, and the name used in open publications as an euphemism for the atomic site. This reference showed a water depth of 10 feet and indicated it was sufficient to handle any sludging and frazil ice that might occur to inhibit flow in the depth of winter.

The photometrically measured width of the intake bay operating in 1957 at the Tomsk site was 19.5 meters. Jack calculated from this width, using Russian design criteria for intakes of this general shape, that the designed flow rate was 178,000 gallons per minute in winter and 355,000 gallons per minute in summer. Frank McKeon had guessed that the description of the Tom River "right bank water intake bay No. 5 with downstream inflow opening, and with a water flow capacity up to 175,000 gallons per minute" described in 1961 by Kuzhovlev and Merzon in *Vodosnabzhenie i Sanitarnaya Tekhnika*, No. 3 was actually the one at the Tomsk atomic site. However, even the coincidence of general shape, general location and calculated winter flow rate was not really sufficient proof of his guess. We now know from Col. Penkovskiy what we had then guessed, that all published Soviet scientific and technical articles, and especially those on militarily important subjects such as atomic energy, have been censored carefully prior to publication for any obvious clues to "information of intelligence value to a foreign country." This is why Jack Lundin used the data supplied by the sanitary engineering firm as a basis for calculation against photometric data, rather than spending a lot of time trying to prove directly the pertinence of censored articles.

The maximum calculated summer flow through the intake was, of course, coincident with Charlie Reeves' 1958 estimate of power plant requirements, leaving no water for the reactor area. As the later downward revision of power plant cooling water requirements had not yet occurred, Jack could only note there was a problem and

proceed onward with good courage! The canal was of the right general size for the intake. He could not size the pumphouses independently—there were too many possibilities all about the same physical size.

Continuing along the water circuit, the sanitary engineering firm's report stated that the largest size steel conduit manufactured in the USSR in 1957 had a diameter of 4.6 feet, thus being in the 4-5 foot range estimated by Dick Kroeck for the exposed section of pipe near the water treatment building at the Tomsk site. The older design maximum water velocity in the USSR for this size pipe was equivalent to 72,800 gallons per minute for two pipes, significantly less than the 100,000 gallons per minute estimated in 1958.

The long water treatment building was re-identified as a water clarifier building. Prior to 1957 normal Soviet water treatment practice used horizontal sedimentation basins for large water purification plants. With normal coagulants, a unit flow of 84.5 m³ per day per m² of building was considered standard practice. So the clarifiers of the sedimentation building had been designed to handle 60,000 gallons per minute.

The associated long, high buildings could only be filter buildings with water hold-tanks in the upper portion. Up to 1949, conventional rapid sand filters were the only ones used. By 1956, after experimentation with several new types, the two-layer rapid filters became the recommended standard for industrial as well as municipal water supply stations. Applying appropriate engineering factors, the filter-water holding building would have handled 56,000 gallons per minute before 1956 and, if a change in filter systems had then been introduced, up to possibly 95,400 gallons per minute at a later date.

Thus Lundin had shown that up to 1957 Reactor No. 1, a purely plutonium producing reactor, could have been cooled with a maximum of 56,000 gallons per minute, rather than the 100,000 gallons per minute value originally derived in the absence of detailed knowledge on Russian water treatment practice. Jack could only conclude that our original judgment of the range of likely power levels for the first reactor must have been at least 40 percent too high.

The technical literature also indicated that some time after 1957, the Russians could have increased reactor flow to 90,000–100,000 gallons per minute based on technical advances in a variety of water purification and handling equipment culminating in that year. However, there was no direct evidence in terms of observable building changes that water flows were indeed being increased in 1957, and prudence on the part of the Russians would have suggested a delay

in their implementing plans for increased flow until they were certain there were no engineering difficulties in long-term application.

Receipt in early 1959 of a Clandestine Service report from a defector who had been an enlisted man in a military construction battalion at the Tomsk site had reinforced the view that the water cooled the first reactor at Tomsk by passing directly through it, as in the Hanford reactors. He had reported a covered effluent line passing to the north of the U-235 plant eastwards to "*Malaya Ploshchadka*" (the reactor area) along the course followed by the reactor effluent line in the photography. He had stated that the "polluted water in this canal was hot in the winter and (inexplicably) had a strong phosphorus-like smell...Even when the temperature was minus 30°C to 35°C and the snow was one meter deep, the snow on the canal covers melted." Also he reported that "a special order prohibiting the use of water from a tributary northwest of the U-235 separation plant was read to all personnel stationed on the site. The use of this water for washing floors or laundry or for drinking purposes was forbidden. It was also forbidden to shoot wild fowl which had been in the vicinity of this stream." The last prohibition is characteristic of radioactivity-contaminated water, because poison in amounts dangerous to humans would be expected to be ingested by the wild fowl before they could be shot.

This report lent substance to the earlier conclusion that the first reactor was inoperative and being repaired at the time of the August 1957 photography. Jack was aware of the indication in the technical literature that a change in the fuel element structure for some reactors had occurred in 1957. He felt this might well be the immediate reason for the major repairs to Reactor 1, rather than a change to accommodate greater water flow. Of course, there could have been a straightforward failure of some kind which had no relations to water flow or reactor power levels.

As has been previously mentioned, Jack had been the contracting officer from the very beginning in 1958 with the reactor engineering firm which was assessing Russian plutonium production reactor technology from a review of the published literature. As the officer now responsible for the analysis of the Tomsk reactor area, his next task was to obtain a detailed correlation between what the aerial photography showed at Tomsk and what the reactor engineering firm had learned about Russian reactor technology.

In the initial period of the contract (1958-61), one of his main tasks had been locating pertinent Russian literature for them and getting it translated, if it were not in English.

Early in their association, they had decided on the important subjects to cover, including graphite stacking technology; fuel rod fabrication; physics of graphite moderated and heavy water moderated reactors—to name a few. As data were found, the engineers would discuss with Jack the still missing pieces and where such information might be found. Finally, after the sources had been exhausted, the material was reviewed and the salient technical facts extracted.

Many of these facts were of the type that, when known, indicate the specific problem areas that have been satisfactorily solved for that state of technology. The engineers could then ignore them in further technical assessments.

Other facts were basic to any appreciation of specific technologies, and their true import could only be discovered by making elaborate reactor physics calculations to determine limiting factors. This was especially true in that literally no information was found on fuel rods for plutonium production reactors.

An exasperating problem was the dating of the work reported, since the date normally given was the date of publication. Practically nothing nuclear had been published before Stalin's death. Then, from 1955 on, it came out in considerable quantity, but only after passing a declassification or censorship board. Sometimes early work would be identified as such because it mentioned one of the early research reactors, such as the Fursov Reactor, the first one on Russian soil. Other times a scientist might be a contributor when it was known he had died in the early fifties. Frequently one could only tell when a specific bit of research had been done by placing the article in a subjectively ordered chronology of Russian technical advancement. Fortunately much of the early research work (and scientific articles about it) had been aimed at the first plutonium production reactors, for there had not in those days been enough competent research workers in the nuclear field for the Russians to handle more than a few major projects at a time. Nevertheless, it was a truism that not a single scientific article ever said the work had been performed for a plutonium production reactor.

Jack got his first real break by assuming provisionally that several articles published in the minutes of the July 1955 Moscow Conference on the Peaceful Uses of Atomic Energy were early works aimed at production reactors. These discussed small graphite-uranium three-dimensional arrays, the so-called exponential piles, work necessary to understanding how to put together the fuel elements and graphite moderator in between them so that a full-scale array would work. One of these, "A study of the parameters of uranium graphite heterogenous

systems by the prism method," written by a Who's Who of younger Russian nuclear physicists (Groshev, Kosinets, Lazareva, Tolstov, Feinberg, Frank, Shapiro, Stranikh) stated the optimum lattice spacing was 20 cm, the optimum uranium to graphite atomic ratio was 0.013, and the optimum water annulus around a cylindrical piece of uranium fuel was 2 mm. The 20 cm was, of course, the familiar 8-inch lattice spacing in a graphite reactor; the fuel-to-graphite ratio came out to a fuel diameter of 34 mm. These values agreed well with ones actually used in our early Hanford reactors; and a 2 mm annular space with 1 mm of aluminum cladding around the chemically active uranium appeared in a number of articles. Jack had recognized the key article.

As summarized by the engineering firm, the fuel elements of all early Russian research reactors were described as solid cylinders of varying diameters, clad with 1 mm of aluminum and cooled by varying sizes of water flow spaces around the outside. Some later fuel elements had distinctly larger coolant spaces than 2 mm. By the mid-fifties, mention is made of annular fuel elements cooled by water flowing both through a cylindrical hole in the center and around the outside. The heavy water research reactor at the Institute of Experimental and Theoretical Physics in Moscow originally used a solid uranium rod clad in aluminum but changed in June 1957 to an annular type fuel element. Petrov, in his book on power reactors prepared in 1956-57, cites annular fuel elements as "typical." So both Jack and the reactor engineers felt it reasonable to assume the Siberian dual purpose reactor had annular fuel elements, even as reported by a DCS source.

The kinds of cladding or canning materials were mentioned frequently, for uranium reacts pyrotechnically with hot water and must be kept from the water by a metal coating or can. These changed from nearly pure aluminum in all the early reactors to tests described at the 1958 Geneva Conference by R. S. Ambartsumyan and co-workers on AlSi alloy containing 90 percent aluminum, 9 percent silicon and 1 percent nickel: "The tests were carried out in the 180 atmosphere loop of the RPT (research) reactor. The water temperature at the channel outlet was 220°C. . . . The fuel assembly was tested in the channel during 6337 hours without any damage. . . ." Even as reported by a DCS source, the technical specifications down in the text of the article indicate the article discusses the fuel element of the dual purpose reactor described at Geneva and gives the maximum temperature it could stand, even though the scientific article definitely does not say anything about usage.

The literature indicated that in early reactors the Russians kept the maximum cooling water temperature 18°C below the boiling point, and the average temperature below 70°C. By 1955 Russian graphite-moderated research reactors were still operating with coolant temperature rises to a maximum of 70°C, indicating the original stricture was still in force. Research about this time on fuel elements which could stand temperatures (under pressure) up to 220°C, as Ambartsumyan's work referred to earlier, implied that average cooling water temperatures of up to 90–95°C could have been expected in plutonium production reactors by 1957–58.

Incidentally, as found out in the U.S. quite early in reactor operations, the alpha-beta phase transformation of uranium at 660°C with the swelling resulting from this change in crystalline structure causes a maximum permissible temperature at the center of solid fuel elements. Swelling can stop water flow and cause melting of the fuel elements in a reactor, or even worse problems. This provided another specific limit which the reactor engineers had indeed to take into account in their reactor calculations.

A reactor is a leaky box or bucket as far as neutrons are concerned. This means that the nuclear reaction is more vigorous (because there are more neutrons) in the center than it is at the edges of a reactor. Indeed the rate of reaction across a reactor follows the mathematical function known as the cosinc. Little can usually be done with changing the form of reaction rate or flux between the two ends of the reactor core cylinder, but much can be done in making the flux "flatter" across the reactor core. Our Hanford reactors, and apparently the Russian reactors, were originally operated without any flattening. Special ways were developed at Hanford to dampen the reaction in the center of the reactor and permit greater reaction near the edge. There was some evidence of a similar progression of events in Russia.

With these facts the reactor engineers had sufficient data to make reactor calculations, and to deduce with good reliability reactor power levels and how these changed with time, provided they assumed the size and configuration of the standard Russian plutonium production reactor. Here was the real worth of the "in cinema" pictures from Geneva. Without the pictures all calculations would have been made on "models" based on American (Hanford) design; the spread of possibilities for actual Russian practice would have been so large as to make results almost meaningless. From the Geneva pictures they knew the Tomsk dual purpose reactor in Reactor Building #2 had a cylindrical core 37 feet in diameter and 24 feet long, contained 2100 fuel elements, each 32 mm in diameter

unclad and weighing 95.3 Kg. No other data reliably attributable to Russian production reactors existed.

Their reactor calculations, based on their knowledge of the Russian scientific literature, then indicated that for Tomsk type reactors the earliest (1952?) configuration⁶ used a solid fuel element about 34 mm in diameter clad with 1 mm of aluminum and cooled with 2 mm of flowing water. The reactor was judged to be unflattened, and must have been cooled with about 45,000 gallons per minute of water, for more could not be reasonably forced through the 2 mm annuli. With the 70°C maximum water temperature, it was estimated to have developed 700 MW.

This reactor would have been designed with a 60,000-gallon-per-minute water treatment plant (as actually found at Tomsk) to allow for unforeseen usages, a standard engineering practice with water treatment plants. This extra capacity would allow a simple change by, say, early 1957 to a 32 mm solid uranium cylinder with a 3 mm water gap for a fuel element. With considerable reactor flattening, this could have operated on the 60,000 gallons per minute of water available and have produced about 950 MW, a 250 MW increase from the original 700 MW.

The refurbishing of the first reactor at Tomsk in August 1957 is timewise consistent with the development of annular fuel elements and with the expectation of later being able to increase the capacity of the original part of the water works to 95,000 gallons per minute. If an annular fuel element is chosen with a 10.5 mm hole in the center and a uranium diameter of 35.5 mm, compared to the 32 mm deduced by Frank McKeon, the reactor can operate up to 2100 MW if an increase in the water flow in the early sixties to 95,000 gallons per minute value is accepted.

The dual purpose reactor, the calculations showed, would not work properly without the annular fuel element. With it, it could be operated at 700 MW giving 100 MW of by-product electricity as suggested by the Russians in Geneva. Alternatively, the site was clearly arranged to send treated water through the reactor, passing through the steam generators to make by-product steam for electricity production, and then dumping the hot water into the exit flume. The latter set-up would produce 1700 total thermal MW, a correspondingly larger amount of plutonium, and 100 MW of electricity.

This then was good evidence that the Russians intended in 1957 for the two dual purpose reactors under construction to operate on

⁶ Presumably at the plutonium production site near Kyshtym in the central Urals.

the second half of the water treatment plant at a rate of 90,000 gallons per minute. By 1960-61 estimated water usage for all three reactors would have required the capacity of the water treatment plant to be increased 50 percent, yet because of increases in water treatment plant efficiency, would not require additional water treatment plant construction.

The analysis of all available data thus produced a self-consistent, gradually increasing estimate of Russian plutonium production reactor capabilities firmly based on photography and the careful directed study of the pertinent Russian scientific and technical literature. The results covered a period from 1952 into the early sixties and could be applied to other Russian reactor sites than Tomsk whenever data became available. Further, comparison of the limitations in Russian reactor technology in the early sixties with that in the US would provide a basis for future estimates. It took five years, but it was a definitive job well done.

*More on the intelligence analysis
of the Soviet nuclear weapons program*

DC POWER AND COOLING TOWERS

Henry Rubenstein

In October, 1962, the tensions of the Cuban missile crisis were increasing with each U-2 photograph, and with each fresh bit of intelligence from Cuba. At the same time, the last big series of the 65 Soviet nuclear weapons tests which had started on 1 August 1962 was being conducted on and over the mountains of Semipalatinsk and the ice of Novaya Zemlya. Nikita Sergeyevich Khrushchev's moves were under intense scrutiny. We knew the number of ICBMs available to him. Compared to U.S. capabilities, his were wanting. Consequently the CIA position was that he was bluffing.

There was, however, little doubt, that the USSR had thermonuclear (TN) warheads. These dated back to the Soviet nuclear detonation on 12 August 1953, the Soviets' fourth, of a device designated JOE 4 by the U.S. Although Soviet propaganda built up this accomplishment as implying a great military threat, the Russians had no TN warhead suitable for ICBM delivery until at least 1957-58, and that probably was deployed no earlier than 1960. By the end of the tests on Christmas Day, 1962, there was ample evidence that a number of well-designed families of Soviet TN devices and weapons were available to the Soviets. Early in 1963 they signed the Test Ban Treaty, and their testing program went underground. The big question became, "What of the future?"

The Requirement

Two key materials upon which a TN weapon program is based are tritium and lithium. We had quite a bit of qualitative information on Soviet lithium technology including its isotope, lithium-6, but almost none on tritium, a hydrogen isotope usually produced by exposing lithium-6 to neutrons in a nuclear reactor. We needed quantitative information on Soviet production, raw materials, and patterns of use as well as future applications and trends. This also meant pinning down the laboratories, plants, processes, personalities, and organizations involved. Of special importance was the amount of electric power

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and other utilities available to the production plants we thought might be involved.

Hunt for the Lithium Plants

A great deal of good analysis had been done with respect to the Soviet lithium problem long before the author's arrival on the scene, and there was a general consensus that the isotope separation process the Soviets were using was similar to the one which the U.S. Atomic Energy Commission had set up at the Y-12 plant at Oak Ridge, Tennessee. That process consists of using direct current to make a liquid mercury alloy (called an amalgam) with lithium metal enriched in the lithium-isotope. The amalgam is then brought in contact with a water solution of lithium hydroxide having a natural isotopic ratio of 12.5 parts lithium-7 to one part lithium-6. The lithium-6, having a greater affinity for the amalgam, gradually replaces the lithium-7. As a result, a more highly enriched lithium in a number of forms can then be obtained by treating the mixture with water. The process has one characteristic which it shares with other isotope separations—the amount of heat it emits is approximately equal to the electric power input. Each plant under study had a large supply of direct current and of steam, and except for Nizhnyaya Tura, a ventilation system suitable for handling large amounts of mercury safely by Soviet standards. U-2 photography helped to provide us with two candidate production-scale plants for lithium isotope separation by the amalgam process. The first was in the remotely situated Area 1 of the Nizhnyaya Tura Atomic Energy (AE) Complex near Sverdlovsk, in the Urals. The other was in the AE Complex along the northeastern outskirts of Novosibirsk in Siberia. The Novosibirsk plant was directly along the main line of the Transiberian Railroad.

By the middle of 1963 Jack Lundin, Bob Vasey and I had quite a few new questions seeking answers. Jack had succeeded in getting the classification of some of the U-2 photographs downgraded, and descended upon John Grogin and some of the other Union Carbide people at the Y-12 plant. After a long but stimulating session, including a tour of the amalgam plant, then on standby status, we had a much better feel for the lithium amalgam process.

Both Area 1 at Nizhnyaya Tura and the Novosibirsk plant are part of AE nuclear complexes which are functionally and organizationally correct for lithium-6 separation plants. Moreover, the necessary administrative and technical support are present, and operation in an AE complex permits use of existing security facilities as well as the health, safety, and other functions peculiar to AE operations.

Area 1 has two connected buildings which could adequately contain an isotope separation process and a supporting chemical or ore processing operation. The west building because of the height of its probable bay area would contain the isotope separation process. We noted a strong resemblance between this building (22) and a US electromagnetic separation building at Y-12. Since several articles pertinent to electromagnetic separation of lithium had been published by the Soviets, it was considered quite possible that the Soviets used this expensive process in the early 1950's to prepare small amounts of lithium for use in development of nuclear devices.

We estimated that electric power available at Area 1 was limited to 2 and 3 MW, judging by the relatively small size of a probable rectifier building situated between the 50 to 100 MW capacity substation and building 22. Since 2 to 3 MW would be sufficient to support a production of only modest size, we concluded that an additional 16-MW DC of motor generator capacity might be obtained from within the lower sections of building 22. A 40-MW cooling tower which was available was more than adequate to dissipate the byproduct (heat) from decomposition of the amalgam. The tower's location, however—a quarter of a mile from building 22—was not consistent with good plant layout, although it could have been used. Moreover, we had never been able to detect the steaming which normally comes from operating cooling towers. Nevertheless, there was cooling water available for pumping from the Tura River 1 to 1¹/₄ nautical miles from the site, or from the Nizhhe-Turinskiy Pond within 3 nautical miles. According to John Grogin, water from a nearby lake is often used at Y-12 for cooling without steaming towers. The general lack of steam and vapor from the postulated process buildings also continued to bother us.

The ventilation system appeared to be very diversified—a factor we had considered inconsistent if the facility was actually planned for the amalgam process we believed existed at Novosibirsk. Once again, however, the visit to Oak Ridge paid off by reminding us that perfectly satisfactory ventilation can be obtained by blowing the air contaminated by mercury vapor out through a hole in one end of the building while clean air is drawn in through an opening in the other end wall. In summary, therefore, we concluded that Area 1 of Nizhnyaya Tura was quite possibly an amalgam process plant rated at 16- to 18-MW DC, where production-scale operations might have started between 1951 and 1955.

We believed that a portion of the Novosibirsk AE Complex between the uranium metal plant and thermal power plant contained the separation facility. U-2 coverage, supplemented by collateral photog-

raphy, enabled us to conclude that this was probably a lithium isotope separation facility. It appeared to fulfill the requirement that power input should approximately equal the heat rejected: 42 Mwe (Megawatts electric) of AC and DC electricity plus 25 Mwt (Megawatts thermal) of hot steam, balanced against two 35 Mwt cooling towers. This was supported by the large amount of energy available per square foot of roof space (about 0.5 kw/ft²) in buildings 15 and 16, which was of the same magnitude as that in Soviet gaseous diffusion plants. Production was believed to have started between August 1957 and April 1959, with about 31 megawatts of DC power.

Although the Novosibirsk facility is almost classic in pattern, we have yet to confirm its function. We have kept our eyes open for other locations possibly associated with lithium production. One such possibility is a uranium gaseous diffusion building belonging to the AE program, which would meet the requirements of organization, security and personnel. Adequate ventilation, power and many cooling towers are available.

The Analysis

Converting our megawatts of direct current power to kilograms of weapon-grade lithium-6 was quite a task. It was possible only with support from the Office of Reports and Research (later the Office of Economic Research) on the supply of mercury, and of lithium minerals and concentrates available to the Soviets domestically and from Communist China. The evidence showed that the Chinese had supplied half of the Soviet requirements, and it indicated that without such Chinese assistance or some new sources, the Soviet lithium-6 program was limited by available ore supplies. In light of this conclusion, and some use patterns we observed, we estimated that there was only a 15 percent diversion of concentrates from TN weapons.

Important assistance was provided by AFTAC and by Y-12 so that we could make logical deductions about the percentage of lithium-6 available to the Soviets that could be considered of weapon grade. This varied with time as shown by debris analysis and by the mention in collateral reports of highly enriched samples with lithium-6 contents. These mentioned samples of 91.7 per cent being used in physics, and 92.5 per cent in chemical experiments; as available for sale in the form of metal and chemicals at 95 per cent; and in a piece of analytical apparatus at 99.8 per cent. In August 1960 a sample was bought from the Soviets which assayed 92.16 per cent. This also contained mercury in a quantity that could only be explained by contact with that metal during exchange processing.

John Jennings of SOVMAT (now FORMAT) helped us to set up and operate a sampling program to keep watch for items in the Soviet economy that would be likely to contain lithium amalgam process tailings. In June of 1964, he turned up several packing cases of a Soviet diuretic medicine called "Urodan," labelled as having been manufactured on 11 February 1964. This variety of medicine had been chosen with the assistance of the Agency Medical Staff as being likely to contain lithium. Analysis indicated 3.08 percent lithium-6 (or a depletion of 58.5 percent from the normal content of 7.42 per cent), which matched Y-12's suggestions fairly well. We concluded that this tailings assay was the most probable value to have been used throughout the Soviet program.

It was necessary to use some somewhat unorthodox techniques in order to get a true grasp of the large range of much of our basic data. This resulted in carrying three separate calculations, the probable value, and the probable maximum and minimum values. The final results of our analyses were published with a spread of plus or minus 62.5 percent, which was an order of magnitude higher than most engineers like to see or report on. Nevertheless, these results have had some utility for making estimates of the number of TN weapons available to the USSR.

Tritium

Tritium, which is vital to advanced and compact nuclear weapons, has continued to be an enigma, although AFTAC has been able to detect its use in the weapons program by the Soviets. Soviet scientific writings on matters related to the subject of tritium production technology have been traceable to U.S. experience or practice. U-2 photography has not provided us with direct answers on processing techniques and production quantities. Except for very small quantities that can be made by strong isotopic neutron sources or in accelerators, production of tritium requires a nuclear reactor. The Soviet reactors possessing sufficient reactivity to handle any tritium production, and which also were available (prior to 1954) at the right time to have contributed to the Soviet program, are the TVR heavy water reactor in Moscow, the IR isotope reactor suspected to be at Kyshtym, and the plutonium production reactors at Kyshtym. The TVR could have yielded enough for R&D only starting in 1949 or early 1950. The IR at Kyshtym could have contributed about 20 grams and the production reactors at that site could have contributed about 2100 more grams if operated for maximum tritium production, which was considered unlikely.

Calculations for tritium production were made by assuming that 10 percent of plutonium-equivalent was diverted to tritium and consequently the result was based on fairly good numbers. Fortunately, this result agreed with the maximum requirement for tritium derived from OSI's estimate of the Soviet nuclear weapon stockpile. Despite our problems in obtaining hard data on tritium, we thus had been on the right track.

MORE YET ON "LUCY"

The author replies:

In pp. 109-111 of Vol. 16, No. 2, of *Studies in Intelligence* Mr. Andrew K. Megaris offers some observations about an article of mine called "The Rote Drei: Getting Behind the Lucy Myth". Some of these observations require a reply.

First, Mr. Megaris challenges the statement that Lucy had four important sources in Germany. He lists as perhaps naive the assumptions that Lucy had sources, that he knew their identities, and that he divulged them truthfully.

Admittedly, the word *had* is far from exact. It is more accurate to say that a large number of Rote Drei messages are sourced to "Werther", "Teddy", "Olga", and "Anna". The traffic shows that Moscow believed that these sources were people.* The traffic also shows that the Center, like Rado and Rachel Duebendorfer, considered these sources Lucy's.

I agree that Moscow may well have been wrong and that the information supplied by the unidentified sources in Germany probably reached the Swiss General Staff first, then Lucy, and not the other way around. In fact, as Mr. Megaris was kind enough to note, I said so near the end of the article. I gather that he feels that I did not say so loudly enough.

Mr. Megaris attributes to me an assumption that the four persons named by Roessler were identical with Werther *et al.* I did "assume" that the sources were human individuals, and the facts continue to support that assumption. But I did not equate Werther, Teddy, Olga, and Anna with Oster, Gisevius, Goerdeler, and Boelitz, the men Roessler named. I said (p. 71), "We have no basis for matching true and cover names, although Oster seems the likeliest candidate for Werther."

Mr. Megaris observes that Roessler remained silent in an era of war-time reminiscences, must have had strong motives for silence, and may have thrown out red herrings. I certainly agree about the strong motives for silence: he had twice been jailed for spying. To have come out with his memoirs would have been a bit naive. As for red herrings, those who throw them make sure that they are seen.

*It is important to note that the Soviets sing a different song today. In the recent Russian and Hungarian versions of Alexander Rado's *Dora Jelenti (Dora Reports)* the claim is made that Werther *et al* were not individuals but offices, components of the German military structure. Soviet views during the war, which we know through intercepts, deserve full weight. Their published views in 1972 do too--as disinformation.

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Notes and Comments

Roessler had no reason to think that a statement made in strict confidence to a friend would ever be relayed to American intelligence.

Mr. Megaris proposes what he considers a promising but neglected lead: that the communication channel from Germany to Switzerland may have been Swiss General Staff rather than Abwehr. This possibility was not ignored. I found no evidence to support it—though that's not much of an argument. I found some evidence to the contrary. There was German censorship of official and unofficial Swiss communications during the war, though I do not know how thorough it was. If the Werther, Teddy, etc. messages had been transmitted as Mr. Megaris suggests, the Germans might well have found out about it. It was a risk that Switzerland, in a precarious position and very afraid of a German assault, would be quite unlikely to run. Where was the commensurate gain? The Rote Drei sources in Germany were providing information of great value to the USSR, not Switzerland. The argument for Abwehr channels is bolstered by the fact that they were much less susceptible to monitoring by the RSHA. Otherwise the 20th of July conspirators would have been arrested long before they were.

Since the article in question was printed, more than three years ago, we have learned a good deal more about Soviet espionage in Europe before, during, and after World War II. We are still far from having all the answers. But as the article said, the traffic itself remains the best foundation for analysis. The source line of a message of 20 April 1943, Dora to Director, reads as follows: "Durch hier angekommenen Generaldirektor...Buergermeister Goerdeler aus... Bendlerstrasse". (From the general director and [former] mayor Goerdeler, who has come here from the Bendlerstrasse.) Rado's book cites part of the text that followed. It omits any reference to Karl Goerdeler. The Soviets, unable to make a case for the old argument that Lucy's sources in Germany were Communists, now assert that those sources were not people. If forced to face the fact that all the evidence suggests that they were living individuals, they seem determined to suppress the possibility that those individuals may have been members of the 20th of July group, as Lucy said they were, because the dominant wing of that group—the wing that included Oster, Gisevius, and Goerdeler—was pro-Western, not pro-Soviet. The fact that the Soviets seek to preclude consideration of these men as Lucy's sources means nothing in terms of the validity of the theory. But it does mean that we should not join them in such a preclusion until the weight of facts tips the balance that way.

Mark A. Tittenhofer

SECRET

INTELLIGENCE IN RECENT PUBLIC LITERATURE

THE SERVICE: THE MEMOIRS OF GENERAL REINHARD GEHLEN. By *Reinhard Gehlen*. (World Publishers, New York, 1972. 386 pages.)

THE GENERAL WAS A SPY: THE TRUTH ABOUT GENERAL GEHLEN AND HIS SPY RING. By *Heinz Hoehne* and *Herman Zolling*. (Coward, McCann and Geoghegan, New York, 1972. 347 pages.)

GEHLEN, SPY OF THE CENTURY. By *E. H. Cookridge*. (Hodder and Stoughton, London, 1971. 402 pages.)

NICHT LAENGER GEHEIM: ENTWICKLUNG, SYSTEM UND ARBEITSWEISE DES IMPERIALISTISCHEN DEUTSCHEN GEHEIMDIENSTES. By *Albrecht Charisius* and *Julius Mader*. (Secret No Longer: Development, Organization and Methods of the Imperialistic German Secret Service. Deutscher Militaer-verlag, [East] Berlin, 1969. 632 pages.)

In April 1968, after some 22 years as chief of the West German intelligence service and 48 years altogether of public service, Lieutenant General Reinhard Gehlen retired as President of the Federal Intelligence Service (BND).* He was accurately described as the doyen of western intelligence chiefs. Whatever was thought of Gehlen—and he had many enemies—he was by this time quite well known throughout the world, so it is not surprising that his retirement has occasioned no less than four books.

The first to appear, in May 1969, was the East German effort *Nicht Laenger Geheim*. The other three were published in their German editions within a few weeks of each other during the fall of 1971. *Nicht Laenger Geheim* and *The General Was a Spy* are tendentious and inaccurate; the Cookridge book is inaccurate; none of them is worth reading. Gehlen's book *The Service* has many faults, a lot of which are inherent in such a book, but for any officer assigned to Germany

*From 1942 until 1945 Gehlen was theater G-2 for the Russian front. As the war ended, he assembled his people and his files and, after capture by the U.S. Army, offered his organization to the U.S. Since the Army knew very little about the USSR and since the Cold War had begun, his offer was accepted. After some months of delay the Gehlen Organization, as it was called, was sponsored by the U.S. Army as an intelligence collection and evaluation organization against Communist targets, principally the Soviet forces in East Germany. The U.S. Army retained this trusteeship until 1949, when CIA assumed it. In 1956 the Bonn government took over and the Gehlen Organization became the BND.

it is worthwhile reading, and for anyone assigned to liaison duties with the BND it is a must.

While I approached Gehlen's book, *The Service*, with the keenest interest, I had not expected too much of it. For one thing, I was afraid that it would be written in field manual style. Secondly, intelligence chiefs may not, and do not, tell all; therefore many of the most interesting points are missing, and the picture which emerges is of necessity incomplete and distorted. I was wrong on the first point and right on the second. So far as style goes, the book reads easily. My overall rating of the book is a gentleman's C plus. The reader should not expect too much in the way of excitement. And this word excitement brings up a point which must be discussed. There is a segment of opinion in German public life and in the ranks of CIA where the people seem unable to talk about Gehlen—they simply splutter. I have experienced this phenomenon in the ranks of CIA on many occasions during the past 15 years or more, and some of the articles and reviews on the book which appeared in the German press bear out the point about the Germans.

We know, incidentally, that the book was not reviewed by anyone in the BND prior to publication.

The Service opens its American edition with Gehlen on board a flight to the United States to begin his cooperation with us, then turns back to his earlier career. The German original was more chronologically arranged in three parts. One deals with Gehlen's experiences as chief of Foreign Armies East (Russian Theater G-2) from early 1942 until the end of the war. The second part deals with the postwar Gehlen Organization, first under U.S. Army and later CIA trusteeship, then accepted by Bonn as the BND. This second part also discusses the successes and failures from 1946 to 1968, the types of persons who worked for the BND, relationships with other services—in other words, the whole gamut of intelligence activities. The third part consists of three chapters on Soviet ideology, Soviet tactics, and the outlook for the world in the face of Soviet imperialism.

It should be borne in mind, particularly when reading the last part but also for the book as a whole, that Gehlen is a Cold Warrior. He always was and always will be; he makes no bones about it, he says that history will be the judge, and he has no doubts about that judgment. Of course, during most of Gehlen's years, the US Government and CIA in particular were heavily oriented in that direction too. Gehlen's attitude almost certainly does not sit well with some of the present political leaders in Bonn who are pursuing *Ostpolitik* (no

criticism intended), but in light of Czechoslovakia in 1968 and the Brezhnev Doctrine he certainly feels he has a point.

The section on Foreign Armies East is perhaps the best part of the book, although it is of interest primarily to military historians. From all accounts, Gehlen did an excellent job as chief of an Order-of-Battle analysis organization. All commentators—from the U.S. Army (in a 1946 study) to Zolling and Hoehne in 1971—agree on this. It was during the latter part of this period, i.e., during 1943, that Gehlen decided to keep his people and files together and turn his organization over to the Americans. *The Service* does not tell us much that we did not already know about this period, but Gehlen's description of the spring and summer of 1945 makes interesting reading. There are some fascinating anecdotes.

The *Bundespost* (the mail service), the *Bundesbahn* (the railroads, formerly called the *Reichsbahn*), and the German intelligence service are the only three national German organizations which carried on with a pause of only a few weeks when the war ended. Gehlen for his part, although betrayal to the Nazis of his post-defeat-plans would have meant death, was most concerned to legalize his position as much as possible. Therefore in April 1945 (before the end of the war) he disclosed his intentions to General Winter, Chief of the Operations Section of the Armed Forces High Command and received his "sanction." I imagine that was about as high an authority as Gehlen dared to go at the time. Then, several weeks later in June 1945, after VE Day, Gehlen met Admiral Karl Doenitz, who had been appointed by Hitler as his successor during the last days of the Third Reich. Gehlen and the Admiral were now in a U.S. Army VIP prison camp in Wiesbaden; Gehlen sought and received approval from Doenitz too!

It is in May and June 1945 that the Americans first appear in this book and here I must say that neither the Americans in general, nor CIA in particular, have any reason to complain about what Gehlen has to say about us. He mentions very few personalities and for most of these he uses an alias or a similar device. A well-known figure such as Brigadier General Edwin L. Sibert, then G-2 of the European Theater, is mentioned by name, and in a very favorable way. The other Army officers are either given aliases or are referred to as Colonel D., Colonel L., or Colonel Rusty (a nickname).

The only CIA personality mentioned by true name is Allen Dulles, whom he describes as being, along with the Admiral Canaris, the best of the intelligence chiefs he met. The only other CIA personality is "Herr M," (the first Chief of Pullach Base, who was Gehlen's opposite

number for nearly eight years); Herr M gets only brief mention, but in the most favorable terms. CIA is at one point gently chided for being overly bureaucratic; there is a heavily disguised reference to one of our OPC flaps; but that is about as far as the criticism goes. He discloses nothing which should not be disclosed and washes none of our dirty linen in public. Heaven knows there were some first class rows and hard feelings between Gehlen and us, and while he was often at fault, there was one time in particular when, largely through bureaucratic inertia, we were definitely the culprits, and where Gehlen on both official and personal grounds had every reason to be aggrieved and angry (he was, but only in private). The book shows him to be both a decent man and a big enough one to forgive, if not forget, these slights from the past. It is an old-fashioned way of putting it, but Gehlen is a gentleman and behaves like one.

There are many faults in this book, but before discussing them let us look at his towering achievement, the biggest item on the credit side of his ledger. The idea of the BND was Gehlen's. Whether he envisaged such an organization in 1943 is doubtful and unimportant, but by 1946 he was definitely thinking in terms of a national intelligence organization. He showed political skill of the highest order in pushing through his concept in the face of considerable opposition from other embryonic services in Bonn, various German politicians, allied intelligence services, and hostile services. He describes this process with modesty. The BND has today the most powerful and broadest charter of any western service. When one considers the duplication which abounds in other western intelligence communities, the position of the BND is both desirable and enviable. This does not mean to say that the BND is a first class intelligence service; it is not (more on this later), but it is in a position to become one.

Now for the debit side of the ledger. Here the reviewer must read carefully. I am writing a classified review and can say things which Gehlen, in his book, obviously could not say. Tempered criticism is in order, however. In the first place, Gehlen was never a good clandestine operator, nor was he a particularly good administrator. And therein lay his failures. The Gehlen Organization/BND always had a good record in the collection of military and economic intelligence on East Germany and the Soviet forces there. But this information, for the most part, came from observation and not from clandestine penetration. As far as we know (and we know a great deal) the Germans never had a good political penetration in East Germany or anywhere else in the Soviet Bloc. Thus Gehlen's descrip-

tions of most of his so-called successes in the political intelligence field are, in my opinion, either wishful thinking or self-delusion. While one might have expected the German service to be capable of staff penetrations within the East German government, the extent of its greatest success seems to have been the recruitment of the boyfriend of a secretary (Elli B—Operation Gaensebluemchen, mentioned by Gehlen) in East German Prime Minister Otto Grotewohl's office; the boyfriend was able to debrief the unwitting Elli B on what went on in the office. The unfortunate woman paid for her indiscretion with her life. Similarly, when Gehlen states that he received "two reliable reports" in the 1950's that Martin Bormann was living in the USSR, I can only wonder and point out that he never informed us, although that case and others like it were discussed in great detail by CIA and the BND. Incidentally last year's uproar in Germany about Gehlen's Bormann revelation is unwarranted. That Gehlen and Canaris had a conversation about a Soviet penetration of Hitler's entourage, and that they considered Bormann the most likely candidate, is entirely credible. Furthermore, although there is no evidence one way or the other, I accept the possibility that an unprincipled villain such as Bormann would have been very receptive to a Soviet recruitment pitch by, say 1943, when all could see that the war was lost. Bormann's being a red-hot Nazi was no bar to such an alliance. Any real Nazi despised democracy and admired dictatorships.

To get back to Gehlen's descriptions of world events and his cases found in Chapters 5 and 9, I consider the picture to be too rosy, far too rosy.

Gehlen makes much of the struggle between his organization and the East German intelligence service under Ernst Wollweber. This ended with the dismissal of Wollweber and one infers that the West Germans "won" this one. Perhaps they did in a certain sense. But the very real and crushing defeat of the BND came at the hands of the KGB and is best personified by the Felfe case.* Again Gehlen is severely limited in what he may say, but the fact of the matter is that staff security, while a horrendously difficult problem in Germany in the early post-war years, was also the well-nigh fatal weakness of the

*Heinz Felfe, formerly a lieutenant in the intelligence arm of the SS (a fact which he concealed from the BND), was a member of the BND's CI staff. For the ten years of his employment by Gehlen, he was an agent of the KGB. He was arrested in 1961, sentenced to 14 years, and exchanged in 1969. He is now completing his Ph.D. studies at the Humboldt University in East Berlin. His field is criminology and he will be given a teaching position at Humboldt—how nice.

SECRET

Recent Books

German service. He could have dwelt on these very real difficulties, for there are at least ten reasons why West Germans were, in the early days at least, peculiarly susceptible to Communist blandishments. The West German government has been, and doubtless still is, thoroughly penetrated, and more frankness on Gehlen's part with respect to this problem would have been in order. His two and a half pages on Felfe make poor reading.

Gehlen's critics have made much of the ring of informants which he is said to have woven through West Germany. This question of domestic operations is a difficult subject to evaluate. Consider the following points: there was no national security organization in West Germany until 1950, and not much on the state level before then; Gehlen was, with justification, desperately concerned about Communist penetration and in running CI cases naturally became involved with West German citizens; West Germany swarmed with Communist spies, literally thousands; Gehlen operated a lobbying apparatus aimed at paving the way for his organization to become the BND; Gehlen did make some accusations about West German citizens, some of which were justified and some absurd; some West Germans genuinely thought they were being investigated by Gehlen's people—sometimes they were, sometimes they were not; Gehlen's many enemies were quick to turn any of his mistakes to their advantage. I do not consider that Gehlen's activities in this field, while sometimes ill-advised, were nearly as sinister as some of his critics make them out to be. Gehlen does not discuss this aspect in his book, but his reviewers do, so it is worth mentioning.

Gehlen is bedeviled by one of the problems which beset the intelligence business. The problem is that people will believe almost anything you tell them about it. As one senior CIA official put it: "Talking to people about intelligence is the same as talking to young people about sex. The more improbable you make it, the more they believe it." For years Gehlen was the Master Spy, the Man of Mystery, Spy of the Century. His whole career as a General Staff officer, then the secrecy of the U.S. Army and CIA trusteeship, the mystery surrounding the Pullach headquarters compound, and particularly, because of a genuine fear of Communist reprisals (such things frequently occurred during the Cold War days), the fact that he never allowed himself to be photographed—all this built up a legend far in excess of the reality. This comes out very clearly in *The General Was a Spy* and Cookridge's book. To those in the know, however, this legend, while harmless, was known for what it was, just a legend. But now his book provides his critics with a perfect peg on which to hang their criticism. A review

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in the West German news magazine *Der Spiegel* by a former high-ranking German security officer entitled "A Well-Deserved Self-Revelation" is a case in point; the theme is that Gehlen has at last revealed himself as a straw man. In point of fact, if you do not know the full inside story and accept Gehlen's book, he does not reveal himself as such. However the review has many excellent points (spoiled, let it be said, by the critic's intemperance) and viewed against the overblown legend, the denouement is quite shattering.

Gehlen might have made more of one aspect of his service which is generally rated quite high. I refer to his intelligence analysis department, which from its beginnings has turned out a lot of sound work. But Gehlen, although not an operator, loved operations for operations' sake, and tended to see the success or failure of his organization in these.

As I said, an intelligence chief should not write a book on his own organization; the forbidden subjects are too numerous and too restraining, and a stunted picture is bound to emerge. But for better or worse Gehlen wrote one, and it makes interesting reading, at least for the specialist. I have thought of raising that C plus to a B minus, but I think I'll leave it as it is.

The General Was a Spy, while a poor book, has an interesting background. Both Zolling* and Hoehne were staff writers for *Der Spiegel* and the book first appeared in serial form in that magazine in the summer of 1971. Spiegel tends to be quite nihilistic, particularly when it comes to anything to do with the state, the establishment, the U.S., and so on. As Conrad Ahlers, one of the Bonn Government Press Secretaries said, on the occasion of the start of this serialization, "Spiegel is singing its old song: alles ist Mist was der Staat macht." And Ahlers is quite right. But at the same time the "line" of the book zigs and zags. The first part has a powerful attack on General Wessel, Gehlen's successor; then the part which describes Gehlen's G-2 career in the German Army is very laudatory; then the description of the Gehlen Organization's battle with the East German service under Wollweber is laudatory (it has to be since it is based squarely on a cover story on Gehlen which *Spiegel* had published in 1954); then it turns anti-Gehlen. Granted that the 1950's were Gehlen's salad days and the 1960's his time of troubles, it is quite obvious that Spiegel attacks him and Wessel as part of a calculated policy.

One of the most flagrant examples of anti-BND writing by the *Spiegel* occurs in Chapter 9 which has the title "The Hunt for Enemies

*Zolling died recently.

of the State." This deals with Gehlen's domestic operations, mentioned earlier. After setting forth pages of lurid "facts" to make their point, the authors conclude: "In the backrooms of Bonn and Pullach something was created which still haunts the BND: the unholy alliance between secret service and state party (Staatspartei)." This is utter nonsense, and it is ironic that one of Gehlen's low points came in 1962 when Chancellor Adenauer suspected him of having tipped off to the Spiegel editors a proposed government raid against their offices, permitting them to destroy documents the government was seeking in a security leak.

Another basic fault of *The General Was a Spy* is that so much of it is sheer garbage. Many of its facts are incorrect. For example:

- a. Neither CIA nor any U.S. government agency made Gehlen a gift of DM 250,000 or of any amount—to purchase his home in Berg. (Incidentally, Cookridge makes the same error.)
- b. The first annual budget (presumably for FY 1947, although this is not stated) of the Gehlen Organization was not \$3.4 million, but much less than a half of that.
- c. Gehlen did not meet Chancellor Adenauer for the first time in September 1949, but on 20 September 1950.
- d. Lieutenant Colonel Siegfried Dombrowski, the chief of administration of the East German military intelligence service, was not recruited by CIA and turned over to the BND for handling prior to his defection in 1958; he was a walk-in to CIA, and the BND was brought in when he was surfaced and then resettled, months later.

There are many more such errors, and the above are only a few which this writer was able to identify from memory. There is probably not one book about intelligence operations written by an outsider which is not full of such errors, but this does not make *The General Was a Spy* a good book. It is plausibly and quite dramatically written, but is tendentious, and although some parts seem to be quite accurate (Gehlen as theater G-2, the Felfe case, as far as the description goes), it has far too many errors. I give it a D plus.

Cookridge's book is in many ways similar to the *The General Was a Spy*. It is written in a quite racy style (I guess most spy stories are—*The Service* being a notable exception) and it is chock full of errors. This is not surprising, since it is obvious that Cookridge based whole sections of his book on *The General Was a Spy*. Its reproductions of the illustrations from *The General Was a Spy* are extremely poor. Cookridge's line is quite interesting. One would expect "Spy of the Century" to be a panegyric, but it is not. Cookridge obviously does not like the Americans, CIA, and Allen Dulles very much, and makes Gehlen look quite good in comparison. But the sum total of the book

is rather negative toward Gehlen; either that, or the rest of the twentieth century spies were a pretty poor lot.

I shall not bore the reader with another list of mistakes; one will suffice. When Gehlen was brought over here in 1945 to help G-2 write a handbook on the Soviet Army, he was not a very important person. He was a rather shabby POW in civilian clothes, and he was kept very much under wraps. German brigadier generals did not rate very highly in 1945, and so far as we know the highest ranking American he met was a colonel. He certainly did not sit across the conference table from Admiral William D. Leahy, then the equivalent of Chairman of the JCS. This book rates a D minus.

Now to *Nicht Laenger Geheim*. The trouble with Communist descriptions of current politics is that they are so tied to the party line and jargon that everything sounds like Pravda. "The Position of the West German Secret Service in the State-monopolistic Control and Power Apparatus" and "The Role of the Secret Service in the Counter-revolutionary Expansion Strategy of West German Imperialism"—these two headings will show what I mean. This book also has garbage coming out of its ears. It is inaccurate, tendentious, and brutally dull.

The interesting thing is that the East Germans could write a whale of a book about the BND if they wanted to. But somehow their Prop-department is unable to get together with the Intelligence Service. When this same Dr. Mader produced a book called *Who's Who in CIA*, consisting mostly of lists of names from the U.S. State Department Biographic Register, 99 percent of them were entirely innocent of any intelligence connection. Although the Felfe case was run by the KGB, the East Germans must have gotten a lot of his information. Yet Felfe is not even mentioned in *Nicht Laenger Geheim*, a rather strange omission.

Nicht Laenger Geheim is probably compulsory reading in East German intelligence schools and I'm awfully sorry for the students. But then, it probably is not any worse than their other political texts. It gets an F.

* * * * *

Much has been made in American reviews of the Cookridge and Hoehne/Zolling books of the role Gehlen played in the Cold War. Thus: "Reinhard Gehlen . . . may have had more important influence on the course of the Cold War than any other man." And later "His . . . rigid anti-Communism probably contributed to prolonging the most dangerous period of the Cold War and may have slowed the evolutionary political process in the USSR and Eastern Europe." These two quotations appeared recently in a well-known daily news-

paper. They are sheer and utter nonsense, picked up primarily from Cookridge.

The writers, Cookridge *et al*, as well as the reviewers, suffer from a terrible disadvantage (whatever their scholarly integrity may be) in that they seldom if ever get hold of any basic source material. None of the reviews I have read note that Cookridge cribbed most of his material from Hoehne/Zolling, or that the latter, in discussing the period up to 1954, drew heavily on *Der Spiegel* cover story of that year, which itself was based largely on speculation, and contained a great deal of proven nonsense. So I am afraid that the dissemination of nonsense will continue ad infinitum, as each successive writer draws on his predecessor.

But all that is secondary to the main point of Gehlen's role in the Cold War. Without disclosing too many "house secrets" I think it is safe to say that his organization: (a) did not set up the Berlin Tunnel; (b) did not acquire Khrushchev's secret speech; and (c) did not play a role of any appreciable influence in the Cold War. Certainly major U.S. policy makers never saw his product; indeed had probably hardly heard of him. The U.S. leaders in the era from 1946 onwards needed no advice from Gehlen on the menace of Soviet imperialism. Besides, the political intelligence product of the German service left much to be desired. So far as the German government was concerned, Adenauer needed no pushing from Gehlen either, and from 1962 onward, due primarily to the Felfe and Spiegel affaires the influence of the BND on Bonn foreign policy was close to zero.

THE GAME OF THE FOXES: The Untold Story of German Espionage in the United States and Great Britain during World War II. By *Ladislav Farago*. (David McKay Co., Inc., New York, 1971. 696 pages.)

Ladislav Farago is a prolific writer. Fifteen earlier works preceded *The Game of the Foxes*. One of these, *The Broken Seal*, was reviewed in *Studies in Intelligence* (Vol. 12, No. 1, Winter of 1968, pp. 76-82). A passage from that review shows that Farago, like a locomotive in a museum, has been staunchly impervious to time. "In dealing with this history of cryptologic operations Farago acquired just enough information, and possessed just enough technical knowledge, to entangle himself in a series of stories which are unsatisfying at best . . . and badly misleading at worst."

In an unusual moment of candor Ladislav Farago said last February, during a radio interview about *The Game of the Foxes*, "My background in intelligence is really sort of peripheral to my profession as a journalist."

Farago's introduction to this book is less honest. It was intended to lay the foundation for his claim to have made an important contribution to the history of espionage through utilization of significant historical records that lay mouldering until he found them and recognized their worth. The fact is that U.S. intelligence researchers who are more familiar with National Archives and other governmental repositories than is Farago had long ago made proper professional use of these records. Farago introduces so many misrepresentations into the preface of this book that only parallel columns can set forth the facts clearly:

FARAGO	FACT
1. "For over ten years I had been gathering material . . . about the Abwehr. . . . But the problem of unravelling the super-secret activities of this organization, whose records presumably had been destroyed at the end of the war . . . seemed well-nigh insurmountable. Then in 1967, in a dark loft of the National Archives in Washington, D.C. . . ."	There are no dark lofts at National Archives. If Farago refers to the stacks, these are no darker than in many other places.

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FARAGO

FACT

2. "... in a dark loft . . . I stumbled over a metal footlocker. . . ."
 3. "It held hundreds of little yellow boxes containing rolls of microfilm."
 4. "It was obvious from the dust on the boxes. . . ."
 5. "It was obvious from the dust on the boxes and the seals on the old metal rolls that they had never been opened."
 6. "The collection was as raw as it must have been when originally found in Bremen. . . ."
 7. "Dozens of the rolls, with about a thousand frames in each, contained the papers of the Hamburg and Bremen outposts. . . ."
 8. "... the Hamburg and Bremen outposts of the Abwehr, the two branches of the German . . . agency that specialized in clandestine coverage of Britain and the United States."
- The captured German records are not kept in metal footlockers. They were transported from Alexandria to National Archives in boxes resembling footlockers, ca. 1959-1961; but they were taken from these boxes and stored like any other records.
- The reels of microfilm are kept in standard film boxes which are either yellow or blue.
- National Archives has an effective air-conditioning system, designed to hold dust to a minimum. The air is washed.
- After the war the U.S. Navy had custody of these films, which are the partial records of AST (*Abwehrstelle* or Abwehr office) Hamburg and NEST (*Nebenstelle* or sub-office) Bremen. The records include an extensive index on 4" x 6" cards of the Abwehr agents under the jurisdiction of these offices. The Navy microfilmed the records because of their importance. The records were used by U.S. Forces during the immediate post-war period. The films, stored in Alexandria until ca. 1961, were scrutinized by Army research personnel. In early 1950 Army completed the task of carding each reel. Each card describes the contents of the reel. Many persons, both intelligence researchers in the employ of the U.S. and other government and non-governmental researchers and historians, have consulted the index and the films. The name of each Abwehr agent in the holdings has been indexed.
- Untrue, as shown above.
- All of the records that Farago saw came from the subordinate Bremen office. They included such correspondence as Hamburg had sent to Bremen.
- The clear implication is that only Hamburg and Bremen ran such operations, and that therefore Farago has the whole story. The implication is false.

FARAGO	FACT
<p>9. "For years I had tried to uncover primary documentation of the Abwehr's personnel and activities, but was told . . . that the vast bulk . . . had been destroyed. . . yet now I had before me a very substantial part of those very records."</p>	<p>Experts agree that the extant Abwehr records in the West constitute only a very small fraction of the original files. It is nonsense, on the face of it, to claim that the Bremen files are a "very substantial part" of the total Abwehr files.</p>
<p>10. "The profiles of Germany's espionage executives now suddenly appeared in sharp focus. . . ."</p>	<p>Germany's "espionage executives" were, one supposes, Himmler, Heydrich, Kaltenbrunner, Schellenberg, Canaris, Oster, and a few others. It is safe to assume that they appeared in the files of NEST Bremen about as often as Stan Laurel and Oliver Hardy. A much better source on Abwehr officers is the records of the German Foreign Ministry, also held at National Archives and just as available to Farago or anyone else as the records of NEST Bremen.</p>
<p>11. "The profiles of Germany's espionage executives now suddenly appeared . . . together with detailed biographies and photographs of long-forgotten agents. They were the voluminous fiscal records [of] . . . Herr Toepken, the Abwehr's pay-master."</p>	<p>Researchers familiar with the material recall no photographs. Farago's book contains none. What Farago seems to have seen are the lists of Abwehr personnel whose names were sent to the finance office because they were authorized to exchange specified amounts in Reichsmarks for foreign currencies. All the names in these finance lists were indexed long ago.</p>
<p>12. "Now, practically the entire files of [the Abwehr] . . . became available to shed light on every aspect of its operations."</p>	<p>With negligible exceptions the Abwehr records captured by the Allies have been available to all scholars since the tripartite agreement was signed in 1956.</p>
<p>13. "The German secret service operated in two . . . compartments. One covered the East, mainly the Soviet Union. The other was engaged in operations against the West . . ."</p>	<p>Farago's ignorance is revealed here pitilessly. <i>Fremde Heere Ost</i> (Foreign Armies East) and <i>Fremde Heere West</i> (Foreign Armies West) had nothing to do with the Abwehr. They were the collection arms (concentrating on OB) of the German G-2.</p>
<p>14. "This book. . . . covers the period between 1920 . . . and 1945, when the defeat of the Third Reich resulted in the apparent demise of the German Secret Service."</p>	<p>The attempted coup of July 20, 1944, killed the Abwehr, not Hitler. It was absorbed by the RSIIA.</p>

FARAGO

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15. "In addition, thirty-four uncatalogued films have also been inspected, yielding vast source material never before used in research."
16. "By tapping archives not easily accessible . . . this book attempts to compensate. . . ."
17. "It was . . . no small task to penetrate behind the mask of the Abwehr. . . . It took me two years, for example, to uncover the identity of a remarkable secret agent stationed in the United States. . . ."
18. "By holding up the mirror to the Abwehr, one can see every big intelligence agency that has existed in the past or that functions in the present."
- Not all records have been catalogued, but practically all are available to researchers, and all have been studied and exploited.
- So heroic an undertaking should have led Farago to study the 30,000 rolls of the entire collection, not the 17,478 he claims to have seen.
- What Farago does not explain is that the indices to these records frequently provide the true name, the alias, and the code number of the agent. For example, Farago says (p. 22), "I discovered 'Daneberg's' dossier among the overlooked Abwehr files, and can now reveal that he was a 51-year-old, one-armed, German-American engineer, Christian F. Danielsen by his real name." Farago also explains that "Griekl's file in the Abwehr later referred to him as 'Daneberg'. . . ." The index entry under GRIEBEL, I. T., reads as follows: "Physician in New York City. Address: 56 East 87th St., German agent in USA, engaged in Operation SEX. His field agent was the "chief constructor" at the Navy yard, named 'DANEBOURG.' Born circa 1893. Real name believed to be DANIELSON. Cover name: 'HLBERG.' Number: F2339."
- By holding up a mirror to the Abwehr, one can see no mirror image other than that of the Abwehr itself. First of all, it was a military counterintelligence service, and thus a very different organization from a civilian service or from any services with major collection and/or covert action functions. Secondly, it was a German service. Thirdly, it worked under a dictatorship and, from 1939 to mid-1944, in wartime conditions. In fact, the Abwehr was unlike any other intelligence service, even the other German wartime services.

These columns show the result of close analysis of just four and a half pages of Farago's book, which contains 696 pages.

Farago's foxy account of the games of the foxes (and dyed rabbits) is unremittingly sensationalized. Of course, if the author had sustained real objectivity and integrity, the public sale might have been very small. After all, the essential details of the few German military espionage cases and counterintelligence operations of significance during World War II have long since been reported in other books by other authors. What we have here, with a few important exceptions to be outlined below, are accounts of trivial or mis-reported operations that failed.

The book sheds new but faint light on the character of Admiral Wilhelm Canaris. Farago observes that "much that has been said and written about Canaris has merely obscured his biography, falsified his record, and especially deepened the mystery that goes naturally with any chief of a secret service. . . . He succeeded admirably in his own camouflage. . . ." The character of Canaris is discussed by Farago and reflected in the operations of the Abwehr, which was, after all, mainly Canaris' handiwork. The main outlines of the picture that emerges are presented briefly below.

Farago claims that he first met Canaris in 1935, shortly after Canaris had assumed command of the Abwehr. The occasion was a dinner during which, according to Farago's hindsight, Canaris was intent upon sizing up Farago as a potential agent. During the meal Canaris abandoned this idea.

Farago says (p. 9): "When Captain Canaris appeared on the scene, . . . the moribund Abwehr came to life. . . . He made the Abwehr palatable to the Nazis. . . . struck up a close and seemingly genuine friendship with Heydrich.* . . . bought a house next to the Heydrichs in a Berlin suburb. . . . Canaris treating the Heydrich boys to candy and Frau Canaris fawning on the pretty blonde wife." Meanwhile, Canaris built up the Abwehr rapidly, fortifying himself as well as he could against his rivals.

For all its deficiencies, Farago's book does reflect vividly the travails of Canaris and the Abwehr in the wartime environment of Nazi Germany—distrusting and being distrusted on every hand, caught on the zig when policy zagged, beset by failures and betrayals within, forced into repeated cover-ups and explanations, and misguided until

*Heydrich and his boss Himmler were building up the Reich Security Service and in fact became strong antagonists of the Abwehr.

too late by personal predilections and prejudices. A few examples suffice:

"The exposure of the Rumrich spy ring in the United States produced what [Foreign Minister] Ribbentrop considered conclusive evidence that the Abwehr was nothing but a cabal of blockheads whose operations in foreign lands muddied international waters and caused Germany irreparable damage. . . . Thus began a feud that endured to the bitter end. . . ."

"Hitler ordered Canaris to refrain from espionage in Britain, and Canaris had to circumvent these instructions. And all during this period Hitler was seeing Canaris more often than at any time during the admiral's tenure of the Abwehr. Hitler's appointment book listed seventeen sessions between December 1935 and March, 1936, all of them private meetings of just the two. . . ."

"On 10 September 1939, Canaris had gone into the field to watch the Wehrmacht [armed forces] in action, and what he found in Poland turned his stomach. At different stops . . . his Abwehr officers . . . reported . . . that special SS and Gestapo murder squads that travelled behind the army had embarked on an orgy of massacre." Canaris could not believe that Hitler had given these orders. "He was emotionally convulsed and physically sick when he got back to Berlin on the 14th."

In June 1941 Canaris began trying to explain away the round-up of some 45 Abwehr agents by the FBI in the United States. He issued a long memorandum minimizing the damage, denying that he had trusted these agents, and complaining about the lack of Foreign Office support. ". . . the document was brazenly mendacious from beginning to end." But his explanations were accepted at face value.

Farago records (on p. 609) that Canaris was fired on 19 February 1944. (Actually, Hitler dissolved the Abwehr one day earlier.)* The Gestapo had detected and produced convicting evidence against "a small group of anti-Hitler dissidents, including General Oster and the lawyer Dohnanyi." The network in Argentina had been exposed, knocking out the last viable Abwehr base in the Western Hemisphere. Canaris' influence in Spain had been exposed as a myth. In Turkey Abwehr agents began to defect, and three officials went over to the British. The Himmler organization, the RSHA, thereupon blamed the Abwehr for the exposure of Cicero, which was the result of a defection of its own. Farago equates the departure of Canaris with the destruction of German foreign intelligence.

Farago's book can be neither trusted nor ignored. It would be a monumental task to sort out his facts from his fictions, his embroideries and his errors. Old hands familiar with the wartime cases of German agents in the United States find *The Game of the Foxes* inaccurate, and as for Britain, on the various occasions when Farago's version and that of Sir John Masterman are at odds, one is bound to opt for Masterman's. Farago, for instance, has the wrong identity for "Garbo," one of the key British double agents. It is tempting to say

*See William Shirer, *The Rise and Fall of the Third Reich*, p. 1026.

that Farago has created a farrago and let it go at that, but this would be too facile. The book is well-organized and highly readable. Farago presents a good deal of new information—"new" in the sense that it had not previously appeared in a book—and enough so that *The Game of the Foxes* would be a better book if cut by at least a third.

And there's the rub. Farago has combined enough intelligence with enough industry to produce a book that headed the best-seller list for months. He has not trumpeted an ideology nor written an "exposé" of one service or another. Yet a falsity pervades his work. He pretends that the bulk of the original Abwehr materials ("... 17,478 rolls of microfilm containing almost eighteen million pages of documents...") is an adequate basis for "... unravelling the super-secret activities..." of the Abwehr and also for unravelling the character of Canaris, a latter-day Hamlet whose subtlety evades Farago.

Can anything be done about the falsifiers of the history of intelligence? They would have to be exposed publicly, not in the pages of this journal. Perhaps the best that we can do is to keep our own holdings and our analyses uncontaminated by their inventions. This is a meager and disheartening prospect. These pseudo-scholars will go on reinforcing each other, padding each other's bibliographies, perpetuating the old myths, wearing plumed hats and striking poses. They are one of the plagues of the earth, enduring as locusts.

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CODEWORD: DIREKTOR; THE STORY OF THE RED ORCHESTRA. By *Heinz Hoehne*. (Translated from the German by Richard Barry. Coward, McCann and Geoghegan, Inc., New York, 1971. 310 pages. \$10.00)

The author's opening words call this book "The story of Soviet espionage in Germany . . ." This statement is a half-truth. *Codeword: Direktor** deals almost entirely with the GRU net in Germany in which key parts were played by Harro Schulze-Boysen, Arvid Harnack, and others in Berlin. Red Army nets and agents in France, Switzerland and Belgium are mentioned; there is passing reference to Holland; and the rest of Europe is ignored. In contrast, Hoehne deals with Germany at length, in somewhat pedantic and sometimes irrelevant detail. But he does not tell the story of *Soviet* espionage there, in the sense of the directing element in Moscow. Neither does he tell us enough about the Red Army intelligence officers in Germany who directed the activities of the agents. His spotlight is turned upon the agents themselves and upon their immediate antagonists in the Gestapo and the Abwehr.

Codeword: Direktor bears some of the outward signs of painstaking scholarship; yet it lacks both the breadth and the depth that those signs seem to augur. The bibliography lists 79 books, 21 unpublished manuscripts and articles, 17 short pieces printed in newspapers and periodicals, and 7 reference works. But with the exception of Gilles Perrault's *L'Orchestre Rouge*, every one of these works is in German or English. At first glance the sheer volume of footnotes is staggering; the 247 pages of text contain 1,927 footnotes. David Dallin** alone is cited 184 times. Perrault and Wilhelm F. Flicke are also quoted frequently. Hoehne indicates some awareness that Perrault is not reliable, but his quotations from all three of these sources, and others as well, are wholly indiscriminate.

Also disturbing are source citations like these:

" . . . private collection, the owner of which wishes to remain anonymous."

"Letter from Professor Heilmann . . . in Heilmann's private papers."

"Unsigned memorandum on organization and duties of the Soviet intelligence service . . . in archives of *Der Spiegel*."

"John Nemo (pseudonym of a Gestapo official, name unknown): *Das rote Netze*." Nemo's work is identified as an unpublished MS held by *Der Spiegel*.

**Call Sign: Direktor* would have been a better translation of the original title.

***Soviet Espionage*, Yale University Press, 1955.

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Another kind of footnote is even more disturbing. Hoehne says (p. 237), “. . . Major-General Tupikov, the Soviet Military Attache [in the Soviet Embassy in Berlin shortly before World War II] and the direct contact for the Schulze-Boysen/Harnack circuit. . . .” He sources the statement to Georgi K. Zhukov, *Memoirs*, p. 227. Zhukov’s book, however, says nothing about Tupikov’s intelligence role in Berlin. It is true that Vasilii Ivanovich Tupikov was an RU officer, Section I (Western Europe). In 1940–1941 he was a major and was indeed the military attache in Berlin. But some time in 1941 he was recalled, reportedly for talking too much when drunk. We just do not know whether Tupikov was involved in the work of the RU nets in Berlin. It is a reasonable presumption. But Hoehne does not label it as such.

The principal strength of Hoehne’s book is that it tells us quite a bit more about the German counterintelligence work against the Schulze-Boysen/Harnack group than was known before. A second virtue is that Hoehne warns his readers that both the political wings, left and right, have made strenuous efforts to distort the story of the Rote Kapelle for ulterior purposes. (He does not, however, really get down to cases. With an air of slight surprise, Hoehne points out every now and then that Perrault is wrong about something or other; he never evaluates Perrault, however, or considers whether the Frenchman’s errors are tendentious.) He also concludes his book with some clear-sighted comments about how the importance of the Rote Kapelle has been greatly exaggerated. He observes (p. 244), “If the casualties caused to Hitler’s forces by Rote Kapelle be reduced to figures, the alleged losses of 100,000 shrink to some 36. . . . Anything more than this is sheer imagination.” In fact, the last chapter, called “Rote Kapelle: Fact and Fiction,” is the best in the book and well worth reading.

There are a few trivial annoyances. For example, the footnotes frequently refer to the Gestapa (for *Geheimes Staatspolizeiamt*), thus drawing a pedantic and useless distinction between the office and the organization. Another example, from p. 128: “The Soviet Secret Service chiefs in Moscow . . . radioed their final instructions to Erdberg—not a moment more to lose: all agents on the alert.²⁵⁷” Footnote 257 refers the reader to pp. 134–5 of Dallin, but neither these nor the pages immediately preceding and following hold any reference to Erdberg (an alias) or to instructions from Moscow. The book has photographs of only fourteen people. Two of them, for no valid reason, are Wilhelm Canaris and Reinhard Heydrich.

Codeword: Direktor has two serious defects. The first of these results from the fact that Hoehne and his sources are misinformed about the GRU and RU. The author maintains rather insistently that Marshal Ivan Terenchevich Peresyppkin (the matronymic is usually given as Timofeyevich) was chief of the GRU (which the author calls the *Razvedupr* throughout his book) in 1941. Hoehne also argues that General Fedor Fedotovitch Kuznetsov never headed the GRU. He is wrong on both counts. (Peresyppkin was in charge of the Soviet signals troops and a close friend of Stalin.) The mistake helps to explain why the book goes flat when it tries to transcend the Gestapo-Abwehr—Berlin level and show the action in broader perspective.

The second defect is that Hoehne confuses the Rote Kapelle in Germany with the Rote Drei in Switzerland.* He also perpetuates the myth that unknown members of the Schulze-Boysen and Harnack group escaped detection by German counterintelligence and continued their reporting via the Swiss General Staff and the Rote Drei transmitters. He quotes (from the Flicke collection) from messages of 21 October 1941, 22 October 1941, 9 December 1941, 12 December 1941, 12 August 1942, and 25 August 1942. He says that all but the last of these went from Berlin to Moscow. In fact, all but the last went from Switzerland to the Center, and Hoehne must have known this fact because all five were signed by Dora—i.e., Rado. Presumably the Flicke collection includes the full messages, complete with source lines. A look at these is illuminating:

9 December 1941. Dora to Director. "From Berlin, from Luise," "Luise" being the intelligence section of the Swiss General Staff. "The fresh assault on Moscow is not the outcome of some strategic decision; it is indicative of the dissatisfaction prevailing in the German army over the fact that, ever since 22 June, new objectives are always being set and never reached. As a result of Soviet resistance, Plan I (Urals), Plan II (Archangel-Astrakhan) and Plan III (Caucasus) have all had to be abandoned."

Hoehne says that this report came from Schulze-Boysen's agents. If he were right, we should know for the first time that one or more members of that circle provided intelligence to the Swiss G-2 in Germany or Switzerland—or conceivably, though far less probably—to Rudolf Roessler directly. The footnote for this message refers us to the private collection of papers from Wilhelm F. Flicke. Actually, the same message appears in Flicke's book *Agenten Funken nach Moskau***

*See *Studies*, XIII/3/p. 51.

**Welsermuehl Verlag, Wels-Muenchen, 1957.

(with correct attribution to Berlin and "Luise," but without any reference to Schulze-Boysen or any of the other Rote Kapelle agents in Germany). The text is correctly quoted except for one omission. The last sentence of the full message read: "Resupply [or reinforcement: *Nachschub* in the original] suffers most from this switching of plans." A recent book by Alexander Rado, *Dora Jelenti (Dora Reports)* was translated from the Hungarian into Russian by V. Aleksandrov and printed in the Moscow periodical *Oktyabr*, where it ran serially in 1972. This book quotes the same message with the same omission. Inasmuch as the missing sentence contains nothing helpful or harmful from the Soviet viewpoint, one may conjecture that Hoehne and Rado may have worked from the same collection of messages, and that for reasons unknown the message of 9 December 1941 happened to be defective. If this guess is right, what was the common source? When *Dora Reports* first appeared in the original Hungarian (running serially in the Budapest daily *Nepszabadsag* starting 16 October 1971), the final sentence of the introduction said of Rado: "Using original documents in the files of the Soviet Union, he has written the truth about this chapter of the secret war."

If the 9 December message had originated with the Schulze-Boysen group, it would probably have been sent to Switzerland for relay only if the Berlin W/T operator, Hans Coppi, was off the air at the time. He may have been. Some time earlier Coppi, who was most inept, had plugged his transmitter into a DC power source, blowing out the transformer and tubes. Schulze-Boysen, however, had put Coppi in touch with Kurt Schulze, an expert, in November 1941, and by the end of the year Schulze had given him some sorely needed training and a new transmitter/receiver. Even if Coppi was still off the air on 9 December, it is most unlikely that messages from the Rote Kapelle group in Germany were being sent to the Swiss G-2 for transmission to Moscow. The Center in Moscow had adamantly refused to let Rote Drei people establish contact with the British or the Americans in Switzerland, and there is no reason to think that the Center's attitude toward sharing with the Swiss General Staff would have been any different. If someone in the German ring had passed reports to the Rote Drei or to the Swiss without Moscow's knowledge, the duplicity would soon have become apparent, especially when Coppi got back in business, and the Center would have exploded with wrath. It is much more likely that Hoehne is wrong, and that the Schulze-Boysen and Harnack circle had nothing to do with this message.

Hoehne also drops the source line from a message of 12 December 1941 and attributes the information to the Rote Kapelle in Germany.

The expunged source line reads: "From an officer in Munich via Luise." The translation of Hoehne contains a seemingly trivial error, a reference to ". . . the line Rostov-Smolensk-Vyasma-Leningrad," whereas the original message referred to ". . . the line Rostov—between Smolensk and Vyasma—[and] Leningrad." The discrepancy would be unimportant if it did not also appear in Rado's book. But it does, and thus strengthens the argument that Hoehne and Rado may have been using materials from a common source.

In the remaining 1941 messages, Hoehne follows the same pattern of suppressing the source data and the sender's alias, and of falsely attributing the message to the agent network in Berlin. A sixth message, dated 25 August 1942, is said by Hoehne to have been sent from Moscow to Berlin, whereas it was in fact sent to Rado in Switzerland.

Codeword: Direktor is well worth reading as an account in depth of the struggle of spy vs. counterintelligence official—an unequal contest because Schulze-Boysen, Harnack, and the rest were by far the weakest of the Rote Kapelle groups. They flouted the elementary rules of security not only amateurishly but with a kind of willfulness, like neurotic criminals making sure that the police have all the necessary clues. The book tells us nothing new about the Rote Kapelle nets elsewhere in Europe. It has little to say about the role played by the Soviets, and what it does say is badly awry. Hoehne deliberately altered Rote Drei messages and falsely attributed them to Berlin. He may have done so in order to simplify his story. But the odd parallels noted between Hoehne and Rado also suggest the disturbing possibility that the KGB may have supplied both with some of their source materials. If so, Hoehne is probably unaware of the taint, for his book neither serves nor hinders the purposes of Soviet intelligence. But Hoehne's non-public sources are chiefly in the archives of *Der Spiegel*, a magazine which has been afflicted with a pro-Soviet bias in recent years.

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