Killian and Land influence

SCIENCE AND TECHNOLOGY: ORIGINS
OF A DIRECTORATE

Donald E. Welzenbach

Although the Directorate of Science and Technology was not formally established until 5 August 1963, recommendations for its creation were made almost nine years earlier, and the Directorate of Research had been created in February 1962. The suggestion that a science and technology entity was needed arose from a little-known, yet highly influential effort called the Technological Capabilities Panel (TCP), authorized by President Dwight D. Eisenhower in July 1954. The directorate's eventual formation came as a result of pressure brought to bear by another entity, the President's Foreign Intelligence Advisory Board (PFIAB), which traces its origins to this same 1954 period. And it was the same two men in the TCP and the PFIAB who wanted such a directorate: Massachusetts Institute of Technology (MIT) President James R. Killian, Jr., and Polaroid Corporation President Edwin H. (Din) Land.

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The TCP endeavor grew out of a 15 March 1953 report by the Science Advisory Committee of the Office of Defense Mobilization (ODM). This panel, which included in its membership MIT's Killian and Polaroid's Land, warned newly elected President Eisenhower about US vulnerability to surprise attack. Both Land and Killian had been associated with Air Force advisory groups since World War II. During the war, Killian, as assistant to MIT President Karl T. Compton, oversaw the administration of the nation's largest scientific endeavor, Radiation Laboratory (RadLab). At its peak, RadLab was substantially larger than the Manhattan Project. It brought together more than 20 percent of the nation's physicists and employed more than 4,000 persons. RadLab scientists refined a British invention known as radio detection and ranging, or radar, designed a 10-cm radar small enough to put aboard aircraft, developed a precision gun-laying radar, and designed a long-range navigational system known as Loran.

During President Eisenhower's first year in office he worried about this nation's vulnerability, especially in the light of the paucity of hard intelligence about Soviet capabilities and intentions. Reinforcing his concern were the predictions of several 1950 NSC and CIA estimates that recommended the United States should be prepared to wage a global war in 1954, the so-called "year of maximum danger." Foremost among the President's concerns was the size and disposition of the Soviet Union's fleet of intercontinental Bison bombers.

To many US political and military leaders, the Soviet Union in the early 1950s appeared to be moving inexorably toward a position of parity with the United States. First, the USSR detonated an atomic device in the late summer

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of 1949, nearly three years sooner than US experts predicted it could. Then, only four years later, in August 1953—a scant nine months after the United States did—the Soviet Union also succeeded in detonating a hydrogen device manufactured from lithium deuteride, a more advanced technology than the heavy-water method used by US scientists. Only two months before this Soviet nuclear success, an uprising in Berlin to protest the Soviet occupation was promptly crushed by Soviet troops. Even in the United Nations the Soviet bloc seemed bent on causing dissension and unrest between Western Europe and the United States and between the developed and undeveloped nations.

President Eisenhower became greatly concerned with the possibility that the Soviet Union might attempt a surprise attack against the United States after a US military attache sighted a new Soviet intercontinental bomber at Ramenskoye, south of Moscow, in mid-1953. This was the Myecheslav-4 Bıson, the Soviet counterpart of the US B-52 which was only then going into production. Pictures of the Bıson taken at the Moscow air show in 1954 had an enormous impact on the US intelligence community. Unlike the Bull and several other Soviet postwar aircraft, the Bıson was not a "derivative" of US or British designs, but represented a "native" Soviet designing capability which surprised US intelligence experts.

In early 1954, Trevor Gardner, Air Force Secretary Harold Talbott's special assistant for research and development, learned of President Eisenhower's anxiety over the possibility of surprise attack. Gardner thought the nation's scholars could be of some help in this matter and went to see Dr. Lee DuBridge, chairman of the ODM's Science Advisory Committee (SAC), to urge him to have a group of experts meet with the President on the matter of surprise attack.[1] DuBridge arranged a plenary meeting of his group with the President on 27 March 1954 at which Eisenhower told the assembled scholars about the discovery of the Soviet Bıson bombers and of his concern lest they be used in a surprise attack on the United States. Stressing the high priority he gave to reducing the risk of military surprise, the President challenged the scientists to advise him on this problem.

The President's challenge led SAC Chairman DuBridge * to ask MIT's Killian to convene a subcommittee of SAC members, many of whom lived and taught in the Boston area, to examine the feasibility of conducting a scientific assessment of the nation's defenses. Killian held this meeting at MIT on 15 April 1954. The subcommittee recommended that a task force be recruited, but stressed that it needed the expressed endorsement of the President. If approved, the task force would undertake studies in three areas of national security: Project One, offensive capabilities; Project Two, continental defense; and Project Three, intelligence, with supporting studies in communications and technical manpower.

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[1] Michael R. Beschloss, *Mayday*, (New York, Harper & Row) 1986, pp. 73-74.

* DuBridge, who headed MIT's RadLab during World War II, later became science adviser to President Richard M. Nixon.

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"Direct a Study"

On 26 July 1954, President Eisenhower authorized Killian to enlist such a panel of experts and to direct a study of the country's technological capabilities "to meet some of its current problems."[2] Eisenhower had a great deal of confidence in Killian. Prior to his election as President, it should be recalled, Eisenhower was president of Columbia University. During his tenure there, Eisenhower came to know and respect Killian, a fellow college president who was elected to head the prestigious MIT when he was only 45 years old.

During July and August 1954, Killian organized 42 of the nation's leading scientists into the three special project areas and an additional communications working group. The various TCP groups, working under the aegis of the National Security Council, began meeting on 13 September 1954. For the next 20 weeks, until 4 February 1955, the members of the various panels met on 307 separate occasions for briefings, field trips, conferences, and discussions with every major unit of the US defense and intelligence establishments. They were made privy to all of the nation's defense and intelligence secrets as well as to the status of all on-going programs before they began drafting their final report.

The Project One group, charged with investigating US offensive capabilities, was headed by Marshall G. Holloway of the Los Alamos Scientific Laboratory. This 10-man panel included Ruben F. Mettler from the staff of the Assistant Secretary of Defense (R&D) who later cofounded Space Technology Laboratories (STL) which subsequently became a part of the TRW Corporation.

Project Two, which investigated the nation's defensive capabilities, was headed by Leland J. Haworth of Brookhaven National Laboratory. This 12-man panel included Herbert (Pete) Scoville, Jr., then of the Armed Forces Special Weapons Project who later became CIA's Assistant Director for Scientific Intelligence and its first Deputy Director for Research; and Brockway McMillan, then of Bell Telephone Laboratories and later the second Director of the National Reconnaissance Office.

Project Three, whose task was to investigate the nation's intelligence capabilities, was headed by Polaroid's Din Land. It was the smallest of the three groups with only six members. In addition to Land, they were: Harvard's James G. Baker, the nation's leading designer of aerial lenses; Nobel physicist Edward M. Purcell; Joseph W. Kennedy of Washington University, St. Louis, a renowned chemist responsible for isolating plutonium; John W. Tukey of Princeton University and Bell Telephone Laboratories; and Allen Latham, Jr., of Arthur D. Little Inc., an engineer and former treasurer of Polaroid Corporation.[3]

The formal TCP report was published on 14 February 1955. This 190-page document, titled: *Meeting the Threat of Surprise Attack*, had a momentous

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[2] J.R. Killian, Jr., *Sputnik, Scientists, and Eisenhower—A Memoir of the First Special Assistant to the President for Science and Technology*, Cambridge, The MIT Press, 1977, p. 68.

[3] *Technical Capabilities Panel Report, Meeting the Threat of Surprise Attack*, 14 Feb 55, Top Secret—Restricted Data. The entire report was downgraded to Secret on 18 June 1973. Then, in 1975, more than three-quarters of the report was declassified and it has since been cited by a number of scholars writing on the topic of nuclear strategy and defense.

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impact on the US Government during the next two decades. The TCP recommendations were responsible for great changes in the US defense and intelligence communities. At the outset, the *TCP Report* noted: "We obtain little significant information from classical covert operations inside Russia . . . . We cannot hope to circumvent these elaborate (Soviet security) measures in an easy way. But we can use the ultimate in science and technology to improve our intelligence take." [4]

The importance that President Eisenhower attached to this report was apparent in the issuance, on the very day of its publication, of National Security Council (NSC) action No. 1355, requiring all executive departments and agencies of the government to comment on the TCP recommendations by 6 June 1955. DCI Dulles assigned overall coordination for this effort within CIA to his new assistant, Richard M. Bissell, Jr., who, along with the DDCI, Lieutenant General Charles P. Cabell, USAF, assigned action to suitable Agency officers for each paragraph on which the Agency had to comment. [5]

The TCP intelligence panel saw the need for "a research program producing a stream of new intelligence tools and techniques." It felt that existing groups within the intelligence community were too small and too heavily burdened with specific requirements in support of field operations. The Project Three panel found such efforts "not appropriate for broad, fundamental, and imaginative research in intelligence techniques," and went on to propose "a new laboratory facility where broad fundamental research in intelligence can be conducted." [6]

CIA, in responding to specific TCP recommendation C 3, which urged "adoption of a vigorous program for the extensive use, in many intelligence procedures, of the most advanced knowledge in science and technology," stated that it had "created a permanent Advisory Board, composed largely of former members of the Technological Capabilities Panel, to advise the Director and to supplement existing activities." [7] In subsequent years, this advisory unit, known officially as CIA's Scientific Advisory Board, came to be referred to as the "Land Panel," because Land chaired it for almost a decade. Its membership included the six men on the Project Three panel plus Jim Killian and Jerome B. Wiesner, professor of electrical engineering at MIT and Killian's successor as MIT president. Administratively, the Land Panel was attached to the DCI's Special Assistant for Planning and Coordination, Dick Bissell. [8]

The Land Panel was destined to exert great influence on the activities of the Central Intelligence Agency, especially in the field of overhead collection, but in other fields as well.

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[4] *TCP Report*. p. 188.

[5] Memo from AD/SI Chadwell to AD/CI dated 1 Apr 55.

[6] *TCP Report*. p. 145.

[7] *Comments on the Report to the President by the Technological Capabilities Panel of the Science Advisory Committee*, NSC 5522. 8 Jun 55. Annex C. Tab A. p. A51.

[8] CIA Notice 1-110-6 of 12 May 55. HS/HC-435.

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Roots of PFIAB

While the TCP effort was being organized, a four-man Special Study Group, authorized by President Eisenhower and chaired by General James H. Doolittle (USA, Ret.), completed its investigation of CIA's clandestine operations being carried out by the Directorate of Plans, forerunner of the Directorate of Operations. Doolittle was concurrently deputy director of Killian's TCP endeavor. Doolittle's Special Study Group report, issued on 30 September 1954, recommended that a committee of civilians be appointed to oversee the CIA. No action was taken on this matter until more than a year later, on 15 November 1955, when DCI Dulles resurrected the suggestion in a letter to President Eisenhower.

For several years, Montana Senator Mike Mansfield had introduced resolutions calling for a joint congressional "watchdog" committee for the CIA. Because the Doolittle report made a similar suggestion, the Mansfield resolution picked up senatorial support and, by the end of the 1955 legislative session, it looked as though such a resolution might win Senate approval. It was DCI Dulles' idea to forestall such a possibility by having the President appoint a civilian committee before the Congress reconvened early in 1956. President Eisenhower, who was also "concerned about the state of management within the Agency,"[9] agreed with Dulles' suggestion and, by Executive Order 10656, effective 13 January 1956, established the President's Board of Consultants on Foreign Intelligence Activities (PBCFIA).

That Eisenhower looked upon the PBCFIA entity as something more than just a *pro forma* panel can be seen from an entry in his diary concerning his first conference with the board on 24 January 1956: "Each (member) will be required to take an oath to reveal nothing to any nonauthorized person of any information he may gain while on this task. The charter of the board I intend to be very broad."[10]

The original 10-member PBCFIA included three of the four members of the Doolittle panel and its first chairman was Killian. By this time, Killian had gained an enormous amount of respect from President Eisenhower for his ability as a "presiding officer" who could draw people together and get constructive solutions to problems. The President was "quite confident that Killian could get the PBCFIA going and get it aligned to what he (Eisenhower) really wanted it to be."[11] The PBCFIA, and its successor, PFIAB, was to act as an oversight board for the Central Intelligence Agency, the National Security Agency, and other intelligence units for the next 20 years.[*]

The Land Panel

When Killian set out to appoint the TCP panels he first approached Bruce S. Old, a vice president of Arthur D. Little, Inc., to head Project Three. Killian placed such importance on the TCP effort that he expected panel chairmen to

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[9] General A.J. Goodpaster interview, 6 Jul 83.

[10] Robert H. Ferrell, ed., *The Eisenhower Diaries*, New York, W.W. Norton & Co., 1981, p. 312.

[11] Goodpaster interview.

[*] President Carter abolished the PFIAB in 1977. President Reagan reinstituted it in 1981.

spend full time at the task. Arthur D. Little was reluctant to release Old for the several months it would take to do the study. Because Killian was anxious to get on with the effort, he told Old to forget about his offer, and instead contacted his close friend, Land.[12]

Land had to make a major decision about his career. When Killian asked him to head the Project Three panel, Land, the millionaire inventor of the polarizing filter and the instant camera, had just turned 45. He was on a leave of absence from Polaroid and was living in Hollywood, California, advising Alfred Hitchcock on the technology of making three-dimensional movies. Land's choice was to give up his current interest in cinema's third dimension and return east to Polaroid and the TCP appointment.[13]

Unlike Killian, Land did not believe in large committees. Following his rule that any committee of which he was a part must fit into a taxicab, Land limited his group to five plus himself. The five he chose included four eminent scholars and an engineer.

In mid-August 1954, Land and Harvard's Jim Baker traveled to Washington to prepare for the Project Three study and arrange for briefings by the various intelligence organizations. As these briefings progressed, the panel members, according to Land, became more and more distressed at the poor state of the nation's intelligence resources. "We would go in and interview generals and admirals in charge of intelligence and come away worried. Here we were, five or six young men, asking questions that these high-ranking officers couldn't answer." Land added that Project Three members were also not overly impressed with the Central Intelligence Agency.[14]

At the end of August 1954 Land got around to conferring with DCI Dulles' special assistant, Dick Bissell, who came away from the meeting without any definite ideas as to why Land had contacted him.[15] Project Three panel members, it should be recalled, were not very happy with the status of US intelligence agencies at the time. But, Killian had confidence in Bissell. A special relationship existed between Killian and Bissell going back to 1942. In that year, Killian, the executive assistant to MIT President Karl Compton, headed a panel that recruited this brilliant young economist from Yale in order to strengthen MIT's Economics Department. Since that time, Killian held Bissell in high esteem.[16]

Meanwhile, Killian was in Washington arranging for the many trips and briefings to be given the members of the three major TCP panels. On 14 and 15 September, Killian and General Doolittle, the TCP's deputy director, reviewed these plans. On 24 September, Killian lunched with Air Force Secretary Talbott to discuss the study.[17]

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[12] Interview with James R. Killian, Jr., 2 Nov 84.

[13] Interview with Edwin H. Land, 20 Sep 84.

[14] Land interview.

[15] Interview with Richard M. Bissell, Jr., 8 Nov 84.

[16] Killian interview.

[17] Data obtained from J.R. Killian's appointments calendar

Land's was not a typical committee; it had a power base that lent consid-erable weight to any suggestions it might make. The panel had been directly commissioned by President Eisenhower to examine the activities of the nation's intelligence community and to recommend changes. Having participated in a number of Air Force-sponsored studies since 1951, several panel members had definite ideas on how to improve intelligence collection, and, more importantly, they had in Killian a direct line to the White House.

It was Land's Project Three panel that pushed the idea of building a high-flying aircraft to obtain photographs of the Soviet Union. The conclusive action came in late October 1954 when Land and Killian "met with Eisenhower to discuss various TCP recommendations that the President, concerned about leaks, had considered too highly classified to include in our TCP presentation to the National Security Council." [18] Indeed, the *TCP Report* included the following footnote:

> In order to keep this report out of a more restricted classification, the Panel has prepared for highly restricted circulation two other reports on intelligence embodying recommendations and conclusions for transmittal directly to appropriate offices of the government. [19]

One of these "two other reports" was the proposal to build the U-2 aircraft. The other was a proposal to develop a missile-firing submarine that resulted in the construction of the Polaris-class of submarines. [20] Killian describes his and Land's meeting with President Eisenhower thusly:

> Land described the U-2 system using an unarmed U-2 plane and recommended that its development be undertaken. After listening to our proposal and asking many hard questions, Eisenhower approved the development of the U-2 system, but he stipulated that it should be handled in an unconventional way so that it would not become entan-gled in the bureaucracy of the Defense Department or troubled by rivalries among the services. Consequently, a special management arrangement was devised that made it possible for the advisory group of scientists and engineers constantly to appraise and guide the devel-opment program and to permit quick decisions to be made. The project was made the responsiblity of the CIA, Richard Bissell was to be in charge of the project, and Trevor Gardner provided full Air Force support. [21]

Land's version of the meeting with Eisenhower is more succinct: "We told the President we were confident this aircraft could and would find and pho-tograph the Soviet Union's BISON bomber fleet." [22]

Concerning the uniqueness of this proposal, Killian remarked that Eisenhower's "readiness to receive a proposal of this kind and to act upon it on

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[18] Killian, *Sputnik, Scientists, and Eisenhower*, p. 82.

[19] *TCP Report*, 1954, p. 27.

[20] Killian interview.

[21] Killian, *Sputnik, Scientists, and Eisenhower*, p. 82.

[22] Land interview.

the recommendation of a group of scientists external to the government was an omen of great importance for the future relationship of the scientific community to him. It was also an illustration of his responsiveness to innovative ideas." [23] Both Land and particularly Killian remained closely associated with the Eisenhower White House for the remainder of his presidency.

Channel for Scientific Guidance

Killian, first as chairman and later as a member, served on the PBCFIA throughout the second Eisenhower administration. In early 1961, President John F. Kennedy asked Killian to again chair this panel, by then renamed the President's Foreign Intelligence Advisory Board (PFIAB), and he also made Land a member. Land remained a PFIAB member until the end of the Ford administration.

After the Soviet success in launching two earth satellites in the fall of 1957 there was even greater demand for scientific guidance to President Eisenhower as well as to many Cabinet-level executives. The main channel for this advice was Killian. After consulting with White House Chief of Staff Sherman Adams, Director of the Office of Defense Mobilization Gordon Gray, and Special Assistant for National Security Affairs Robert Cutler, President Eisenhower decided to reorganize and upgrade ODM's Science Advisory Committee. He wanted it to be directly responsible to the President, located in the Executive Office of the President, and chaired by a Special Assistant to the President for Science and Technology who would be his scientific adviser, would regularly attend National Security Council meetings, and have an office and staff near the NSC quarters in the Executive Office Building. According to Cutler, "our first, and only, choice for this new position was Dr. James R. Killian, whose effective conduct of the earlier Technological Capabilities Panel study had won everyone's confidence." [24]

Thus, on 7 November 1957, President Eisenhower named Killian the first Special Assistant to the President for Science and Technology, a position he held until July 1959 when he turned it over to a hand-picked successor, Dr. George B. Kistiakowsky, a professor of chemistry at Harvard, the designer of the implosion device for the second atomic bomb, and an original member of CIA's Boston Scientific Advisory Panel.

During Killian's tenure, he met almost daily with Eisenhower and became one of the President's five most trusted advisers of this period. Owing to his increased workload as presidential science adviser and his position as a paid government employee, Killian relinquished the PBCFIA chairmanship in early 1958 but remained a member of the board.

On 1 December 1957, President Eisenhower completed his reorganization plan by co-opting ODM's Science Advisory Committee and making it the President's Science Advisory Committee (PSAC) with Killian its chairman. This "interlocking" aspect of Killian's service to the President as both scientific adviser and chairman of PSAC as well as a member of the PBCFIA gave the

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[23] *Sputnik, Op. Cit.*, p. 82.

[24] Robert Cutler, *No Time for Rest*, Atlantic, Little, Brown, Boston, 1965, p. 352.

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scholar unusual influence within the Eisenhower White House. Killian's accep-
tance and effectiveness as special assistant "were greatly facilitated by a remark-
able letter written by President Eisenhower to Cabinet officers, White House
staff, and all members of the National Security Council, which stated his wish
that" Killian and all members of PSAC "have access to all documents and other
material, however sensitive, that we might need for our work and which indi-
cated further that the science adviser and PSAC would be available to be of help
to these other officers at the top level of government." In addition, Eisenhower
invited Killian "to be present at NSC and Cabinet meetings and sessions of lesser
policymaking bodies." [25] These actions by President Eisenhower brought the
scholars inside the White House and gave their recommendations the cloak of
highest authority. The suggestions of Killian, as science adviser, and the reports
of the various PSAC committees, over which he presided, came to be considered
by many defense and intelligence units as White House edicts. Changes in
programs were often effected without resort to presidential directives. A quarter
century later, Killian, in his book *The Education of a College President, A
Memoir*, referred to this era as one of "creative integrations and interdisciplinary
congeniality among a variety of research fields." In a postscript, Killian discusses
this influence:

> . . . Those individuals who served on the Technological Capabilities
> Panel, on the President's Board of Consultants on Foreign Intelligence
> Activities, and on PSAC provided this creative integration of which I
> speak. For example, the fact that William Baker, Edwin Land, and I
> were engaged concurrently in several of these groups made it possible
> to achieve an extraordinary synthesis of minds and ideas to aid the
> President in achieving his goals in shaping our defense and intelligence
> programs and policies. The fact that a number of us, including Baker,
> Land, Zacharias, Wiesner, Beckler, Kistiakowsky, and many others,
> worked together with interdisciplinary congeniality made possible the
> success of such achievements as the Polaris, the acceleration of our
> intercontinental ballistic missile program, the U-2, new techniques of
> undersea warfare, and spectacular advancement in our reconnaissance
> capabilities. Coupled with this concert of minds was the fact that the
> results generated could be brought directly to the President for his
> consideration. My ready access to President Eisenhower made it pos-
> sible for me promptly to bring to him, and to open opportunities for
> others to bring to him, new and important technologies, concepts, and
> analyses that added to the strength of our nation. [26]

Examples of the influence the PSAC scientists wielded can be seen in the
creation in early 1958 of the position of Director of Defense Research and
Engineering (DDR&E), the establishment of the Advanced Research Projects
Agency (ARPA), and also of the National Aeronautics and Space Administration
(NASA). Killian and PSAC urged the Eisenhower administration to create NASA
in order that there be a means for implementing a civilian space program.
Indeed, it was PSAC's idea that NASA should be comprised of the National

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[25] James R. Killian, Jr., *The Education of a College President, A Memoir*, Cambridge, MA, The MIT Press, 1985, pp. 331-32.
[26] *Ibid.*, p. 455.

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Advisory Committee for Aeronautics (NACA) and Werner von Braun's Redstone Arsenal team of missile experts from the US Army's Ballistic Missile Agency.[27]

A Note of Discord

During the years 1955 to mid-1959, things went swimmingly for Dick Bissell's small and highly secret Development Projects Staff. This select group of engineers and managers was doing the things which the Land Panel believed needed to be done to use technology for the collection of intelligence. However, a note of discord crept into Bissell's relations with Land and Killian after he assumed the duties of Deputy Director for Plans in late January 1959. Both Land and Killian looked upon science and technology almost as a religion, something sacred to be kept from contamination by those who would misuse it for unwholesome ends. Into this category fit the covert operations and "dirty tricks" of Dick Bissell's Directorate of Plans. It rankled Land that Bissell had taken the Development Projects unit with him into the Directorate of Plans in early 1959. Land was greatly upset when he learned that Bissell had involved one of Land's favorite projects, the U-2, in the Bay of Pigs fiasco.[28]

In November 1961, Allen Dulles announced his retirement and President John F. Kennedy named West Coast millionaire and former chairman of the Atomic Energy Commission John A. McCone to be his successor. In one of McCone's first meetings with President Kennedy's Foreign Intelligence Advisory Board, the new DCI learned of that body's concern that the Agency's scientific and technical efforts might be inhibited by continued association with the Directorate of Plans. Both PFIAB chairman Killian and board member Land explained to the new DCI their strongly held belief that the scientific and technical part of the Agency should be a separate entity and not a part of the Plans Directorate.

Following this session, McCone set up a three-man working group to review the organizational structure and activities of CIA. This group was chaired by CIA Inspector General Lyman B. Kirkpatrick and included PFIAB Secretary J. Patrick Coyne and General Cortlandt V.R. Schuyler (USA-Ret.), an adviser on the staff of New York Governor Nelson Rockefeller. One of the working group's major concerns was the proposal for establishing a new directorate for research and development. All deputy directors were asked to comment on the idea. DDP Bissell adamantly opposed the proposal. His reply included his arguments for keeping such efforts under the aegis of his directorate.[29]

At a 22 January 1962 PFIAB meeting, DCI McCone told Chairman Killian he intended to create a new position of deputy director for technical collection under whom all of CIA's scientific activities would be consolidated. Meanwhile, Bissell's opposition to PFIAB pressures for stripping the Development Projects Division from his directorate, when added to the fallout from the Bay of Pigs fiasco, resulted in his losing the favor of his two strongest supporters, Killian and Land. Dick Bissell resigned on 17 February 1962.

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[27] *Ibid.*, p. 335.

[28] Land, Killian interviews.

[29] R.M. Bissell memorandum to DCI McCone, Subject: "Techical Intelligence Collection," 10 Jan 62, Secret.

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Bissell's departure confronted DCI McCone with the problem of finding a manager for three, large, nearly-billion dollar projects—the remains of the U-2 program, a photosatellite effort, and a project to build a superfast reconnaissance plane—which Bissell had headed for more than seven years.

Killian and Land, who were almost singlehandedly responsible for CIA's involvement in the three major technical collection efforts, were anxious that action be taken swiftly, following Bissell's departure, in order that none of these reconnaissance programs suffer for lack of management direction. Thus, they again uged McCone to consolidate these and all other technical and scientific endeavors in a new directorate unconnected with covert activities.[30]

On 14 February 1962, shortly before Bissell's departure, McCone approved the issuance of Headquarters Notice 1-8 announcing the appointment of Richard M. Helms to succeed Bissell as Deputy Director for Plans and indicating that a Deputy Director for Research and Development would be created at some future date.

Two days later, Headquarters Notice 1-9 established the position of Deputy Director for Research (DDR), effective 19 February 1962. The notice said that certain of the activities of DDP's Development Projects Division would also be transferred to the DDR, along with other activities in research and development. And two months later, HN 1-15, effective 15 April 1962, transferred the "Special Projects Branch" and supporting elements of the Development Projects Division to the DDR and stated that additional activities might be transferred at a later date. The first DDR was Dr. Herbert (Pete) Scoville, Jr., who was moved up from his job as Assistant Director for Scientific Intelligence (ADSI).

This piecemeal publication of a major organizational change was indicative of the foot-dragging attitude in many Agency quarters toward moving ahead with DCI McCone's plan to consolidate all scientific and research efforts in one directorate. By 30 July 1962, when the terms of reference of the DDR were published in HN 1-23, McCone had been forced to compromise on the scope of the new directorate since neither the DDI's Office of Scientific Intelligence nor the DDP's Technical Services Division could be pried from those two directorates. Ray S. Cline, who replaced Robert Amory as DDI on 23 April 1962, refused to give up OSI to the new directorate because he saw this as "weakening CIA's analytical voice."[31] Richard Helms, the new DDP, felt just as strongly about TSD and several of his directorate's aircraft operations. As of 1 August 1962, the DDR consisted of three offices: the Office of Special Activities (OSA) which was primarily the Special Projects Branch of the Development Projects Division; the Office of ELINT (OEL), comprised of a small part of the Directorate of Support's Office of Communications and an even smaller contingent from the Directorate of Intelligence's Office of Scientific Intelligence; and the Office of Research and Development (ORD) made up of several former members of the Directorate of Plans' Technical Services Division.

Pete Scoville's writ ran long on the tasks his new directorate was supposed to accomplish and short on the manpower needed to achieve such goals. The

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[30] Killian, Land interviews.

[31] Ray S. Cline. *Secrets, Spies and Scholars, Blueprint of the Essential CIA*, Acropolis Books Ltd. Washington, D.C., 1976, p. 200.

Directorate of Research, as approved by DCI McCone in July 1962, never had a fighting chance. All of the scientific and engineering expertise within the Agency, aside from the few experts in the DPD/OSA group, resided in the Office of Scientific Intelligence, and that unit belonged to the DDI.

In addition, 1962 was not the best year for establishing a new directorate in the CIA. Early in the year the intelligence community was caught up in trying to learn more about a new missile installation seen in overhead photography of Tallinn in the Soviet Baltic state of Estonia. A similar, prototype installation had been photographed in early 1960 by the last successful U-2 mission during an overflight of the missile test center at Saryshagan. The satellite photography, however, was substantially poorer than the U-2 imagery and photo-interpreters could not determine whether the Tallinn missiles were intended to shoot down aircraft or missiles.

Then, late in the summer came the upsetting discovery of surface-to-air missiles in Cuba, which led eventually to the discovery of medium-range offensive missiles in the early autumn. Scoville was caught up in both of these problems. In response to the Tallinn question, he agreed to cooperate with Under Secretary of the Air Force Joseph V. Charyk in a crash project to develop a high-resolution photosatellite that could possibly obtain better imagery of the missiles.

The matter which consumed more of his time, however, concerned the warheads which the Soviets intended for the missiles being moved to Cuba. Prior to coming to work for the Agency, Scoville had been technical director of the Armed Forces Special Weapons Project, and his assistant, then as now, was Air Force Colonel Edward Giller. Because of this background, Scoville was considered one of the nation's leading experts on warheads and both his and Giller's expertise was needed to answer the questions being asked by high-ranking Kennedy administration officials about the real nature of the Cuban missile threat. Thus, Scoville and Giller spent a large part of the late summer and much of the autumn of 1962 organizing efforts within the intelligence community to obtain nuclear-type data from these warheads.[32]

Spelling It Out

By late winter of 1963, Scoville was frustrated and fed up with trying to preserve an Agency presence on the overhead reconnaissance arena as well as provide the type of technical and scientific support expected from his undermanned directorate. Scoville's dissatisfaction came to the attention of PFIAB chairman Killian in early 1963. Neither Killian nor Land had been satisfied with the Directorate of Research concept, and in early 1963 they decided they should provide DCI McCone with more specific guidance for strengthening the Agency's technical capabilities by creating, organizing, and exploiting *new* resources of science and technology.[33] Their effort, titled "Recommendations to Intelligence Community by PFIAB," was approved by the entire Advisory Board in March 1963 and given to DCI McCone. This time they left nothing to

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[32] Interview with BGen. Edward B. Giller, 8 April 1986.
[33] "Recommendations to Intelligence Community by PFIAB."

chance, but spelled out in great detail just what they had in mind, as can be seen in the following points:

> (a) The creation of an organization for research and development which will couple research (basic science) done outside the intelligence community, both overt and covert, with development and engineering conducted within intelligence agencies, particularly the CIA. Institutional research, academic and industrial, must be joined to mission-oriented research.

> (b) The installation of an administrative arrangement in the CIA whereby the whole spectrum of modern science and technology can be brought into contact with major programs and projects of the Agency. The present fragmentation and compartmentation of research and development in CIA severely inhibits this function.

> (c) The clear vesting of these broadened responsibilities in the top technical official of the CIA, operating at the level of Deputy Director. Recasting and extending the CIA's present Office of Research may accomplish this. If it does not, alternative administrative arrangements must be devised. This technical official, as we conceive his responsibilities, should have reporting to him the following groups, each managed by a competent technical leader:

> > (1) Technical Requirements Group . . . .

> > (2) Systems Engineering Group . . . .

> > (3) Development Group . . . .

> > (4) Field Engineering Services Group . . . .

> > (5) Behavioral Sciences Group . . . .

> (d) Formation of a few special research and development groups that may be part of a natural science division, probably coordinated with the behavioral sciences group, that cross-connects various classic disciplines in ways of primary importance to intelligence missions. Thus, studies of camouflage in plant, bird, and animal systems (where it seems to be a highly developed element in survival) coupled with physical optics, radiation and spectroscopy, might reveal new methods of both disclosure and concealment. . . .

> The importance of intelligence warrants a major effort to draw fully upon the most advanced science and the best scientific brains in the nation. Our scientific intelligence should be so sophisticated and advanced that it will be beyond the capabilities, if not the imagination, of our adversaries.[34]

The very detail of these recommendations reflects the importance that Killian and Land attached to them. In effect, they were telling DCI McCone just how they wanted him to revamp the Agency's scientific and technical efforts. Indeed, before the year was out, these recommendations would be exploited to the full. McCone's initial response to these PFIAB recommendations was made through President Kennedy's Special Assistant for National Security Affairs,

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[34] *Ibid.*

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McGeorge Bundy, on 15 April 1963. Because he had taken no action in the direction suggested, McCone generalized about the progress made. His response acknowledged that he had considered including OSI and TSD in the Directorate for Research, but had suspended action in this regard. His answer included a promise to "move ahead with additional changes" that would give the DDR "expanded responsibilities."

Before McCone had a chance to do much in this direction, Pete Scoville submitted his resignation, on 25 April 1963, to take effect on 1 June (this date was later extended to 14 June) 1963. Scoville's letter of resignation said he had been frustrated in his attempts to merge all scientific and technological functions under the new Directorate of Research.* McCone asked the Director of the Office of Scientific Intelligence (OSI), Albert D. (Bud) Wheelon, to take over Scoville's responsibilities. The brilliant but brash missile expert demurred. Wheelon told McCone he thought the Directorate of Research was a no-win situation because it did not control all of the Agency's scientific endeavors.[35] Although he was McCone's first and only choice for the position, Wheelon dragged his feet until he managed to win from McCone the concessions he sought: the inclusion of the DI's Office of Scientific Intelligence and the DS's Automated Data Processing Staff within the new directorate. Before the end of 1963, Wheelon's directorate also included the Foreign Missile and Space Analysis Center (FMSAC) headed by former US Army missile expert Carl E. Duckett.

When Wheelon finally agreed to accept the position, he insisted that the directorate be renamed and that PFIAB's March 1963 recommendations be considered the new directorate's charter document. Also, Wheelon persuaded McCone to establish a separate, higher pay scale for scientists and engineers so that he could hire experts from the private sector to work within the Agency on advanced reconnaissance projects. Thus, when Wheelon assumed control of the Directorate of Science and Technology on 5 August 1963 he became the leader of what would become one of the nation's most productive units for employing science and technology to collect intelligence.** During the next three years, using the expanded charter and special pay scale, Wheelon fashioned what several Air Force observers have called the nation's most powerful development and engineering establishment.[36] Before the end of the decade, the Agency's youngest directorate dreamed up, engineered, built, and deployed collection systems which gave our nation a substantial intelligence advantage.

After nearly nine years of urging the use of science as the handmaiden of intelligence, Killian and Land succeeded in August 1963 in having a governmental unit created which embodied their ideas. The existence of the Directorate of Science and Technology must ultimately be considered a monument to the wisdom of Edwin H. Land and James R. Killian, Jr.

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* Scoville later became Deputy Director of the Arms Control and Disarmament Agency.

[35] Albert D. Wheelon lecture, September 1984.

** An update: Wheelon is senior vice president of Hughes Aircraft Corporation and a member of PFIAB; he served on the commission that investigated the Challenger disaster. Duckett is president of Intech, Inc., and the magistrate of Mathews, Virginia.

[36] Colonels Paul E. Worthman and Frederick C.E. Oder interview, 19 August 1985.

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