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This is a final response to your letter of 27 July 2013 requesting an Executive Order 13526 mandatory declassification review of the following document:

> "The National Photographic Interpretation Center, Volume 1, Antecedents and Early Years, Directorate of Science and Technology Historical Series NPIC-2. 1972."

While conducting our research, we located a recent review of this document where we had determined that the document could be released in sanitized form. Since the information was reviewed for declassification within the past two years, it is not subject for a declassification review at this time pursuant to Section 3.5(d) of Executive Order 13526. In view of this, the information is not subject for a declassification review until 10 July 2014.

Sincerely,

Michele Meeks
Information and Privacy Coordinator

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The Directorate of Intelligence Historical Series

NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

VOLUME ONE ANTECEDENTS AND EARLY YEARS, 1952-56

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December 1972

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THE DDI HISTORICAL SERIES

NPIC-2

NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

VOLUME ONE ANTECEDENTS AND EARLY YEARS, 1952-56

by

[redacted] 25X1

December 1972

[redacted] 25X1

Arthur C. Lundahl
Director
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HISTORICAL STAFF
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Foreword

The National Photographic Interpretation Center (NPIC) was established in January 1961 under the Director of Central Intelligence to provide efficient and timely exploitation of photography as a source of foreign intelligence in response to the needs of national security. Though the Center is jointly manned by personnel from several departments and agencies represented on the United States Intelligence Board, it is the lineal descendent of three successive photo intelligence organizations established and nurtured by CIA. They are, in order of founding, the Photo Intelligence Division (D/GP), Project HTAUTOMAT (HTA), and the Photo Intelligence Center (PIC).

This history is the first of several volumes planned to trace the evolution of photo interpretation in the national center and in predecessor organizations. It is the story of D/GP, an obscure division founded on the assumption that competent photo interpreters exploiting high-quality, up-to-date photography of strategic targets with the aid of all-source collateral information could produce definitively important information concerning the capability and, to some extent, the immediate intentions of potential enemies of the United States to initiate military action against this country and its allies. It traces the trials and frustrations of the early years, during which repeated attempts

to find the right combination of intelligence problems and photography yielded many pedestrian accomplishments but only rare startling successes. It closes with the dramatic development by the Agency of an extraordinary collection vehicle, the U-2, which projected the struggling division into a key role in planning and preparing for the collection, processing, and exploitation of the anticipated photography.

Much of the continuity in this narrative and virtually all the dates come from documents current at the time the events were taking place. Most important in providing this framework of facts are monthly reports of the division and documents relating to specific actions, operations, and events. On the other hand, recollections of the participants in the drama, recorded on magnetic tape, are the source of many of the embellishments that give life and human interest to what would otherwise be a lifeless chronicle on a clinical examination of the facts. Copies of most sources cited in this volume are filed in the NPIC Historical Collection and can be consulted in the NPIC library.

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Appendixes

NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

ANTECEDENTS AND EARLY YEARS

I. A Growing Awareness (1950-1952)

At the opening of the second half of the twentieth century, the fledgling CIA was struggling to assimilate and apply lessons learned from World War II. The impressive accomplishments of photographic intelligence during that conflict coupled with the rapid advances in other applications of science to the collection and processing of information presaged profound changes in intelligence operations. Though some of the basic concepts were far from new, the technological explosion generated by crash efforts to apply scientific knowledge to the collection and evaluation of information about the enemy was soon to produce systems so sophisticated and so prolific as substantially to emancipate policy makers and operations personnel from their former dependence on the shadowy figure of the classical spy.

Indeed, traditional methods of obtaining information about the Communist enemy were rapidly becoming less productive than ever. The descent of the Iron Curtain on overt reporting, including the official release of economic data, sharply curtailed previous sources of information on countries within the Soviet orbit.

Moreover, limitations on travel behind the Iron Curtain reduced still further the low potential of human source collection. At the same time, the outbreak of the Cold War and inauguration of a new and more sophisticated arms race dramatized the need for more and better intelligence, not less. At this critical juncture, photography became the beneficiary of heightened interest as a possible source of strategic information.

Following World War II, technical survey teams sponsored by US Forces had been sent to Germany and Japan to assist in estimating the effectiveness of photo intelligence during the war. The resulting studies, published as part of the United States Strategic Bombing Survey reports, concluded that between 80 and 90 percent of all military intelligence information came from aerial photography, and that it was about 85 percent accurate. The fact that there were in the Agency many who had been in intelligence during World War II ensured that the potential utility of aerial reconnaissance and photo interpretation for filling some of the growing gaps in intelligence would not be overlooked.

The relationship between evolving Agency plans and organization and the experiences of World War II was evident in the functions that were adopted as well as in the continuity of personnel. With the introduction of communications intelligence in the Agency, the General Division, Plans and Policy Staff, Office of Reports and Estimates (ORE), became the nucleus for its

exploitation. One of the men engaged in this work was Frederick A. Voigt. During World War II, Voigt had been an Army officer in G-2 and had worked with COMINT materials. Among his contacts was [redacted] a fellow officer in G-2, who, as a photo interpreter, had earned some distinction as the head of a small unit assembled late in the war for the joint exploitation of reconnaissance photography and communications intercepts. 25X1

The possibility of undertaking all-source exploitation in one area was often discussed in the General Division, ORE, by Voigt, [redacted] the Chief, Plans and Policy Staff. 1/ Recalling [redacted] and the success of his unit in G-2, Voigt advocated the joint exploitation of photography and COMINT as part of the all-source effort. Though the general lack of current aerial photography of denied areas tempered enthusiasm for the proposal, the idea got a favorable hearing. In due course, Voigt was authorized to contact [redacted] then a teacher at the Fountain Valley School near Colorado Springs, Colorado, and invite his interest in submitting a proposal for establishing a photo interpretation unit in the Agency. 25X1 25X1 25X1

[redacted] agreed. The result was a 10-page proposal dated 8 August 1950 and entitled, *The Operation of High Level Photo Interpretation.* 2/ [redacted] recommended establishment of a photo 25X1 25X1

interpretation* unit utilizing all-source materials, including COMINT, and having close working relations with both analysts and collectors. To accomplish the job, he proposed that staffing consist of nine interpreters, three liaison officers (with experience as interpreters), two draftsmen, one map and photo librarian, and three clericals.

[redacted] envisaged the hiring of highly experienced photo interpreters having a solid intelligence background in certain specialized fields, such as industry, shipping, aircraft, guided missiles, and radar. He stressed the need for constant and free interchange of information between PI specialists and their analytical counterparts. He also called for close and confidential working relationships between the PI unit and reconnaissance planners. In all these respects, his concept was decisively different from the method of operation then current in US military photo interpretation units, whose interest was oriented primarily toward bombing targets and whose interpreters were discouraged from using collateral information. [redacted] thus, perceived clearly the peculiar needs of a photo interpretation effort integrated with the production of strategic intelligence for use by policy makers and planners at the highest levels of government. His initial

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*Photo interpretation is more familiarly known as PI, and the interpreters who practice it are commonly called PI's. Moreover, in the use of this designation no consistent distinction is made between "interpretation" and "intelligence."

proposal, made somewhat in the dark, was a most appropriate one, and was destined to ensure that when the breakthrough came in strategic aerial reconnaissance a cadre of trained interpreters would be available in the right place and at the right time to exploit the photography.

The seed which [redacted] sowed took a long time to sprout, and the appearance of the first spindly growth took even longer. During the remainder of 1950 and early 1951, the Agency in general, and ORE in particular, was in a state of flux. On 7 October 1950, Lieutenant General Walter B. Smith assumed the duties of Director of Central Intelligence and William H. Jackson was designated Deputy Director of Central Intelligence, thus providing the Agency with a strong management team. Moreover, in the fall of 1950, ORE was reorganized. Within the next few months, several new entities were created, including the Office of Research and Reports (ORR). Soon thereafter, OCI, with its cadre of analysts having a prime interest in COMINT, was formed in part from ORR. These were days when reorganization and reassignment of personnel were pressing problems. There was little interest and less opportunity to wrestle with the establishment of new functions and problems of staffing them. However, in spite of delays and competition with ongoing problems, [redacted] proposal was not dead. In June 1951, Voigt was delegated to tell [redacted] that things were beginning to move, and to invite him to travel to Washington at government

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expense to talk "turkey." 3/ A month later [redacted] came to Washington, at which time he apparently made formal application for employment as a part-time PI consultant. 25X1

More months passed while [redacted] was being investigated and cleared. The definitive break came in March 1952. On the twentieth of that month Robert Amory, Jr., who had become Assistant Director, Research and Reports, just three days earlier, sent a memo to the DCI seeking approval for hiring [redacted] as a consultant and for bringing him on board on 26 March for an initial two weeks. Approval was granted. 4/ 25X1 25X1

Thus, the action which had been initiated by those concerned primarily with COMINT, but who had subsequently left ORR in the spinoff of OCI, now shifted to others in ORR whose chief substantive concerns were economic and geographic intelligence. Though the new organizational relationships were potentially excellent, particularly with the geographers who were no strangers to photo interpretation, the shift complicated and delayed full attainment of [redacted] objective of integrating the exploitation of photography and COMINT. Nevertheless, action was at last under way. 25X1

The results of [redacted] survey were contained in a memorandum dated 11 April 1952. 5/ In it, he concluded that there was a large potential "demand" in CIA for photo intelligence, and that it could not be met with the photo interpretation reports and 25X1

limited PI services available from the military. [redacted] advocated the hiring of a small number of photo interpreters, three at the beginning, who would work directly with analysts at their desks. He characterized this relationship as the "team" approach. He also recommended that ORR have on its staff, at the outset, a skilled photo intelligence officer who could advise analysts on the use of photography and train them to do simple interpretation tasks themselves. For this position, [redacted] unqualifiedly recommended [redacted], who had served with him in World War II. 25X1 25X1 25X1

[redacted] April 1952 report differed from his initial proposal of August 1950 primarily in that it was much less expansive. For one thing, it was based on a current, first-hand survey of the status of photo interpretation inside and outside the Agency. It is not apparent, however, how he reconciled his exceedingly low-profile proposal with what he characterized as the "large demand" for photo intelligence. In just a few months the Agency was to demonstrate a willingness to approve a much larger commitment than [redacted] recommended. Though he did not change his philosophy and, indeed, stressed his belief that the Agency requirement was for photo intelligence 25X1 25X1

rather than photo interpretation,* his proposal now was for one photo intelligence officer, who would occupy a senior position, and a complementary group of photo interpreters. Likewise, instead of speaking confidently of a unit composed of photo intelligence officers, using all-source materials, he was now expressing the hope that the initial three photo interpreters might serve as a "pilot operation to work out the techniques of coordinating intelligence on an all-source basis." Very likely the latter change reflected the divorce from ORR of the functions which became OCI, including those related to the handling of COMINT. Fortunately, the pendulum was due to swing back toward Brown's 1950 concept within the next several months.

[redacted] made quite an issue of this point. In his 1952 proposal, he defined photo interpretation reports as those resulting primarily from a careful study of photography and having a minimum of information from other sources. He defined photo intelligence reports as those combining the results of skilled photo interpretation, usually in conference at the working level, with all other available pertinent information about the subject under study.

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II. Establishment of Formal Photo Interpretation Activity (1952-1953)

Action following [redacted] proposal of 11 April 1952 was relatively fast. In a memo to Robert Amory, Jr., the AD/RR, dated 7 May 1952, Otto Guthe, Chief, Geographic Division, ORR, in effect endorsed the [redacted] proposal and suggested that the Agency PI facility be established as the Photo Intelligence Branch within the Geographic Division. 6/ By 26 June 1952, Amory was able to say that the DCI had already approved in principle the proposal for creation of a Photo Intelligence Division, with provision for staffing it over and above the proposed ORR Table of Organization submitted for fiscal 1953. 7/ Guthe's proposed branch was, thus, well on the way to founding as a division. Doubtlessly, this change was related to the impending reorganization in ORR, which included creation of the Geographic Research Area out of the former Geographic Division and elevation of the former branches to the status of divisions.

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A. The Die is Cast.

The formal proposal for establishing the division was made in a staff study signed by Amory and forwarded to the Project

Review Committee on 17 July 1952. 8/ This study was prepared in the Geographic Division, ORR, by James A. Brammell, with the assistance of [redacted] 9/ It recommended approval of an allotment of [redacted] from vouchered funds and an increase of 12 persons in the Table of Organization and personnel ceiling for ORR for fiscal 1953 to provide for establishing a Photo Intelligence Division (D/GP) in the Geographic Research Area, ORR. 25X1 25X1

The Office of the Photo Intelligence Division Chief was to consist of three persons, and there were to be two five-man branches, one the Industrial and the other the Geographic (Figure 1).* The latter was intended particularly to support work in the Geographic Division of ORR and to serve the needs of the DDP; the former, to support the Economic Research Area, ORR. Most of the funds requested, [redacted] were earmarked for personal services. Only [redacted] was allocated for the purchase of equipment. The remaining [redacted] was intended to reimburse the military for an estimated four projects to be done in accordance with Agency specifications. 25X1 25X1 25X1

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* [redacted] entered on duty 1 July 1952 as a GS-13 Intelligence Officer assigned to the Office of the Assistant Director in ORR. With the establishment of the Photo Intelligence Division, [redacted] slot was added to the 12 new ones bringing the T/O of the division up to 13. On 26 October 1952, he was formally reassigned to the new division. 10/ 25X1 25X1

In justifying placement of the new centralized PI facility in the Geographic Research Area (GRA), the study cited the broad support provided by divisions in the GRA, the need of the PI's for cartographic and graphic support, and the close ties of the GRA with other parts of ORR and the DDP. The plan also called for provision of 610 square feet of floor space in Building 11, where the Geography and Cartography Divisions were housed.

On 25 July 1952, the Project Review Committee approved the recommended allocation of funds and increase in the ORR T/O. 11/ Ten days later, on 4 August, a project brief based on the 17 July staff study was signed by the DCI, General Walter Bedell Smith, with the concurrence of Allen W. Dulles as Chairman, Project Review Committee. This brief also stated that beginning in fiscal 1954, the first full year of operation, the annual cost of the new activity would be [redacted] 25X1

With the formal approval of the proposal, one step remained -- to carry out the plan. Once again Amory demonstrated both his strong interest in establishing the photo intelligence function and the speed with which he could act. On 4 August, the same day the project was approved by the DCI, Amory sent a memo to the Deputy Director (Administration), Walter R. Wolf, submitting the proposed Table of Organization for the Photo Intelligence Division, requesting that it be considered along with the overall ORR T/O, then under study, and that the office

T/O be increased by 12 positions. 12/ Administrative work in response to this proposal took nearly three months to complete, however. On 2 November 1952 the CIA Photo Intelligence Division was formally established. 13/

B. Concept of Operation and Products.

The method of operation and resulting products were also specified in some detail. 14/ The new division was to be staffed with PI specialists in each of several topical fields of particular concern to CIA, and these specialists were to maintain continuing liaison with their counterparts in the military. It was initially envisaged that these Agency PI's would utilize all-source materials and work shoulder-to-shoulder with economic and other analysts in bringing their knowledge of available photography and how to analyze it to bear on the solution of specific intelligence problems. The fact that only one photo intelligence officer was on duty for the first several months and that the PI's were separated physically from other analysts seriously hampered full implementation of this working arrangement. Indeed, the initial concept of shoulder-to-shoulder work was never fully realized.

The resulting products were expected to be working papers consisting of sketches, tabulations, and typescript to be used by other analysts in planning and executing operations or in the

production of finished intelligence. There were no initial plans to produce formal photo intelligence reports, as such, for wide dissemination within CIA and throughout the Intelligence Community. This carefully circumscribed view of PI products and their use was faithfully reflected in practice for more than the first year of operation.

Consistent with its concept of a high-level photo intelligence operation, the staff study included one exceedingly ambitious proposal which matured very slowly. It announced that the Photo Intelligence Division would develop a mechanism, probably an interagency committee, to formulate intelligence requirements for aerial reconnaissance missions and to foster maximum use of photo interpretation facilities to meet national intelligence requirements. Obviously, this was the expression of a desire to bring photo reconnaissance and photo interpretation efforts to bear on the solution of national intelligence problems rather than merely to locate, identify, and describe potential bombing targets. The foresight thus displayed, as well as the difficulty of attaining the desired goal, was demonstrated by the fact that such a comprehensive approach to the joint management of national collection and exploitation assets was realized only with the establishment of the Committee on Imagery Requirements and Exploitation (COMIREX),

a USIB subcommittee, 15 years later.*

In still another way the initial concept and plan for a photo intelligence division in CIA set it apart from and above similar organizations in existence at that time. Consistently, the proposed division was called the Photo Intelligence Division, and the products were named photo intelligence. Moreover, the PI's were designated Intelligence Officer (Photo Analysis), not interpreters. On the one hand, this emphasized that they would work with all-source materials, and on the other that they would do analysis, not merely interpretation. Thus, Agency PI's would not simply identify facilities and their component parts, but, working with functional analysts, they would explain what went on in the facilities, how the component parts functioned with respect to each other, pinpoint the bottlenecks or critical control points, and the like. These distinctions in the naming and job titles were intended to convey what Agency planners believed to be the critical difference between photo intelligence, which was to be pursued in CIA, and photo interpretation, which was to be done elsewhere. This was a titular distinction that was to endure for nearly ten years, until the establishment of

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*Though the Committee on Overhead Reconnaissance (COMOR) and its predecessor the Ad Hoc Requirements Committee (ARC) achieved a notable degree of coordination and control in the levying of national collection requirements, it remained for the COMIREX to undertake the difficult task of exercising some control in the allocation of limited resources available to exploit that photography.

a separate national center and other considerations resulted in a tactical retreat, at least as far as terminology was concerned, in naming the National Photographic Interpretation Center.

C. Jobs and People.

The first attempt at staffing the new function was deceptively easy. The ease with which this initial step was accomplished was no measure, however, of the difficulties to follow. To get just one PI adviser, [redacted] from a Colorado museum apparently excited no one. To commence the building of a new division was clearly another matter, one not to be accomplished without all interested elements, inside and outside the Agency, getting a piece of the action. 25X1

Bureaucracy wasn't the only impediment. The scarcity of qualified PI's and an initial miscalculation in the grade scale seriously hampered recruitment, particularly to fill those positions below GS-12. The Agency was seeking not merely skilled interpreters, but those expert in at least one of several technical specialties, such as guided missiles, radar, aircraft, naval shipbuilding, and the like, or in earth sciences, such as geology or geography. Moreover, it was intended that the Agency PI would be no mere technician; in addition to his substantive specialty, each was expected to have some knowledge of related intelligence problems and of how his specialized knowledge could contribute to their solution.

This was a large order. Most PI's skilled in the desired topical specialties were either in military service as a consequence of the Korean War, or working as civilians for the military. By March 1953, with only four PI's cleared and on board, steps were taken to raise the lower end of the grade scale. On the third of that month [redacted] Chief, Administrative Staff, ORR, 25X1 sent a memo to [redacted] Chief, Classification and Wage 25X1 Administration Division, requesting a general raising of working level grades in the Photo Intelligence Division to a minimum of GS-12.

In his covering memo, [redacted] justified the proposed change 25X1 on the grounds that the Agency needed "experts" who could instruct ORR analysts in the use of photography as well as conduct extensive liaison with other government agencies. 15/ Besides, he added, the higher grades were needed to make ORR competitive with other government agencies in a scarce labor market. That the latter was the more important reason is suggested not only by the slow pace of recruitment, but also by a statement in the March 1953 monthly report for the Geographic Research Area which complained that delay in the entrance on duty of the division chief, who had been named several months earlier, was seriously affecting progress in the classification of positions intended to permit the hiring of "capable persons demanding more salary than is permissible

under the present T/O." 16/ The decision on this important point was clearly going to await arrival of the division chief. This was to be Arthur C. Lundahl, whose appointment and arrival are recounted in the next chapter. In the meantime, [redacted] 25X1 who was officially serving as Acting Chief, Industrial Branch, 17/ was functioning as the de facto division chief in the absence of the designated head, whose release by the Navy was still pending.

In spite of difficulties, however, some qualified persons were brought on board before the arrival of the division chief on 11 May 1953. [redacted] an Agency employee since 1947, 25X1 had the distinction of being the second person to join the division. Though not an experienced PI, he reported for duty in December 1952 following an 11-week course in photogrammetry at The Ohio State University. The third person on the payroll was [redacted], who also entered on duty 25X1 in December, before he was cleared. He was sent to the Georgetown University Institute of Linguistics for three months, and did not become a functioning member of the division until March 1953. [redacted] was a former Naval officer who had 25X1 served with Lundahl at Navy PIC during the Korean War. Through his researching of photos, he had become acquainted with [redacted] head of the CIA Graphics Register and a former 25X1 Naval officer himself. Knowing that [redacted] was due to be 25X1

discharged from the Navy, [redacted] had alerted him to the opportunity opening up in the Agency and helped him to arrange an interview. 25X1

In January 1953 [redacted] joined the division. During World War II, she had been a photo interpretation officer in the US Army. Inasmuch as [redacted] was not an experienced PI and [redacted] was not yet cleared, [redacted] became the second working PI in Photo Intelligence Division. Prior to the arrival of Lundahl there were just two other PI's in D/GP. Both entered on duty in D/GP on the same day, 9 April 1953. One, [redacted] served with Lundahl at Navy PIC during the Korean War and came to the Agency through his contacts with [redacted] in the Graphics Register. The other, [redacted] was a civilian photo interpreter with the US Air Force who had resigned, taken a trip to Canada, and then come to the Agency upon his return to the US. Like [redacted] he had entered on duty in the Agency without being fully cleared and had spent more than two months at the Library of Congress doing unclassified reading and research before becoming a productive member of the division. 25X1 25X1 25X1 25X1 25X1 25X1 25X1 25X1

Of the original six, [redacted] remained with the organization and moved up in the hierarchy as the division grew. The other three were gone by May 1955. 25X1

[redacted] left in the summer of 1953 to pursue advanced studies in geodesy at The Ohio State University, after which he moved elsewhere in the Geographic Research Area to work in that field. The other two resigned from the Agency. Before leaving, however, [redacted] was able to arrange social contacts between her new division chief and Robert Amory, Jr., who had become the DDI, thus expanding the channel for direct communications and fostering the strong bond of friendship that developed between them. She also proved to be especially able in providing staff support, as needed, to the office of the division chief.

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D. Requirements and Photography.

Requirements for photo intelligence or photo interpretation and photo collection are inseparable, but their relationships in 1952 were very different from those following the advent of the U-2. During the early years it was primarily a question of gearing requirements to the exploitation of existing photography. Aerial coverage of the Soviet and Chinese interiors was limited and largely of World War II vintage. For European Russia, there was much excellent World War II German photography, known to postwar American interpreters as GX. There were lesser amounts of poorer Japanese photography of comparable age covering eastern Asia. Known as JX, most of it was difficult or impossible to obtain in Washington. Though none of this coverage was of current

intelligence value, it was of considerable utility in strategic studies. From it much useful information could be gleaned concerning immobile, slowly changing cultural features, such as settlement patterns or established industrial plants, and features of the physical environment.

Even as early as 1952 there was more recent aerial photography of parts of the Soviet Bloc as well as highly selective current coverage of border areas of high interest. There were, of course, literally tons of photography of Korea, but it was of limited importance from a strategic point of view. In addition, there were selective clandestine collection efforts, both in the air and on the ground. Without exception, those who surveyed existing needs and available photography concluded that enough suitable photography was already available to justify the establishment of a photo intelligence capability in CIA.

Within the Geographic Research Area itself there were many unsatisfied demands for photo intelligence which lay beyond the capability of most geographers or cartographers to produce for themselves. In addition, the GRA served a broad spectrum of customers, not only within but outside the Agency, including the military services. There was, for example, the analysis of safe areas within the USSR for DDP, detailed area studies for the Strategic Air Command (SAC),

escape and evasion studies for the joint services, border studies in support of infiltration operations, studies in support of comprehensive clandestine operations in the Far East, and urban analyses for DDP. In one or another of these types of studies, photo-derived information was needed on topography, roads, railroads, rivers, bridges, settlements, areas of concealment, key industries, security measures, military installations, communications facilities, and the like. Existing maps also needed correction and amplification, and, to the extent that recent photo coverage was available, frequently needed to be updated to guard against the possibility of disastrous miscalculations.

The new Photo Intelligence Division also had something to offer analysts in the Economic Research Area, though at the beginning many of them were skeptical about the utility of available aerial photography of the USSR because of its age. Excellent GX photography could yield much information on the layouts of Soviet industrial plants, their siting, the existence of room for expansion, physical relationships of their component parts, and the flow of materials through production. At the very least, it afforded the economic analyst a grasp of the physical reality of installations not available from a study of production statistics, as well as a rough and ready means for speculating informatively about the

credibility of information from other sources.

Though requirements of the Office of Scientific Intelligence (OSI) were not as susceptible to being defined in terms of information potentially available from World War II photography as were many of those from ORR, they did exist. Wherever research and development activity was known or suspected in an area covered by photography of suitable date, there was need for photo intelligence support. As early as July 1952, OSI had continuing requirements for intelligence utilizing aerial photo coverage of guided missile and radar sites. 13/ Moreover, that office anticipated requirements for a more exhaustive analysis of high-priority installations reported in insufficient detail in military photo interpretation reports.

To a greater degree than any other office, OCI needed current photo coverage to make photo intelligence useful in its reporting. Furthermore, the very fact that the greatest interest of this office usually centered in trouble spots around the periphery of the Soviet Union or elsewhere in the world, and that such spots were relatively accessible to aerial reconnaissance, ensured the existence of requirements from OCI.

The mechanics of levying requirements were relatively simple at first. With only one interpreter on board for much of the time, he was both the screen through which requirements passed and the means by which they were answered.

To provide the needed guidance in accepting them and help in setting priorities, he had the assistance of the GRA Project Review Committee.*

According to the philosophy laid down at the founding of the division, as soon as any ORR analyst or his supervisor became aware of the potential need for photo interpretation support, he would call for and obtain the services of a photo interpreter. In consultation with the analyst, the PI would determine the pertinent photo coverage, if any, suited to solution of the problem. Upon obtaining the desired photography, the PI would sit down with the analyst again, and, working together, they would define the nature and scope of PI support required.

This somewhat idealized approach was typical of the way most requirements were generated in the early period, particularly when [redacted] was the only PI. Indeed, there was, at the outset, no other viable approach. In most instances, he alone knew what photography was available, whether or not it was potentially suited to answering the requirement, where and how to obtain it, and how to counsel the analyst in modifying and firming up the request once the photography was in hand. At first, [redacted]

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*The GRA Project Review Committee at this time was composed of the Chief, GRA, who served as Chairman; the chiefs of the four divisions comprising GRA; the Assistant to the Chief of the Cartography Division; and the Assistant to the Chief of the Geography Division.

had the benefit of close supervision by Guthe as Chief, Geographic Research Area, out of whose office he worked as a photo intelligence adviser. He also had the assistance of [redacted] who spent several weeks as consultant helping to launch the new activity. The GRA July 1952 monthly report said ten "desk-side" consultations were held with substantive analysts, and that they resulted in six projects. 19/ Succeeding monthly reports mentioned similar consultations, many of which also resulted in the levying of requirements for PI support. 25X1

Though the foregoing approach to the development and levying of requirements was the rule during the early period of operations, there were exceptions, particularly as additional PI's arrived on duty and as analysts became more familiar with photography as a source of intelligence information. As time passed, [redacted] tended more and more to serve as a kind of broker, receiving or shaping up the requirements and delegating more of the actual interpretation work to the growing number of PI's in the division. Even this change, however, was one that brought the mode of operation closer to the method proposed by [redacted] in his 11 April 1952 memo to Amory. In other instances, particularly where PI support was needed by members of the Geography or Cartography divisions for projects on which they were working, a direct approach from analyst to PI was sometimes used. Requests from the DDP posed special problems. Not only 25X1 25X1

were their representatives anxious to discuss their needs with as few persons as possible, but they were frequently evasive about the precise scope of their requirements. The latter policy led to a considerable waste of scarce PI talent; the former usually cast [redacted] firmly in the role of go-between. 25X1

Toward the close of the pre-Lundahl period, a new type of requirement appeared. The D/GP monthly report for April 1953 revealed for the first time that PI's were working on self-initiated projects. 20/ Two such were identified. One dealt with explosives industries and the other with ammunition industries in parts of European Russia. These projects were said to have been undertaken in anticipation of requests and as a basic approach to the production of photo intelligence concerning these industries. This change in defining work to be done represented, in some degree, a declaration of independence for the PI's. It demonstrated the growing confidence of the PI's in their ability to anticipate what photo intelligence information economic analysts would be needing and to determine the most advantageous time for its production. Indeed, in future years, as widespread coverage of denied areas became available, this ability to anticipate needs in all areas of intelligence interest became a way of life for the PI's. Philosophically, it marked a small but significant movement away

from the extremely close working relationships envisaged between PI's and analysts, a relationship which was one of the distinctive differences between the work of photo intelligence officers and photo interpreters. There was no indication, however, that the direction of this movement was a matter of concern to either party.

In these early days, Agency PI's were heavily dependent on the military services, particularly the Air Force, for the aerial photography they needed. This called for the establishment of good working relations and frequent contacts between Agency PI's and those in the military. Though this community of interest was helpful in encouraging the liaison desired between Agency photo intelligence officers and military interpreters, it had its drawbacks. For one thing, it argued for the necessity of keeping at least the main working quarters for Agency PI's outside the Special Center created for the handling of COMINT. This contributed significantly to the delay in progress toward the production of all-source photo intelligence in CIA.

Actual procurement of photography, both aerial and ground, was chiefly through the Graphics Register Division or the Industrial Register, both of which were components of the Office of Collection and Dissemination. In the case of the Industrial Register, GX and similar photography as well as town plans based on such photography were filed in plant dossiers.

Use of these files, particularly by ORR analysts, stimulated requirements for PI assistance and inquires about collection capabilities.

In the early 1950's, interpretation was done, with few exceptions, from photographic prints. Since most of the negative materials were held by the military, the task before [redacted] and his staff in the Graphics Register was to procure prints from those who held the negatives. In spite of an obviously high degree of good will by all concerned, there were many problems, particularly at first. Most serious was the time lapse between arrival of an urgent requirement and receipt by the PI of the photographic prints needed to answer it. By March 1953, this time span had been greatly reduced through the efforts of [redacted] of the Graphics Register and the cooperation of the US Air Force. Agency photo analysts were granted clearances to work in the Aeronautical Chart and Information Center (ACIC) photo collections. They were also permitted to borrow GX prints for exploitation while retention copies were being reproduced. 21/ In spite of problems in procuring photography, however, there is no record of any request for PI support having been turned away for this reason.

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E. Activities and Products.

From the beginning, the Photo Intelligence Division was, in some degree, a victim of its own success. [redacted] survey,

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in March and April 1952, had whetted the interest of many analysts and their supervisors in obtaining photo intelligence support. This interest was further developed after the arrival of [redacted] by his consultations with analysts. It 25X1
wasn't as though the latter were ignorant of the existence of aerial photography or the fact that it was highly useful in mapping and certain military applications. Until now, however, they had lacked the technical background needed to relate its potential to their own problems. The success with which this was done, even on a pilot basis, all but overwhelmed the capability of the embryonic division to provide the desired answers. It also substantially converted the photo intelligence adviser into a working PI, short-circuiting the orderly planning and development of work in the division.

The interpretation of photographs and the production of photo intelligence, thus, became [redacted] single most important 25X1
activity. At first, there were three main types of requesters: the economic analysts in ORR, analysts in the DDP, and geographers within the GRA itself. The latter provided many services to others, so that PI support given them might, for example, be for a DDP project. The job confronting the sole PI was, therefore, one of keeping several different customers happy by doing something for each, with due regard for priorities and realistic deadlines. This was not an easy task.

Most pressing and most difficult in these early days were border studies done for the DDP in support of infiltration operations. Such projects, in which D/GP became involved through requests for support from the Geography Division, were usually done on an "urgent" priority. Where ample photography was available, they involved much detailed and painstaking photo interpretation. The immediate objective in undertaking PI support of these projects was to evaluate the best available maps and to provide information concerning the physical and cultural landscape using photography, primarily World War II German coverage. The resulting products were index plots constructed on map overlays and accompanied by notes describing significant differences between information portrayed on the map sheets and on the photos. A set of photos, on which the political boundary and other notations were marked in grease pencil, was also sent to the requester. Close collaboration, as in locating the political boundary on the photographs, was exercised between D/GP and the Geography Division. The PI contribution formed an appendix to the parent study prepared by the geographers. 22/

The first border study to be undertaken was one on the border of the Karelo-Finnish SSR. Photo interpretation support on this project was substantially completed by the end of December 1952, but the report itself was not issued by the

Geography Division until March 1953. 23/ Problems encountered in doing the work resulted not only from lack of previous experience by all concerned in this application of photo interpretation, but also from the reluctance of DDP to pinpoint the specific areas of interest. Moreover, the scope of the work was increased beyond initial estimates when photography revealed that existing maps were so inaccurate as to require compilation of a sketch map based on the photography. 24/

Photo intelligence support of the Karelo-Finnish border study did more than just provide information needed to satisfy an operational requirement. It demonstrated the potential of aerial photography as a source of reliable detail available nowhere else. As a result, the DDP expanded its requirements for photo intelligence support. In December 1952, the Geography Division submitted a draft of another border study, the Polish-Belorussian SSR, to the DDP for criticism. In response, the DDP requested additional detail which could only be obtained from photography. 25/ Result: the establishment of another PI project by D/GP in support of work being done in the Geography Division for the DDP.

The sense of urgency which the DDP was able to communicate concerning its requirements was reflected in the generally expeditious handling accorded its projects. Thus, of nine

projects initiated in the Photo Intelligence Division between July 1952 and April 1953 in direct support of DDP, eight had been completed by the end of the period (Figure 2). Moreover, both DDP projects initiated in April 1953 were finished in the same month. Of the four projects initiated in D/GP over the same ten-month period to provide PI support on border studies being done in the Geography Division for the DDP, two were completed within that period. If the latter performance seemed sluggish by comparison, it should be remembered that the nature and scope of photo interpretation required on these projects was such that it extended over several months, precluding rapid completion of the work. Another indicator of the concerted effort applied to DDP projects was the fact that 65 per cent of D/GP project time in April 1953 was devoted to the answering of requirements levied directly upon the division by that directorate. An additional seven per cent of the D/GP project time was devoted to work in support of Geography Division projects being done for the DDP.

By comparison, in April 1953 D/GP devoted only six per cent of its project time in direct support of the ORR Industrial Division, though an additional 20 per cent was spent on self-initiated projects established to produce photo intelligence D/GP considered basic to ORR work on the USSR ammunition and explosives industries. The inferior competitive position of

the ORR Industrial Division in obtaining PI support was also reflected in the fact that only three of 16 projects, less than 20 per cent of the total, levied by that division on D/GP during the first ten months of operation were completed by the end of April 1953. The reason was obvious. These were chiefly plant studies utilizing GX photography approximately ten years old. It would, indeed, have been difficult to argue persuasively for the urgent need to produce plant layouts and statistics on floor space for the explosives industry in competition with DDP requirements for area analyses in support of currently planned operations. Even so, to ORR analysts and their supervisors the poor competitive position earned by their projects must have seemed ironic. In justifying establishment of the Photo Intelligence Division, major emphasis had been placed on the need of economic analysts for PI support.

This support had commenced with a bang when [redacted] 25X1 arrived. Four of the six projects initiated in July 1952 as a result of his conferences with analysts were for the ORR Industrial Division, and one of them, dealing with the Kazan Airframe Plant, had been completed in a day. 26/ Then the honeymoon ended. Though a layout and analysis of the

Gorlovka Machinery Building Plant "Kirov"* were delivered to the Industrial Division during September, most of the PI project time in that month was spent on the Karelo-Finnish border study. 27/ Moreover, work on the latter project dragged on into October, November, and December. 28/ Work on low priority projects virtually ceased, though consultations with ORR economic analysts continued at a reduced pace and one urgent requirement was answered. 29/

With the advent of the new year and arrival on board of the first of several additional experienced PI's there was improvement in the scheduling of work on Industrial Division requirements. In January, the study on Soviet explosives plants, which had lain dormant, was reactivated. 30/ By May, it was estimated that work on it was 70 per cent complete and that work on the companion study on USSR military depots reported to be loading ammunition was half done. In the course of their work on the explosives plants project, PI's discovered that there were numerous name duplications and that many plants believed to have been manufacturing explosives were actually making other products. 31/ In addition, the tempo of PI consultations with economic analysts was increased, and the D/GP monthly report

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*The Gorlovka plant study was done for an ORR report on the Soviet mining machinery industry. A PI layout of the Gorlovka Plant may be found in RR-21, published in 1953.

expressed interest in the expenditure of further effort to explore the needs of ORR components for intelligence support. 32/

In spite of manpower limitations, several additional types of projects were undertaken in response to requirements from other sources. At least four were for OSI. Indeed, the first project of record as well as the first recorded as having been completed was one done for OSI. 33/ Among the other three OSI projects was one requesting descriptions from World War II German photography of the neighborhoods in Moscow where certain research facilities reportedly engaged in experimental biological research were located. An urgently requested first-phase effort on this investigation was initiated and completed in February 1953, with an oral response to the requester. As if to demonstrate that the PI division played no favorites in allocating scarce manpower, the second phase, which was estimated to require but 12 hours of PI work, was still not completed on 1 May. 34/

At this point in the evolution of aerial reconnaissance, there was much interest in long-focal-length cameras for the collection of oblique photography of denied areas from offshore stations. The Photo Intelligence Division recognized the need to develop photogrammetric and mapping techniques for utilizing such photography to prepare sketch maps for intelligence purposes. Accordingly, a self-initiated project intended to

accomplish this was established using "one-hundred-inch" photography of a strategic area along the Bering Sea. The assigned photo analyst was [redacted] who had recently returned from training in photogrammetry at The Ohio State University. In the absence of ground control as well as of precise information concerning the location of the aircraft, the depression of the camera, and its altitude for each exposure, the problems involved were formidable. [redacted] who still functioned as PI consultant, spent a week in Washington in March 1953 determining what flight and camera information was essential to the solution of [redacted] problem and where it could be obtained. 35/ By the first of May, 366 of an estimated 600-700 man hours had been expended on this project, 36/ but it was obviously a long way from a successful conclusion. It was, in fact, never completed.

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Though more time was spent on projects than on any other activity,* the philosophy according to which the division was supposed to operate called for much liaison, coordinating, and planning. For example, [redacted] regularly attended meetings of the Graphics Research Coordinating Committee, a group comprised of representatives of all major intelligence organizations

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*In April 1953, projects accounted for 77 per cent of the man hours worked. 37/

involved in the collection, filing, and exploitation of photography. This committee was concerned not only with such things as the latest finds of photography having high intelligence interest and the means for obtaining them, but also with new reconnaissance systems and targets of potential interest.

The embryonic Photo Intelligence Division also became involved, albeit somewhat obliquely, in an historic failure. In the summer of 1952, the US Air Force embarked on an ambitious study called Project HOPE CHEST. The objectives of the study were to determine a wide range of national intelligence requirements as well as the resources needed to collect the information. During the month of August, James A. Brammell, the Deputy Chief, Geographic Research Area, at the request of H. Marshall Chadwell, Assistant Director of Scientific Intelligence, participated in an initial meeting with OSI representatives and [redacted] 25X1 [redacted] of the Office of the Assistant Chief of Staff, Development, 25X1 USAF, concerning the extent to which CIA should participate informally in a series of HOPE CHEST working group meetings. 38/ A month later an announcement containing a list of the working groups, called panels, listed 14, one of which was further subdivided into eight "task forces." CIA was represented on two of the panels. [redacted] was listed as a member of the "Special 25X1 Reconnaissance" panel and [redacted] as 25X1

alternate) as a member of the panel on "Indirectly Controlled Sources." 39/

The October 1952 monthly report for the Geographic Research Area noted that conferences had been held with representatives from CIA and the Office of the Assistant Chief of Staff, Development, USAF, in order to determine ". . . concrete criteria for the formulation of CIA requirements that could be met through improved air photographic reconnaissance." 40/ The same report added that pursuant to these discussions a survey and drafting of "segments of the report" were being undertaken by [redacted] the PI consultant. 25X1

A month later, in November 1952, the report, which was prepared largely by [redacted] under the direction of Guthe, was 25X1 transmitted in the form of a memo over the signature of James Q. Reber, as Assistant Director, Intelligence Coordination, to the Deputy Chief of Staff, Development, Headquarters, USAF. 41/ This memorandum distinguished between "technical intelligence photography" needed for precise analysis and mensuration, "analytic photography" needed for describing installations and providing plant layouts and building dimensions, and "search photography" for identifying targets of interest and determining the need for more detailed coverage. These distinctions, later narrowed to two categories, foreshadowed the development of search and spotting overhead collection systems.

Project HOPE CHEST soon proved to be too diffuse in both scope and number of personnel involved to be manageable or productive. By the summer of 1953, Guthe, then the AD/RR, was complaining that he had heard nothing of the project since the 12 February 1953 meeting of the Intelligence Advisory Committee. 42/ Lundahl recalls the compilation of CIA requirements, done by [redacted] was a huge document lacking in discrimination and unadaptable to machine processing. 43/ Indeed, the high expectations for HOPE CHEST were never realized. 25X1

Among miscellaneous duties performed by [redacted] during these first ten months were administrative tasks, such as preparation of D/GP monthly reports, orientation and supervision of PI recruits when they entered on duty, preparation of training lectures, and the interviewing of geographic attachés and visiting foreign experts in the field of photo interpretation and photogrammetry. One such visitor, [redacted] was interviewed by [redacted] in October 1952. 44/ Among subjects discussed were technical developments in photo intelligence [redacted] and the great advances made by the USSR in the use of aerial photography for mapping and interpretation. 25X1 25X1 25X1 25X1 25X1

Training was a function of fundamental importance in the new division. From the beginning, it had been assumed that economic and other substantive analysts would accomplish many

routine photo interpretation tasks themselves, leaving only the more difficult ones to specialists in interpretation. The success of this plan depended on the effectiveness with which the PI specialists could train other analysts in the rudiments of interpretation. Though such extensive training was impossible during the first year because of understaffing in the new division, no time was lost in preparing for and offering some sketchy PI orientation to other analysts. As early as August 1952, Guthe proposed ORR internal training in map intelligence and geography, in which one of the six sessions would deal with the use of aerial photographs in intelligence. 45/ By October 1952, [redacted] was giving an "orientation talk" of 30 minutes duration on the use of air photos in intelligence as part of the training course for new ORR personnel. This presentation was repeated at least twice during the next six months. 25X1

Not all training in which D/GP personnel participated was given internally. In addition to [redacted] training in geodesy and photogrammetry at The Ohio State University Institute of Geodesy, Photogrammetry, and Cartography and his subsequent attendance in a PI course at the US Department of Agriculture Graduate School, new division employees were scheduled for the Agency orientation course as soon as possible after arrival on duty. Competition between such training and work loads was pointed up, however, when [redacted] escaped such 25X1 25X1

training and a waiver was requested for Lundahl when he at last entered on duty. 46/

Though the foregoing survey of projects and other activities is by no means complete, it gives a representative sampling of the broad scope of activities in which members of the division became involved from the outset, the heavy workload, the slow pace of recruitment, and an indication of some of the obvious problems and shortcomings of the new division. One final step remains, namely, to assess the accomplishments of the new division during its ten months of operation prior to the arrival of its designated leader.

F. Early Problems and Accomplishments.

On the eve of Lundahl's arrival in May 1953, the operation of the Photo Intelligence Division displayed distinct limitations as well as some solid progress. The initial proposal for founding the division seemed modest enough, but problems of implementing it were such as to tax the ingenuity and patience of those responsible for staffing and managing the operation. For six months, but one PI was cleared and on duty, and it was only in the two months preceding Lundahl's entry on duty that the beneficial effects of the recruitment effort were beginning to be felt. At the close of the pre-Lundahl era, the six job incumbents constituted a sort of task force, each member of which

undertook whatever type of project had to be done regardless of the position he occupied on the T/O. Though this was a necessary practical solution to problems created by the mounting number of requirements and lack of proper staffing, as a continuing practice it was contrary to the stated need to foster specialization in each of several designated fields. Moreover, the division was still operating without a formal, approved statement of mission and functions, except for the objectives included in the staff study recommending its establishment. Obviously, the delay in bringing the division chief on board was proving costly in terms of planning and management. There was an urgent need to chart the course of future development for the division as well as to augment and marshal its resources to accomplish the stated objectives.

Space was also becoming a problem. Though it was realized from the beginning that new quarters would have to be found as soon as the division began to approach full strength, the slow rate of growth during the early months encouraged postponement of the eventual solution. Early in 1953, the division monthly report claimed that the space in Building 11 was no longer adequate for efficient operations. It called for new quarters "near the analysts." 47/ Presumably this meant the economic analysts; the PI's were already in the same building as the geographers. By late February, the problem had moved up one

echelon. The new Chief, Geographic Research, James A. Brammell, noted that prospects of getting the expected space in "M" building were gloomy, and warned that the assignment of additional personnel to the already cramped quarters in Building 11 would delay establishment of an adequate support program for the economic analysts. 48/ A month later he pointed to the embarrassment and difficulty the new division chief would experience by being placed in inadequate quarters away from his operating branches. 49/ Clearly, the provision of functionally suitable space for the Photo Intelligence Division was another of the immediate problems to be faced by Lundahl upon his arrival.

Equipment used by Agency PI's at this point in history was not yet significantly different from that employed elsewhere. The initial budget had allocated only $700 for the purchase of equipment. The chief working tool was still the folding pocket stereoscope, though funds had been earmarked for purchase of a bench stereoscope and an Abrams Sketchmaster. Neither had been procured, however, by the time Lundahl arrived. In fairness to this approach, it should be realized that there was nothing unique about the scale or resolution of the photography being used in CIA, and that neither the photo coverage nor the intelligence problems to whose solution it could be addressed demanded a high degree of sophistication in techniques of interpretation.

Nor was there time, in these early days, to lavish on the interpretation of minutiae or to dream of new exploitation systems. Though neither immediate need nor opportunity called for inauguration of a research and development program at this time, it was an obvious future requirement if the Agency were to assume leadership in the development of a photo intelligence capability geared to the production of increasingly detailed and critical information for use by strategic planners and policy makers at the highest levels in government. Moreover, in view of the significance of lead time in such development, this was another problem to which Lundahl would have to direct his attention with some sense of urgency.

Since service to other analysts and the evolutionary development of photo interpretation programs to support them was the prime objective of the operation, this was the area in which greatest progress was made. The most striking success was probably achieved in support of the DDP. The greatest deficiency was the slow progress in developing a program for realizing the potential for providing all-source PI support to economic analysts in the ORR Industrial Division. As late as April 1953, at least four of the six PI's in the division still lacked an SI clearance. 50/ Moreover, the exigencies involved in work on higher priority projects were seriously compromising work on those initiated in response to requirements from the

Industrial Division.

Though relatively good service was provided in response to the limited requests for support from OSI, the whole gamut of exciting and exotic developments in Soviet missilery, aircraft, atomic weapons, biological and chemical warfare, and the like seemed to stand just beyond the reach of the photo interpreters. This was a sleeping giant that could be awakened by the first reconnaissance aircraft penetrating his domain. And this was the type of photographic input most likely to precipitate a crash effort to develop new and more exacting exploitation systems and techniques. There was one other sleeper. The low level of support provided to OCI in the first ten months was hardly a fair measure of the potential demand. All that was needed to trigger virtual production pandemonium was some photogenic world crisis. Thus, the new division chief would be confronted with the joint tasks of providing responsive answers to all requirements, whatever their priority, while at the same time developing adequate photo intelligence programs to maximize contributions of photography to the solution of all kinds of intelligence problems, not just a fortunate few.

In spite of uneven progress in the development of photo intelligence programs to support economic and other analysts, the division had held firmly to the goal of establishing a photo intelligence organization dedicated to the use of all-

source materials in the exploitation of photography. This was the concept initially introduced by [redacted] and subscribed to by [redacted] It was also the approach advocated by Lundahl when he arrived and the one brought to fulfillment in later years under his persuasive leadership. Though it may not have been an obvious accomplishment during these early and trying months, this unwavering adherence to the concept of photo intelligence based on the use of all-source materials may well have been the most significant achievement during the pre-Lundahl period. 25X1 25X1

If the job which faced Lundahl seemed discouraging because of its complexity and the mounting urgency of all its constituent parts, there was one reason for optimism. He and the cause of photo intelligence had staunch supporters in Brammell, Guthe, and Amory, and the latter two had recently been moved into positions that ensured their continued strong support no matter what opposition developed.

With the appointment of Amory as Assistant DDI on 23 February 1953, Guthe became the AD/RR. In his previous position as Chief, Geographic Research, Guthe had been responsible for supervising the development of the PI function and for staffing up and overseeing management of the division. In this capacity, he had first-hand knowledge of divisional problems, and he had, over the months, been justifying proposals for their solution

to his superior, the AD/RR. Now he occupied that position himself. When his successor, Brammell, reiterated the same claims and reminded him that some of these problems had been around nearly a year, he would get a favorable response.

The situation with regard to Amory was even more important. Not only did he, as Assistant DDI and, beginning 1 May 1953, DDI, occupy a more influential position, but he was also an extremely dynamic person. From the beginning of his short term as AD/RR, Amory had pleaded the cause of photo intelligence before his superior and, through him, before the highest councils in the Agency. Now he was one of the Deputy Directors. Like Guthe, he could hardly repudiate his previous stand, and there was no indication that he had any desire or intention to do so. As DDI he retained his strong enthusiasm and support for photo intelligence.

III. Photo Interpretation Finds Its Identity in CIA (1953-1955)

The man selected to head the Photo Intelligence Division was Arthur C. Lundahl (Figure 3). In education, training, experience, and personality, Lundahl was ideal for the job. Imaginative, outgoing, perceptive, with a broad grasp of the technology of photography and photographic interpretation as well as an extraordinary gift for reporting its current achievements and pleading the inevitable course of its future development, Lundahl was a perfect example of the right man in the right place at the right time. His academic credentials were in good order: a bachelor's and a master's degree in geology from the University of Chicago, and work towards a PhD nearly completed. During World War II he had served with the US Navy as a photo interpretation officer. When the Agency discovered him and decided to hire him he was employed by the US Navy Photographic Interpretation Center, where he was the second ranking civilian with the title of Assistant Chief Engineer. There was just one problem; the Navy was reluctant to lose him.

Even before the formal establishment of the division, plans for naming its head seemed well advanced. The July 1952

GRA monthly report revealed "a definite indication" that the position of chief of the new division could be filled by an "exceptionally competent person" early in 1953. 51/ By August, action was reported to have been taken to secure the division chief on an eight-month reimbursable loan from the Navy, with the option of having him transferred near the end of the period. 52/ By September it was apparent that negotiations were not going well. The GRA monthly report blamed difficulties on "low level action" by the Personnel Division, and, with a show of confidence, said that steps were under way to request loan of the individual "through high-level channels." 53/ In a memo dated 3 September 1952, Guthe provided background information to [redacted] 25X1 of the ORR Administrative Staff, concerning Lundahl and some of the circumstances surrounding his selection. 54/ The information was intended for transmittal to the Director of Personnel, presumably for "high level" action. Though these sources fail to explain how the new chief was selected, Lundahl and Guthe both recall many circumstances concerning the negotiations.

To the best of Guthe's recollection, he first identified Lundahl as the most qualified candidate for the position. Guthe's acquaintance with Lundahl dated back several years. He had known Lundahl through the latter's work in the American Society of Photogrammetry and their joint work in connection with the

meeting in Washington in the summer of 1952 of the International Geographical Union. He had also been associated with Lundahl on the Committee on Geographical Exploration (1947-48) and on the Committee on Geophysics and Geography (1948) of the Research and Development Board at the Pentagon. On these committees, Guthe came to know Lundahl and respect him for his grasp of technical matters. As a result of the favorable impressions gained through these professional contacts, Guthe came to regard Lundahl as the foremost exponent of aerial photography and its exploitation in the United States.

There was one other incident, a quasi-social contact, that also made an impression on Guthe. At a banquet in connection with the annual meeting of the American Society of Photogrammetry in Washington, Guthe sat with Lundahl and Lundahl's wife, Mary, at a table arranged by Arthur Caesar, American representative of Wild, the Swiss instrument manufacturing company. Guthe not only found Lundahl's company on that occasion as pleasant as their working relations, but he was also very much taken with Mrs. Lundahl's charm. This was another favorable impression in Guthe's mind as he considered Lundahl for the new position.

Guthe is reasonably certain that he discussed the vacancy and sought to determine the degree of Lundahl's interest in it before he recommended him to Amory. This initial contact took

place at Guthe's residence one Saturday afternoon in the summer of 1952 in response to an unprecedented telephone call from Guthe to Lundahl inviting him to come over and have a drink. At that time, Guthe guardedly outlined plans for the new division, stressed the fact that the Agency was interested in developing a photo intelligence capability involving the use of all-source materials, as opposed to photo reading or barebones photo interpretation, and inquired of Lundahl whether or not he would be interested in being chief of the division. Though Lundahl expressed interest, he asked for a week to think it over and to discuss the future implications of such a move with his wife. On further reflection, Lundahl found the proposal challenging, his wife firm in her desire to remain in the Washington area, and the prospect of escaping from the frustrations of military-civilian power plays in the Navy inviting. He accepted the position. Upon receiving a favorable reaction from Lundahl, Guthe sought and obtained confirmation of his proposal from Amory. In this action he had the support of [redacted] the Agency's PI consultant, 25X1 and [redacted] Guthe's deputy. 25X1

Negotiations dragged on, first with no success in setting a transfer date and later with successive postponements of the prospective date of arrival. Finally, on 11 May 1953 Arthur C. Lundahl reported on duty as Chief, Photo Intelligence Division.

As if to remind him that his was not the only recruitment problem, he found no secretary in the division. [redacted] 25X1 [redacted] who had recently returned from an overseas position, 25X1 was assigned as the division secretary effective two weeks later, on 25 May. During the long months between the selection of Lundahl and the time when the Navy reluctantly released him, Guthe is firm in his recollection that neither he nor the Agency ever wavered in their determination to wait for the man they had selected.

A. The Division Takes Shape.

When Arthur C. Lundahl arrived he quickly established himself in the Agency as a man on the move. He immediately engaged in a busy schedule of orientation, administration, and substantive work in his Division and for other parts of the Agency. He also moved aggressively to develop further the existing liaison channels with the military services and to dovetail Agency PI operations with those of the Department of Defense. As if this weren't enough to exhaust his enthusiasm and energy, he brought with him numerous related professional activities and commitments. Among these, the most demanding was his position as First Vice President of the American Society of Photogrammetry, a post that ensured his becoming President a year later.

In a figurative sense also, Arthur C. Lundahl was a man on the move -- upward. There were few indeed, in those early days, who, upon being exposed to the Lundahl charisma, expected him to remain the chief of a 13-man division. He was obviously destined for bigger things. Just what those bigger things might be wouldn't yield to even the most informed speculation of the time. Meanwhile, there was work, much work, to be done in D/GP before either the new chief or his organization could capitalize on any unexpected opportunity.

The first problem solved was that of space. On 30 June 1953, the Photo Intelligence Division moved into Room 1337 M building, 55/ ending a long and sometimes frustrating delay in finding a home for the activity. This move not only provided more adequate working space, but also placed the division closer to important centers of activity, the offices of the DDI, the AD/RR, and the Chief, GRA, as well as the ORR economic analysts. Though the importance of proximity to the latter was a debatable point, it had been emphasized ever since the inception of photo interpretation in the Agency and therefore had finally become, in the minds of many, a prerequisite to providing adequate support for analysts in the Economic Research Area.

If solution of all outstanding D/GP problems were as easy as this one, the shaping up of the division might have achieved much greater initial success, and it certainly would have been accomplished more quickly. As it turned out, progress on most other fronts was slow and grudging, with the result that the division tended to worry through its day-to-day crises by reacting to external circumstances rather than being able to take the initiative in determining its own course of development.

The most serious problem was the failure to bring the division up to authorized strength at a time when requests for support were mounting rapidly. The first monthly report following Lundahl's arrival called attention to a dramatic increase in short-deadline requests for support. 56/ It pointed out that the volume of such requests not only exceeded the capability of the division's on-board strength, but that a full complement of PI's would only reduce the potential strain from overwork, not solve the problem.

In spite of this situation, only one additional photo analyst entered on duty between May 1953 and March 1954, leaving the on-board strength, including the division chief, still just seven professionals.* In March 1954, [redacted] 25X1

[redacted] entered on duty in June 1953. 57/ His entry was balanced by the departure in the same month of [redacted] 25X1 25X1

[redacted] both of whom later occupied key positions in the organization, entered on duty, although the latter was previously assigned unclassified work at the Library of Congress pending his full clearance. 58/ This net gain of two experienced, senior persons was countered in part by the resignation of [redacted] in June 1954. The four vacancies remained unfilled until the fall of that year when three PI's entered on duty.* There were no further changes in number of photo interpreters until the spring of 1955 when the resignation of one PI was balanced by the arrival of another.** Thus, at the end of June 1955, one slot on the August 1952 T/O was still vacant.

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The immediate result of this understaffing in the face of a chronic backlog of work was a liberal use of overtime. The latter was, incidentally, to become a way of life in D/GP and its successor organizations, including NPIC, at one and the same time ostensibly constituting prima facie evidence of the critical need for photo intelligence and a larger staff to produce it, and a measure of the great dedication of its employees.

[redacted]

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Among the factors contributing to the slow growth of the staff was the caution and care exercised by D/GP in the selection of recruits to fill positions. On 20 October 1953, two representatives of the Wage and Classification Division conferred with the Chief, Geographic Research Area and the Deputy Chief, D/GP, concerning draft job descriptions that had been prepared by the division.* It was agreed that it would be pointless to set qualification standards for positions so high as to preclude filling the jobs. 61/ Nevertheless, the exercise of reasonable discrimination by the division was a sound policy. In a new operation, and especially one which had such a sizable potential for growth, many of those hired during the early phases of staffing would very likely occupy key positions in the future, larger organization. This did, indeed, prove to be the case in D/GP.

The question of D/GP grades was also resolved at this 20 October 1953 meeting. [redacted] agreed, after some negotiation, to settle for one GS-14 chief, and one GS-13, two GS-12, and one GS-11 Intelligence Officer (Photo Analysis) in each branch. This constituted some improvement over the original grade structure of one each GS-14, GS-13, GS-12, GS-11, and GS-09 in each branch, which the division and ORR claimed

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*The Deputy Chief, D/GP, handled this important matter because the Chief was on vacation.

had severely hampered recruitment. On the other hand, it was considerably less than the changes proposed by Brammell and [redacted] which called for one GS-14, two GS-13's, and two GS-12's in each branch. Presumably, the Wage and Classification Division representatives insisted that the recruitment problem was as much, if not more, a matter of unrealistically high job qualification standards as it was of position grades. 25X1

During the summer and fall of 1953 a cut by Congress in the FY 1954 budget was followed by a freeze in ORR positions to essentially the on-board strength. 62/ As might be expected, this freeze weighed more heavily on a component like D/GP, with only 60 per cent of its T/O filled, than it did on one substantially up to authorized strength. A slight thaw later that summer released two of the five vacant D/GP slots for FY 55 so as to permit bringing the division up to what was described as "minimum anticipated strength." 63/ It was apparently against these positions that [redacted] were brought on board late in FY 54. 25X1

Noting the slow rate of staffing, the slight hope of increasing the division T/O, and the practical limitations on use of overtime, Lundahl proposed and Brammell endorsed the assignment of two military officers to D/GP. 64/ Their justification pointed out that Photo Intelligence Division responsibilities were such as to make the use of military personnel

attractive. Among activities in which the latter would be peculiarly useful were the procurement of certain types of closely held photography acquired by the services, the meshing of CIA and military PI efforts, the analysis, including mensuration, of military installations, and the development of new exploitation equipment and techniques. The timing of this proposal, in August 1953, suggests that it was not unrelated to the job freeze and consequent decline in recruitment activity during that summer and fall. As a partial solution to the detrimental effects of the FY 54 job freeze, however, the proposal proved to be little more than an earnest gesture. The first military officer assigned to D/GP did not arrive until nearly two years later.

During these early years, Lundahl and, when he entered on duty, [redacted] were the persons within the organization most responsible for identifying prospective recruits and for interesting them in joining D/GP. Both Lundahl and [redacted] traveled widely and had extensive contacts in professional circles and throughout the Intelligence Community. Among potential recruits with a college education, there was a marked preference for those who had an earth sciences background. These were fields in which the objects of study were more or less related to those being interpreted in D/GP. They were also fields in which teachers and researchers had made use of aerial photography

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in varying degrees. Aside from candidates possessing a college degree with a major in some aspect of earth science, there was a very special interest in recruits who were working PI's, primarily those in or employed by the military services and civilian agencies of the federal government. In some instances, these persons did not have college degrees, but their demonstrated ability coupled with the confidence resulting from personal knowledge of their capability made them attractive candidates.

On 16 December 1953, [redacted] of the Office of the Inspector General made his first visit to D/GP and talked with Lundahl. This was part of the larger survey of ORR which took place in late 1953 and early 1954. In spite of the fact that D/GP, with only six professionals and one sub-professional encumbering a 13-man T/O, was but a minor component, [redacted] probed aggressively and incisively into its milieu. He zeroed in on what he considered to be two problems. One was the placement of the Photo Intelligence Division within ORR and its implications for D/GP operations. The other was the second hat Lundahl was wearing as Adviser to the Director of Naval Photography. 25X1 25X1

The latter arrangement was one in which [redacted] took particular interest, and one about whose advantage to the Agency he expressed serious doubt. 65/ Though he grilled Lundahl about 25X1

this job and its relation to his CIA duties, the issue was not raised in the section of the formal IG report dealing with the Photo Intelligence Division. 66/

This title had, in fact, been arranged for Lundahl with the approval and assistance of interested Agency administrators and with the cooperation of the US Navy. 67/ Before coming to CIA, Lundahl had been extremely busy in a wide range of professional activities. In addition to being first in the succession to the presidency of the American Society of Photogrammetry, as noted above, he had attended meetings of and presented papers before many other organizations, not only in this country, but also including the International Society of Photogrammetry. These peregrinations had brought him in contact with thousands of scientists and technical people, including many foreigners. Through his previous ten years in various capacities with the US Navy, that was the organization with which he was associated in the minds of most of these people. Though his new title of Adviser to the Director of Naval Photography obligated him to be available to the CNO for up to four hours per week, the utility of this bona fide job, complete with secretarial coverage and a telephone number in the Pentagon, would be hard to overestimate, at least until such time as he could gradually disengage from some of his long-term commitments. In the meantime, it provided him with an official

cover for his continuing professional activities.

The position of D/GP as part of the ORR organization was, on the other hand, raised in the IG's report. 68/ It noted that, in providing guidance for collection objectives in behalf of CIA, the division had extensive responsibilities outside the confines of ORR. It recommended that the Management Improvement Staff study D/GP responsibilities and services with the purpose of determining whether all or part of them should be transferred to another component of the Agency.

B. Photo Interpretation Support Services.

The introduction of the products of photo analysis into intelligence production had already begun. Under Lundahl's leadership the tempo of this speeded up and the orientation became more technical. There soon came to be greater emphasis on collection systems, including cameras, films, and platforms. Mensuration was pressed more aggressively and more technical camera data was incorporated into feedback. At the same time, there was no letup in the emphasis on photo interpretation.

Lundahl's interest in things technical was reflected in the photo analysis field by increased efforts to develop new and more sophisticated viewing equipment and improved exploitation procedures. Further efforts were made to provide the photo analyst with collateral, including COMINT information

and targeting materials. The range of photographic materials available, access to collections of intelligence photography, and speed of procurement were all increased. In addition, the form and scope of product dissemination were improved and formal PI reports were initiated. Finally, the division expanded the scope of its services and influence even beyond the confines of its parent agency, e.g., support services to SAC.

1. Support to Agency Components.

The ground on which the new services were built was the support which [redacted] and his handful of colleagues had been providing to other components of the Agency. 25X1

Existing support for DDP, which had already developed more fully than that for other areas, was broadened to include technical services in support of collection efforts, particularly of ground photography. In part, this was a reflection of Lundahl's recent preoccupation with such matters at the US Navy Photographic Interpretation Center, where he had prepared a manual dealing with the subject. It was also in response to a program then underway in the DDP's Technical Services Staff (TSS) to increase the effectiveness of clandestine photographic collection.

A series of conferences with TSS representatives that Lundahl began during his first week of service in the division culiminated in a request for preparation by D/GP of a manual for ground photography oriented to specific CIA needs. The difficulty of meeting such an ambitious requirement was recognized by [redacted] the Chief, TSS, in his request for the manual, when he indicated that preparation of the manual would have to be consistent, ". . .of course, with existing priorities within the Photographic Interpretation /sic/ Division." 69/ In reality, the satisfaction of this request finally required the letting of a contract to Photogrammetry, Inc., whose work was carried on under the guidance of NPIC some years later. The resulting report, published by the Center, was issued in April 1965. 70/

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The DDP did not, however, have to wait nearly 12 years to get currently needed information and guidance. Recognizing the difficulty of providing the uninterrupted effort needed to produce such a comprehensive and definitive work, Guthe accepted the requirement for the manual but proposed that D/GP provide interim spot guidance, as required, to meet urgent and immediate needs. 71/ This arrangement served as a basis for numerous briefings as well as repeated consultations carried on between DDP personnel and D/GP representatives throughout this and subsequent periods.

One especially interesting project undertaken for DDP early in the Lundahl era was the preparation of specifications for a photographic processing and projection kit for intelligence operations. 72/ Initiated at the suggestion of Lundahl in July 1953, 73/ this project led to an incentive award for the Chief, D/GP, nine months later. 74/

Another facet of the interim support provided DDP was the participation by D/GP personnel — at first by Lundahl himself — in DDP training programs. Later, in April 1954, as other competing demands made it difficult for D/GP to provide routine photo intelligence orientation briefings, a new project was established in response to a request from DDP to prepare an introductory text on the subject of photo intelligence for use in its training program. 75/ For the first three months, the project forged ahead encouragingly in spite of low priority to a point where it was about 60 percent completed. Following the seasonal summer slump due to vacations, the project was side-tracked due to higher priority demands related to the Formosa Strait crisis and AQUATONE, the U-2 project. In one last effort to get the job done before the arrival of U-2 photography, this project was finally completed with the issuance of *Introduction to Photographic Intelligence* in March 1956. 76/

ORR economic analysts and their supervisors were also exposed almost immediately to the fresh ideas of the new PI chief. Several new projects were generated as a result of his suggestions and responses to some of the requirements so generated followed within the month. Analytical efforts on older projects were redoubled to bring them to a successful conclusion. In many ways, the situation was reminiscent of the first few months after the establishment of the division a year earlier. As then, the initial flurry of activity subsided somewhat in subsequent months, and response time lengthened.

The joint effects of understaffing and the job freeze were felt in the matter of supplying support services. Under the circumstances, the animated efforts by the division to develop a full range of services for all Agency components having a potential need for photo intelligence created a situation where speedy responses could be provided only to the highest priority requests. As the work load grew this meant that, in the case of ORR for example, only studies having current intelligence interest could be accomplished in as little time as a few weeks. Thus, excellent service was provided on projects related to the Formosa Strait crisis in the spring and summer of 1955, and, even in competition with them, on a few projects dealing with the production of military

aircraft, tanks, and submarines in the USSR and the Satellites (Figure 4). Work done jointly by ORR and OSI on missiles was another type of project on which expeditious support could be expected. Other ORR projects, however, lagged.

Whatever the merits of the case, this selective response to urgent appeals for support and for exploitation of exotic targets was slowly but surely undermining the development of adequate PI support for more basic industrial studies. Considering the initial emphasis on the latter type of study in justifying the establishment of the Photo Intelligence Division, it seemed necessary to recognize the problem and to make an attempt, however abortive, to redress the imbalance.

From the outset, the philosophy of the founders of the division had been to train other analysts to do a wide range of common photo interpretation tasks, which would hopefully constitute a large part of the PI work needed to satisfy their requirements. Tacitly, this approach assumed three things: one, that the ability to do research and to write was by far the most important part of the job; two, that photo interpretation tasks could, on the whole, be characterized as "photo reading"; and three, that most other analysts had both the interest and aptitude to do photo reading. Though the presumed validity of the last two assumptions was eventually proven wrong, the outcome was by no means clear at this time.

In the meantime, in the fall of 1953, one interim token effort was made to teach 30 analysts from ORR/ERA and two from DDP how to do photo interpretation. The course was entitled "Interpretation of Photography for Intelligence Purposes," and consisted of 15 hours of instruction spread over seven class periods, one each week, beginning on 9 November. Since the 32 students were too numerous to accommodate in a single class, they were divided into two sections. Topics covered included: basic interpretation techniques; electric power and steam; coke, iron, and steel; non-ferrous metals and assembly; petroleum; and chemical explosives. Most of the teaching was done by [redacted] 25X1 but Lundahl opened and closed the course and [redacted] taught 25X1 the section on basic interpretation techniques. 77/

Though the course was well received, and a second running was scheduled to begin early in the new year, the next offering was deferred 18 months. The postponement was caused, at least at first, by a lack of suitable classroom space. Some delay was, however, not unwelcome in the division. For one thing, a number of problems had been identified during the first running of the course and preparations for applying solutions to them would take several weeks. Then, too, the time spent in organizing and teaching the initial course had had a serious adverse effect on production. 78/

One of the biggest problems was the need for more time for the course. During the first running, training packets consisting of GX photography had been given to the students so that they could practice interpretation and report on the various types of facilities such as iron and steel plants, petroleum refineries, and the like, which had been studied in class. Though this work was optional, those students who utilized the packets demonstrated clearly the advantages to be gained from doing so. It was decided, therefore, to include such work, with even more photography, as an integral part of future class work. Extending the period of instruction would provide opportunity for such exercises.

Some augmentation of other instructional aids also seemed desirable. 79/ The good intentions of the division and of the entire Geographic Area in preparing for an early resumption of the course were demonstrated by the promptness with which they proceeded to prepare these aids. Following completion of this first course, the Cartography Division was reported to be producing several wall-size training aids, 80/ and a training manual, prepared by D/GP, was finished and reproduced in April 1954. 81/

Evaluation of student performance was another area in which improvement was needed. The severe time constraints imposed by the brevity of the course, coupled with responsibilities toward

on-going work in their own offices, conspired to divert the energy and application of several students from work in the course, introducing circumstances in extenuation of their performance. The instructors, for their part, found available testing materials inadequate as a basis for measuring student achievement. As a result, most quizzes were graded in class by the students themselves and used to diagnose and correct deficiencies on the spot. Only one brief quiz in each section was used to provide some crude evaluation of individual performance. No grades were issued in the first course. Special mention was made, however, of selected students who excelled in some aspect of the work. 82/ It seemed desirable that in future offerings of the course more adequate plans for testing should be worked out and proper materials provided. 83/

In addition to assisting the economic analysts of ORR with photo interpretation reports and training programs, D/GP became involved with the Economic Research Area in another large project. In July 1953, the Planning and Review Staff, ERA, levied a requirement on D/GP to prepare a coordinated ORR requirement for additional photographic collection over China. The resulting project, known as PERISCOPE, involved, first of all, a determination of available existing coverage to use as a basis for identifying what additional collection should be attempted. 84/

Despite the logic and obvious prudence of such an approach, this was not the customary course followed by the military services in planning their photographic missions. 85/ The reason became obvious before many weeks had passed, when the division discovered the magnitude of the task. Nowhere was there a single, much less up-to-date, source of information on existing photo coverage of China. Fragmentary information on photography taken by the US Navy and Air Force, by Japan, and by Nationalist China had to be ferreted out and laboriously compiled against requirements before current collection needs could be stated. This proved to be a costly and slow process, especially when undertaken in competition with other division commitments. Although much work was accomplished, the job was never fully completed. It was closed out with the issuance of a partial report in March 1956. This report consisted of a single-page memorandum for the record identifying the project and indicating that overlays had been prepared to show much of the available aerial photography of China.

As a working tool, however, the substantial information collated and plotted on the overlays proved to be highly useful on many occasions in fulfilling crash requirements, particularly during the Formosa Strait crisis. In a more philosophical way, the project dramatized the need for a central organization, whose functions would include the keeping of such records. 87/

This evident need was to appear as one of the several "suggested idealizations" in a paper prepared by Lundahl the next spring advocating a restructured US Photographic Intelligence System. 88/ As a matter of policy, it was also reflected in the practice, established by D/GP successor organizations as soon as they became the prime repositories of photography, of compiling and publishing information on coverage of photography under their control.

Support for ORR's Geographic Research Area, of which the division was actually a part, formed an important part of D/GP's work from the beginning until early 1955, when it declined markedly in the face of higher priorities. Until the decline set in, working contacts between D/GP and the Geography Division (D/GG) -- both of which were under the management of the same Area chief -- were close and frequent. Moreover, projects established in response to D/GG requirements fared very well in competition with others for scarce PI resources. The most urgent projects, like those for other components, were customarily done within a month or less. Routine projects for D/GG were usually completed within a few months, a performance, on balance, more favorable than that achieved on comparable ORR/ERA projects. The fact that progress on these projects was monitored by the GRA Project Review Committee, which reported to the Chief, GRA, was doubtlessly influential, but

the close working relationships and contacts developed as a matter of course between persons working in the same Area were also a factor.

Compared with the types of projects undertaken in support of other Agency components, those for D/GG were the most varied. They ranged from some that were purely geographic in the broadest sense to specialized installation studies such as cable crossings and dockyards. They reached consumers either as raw material incorporated into reports prepared by D/GG or as independent sections of D/GG reports. The consumers who ultimately received the reports were equally diverse and included not merely Agency components, but those outside, such as the Strategic Air Command, for whom evasion and escape studies were done, and the Office of Naval Intelligence, which was the requester of four reports on cable crossings. The division also provided technical support for two projects related to contract work sponsored by D/GG at The Ohio State University. One resulted in a publication entitled "Technical Index for Ohio State University Contract Study." The OSU study consisted of a list of references to Soviet photogrammetric publications. 89/ The other project simply involved a review of the publications issued by OSU as a result of the CIA contract. The Agency had sought, through contract work, to tap the expertise of scientists in the Mapping and Charting Research Laboratory of The Ohio State University

Research Foundation to assist in answering OSI requirements related to guided missiles. 90/ In addition, Lundahl served as technical adviser to the Chief, Geographic Research, on a wide range of matters concerning photo reconnaissance and interpretation.

Support to OSI was not a major factor in D/GP production during the first two years of the Lundahl regime, but it did experience a steady growth. Basically, the modest level of this activity reflected the paucity of good, up-to-date overhead coverage of Soviet R&D installations and hardware.

In the period from 1953 to 1955 there was a series of projects, totaling about a dozen, on installations suspected of conducting experimental work on biological agents for use in warfare. One or two similar studies dealt with nuclear energy production. Response time on a large majority of these projects was only one or two months, far shorter than that typical of most ORR projects. These categories of OSI projects obviously benefited from high Community interest in biological and nuclear warfare. Moreover, the jobs themselves were generally straightforward and simple, and customarily required no unusual effort to procure materials or accomplish the interpretation. Indeed, in most instances, OSI provided the ground photography to be used.

Work for OSI on missile projects was a different proposition. Photo coverage was virtually nonexistent and the desired intelligence elusive. Though several attempts were made to identify missile-related installations or activities on photography and to tie them in with other sources of intelligence, such as defector reports, the results were generally disappointing. In the spring of 1955, a concerted effort in this field was launched jointly by OSI and ORR*. The attention of D/GP was at first directed to the missile sites around Moscow and to suspected missile-associated activity on Sakhalin Island, but the actual breakthrough on guided missile intelligence did not come until a later date.

Lundahl's interest in things technical opened up other areas of cooperation with OSI, particularly in the field of advanced reconnaissance systems. In April 1954, he and [redacted] were briefed by [redacted] of OSI on the interests and activities of that office in connection with US Air Force 25X1

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*In a DDI Notice dated 25 April 1955, Amory named [redacted] 25X1
Chief, Guided Missiles Division, OSI, the coordinator of intelligence production, requirements, and other activities pertaining to guided missiles. In the meantime a series of informal meetings, held once a month in OSI, had been initiated, with heavy representation from OSI and one or more representatives from each of several other DDI components. [redacted] 25X1
[redacted] was the D/GP representative, but his attendance did not commence until the third meeting, in April 1955. 25X1

reconnaissance photography. 91/ This briefing was followed closely by the establishment of a D/GP project to provide backing for Strong in his negotiations with Duncan MacDonald of the Boston University Optical Research Laboratory in support of the Air Force's research. 92/ A follow-on project of much larger scope, evaluating those phases of the Air Force's project GRAYBACK* having to do with photo exploitation, was undertaken by D/GP. It was completed with the issuance of a report in February 1955. 93/

Development of a productive support program for OCI was extremely slow, largely because of lack of suitable photography covering items of current intelligence interest. Though the relationships between photographic intelligence on the one hand, and current intelligence and COMINT on the other, had been pointed out from the beginning, there had been a singular lack of success in developing a comfortable and mutually profitable relationship. This was true in spite of considerable interest and honest attempts in both D/GP and OCI to develop such PI support. Frederick Voigt of OCI, it will be recalled, had been instrumental in arranging for the initial proposal to establish the Photo Intelligence Division.

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*This was the project which in January and February 1956 yielded balloon photography, called GENETRIX, that covered portions of Eurasia, primarily the Soviet Bloc.

[redacted] the first PI, had worked with both photography and communications intelligence in World War II and was well aware of the potential of combining them. 25X1

Despite these early ties and a meeting in August 1953 between Lundahl and two OCI representatives, Voigt and [redacted] 25X1 [redacted] to consider how photo intelligence might serve OCI needs, there were no practical results. 94/ On 28 January 1954, the AD/CI expressed the opinion that better use could be made of photo intelligence in OCI, and he authorized Voigt to prepare new proposals for achieving that end. 95/ Subsequently Voigt had a conference with Lundahl and [redacted] and obtained their agreement to almost all his proposals. Included were training OCI personnel in the PI course, briefing OCI division and branch chiefs, and a weekly meeting of D/GP and OCI personnel to exchange information and identify any possible areas offering opportunity and need for PI support. 96/ 25X1 25X1

Five months later, however, limited support to OCI apparently was still a matter of concern to [redacted] the Chief, GRA, for Lundahl directed a memorandum to him on the subject. Lundahl explained that in the weekly meetings D/GP was keeping OCI informed of current developments and that key personnel in that office had been briefed on the nature and functions of the division. He also offered to brief OCI personnel on the background of Soviet work in photo interpretation and on recent 25X1

Soviet interest in aerial photography of the United States. 97/ He added, however, that D/GP offerings in current intelligence must necessarily be few. The chief reason was lack of suitable up-to-date photography.

One solution to this perennial problem was faintly sketched in the spring of 1954. In April, D/GP made a mosaic of the Dien Bien Phu area for OCI and provided 11 supporting consultations. 98/ The action was hectic, but it was brief -- too brief to have any lasting effect on division support of OCI.

The situation in the next crisis was entirely different. It started quietly enough, in October 1954, when [redacted] 25X1 [redacted] Chief of the OCI Requirements Branch, requested D/GP 25X1 to provide information on the major roads in Southeast China to assist OCI in an assessment of the current capacity of main supply routes leading to the Amoy, Foochow, and Wenchow areas of mainland China, opposite the Nationalist-held offshore islands, the Tachens, Matsu, and Quemoy. Though exploratory discussion with [redacted] of D/GP revealed that the project would constitute 25X1 a major effort for the PI division, [redacted] expressed the hope 25X1 that work might be completed by 15 November. 99/

In the next three and one-half months, at one time or another, the division used eight different photo interpreters who logged a total of nearly 400 man-hours on the project. 100/ Nevertheless, the job was still not complete at the end of January 1955.

Meanwhile, Chinese Communist pressure on the offshore islands held by the Chinese Nationalists increased. On 18 January 1955, Chinese Communist troops transported in motorized junks captured the Nationalist-held island of Yikiang, eight miles north of the Tachen Islands. A day later, more than 200 Chinese Communist planes bombed the Tachens, and Chinese Communist ground forces on Yikiang shelled nearby Pishan Island heavily. These incidents, coupled with the reiteration by Chou En-lai on 24 January of Communist intentions to conquer Formosa, led to a whole series of reactions by the US government, including the special message sent to Congress by President Eisenhower requesting emergency authorizations to use US armed forces to protect Formosa and the Pescadores Islands.

Reverberations from these events were felt all the way down to D/GP. On 18 February 1955, a conference was held involving [redacted] of the ORR Planning and Review Staff 25X1
and Brammell and [redacted] of the Geographic Research 25X1
Area to discuss the placing of a new priority on the work originally undertaken for OCI in response to the requirement levied by [redacted] the previous October. Now, however, the 25X1
requirement had been modified to include such information as would also be needed by ORR for its contribution to NIE 100-4-55, *Communist Capabilities and Intentions with Respect to the Offshore Islands and Taiwan Through 1955, and Communist and*

Non-Communist Reactions with Respect to the Defense of Taiwan. 101/ The problem had, thus, expanded to include estimative as well as current intelligence implications, but this was a unique experience for D/GP at this early date.

This conference led to a crash effort by D/GP, during which every PI in the division worked on the project and, together, brought the total man hours expended on the project to over 400 in February alone. 102/ The information needed for the NIE was produced on time, and the results of the study were also published in a division report issued on 28 February 1955. 103/ Included was information on the road network leading into the Southeast China coastal area -- the width, type of surface, drainage, maximum grades, strength of bridges, and other characteristics of individual roads constituting the network. The appearance of this report just after the United States Congress had passed a joint resolution authorizing the military defense of the Formosa Strait made it a landmark contribution.

Nine additional projects in support of OCI were undertaken between October 1954 and the end of February 1955, and six of them were completed. 104/ Most were concerned with Communist Chinese facilities, chiefly transportation routes and airfields, and the status of activity on and near the offshore islands. Each of the six completed was, however, a relatively simple task that

constituted no major effort.

For the next four months beginning in March 1955, more D/GP manpower was devoted to support for OCI and, to a lesser extent, ORR in connection with the Formosa Strait situation and related activities on the China mainland than to any other work. 105/ Reflecting the accessibility of the area to reconnaissance, and hence the availability of up-to-date photography, D/GP issued 36 PI memoranda in response to OCI requirements alone, 106/ nearly one-third of all D/GP formal publications up to that date. Numerous briefings were also provided, sometimes on a daily basis, on the latest findings from photography. 107/ Thus, at least one answer to the long standing question of how to use photography in support of current intelligence was finally found, thanks to the acquisition of much current photography in response to the threatening military situation.

D/GP support to the Industrial Register (IR) of the Office of Collection and Dissemination (OCD) is of special interest for two reasons. First, it illustrates the aggressiveness and success with which IR was able to preempt a small part of the scarce PI resources, and second, it constituted an early and mutually profitable working together of photo interpreters and Agency collateral support personnel, many of whom later joined the PI's in Project HTAUTOMAT, the CIA Photographic

Intelligence Center, and the National Photographic Interpretation Center. Indeed, some of these persons became key individuals in the later organizations.

Projects in support of the Industrial Register involved an analysis of collateral reports and recent ground photography and, where appropriate, comparison with World War II coverage of the same installation. Layouts were prepared and recommendations made for the preparation of improved collection requirements for ground photography. Without exception, the four projects formally established in support of IR between 1953 and 1955 were completed in the month in which they were commenced -- a record unsurpassed by any other Agency component or requester below the deputy-director level and a testimony to the eloquence of the requesters in justifying the urgency of their need.

The first of the four projects for IR was established in February 1954. It was a pilot study to develop productive working relationships between IR and D/GP personnel as well as to produce a layout of the Kolpino (USSR) Engineering Plant. Work consisted of an analysis of ground reports and recent ground photography along with exploitation of World War II aerial coverage. 108/ Three months later, in May 1954, IR placed a request for PI support in locating oil pipelines and pumping stations in Albania. 109/

No further formal requests for PI services were received from IR until February 1955, when two more were placed in close succession. The first, done in support of IR for the Strategic Air Command, led to the establishment of a continuing project by D/GP to review special lists of priority targets for which normal SAC search operations yielded no information. 110/ The object was to try to fill the gaps with any available information on photography or PI reports covering the targets. The IR representative in the meetings with D/GP and SAC was [redacted] 25X1 [redacted] 111/ later head of the OCR Statistical Branch in 25X1 HTAUTOMAT and, still later, a senior manager in CIA/PIC and NPIC. This project was also an example of growing D/GP contacts outside CIA as well as a forerunner of the involvement of D/GP in work on collection targets that was to become an integral part of activity in successor organizations. The last of the four projects was a request to confirm the identity and location of the Ulan Ude (USSR) power plant using ground photographs. 112/

2. Other Projects.

Self-initiated projects continued to be a small but significant factor in D/GP production during the first two years following Lundahl's arrival. They consisted primarily of things done as services of common concern for more than one component or analyst. Never large in volume, they accounted for

scarcely more than five per cent of the time that division personnel spent on projects.

One such project, which yielded a hardy perennial among types of publications issued by D/GP and its successor organizations, was the mission scan. The resulting publication, called the mission review report, or any of several different equivalent names used at various times, consisted of a tabular or semi-tabular list of targets of potential intelligence interest covered by a given mission, with appropriate identification data, and with or without a capsule description of the salient information revealed by photography of the mission in question. Photo reference information was also included. The mission review report was intended not only as a convenient record of targets covered by the mission, but also as a reference to be used by analysts in levying requirements for photo intelligence support.

The mission scan, initiated in a low-key manner at this time, was the expression of a profound conviction held by Lundahl and one that had far-reaching future implications. Until this time military photo interpretation organizations, for lack of personnel and/or interest, had frequently filed photography that had never been examined by anyone. It was Lundahl's belief that all aerial photography collected for intelligence should be searched for new targets of potential

significance. Though the critical importance of this procedure was not demonstrated during these early days, it was dramatically evident in later years, when coverage over Sino-Soviet areas became available. Thus, the mission scan became an important function of D/GP and all successor organizations, including the national center.

A broadly similar type of publication was exemplified by a series of memoranda initiated in January 1954 and entitled *"Current U.S. Navy Aerial Photography"*. 113/ In the previous month, arrangements had been made with the Office of Naval Intelligence to place D/GP personnel on the USN panel for the review of incoming aerial photography. 114/ This enabled Agency PI's to scan newly received Navy missions in the light of existing Agency requirements. The purpose of the memoranda was to advise CIA analysts of the existence of the new coverage of targets in which they had an interest and to serve as a guide in levying specific requirements for photo intelligence support. They were particularly significant in providing timely support on items of highest priority interest, since the arrangements made included permission, on a highly selective basis, to borrow the original Navy prints. Normal processing of the duplicate prints took about four weeks. 115/

D/GP personnel got their first experience in active support of a major operation in Project PUMPKIN. This project,

set up in June 1954 in response to a request from the DDCI, 116/ was intended for use by the DDP in backing the overthrow of the pro-Communist Arbenz government of Guatemala by insurgents from Honduras under Colonel Carlos Castillo Armas. This was the first crisis in which the Agency used current intelligence derived from photography, or, as Lundahl put it, ". . .photography made yesterday, for answers needed tonight, for an operation which is going to take place tomorrow." 117/

The key to the success of this effort, aside from the carefully nurtured capability built up in the previous year or two within D/GP, was the availability of current photography. This included covertly acquired aerial and ground photography of key installations and targets within Guatemala, flown to Washington daily. Exploitation of the photography in D/GP was handled by a small task force headed by [redacted] 25X1 and including [redacted] 118/ 25X1

One of the most troublesome problems in connection with Project PUMPKIN was security. Information about the operation was very tightly held. Exploitation of the photography, therefore, had to be compartmented in such a manner as to preclude observation, casual or otherwise, by any but the D/GP task force and the division chief and his deputy. This was physically impossible in the division's M Building quarters, which lacked suitable space for sealing the task force off from

other D/GP activities much less a barrier or any type of controlled entrance. To solve the problem, Brammell arranged to provide space for the task force behind the security barrier in Building 11. Before the close of each day's work and the transmittal of any products to the Chief, Geographic Area, or to DDP, [redacted] would report to Lundahl or [redacted] on the status of the project and the results of work accomplished. 119/ 25X1

As soon as the photography arrived in Washington, it was turned over to D/GP, where the task force would identify such key targets as fuel storage installations, electric power stations, communications facilities, transportation routes, bridges, and the like. These were annotated on the photos and on maps, which were then flown back to the operations base. The next day those in D/GP witting of what was going on could take grim satisfaction reading in the newspapers about the radio tower that was destroyed, the power plant that was disabled, or the key rail or highway bridges that were blown up. Usually they were among targets pinpointed and described the previous day by D/GP. 120/

As a result of its participation in this operation, the division was the object of many commendatory remarks. These testimonials indicated that the descriptions provided by D/GP were accurate, that annotations on the photos and maps were

nicely keyed to operations, that locations given for targets were precise, and that without the photographic intelligence the operation would have been most difficult. 121/ Not only did the performance of the division earn favorable recognition at the highest levels in the Agency for a job well done, but it also gave some of its people a place, however briefly, in the sun.

C. Liaison with the Military Services.

On the photo interpretation scene, D/GP was a johnny-come-lately. Photo interpretation for intelligence had, by default, been the private preserve of the military. It was they who had staked their claims to the territory during and after World War II, and it was they who would, therefore, be sensitive to any encroachment by CIA. Moreover, in these early years, D/GP was heavily dependent on the good will and cooperation of military personnel for much of the needed photography. Not incidentally, the virtual monopoly long held by the military on photo interpretation for intelligence purposes ensured that a large majority of those in D/GP had a military background as well as close friends and former associates in the DoD. Nevertheless, there seems to have been a genuine desire to avoid duplication and to engage in complementary activities that would produce a better and

wider range of intelligence. The net result was frequent and lively constructive interaction between D/GP personnel and those in the DoD and, indeed, elsewhere in government. Next to project work, which accounted for approximately three-fifths of available time, 122/ liaison with other elements in the government was, in all probability, the most time-consuming function in D/GP.

Aside from the cat and mouse game of informally defining supposedly unique areas of responsibility for various organizations competing in the field of photo interpretation, relations between D/GP and the military services were generally cordial, productive, and mutually advantageous. Though the speedy procurement of photography, particularly of closely held materials, such as those within the SENSINT system*, continued to be a problem for D/GP, many significant accomplishments resulted from the cooperative efforts of D/GP personnel and their military counterparts. Most important, perhaps, was work of the informal Joint Working Group on Intelligence

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*SENSINT was a US Air Force control system devised for the compartmented control on a must-know basis, of photography and electronic intercepts acquired by covert manned overflight of the USSR and Satellites. Coverage was mainly peripheral. Chief areas covered were the European Satellites and the Soviet Arctic and Far East. The Air Force exercised very tight control of SENSINT photography, to the point where it raised questions concerning their good will in sharing it with others.

Ground Photography, later and more formally called the Committee for Coordination and Standardization of Intelligence Ground Photographic Procedures and Equipment, under sponsorship of the Joint Chiefs of Staff. Less important, but still noteworthy, was work done by D/GP and other Agency representatives from the Graphics Register and OCD in the Graphics Research Coordinating Group. In addition, the continuing day-to-day liaison between D/GP and DoD personnel at the working level in facilitating the routine flow of aerial photography needed by CIA was as vital and productive as were the periodic conferences between their supervisors to solve the inevitable foul-ups.

During years of serving in various capacities as photogrammetrist and Assistant Chief Engineer at the US Navy Photographic Interpretation Center, Lundahl had attended meetings of many task forces, panels, and committees dealing with photography, photo interpretation, photogrammetry, or related research and development in the fields of collection and exploitation systems and equipment. When he entered on duty in CIA he was well informed on what was going on at the frontiers of development in these fields, where it was being done, and who was associated with it. Consequently, he was in a position to make effective suggestions for overcoming the limited progress in the field of photo intelligence since World War II.

In October 1954, Lundahl visited the USAF Air Technical Intelligence Center (ATIC) at Wright-Patterson Air Force Base in Dayton, Ohio. In the course of a discussion of US capabilities in the collection and exploitation of photography, he proposed a series of informal, regular meetings with representatives from the Army, Air Force, Navy, CIA (including DDP), and the FBI, to share information on new equipment and techniques for collecting and exploiting photography. Later on, State also sent a representative.

Since security constraints were a major concern in implementing this suggestion, the key phrase used to identify the resulting working group was "intelligence ground photography". The title most commonly employed was Joint Committee on Intelligence Ground Photography. Use of this name obviated questions and challenges that could be expected were the phrase "aerial photography," with its many closely held programs in being or under development, incorporated as part of the title. 123/ At the same time, anything related to intelligence photography and equipment, such as lenses, filters, films, exploitation equipment, and mensuration devices, classified no higher than SECRET could be and was open for discussion. 124/ Business of the committee was, therefore, not necessarily confined to matters concerning ground photography.

The first meeting following the proposal at Dayton was held on 29 November 1954 at CIA headquarters, in Washington. Lundahl served as chairman, a position he was to hold for several years. [redacted] another member of D/GP, was named secretary, a position he, too, held for many years. The response to the suggestion and invitation was enthusiastic, and the meeting was a huge success. Among items discussed were such things as photographic lenses and films, quiet operating cameras for clandestine use, photographic techniques, and development plans and problems associated with intelligence ground photography. 125/ This meeting was followed by many others; by May 1955 four others had already been held, each attended by approximately 20 persons. 25X1

The utility of these meetings and the need for the committee were greatly enhanced by the demise earlier in 1954, of the DoD Research and Development Board (RDB) and its tens of committees, including those in the fields of photography and photogrammetry. Elimination of the RDB was one of many changes made by Roger Kyes, the newly appointed Undersecretary of Defense, to reduce the heavy R&D superstructure in the Pentagon. While the RDB existed, its encyclopedic minutes were available for use by authorized officials seeking information on research and contracts under way. With its dissolution, each individual, to a considerable degree, had to

ferret out such information concerning things in which he had an interest. The Joint Committee on Intelligence Ground Photography, under Lundahl's leadership, stepped in to fill a small part of the void, namely that dealing with photography, photo interpretation, and photogrammetry. 126/ Committee members discussed the interests of their respective components, serving both as a source of information for others and a collection device for those they represented. Once again, as in the days of the RDB, an official seeking information about developmental work under way on a specialized type of film or, say, a new piece of equipment for rectifying oblique photography, could find out what work another agency was doing, identify the contract, and, if pertinent, find out whether or not joint procurement was possible. The committee thus served not only as a clearinghouse for information, but also as a channel for effecting significant government savings in time and money. 127/ The utility of the committee and the good work accomplished under Lundahl's leadership were recognized in early 1956 when the group was made one of the permanent advisory committees to the Photography and Survey Section of the Joint Chiefs of Staff, and more formally named the Committee for Coordination and Standardization of Intelligence Ground Photographic Procedures and Equipment. 128/

Representation of D/GP on the Graphics Research Coordinating Group was accomplished at a lower level than that on the Joint Committee on Intelligence Ground Photography. It also predated the latter, going back virtually to the formation of the division. Though [redacted] had initially assumed the task, when there was no other alternative, this responsibility almost immediately devolved upon [redacted] on his arrival for duty. 129/ Not only did this relieve [redacted] at a time when he was still, in effect, acting as Chief pending the arrival of Lundahl, but it was also a very suitable assignment, since [redacted] had served on the group as a Navy representative. It likewise dovetailed neatly with [redacted] past experience and interest in researching holdings in the various photographic libraries. The lower level of effort and representation devoted to this committee was, most of all, a reflection of the fact that it was a committee chaired by the military services, and that it dealt primarily with routine matters concerning graphics collections, recent acquisitions of photography, prospective new photographic inputs, and related collateral materials.

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Though it provided no forum or listening post where valuable information could be exchanged concerning technical breakthroughs on million-dollar contracts for the development or manufacture of sophisticated equipment, this group was

a valuable means for identifying and learning how to acquire photographic and collateral materials vitally needed by D/GP in its daily work. As such, it was a very significant cog in the liaison mechanism utilized by the CIA Photo Intelligence Division in conducting its daily affairs with the Department of Defense.

Throughout the two-year period from 1953 to 1955, D/GP interpreters themselves repeatedly sought out photography and information on photographic coverage not available through normal channels such as the Graphics Register, the Industrial Register, or the CIA Map Library. Thus, names of all D/GP professionals were included in periodic requests for continuing clearance and access to the various DoD collections of photography in the Washington, D.C. area. 130/ Access to these and other files of material helped significantly in the continuing struggle to identify and obtain either little known or closely held materials at a time when procurement of suitable up-to-date photography was still a major problem.

Researching photography was facilitated greatly by agreements hammered out at higher levels. Lundahl, through his numerous contacts with interpretation and intelligence officers in the military services played a major role in making these arrangements and in breaking the inevitable bottlenecks. Soon after his arrival, he launched a con-

certed attempt to improve access by D/GP personnel to service-held photography and to speed the flow of needed material to Agency PI's.

Closer liaison was established with the USAF, Office of Deputy for Targets, and similar arrangements were being explored with other pertinent USAF components. The Photo Records and Services Branch of the Army Map Service (AMS) had likewise agreed to inform D/GP as soon as aerial photography of certain areas of interest flown under contract to AMS was received. D/GP had further arranged to receive [redacted] STAT [redacted] STAT and the Photo Records Branch, Deputy for Targets, USAF, had agreed to handle procurement of limited amounts [redacted] photography to satisfy CIA 25X1 needs. 131/ In working out the details of these agreements Lundahl had frequent assistance from Stallings, who acted in his stead when necessary, and Lenchert, who provided staff support.

As time went by and new situations emerged, D/GP continued to take aggressive action in procuring photography from the military. In October 1954, [redacted] brought to a successful 25X1 conclusion, through negotiations with representatives of the USAF, Deputy Chief of Staff for Operations, Directorate of Intelligence (AFOIN), the Office of Naval Intelligence, the Graphics Register and the Liaison Division of OCD, arrangements

for the receipt by D/GP, on a continuing basis, of copies of optimum (best-quality coverage) stereo photography lists maintained in DoD. 132/ This represented the successful conclusion of discussions commenced in August 1954 by [redacted] 25X1 at a meeting of the Graphics Research Coordinating Group. 133/

The Formosa Strait crisis, which reached a peak in the late winter and spring of 1955, created new problems in the acquisition and sharing of current photography of the area. However, determination by both D/GP and the military services to solve the problem constructively, coupled with the exercise of patience and goodwill, averted any breach in continuing cooperation.

Difficulties resulting from the length of time required for reproduction of [redacted] photography 25X1 received in Washington began to show up as early as December 1954. An immediate conference, in which [redacted] 25X1 met with representatives of the Collection Division, Reconnaissance Branch, Photo Interpretation Section, AFOIN, and the Photo Records and Services Division, ACIC, identified the deficiencies and rectified most of them. 134/ Further difficulties developed, however, as the crisis deepened after the first of the year. With several different intelligence agencies attempting to answer crash requirements using the same photography, problems arose involving the sharing of original materials and/or the

expeditious reproduction and delivery of copies to potential users. During March 1955 alone, Lundahl, [redacted] 25X1 [redacted] separately, met in a total of eight conferences with 25X1 representatives of OCI, OSI, DDP, the Navy, and the Air Force on problems of photographic procurement. 135/ In April 1955, Lundahl and [redacted] met with [redacted] to 25X1 confirm agreements reached between ONI, US Navy PIC, and the Graphics Register for rapid delivery to D/GP of each Far Eastern nine-by-nine-inch or nine-by-18-inch aerial photograph forwarded by the CNO to the Naval Photographic Center for reproduction. Furthermore, the CIA Photo Intelligence Division was to be notified by telephone each time a package of prints was available to be picked up by courier, 137/ reflecting the urgency with which these materials were needed.

Even these extraordinary measures were inadequate, however, to ensure faultless and speedy delivery of photography to D/GP. The May 1955 D/GP monthly report noted that Lundahl and [redacted] 25X1 on several occasions discussed with Navy PIC and ONI representatives the timely delivery of photography covering critical overseas areas. 138/

In spite of frustrations resulting from untoward events, the most important thing, in and out of crisis situations, was that supervisors and PI's in D/GP were able to establish and keep open the sources and transmission channels for obtaining

the photography essential to do their work. Moreover, they were able to do it without high-level intervention, which might have been even less productive. Though the cost was fairly high in terms of time and patience expended, the results were remarkably successful in an environment that could be characterized as one of latent mistrust and misgivings generated by the introduction of a "foreign body" into the preexisting Intelligence Community photo interpretation organism.

D. Equipment and Interpretation Techniques.

Changes in interpretation techniques during this period were generally few and insignificant. The PI's still depended primarily on the folding pocket stereoscope, the tube magnifier, the PI scale, and the PI slide rule to accomplish their daily tasks (Figure 5). There was still no collateral support unit in the division; each PI ordered and/or searched for his own maps and documents. Though several interpreters were COMINT cleared, facilities for using such materials were extremely awkward. For the most part, PI's had to consult COMINT sources in secure areas behind the barrier, note mentally for background use any pertinent COMINT information, and then return to their desks to complete their analyses and write their reports. Moreover, the number of requirements levied on the division by COMINT-

using analysts in OCI and ORR was small. Together, these limiting factors inhibited substantial growth of an all-source exploitation capability in D/GP.

Concern for this lag was reflected in the assignment of [redacted] still PI consultant to the Agency, to make a study of the problem in November 1954. His report noted that there was little effort on the part of COMINT-using analysts to employ photography as a correlative source of information. He attributed this failure partly to a lack of awareness by such analysts of the potential utility of available photography in their studies. He also blamed the failure on the cramped D/GP quarters in M building, the existing heavy PI workload, and the location of D/GP outside the barrier. [redacted] hoped that the new quarters for D/GP in Que building might help alleviate the difficulties, but he conceded that it was impractical to move D/GP behind the barrier because of its close association with other Agency analysts and with military PI's who were not COMINT cleared. 25X1 25X1

[redacted] was a strong advocate of the thesis that, in a crisis situation, the admittedly limited Agency PI resources would have to be directed almost exclusively to the coordinated use of COMINT in conjunction with the interpretation of photography. He stressed the need to develop such a capability, at least on a pilot basis, before such time as a major inter- 25X1

national crisis might occur. 139/

Acquisitions of new instruments and equipment during the first two years under Lundahl provided no dramatic departures in type or in number from what might be expected in any comparable organization. This was not to say, however, that D/GP was unaware of the long-range need for better and more sophisticated equipment, or reluctant to make a start in acquiring it. The procurement of such equipment as a step in upgrading the capability of the division was high on Lundahl's list of priorities. Yet early progress toward this goal was somewhat difficult to justify in the light of requirements levied on the division and the nature of the photography being exploited. It was also discouraged by the generally non-technical orientation of senior ORR managers and the lack of an established office tradition for purchasing expensive, sophisticated equipment. 140/

Lundahl was successful in obtaining an "Old Delft" scanning stereoscope, manufactured in the Netherlands. He forwarded the requisition for its purchase on 26 May 1953, exactly one week after his first "working" day in D/GP. 141/ A subsequent justification for this viewer pointed to the ability to scan nine-by-nine-inch photos completely in both x and y directions without moving the photography or the instrument. Another attribute of the instrument that may

have been of some significance in winning approval for it, in view of the high interest in training analysts to interpret photography, was the possibility of joint viewing by two persons for training or in conferences. The fact that the cost was not quite a thousand dollars may also have helped, in a negative way, by failing to invite exaggerated scrutiny of the item.

Not so successful was Lundahl's attempt to augment division capability for the preparation of accurate plots and data concerning land relief in small areas of special interest. To this end he attempted, at the same time, to obtain a Zeiss Stereotop II for stereo observation and plotting. 142/ Possession of such an instrument would have enabled the division to provide more timely and accurate responses to requests by DDP and others about the topographic configuration in areas of special interest as well as answers to questions of defilading and enfilading.* The attempt to procure the Stereotop, whose cost was fully three times that of the Old Delft, failed.

Two years later, Lundahl tried again. By this time the choice of instrument had changed, and the request was to

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*An enfilade is a condition of exposure -- e.g., of an agent -- to observation or fire from a given point of observation. A defilade is a condition of protection or screening from fire or observation from a given point.

procure a Kelsh Plotter. 143/ This decision clearly reflected the influence of [redacted] who had become Lundahl's right-hand technical man and who had experience in using the Kelsh. This attempt was no more successful than the first, however, and D/GP obtained no plotter prior to the move into the Steuart building in 1956. STAT

The failure of D/GP to obtain approval for the purchase of stereo plotting equipment was due at least in part to the GRA policy of not wanting to begin development of a contour-map compilation capability. Such a development was regarded as duplicative of AMS and ACIC capabilities, which were readily accessible to GRA. Furthermore, the GRA view was that such a capability belonged in the Cartography Division, where it would have involved a substantial increase in the T/O and the inauguration of an extensive training program. This was a commitment with which GRA management did not wish to become involved at this time.

The interest of D/GP and, perhaps even more to the point, the interest of senior ORR managers in basic PI training for other intelligence analysts was reflected in a purchase by D/GP of a Jackson Stereoscopic Projector with a floating mark. Procurement was recommended in March 1954. 144/ On 28 February 1955, Lundahl announced at the Geographic Research Area staff meeting that D/GP had received this piece of equipment, and

that it was available for use in briefings. 145/ Thus, the projector was obtained in time for the new course in basic photo interpretation for intelligence analysts given by D/GP many times over, beginning in July 1955. Once again, however, the division had to reach out beyond the boundaries of the United States to get the equipment needed. The Jackson projector was of Canadian manufacture. The ability of the division to search out and identify unique pieces of foreign manufactured equipment such as this was a demonstration of the utility of cultivating Lundahl's wide-ranging interests and contacts.

The failure of the Photo Intelligence Division to obtain more sophisticated equipment at the outset caused no serious crisis. Most obvious was the lack of success in procuring equipment for mensuration and for the preparation of more precise maps. Even so, the division was able to prepare rough sketch maps in place of accurate plots. It was, moreover, possible, at the sacrifice of some accuracy, to provide ballpark figures in place of precise measurements. On rare occasions, the division was able to farm out a job to the Engineer Research and Development Laboratories at Fort Belvoir or to the Army Map Service, security permitting. The jobs that the division was asked to do and the photography with which the division had to work were very forgiving of such

improvisations. This was not to be true, however, in later years.

In spite of little tangible change in D/GP equipment during Lundahl's first two years, the stage was being set to take advantage of future developments. Lundahl had brought with him a strong interest in technical development. Even though this was not immediately translated into an abundance of sophisticated equipment, he was aggressively following developments in the state of the art and work being done on new exploitation systems and devices through such contacts as those in the Joint Committee on Intelligence Ground Photography. As time went by, he was also learning about new collection systems and components, such as cameras used in Project GRAYBACK*, through his associations with [redacted] 25X1
[redacted] of OSI and, toward the end of the period, a much 25X1
wider range of equipment through his participation as a key figure in the AQUATONE project. He had brought [redacted] 25X1
a budding young photogrammetrist, from Navy PIC to D/GP, and he had secured a strong technical man from ERDL in the person of [redacted] All these things gave assurance that, 25X1
when the need was more urgent, D/GP would be in a position

*This was the Air Force balloon project known earlier as GOPHER and GRANDSON, later as OPEN HEARTH and GENETRIX.

to move swiftly and surely to cope with the greatly increased technical demands of a new era.

E. D/GP Inaugurates Formal Reporting.

The initial plan to issue no formal PI publications did not last long after the arrival of Lundahl. Indeed, such a policy was untenable once the division got fairly well established and commenced producing more than a trickle of information. From the point of view of D/GP and ORR management, justification of the PI activity would, sooner or later, require more tangible evidence and production statistics than could be mustered without formal reporting. From the customer point of view, there was growing need to have more authoritative information, which could be used to establish authenticity and to cite in publications as references. There was also the desire to have something less transient than working papers for reference purposes. 146/

In August 1953, less than three months after he entered on duty, Lundahl recommended the establishment of two series of PI publications, one the Photographic Intelligence Report, the other the Photographic Intelligence Memorandum. He proposed that one type of report be designated for standard distribution only. 147/ This distinction was obviously intended to provide a means for publishing certain sensitive PI information, for example, that relating to DDP operations. Memoranda would also fall in either

of two subtypes, those in response to internal requests and those answering requests from outside CIA.

Following staffing out of the recommendation in Brammell's office, a memo, spelling out the same proposal in somewhat better context, was prepared for Guthe to send to the Assistant Director for Intelligence Coordination. This memo noted that the proposed series conformed to existing specifications for intelligence publications approved by the DDI, and that action had been taken to ensure that there was no danger of duplication or confusion with publications of the Graphics Register. 148/

The memorandum was dated 5 October 1953, suggesting not only strong interest and quick approval by [redacted] but also the absence of significant opposition by higher authority or other components with whom the proposal was coordinated. The first formal photo intelligence publication, GP/I-1, *Rumanian/Ukrainian-Moldavian Border Study*, was dated 9 November 1953. 149/ Like most early D/GP publications, this one was prepared in typescript in response to an internal CIA (DDP) request. 25X1

For the first few years most formal PI publications issued were memoranda rather than reports. Typically, they were no more than a few pages in length; the text of some merely identified the requester and noted that the requirement had been fulfilled. Graphics were generally annotated photographs, with or without acetate overlays. Maps were sometimes included, and, rarely,

utilitarian perspective drawings were prepared. For the most part, an office typewriter was the chief machine used for reproducing text, with copies other than the original consisting of carbons. Graphics accompanying such reports were usually prepared in only one copy, for the requester.

In the case of publications having a wider appeal, such as those of the mission coverage type, reproduction was in purple ditto. When multiple copies of graphics other than photos were required, reproduction was most commonly by ozalid. Generally speaking, problems of reproduction involving the [redacted] facility were minimal, in view of the small scope of D/GP production. It was recognized by Lundahl and others, however, that this could become the Achilles heel of the CIA PI production operation. Indeed, one problem had already cropped up, and two other potentially serious ones had been identified by the spring of 1955. 25X1

The much augmented volume of D/GP publications in the late winter and spring of 1955, and the urgency with which they were needed, created a glut of high-priority reproduction work at the [redacted] seriously compromising its ability to render prompt service to other parts of the GRA. When [redacted] who was temporarily acting as Chief, GRA, in [redacted] absence, mentioned this problem at the GRA staff meeting on 20 June 1955, Lundahl responded that the Office of 25X1 25X1 25X1

Logistics was planning to get in touch with Brammell to obtain official confirmation that the recent high level of D/GP work would continue. 150/ Obviously, Logistics hoped to establish a continuing need beyond the peak activity associated with the Formosa Strait crisis before undertaking any long term augmentation of their capability. At a time when Lundahl, at least, was beginning to think about how to prepare for the reproduction of large volumes of extremely high priority information from U-2 photography, the precariousness of having to depend on someone else for reproduction of such materials could hardly have been lost upon him. Fortunately, the sensitivity of U-2 materials would provide a persuasive argument for setting up a self-contained operation.

On 2 June 1955, representatives of the Office of Logistics met with [redacted] and Lundahl to discuss certain potential reproduction problems involving D/GP. First and foremost was the concern about what would happen if the arrangement made with the Navy for furnishing large numbers of photographic prints to D/GP should break down. The other major problem concerned the provision of adequate reproduction support in the event of relocation outside the metropolitan Washington area during an emergency. 25X1

In the first case, the Office of Logistics expressed a definite preference for having the Navy continue to supply

prints to D/GP. Agreement was reached, however, to augment OL's capability to respond to limited short-deadline requests by D/GP for photo reproduction. 151/ In the second instance, Logistics pointed out that a detailed plan had been prepared, providing for all aspects of such support to Agency components, but that it was being held in abeyance somewhere in the DDS. In both cases, the Logistics representatives gave assurance of their desire and ability, with some advance warning, to provide any additional essential services, but they stressed the need for adequate written justification. 152/

F. The Onset of U-2 Support.

By 1954, gaps in US intelligence which precluded adequate knowledge of Soviet capabilities and intentions with respect to the possible launching of nuclear attack on this country were generating strong pressure to find some means to fill the gaps. Though aerial photography ranked high on the list of prospects, enthusiasm for the use of this promising sensor were tempered by consideration of the possible consequences of a shootdown of an American military aircraft deep within Soviet airspace. At this critical juncture, intensive work being done on the problem began to point to a possible solution.

The first inkling came in a report dated 30 September 1954 and issued by the Special Study Group of the Hoover Commission

investigating the covert activities of CIA. This group, under the chairmanship of General James H. Doolittle, urged the use of all possible techniques to increase the capability to gather intelligence information by means of high altitude photo reconnaissance. As if to emphasize the overriding need for such a capability, the report added that no price paid would be too high. 153/

The specifics of how to develop the capability were the result of work done by a sub-group of the "Surprise Attack Committee" of the Office of Defense Mobilization. On 5 November 1954, [redacted] Chairman of the "Project 3" Technological Capabilities Panel* wrote a letter to Allen W. Dulles proposing that CIA, with the "assistance" of the Air Force, undertake a program of photo reconnaissance over the USSR. The proposal accompanying the letter stated that there was available a "jet-powered" glider that could fly at an altitude of 70,000 feet. Unarmed and weighing in at a mere 15,000 pounds, this aircraft was so obviously devoid of military usefulness as to minimize the level of reaction to be expected should it be intercepted by the Russians. According to the proposal, a single mission by this aircraft in clear weather could provide photographic

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[redacted]

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coverage of a strip of territory 200 miles wide and 2500 miles long. 154/

During the next two weeks, the Agency and the Air Force held discussions concerning the feasibility of the proposal. On 19 November 1954, Dulles and Cabell attended a luncheon meeting in the office of Harold E. Talbott, Secretary of the Air Force, to hammer out a coordinated proposal for submission to the President of the United States.* It was agreed that the proposal was a practical one, that steps should be undertaken to contract for the equipment needed, that the project should be a joint CIA-Air Force undertaking, and that CIA unvouchered channels should be used for procurement. 155/

Dulles next turned to the Intelligence Advisory Committee. On 23 November 1954, he obtained from that committee a memo for President Eisenhower supporting the proposed reconnaissance program. 156/

The proposal was presented to the President at the White House on the next day, 24 November.** A memo for the record, in

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*Present: Dulles, Cabell, Talbott, Trevor Gardner (Assistant to the Secretary for R&D), Fred Ayres, Jr., (Assistant to the Secretary for Intelligence), Lieutenant General Donald Putt (Deputy Chief of Staff, Development), and Clarence L. (Kelly) Johnson of Lockheed, the designer of the CL-282 (Air Force designation: U-2).
**Those present: President Eisenhower, Allen Dulles, John Foster Dulles, Charles E. Wilson, and Brigadier General Andrew J. Goodpaster.

the hand of Lieutenant General Cabell, noted that the President approved the proposal, subject to a reservation by the Secretary of Defense providing for a final review of responsibilities for managing the project just before it became operational. In the meantime, plans and procurement of equipment would proceed as initially proposed. 157/ Though the decision as to who, CIA or the Air Force, would ultimately exercise control was, thus, undecided, the project had gotten the starting flag and, at least for the time being, CIA was in the driver's seat.*

Lundahl was first made aware of the U-2 project on Monday, 13 December 1954. On that day, he received a call to report to the DCI. Upon arriving, he was ushered into Dulles' office, where, for the first time, he met Richard M. Bissell, an economist with a PhD from Yale University, who was attached to the Office of the Director as Special Assistant for Planning and Coordination (SA/PC). 158/ Though the DDCI, Lieutenant General Charles P. Cabell, had been made responsible to the Director for overseeing work on the project, Bissell was the man designated to set up the organization and manage the operation. At this December meeting in the Director's

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*A much fuller treatment of the history of the U-2 program, including copies of key documents, can be found in the excellent history of OSA [redacted] 25X1

office, Lundahl was given a complete briefing on AQUATONE, the code name applied to the U-2 program. He was also told he was relieved of his regular duties and directed to commit himself full-time to support of Project AQUATONE. Among other things, he was to study contract specifications, visit instrument and equipment manufacturers, talk with designers and contractors, and, more generally, to take whatever steps might be needed to ensure that the exploitation potential of the resulting photography would be commensurate with the performance of the remarkable airplane which would penetrate far beyond unfriendly boundaries and permit exposure of the film at unprecedented altitudes.

This created some problems for Lundahl. For one thing, none of the three supervisors above him -- [redacted] Guthe, and Amory — was cleared for the project. Nor were any of them to be cleared for another several months. Moreover, it was unrealistic to expect Lundahl to disassociate himself completely from ongoing D/GP work, though he did turn the day-to-day management of the division over to [redacted] who thereby became entrenched as deputy division chief. Lundahl made every effort to keep in touch with work in D/GP and with staff affairs in the Geographic Research Area when he was in town, but he spent considerable time traveling all over the United States doing the job Dulles had given him to do. The word was out to

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provide whatever support was required for the extremely important project being undertaken for the DCI by the Special Assistant for Planning and Coordination. 159/

Almost immediately, others in D/GP besides Lundahl became involved in the project. By early 1955, two additional members of D/GP, [redacted] were also cleared, ostensibly to support EQUINE, a sub-project under AQUATONE. 160/ Though EQUINE was established to formulate photo intelligence collection requirements for the U-2, [redacted] quickly became involved in broad-gauge support for AQUATONE itself. On 18 January 1955, they moved to separate quarters on the third floor of the dilapidated former Briggs School building at 2210 E Street, N.W. Here they could work on sensitive tasks well removed from persons whose background might otherwise lead to inconveniently well informed speculation. In April 1955, [redacted] was detailed to work on this task force, 161/ replacing [redacted] who asked to return to his former assignment because of a personality clash with [redacted] A few weeks later, [redacted] joined the group as an illustrator. 162/

[redacted] had majored in geography both as an undergraduate and graduate student at the University of Pittsburgh. [redacted] was a former SAC officer who had also majored in geography as an undergraduate at the University of Wisconsin, and had been

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a PI, editor, and supervisor during his two years of military service. [redacted] had been employed by the OCR Machine Division as a draftsman and mechanic. [redacted] who had graduated from the Missouri School of Mines as a Civil Engineer and had further training in photo interpretation as well as extensive experience in it and related aspects of engineering, had come to D/GP from the Engineer Research and Development Laboratories, at Fort Belvoir, where he worked as a project engineer on the development of precise globes and spherical maps. He was the technical man, and, at GS-12, the leader of the unit. A perfectionist and a driver who possessed scarcely any detectable capacity to work harmoniously with people [redacted] got the job done at the expense of alienating nearly everyone who worked under him. Though this created serious problems in the unit and repeatedly caused persons in it to seek a transfer [redacted] was virtually indispensable at this juncture, and was retained for a few years as a supervisor precisely because of his indispensability.

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This small, carefully compartmented task force handled a variety of projects. One example, PATHFINDER II, was undertaken and completed in January 1955. 163/ A first phase, PATHFINDER I, had been accomplished as a "crash" project in November, a month before even Lundahl was cleared for AQUATONE. 164/

Both phases involved plotting on maps the radius of "bomber" operations from various US Air Force bases. 165/ In the case of PATHFINDER II, the bases were Clark, Kadena, Yokota, Shemya, Nome, Thule, Dhahran, Wiesbaden, Adana, and Wheelus. As more and more people became aware of unexplained activities in support of the high priority DCI project, this was the kind of job that couldn't be exposed to casual observation. As it was, elaborate care was taken to requisition additional maps that had no conceivable connection with the areas of primary concern so as to reduce the chance of successful speculation. 166/

As weeks and months went by, [redacted] became involved in the search for or development of equipment needed to process and exploit U-2 photography. As early as the spring of 1955, they made exploratory trips to ACIC in St. Louis, to Wright-Patterson Air Force Base in Dayton, and to Eastman Kodak in Rochester. Items being considered included equipment being developed at Wright-Patterson Air Force Base for automatic processing of aerial film, a project made feasible by the development at Eastman of a new film, SO-1121. Automatic processing of previously available film exposed under widely varying atmospheric and weather conditions did not yield negatives of acceptable quality .

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At Wright-Patterson, [redacted] also examined the reconoscope, a device for viewing film in the form of positive transparencies. 167/ At that time, PI's, including those in D/GP, worked primarily from prints. Since the reconoscope reversed the image on the negative electronically it was in no way a forerunner of microstereoscopes and other direct viewing equipment used by PI's at a later date for the exploitation of positive transparencies. Nevertheless, the concept of examining transparencies rather than prints was suggestive of changes in exploitation procedures that would come soon after the exploitation of U-2 photography commenced. 25X1

Another type of equipment that was introduced to the task force was the Minicard system, initially conceived under CIA auspices at Yale University and later developed by Eastman. [redacted] Chief of the OSI Nuclear Energy Division, had already been working with [redacted] and others at Eastman, and they had convinced him that Minicard was the key to automation in processing photo intelligence. Bissell had also become interested, and felt that acceptance by the Agency and the Air Force of the Minicard system for information retrieval was strong evidence of its value. At this early date, however, neither [redacted] nor other witting persons in D/GP had any firm opinions on the subject; they had, in fact, just been introduced to the system a few months earlier. Even so, 25X1 25X1 25X1

[redacted] was obviously less bullish about the broad-gauge utility of the system than Miller, and he cited some very pertinent reservations, which later proved to be correct. 168/ 25X1

The task force under [redacted] thus, addressed its efforts to the examination of a whole range of equipment of potential utility in all phases of production, from the processing of the exposed film to the storage and retrieval of information in published reports. 25X1

Another important job tackled by the task force was comprehensive planning of the space, functions, and organization required to provide a centralized, self-contained facility for the processing of photo orders, for the exploitation of the film, and for the publication and dissemination of photo intelligence products. As early as 20 June 1955, [redacted] forwarded to Lundahl a proposal covering all aspects of such a facility. 169/ Though it did not presume to be the final word, it was a very comprehensive beginning, and, as such, represented a substantial amount of effort. 25X1

This early planning was important because the progress toward the development of the unprecedented new collection system was unrelenting; it was absolutely essential that detailed thinking about inputs, space, functions, procedures, personnel, and the like, be accomplished at the earliest possible date. There would be no time to halt development

of the collection system or efforts to develop or procure exploitation equipment while planners proposed, coordinated, argued, refined, and agreed upon all the fine details of the PI system. The component parts of the program were being born in pell mell fashion to meet a deadline — hopefully, soon enough to provide a year or so of overhead reconnaissance before the Soviets should have developed effective detection and counter-measures. Getting the complete system shaped up required much cut-and-try, much interaction between innovative hardware and plans for using it, and the devising of modifications and compromises to assure a fine dovetailing in the final, working system.

Numerous details involving the interface between the collectors and the exploiters of the photography and users of the resulting photo intelligence had to be worked out, too. Though the time was too early and the task force too ill-equipped to do any detailed or definitive work about targets, collection priorities, flight lines, photo plots, and other mission-related coordination and support, it was apparent that the expertise of the photo interpreters would be called upon to some degree in dealing with all such problems. This, too, was a fact recognized by Lundahl and the task force, and they proceeded to think through and to get down on paper their plans for participation in all these areas.

Thus, during the late winter and spring of 1955, the small D/GP task force supporting AQUATONE was already engaged in a whole host of vital activities intended to ensure that the surprises and mistakes to be discovered as preparations came down the home stretch would be as few as possible. The broad scope and the extraordinary productiveness of this small group was, at one and the same time, a testimony to the enthusiam and leadership displayed by Lundahl and the technical competence and hard-nosed drive of [redacted] That the troops didn't buckle under the strain was a tribute to their appreciation of the effort with which they were associated and their dedication to the job. 25X1

G. Outlook in Mid-1955.

After two years under Lundahl, photo intelligence in CIA could be characterized as a mildly successful operation about to be projected by external forces into a role of critical significance, nationally and internationally. At the same time, it would move behind a shroud of secrecy so heavy and, ultimately, so successful as to rival that of any intelligence operation in the Western World. In mid-1955, however, only the chief and a few heavily committed associates among the division's personnel were aware of this prospect.

By the end of June 1955, the Photo Intelligence Division was, thus, approaching an abrupt change in its character, its size, its composition, its method of operation, and the location of its place of business. The change was to be revolutionary. In such a situation, past performance would be less important than future potential. Nevertheless, D/GP would have to provide the cadre of experienced people on which the success of the new venture would depend. In this sense, at least, the accomplishments of D/GP and the state of its development at the end of June 1955 were matters of great concern.

The most important question, that of leadership, had been decisively settled. Lundahl was the choice. Higher authority was obviously satisfied with his personal, professional, and managerial qualifications. He had commenced his Agency career on a note of strong confidence. Guthe had selected him to head the Photo Intelligence Division virtually as soon as it was established, and had never wavered in his decision through the long months of negotiation leading up to Lundahl's release by the Navy. [redacted] had recommended him for promotion to GS-15 after only five months on the job. His subsequent performance seemed to confirm the wisdom of those earlier judgments. If the work of the infant PI division was seldom glamorous enough to bring the chief into close working relations with senior Agency managers, the few opportu- 25X1

nities he did have gave him and the division favorable exposure. Lundahl had a gift for communicating animatedly and successfully with those above his rank and beyond his division and office, both inside and outside the Agency.

Of nearly equal importance was the question of adequate staff for the division. The on-board personnel had established a solid record of accomplishment, but ever since its inception the Photo Intelligence Division had operated with fewer than the authorized number of people and without enough personnel to meet the quantity of requirements levied on it. Overtime had become a way of life, at least periodically, and the division had to work selectively on those projects deemed to be most urgent. Such a situation suggested the need for more adequate staffing. Yet, considering the slow pace of previous recruitment and the inertia typical of any bureaucracy, some crisis or anticipated crisis was needed to justify a proposal for expansion. The Formosa Strait crisis and the prospect of the U-2 turned the trick.

On 13 May 1955 the AD/RR forwarded to the DDS a staff study prepared in [redacted] office proposing a reorganization of D/GP and an increase in its T/O from 13 to 44 persons. 170/ With some forethought as to where the additional slots and funds might come from, the proposal provided for an increase in the ORR T/O from 859 to 890 persons and a commensurate

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increase in 01 (personal services) funds, to cover the additional salaries.

In justifying the increase, the staff study mentioned the deleterious effect of so much crash work on long range planning to meet expanding Agency needs for photo intelligence. It claimed that five PI's were working at least part time on a special project of highest priority for the DCI, and said that the number needed for this would soon rise to 20. These were points that could scarcely fail to convince those responsible for the success of the U-2 program. The staff study also exploited constructively the situation created by the crash effort D/GP devoted to reporting on the Formosa Strait crisis. It called attention to the fact that whereas D/GP support for current intelligence was then exceeding 50 per cent of the division capability, that for the ORR Economic and Geographic Areas combined was down to approximately 12 per cent, DDP was down to 10 per cent, and OSI requirements were being handled only on a delayed response basis. Backed with such statistics, the proposal was successful. On 1 July 1955, the expanded T/O was approved by the DDS, with minor changes in the requested jobs and grade levels and in the names of two of the new branches. 171/

Several other administrative problems were also tackled about this time. One was the division of responsibilities

between D/GP and the Graphics Register. The issue had been raised in January 1955 in the report of the survey of services and facilities of the Photo Intelligence Division conducted by the Management Staff, DDA, at the request of the AD/RR as a follow-up to the IG's earlier recommendation. As a result, Brammell drafted a proposed regulation on the subject of D/GP responsibilities. Coordination of this regulation with other components was to continue for months. The most thorny questions were the differences of opinion between D/GP and the Graphics Register over (a) which component was responsible for what type of liaison with the military services in coordinating collection requirements and in obtaining certain types of photography for exploitation, and (b) whether D/GP was, in fact, engaged in producing photo intelligence at all. 172/ By the fall of 1955, D/GP was well on its way to much bigger things and further efforts to reach an accommodation with the Graphics Register ceased. The proposed regulation was never issued. What might otherwise have been an important struggle for power was rendered irrelevant by the advent of an entirely new and exclusive source of photography over which the Graphics Register would have no control.

In April 1955, D/GP moved from Room 1337 M Building to space in Rooms 1009, 1134, and 1142 Que Building. 173/ The prime reason for the move — and the chief advantage in making

it -- was more space. Since the original move to M Building about two years earlier, the on-board strength of the division had nearly doubled and several additional recruits were scheduled to report for duty by midsummer 1955. Though it was already clear that if the U-2 program were successful still another move would have to take place during the next year, the build-up in personnel precluded the possibility of waiting. Moreover, with only 12 people involved and a minimum of equipment, all of which was easily portable, the move within the M and Que Building complex was neither difficult nor costly.

Meanwhile, D/GP's support for the Guatemala operation had been highly successful and much appreciated. After many abortive attempts to provide support for OCI, the division came through impressively during the Formosa Strait crisis. Nevertheless, the most important work, in terms of future development, was the support the division and its chief were providing for Project AQUATONE. Once briefed into it, the DDI, Amory, came to rely on Lundahl to keep him up to date on the details of this project and to provide guidance in the more technical aspects of the undertaking. 174/ The communication patterns set in this way endured, and the team of Lundahl and Amory reappeared often in events involving D/GP and its successor organizations over the next several years.

IV. A Star is Born (1955-1956)

HTAUTOMAT (HTA) was the name given the task force whose responsibility it was to exploit AQUATONE photography. The history of the Photo Intelligence Division in the mid-to-late 1950's was very substantially that of HTA. Lest there be confusion about the relationship of HTAUTOMAT to contemporaneous CIA components, it should be understood that HTA was not regarded as a "permanent" organizational entity. Rather it was a group of persons, initially nearly 150 in number, assembled from ORR and OCR to work together under one management on the exploitation of U-2 photography. It was, in effect, the exploitative arm of the AQUATONE project. At the time HTA was constituted, no one could say just how long the collective effort under AQUATONE would continue or how long the capability represented by HTA would be needed.

If one were to reckon the date of conception of HTAUTOMAT (HTA) from the time when those on the small task force were detached from their regular duties and moved to 2210 E Street in January 1955, and the date of birth as the removal to the Steuart Building in July 1956, then the period of gestation was close to 18 months. It is with the last year of this period, from July 1955 to July 1956, that we are now

concerned -- how the organization evolved and grew, how the new recruits were phased in and employed, what provision was made for financing the operation, what noteworthy substantive and other accomplishments were achieved, and, more generally, the trials and the successes in getting ready for one of the most challenging and exciting undertakings in the annals of American intelligence.

A. Precursors of the U-2 Project.

The U-2 system was not conceived on the spur of the moment. Several studies of military intelligence problems during the early 1950's set the stage. Most important with respect to D/GP participation in Project AQUATONE was the report of the BEACON HILL Study Group, but work done under Project HOPE CHEST was of some significance in stimulating earlier thinking about strategic targets for coverage by overhead photography. Both were initiated under Air Force auspices, but involved at least limited participation by representatives from other organizations in the Intelligence Community, including CIA.

The BEACON HILL Study Group was established as a result of a proposal, in May 1951, by the US Air Force Deputy Chief of Staff, Development, to the Massachusetts Institute of Technology to undertake a study of Air Force intelligence and reconnaissance problems. Two months later, in July 1951,

this proposal was incorporated as a part of MIT's Project LINCOLN. Plans were made, however, to locate the BEACON HILL group in quarters separate from Project LINCOLN and to provide special security safeguards.

The BEACON HILL Study Group consisted of a Central Study Group of 15 members and 10 consultants. Five Air Force liaison officers were also assigned to the group. In addition, there was a small administrative staff. A total of 39 "visitors," each a specialist in some subject being discussed by the group, attended pertinent meetings.

It is interesting, in passing, to note the galaxy of scientific talent engaged in the BEACON HILL study. Since the contractor was Project LINCOLN of the Massachusetts Institute of Technology, a majority of those on the Central Study Group hailed from Boston or southern New England. Among those most closely associated at a later date with the U-2 project were:

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Organizational work proceeded at a slow pace, but things moved rapidly once work commenced. Between 7 January and 15 February 1952, the group attended Air Force and other briefings in Washington and at Air Force installations elsewhere in the U.S. Following these briefings, the group defined three areas in which they believed they could contribute, namely, intelligence objectives, sensors, and data handling. Panels were constituted to study each of these areas.

By the middle of April 1952, substantial agreement had been reached, and the major conclusions formulated. The BEACON HILL Report was issued on 15 June 1952, with a letter of transmittal to the Chief of Staff, US Air Force, dated 2 June 1952. The letter of transmittal pointed out that the study reflected two points of view. On the one hand, the group tried to view in broad perspective the problems of orientation, emphasis, and priority with respect to the overall job of Air Force intelligence. On the other hand, the group addressed its effort to technical problems involved in the collection, reduction, and utilization of intelligence data. 175/

Recognizing the need to develop a highly sophisticated photo reconnaissance system for peering inside the Soviet Union, while at the same time overcoming operational and maintenance problems inherent in the use of routinely trained military personnel, the BEACON HILL report proposed separation of these

"specialized" systems and their maintenance from normal tactical photo-reconnaissance tasks using standard equipment. 176/ It proposed extreme-altitude (at 70,000 feet!) oblique photography of the Soviet Union. At the same time it mentioned guardedly the possibility of pre-D-Day invasion of Soviet air space, and recommended rapid development to the point of feasibility trials of a number of the more promising vehicles, among them high-altitude balloons and aircraft. 177/ In the same sense that the mention of high-altitude aircraft presaged the U-2, the proposal to use balloons foreshadowed the GENETRIX program. In discussing prospective reconnaissance vehicles, the report stressed the need for integrated design of the whole system, rather than the more common process of accretion whereby independently conceived pieces of equipment were stuffed into vehicles not specifically designed to accept them. This systems approach was pursued, with some hindsight, in the development of the U-2 reconnaissance system and was reflected in the AQUATONE assignment given Lundahl by Dulles and, less directly, by the extensive operational and exploitation planning and support in which the task force headed by became engaged. 25X1

The BEACON HILL group, following its own precepts about the systems approach, also directed its attention to data handling. On the assumption that, even with greater use of

information priorities, there was grave danger that new, prolific collection systems would produce a volume of inputs that would overwhelm existing capabilities to sort and handle data, they proposed (a) microfilming all data inputs, (b) indexing the material and recording the index codes directly on the microfilm, and (c) using machines to search and locate the desired information. 178/

The greatest significance of HOPE CHEST to D/GP in its participation in AQUATONE and HTAUTOMAT was in the field of collection requirements. Following the initial D/GP contribution to the Reber memo of 18 November 1952 giving a preliminary and very general statement of CIA photo reconnaissance requirements, 179/ it served as a vehicle and, as AQUATONE was undertaken and then brought to near operational status, a convenient cover for shaping up initial collection requirements. In this connection, it is of interest that in 1952 the BEACON HILL Study Group had advocated controlled search of the Soviet Union as opposed to random coverage. In spite of some early proposals to the contrary, 180/ it was decided before the U-2 became operational that it would be targeted primarily against highest-priority installations. Coverage of installations of lesser importance would be a bonus, depending on their location near primary targets.

B. Development of a New Organization.

The reorganization and expansion of D/GP which was approved on 1 July 1955 was, in part, a hedge against probable future developments. Though one of the arguments used in its favor was the burgeoning demands being made on the division to support Project AQUATONE,* the magnitude of that effort and the precise nature of the functions to be accomplished were as yet unknown even to those most intimately concerned with the planning. Indeed, the degree of ignorance was demonstrated by the prediction, in justification of the proposed reorganization, that "a most conservative estimate" of the manpower needed to support AQUATONE was 20 persons. 181/ In a little more than six months, the number of authorized D/GP employees earmarked for this purpose would approximately quadruple.

The chief utility of the 44-man T/O, as it worked out, was (a) to provide authorization for bringing additional PI's on board in an orderly fashion, in view of the difficulty of finding them and the long delay occasioned by security investi-

*For communicating with those not cleared for AQUATONE, the project established in D/GP to provide support of all types to the U-2 program was known as EQUILATERAL. This was the name used in such things as administrative papers and D/GP monthly reports to refer to AQUATONE support.

gations and other processing, and (b) to define and establish the organizational elaborations needed for the future. In the latter connection, the expanded division provided not two, but four branches. It also provided a new support staff (Figure 6).

Two of the three new components would provide formally for specialized functions heretofore performed by the PI's either as an adjunct to their work or undertaken, in special circumstances, on an ad hoc basis by those best equipped and most interested in doing the job. Previously the tasks of coordinating collection requirements for the division and of handling the many facets of photo coverage information and procurement frequently had been undertaken by [redacted] At this juncture, a Support Staff, with the position of Chief pegged at GS-13, was established, with three other photo intelligence officers and a clerk-typist to round out the complement of personnel. This staff, of which [redacted] was named Acting Chief, greatly eased the pressure on the office of the Division Chief in these functional areas and also reduced the diversion of PI effort to related non-substantive tasks.

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Similarly, difficult mensuration problems and other tasks encompassed by the broader name of photogrammetry had often been undertaken by [redacted], who, like [redacted] had occupied a position on the Geographic Branch T/O. Simple mensuration

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tasks were performed by the PI's themselves, though as new, less experienced hands reported for duty, this was done at some cost in efficiency. With the reorganization of the division, the opportunity was at hand to establish an independent branch staffed with specialists, who would develop a strong capability in this highly technical field of photographic exploitation and free the PI's to devote their energies to the more qualitative interpretations which they were best equipped to handle. The newly established Technical Intelligence Branch was headed by [redacted] as Acting Chief. He occupied a GS-14 slot, and, at full strength, would have five additional photo intelligence officers working under his direction. 25X1

The third new component, the Special Projects Branch, was primarily a promise for the future, when the division or its successor organization would hopefully be receiving large amounts of high-resolution, current coverage of some of the most sought-after Soviet targets. When inputs from such missions should arrive, the pressure would be intense to learn the quality of the photographs, the scope of coverage actually achieved, and what was revealed about primary targets for which the missions were flown. Moreover, CIA would not be the only interested consumer. These targets would be agreed upon by all interested participants in the Intelligence Community, but, for the first time, CIA would control the film. If the Agency failed to

provide the Community with the initial, immediate summation of important results, the Air Force, in all probability, would fill the void by producing such reports from their copy of the mission photography.

In the meantime, until the U-2 became operational, the Special Projects Branch would produce photographic intelligence reports, memoranda, and data in support of "high priority current requirements," and develop a program for the exploitation of "current photography in support of Agency and national indicator programs." Ostensibly it would relieve some of the pressure on the Geographic and Industrial branches in any future situations like the Formosa Strait crisis and permit correction of the imbalance that had resulted in the dramatic decline in support of DDP, ORR, and OSI during that crisis. In any event, it would also be responsible for providing support to Project AQUATONE, whose demands for scarce PI resources were beginning to annoy [redacted] and Guthe. [redacted] was named Acting Chief of the Special Projects Branch, occupying a GS-14 slot. At full strength, the branch would have five additional photo intelligence officers. 182/ 25X1

One by-product of the reorganization was the identification of key managers and supervisors, at the branch level and above, who would be responsible for the functioning and success of D/GP as it faced the transition leading to the exploitation

of U-2 photography. Lundahl would continue to lead the division and [redacted] to serve as his deputy. [redacted] 25X1
would still be chiefs of their PI branches, but [redacted] would 25X1
join them as chief of a third PI branch. [redacted] would head the 25X1
new branch providing photogrammetric support to the interpretation branches, and [redacted] would head the staff handling 25X1
requirements, production control, and procurement of needed
photography. [redacted] alone among senior members of the divi- 25X1
sion failed at this time to get a key post, but he was soon
assigned to the division office to serve as a special assistant. Of these senior people in key positions, only two,
[redacted] were not former Navy PIC employees. 25X1
Thus, in the months ahead, as Lundahl became involved in critical decisions and challenging tasks, he would have the satisfaction of having familiar and trusted associates by his side.

August 1955 brought a cut in CIA's FY 56 operating budget, which resulted in the imposition by the DDI of a 5.3 percent cut in the personnel ceilings for all offices, including ORR. At the same time, he eliminated all new positions requested for FY 57 and any positions above the newly established ceiling, with the exception of the 31 positions recently approved for D/GP. The DDI further specified that of these the 20 new positions earmarked for support to the "DCI-Bissell project"

could not be used for any other purpose and should be filled as rapidly as possible. He authorized Guthe to distribute at his discretion the remaining 11 of the 31 positions, 183/ but Guthe chose to freeze them, precluding their use by any other GRA division. 184/ Thus, D/GP, which again found itself with numerous unfilled slots -- albeit newly approved ones -- in the face of a job freeze, was spared repetition of the ill effects suffered in a somewhat similar situation two years earlier. Clearly the chief factor responsible for the difference was critical concern for the success of Project AQUATONE.

New arrivals in the division spurted in July and August 1955, when one clerical employee and four professionals, including a military officer, entered on duty. [redacted] 25X1
[redacted] a Navy Lieutenant Commander at the time, reported 25X1
for duty in D/GP on 5 July 1955, 185/ the first military liaison officer assigned to the division. Unfortunately for the ongoing D/GP operation, [redacted] quickly became involved 25X1
in support of AQUATONE collection planning and operations, and was essentially lost to the division. 186/ Before the break in service was complete, however, [redacted] was able to 25X1
obtain a Navy plane in September 1955 to fly photographic coverage of the area around Langley, Virginia, and other areas, such as the "Winkler Tract" in Alexandria, Virginia. 187/

This was in support of Project PURPOSE, established in response to a requirement from the DDS to procure and interpret photography and lay mosaics of certain sites being considered for the construction of the new CIA headquarters building. 188/

Two other professionals entered on duty in July and one in August.* Though no other professionals arrived until December 1955, when two more arrived,** D/GP was in a strong growth phase. Between the end of June and the end of December the division had acquired six more professionals and one clerical, an increase of more than 50 percent in on-duty strength during the six month period. Moreover, the pace of new arrivals was about to increase still more during the next six months.

In spite of the use of Project AQUATONE to justify the 44-man T/O, and in spite of its utility in establishing some of the key functions needed later for exploitation of U-2 photography, the reorganization approved on 1 July 1955 could never have been intended as a definitive solution to the problem of staffing up for exploitation of U-2 materials. During

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[redacted] on 25X1
the 28th. 189/ Nearly a month later, on 25 August, [redacted] 25X1
[redacted] transferred to D/GP from elsewhere in ORR. 190/ 25X1
**On 6 December 1955, [redacted] transferred from the Carto- 25X1
graphy Division and on 16 December [redacted] entered on 25X1
duty. 191/

the summer of 1955, the small task force headed by [redacted] 25X1 produced the first formal proposal for what was initially called a "central interpretation unit" to exploit AQUATONE materials. The form of the proposal was exactly what might be expected from a driving perfectionist like [redacted] 25X1 with an engineering background. It included, in the most painstaking detail imaginable, a listing of all jobs on the proposed T/O, a complete statement of functions and capabilities down to branch level, and an exhaustive accounting of the expected cost. It had one basic fault, however; the proposal was too expansive. It provided for a total of 227 positions by 1 October 1956 and for FY 56 expenditures of approximately [redacted] 25X1

[redacted] 25X1

was earmarked for technical equipment, chiefly Minicard, an automated, miniaturized storage and retrieval system. Inasmuch as neither the success nor the duration of the collection program could be predicted at this early date, it was hardly realistic to expect such a proposal to be forwarded to higher authority without considerable revision. Moreover, even assuming success of the project, the volume and rate of inputs were not yet known, nor had the number and type of services to be provided others in the Intelligence Community been decided. Indeed, even if such a proposal were to be accepted in its original form, past experience proved that it would be virtually impossible

to recruit, select, and get on board in the time available so large a number of people, or to obtain, on short notice, complex equipment not yet out of the prototype stage. On the other hand, the proposal did anticipate essentially all the functions later performed by HTAUTOMAT.

The coordinated proposal for the central interpretation unit finally emerged as Project HTAUTOMAT.* Dated 2 December 1955 and bearing Amory's signature, it proposed establishment of an Office of Statistical Research,** to consist essentially of an expanded photo interpretation unit with its director reporting to the DDI, and a collocated OCR group, to be known as the OCR Information Register, under the administrative

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*According to Lundahl, it was he who chose the name AUTOMAT for the new organization. With considerable foresight, he envisaged the operation as the Horn and Hardart of the Intelligence Community, with its doors never tightly closed and with customers going in and out, day and night. By the time security approved it, however, the name had been transformed to HTAUTOMAT. Ostensibly, specifications called for the original name, which commenced with a vowel, to be prefixed by two consonants. Lundahl's good-natured plaint to [redacted] 25X1 the HTAUTOMAT as well as CIA TALENT Security Officer, was that he prefixed the name AUTOMAT with his own initials. (Though the name AUTOMAT was the one used in the initial proposal, HTAUTOMAT will be the form used henceforth in this history.)

**The misleading name proposed for the expanded D/GP organization was intended to provide cover for the operation and to discourage association of what was going on in HTAUTOMAT with photography. In the planning stages, AUTOMAT was similarly used to refer to the photography expected from Project AQUATONE. 193/

control of the Director, OCR.* Together, these would constitute Project HTAUTOMAT. The Office of Statistical Research would be staffed by 92 persons, mostly photo interpreters, organized, save for the addition of an Administrative Staff, in the same major components as the 44-man T/O, except that each of the operating branches would now be called a division. The OCR Information Register would consist of 53 positions in three branches, Support, Technical, and Information. Thirty-three of the 145 positions in HTA would be transferred from the ORR T/O,** and the remaining 112 would be in addition to the current ceiling authorized for the DDI.

It was expected that the financial requirements for the proposed operation would be approximately [redacted] for the remainder of FY 56. Of this total, about [redacted] was for personal services and the rest mostly for equipment. The DDI indicated that he was prepared to absorb the above amount in the FY 56 allocation to the DDI area. 194/ 25X1

Approval of the augmented PI capability envisaged in the foregoing proposal, with one major and a few minor changes,

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*This proposal was drafted by [redacted] of OCR. 25X1
**The difference between the 33 positions and the existing 44-man D/GP T/O represented the 11 positions whose disposition the DDI left in the hands of Guthe, who chose to freeze them in the D/GP T/O.

was obtained on 21 January 1956 (Figure 7). The major change involved rejection of the proposal to elevate the division to office level. D/GP it would remain, at least for the present, and the proposed operating divisions would still be branches. 195/ Several circumstances doubtlessly contributed to the scaling down of the proposed hierarchical position of the PI component. Most obvious was uncertainty as to the initial success or ultimate duration of the U-2 program. Another was the doubtful wisdom of vaulting a highly promising but small operation, consisting of only 14 Agency photo interpreters at the time of the proposal, to office status before it had even attained the normal size of other GRA divisions. Moreover, the problem of thus removing D/GP from under control of two echelons of management and declaring it the organizational equal of ORR and other offices would, under the circumstances, have been a challenging coup to execute. In spite of the revisions, however, the proposal succeeded in dramatizing the importance and promise of the new operation and, perhaps most of all, the high degree of confidence that Amory placed in the value of photo interpretation in general, and in Lundahl and his staff in particular.

Though the exact date when U-2 operational photography might arrive was, to say the least, uncertain, there was one thing about which there was no room for doubt. The pace of

recruitment and of new arrivals would have to be increased if D/GP were to be ready to cope with the complex tasks involved in handling, processing and exploiting U-2 materials. Fortunately, the pace did quicken.

Although there were only 17 professionals in D/GP on 31 December 1955, including one military liaison officer, the number increased to 41, including [redacted] by the end of FY 56. 196/ A new military liaison officer, [redacted] joined the organization during this time and played an important role in research and development during the HTA and PIC years.* 25X1 25X1 25X1

Incidentally, as preparations for exploitation of AQUATONE materials became more critical, the small D/GP task force, consisting of [redacted] which supported AQUATONE, was dissolved, and [redacted] turned to full-time work in preparation for HTA. 197/ Even [redacted] who had been on the AQUATONE T/O, became deeply involved in 25X1 25X1 25X1

[redacted] 25X1

planning for utilization of space in the Steuart building and transferred to the D/GP table of organization.* 198/

The PI element was not alone in having its proposed hierarchical position scaled downward. The proposed OCR Information Register, with its three branches, suffered a similar fate. It emerged as the Statistical Branch, Special Register, OCR, and its proposed three branches became sections. 199/ To a much greater degree than in the PI element, however, grades of key positions in the Statistical Branch were revised downward. 200/ As in the case of the PI element, there was no change in the proposed number of positions, 53. 201/

Though personnel in the Statistical Branch remained under the administrative control of OCR throughout HTA years, it is interesting to note something of the organization and the people involved because of their close working relations with HTA and their operational identity with it. Indeed, it would be difficult to overemphasize the importance of the relationship or the ramifications of its influence on the evolution of photo interpretation in the Agency and, ultimately, in the Intelligence Community.

Most important, as far as HTA was concerned, was the role played by the Information Section, headed by Dino Brugioni,

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*Acquisition of space in the Steuart building is discussed on pages 173 and 174.

in making possible the development of an all-source photo exploitation capability. Ever since the establishment of D/GP, great emphasis had been placed on the need in the Agency for photographic intelligence as opposed to photographic interpretation data. One of the cardinal points in this connection had been the definitive importance ascribed to COMINT as a collateral source of information for photo interpreters. Until HTA, however, the attainment of an all-source capability had proven extremely elusive, and only limited progress toward it had been realized.

In another major sense the Statistical Branch left its mark on its host, which thenceforth would never be the same. With the exception of editorial work, which was still only a gleam in the eye of D/GP, and graphics work, which existed in only a rudimentary form,* the Statistical Branch was the vehicle for implementing the concept of specialized non-PI support for photo interpreters and photogrammetrists. Not only was this reflected in collateral support provided by the

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*At this early date, there were no editors in D/GP, and the only hint for the future was the inclusion of slots for two GS-13 editors, one each in the Industrial and Geographic divisions, in the 2 December 1955 proposal for HTA. The limited graphics capability existing in the division at this time consisted of occasional jobs done by the PI's themselves — or those among the PI's who were able to do them. In the 2 December 1955 proposal, provision was made for four draftsmen in the "Special Projects Division." 202/

Information Section, but it also appeared in the form of the photo lab, of information storage and retrieval, and of printing support, as well as in services provided for the controlling and filing of film and the control and dissemination of PI documents.

Though only a beginning, the establishment of a large organization to support the PI's was a step that had critical long-range implications. It would be incorrect to assume that this decision was based primarily on the assumption that it was best to relieve the PI's of as many non-interpretative tasks as possible, even at the risk of ultimately causing them to be far outnumbered by support personnel. Most basic of all factors, and one over which D/GP managers had no control, was the highly sensitive nature of U-2 materials and the rigid compartmentation to which they were subjected. This alone required separate control and storage of film, a separate photographic laboratory, and separate reproduction and dissemination facilities.

Less important at the outset, but of increasing importance as time went on, was the speed with which the operation was overtaken by onrushing technological developments. At first it was only Minicard, but before long it would be microstereoscopes, comparators, computers, and a whole host of sophisticated equipment hardly appropriate for developing and/or servicing by

photo interpreters. Whatever the personal preferences of those responsible for the planning and functioning of D/GP, whether they behaved as technical innovaters, prudent managers, or only as harried taxpayers, they were locked into a system that demanded a large measure of support for the photo analysts. Their latitude of choice was decidedly limited, and by no means admitted of substantially reducing support services by administrative fiat at such future time as they might be deemed to have become too burdensome.

In calling the support element the Statistical Branch, as opposed to D/GP, which would remain a division, as well as in downgrading key positions in the Statistical Branch, another precedent was set. Photo interpreters and those who supervised them and managed the PI operation were clearly judged to merit higher grades than their counterparts in supporting elements. Insofar as this was a reflection of the prime importance of photo interpretation in the organization, and, especially in the early uncomplicated days, of the lesser skills involved in the control and handling of film and documents, the distinction was not only realistic but just. In the future, however, when some support functions would become quite sophisticated and involve the development of skills and expertise roughtly equal to or even exceeding those of the photo interpreter, the distinction would prove troublesome. Most difficult of all would

be the problem of utilizing fairly, and with best advantage to the organization as a whole, the talents of first-rate managers developed in support areas who were stigmatized by the imprint of the support component with which they were associated. Although this problem was neither as critical nor as seemingly insoluble as that of keeping a tight rein on support services, it was to be many years before a non-PI advanced to occupy a key position in a PI element.

Staffing up the Statistical Branch seemed to present relatively little difficulty, though a few of the more technically demanding positions, such as in the photo lab and in Minicard, created minor problems. The quality, capability, and dedication of key people assigned to the Statistical Branch was noteworthy. For this, Lundahl gave great credit to Dr. James M. Andrews, Chief, Office of Central Reference, who, according to the former, quickly recognized the overriding importance of the U-2 program and immediately decided to assign some of his best people to support D/GP in Project HTAUTOMAT. 203/ Included were such stalwarts as [redacted], who 25X1
served as Chief, Statistical Branch; 204/ [redacted] 25X1
who was Chief, Technical Section and doubled as deputy branch chief during the early months of HTA; and Dino A. Brugioni, who was Chief, Information Section.

C. Teachers and Students.

During FY 56, training involving D/GP personnel consisted primarily of two types, namely, training in photo interpretation given by experienced D/GP photo analysts and routine orientation given by OTR to the rapidly mounting number of PI recruits.* Though the division in principle did not abandon the provision of other training, such as advanced exploitation techniques, languages, supervision and the like, the pressure of project work plus the final push to get the organization, the people, and the new quarters ready for receipt of U-2 materials precluded all but the most urgent ancillary activities.

The series of photo interpretation courses offered by D/GP was, by far, the most time consuming and significant aspect of division training during this period. Ever since the founding of D/GP, one of the important assumptions had been that economic analysts and, insofar as possible, those from other offices would be trained to do much of the routine photo interpretation needed in the accomplishment of their daily tasks. Though one course for analysts had been given in the fall of 1953, further plans for offering others had been deferred, primarily because of the pressure of other work. With

*The D/GP photo interpretation course was offered in coordination with the Office of Training.

the prospect of a huge influx of high resolution current photography covering some of the highest priority Soviet targets, as well as the predictable future preoccupation of D/GP with the exploitation of U-2 materials, a new attempt was made to get the long deferred PI course under way again. Though the validity of some of the earlier assumptions concerning the practicability of having intelligence analysts do most of their own photo interpretation was, by now, highly suspect, eight offerings of the course were made during FY 56 to a total of approximately 125 students. 205/

The first offering of the new course, entitled the "Industrial Photographic Intelligence Course," ran from 12 July through 5 August 1955. It met on Tuesday and Thursday mornings from 0845 to 1200 hours in Room 1128-32 M Building; on Friday, 5 August, the class took an all-day field trip to the Esso petroleum refinery in Baltimore. 206/ Total class time, exclusive of a 15-minute coffee break each day, was, thus, 32 hours. The student body comprised 12 from ORR and 6 from the OCD Industrial Register.

The title of the course and the composition of the class, which, incidentally, had both [redacted] and his Special Assistant as auditors, 207/ reflected past commitments to train economic analysts in the fundamentals of photo interpretation as well as the preoccupation with serving, first of all, the needs of

25X1

the parent office, ORR. [redacted] Chief of the D/GP Industrial Branch, was in charge of organizing the course and managing the first offering. Other D/GP PI's assisted by giving class presentations in their fields of special competence. The choice of [redacted] was certainly appropriate. Most of the students were functional analysts whose chief interests and responsibilities were in the industrial field. Moreover, for years before coming to CIA [redacted] had been Chief of the Training Department at Navy PIC. 25X1 25X1 25X1

The announced purpose of the course was threefold: (a) to teach functional analysts to do basic interpretation of industrial installations imaged on photography; (b) to demonstrate the capabilities and limitations of photography as a source of intelligence; and (c) to acquaint functional analysts with the types of services available in the Photo Intelligence Division. 208/ These objectives continued without change during the remainder of the pre-HTA period.

Compared with the basic photo interpretation course offered in the fall of 1953, this one provided 60 percent more class time plus an 8-hour field trip at the end. The latter, in one form or another, was to become an almost standard feature of D/GP PI courses, since it afforded students an opportunity to see first hand one or more types of targets that they were learning to interpret on aerial photog-

raphy. Essentially all the additional class hours were devoted to an elaboration of photographic services and PI techniques far beyond those offered in the earlier course. There were also some changes in the industries studied as well as in the time allocated to industries common to both courses. Thus, aircraft and ships, and industrial plants producing them, were added to the July 1955 course, and chemical explosives were dropped. There was also a 50 percent increase in time allocated to study of the coke, iron and steel, and petroleum industries. In spite of the strong recommendation in 1953 that more class time be spent interpreting photography, most of the increase in class time was allocated to ancillary subjects, such as photo intelligence services in CIA and DoD, and to PI-related tasks, such as map reading and the plotting of photo coverage. Doubtlessly the course changes reflected the philosophy and past experience of [redacted] who had brought many teaching aids with him from Navy PIC and could borrow additional needed materials from his old associates. 209/ 25X1

Reactions from those attending the course were very favorable, and interest in a comparable one geared to somewhat different needs was reported from OSI and DDP. 210/ Indeed, the planning of a PI course for other than economic analysts was given serious consideration. 211/ In September [redacted] 25X1

who had briefly replaced [redacted] as the principal instructor during the summer, was, in turn, expected to be replaced by Walker so that [redacted] could commence developing a course on "geographic" photo intelligence. 212/ Pressure of regular work in the division, however, made impracticable allocation of the time necessary to offer the "geographic" course, and no such course was offered at this time. The fact that the prospective students would be drawn largely from outside ORR doubtlessly also entered into the decision. 25X1 25X1

In spite of the earnest attempt to teach functional analysts to do their own interpretation, there is no indication that the course succeeded in any substantial measure in attaining this objective. To dabble in the interpretation of excellent, relatively large-scale coverage of targets of high interest to the analyst was admittedly fascinating. When it came to getting the answers to critically important questions based on photography and to documenting them, fascination apparently turned to uncertainty and, in many cases, boredom. It was undeniably exciting, for example, to see what appeared to be air frame components in a plant yard, but what were their dimensions -- on oblique photography of only fair-to-good quality? And could they be identified, from their dimensions and the details of their configuration, with the Mod I or the Mod II version of the aircraft? Or would the details, as

revealed by analysis of the photography, suggest the first evidence of the Mod III? Then, too, given repetitive coverage, there was always the question of when they first appeared. This obviously involved a search of past coverage and painstaking comparison with the most recent photography. At some point very early in the process, most functional analysts apparently — and with good reason — reached the conclusion that either (a) they needed help, or (b) there were other tasks much better suited to their talents, or (c) both.

If the course failed substantially to attain its chief objective, it did succeed in the other two. Though fairly superficial, the course was adequate to introduce functional analysts to some of the more obvious capabilities and limitations of the photographic source. Moreover, in these early years, when few functional analysts had any familiarity with the interpretation of photography — particularly aerial photography — much less the more sophisticated techniques for analyzing it, the importance of such an introduction to the subject was probably greater than most persons realized. The arrival of U-2 photography would project these same analysts into a position of levying requirements for information and, once they got it, of using it astutely. To do so without creating chaos demanded some slight experience factor in dealing with aerial photography. Then, too, photo analysts

and functional analysts would have to work together productively. The reservoir of functional analysts who had taken the PI Course promised some smoothing of problems at this interface.

In the same measure, knowledge of the types of services available from the Photo Intelligence Division also helped. This was particularly true in approaching the solution of the more difficult technical problems, such as those associated with mensuration, or the exploitation potential of photography having varying degrees of obliquity or image degradation.

Though D/GP continued to offer the photo interpretation course in one form or another for a few more years, these eight offerings in FY 56 represented the high-water mark of such activity by D/GP. The proposition that functional analysts should learn to do most of the photo interpretation needed in their daily work soon became a dead issue, except for occasional resurrection by senior managers as a possible solution to coordination or staffing problems. As for the analysts, most of them opted out.

D. Publications in Transition.

In July 1955, [redacted] the Chief, Geographic Area, initiated an examination of photo intelligence reporting by D/GP to develop recommendations that would result in ". . .

25X1

greater community utilization of the PI product by essentially changing it from a custom made job in answer to a specific request to reports that are usable by other consumers as well." 213/ The conflict of objectives implicit in this statement was, incidentally, to be a recurring phenomenon in later years. The tendency for photo interpreters to see only the need to communicate with the requester, with whose interest and preferences they were usually intimately acquainted through working-level contacts, would by no means be solved once and for all at this time. Likewise, the temptation to use technical jargon in PI reporting would triumph on many future occasions, though the struggle to serve the generalist as well as the specialist would also continue.

During the summer of 1955 [redacted] assigned [redacted] 25X11

[redacted] of ORR's Geography Division to survey D/GP publications 25X1
and to make suitable recommendations. 214/ The results of her survey consisted of several pages of informal data and recommendations on a variety of subjects. 215/ Each of the [redacted] suggestions, 25X1
whether major or minor, was based on the existence of a problem or a prevailing practice susceptible to improvement. In many cases, what was called for was only a uniform application of solutions or conventions already in use in the division, since under prevailing practices each individual was either privileged or obliged to exercise his own judgment in many matters relating

to the preparation for publication of the results of his analysis. This was not surprising, since the division had neither editors nor approved style guidelines.

Among her specific points, [redacted] questioned the consistency in usage of the ubiquitous PI terms "possible" and "probable" and attempted to relate them to other qualifiers. Improvement in this area was initially very limited, and it was to be several years before preparation of a glossary of PI terms, compiled by the National Photographic Interpretation Center, would set the stage for the achievement of measurable progress in the consistent use of such terms for hedging interpretations. 25X1

One of the recommendations was for the establishment of two distinct publications formats, one for a "complete" GP/I and the other for a one-page memo that simply reported receipt of a requirement and its fulfillment. The latter type of report was very common in the case of DDP projects, where the detailed data and results went only in one original copy to the requester. It was also common, for record purposes, in reporting on highly classified or confidential jobs done for other requesters. The "complete" GP/I, as defined by the terms of reference in the recommendations, comprised all other PI reports.

Another recommendation dealt with covers. Up to this time, some GP/I's had covers, some did not. Moreover, there were several varieties of covers, all hand-made as regards titling and any other cover information. For the future, uniform front covers were suggested, together with two types of back covers, one the conventional type, the other a folding cover. The latter was intended to accommodate the incorporation of large photographs in PI reports. In addition, the numbering of individual copies was proposed, as well as the initiation of distribution lists for each publication with a record of which copy, by number, went to each recipient.

Among the more detailed recommendations were several pertaining to graphics, especially in regard to the presentability and readability of annotated photographs. With guidance from [redacted] of the Cartography Division, the report urged the cropping of photographs to eliminate areas of no interest and enlargement of the rest; the use of ad-type paper* for photographs blown up to dimensions exceeding those of the report format, so as to permit folding; the use of stick-up**

25X1

*Ad-type photographic paper has a matte (dull) finish and can be folded without damaging the image.
**Stick-up consists of lettering or symbols printed on transparent material and backed by a beeswax adhesive that sticks to the graphic after burnishing.

rather than Leroy lettering* for neater annotations; and the removal of legend boxes from the image area of the photograph. Offset reproduction was also suggested for photographs. Detailed comments were made on the presentation of the text. Most of these dealt with consistency and the application of the rules given in the GPO Style Manual.

Generally speaking, an examination of D/GP publications subsequent to the [redacted] recommendations fails to reveal much evidence that they had any immediate effect. Probably, the basic similarity of requirements handled and PI reports produced prior to the activation of HTA eliminated any compelling cause for change. Moreover, key personnel in the division almost certainly were far more urgently concerned over preparations for the receipt and exploitation of U-2 materials than they were over improvement of existing publications. The most significant contribution of the [redacted] survey was its critical assessment of D/GP publications just a few months prior to the time when the need for publishing photo intelligence from U-2 materials would make a fresh approach imperative. 25X1 25X1

*Leroy lettering is done with the aid of a template and specially designed pen.

E. Photo Interpretation Projects.

The Photo Intelligence Division had served the Agency well during the spring of 1955, and there was no subsequent letdown. It was as though D/GP was at last commencing to smell big business. The division chief was a dynamic and persuasive leader. A cadre of experienced PI's had been painstakingly assembled and well oriented in the work of the division, and every man in D/GP was a believer in the power of photo interpretation. Recent successes in support of current intelligence in the Far East had by no means exhausted that vein of material. Guided missiles intelligence, which had until now eluded the grasp of the PI's, was about to come on stream. Standing apart from and towering above the ongoing project work was support to Project AQUATONE and plans for the exploitation of U-2 photography. In the latter area, the pace was increasing and work was entering more urgent and exciting phases. Moreover, as the months went by, the curtain was being carefully parted, slightly at first, to reveal to division PI's some glimpses of their challenging future.

Among the information disseminated by D/GP in the spring of 1955 was a small item on possible railroad construction in the Nan-ping area of China. A one-page photo intelligence memorandum published in May cautiously reported evidence of survey work and right-of-way clearing along the northeast

bank of the Sha Chi (River). 216/ No such evidence was present on the next earlier photography, dated December 1953. On the basis of the pattern of earth scars, this PI memorandum further suggested that, if a railroad were being constructed, it might split southwest of Nan-ping, with one branch going to Foochow and the other to Amoy. Though this initial memorandum was couched in terms that suggested considerable uncertainty about the interpretation, there was none in the mind of [redacted] 25X1 who made the discovery. 25X1 The caution reflected in the reporting was partly in deference to area analysts who were not ready to accept an interpretation obvious to an experienced PI, and partly a hedge by the division to eliminate the slightest risk that an interpretation based on fairly skimpy evidence might prove to be wrong. 217/

[redacted] and other division photo analysts continued to 25X1 watch developments for more than a year. Six weeks after the original memorandum, another photo intelligence memorandum reported that, on the basis of 8 June 1955 photography, the railroad construction was confirmed. 218/ This more extensive aerial coverage revealed survey lines, right-of-way clearance, and preliminary grading for a distance of 65 miles, nearly twice that observed on the 28 April photography. It was further suggested that the line might extend north to Kueichi, on the Chekiang-Kiangsi rail line, though it was admitted that

lack of photo coverage precluded confirmation of this speculation.

These early reports begot further photo coverage of key areas. D/GP continued to watch. In September, the division reported evidence, on photography of 11 and 14 August, of 175 miles of survey and construction work, nearly tripling the previous figure. A large part of this increase resulted from new coverage north of Nan-ping, which confirmed the earlier hypothesis that the new line would, indeed, join with the Chekiang-Kiangsi rail line, thus creating a connection between the latter rail line and Amoy via Nan-ping (Figure 8). Construction on the segment north of Nan-ping, which was supported by at least eight construction camps, was more advanced than elsewhere, and included what appeared to be tunneling at three points. 219/

The first evidence of construction on the predicted Nan-ping -- Fu-chou rail line was reported by D/GP in April 1956. 220/ A few weeks later another 9.5 miles of survey traces along the course of this same rail line, as well as many details of right-of-way and construction at the Amoy end of the Ying-tan -- Amoy rail line, were reported. 221/ Photo coverage of 8 June 1956 showed rapid progress on all remaining incomplete sections of the latter rail line. 222/

This analysis and reporting on railroad construction in southern China, opposite the island of Formosa, was not only a considerable substantive contribution but, even more, it was a demonstration to all concerned of the value of an imaginative and sustained effort directed by competent photo analysts to the solution of an intelligence problem. The initial evidence was only a fragment. Nevertheless, the photo analyst not only identified it as something worth his attention, but he also related it to a cultural feature, railroad construction, with which he was familiar. Few persons not versed in photo interpretation would have been able to make such an association, however tentative. In this case, the early hypothesis about the ultimate goals of those first 35 miles of survey lines and clearing proved to be a stunning success.

The manner in which the story unfolded was also a lesson in photo analysis techniques. Upon discovering the construction, the PI attempted to determine approximately when it commenced. He did this by examining earlier photography of the same area and establishing a "negation date," the date of the most recent coverage which revealed no such activity. Obviously, construction would have begun some time between the "negation date" and the date of the photography on which it first appeared. The informed speculation of the photo

analyst about the supposed destination of the apparent rail line was productive in two ways: (a) it alerted the functional analyst to the possible significance of the discovery; and (b) it helped set in motion and direct further productive collection efforts. Finally, the persistent attempt to discover the missing pieces and to monitor progress in construction work already observed demonstrated the ability of photo analysts to search out the evidence and bring it to bear on the solution to the emerging problem. Successes such as this could not fail to attract attention and to convince other intelligence officers that there was something more to photo interpretation than the mere identification and positioning of potential bombing targets.

The fall of 1955 also saw a breakthrough in the application of photography to the production of intelligence on Soviet guided missile installations. Heretofore, little success had been realized in this aspect of photo intelligence, primarily because of lack of suitable photographic coverage. Projects identified as MANANA and MANANA II had been established in D/GP, the first in February 1954 and the second in June 1954, to provide such support. The most significant of the early accomplishments resulting from work on these projects was a theoretical paper stating minimum scales needed for (a) identification, and (b) technical description

of components of a guided missile test range imaged on photography of optimum quality. Bearing the title, *Operation CABBAGE PATCH (MANANA)*, this photo intelligence memorandum was issued in August 1954. 223/

A year later, circumstances were changing rapidly. Acquisition of photography covering certain of the defensive missile sites west and southwest of Moscow, on air routes into the city, provided D/GP the opportunity to show CIA and the Intelligence Community what D/GP photo analysts could do. A small team of PI's consisting of [redacted] Chief, Industrial Branch and [redacted] to provide mensuration support, tackled the problem. None was expert in the interpretation of aerial photography of missile sites, for there were as yet no experts in that field. Indeed, they were starting almost from scratch. There were no PI keys to the subject, no earlier landmark PI reports. 224/ 25X1 25X1

Lacking specialized expertise or precedent, they had one invaluable asset -- their determination to succeed. Following the well established D/GP policy of using all available sources of information, the team made a trip to Dayton, Ohio, to review what technical information was there on the guided missile installations around Moscow. 225/ In Washington, a limited amount of collateral information, based primarily on ground observations, was made available to the team by missile

analysts and by OCR collateral researchers, 226/ with whom division personnel were establishing ever closer working relations.

The job was not an easy one. Most of the photographic prints were from negatives copied from other prints. All prints were enlargements, and on most of them cropping had eliminated the horizon trace. Even on those where the horizon was present, quality was so poor as to preclude its accurate determination. Focal length of the camera used was unknown, and the enlargement factor for the prints was uncertain. Finally, not all prints covering the area surrounding the installations themselves were included in the photographic inputs available to D/GP.

The first photography was received in August 1955, and the remainder trickled in intermittently as work progressed. The report, entitled *Missile Launching Sites in the Moscow Area*, 227/ was issued on 28 October 1955. Considering the comprehensive nature of the job and the formidable interpretation and mensuration problems involved, this must have set a record for speed of publication for a PI report consisting of 13 legal-size pages of text and six appendixes, including maps, line drawings, and perspective sketches.*

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*This report was published at the Top Secret level and con-

The report pointed out (1) that the seven launch sites covered by the photography fell on arcs of two concentric circles centered approximately on the Kremlin and at distances of approximately 30 and 50 statute miles from Moscow; (2) that each launch complex consisted of a launch site, a Yo-Yo* bunker, and a barracks area; (3) that the Yo-Yo bunker was always located on the Moscow side of the launch site, and that an imaginary line drawn along the center road of the launch site would pass through the Yo-Yo and on through Moscow; and (4) that the launch bays were always on the Moscow side of the transverse roads serving the launch points. It pointed out that each launch site probably had 60 launch points. The report further predicted that, on the basis of spacing observed between the four contiguous sites in the southern quadrant of the outer ring and the three contiguous sites in the same quadrant of the inner ring, there were approximately 60 missile sites

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trolled within the SENSINT system. [redacted] has vivid recollections of the bizarre circumstances connected with reproduction of the report. Material for duplication was carried by [redacted] to the reproduction facility in another building under armed guard. All personnel in the area where it was to be reproduced were cleared out, and [redacted] and [redacted] personally duplicated the materials. They then returned, with their armed guard, to D/GP quarters in Que Building, where they assembled copies of the publication. 228/ 25X1 25X1 25X1 25X1

*It is believed that the name Yo-Yo was first applied in D/GP. 229/ According to [redacted] recollection, the configuration of this radar reminded division photo analysts of a Yo-Yo. 25X1

deployed around Moscow, 24 sites on the inner ring and 30 on the outer ring. 230/

The impact of this prediction was electrifying. With the prospect of something like 60 missile sites having 3600 launch points clustered around the Soviet capital, cheek by jowl and in two rows, contingent plans for massed air attack, even with high-flying jet bombers, had to be reconsidered. This PI report, the most comprehensive and thought-provoking to that date on the Moscow defense system, established the credentials of D/GP as a leading producer of photo intelligence in the field of guided missiles.

Participation by the Photo Intelligence Division in Project GENETRIX was another activity worthy of note during this period. GENETRIX was the name of an Air Force program designed to collect aerial photography, primarily over the Soviet Union and Communist China, by use of balloons. Huge plastic balloons released in Scotland, Norway, Germany, and Turkey 231/ were expected to transit the USSR and/or China carried by prevailing westerly air currents in the upper troposphere. Though they were instrumented to parachute their loads to earth whenever they dropped below 30,000 feet, it was believed that a majority of them would succeed in reaching the Pacific, where they could be captured in the air, using a line and hook with which each payload was equipped, or by

retrieval from the ocean. Among other instruments, the balloons carried cameras* with a nominal focal length of six inches. At an average expected altitude of 45,000 feet, the photography would have a scale of about 1:90,000. Individual frames would measure 9 by 9 inches, a format common to many aerial cameras of the day. 233/

Designed primarily as a system to collect information for targeting and the production of maps and charts, initial GENETRIX exploitation was carried out at the Aeronautical Chart and Information Center in St. Louis, Missouri. During the previous several years, however, the Central Intelligence Agency had cooperated with the Air Force in bringing the collection system to operational readiness.** Accordingly, the Agency was invited to participate in exploitation of the photography, an invitation that was accepted with alacrity. 235/ From the D/GP point of view, this would not only ensure access to this new and exciting photography, but it would also provide an opportunity for most, if not all, division PI's to try their

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*As regards several features incorporated in the optical design, these cameras were forerunners of the ones used several years later in the KH-4 system, 232/ the first American satellite photo reconnaissance system. Plans for retrieving parachuting GENETRIX payloads also foreshadowed recovery of the photographic packages parachuted from satellites.

* [redacted] DAD/Collection, Office of Scientific Intelligence, was the author of an excellent summary of Agency participation in the development of the GENETRIX system. 234/ 25X1

hand at interpreting it. CIA proposed that one man be assigned full time, beginning with the organizational phase of the work, to provide continuity of CIA participation, and that others be sent to St. Louis on a rotational basis, the timing and number to be determined by the success of the collection effort and the duration and amount of the resulting exploitation work. 236/

[redacted] was the man chosen by D/GP for continuous service. He arrived in St. Louis on 6 December 1955, accompanied by [redacted] who introduced [redacted] USAF, the Director of Project JACKPOT.* 237/ All D/GP professionals except [redacted] were included on the roster of those available to participate, 239/ though only a few, most notably [redacted] saw much service on rotation.

[redacted] and other D/GP participants were assigned to the photo interpretation unit, under [redacted] D/GP PI's contributed to the three types of reports issued by ACIC: an initial PI report (IPIR) primarily tailored to the needs of SAC; a periodic report which summarized information contained in IPIR's for a given period and arranged it by jet-navigation-chart areas; and a geographic position report

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* [redacted] had been in St. Louis several weeks earlier to be briefed on details of Project JACKPOT, the name given the exploitation phase of GENETRIX conducted at ACIC. 238/

25X1

intended to satisfy requirements for immediate location data on coverage by each mission. 240/ D/GP participants worked shoulder-to-shoulder with PI's from the military services, but were free to forward directly any information judged to be of particular interest to CIA. 241/ Back in Washington, D/GP issued memoranda consisting of mission-coverage information keyed to maps of Asia and surrounding areas for use by Agency analysts in levying requirements. 242/

The brevity of the program, coupled with its distinctly limited success in covering installations of strategic interest -- with the exception of airfields -- led to the termination of D/GP participation at St. Louis in just a few months.* GENETRIX photography continued to be exploited within D/GP and the later NTA, however. It was in this phase that some of the most significant D/GP contributions were made. Probably the most important of these, and certainly the one having the most far-reaching influence as well as the most durable value, was

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*The project ended early in 1956 following a blizzard of protests over the balloons from numerous nations in the Soviet Bloc. US claims that the balloons were being employed in meteorological research seemed disingenuous in the face of the kind of hardware, including cameras with exposed film, that dropped out of the skies all the way from Eastern Europe to Japan. Newspapers and news magazines of the period carried numerous items and interpretive reports on the US "meteorological research" balloons and the barrage of complaints they evoked from countries whose airspace they entered.

a Photographic Intelligence Memorandum entitled, *Special Installation Near Krasnoyarsk, USSR (Dodonovo Complex)*. 243/

Based primarily on GENETRIX photography of 1 January 1956, this publication, the work of [redacted] of the 25X1 Industrial Division, reported in great detail the components of a vast industrial complex that stretched for some 18 miles along the Yenisey River, 28 miles northeast of Krasnoyarsk (Figure 9). Though the function of the installation, which was still in the process of development, was not specified, it was suspected to be an atomic energy complex. Even with the passing of years, the function of the installation, now generally tagged with the Basic Encyclopedia name "Dodonovo Atomic Energy Complex" is still a matter of dispute. Moreover, in 1971, after some 100 photographic coverages, the 1956 GENETRIX photography is still used by NPIC PI's for base-line reporting, i.e., the starting point from which the continuing changes and expansion of the installation are determined. Indeed, some Center PI's rate the interpretability of the GENETRIX photography better than KH-4 [redacted] 25X1

F. Preparations for Exploiting U-2 Materials.

During FY 1956, D/GP became increasingly committed to preparations for the exploitation of U-2 photography. This involved much more than a new table of organization, additional

PI's, and a proportional increase in space to house them. The HTA operation would be a whole new ball game. The photography and products resulting from its exploitation would be very closely held. In format, scale, and resolution, the photography would be significantly different from that to which D/GP photo analysts had become accustomed. Relations between D/GP and other components in the Intelligence Community would be expanded. Instead of deferentially seeking out photography to use in answering Agency requirements, D/GP had to prepare to become the prime recipient of the hottest aerial coverage yet obtained and, under the guise of HTAUTOVAT, to do first-phase reporting for the entire Intelligence Community.

The most basic change was in the sensitivity of the material to be handled. Indeed, a whole new security system, the TALENT system, was devised to ensure the desired degree of compartmentation. All U-2 photography and the products derived from it, whether in D/GP or elsewhere in the Intelligence Community, would be handled within the TALENT control system. 244/

The creation of the new security system had profound ramifications for D/GP planners. Possession of a TALENT clearance became a prerequisite for division employees and all future recruits. Space was also a problem. The question

was not merely to find space for 145 people, but how to do so without attracting undesirable attention from curious observers. Once within suitable quarters, the division faced the problem of providing secure handling for massive quantities of highly visible graphic materials, particularly photography. When the solution to that problem was found, there was the painstaking drudgery of devising and writing seemingly endless procedures for internal utilization as well as for dissemination outside the building of everything from incoming photography to outgoing intelligence products.*

Clearing division personnel, though a matter of internal interest, was, of course, not the responsibility of the division. The other matters involved D/GP more directly.

Space was found in the Steuart Motors building at 5th St. and New York Ave., N.W. Here, on the upper floors of a shabby edifice situated just three blocks from the Gospel Mission, the operation was far removed from knowledgeable intellectuals who might, without benefit of proper clearance, come uncomfortably close to divining what was keeping so many people busy around the clock. Moreover, the 55,000 square

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*Of the many manuals and procedural papers prepared for internal operations, copies of only a few are still extant. Two that are still available serve as examples of these papers and, incidentally, reveal the fine details of certain aspects of the projected HTA operation. 245/

feet of floor space provided room for expansion for the foreseeable future. Secure handling and storage of material was facilitated by vaulting PI work areas. Though denizens of the neighborhood were unlikely to speculate informatively about the type of work going on in the upper floors of the building, the windows there with ADT tape on them were repeatedly the object of comment by local residents and businessmen.

The characteristics of the photography also differed from those of materials with which D/GP photo analysts were familiar. Photographic inputs were expected to be taken at an altitude of approximately 70,000 feet with a lens having a nominal focal length of two feet.* The resulting scale on vertical exposures would, thus, be about 1:35,000. This was, for the time, exceedingly small-scale material from which to attempt to extract technical details of military installations and developments at Soviet R&D centers. There was one mitigating circumstance. Even though the scale was small, the ground resolution was expected to be high, [redacted] 25X1

[redacted] 25X1

*This was the A-2 camera configuration which featured three cameras in a fixed-fan mount. One camera was vertical, another had 37° left tilt, and the third 37° right tilt. 246/

Trading off scale for resolution introduced other problems, however. Viewing equipment with improved magnification and better optics than those afforded by the folding pocket stereoscope would ultimately be needed to study the photography, whether as prints or transparencies. Reproduction of installations and objects of special interest for reporting purposes, either as briefing boards or illustrations in reports, would require the best obtainable enlargers and printers. Metric analysis of this small-scale, high-resolution photography would not only require precise data on the location and attitude of the collection platform in space at the time of each photograph, but also new high-precision instrumentation to realize the potential of the photography to the fullest extent possible. Moreover, new techniques would have to be developed to do the mensuration, and, in the process of developing them, many additional problems would have to be solved.

Photography expected from U-2 cameras, exclusive of the tracker, would have a 9 by 18 inch format.* Most aerial photog-

*The format of both the A-2 camera, and the B camera, which was not scheduled for use during early phases of the U-2 program, was 9 by 18 inches. The tracker (charting) camera had a focal length of three inches, utilized 70 millimeter film, and yielded an exposure size of approximately 2-1/4 by 10 inches. 248/ Tracker photography, which was extremely small scale, was used primarily for charting the course of the mission rather than for intelligence purposes.

raphy used by the division up to this time had been 9 by 9 inch. Thus each frame would be twice as long. This meant that viewing equipment used in scanning the photography and plotting the coverage of targets would need to cover a greater area in order for PI's to comprehend the spatial relationships of objects imaged on the photography. For viewing roll film, primarily in the form of duplicate positive transparencies, a technique that foresighted planners realized was almost certain to be used in the not too distant future, larger light tables would be required. Moreover, as prime recipient of U-2 photography, HTA would be expected to provide to organizations in the Intelligence Community, for their use in levying requirements, plots of the areas covered by each mission and an index to targets judged to be of intelligence interest. The latter indexes were known as mission review reports.

Though preparations for and problems associated with the exploitation of this radically new photography were undoubtedly of greatest personal interest to D/GP photo analysts, a bigger problem for the division, at least in terms of money and the need for decisions, was the procurement of equipment. The hottest debate in this field was over Minicard.

Minicard was a system developed by Eastman Kodak to combine many of the desirable features of both microfilm

and punched cards. Each Minicard frame, or exposure, was a small film chip measuring 32 by 16 millimeters and having on it space for imaging whatever documentary or other material was to be preserved, plus coded data that would permit manipulation and retrieval of the chip from the file. Assuming the feasibility and effective working of the retrieval aspect of Minicard -- an assumption that was open to some question in view of the newness of the system -- no unsolvable problems were involved in photographing in miniature and subsequently enlarging documents consisting of line work or text. The prospect of performing the same manipulation on U-2 photography was a different proposition, however.

D/GP was extremely reluctant to adopt Minicard for the storage and reproduction of U-2 photography to be used subsequently by photo analysts and photogrammetrists. The primary consideration was loss of quality. Quite apart from the problem of providing a lens suitable for copying photography, as opposed to line work, there was the inescapable progressive loss in definition that accompanied each successive generation of material. There was also concern for the danger inherent in allowing the whole HTA operation, exploitation as well as document storage and retrieval, to be completely dependent on an as yet unproven system.

After several months of strained consideration, Lundahl recommended to Bissell, on the basis of a D/GP-OCR study, that the Minicard system not be adopted, but rather that the storage, retrieval, and duplication of film be done in the conventional manner while development of Minicard was carried forward as a parallel operation. 249/ Herbert Miller, who served as an expediter for Bissell, was personally committed to the integration of all aspects of the HTA operation with the Minicard system. Bissell ruled in favor of the Lundahl recommendation, much to the relief of D/GP planners.

Minicard was not a dead issue, however. Adoption of the Lundahl recommendation led to the funding, on a more modest scale, of a pilot system in Rochester. The cost of this developmental work was borne in approximately equal amounts by Project AQUATONE and HTAUTOMAT. 250/ Though joint work by Eastman and HTA on use of Minicard for the storage and reproduction of U-2 photography continued for several years, and though HTA did subsequently obtain Minicard equipment, it was applied primarily to documents and photo mosaics for reference purposes.

Minicard procurement activity by Project AQUATONE personnel in the summer of 1955 led, incidentally, to the briefing on a limited basis of the first OCR personnel made witting of Project AQUATONE. On 26 August 1955, James A. Cunningham, Administrative Officer for PCS/DCI, reported to Bissell that the Logistics

underground had learned of visits by AQUATONE personnel to Eastman to see the Minicard. Cunningham informed Bissell that Amory intended to propose briefing [redacted] who had been working on procurement of the same system for OCR for over a year, on AQUATONE interest in Minicard so as to get the benefit of his judgment. [redacted] was given a limited AQUATONE briefing on 25 August 1955; this was soon followed by a second briefing that included [redacted] of OCR. 251/

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As if the whole host of technical problems related to the exploitation of U-2 photography were not enough, the new mission for HTA provided for the continuation of all previous D/GP functions, plus the addition of important responsibilities for serving all those organizations and components in the Intelligence Community authorized to receive TALENT materials. 252/ Thus, HTA would be expected to communicate to the Community the results of its exploitation of U-2 photography and to engage in national reporting. It would plot the photography and provide mission plots for other users, thereby establishing a precedent for providing support services to other PI organizations in the Intelligence Community. It would be the chief repository of U-2 photography, and would provide storage and retrieval facilities not only for its own internal use but also as an adjunct to service to be provided other users outside the Agency. It would also prepare data on intelligence targets for acquisition

of additional photographic coverage, and, in this way, play a role in mission planning. Preparation for all these new roles was a major activity during late 1955 and early 1956.

Two functions that were already becoming significant features of D/GP operations were not covered, however, in the 2 December 1955 proposal to create HTAUTOMAT. One was the support being given Project AQUATONE, especially in the development and testing phases of the program. This would taper off substantially, but not end, once the program became operational. The other was technical support to operations, such as evaluation of film to identify imperfections and, working with operational and contractor personnel, to explain and remedy problems before additional missions were flown.

The extensive and intensive preparations carried out by D/GP during FY 56 in anticipation of its new responsibilities fell unequally upon those in the division. Primarily, it was a matter of clearances, though [redacted] who had a legendary capacity for work, never hesitated to take on any and all kinds of tasks, either in support of AQUATONE or in planning for HTAUTOMAT. The brunt of the work fell on the task force, but other D/GP personnel were gradually introduced to plans for HTAUTOMAT and geared into preparations for it. 25X1

In December 1955 Lundahl gave a limited briefing on Project HTAUTOMAT to certain D/GP branch chiefs and staff

assistants who had had no previous official word on AQUATONE or HTAUTOMAT. It is significant to note that he referred to this as an "AUTOMAT" briefing, rather than one on AQUATONE, as such. Those briefed were [redacted] 25X1

[redacted] The resume of the briefing which accompanied the 25X1
list of those cleared indicated that it consisted entirely of information concerning the HTAUTOMAT organization whose creation had been proposed by Amory on 2 December. 253/ Clearly, it was intended for administrative planning.

In April 1956, Lundahl gave another briefing for D/GP personnel, this one covering camera configurations and photography. 254/ Among those briefed were the supervisory personnel first introduced to HTA in December plus several others, mostly working PI's and photogrammetrists, a total of 14 persons. In addition, three OCR personnel who were expected to occupy key positions in support of HTAUTOMAT were given a separate briefing so as to equip OCR planners to anticipate problems that would be faced by their personnel in connection with the HTA operation.

The briefing for the D/GP personnel came just as the first domestic U-2 missions were being flown. There were eight of these between 10 and 14 April 1956; [redacted] 25X1

[redacted] 25X1

the U-2's covered installations as far east as Birmingham and Nashville. 255/ These were used to familiarize selected division PI's with U-2 photography and with US industrial and military analogues of high-priority Soviet installations. In exploiting the 27,000 feet of film obtained from the domestic missions, D/GP photo analysts had their first real crack at exploiting U-2 photography.* They also logged 283 hours of overtime in the process. 257/

While most D/GP photo analysts were only slowly and sparingly introduced to U-2 photography and operational plans for HTAUTOMAT, those in the task force under [redacted] were deeply involved not only in support of AQUATONE but also in planning for exploitation of the resulting photography. At a time when full operational clearances in D/GP were few and when the heavy cloak of secrecy surrounding the project demanded explicit justification for the revelation of every small segment of new information to those not already witting, the path of least resistance in getting a job done lay in the direction of assigning it to those already cleared to do it. Indeed, there

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[redacted]

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*For several months the D/GP task force had done technical evaluations 256/ of test photography in support of AQUATONE. In no sense, however, could this be considered an indoctrination of division PI's in the exploitation of U-2 materials.

were many who felt that [redacted] was not above using this convenient circumstance to restrain further diffusion of operational information in the division and to consolidate his own position. 25X1

In the fall of 1955, the task force moved, along with other AQUATONE personnel, from 2210 E Street to Wings A and C, Quarters Eye. 258/ There was no change in D/GP personnel at this time. [redacted] who, since the approval of the 44-man T/O, were, in effect, the D/GP Special Projects Branch, 259/ still had [redacted] of the AQUATONE project working with them. They were, however, enlarging the scope of their work as the success and momentum of the project increased. Though heavily involved in Minicard during the fall of 1955, they had a host of other things to stimulate their interest and test their endurance. 25X1 25X1

For example, there were trips [redacted] 25X1

[redacted] to confer with project contractors, consultants, and operations personnel about the cameras and their functioning, or the resulting product and its suitability for interpretation. At the same time, there were problems to be handled concerning coordination among Hycon, the camera manufacturer, Eastman, the vendor and processor of the film, and operations personnel. 260/ 25X1

Task force personnel made numerous trips to Eastman Kodak in Rochester to represent Bissell and Lundahl in discussions

about many aspects of their joint participation in the project. For instance, at a very early stage in the discussions, [redacted] of Eastman Kodak served notice on D/GP representatives that one or more PI's would be needed during processing of mission inputs to edit the film and authorize elimination from the duplication cycle of large quantities of useless film, such as frames on which nothing but clouds were imaged. 261/ Then, too, there were questions to be settled about the handling and shipment of processed film and photographic prints. 262/ There was also an evaluation of the operational status and current capability of the processing facility for the Project Operations Officer. 263/ 25X1

By winter and early spring, this type of activity was beginning to reflect the initial success of the test phase and the accelerated preparations for operational readiness. Procurement of viewing and rectification equipment began to assume greater importance in thinking and planning, 264/ though little of it was actually available at the start of HTA operations. Titling of the film became a high-priority concern 265/ and led to no little friction between D/GP representatives and [redacted] of Eastman Kodak, a former Army Colonel with a domineering mien and a proclivity for issuing commands and making arbitrary decisions. 266/ The high interest of the Photo Intelligence Division in this matter stemmed, of course, from the need 25X1

to provide photo data to exploitation personnel in a complete and easily accessible form. There was also growing consideration of the respective responsibilities and roles of Eastman and HTA in providing film and/or photographic prints to customers other than major users who would receive the few complete copies of material from each mission. 267/ If HTA were to assume responsibility for filling requests for photography of selected installations, it would require extra funding for the purchase of laboratory equipment.* It was apparent by late spring, despite valiant efforts to have the photo lab ready for full production by the opening of HTAUTOMAT, that HTA would not immediately be able to supply photographic prints to the Army and Navy. Accordingly, temporary arrangements were made to have two additional sets of prints for each mission produced by Eastman for selective use by the Army and Navy. 268/

Early in 1956, the initial task force under [redacted] was augmented by the arrival first of Dino A. Brugioni, and then of [redacted] all from OCR. Their basic task was to assemble a small working library of maps and collateral

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*By early 1956, in all such matters affecting support services to be provided under the aegis of the OCR Statistical Branch, [redacted] joined in the search for equipment and in deliberations leading to decision making.

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material to support the PI's at such time as the U-2 would become operational and exploitation of the resulting photography would commence. Very quickly, however, Brugioni also began to provide close support to [redacted] in the selection of targets for missions, both domestic and foreign. This introduction of collateral support personnel in mission planning helped fill the very considerable intelligence gaps in the background of the more technically oriented people in the D/GP Special Projects Branch and in the AQUATONE project. It was, indeed, the beginning of a relationship that became an important characteristic of HTA. 25X1

With the phasing out of work on Project GENETRIX, [redacted] 25X1
[redacted] returned from St. Louis and was assigned to the 25X1
Special Projects Branch, where he became the unofficial deputy
[redacted] Soon he was joined by some of the newer D/GP 25X1
recruits, including [redacted] 25X1
[redacted] The OCR contingent was augmented 25X1
by the transfer of [redacted] 269/ On or about 17 25X1
April 1956, before the augmentation was complete, the [redacted] 25X1
group, which had outgrown its working space, was moved to Wing G, Quarters Eye. 270/ This was their home until they joined their fellow HTA workers in the Steuart building a few months later.

The amount of work accomplished by the small group under

[redacted] during the year prior to the move into the Steuart building was little short of astounding, in terms of both scope of coverage and sheer volume. This group, aware of the historical importance of the work in which they were engaged, protected by a heavy security blanket, supervised by a driving taskmaster, and insulated from bureaucratic wrangling and incessant coordination, achieved a level of productivity seldom known in larger organizations. 25X1

While [redacted] and his task force were laboring under the gun of prospective U-2 inputs, Lundahl was doing the same in a different arena. Though he was in frequent contact with [redacted] so as to keep cognizant of task force work, Lundahl was primarily involved with a growing network of contacts with upper-echelon managers in the Agency, as well as with AQUATONE participants outside CIA. At first Lundahl's meetings were directed primarily to planning, but as the project moved into the test phase and produced its first live photography, the tempo of activity increased and the scope of the contacts widened. 25X1 25X1

In late September 1955, Lundahl was one of a group of key Agency participants in AQUATONE who went [redacted] to inspect the flight-test operation then underway and to familiarize themselves with its problems and with the performance of the system. The group, which also included the DDCI, Lieutenant General Cabell, and Richard Bissell, the Special Assistant to the DCI for Planning 25X1

and Coordination, who headed Project AQUATONE, left Washington by Agency plane on Sunday, 25 September, on a flight to San Bernardino and thence, via a Lockheed company aircraft, [redacted] 25X1

[redacted] The next day Lundahl had his first glimpse 25X1 of the U-2. He saw it take off and land, talked to the pilots, and examined the placement of the cameras in the plane. He met Kelly Johnson of Lockheed, who designed the U-2. He also met [redacted] of Perkin Elmer, who was the chief photo 25X1 engineer on the project, and spent considerable time with him in the field laboratory examining the photography, which Lundahl pronounced good. The travelers returned to Washington at midnight on 28 September. The next afternoon there was a long meeting in Cabell's office to assess the results of the trip and to relate them to anticipated future developments. 271/

By November, activity had picked up still further. On Friday afternoon, 18 November, Lundahl and Amory went to the office of the DCI, Allen Dulles, where they had a long and involved discussion concerning the potential of U-2 photography, the kinds of details that might be discerned, and the volume of the expected information. 272/ This was the first time that Lundahl had met with Dulles since he was briefed into the AQUATONE system the previous December but, considering his rank as a mere division chief, it was a rather good record at that.

November was also marked by conferences with [redacted] 25X1
[redacted] Administrative Assistant to the DDI, and others 25X1
concerning plans for the new central interpretation unit which were subsequently to be translated into the proposal to create HTAUTOMAT. There were questions of organizational structure, of slots and grades, of funding, and of the relationship of all these things to Project AQUATONE. 273/ In view of the heavy cost of some of the equipment, particularly Minicard, needed by the new central interpretation unit, the possibility of some joint funding by Project AQUATONE appeared very attractive.

Toward the close of the year, [redacted] introduced 25X1
Lundahl to [redacted] For several months previous, 25X1
Lundahl had been interested in finding a dynamic young man with some familiarity with photo interpretation and good managerial potential to serve as Executive Officer in the new organization. Though [redacted] had no photo interpretation experience, he had many 25X1
other qualities that appealed to Lundahl. He was a strapping young ex-Marine, with a good record in the Agency and at Dartmouth College, where he had worked in the Office of the Dean of Men prior to coming to CIA. As a manager and administrator, he was much stronger than [redacted] Furthermore, in the 25X1
hazardous environment typical of any new organization undergoing explosive growth in a competitive field, [redacted] had the 25X1

political acumen needed for self-preservation and for helping Lundahl guide the new organization. [redacted] who had been serving as a Special Assistant in the Office of the Deputy Director for Support since June 1955, commenced working with Lundahl and D/GP in November 1955, 274/ though he was not officially transferred to the Photo Intelligence Division as Administrative Officer until 12 August 1956. 275/ The arrival of [redacted] rounded out the team of senior division managers primarily responsible for conceiving, planning, and implementing changes that ultimately resulted in the transformation of D/GP into a national PI center staffed by more than a thousand CIA and DoD employees. 25X1 25X1

Lundahl and his assistants also began to conduct briefings for representatives from the military services and to confer with AQUATONE-cleared military personnel. One typical briefing of Army, Navy, and Air Force representatives was held in the DCI's conference room on 1 February 1956; it dealt with AUTOMAT -- its organization, its staffing, and its new quarters in the Steuart building. The persons in attendance were largely those involved in the preparation of requirements for AQUATONE collection. 276/ The military services were interested not only from the point of view of participating in the preparation and ordering of requirements, they were also interested in how they would fare in sharing and exploiting U-2 photography in competition with CIA.

The eventual outcome was that the Air Force decided to remain aloof from HTAUTOMAT and the Navy decided to participate only on a decidedly limited basis. The Army, on the other hand, chose to join HTA in force, sending both personnel and equipment, much of which would be used jointly with that of the Agency. The options chosen were not surprising. The Air Force, which had lost the struggle to control the U-2 program several months after its conception, had several photo interpretation organizations and could afford the luxury of going its own way. The Navy had fewer facilities and PI's, but these included an excellent organization in the U.S. Navy Photographic Interpretation Center. The Army, which had established its photo interpretation facility at Fort Holabird in Baltimore just a year earlier, regarded the prospect of a cooperative effort most favorably. The resulting joint operation, involving both Army and Navy, was the first step in setting the stage for creation of the National Photographic Interpretation Center four and a half years later.

Security provisions for protecting the expanding AQUATONE activities were also shaping up. On 15 February 1956, Lundahl, [redacted] attended a meeting at which they were first introduced, by [redacted] of the Office of Security, to the codeword TALENT. 277/ The informal but nevertheless effective arrangements used up until then to guard project materials and activities from unauthorized exposure would

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no longer be deemed acceptable in view of the forthcoming sharp increase in the number of persons and volume of materials involved. Though necessary because of the vastly increased opportunities for accidental disclosure, the imposition of TALENT controls inevitably saddled all aspects of project work with a new bureaucracy and a huge record-keeping operation.

Lundahl visited NSA on 15 March 1956. The relations between COMINT, on the one hand, and AQUATONE operations and the exploitation of U-2 photography, on the other, were due to be extremely close. They would, indeed, be vital to the success of U-2 missions as well as to realization of the full potential of the photography. 278/ This was but the commencement of a long and increasingly close relationship between NSA and HTA and its successors, a relationship that was to prove mutually profitable beyond all early expectations.

Though the procurement of equipment had repeatedly required Lundahl's attention during previous months, such demands became especially heavy in April 1956. The time when U-2 photography covering targets in denied areas would begin to arrive was getting close. Whereas questions and problems up until then had primarily involved decisions on the design of new equipment or the selection of shelf items, together with the setting of target dates for delivery, by April the questions began to revolve about what would actually be available when the first operational inputs arrived, whether or not it would suffice, and, if not, how to improvise

until delivery was made. Moreover, these new and urgent concerns were not confined to those in HTA. The military services, who would also exploit U-2 photography to satisfy their own departmental needs, were equally anxious.

On 6 April 1956, Lundahl, [redacted] made a trip to Offutt Air Force Base near Omaha, Nebraska, to brief representatives of SAC, the major expected user of U-2 photography outside the Washington, D.C. area, on equipment on order or under development. As a result, it appeared for a time that HTA procurement for its own needs might be overwhelmed by the equipment demands of this large and well-heeled competitor on the decidedly limited production capacity of the manufacturers. However, Lundahl and the Agency had the problem well under control and, in spite of some jockeying with service elements for delivery dates of individual pieces of equipment, procurement proceeded in an orderly manner. 279/ 25X1

By May it was apparent that receipt of U-2 photography would not be long delayed and that one of the main questions, as far as HTA was concerned, was whether or not D/GP and OCR personnel and their equipment would be in place in the Steuart building when the first inputs arrived. In any event, it was already clear that a small group of D/GP photo analysts would remain behind, to be organized as a branch later called the Central Branch after the building in which they were housed. Though all veteran D/GP photo

analysts in this branch would be TALENT and SI cleared, the space occupied by the branch would not be secured for handling these materials. The raison d'etre for this branch was to serve those elements in the Agency, particularly DDP, not routinely involved in work that required TALENT and COMINT clearances. It would also provide a place where exploitation of photography covering the Far East, most of which was classified no higher than SECRET, could be carried on without interfering with work in the Steuart building. Finally, it could function as a convenient half-way house to the Steuart building for new recruits who had their Agency TOP SECRET clearance but had not yet been briefed into the COMINT system -- a step that was sometimes delayed as much as a few weeks.

G. U-2's Over Eastern Europe.

The first U-2 mission was flown on 20 June 1956; it was followed by two more on 2 July. These missions covered European Satellites from Poland through the Balkan Peninsula. None penetrated Soviet air space. The first mission over the Soviet Union was flown on 4 July 1956. It covered the Baltic States and the extreme western part of Russia, including Leningrad. A day later the first U-2 coverage of Moscow was obtained.

Between the flying of the mission and the interpretation of the photography there was a lapse of a few to several days while the film was flown to Rochester for processing. The first U-2 film

was delivered to D/GP on 22 June. It was the original negative and a duplicate positive from the tracker camera on the 20 June mission over the Satellites. The prints for the 24-inch camera from the same mission did not arrive until 29 June. The next U-2 material delivered was the original negative and a duplicate positive of the tracker film for both the 4 July and 5 July penetration missions. These were logged into D/GP on Sunday, 8 July, 280/ a day before the move into the Steuart building. 281/ Thus, preparation for HTA and the move into the Steuart building were successfully accomplished before the receipt by HTA of the larger-scale photography from the first two missions flown over the USSR.

Meanwhile, Lundahl had been planning an ambitious trip abroad, together with [redacted] Their departure date was contingent, however, on the arrival of the first U-2 film and completion of the move into the Steuart building. There were, nevertheless, compelling reasons for Lundahl to get off to Europe as soon as practicable. For one thing, the U-2's were flying out of a U.S. Air Force base near Wiesbaden, Germany. The exposed film from the first flights was flown to Rochester for processing and to Washington for exploitation, but it was deemed necessary within the Agency to set up a film processing and exploitation facility at the base, at least on a standby basis. 282/ It was felt that such a facility would be needed to supply current intelligence should any international crisis develop within flying range of Wiesbaden. Lundahl was

25X1

scheduled to visit Wiesbaden to assist in planning for the secure and satisfactory processing of valuable U-2 material and because the exploitation operation would most likely have to be staffed by HTA personnel.

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The high point of Lundahl's trip would be the VIIIth International Congress of Photogrammetry to be held in Stockholm. There he would have an opportunity to renew acquaintances with many foreign photogrammetrists and photo interpreters and to learn firsthand what foreigners were doing in these fields. At the exposition of equipment displayed at the Congress, Lundahl and [redacted] would be able to see and manipulate the instruments, to ask questions, and to gather pamphlets and brochures about the latest instrumentation available, including that of European manufacturers. After the congress, he, and especially [redacted] planned to follow up these contacts with visits to key European manufacturing establishments, mapping agencies, and training schools.

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The first week in July was particularly rushed. The first U-2 flights were made and the first penetrations of the Soviet Union were undertaken; plans for the move into the Steuart building were in their final stage and the actual move was only a few days away; and high level meetings were being held on requirements for future U-2 missions. On Friday morning, 6 July, Lundahl gave Amory a final briefing on the status of exploitation of the U-2 materials already on hand and on the latest plans for the move.

By evening he had left behind the pressures of preparing for the missions and exploiting and reporting the results, and taken off for Europe with [redacted] of DDP. 25X1

Appendix A

List of Figures

FIGURE 1

Proposed Table of Organization, July 1952. Note planned phasing in the staffing. (This table was included as part of Annex "C" to the 17 July 1952 staff study.)

FIGURE 2

Production statistics for the Photo Intelligence Division for April 1953, with a summary of the number of all projects initiated up to that date. In effect, this constitutes an accounting of division production at the close of the pre-Lundahl period. (Included as Appendix A to the Photo Intelligence Division contribution to the Progress Report for Geographic Area, ORR, April 1953)

PRODUCTION STATISTICS-APRIL 1953

REQUESTER	PREVIOUSLY INITIATED	PREVIOUSLY COMPLETED	APRIL INITIATED	APRIL COMPLETED	TOTAL INITIATED	TOTAL COMPLETED
ORR-Industrial	14	3	2	0	16	3
ORR-Geographic	4	2	0	0	4	2
OSI	3	2	2	1	5	3
OCI	1	1	0	0	1	1
DDP	7	6	2	2	9	8
Self-Initiated	3	0	2	0	5	0
	32	14	8	3	40	17

APPENDIX B - PERCENTAGE DISTRIBUTION OF MAN-HOURS, APRIL

Projects	77 percent
Consultation and Coordination	3 percent
General Research	7 percent
Administration, Development and Planning	13 percent
	100 percent

APPENDIX C - DISTRIBUTION OF PROJECT TIME, APRIL

ORR - Industrial	6 percent
ORR - Geographic	7 percent
OSI	2 percent
DDP	65 percent
Self-Initiated	20 percent
	100 percent

FIGURE 3

Arthur Charles Lundahl, Chief of the Photo Intelligence Division and leader of Agency and National photo interpretation activities. Photograph c. 1954.

FIGURE 4

Sketch of certain buildings in the Vodochody jet aircraft plant, Czechoslovakia, as it appeared in GP/I-59, dated 18 February 1955. This perspective sketch was based entirely on four series of ground photographs taken by military attaches between 1952 and 1954. Incompleteness of the lay-out resulted from lack of full coverage of the plant area. Measurements were accurate only to plus or minus 10 percent because of lack of technical data, such as type of camera, focal length of the lens, and location of the camera stations. Scale was approximated by using the wing span of a MIG-15 and the height of men imaged on the photography. Information obtained from these poor quality ground photographs resulted, nevertheless, in a 50 percent increase in the previously known figure for floor space of this factory and in a consequent increase in the estimated MIG production.

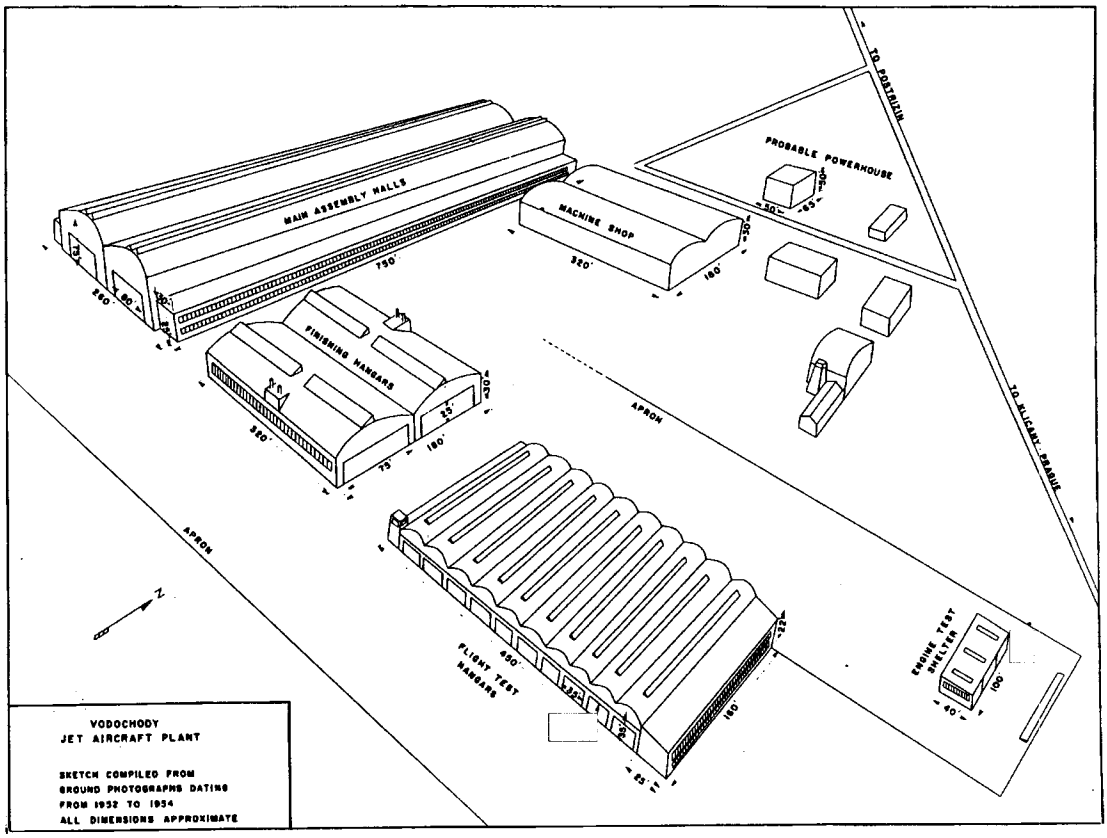

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FIGURE 5

Folding pocket stereoscope, tube magnifier, PI scale, and PI slide rule, four basic pieces of PI equipment during early D/GP years. The stereoscope provided magnification and facilitated three-dimensional viewing of suitably exposed pairs of photographs. The tube magnifier had reticles inscribed on it for measuring distances. The PI scale was graduated in thousandths of a foot so as to be compatible with measurements of distances and altitudes, both of which were usually expressed in feet. The PI slide rule provided the interpreter with a nomographic device for the speedy solution of simple photogrammetric problems.

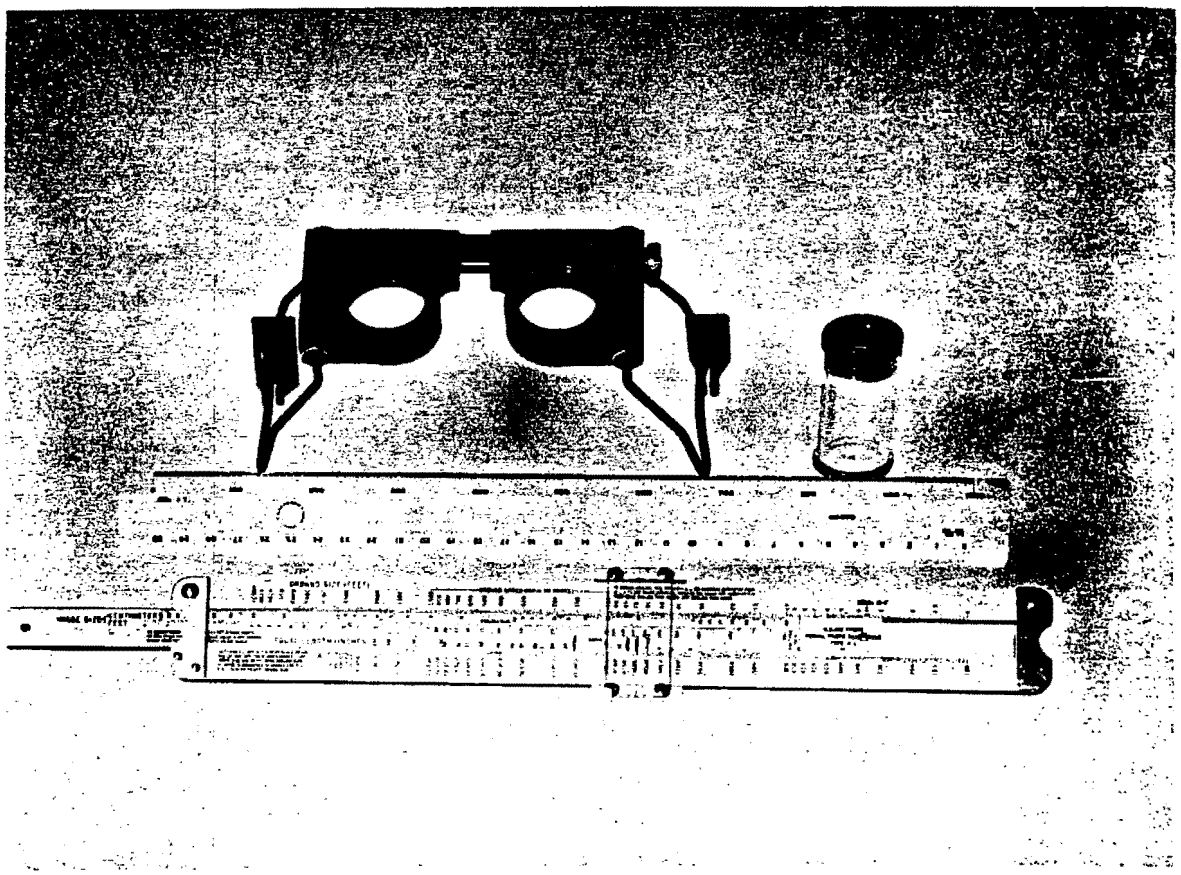

FIGURE 6

The augmented Table of Organization approved by the DDS on 1 July 1955.

Declassified in Part - Sanitized Copy Approved for Release 2012/07/09 : CIA-RDP04T00184R000400070001-5

FIGURE 7

Table of Organization approved on 21 January 1956.

Declassified in Part - Sanitized Copy Approved for Release 2012/07/09 : CIA-RDP04T00184R000400070001-5

FIGURE 8

Railroad construction in Fukien Province, China, as revealed on photography of 11 and 14 August 1955. Note the developing pattern of construction with relation to the Chekiang-Kiangsi rail line and to the port city of Amoy. Note also the spur to Nan-ping and its location with respect to Foochow. This illustration, which appeared in GP/I-25, 21 September 1955, is an example of a type of sketch map used to illustrate reports on targets of current intelligence interest and thereby speed up the production process.

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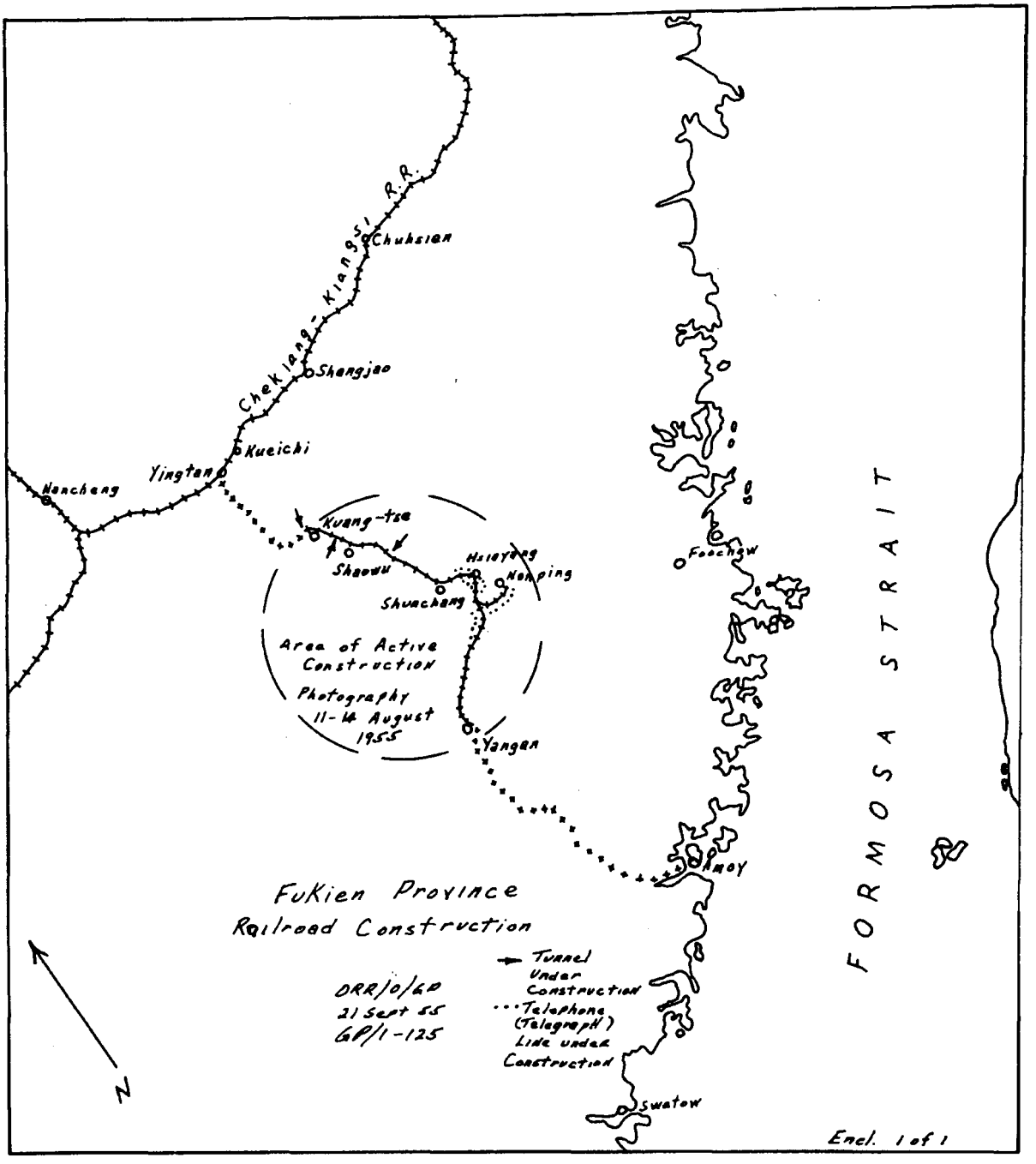

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FIGURE 9

Layout and components of the several functional areas in the Dodonovo Complex as interpreted from January 1956 GENETRIX photography.

Appendix B

Chronology: 1950-1956

1950

8 Aug	Initial proposal made by [redacted] to establish the photo interpretation function in CIA.	25X1

1952

11 Apr	[redacted] submits results of his survey of the need for photo intelligence in CIA; recommends hiring [redacted]	25X1 25X1 25X1
1 Jul	[redacted] enters on duty as an Intelligence Officer slotted in the Office of the Assistant Director, ORR.	25X1
17 Jul	Robert Amory, Jr., the AD/RR, forwards a proposal to the Project Review Committee for establishment of a Photo Intelligence Division.	
25 Jul	Project Review Committee, chaired by Allen W. Dulles, approves proposal to establish the Photo Intelligence Division.	
4 Aug	Walter Bedell Smith, the DCI, approves establishment of the Photo Intelligence Division (D/GP).	
2 Nov	Formal establishment of the CIA Photo Intelligence Division.	

1953

11 May	Arthur C. Lundahl reports for duty in CIA as Chief, Photo Intelligence Division.
30 Jun	D/GP moves from Building 11 to Room 1337 M Building.
5 Oct	Proposal for issuance of formal PI publications by D/GP forwarded from Guthe to Assistant Director for Intelligence Coordination.

9 Nov	GP/I-1, *Rumanian/Ukrainian-Moldavian Border Study*, the first formal PI publication issued by D/GP.	
16 Dec	[redacted] commences first IG survey of D/GP.	25X1

1954

June	D/GP provides PI support for the operation to overthrow the Communist-dominated government in Guatemala.	
29 Nov	CIA hosts first meeting of Committee for Coordination and Standardization of Intelligence Ground Photographic Procedures and Equipment.	
13 Dec	Lundahl first introduced to Project AQUATONE, the U-2 Project.	

1955

18 Jan	Small task force under [redacted] established at 2210 E Street to support Project AQUATONE.	25X1
Feb-Jun	Crash effort by D/GP in support of OCI and ORR work on the Formosa Strait Crisis.	
Apr	D/GP moves from M Building to Rooms 1009, 1134, and 1142 Que Building.	
13 May	Proposal made to reorganize and increase the level of staffing in the Photo Intelligence Division.	
31 May	Robert Amory, the DDI, briefed into Project AQUATONE.	
1 Jul	Reorganization and increase in level of staffing approved.	
Jul	[redacted] orders survey of D/GP publications.	25X1
5 Jul	[redacted] the first military liaison officer assigned to D/GP, enters on duty.	25X1
12 Jul	D/GP resumes training of intelligence officers in the art of photo interpretation.	

Sep-Oct	Task force under [redacted] moves from 2210 E Street to Wings A and C, Quarters Eye.	STAT
28 Oct	D/GP issues report entitled *Missile Launching Sites in the Moscow Area*, predicting the deployment of surface-to-air missile sites in two rings around the Soviet capital.	
Nov	Otto E. Guthe, the AD/RR, briefed into Project AQUATONE.	
2 Dec	Amory forwards proposal to establish HTAUTOMAT to the DDS.	

1956

21 Jan	Proposal for establishment of HTAUTOMAT approved, with revisions.	
Feb	First OCR personnel join the [redacted] task force in Quarters Eye.	25X1
Apr	[redacted] the Chief, GRA, briefed into Project AQUATONE.	25X1
Apr	D/GP photo interpreters introduced to U-2 photography of US installations.	
Apr	Task force under [redacted] moves from Wings A and C to Wing G, Quarters Eye.	25X1
20 Jun	First U-2 photographic mission over the European Satellites.	
22 Jun	D/GP receives first operational U-2 tracker photography in Quarters Eye.	
29 Jun	D/GP receives first large-scale operational U-2 photography in Quarters Eye.	
4 Jul	First U-2 photographic mission over the Soviet Union.	

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137. Memo, [redacted] for Commanding Officer, U.S. Naval Photographic Center, 7 Apr 55, sub: Request for One Set of Aerial Photographic Prints for Each Far Eastern Sortie Processed for the U.S. Naval Photographic Interpretation Center. S. 25X1

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139. Memo, [redacted] for Guthe, 12 Nov 54, sub: The Coordination of Photo Intelligence and Communications Intelligence, [redacted] TS CODEWORD. 25X1 25X1

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141. Memo, Guthe for [redacted] 20 Jun 53, sub: Justification for Procurement of Old Delft Scanning Stereoscope. R. 25X1

142. Memo, Guthe for [redacted] 23 Jun 53, sub: Justification for Procurement of Zeiss Stereotop II for Stereo Observation and Plotting. R. 25X1

143. Memo, Lundahl for [redacted] 12 May 55, sub: Justification for Purchase of the Kelsh Stereoscopic Projection Plotter with Variable Ratio Pantograph. OUO. 25X1

144. Memo, Lundahl for Chief, Purchase Order Branch, OL, 23 Mar 54, sub: Justification for Procurement of a Jackson Stereoscopic Projector and Floating Mark. U.

145. Minutes of the Geographic Research Area Staff Meeting, 28 Feb 55, p. 2. S.

146. Interview, Arthur C. Lundahl with author, 26 Oct 70, p. 22. TS CODEWORD.

147. Memo, Lundahl for Guthe, 13 Aug 53, sub: Recommendation for the Establishment of Report Series for the Photographic (*sic*) Intelligence Division. S.

148. Memo, Guthe for AD/IC, 5 Oct 53, sub: Proposed Photographic Intelligence Publications. S.

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150. Minutes of the Geographic Research Area Staff Meeting, 20 Jun 55. S.

151. *Monthly Report*, Jun 55, p. 2. S.

152. Memorandum for the record, 2 Jun 55, sub: Meeting to Discuss Reproduction Problems. C.

153. CIA, DDS&T. DDS&T Historical Paper No. OSA-1 *History of the Office of Special Activities* b[redacted] 25X1
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155. Memo for the record (by C.P. Cabell), 19 Nov 54, sub: Luncheon Meeting in the Office of Secretary Talbott. Not classified. (For copy in Cabell's handwriting, see Chapter II in the above
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156. *Op. cit.*, (153, *above*), Chapter II, p. 2.

157. Memo for the record (by C.P. Cabell), 24 Nov 54, sub: Meeting at the White House. Not classified. (For copy in Cabell's handwriting, see Chapter II in the above OSA History [redacted] 25X1
[redacted] 25X1

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159. *Op. cit.*, (43, *above*), p. 8.

160. *Op. cit.*, (123, *above*), p. 24.

161. Memo, Lundahl for Guthe, 19 Oct 55, sub: Request for Promotion [redacted] S. 25X1

162. Interview, [redacted] with author, 8 Oct 70, p. 1. 25X1
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163. *Monthly Report*, Jan 55, p. 1. S.

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165. ORR, D/GP. GP/I-53, 19 Jan 55, sub: *PATHFINDER II*. S.

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167. Memo, [redacted] for Lundahl, 29 Apr 55, sub: Development of Aerial Photographic Processing Equipment (and other items). U. 25X1

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185. *Monthly Report*, Jul 55, p. 5. S.

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191. *Monthly Report*, Dec 55, p. 3. CIA Internal Use Only.

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260. Memo, [redacted] for Lundahl, 2 Aug 55, sub: Test Site Support. No classification given. 25X1
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262. Memo, [redacted], 30 Aug 55, sub: Film Requirements, (SAPC-1736). S. 25X1

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