



## PHOTO INTERPRETATION: MATA HARI WITH A GLASS EYE\*

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THE aerial camera is causing a widespread technological unemployment among spies these days, for this one-eyed Mata Hari of the blitzkrieg era supplies an estimated 80 per cent of the military information by which modern strategy is decided. Oftimes the report of this high-flying mechanical spy is the sole basis for a GHQ decision on major tactical or strategic moves.

Often official communiques comment: "Enemy planes flew over but no damage was done." The damage is coming later. That was an aerial camera attack.

A human secret agent can direct his attention to only one objective at a time, while an aerial camera with a single wink of its eye can observe everything within a given number of square miles, an area varying with its particular equipment and altitude. Not only better than the human eye in daylight, it can also work the night shift without lessening its effectiveness, and can see through eye-baffling haze.

Without passport, false whiskers or invisible ink, the aerial camera, penetrating enemy territory at an altitude of two and one-half miles, can make an instantaneous record of all that goes on over an area of more than six square miles, on a single seven by nine inch photographic plate. Blinking the shutter eye as rapidly as once every six seconds, the camera super-spy may be able to turn in 500 or more accurate, complete, concentrated photographic reports from a single reconnaissance flight. Each report is an unposed, candid-camera portrait of a six square mile patch of the enemy, with its bony structure of hills, its river arteries, its clothing of verdure and farm crops, its nervous system of transmission and communications lines, its prominent features of factories, cities, mines and airports.

But while the aerial camera sees all, it is the photo interpreter who must know all and tell all. To the untrained eye, the aerial photograph is a confused patchwork of the landscape's major features reduced smaller than the Lord's Prayer on a pinhead. The photo interpreter must decode the camera's compact report and expand it into: 1) a photographic map, with vital spots marked more clearly than with x's, and 2) a verbal report, commenting on any unusual activity shown and conjecturing on its possible military significance. Working behind the scenes of this modern war of multiple fronts and shifting objectives, the interpreter knows it may be less important to blow up a steel and concrete pillbox fort than to destroy the plants supplying the steel and the concrete.

By comparing photographs taken at intervals of 24 hours or several days, he can deduce that damaged armaments plants are in production again, or that railroad cars are being assembled to move supplies to the front. After sending the flying camera on a quick reconnaissance tour of railroad yards in certain key areas, he can discover that munitions and supplies are being moved toward the

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enemy's western frontier. On successive photographs of a compact area he can also spot where new batteries are being set up, oil depots established or tanks assembled.

By piecing together overlapping aerial photographs in a stereogram, he obtains a three-dimensional view, and can tell whether a certain dark line is a hedge, a path or a ravine. If it proves to be a ravine, he can tell how deep it is.

The precision which work on aerial photographs can achieve is exemplified by a computation based on the "highest" photograph ever made, the vertical photo made by Lieut. Col. A. W. Stevens at an altitude of 13.7 miles above the earth from the stratosphere balloon of the United States Army-National Geographic Stratosphere Expedition in 1935. Capt. B. B. Talley of the United States Engineers computed that the photograph was taken at an altitude of 72,290 feet, only 0.11 per cent less than official barograph readings.

The use of the lens as a secret agent, if not a secret weapon, has forced belligerents to develop camouflage to new heights of concealment and deception. What the aerial photo records as a hillside may be a hidden hangar. That innocent country crossroads may be merely whitewashed lines across the surface of a disguised airport. So the first duty of a photo interpreter is to suspect, as a counter-camouflage precaution. Even color photography has been enlisted to bring before his careful scrutiny, for instance, the slight difference in color between living foliage and wilted branches cut for camouflage.

The natural protection of darkness and blackout strategy has made it almost axiomatic for military leaders to make their important secret moves at night. Thanks to the experiments of the Materiel Division, great strides have been made in the field of night photography. It is now possible to penetrate the darkness with specially controlled flash bombs and cameras, thus surprising the enemy red-handed in his most secret activities.

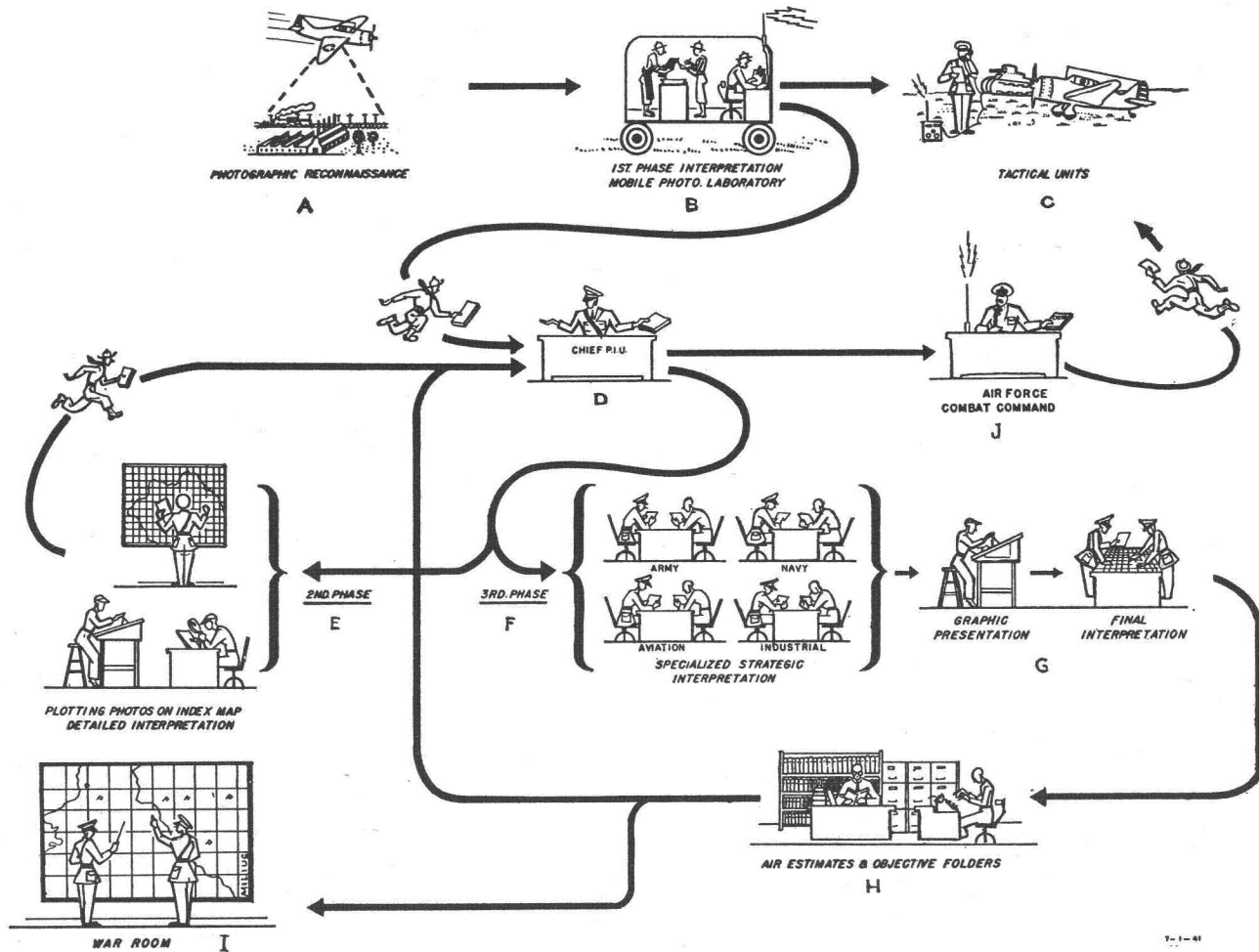
Without the all-seeing hawk eyes of the aerial reconnaissance units, the British would not have been able to smash every German concentration along the invasion front. The much vaunted coordination of the German armed forces would be impossible without proper exploitation of aerial intelligence. The role of aerial photography has played a very large part in the success of blitzkrieg tactics thus far.

Actual war operations show a natural division on this whole function of aerial photographic intelligence. All the activity involving the operation of photo planes, aerial cameras, processing of films and preparation of flight diagrams falls within the scope of the photographic reconnaissance tactical units of the Combat Command.

The other function of exploiting and developing the intelligence from the aerial photos falls within the sphere of photo interpretation units, placed so as to best serve the command echelons throughout the Air Forces. Initial steps have already been taken to establish a Photo Interpretation Unit in the Intelligence Division of the Office, Chief of Air Corps, in Washington, and throughout the Combat Command.

Interpretation has been described as the science of determining the nature of various objects shown on photographs, and the discovery of hidden objects which are either visible or known to exist. It is the practical application of the trained powers of deductive reasoning, with the aid of technical instruments, previous photographs and supplementary maps and information already collected about the territory being studied in the photograph.

By putting together in time and space the total results of aerial reconnaissance, the photo interpreter converts hindsight into foresight, and puts the



secrets hidden in the picture into a form of information that can be rapidly used in preparation for future action.

The functions of a Photo Interpretation Unit are:

- 1) To receive, record and collate all aerial photographs from all sources.
- 2) To develop by interpretation the maximum accurate intelligence from aerial photos in the minimum time.
- 3) To prepare, arrange and reproduce this intelligence into the most concise and usable form.
- 4) To maintain a complete, current photolibrary and filing system with an adequate supply of all necessary technical instruments and aids to the task of interpretation.
- 5) To assist in the training of personnel in all phases of photo interpretation.
- 6) To conduct research to test and improve methods of interpretation.

Theoretically, the operation of a photo interpretation unit is illustrated in the accompanying animated chart.

"Shots" of tactical or strategic activity of the enemy, as depicted at point A, are transmitted to a mobile or stationary photographic laboratory (at point B), where the film is quickly processed. The interpretation officer (C), who has been studying all previous photos and other available intelligence, is prepared to analyze speedily the new photos and report any activity which affects "the day-to-day conduct of the war." His quick "first-phase" interpretation is immediately transmitted to all tactical units affected. The value of this operation depends on speed and accuracy, which are both of the utmost importance.

The films, prints and copies of the first-phase report are quickly forwarded to the Photo Interpretation Unit (point D). Copies of the prints go to points E and F for simultaneous processing. The "second-phase" interpretation, administered at E, involves the plotting of the photos on large index or situation maps. The first-phase report is here verified and greatly amplified, after which it is forwarded to the HQ of tactical units at G.

The final "third-phase" interpretation is a specialized strategic analysis. Officers and civilian specialists in various spheres go over each photo minutely to extract every grain of intelligence affecting their respective fields—for example, the Army, Navy, Air Forces or industrial fields.

Army specialists, for example, would offer their interpretation in the light of their knowledge of ground force tactics, Army installations, equipment, ammunition dumps and barracks. Industrial specialists would be well versed in the appearance and importance of oil refineries, power stations, munitions industries, railroad centers, all types of manufacturing, docks and shipping.

The results of their analyses are graphically illustrated and arranged into a final interpretation report by a staff of photogrammetric draftsmen and clerical assistants, comprising officers, enlisted men and civilians. These final interpretation reports provide valuable source material in the preparation of air estimate, objective and target folders (point H). They also play an essential role in the functions of the War Room and are given a limited distribution to the higher echelons of command.