

Operational uses for **STRATEGIC PHOTOGRAPHS**



Manual Prepared by...
Office of Naval Intelligence
Graphic Section, Op-16-P-5
Strategic Photograph Division

C O N F I D E N T I A L

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S T R A T E G I C P H O T O G R A P H S

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This manual, "Operational Uses of Strategic Photographs", was prepared by the Office of Naval Intelligence, Graphic Section, Op-16-P-5, Strategic Photograph Division, to give a general outline of the many ways in which horizontal and oblique photographs are being used today by the Armed Forces in planning and carrying out military operations.

The instances enumerated here are not, by any means, exhaustive or complete, but are only indicative of the different phases of operations where pictorial information is useful and valuable. From photographs information can be obtained which is not only valuable, but essential in almost every stage of any campaign from the initial phase of mapping and planning, up to and including continued occupation by an Allied force.

As to the areas of interest, the Strategic Photograph Section desires pictures of areas which may become possible theatres of operations. It is not interested in photographs of areas which will not become a scene of action, nor of areas which are now under Allied control.

To be of value to operations, all pictorial coverage must be on areas where we are going, not where we now are.

The first decision that must be made in Photo-Intelligence work in the selecting and taking of horizontal and oblique pictures is whether the particular photograph to be selected or the subject to be photographed contains anything of strategic importance; whether it will present any information which may be of value for military purposes.

With the thousands of pictures that today are being handled by the Photo-Intelligence units of the Army and Navy, a correct decision in the first instance is necessary to save time and labor which would be wasted on pictures of no value. Also, what is more important, to select and take those pictures which are of value and to prevent them from being discarded or not photographed as being of no worth simply because the use to which they might be put is unknown to the Selector or Photographer.

The following is presented to show what ADDITIONAL INFORMATION should accompany any picture in order that it be of value, WHAT pictures are valuable, and WHY such pictures are valuable.

For a basic concept of what is of military significance, Photographers and Selectors should become thoroughly familiar with the ONI Monograph Guide. A close study of the divisions of this guide will present the military aspect of subject information which might be recorded in pictures. Before a picture is taken or before a picture is selected, read the ONI Monograph Guide.

In selecting or taking, the absolute first requisite of any picture is its location. This cannot be stressed too highly. No picture, no matter how clear, nor if of the most important

military objective in the world, is worth the paper on which it is printed unless it is accurately located. Without accurate, definite location such pictures cause more trouble than benefit. Without location such pictures are useless, and without accurate location they are misleading and misinforming, and for military purposes misinformation is the keynote of casualties.

Location should be as to town and country at least and, if possible, the latitude and longitude. If the subject be not of a town or place on a map, such as a bay, mountain, etc., then it should be located as being so far in such a direction from some place for which the coordinates may be obtained. For instance, it could be described as being five miles northwest of Bangkok on the road to Rangoon. This would be definite enough for any type of picture if there were no name for the place photographed, as if it were just a terrain or road shot. But a picture with the type of caption of "Somewhere in China", is Photo Enemy No. 1, and should be discarded by the Selector.

For persons taking pictures of terrain and beaches, if sufficient background is included so that distinctive features of the terrain will appear in each picture, this will aid greatly in later collation of the material. For instance, a rocky headland or point, if appearing in different shots of the same area, will enable orientation of all photographs containing the identifying landmark.

Location is the watchword of Photo-Intelligence and this should be in longitude and latitude down to at least minutes to be useful.

Almost as important as the location of the picture is the time of day, time of year and date on which the picture was taken. Time of day is very important as an aid in direction which can be determined from shadows. In all coastline pictures it is very important because of the tidal factor, without which such pictures lose much of their value. In fact in pictures which may contain beach information, time and weather conditions are almost as important as the location. No picture has value without location and beach pictures showing tidal conditions have not much more unless the time of day, seasons and weather is known. This applies primarily to Photographers, in that they make note of these factors when taking pictures. However, Selectors should always be on the alert for such information for sometimes it may be attached to, or on the back of prints, and if so should be included in the caption description. Time of year is important along these same lines and also because of snow depth, condition of vegetation and terrain.

As for the date of pictures; in many certain types they are practically worthless unless this information is present. Any old photograph of any area or subject likely to be altered by constructional improvements may be worse than useless. It may be misleading and dangerous. As a general rule no picture should be selected which is known to have been taken prior to 1923 and in priority areas the date should be much later, depending upon the nature of the photograph and the area shown. Photos, especially of towns, waterfronts, any kind of structures, roads and bridge

should be dated as to time of taking because of the possible rapid change which may occur. In many places the appearance of the whole town will completely change due to changes in building and expansion. Roads and bridges are continually being widened and rebuilt and as a result, unless the time of such pictures is given, they are a doubtful source of information.

About the only type of photo which is not affected much by the time are those of simple terrain shots; and even here sometimes, due to changes in growth, making of a clearing or the effect of erosion, such pictures may be very misleading as to the present day appearance, especially as to the appearance from the air or the nature of vegetation now growing.

As an example, suppose a picture were selected, carrying an old or unknown date, showing a road in a beach area. The picture indicates that the road is narrow, one-way, steep, with sharp curves and sandy surface. Suppose, then, that the beach in this area were selected for an operation. The picture of the road is used on the basis that the road is as it appeared in the picture, in planning for the type of equipment to be used in moving in troops and material. However, since the time the picture was taken, the road had been greatly improved. It was now a broad two-lane paved highway, so that when the troops had reached the road, instead of finding a narrow, crooked road they find a well-paved thorofare. At first one would say that this would do no damage, as conditions were better than expected. However, if the true conditions had been known, much better and more effective equipment could have been used; and secondly, this type of highway would enable the

enemy to bring up much heavier equipment as an opposing force, and as a result the invading operation could be badly defeated because of superiority in armament and personnel which they had not foreseen could be brought to bear against them. Thus the raid, planned on such information, would fail because of too old photography.

Usually simple terrain shots are good no matter how old, however, the exception to remember is that in countries which are advancing or expanding rapidly this may not be true.

The direction of the shot, while important and helpful in many instances, is not really necessary; although in some instances if the direction is known much more may be deduced from the picture. Where the picture is being originally photographed, this should always be included.

In order to extract all the value from any picture the LOCATION, TIME and DIRECTION should always be given.

One point to be mentioned here, about which the Selector and Photographer should know, is the focal length of the lens; even though it is one with which the Selector will have little to do. Focal length is the distance between the negative and the point at which the light rays cross the lens. This distance is primarily used in calculating distances in pictures in vertical photography. When the focal length is known and the distance or altitude from the object photographed is given, the ratio of the focal length to the altitude will be in the same ratio as the size of the objects in the picture to the original subject. Due to distortion

in oblique photography, focal length ratio is only reliable where the focus angle of the camera makes a near right angle with the surface or distance on the object to be measured. When such is the case, however, the focal length furnishes sufficient information to calculate distances. The principle use of this numerical factor is with vertical photography in determining scale and is very valuable when mapping is to be done from aerial verticals and mosaics. The only instance in which the Selector will come in contact with this factor is where additional information is supplied with the print. In this situation he should always note such information where it cannot become separated from the print. Obviously, to make the focal length of any value whatever, the altitude or distance from the object photographed must also be known and should be noted together with the focal length.

Another factor which must be kept in mind is the clarity of the print. For Photographers, besides needing experience in picture taking, a great deal of detail can be saved by the use of filters. Even with experienced personnel many times beach pictures especially (due to the glare from sand and water) are ruined because of the lack of filter on the camera. For Selectors, ability to make correct decisions on this matter can only be gained by experience. Different types of postcards, snapshots, clippings from magazines and papers will give varied reproduction. Some color postcards will reproduce better than the originals. Any photo-engraving prints usually reproduce excellently, as will any picture which is taken from a smooth finish paper. Factors which must be reckoned with in this decision are the texture and nature of the

paper, whether rough or smooth, the size of the screen used in the engraving and the quality and color of ink. A small engraving or postcard will sometimes enlarge satisfactorily. A large engraving, even though with a coarse screen, will usually reduce to a clear picture.

Newspaper photographs are usually unsatisfactory. First, due to the very rigid censorship in the Axis countries, little appears in this form of medium, however, once in a while a valuable picture is obtained from this source. The second, and more important reason as far as the Selector is concerned, is the fact that due to the coarse screens newspaper engravings will not enlarge without great loss of detail. A large print will reduce to clarity, but to attempt to obtain anything of value from small newspaper prints is a waste of time.

A very important consideration which Selectors should always have in mind is the procurement of available original negatives of any picture which has value.

A photograph which is of value must be widely disseminated to the many interested sections and forces. Such dissemination requires reproduction of a sufficient number of prints so that duplicate prints may be retained by all parties to which distribution is made. For this dissemination a negative is required. If only a positive print is received by Op-16-P-5, then the required negative must be produced by a photo copying process. When such photo copying process is used the loss of definitive clarity is about thirty percent - the loss of detail clarity may sometimes be one hundred percent.

Therefore, whenever possible a great effort should be made to obtain original negatives.

In the selection of strategic photographs only exact duplicates should be discarded, for if only a small strip of additional area is shown in one picture, it might provide just the one point of information to give a complete picture. An example of this is two pictures taken from the same spot, but in which the camera had been moved slightly between the two exposures. The first picture showed a breakwater on the right-hand side, which just ended at the edge of the picture and on the left-hand side of the picture the breakwater did not end. The second picture showed the breakwater ending on the left-hand side of the picture, but not on the right. The two pictures together gave a picture of the breakwater which neither picture would show by itself; yet the difference between the two was only a strip approximately one-quarter inch, otherwise they were exact duplicates.

As to the subject nature of photographs; almost any clear picture will have some value. The varied uses to which photographs are now being put, because of the ability of a picture to present information in a form which is available for intense comprehensive study, makes it almost impossible to say that a well-located picture is of no value. The value of any picture, providing it has the necessary information as to location, etc., will depend on the purpose for which the picture may be used and the area in which it is located.

The purpose of the Strategic Photograph collection is to

present the Services with pictorial information on every aspect of any area in which they may operate. The photographs should be chosen from the standpoint that they contain information which may be of value to any division of all three Services; land, sea, and air.

In making a decision as to whether a photograph contains any information of this nature the person should put himself in the position of an officer planning the operation. He will want to know about the possibility of landing troops, tanks, artillery, transportation and all the accompaniments of a modern army. He will want to know what beaches, harbors, piers, docks, roads, bridges, utilities, communication centres and all military objectives look like TODAY. A planning officer wants to know how he can land his troops from ship or plane, how he can transport them when they are landed, buildings in which they may be quartered when they arrive and how, after the troops have gained their objective, they may hold it and receive supplies. Always think of any possible value that a picture may have to a planning officer from the initial formulation of the plans to the final complete and continued occupation by his troops.

An important concept that a Picture-Taker or Selector should keep in mind is that there is both affirmative and negative pictorial intelligence. The type of intelligence presented will vary the exactness of additional information which will be necessary to give the picture value. Negative informational pictures usually will have value with less data than affirmative intelligence.

In short, affirmative intelligence is information which would be used in going into any area and negative intelligence would be that information which would tell a planning officer where not to go. For example, pictures of wide smooth roads and shallow streams would present affirmative intelligence, in that it indicates operations could take place there. Good roads for transportation, streams which could be forded if the bridges were blown out, etc. These pictures would have to have accurate location.

On the other hand, photographs showing narrow roads and high bridges over rocky chasms would present negative intelligence. These pictures would indicate that this area would probably not be suitable for operations. Roads could be too easily blocked, bridges blown out, and be kept blown out, and fording of the chasms would be impossible. These would all be signs to stay out. For pictures of this nature specific location would be best, but even location only as to province would, if no other were available, be sufficient.

Generally, there is just as much interest in pictures of strategic areas which show places where operations could not take place, as pictures showing where such operations might be successfully accomplished. In other words, pictures of rocky and unsuitable landing beaches furnish negative intelligence, which tells the planning officer that this is a place he should not attempt to land. The Army and Navy is not only interested in information which tells them where they can, but also where they cannot invade.

Some of the main uses for pictures are for general information, planning, map-making, training, recognition in bombing,

periscopic silhouettes, camouflage, engineering and numerous others. A detailed list of photographs which may be used for these purposes is as follows: beaches (showing low, half and high tide), cliffs, dunes, cliff paths and roads leading inland, lighthouses and buoys, ports (large and small), docks, dry docks, jetties, warehouses, cranes, silos, river estuaries (from all angles), canals and locks, roads (including those which show close-ups of road surface), railways (including those which show close-ups of gauge and type of sleeper, etc.), bridges, all industrial buildings (large and small), all oil and petrol installations, pipe-lines, etc., mountain passes, mines and quarries, hotels, barracks, hospitals, post offices and telephone exchanges, wireless stations, waterworks, dams, power stations, gas works, aerodromes, streets and exits from towns, by-passes, etc., landmarks, suitable stretches of water (lakes, wide rivers where seaplanes could be landed), ferries and topographical shots.

In the Strategic Photograph Section of Naval Intelligence, all pictures are broken down into one or more of ten categories, i.e., Airdromes, Oil Facilities, Utilities, Port-Dock Facilities, Railroads, Roads and Bridges, Coast Beaches Hydrography, Military and Naval Installations, Lakes-Rivers-Terrain, and Cities and Towns, under which is also included miscellaneous shots. Since these categories practically cover the field of possible subject matter, they will be used as a guide rule in pointing out what pictures are useful and why.

AIRDROMES -

Every picture of an airdrome, whether a land or sea base, is of importance. A knowledge of the size and location of enemy fields can be greatly enhanced with pictures. They are invaluable in planning bombing raids, for recognition by bomber pilots, in estimating the number and type of ships which may operate therefrom, and for a comparative study if an attempt should be made to camouflage their appearance. If occupation of that section is being contemplated pictures will furnish information which will show possible available facilities for use of our own aircraft. It is not always the airfield itself which is important, but many times the surrounding terrain for purposes of expansion and installation of defenses.

Pictures of small local fields in foreign areas are extremely important for they may be the spot which may be expanded into a large base if surrounding conditions are suitable.

For Photographers taking pictures in such areas, photos taken in the direction of prevailing winds are most valuable. Also an attempt should be made to include any vertical obstacles that could not be removed for, in the area of an airfield, any upright obstruction shortens the width or length of the field approximately seven feet for every foot of vertical height of the obstruction.

Location again is absolutely essential and, due to the rapid change which may occur in the expansion of air fields, the date is very important.

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OIL FACILITIES -

Obviously important, because from pictures of oil facilities can be derived estimates of the capacity of such installations. An expert can calculate the capacity of each storage tank and the resultant capacity of the plant both for refining and storage purposes. This information is valuable in two ways - for possible quantities which may be captured, or for a supply base for our own forces should such plant be captured and the surrounding area occupied. Such pictures are also useful for recognition and study purposes by pilots and bombardiers and valuable as a basis for comparison in calculating present output with previous capacity which may indicate military activity in that area.

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UTILITIES -

This class of picture is in much the same category as oil facilities. They are always important from a military standpoint both for planning possible operations in commando raids, or in laying down barrages. If the power plants, gas works or communication terminals are recognizable, landing parties approaching by parachute, vehicle or on foot will know in which buildings such vital nerve centres lie and will not waste time searching for the spot where the vital blow should fall.

Here too, of value are close-up shots of buildings which house utilities for if each squad has studied such pictures of the different buildings they will know the best means of approach to each individual objective; thus saving time and Allied lives.

Such pictures are also valuable when barrages are being controlled from observation posts, planes or balloons; for if the exact building is known to the observer as a result of photographic study, he can direct his batteries much more effectively.

A knowledge of the types and sizes of facilities is also important if occupation is planned.

PORT AND DOCK FACILITIES -

Besides giving general information on such facilities, pictures are a valuable aid here to supplement descriptive material and, if in a small out-of-the-way place which is now held by foreign interests, the best available information may be a snapshot taken by some tourist.

For example, suppose that on a small out-of-the-way place charts and maps indicate a landing place, but give no information as to the size or adequacy of any piers or docks. Here two pictures, one taken in the morning and the other taken in the afternoon can supply much valuable information. The size, shape and construction of the pier, size of vessels used at this point and also, which is highly important, different tidal conditions will be shown. Since the location is known the direction of the shot can be figured and correlating this with the shadow of the sun much can be determined about problems of high and low tide. A picture taken at low tide will reveal the important fact of the nature of the beach and bottom. These facts are very important for operations and cannot be determined from charts or maps.

Pictures are also a great aid in planning bombing or landing operations, for good picture coverage can show the size of port or dock accommodations, where and what craft can be tied, protection for landing parties, etc. Close-up shots of buildings along dock areas may show different types of structures, whether inflammable or non-inflammable, which is a guide as to whether incendiary or high explosive bombs should be used. However, shots of this nature must be recent and closely located as to the name of

the street photographed.

For recognition from the air or sea, either verticals or horizontals may be used, both distant and close. Such pictures when used for study purposes for bombing can greatly increase accuracy and efficiency due to a predetermination of what to look for and where the bombs should be dropped. They will often disclose identifying characteristics much more effectively than if described by word or drawn up in a diagram.

A great deal of mapping and charting of wharves and water fronts may be made from pictures if they are known to be of recent date. Much work has been done by the Axis countries to completely change by camouflage the appearance of their important ports and a good photograph taken before such activity will often disclose the extent of such disguise.

RAILROADS -

Pictures of this subject are, naturally, in about the same class as most utilities and are valuable for bombing, recognition, etc., with the additional possibility that pictures of stretches of railroad in mountains or in the country may indicate a possible location which would be especially adaptable for cutting this mode of transportation. Information on narrow defiles (where well-placed charges of dynamite could effectively block the trains) or bridges over deep rivers or rugged canyons, can be obtained from well-located photographs. Neither by description nor diagram could this be so accurately and comprehensively presented as in pictures.

Another value of photographs of this kind, if they are accurately located, is that it can be told almost at a glance whether or not the subject would be an objective worthy of a sabotage attempt, due to the fact that the extent of damage and obstruction can usually be calculated from the picture.

Information on the size, quality, and type of transportation facilities may also be obtained from pictures of this subject.

ROADS AND BRIDGES -

~~When an officer is planning an operation,~~ whether he is going in by land, sea, or air, he wants to know what type of roads will be available from the point at which his troops land to the point to which they want to advance. He wants to know whether the roads are straight, wide, crooked, rough, smooth, steep, or sandy; the width of bridges, their possible strength and whether they are open or sheltered. Here one picture can do the work of a thousand words. If it is going to be necessary to transport troops by foot or vehicle he will want to know the available roadside cover in the event his troops are subjected to strafing by enemy planes. Pictures can supply most of this vital information.

Often times such a series of pictures, taken from many different collections, can be assembled to show all of the desired information along a particular route, because travelers many times will photograph different roadside spots and streams, thus presenting in a central file a composite picture of the route to be traveled. The presence in the picture of vehicles or persons will add greatly to its worth; for here will be a unit of measurement from which can be calculated the width and grade of a road, capacity of bridges, height of surrounding growth, type of road surface and changing dimensional conditions along the route to be traveled.

It should also be remembered that pictures showing the size and nature of a stream or ravine to be crossed is of great value for planning where advancing or retreating troops may have to build or destroy bridges. Pictures will aid engineers to plan

on the amount and kind of material which will be needed for rapid reconstruction and repair, or the type of material to be used in demolition. Close-ups showing the type of steel, wood or stone construction are of value for this purpose.

An attitude of a little of value in each picture, just as in each piece of a jig-saw puzzle, should be the approach adopted by the Selector or Photographer in order that he may make accurate and valuable selections.

Many times even though a picture is only generally located, it should not be discarded because of lack of specific location; for, when the general area is known and good picture coverage is possessed, distinguishing landmarks shown in various shots will enable the tying-up of many of the various views.

Pictures of roads and bridges furnish good examples of positive and negative information which was previously discussed. For instance, in a particular study which was made on a certain Axis country, nearly all the photos of bridges showed deep chasms crossed by small bridges in exposed positions and roads which were steep and narrow.

Here was sufficient "Negative Intelligence" to say, "Stay out, do not attempt an invasion".

From a study of such pictures it can be determined that in this area, if an invasion were attempted, besides meeting with great difficulty in traversing the bad roads existing, that the bridges were in exposed positions and would be easily blown out and if rebuilt could be easily destroyed again by enemy fire. Also being over rugged chasms, fording would be impossible and this

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factor alone could be enough to spell defeat for any invasion attempt.

This negative photo intelligence factor sometimes is not obvious in many pictures, but the Selector should always be on the lookout for such a factor.

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COAST, BEACHES, HYDROGRAPHY -

In this classification are included all pictures of all shore lines from sandy beaches to rugged bluffs. Due to the amphibious character of modern-day warfare, this category ranks among the first in importance, and is of the greatest interest to the Navy. An exhaustively complete and exact knowledge of possible landing beaches in foreign countries is absolutely imperative for successful invasions, for here it is that the first one hundred feet are the most important and most difficult.

Types of beach pictures which are valuable are those which show the width, length, slope, strength; type, whether of sand, stone, or mud; and the surrounding terrain. These different factors can usually be derived from such pictures if there is some additional object shown which can be used as a unit of measure.

A stretch of beach with a bather or two will give an idea as to its width and length, and, if the bathers are in the water, will furnish information as to the depth of the water. Also, where some object which can be used as a unit of measure is shown, the height of the bank in back of the beach can be figured.

A careful comparison of pictures on the same beach should always be made, for sometimes one shot will give the angle of the beach's slope and an almost identical picture will not. Two pictures from the same spot, one looking in one direction and the other in the opposite direction will often disclose important variations. Such items are very important in figuring of landing operations and in the construction of landing barges to be used in

that area, for different types of beach present different problems in barge construction. As a result, almost identical shots may be quite different for strategic informational purposes.

Such an object as an automobile standing on the beach is valuable since it indicates there is a hard surface capable of supporting motorized equipment.

Photographs that show adjacent terrain are also of great value for it is in this territory that beach-heads must be established or transportation across country begun. A sequence of pictures going from offshore to road will tell practically a complete story for the officer working out plans for a landing party. From such a series he can tell his position from prominent landmarks; whether or not the beach is capable of receiving his amphibious craft, the nature of the terrain with which he will be confronted on leaving the beach, and as a conclusion, whether or not he would be wise to go into this particular place. Coordination of these photographs with a map of the area will show the planning officer what he may expect from the moment his troops set foot upon the beach until they have their equipment on the nearby road headed for the objective.

Such a collection of pictures can be made from numerous different sources when taken in the same area, if, and ONLY IF, they are accurately located.

Another point which should be mentioned here is the three types of beach pictures which are valuable in reference to the ebb and flow of the tide. For a complete story on beach conditions, pictures of low, half and high tide are necessary. An

operations officer wants to know ALL the tide conditions so that, in case he must retreat, he knows what to expect as to the rise and fall of the tide.

Such pictures showing different stages of the tide may be taken from different sources and be quite readily coordinated by some distinguishing object such as a point of land, a tree, or other fixed object. Photographers should always have identifying background in all pictures.

Even snapshots of waves rolling in are of value if there is some object, such as a swimmer or fisherman, by which their height may be determined. Time of year is extremely important in a picture of this kind, and in addition whether stormy or normal weather conditions prevailed.

Many times tourists with a movie camera will take pictures of their friends in swimming on some beach. Usual movie camera speed on 8mm or 16mm film is sixteen frames per second and on 35mm film twenty-two frames per second. When such speed is known and some object, such as a swimmer, is present from which wave height may be calculated, it is possible to determine the speed, force and interval of the waves by taking prints from different frames of the film a known distance apart.

The following two quotations taken from wave studies illustrate how wave pictures may present valuable information.

"Depth of water near the shore line and slope of shore line affect wave action by limiting the size of waves. As a wave approaches shore and reaches a gradually decreasing depth of water, its height is reduced and the crest developed."....."Conclusions

drawn from many observations indicate that waves will break before the depth of water becomes less than the height of the wave. Also, in most cases it has been found that waves do not break where the depth is more than twice the height of the wave."

Such information is obviously important to engineers in construction of landing barges, small craft, piers and jetties, and to amphibious forces for landing party information. Very important here is the speed of the camera, the date and the location of taking.

Still another use for pictures of hydrography are horizontal pictures taken low to the water and showing sharp coastal outlines. It may even be a silhouette; for these are of great value to submarine officers who have submerged, run a zig-zag course, and dare only show their periscope to determine their position. If they have such silhouette pictures which show easily recognized coastal characteristics, their position may be determined by looking through the periscope and recognizing the hydrography, pictures of which the Commander may have before him in album form. No great detail need be shown to make these pictures valuable, in fact, a picture showing only a horizontal silhouette is useful for such purposes. Pictures of this type are known in the Strategic Photograph Section as "Submarine Periscopic Silhouettes."

Another type of picture which is of value, which shows only outline and not much detail, are photographs of islands taken at a high oblique which can be used by aviators as landmarks in guiding them to their objectives. Photographs of this kind,

though they show nothing but the bare outline and general contour of an island or group of islands, are reproduced in large quantities in 8" x 8" size, made up into folders to be taken with the dive and torpedo bomber and fighter pilots in their planes when they go out on a strike attack. Here the direction of the shot is of special value.

Another use for such coastal silhouettes is as a guide in amphibious operations. When the landing craft is heading for a designated beach and the beach's position can be located in reference to landmarks, such as, "X" beach is one-quarter mile west of a jutting headland, then a direct course can be determined from the time the landing craft leaves the parent vessel.

Oblique and vertical pictures are a great aid in mapping, bombing and aerial topography. A map made from a high aerial oblique is one of the many uses to which photography of this type can be put. In case a good recent map of a desired area is not available a reconnaissance flight can be made, photograph taken, plane returned to base and map drawn up. The same thing may be done from photographs taken by travellers from high points of some poorly mapped area. As a result, even though detail may be lacking, a photograph which shows general outline and contour of the country will be valuable for this purpose.

During all selections it should be kept in mind that the fact that the picture is of a lonely stretch of beach or coastline does not decrease, but rather enhances its value, for on commando operations lonely beaches are preferred and these usually are the ones on which information is most lacking.

Horizontal and close-up photography has also proven of value in interpretation of vertical photography. Aerial photos will show that certain terrain is covered with vegetation, but will not indicate the nature of such growth. A horizontal shot here will give the information as to whether the growth is short and stubby or high enough to cover trucks and men.

Two photos which illustrate a variation of this principle were a horizontal and vertical of a beach of a South Pacific Island. The vertical was taken on a photo reconnaissance and the photo interpretation indicated a smooth sandy stretch of beach. The horizontal picture showed clearly however that this was not the case and instead of smooth sand it was a beach of white coral boulders. This was not detectable by photo interpretation because the white coral boulders would not stand out against the white beach and consequently the value of this horizontal picture becomes very high, for, as in many cases, this might be the only 'negative' intelligence received regarding this beach, but it would be sufficient to prevent an attempted landing at this precise spot.

MILITARY AND NAVAL INSTALLATIONS --

~~Any pictures on this subject naturally are so important~~
that no time need be used in discussion. Every print of such a nature should be reproduced with the exception of those which are greatly out of date.

There are two points, however, which should be noted here as to pictures which may be out of date for military installations or other subject matter. First, the military installation photographed may be so old as to be of no strategic importance, but it should be remembered that a picture of an old fort or ancient gun installation may show possible sites for present installations. And second, the military installation may be too old to be of value, but in the background may be a terrain shot showing coastline or other factors which have not changed. Therefore, the picture should be selected.

LAKES, RIVERS AND TERRAIN -

In making a decision on which pictures of these subjects should be selected, the best procedure is to again put oneself in the position of an officer planning the operation.

Such officer will want to know possible seaplane landing places, open areas where planes or paratroopers may land, the navigable and unnavigable rivers, the type of growth, whether forest or thick underbrush, any possible outstanding landmarks which may aid in aerial recognition, bombing and directing artillery fire, general orientation of officers and men on the ground, or for tactical maneuvers.

Pictures of trees can aid greatly in determining types of material to be used in covering gun emplacements. From such pictures plans can be made in advance as to just how the appearance can be imitated.

The Bureau of Yards and Docks, in a study prepared by them on advance base planning says, "A comprehensive set of aerial views, both vertical and oblique, should be made of the site before construction begins. These data are necessary for study when the camouflage plan is being worked out. Under some circumstances it is advantageous to lay down over the new construction a camouflage design which will produce artificially the impression that little or nothing has been changed or added. Therefore, existing conditions should be carefully recorded. Exposures should be made at different hours of the day, those taken when the sun is low in the morning and afternoon usually being the most revealing. Attack at dawn and dusk is to be anticipated at many airfields and it is at

that time - when the shadows are longest - that most camouflage will be seen in the weakest aspects. Natural color photographs are especially useful."

Such pictures can also be used in detecting enemy camouflage, for aerial views taken before and after camouflage will often reveal sufficient identification to render the camouflage futile.

Here again, obliques and verticals have value for mapping and for the construction of topographical sand or plastic models. Also valuable for planning are pictures of existing dock facilities which sometimes, in out-of-the-way frontier bases, is the only information as to their adequacy or inadequacy. Here too, a photograph can tell what is needed for construction or reconstruction. Along this same line, photographs of forests or gravel pits may furnish information as to availability of material supplies.

Pictures of natives are valuable in the event that operations may take place where there are both friendly and unfriendly tribes. If the troops going into such an area can recognize the friendly natives, in many cases unnecessary casualties can be avoided. Often times physical characteristics or dress habits may help in this identification. For example, certain of the natives of the New Hebrides Islands wear a very distinguishing type of breech cloth which easily identifies them, or, in some islands of the South Pacific, physical characteristics are pronounced sufficiently to provide easy identification.

Especially valuable in illustrating subjects in this category are colored transparencies, which are used extensively in the preparation of training films. Color photography of fruits, bugs, snakes and natives are desired.

One word of caution for both the Selector and the Photographer is that one of such pictures is usually sufficient. The one danger in selecting this material is that unless a judicious selection is made the Strategic Photograph Section will be flooded with pictures of natives, huts, snakes, fruits and the like. A minimum of selection from each collection will usually suffice. This is in direct contrast to the choice to be used in selecting beach photos, for here every one, no matter how little the difference, as long as it is not an exact duplicate, should be chosen.

The most important requirement for a picture selector is the ability to see all that is within a photograph and then to determine if it is of any conceivable value for military purposes.

Picture analysis and common-sense are the two qualities which every Selector must exercise to the utmost. It must be kept in mind that every picture in itself is not supposed to tell a complete story. All must be viewed with the thought in mind that this picture may contribute but a minor fact, which, when put with all the presented minor facts, will help to start a major offensive.

For strategic evaluation of photographs the Selector must be able to see the "Strategic Potential", or possible picture value, in the material which comes before him for selection.

As a final word of warning - it must not be forgotten, there must be location and it must be accurate.

Note to District Intelligence Officers

Due to the tremendous amount of picture material available which may be received by the Director of Naval Intelligence through the District Intelligence Offices, it is necessary that as much as possible of the task of selection, photo copying and captioning of Strategic Photographs be performed by the District Intelligence Offices.

Whenever possible the selection of original material and all possible translation should be made by the District Offices, and the location plus any additional information such as date, time of year and day, weather conditions and direction of view, etc., should be affixed to the photo, postcard, snapshot or other forwarded material.

Wherever practical snapshots, postcards, pictures from travel folders or publications should be reproduced by the District Offices and two copies of the positive prints (size 7 x 9 inches) plus the negative (minimum size $2\frac{1}{2}$ x $3\frac{1}{2}$ inches, 7 x 9 inches preferred) be forwarded to the Director of Naval Intelligence. Across the bottom of these prints should be captions which include all available pertinent information such as is listed above.

The following four photographs are from a collection which was sent in through one of the District Offices and are here used as an illustration of the way such material is desired by the Office of Naval Intelligence.

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It will be noted that in these illustrations not all desired information was available, which is often the case, but in the caption as much data as it is possible to obtain and which is pertinent to the picture should be included. Anything additional as to donor, reliability of information, and other facts of a like nature should be in an accompanying letter of transmittal.

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