SYMPOSIUM: MILITARY PHOTOGRAPHIC-INTERPRETATION

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FOREWORD

The past ten years have seen the photograph rise to become a principal tool for furnishing engineering information and data. Aside from its important mission in making maps, the photograph has now reached out to other vast engineering applications. Of these applications, Publications Committee last year selected Military Photo-Interpretation as the subject of a symposium of articles for PHOTOGRAMMETRIC ENGINEERING. We are happy to present this symposium in this issue.

To put this symposium across, Publications Committee solicited the very capable assistance of Mr. Arthur C. Lundahl and C. G. Coleman of U. S. Navy Photographic Interpretation Center for monitoring the work involved. Much credit is due them and other contributors identified in the symposium for what is considered a very valuable group of articles.—*Publication Committee.*

INTRODUCTION

No attempt has been made in this issue to present a comprehensive study of the use of photographic intelligence in World War II. The amount of photographic analysis performed in and for the services was so great, and the variation in problems and techniques in the different theatres so wide, as to render such a treatment impractical. A paper on each of several major phases of photographic intelligence work, however, has been prepared, in each case by a man with considerable wartime experience in that phase. It is unnecessary to emphasize that specific information on techniques, procedures, instruments and applications of photographic intelligence remain under Service security restrictions, and that care has had to be exercised by those preparing the papers to insure that these safeguards are not violated.

The science of deriving military intelligence from aerial photographs, known generally as photographic intelligence, was born from the necessities of the first World War, and came of age in the demands of the second. It was carried on in one form or another by all nations participating in World War II; it invaded every theatre of operations and contributed to nearly every type of modern warfare. Its full impact upon military science and tactics will probably not be evaluated for years to come. Its effect has, however, already been felt in the post-war world. Photographic equipment and instruments developed to meet the needs of warfare have found their way into civilian employment, while techniques discovered and perfected by Service and civilian personnel engaged

in photographic intelligence work have been modified and converted to serve the purposes of peacetime mapping, engineering, earth research and prospecting.

The editors believe that the small part of the story of military photographic intelligence recorded in this issue will be of interest to readers of PHOTOGRAMMETRIC ENGINEERING. In November 1938, General Oberst Baron Werner von Fritch, Chief of the German General Staff said, "The nation with the best photographic reconnaissance will win the next war." There seems to be no reason why that prophecy, once-fulfilled by World War II, should not be re-stated with additional emphasis in 1948.

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UNDERWATER DEPTH DETERMINATION BY AERIAL PHOTOGRAPHY*

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INTRODUCTION

SOLUTIONS to the problem of underwater depth determination by aerial photography have been proposed by numerous military and civilian researchers during World War II, and many of their suggestions have been tested under operating conditions. The present paper describes some of the most interesting developments and concludes that they are vital in war where cost is unimportant but are of questionable value in peacetime when indifferent degrees of accuracy must be balanced against expensive photography. Where coastline aerial photography has been taken for other purposes, it is well worth while to attempt to extract hydrographic data by the techniques described.

Aerial photographic depth determination methods may be divided into two general groups. The first is based on evaluations of water depth from measurements of horizontal parallax of sea surface and bottom detail photo images, or from measurements of photo emulsion densities obtained by simultaneous exposures with various filter combinations.

In either case, the sea water must be relatively transparent to the light wavelengths for which the film used is most selective or sensitive. Dietz (1) states that oceanic water is most transparent to blue light with a wave length of 0.48μ, whereas coastal water is most transparent to green light of 0.53μ or higher. The second group of methods is based on evaluation of water depths and bottom gradients from timed photographic records of sea surface wave behavior. An unclassified though very useful method described by Williams (2) is based on aerial shoreline photography taken at carefully recorded times. From the time record, and appropriate tables the tide height is computed. By this method, the waterline shown on each photograph is transferred to a mosaic or master map and Section profiles may be constructed.

The importance of determining the gradient of a beach on which forces are to be landed is obvious. As Williams (2) questions—How far to the seaward will craft ground? To what extent will it be necessary to waterproof the vehicles to be unloaded? What kind of craft will be used? Will special equipment such as pontoons be needed? Will men be in danger of drowning in deeper water inshore

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