SESQUICENTENNIAL OF COAST AND GEODETIC SURVEY

SYMPOSIUM

With the kind permission of the American Society of Photogrammetry, the publication is being initiated herein of extracts from various articles appearing under the above-mentioned title in Photogrammetric Engineering, *Vol. XXIII, n° 2, April 1957, on the occasion of the one-hundred-and-fiftieth anniversary of the U. S. Coast and Geodetic Survey. The present issue of the* Review *contains extracts from the first article only ; extracts from other articles will be reproduced in the next issue, to appear in May* 1958.

I. — DEVELOPMENT AND USE OF PHOTOGRAMMETRY IN THE COAST AND GEODETIC SURVEY

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The operating divisions of the Survey are organized along functional lines and the purpose of the Photogrammetry Division is primarily to supply the large-scale surveys and maps required to produce and maintain aeronautical and nautical charts. Nautical charts must show the features of the adjacent land as guide to the mariner. Consequently, topographic surveys of the coastline have always accompanied or preceded inshore hydrography for chart construction and revision. Until the advent of photogrammetry, this work was done by planetable as a combined field operation with the hydrography, and the first planetable survey, still on record in the Bureau Archives, was made on Long Island in 1832.

Similarly, an aeronautical chart is a special map on which aeronautical information is overprinted on a topographic base. Topographic maps of the Geological Survey and other agencies supply a large part of the information for the topographic base for these charts, but special surveys are required by the Bureau in many instances, as for example, for the preparation of instrument approach and landing charts and airport obstruction plans.

Photogrammetry is essentially a method of surveying, and with its rapid development since World War II has become an extremely effective method for large-scale surveying and mapping. The scope of this modern mapping technique is ever broadening with increasing application to special problems and requirements. For example, it is now being used in conjunction with geodetic surveys for the location of aeronautical aids to navigation : in addition to the regular mapping for the construction of nautical charts, it provides a most effective means of revising and maintaining up-to-date land information on those charts. The following papers in this series provide detailed information about the application of photogrammetry to nautical and aeronautical charting and about the detailed photogrammetric methods and equipment in use.

Although the Survey was quite aware of the possibilities of photogrammetry as a surveying tool, it did not find its wide application practicable until the develop-

ment of the airplane and aerial photography after World War I. As early as 1872 an employee of the Survey studied the possibility of using balloons for this purpose, but found it inadvisable. It was recognized that some mapping of this sort had been done during the Civil War, and that more had been done even prior to that time in Europe.

On a limited scale the Survey had participated in terrestrial photogrammetry in connection with work on the Alaska-Canada boundary as early as 1894. One of the early books in the country written on the subject was by J. A. Flemmer, an Assistant in the Survey, who participated in terrestrial photogrammetric work on the Alaska-Canada boundary survey in 1894, and later was assigned by the Bureau to study photogrammetric methods in Europe. In 1919 the Survey used single-lens photographs for the revision of a chart of Atlantic City, and in 1921-22 for mapping the Mississippi Delta. However, it was the advent of multiple-lens cameras that opened the door for wide application of this method to coastal work ; in 1928 the Ten Thousand Islands of Florida were mapped with three and four lens photographs, and until the Bureau completed its own nine-lens camera in 1937 a considerable amount of coastal mapping was done with four and five lens photographs in the early 1930s.

Participation by the Bureau in professional societies and other efforts for promoting photogrammetry as a field is well known. Captain O. S. Reading and others from the Survey were instrumental in the formation of the American Society of Photogrammetry. The Bureau's Topographic Manual is an important source of information about photogrammetric techniques. Many of the Bureau's personnel have been active in the International Society of Photogrammetry, and in 1948-52 Captain Reading was President of that organization. Other participation and cooperative efforts included work done for the National Geographic Society for use in their expedition to the North Pole in 1953. Mr. G. C. Tewinkel of the Coast and Geodetic Survey assisted the Society by making a geometric analysis of oblique aerial photographs taken over the Pole. This recalls a time nearly a half century ago when it was the calculations of Coast and Geodetic Survey mathematicians, Hugh C. Mitchell and Marvin Duval, that proved the authenticity of Admiral Robert Peary's discovery of the North Pole in 1909.

More than half of the Bureau's energy and effort must be devoted to field surveys to gather the essential data required for charting and for its other functions. Photogrammetry is considered, in the Survey, a principal survey method or tool, and though it is relatively new, it is on this 150th Anniversary accepted, appreciated, and used as one of the principal methods of providing essential information required for charting. We are justly proud of our small but active and alert Photogrammetry Division and trust that the readers of this series of articles will find the ensuing papers informative and interesting.