THURSDAY AFTERNOON SESSION

JANUARY 17, 1946

The meeting reconvened at one-five o'clock, Dr. O. M. Miller, President of the Society, presiding.

PRESIDENT MILLER: I suggest that we start the proceedings, for I suspect the other speakers will arrive very shortly. I know, for instance, that Mr. Randall was up in New York yesterday, and has had to come down in a hurry. I know that he will be here at the time scheduled for his talk.

I have several announcements to make before introducing the speakers.

As you know, there is a business meeting tonight at eight o'clock. Everybody is invited to attend, as not only will the business of the Society be reported on, but there are to be some interesting events in the giving of the awards of the Society to the individuals who have won them. We hope that as many of you as possible will turn out for this occasion.

We planned these talks this afternoon so that there should be a period of discussion after all of the talks had been given. Therefore, the six talks will be given first, and then the discussion will be open from the floor. There ought to be, as we planned it, plenty of time for as much discussion as is wanted by the audience on the very important topics we are going to hear about.

The topics, as you can see from your program, concern "Postwar Plans." Our first speaker this afternoon will be Rear Admiral L. O. Colbert, Director of the United States Coast and Geodetic Survey of the Department of Commerce. It is presumptuous on my part to attempt a further introduction of Admiral Colbert, but I should like to say that his experience before taking on the important administrative position that he now holds has been very wide and varied. His earlier duties included command of a number of survey vessels in New England, Alaska, and the Philippine Islands. He was responsible for the extension of control surveys far to the eastward of Cape Cod by means of anchored buoys located by acoustic methods. His administrative positions have included those of Director of Coastal Surveys at Manila and Chief of Production of the Aeronautical Chart Section of the Coast Survey at Washington. He is also Chairman of the Mississippi River Commission. I have very great pleasure in introducing Admiral Colbert.

ADMIRAL L. O. COLBERT: It gives me great pleasure to be able to appear before you today at this first post-war annual meeting of the Society. A discussion of plans for the resumption of surveying and mapping is of particular importance now that the war is ended.

The use of aerial photographs and photogrammetry is well recognized, but too often, the public assumes that an aerial photograph is a map or that maps automatically result whenever photographs are taken. The members of this Society well know that this is far from being a fact.

It has taken two wars to bring aerial photography to its present state of importance. One might almost say that photogrammetry was born in World War I, that it grew up during the following years, and became of age during World War II. In this morning's program, the speakers left no doubt of the valuable use made of aerial photography, both in mapping and in reconnaissance, in the various theaters of the war.

In the Coast and Geodetic Survey there has been a parallel growth of photogrammetry, since the first World War. Immediately after the war, the Bureau began the investigation of the use of aerial photography in connection with its work and since that time, it has been used in an increasing number of projects

until today no coastal project is planned without the use of aerial photographs. The Division of Photogrammetry has recently been organized in the Bureau because of the growth of this phase of the work. In this division has been concentrated all the Bureau's activities in which aerial photographs are used.

The Bureau has a two-fold interest in photogrammetry. First, in connection with the mapping planned by other agencies, and second, in its own operations.

One of the primary functions of the Bureau is to establish the basic horizontal and vertical control of the country. Economic mapping can result only from a well considered program in which the basic control is established in advance of the actual mapping. Any expansion in the mapping activities of other agencies automatically affects our geodetic control program, and the important point to note is that any such expansion would necessarily alter our proposed operations. The Coast and Geodetic Survey should know of the plans of other mapping agencies about two years in advance.

For its own operations, to meet those duties with which the Bureau is charged, there are five major uses of aerial photographs and photogrammetry.

First, for triangulation reconnaissance in areas where adequate maps are not available. Recently, by use of aerial photographs an excellent scheme of triangulation was laid out along the southern coast of the Alaskan Peninsula. It is estimated that the observations and the field work in this area were performed in half the time that would have been required without the use of these aerial photographs. An area across the Peninsula was photographed for a similar purpose. Triangulation observations are planned in this vicinity during the coming summer. Considering the fact that weather conditions are most important to the efficiency of field work of this character, the time saved in the preparation of the reconnaissance results in an appreciable lessening of the costs.

Second, airport surveys. The Bureau uses aerial photographs of areas surrounding important airports as the basis for Approach and Landing Charts which are compiled for military and civilian flyers, under arrangements with the Army Air Forces and the Civil Aeronautics Administration. A particular use of these photographs is in connection with the location and elevation of obstructions along the letdown or glide path.

Third, for inshore hydrographic surveys. Formerly, a detailed and time consuming planetable survey was necessary to locate the positions of numerous rocks and control points along the shoreline for use of the hydrographer in establishing the position of his soundings. Today, these control points and isolated rocks are located photogrammetrically. Practically no hydrographic survey is planned without being preceded by aerial photographs and the compilation of the shoreline surveys.

Fourth, revision of nautical charts. Shoreline and alongshore features of our coastal charts must be corrected for changes which have occurred through forces of nature or by new construction. The coastal part of our country is probably the most changeable part of our topography. It is a well established fact that there are more man-made changes through construction, to say nothing of natural changes, along our coasts than in any other part of the country. Where the Bureau has already made basic surveys of such coastal areas, corrections can be readily applied from aerial photographs. A considerable part of our photogrammetric activities consists of examination of photographs in order to find changes which have occurred in the coastal features and in the application of the corrections to the nautical charts.

With the resumption of peacetime coastal commerce there arises the need

for new hydrographic surveys and basic large scale maps. The Bureau is planning an extension of its photogrammetric work to meet the need for new surveys in these areas.

Because of the widespread use of radar as an aid to navigation, the delineation of various topographic features on our marine charts is assuming increasing importance. By radar observations, the navigator expects to make good his landfall or to determine his ship's position, at night, in fog, or under other conditions of low visibility. Aerial photography will play an important part in supplying the complete topographic information required for radar use with the modern nautical chart.

The Bureau is maintaining an open mind about the most efficient mapping methods, and expects to obtain much valuable comparative data from the use of three different methods—the nine-lens photographs and equipment; the single lens photographs and the multiplex; and the steroplanigraph. It is considered that each one of these methods has its advantages and disadvantages, and that each method will be found to be most suitable for given conditions of terrain and types of maps.

As most of you know, in 1935 the Bureau designed and built its own nine-lens camera which has been used in many mapping projects along the coasts. During recent years special stereoscopic instruments have been designed and built for mapping from the nine-lens photographs. Nine-lens photographs are most efficient along the coasts where most of our work is conducted, particularly where the coasts are badly indented, and where there are many detached off-lying features. The principal advantage of nine-lens photographs is the fact that the large coverage of each photograph reduces considerably the amount of both horizontal and vertical control required. We expect that maps of standard accuracy can eventually be made with nine-lens photographs with about one-fourth the amount of control needed for comparable maps from single-lens photographs.

The Bureau uses single-lens cameras to photograph changes along the coasts where large-scale base maps are already available. It makes use of single-lens photographs in the multiplex on certain projects where there is already dense control and where the configuration of the coastline presents no difficulties.

The Bureau has recently received on loan from the War Department a Zeiss stereoplanigraph which is now being assembled and adjusted for use on large-scale photogrammetric projects. Due to the complexity of the instrument and the lack of personnel in this country familiar with it, considerable experimentation will be required before its advantages can be fully realized.

The Bureau is now engaged on or will soon undertake the following major mapping projects: On the northeast coast of Maine; at the entrance to Delaware Bay; in lower Chesapeake Bay; on the east coast of Florida; along the shores of the Columbia and Willamette Rivers in Oregon; on the northwest coast of Washington; and along the southern coast of the Alaskan Peninsula.

The control work of the country is being extended at what might be termed the normal rate. There is certainly need for a considerable increase in this activity if the various purposes of control are to be properly used in the mapping of the country. At the request of the Corps of Engineers, there is now a concentration of our work in the Columbia River and Missouri River Valleys. For the detailed topographic needs of the Geological Survey and the Forest Service, control will be undertaken in several sections of the country. During the war, the Bureau was active in establishing geodetic control in Alaska where it was needed for military purposes. It is hoped that we shall be able to expand these

control surveys each year in order that we may provide basic control points for the maps of Alaska.

During the past few years projects in surveying and mapping were very properly limited to those areas which were of interest to our military forces, in the promotion of war activities. Some gain in our mapping was made. It is essential now that there be a return to the peacetime needs for surveys and maps and that the work be performed on a more extended scale than ever before. Federal agencies are cognizant of this need.

I would like to recall to you an earlier statement I made in noting that the primary functions of the Coast and Geodetic Survey were to provide geodetic control and to perform coastal charting. To be effective, these functions must be executed in advance of actual needs. Because of its close touch with the many activities making use of these two main functions, the Bureau has a long range program of work which will make use of photogrammetry to an every-increasing extent. In my opinion, there is need for a realization by the public of the inadequacy of the present restricted programs of this and other federal mapping bureaus. It is earnestly recommended that this Society increase its efforts to educate the public on our mapping needs for the economic development of our resources and of the need to provide adequate funds to the various federal agencies engaged in surveying and mapping.

PRESIDENT MILLER: Thank you very much, Admiral Colbert, for a very interesting talk.

Our next speaker will be Rear Admiral G. S. Bryan, Hydrographer of the Navy for the last six years. Admiral Bryan has played a very important part in the war in that to him fell the full responsibility of supplying nautical and aeronautical charts for naval operations. For his outstanding work he has been awarded the Legion of Merit. Admiral Bryan has been one of the Society's best friends and has always had our interests very much at heart. I have very great pleasure in introducing Rear Admiral G. S. Bryan.

ADMIRAL G. S. BRYAN: Mr. Chairman, Ladies and Gentlemen: In this morning's addresses, the inadequacy of the existing maps and charts for global air-amphibious warfare and the great need for trained personnel and equipment for their production was mentioned. The remarkable accomplishments in overcoming a great part of this inadequacy in specific localities and areas was also mentioned. In spite of all that was done during the war, there is still much to be accomplished and much to be desired for world-wide mapping coverage.

Considering the important part that maps and charts played in the war and in the achievement of victory, it is imperative that aerial photography and photogrammetric procedures which are the keys to rapid modern surveying and mapping operations, have a commanding place in our post-war plans.

The Navy is aware of its responsibilities in this particular branch of engineering which is so essential to our security and to our continued national development. These two factors, security and development, indicate that the job before us is one of cooperation and coordination of effort.

We, therefore, are inaugurating a program of photogrammetric research and development which, with similar programs carried out by other branches of the armed forces, federal mapping agencies, industry and educational institutions, should insure that America will continue to lead the world in photogrammetry.

To eliminate duplication of effort, it is essential that coordination be established as the first and most important step which will govern the general planning procedures to be followed by those who are expecting to be engaged in photogrammetric research and development. Although all of us have a common