

ADDRESS OF WELCOME TO THE PHOTOGRAMMETRY SOCIETY

AT ITS MEETING AT THE
HARVARD INSTITUTE OF GEOGRAPHICAL EXPLORATION,
THURSDAY, SEPTEMBER 21, 1950

*Karl T. Compton, Chairman of the Corporation, Massachusetts Institute
of Technology*

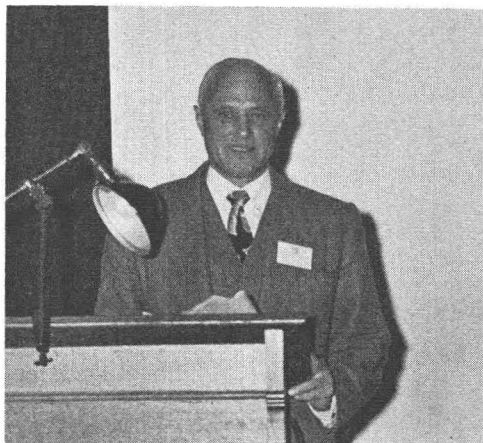
IT IS an honor to welcome, on behalf of the local group, this Photogrammetry Society about whose technical details I know so little, but concerning the exciting possibilities of whose program there is no question. It is particularly appropriate that this Society should meet at the Harvard Institute of Geographical Exploration because the work of the Society is a refinement of the thrilling work of geographical exploration which has continued from the earliest times and whose achievements include much of the most thrilling aspects of man's advancement on this planet.

Although I cannot contribute anything technically useful to your program, the fact of your meeting here has stimulated a train of thought which may be appropriate as the starting point of the meeting. Let me illustrate this train of thought in a personal manner.

In boyhood, doubtless all of you, like myself, read the stories of the great explorers and the adventures of the early pioneers in new territory with fascination. I recall the hours which I spent poring over sporting goods catalogues and the catalogues of Sears Roebuck and Montgomery Ward to make up lists of the equipment which I would assemble for the expeditions to the far west of this country about which I dreamed and planned. I recall my father's comment that I had been born one hundred years or so too late; but was this true?

Vannevar Bush's great book, "The Endless Frontiers," expresses the fact, which we have all come to realize, that the frontiers are ever with us. In the field of geographical exploration the areas open to primitive exploration have more and more shrunk until regions like the Arctic and the Antarctic are the remaining great challenge. But along with the shrinking of the areas of unknown territory there have opened up ever-increasing areas for exploration, where less crude and more technical methods have been developed aimed at the discovery of new values and opportunities which become important only with our advancing state of civilization and competition and which become accessible only through highly specialized scientific progress. In parallel with this trend has come the ever-increasing need of quantitative measurement and technical evaluation.

This trend in the field of exploration, of which the modern work in photogrammetry is an outstanding example, is parallel with the similar trend in other human activities, such as in industrial or agricultural production and dis-



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tribution, in warfare, and really in every aspect of life. The results of your work are as a matter of fact importantly contributory to progress in all these fields.

It was during World War I that the airplane first really became important; and one of its important roles was aerial photography. A former associate of mine at Princeton University was the head of the research and development staff of the British Sound Ranging Service in France. This service was under the Royal Corps of Engineers and was either under or closely associated with the branch known as Maps. I remember a week-end visit with him at his station, just back of the British lines, where I first saw some demonstrations of what could be done by aerial photography. My friend had become very much interested in this field and had worked out some geometrical formulas and had designed some associated equipment for controlled photographic projection. He applied for his military discharge at the earliest possible moment, and devoted the rest of his life primarily to the development of aerial mapping and certain associated applications. My own acquaintance with the field came from my association with him during the succeeding ten years or so on the faculty of Princeton University.

It would seem to me that very few fields offer such an opportunity for the cooperation of scientists and engineers of various specialties as they contribute toward a common objective. The optical and photographic arts are being continually refined. The skilled and inventive designer of precision instruments plays an important role. The applied mathematician finds objectives worthy of his skill. The surveyor and the professional cartographer have at their disposal a new tool of great utility. The geologist is assisted in his search. The military has found these tools of inestimable value in securing the intelligence needed for planning and for operations not only in connection with mapping, but also in connection with the interpretation of terrain secured by both black and white and by color photography.

Some sixteen or seventeen years ago, I had another personal opportunity to learn something about the importance of mapping and the problems relating to the preparation of maps. This was in connection with the Presidentially appointed Science Advisory Board, in which my associates were, the late cartographer, Professor Douglas Johnson, the late geographer, President Isaiah Bowman, and the geologist, C. K. Leith, as they were assigned the problem of studying the mapping services of our Federal Government.

There is another important point which also is illustrated by certain recent experiences pertaining to the field of mapping, but which has wide significance in many other fields. I refer to the competitive aspect in this area of development which becomes particularly important in these days when we are concerned with factors of national security. They illustrate the old adage, "Never underestimate your enemy." They bear on an observation which I had occasion to make several times during my recent tour of duty in Washington, when I was aghast at the honest belief of certain high intelligence officers as expressed, for example, in a question from one of them: "Do you really think that any important scientific discovery or invention is likely to be made anywhere in the world ahead of the U.S.?"

Back in the second half of the 1930's a group of our M.I.T. electrical engineers who had been developing certain techniques and applications of microwave radio became quite excited about the possibilities of utilizing reflected radio signals for the accurate measurement of great distances, as, for example, in mountainous terrain. They developed a process capable of measuring dis-

tance up to many miles within an accuracy of a foot or so. They instituted a patent search to ascertain if the idea were patentable, and found that the same method had been invented and described in Russia a number of years earlier.

Another example struck me forcibly when I was a member of a Scientific Intelligence Group which went into Japan immediately after the Japanese surrender. We were one day examining some Japanese radar developments which were based on a 10 cm. wave magnetron as the power oscillator. This type of magnetron we learned about in early 1941, I think, as disclosed to us by a British Scientific Mission, and the first cavity magnetron brought to America by this mission was described by the historian, James Phinney Baxter, as perhaps the most valuable piece of cargo ever to cross the Atlantic. We tried to find out by what leak from our allies, or by what information from Germany the idea of such a magnetron came into the hands of the Japanese, and were very much surprised to be shown a copy of a Japanese scientific journal which described this magnetron under a date prior to the time when either the British or we knew anything about it.

My point in mentioning these episodes is to illustrate the practical importance, as well as the scientific interest, in pushing the developments of a type in which your Society is interested. Under present world conditions this importance is accentuated on national security grounds by the fact that the areas of conflict, in case we should unhappily be forced into war, will be areas in which our maps and knowledge of terrain are far more scanty than in any other major conflict in which our country has ever been engaged.

These personal contacts have given me from time to time some slight appreciation of the possibilities and interesting character of the work in which you are engaged, but the thing which impresses me most in your activity is the feature which I mentioned in the beginning, namely, that you are exploring and extending an important area of one of these "endless frontiers." I trust that these conferences which begin this morning may bring you the satisfaction and to our society the advantage of definite progress in this area.

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