SYMPOSIUM
NON-TOPOGRAPHIC PHOTOGRAMMETRY
INTRODUCTION

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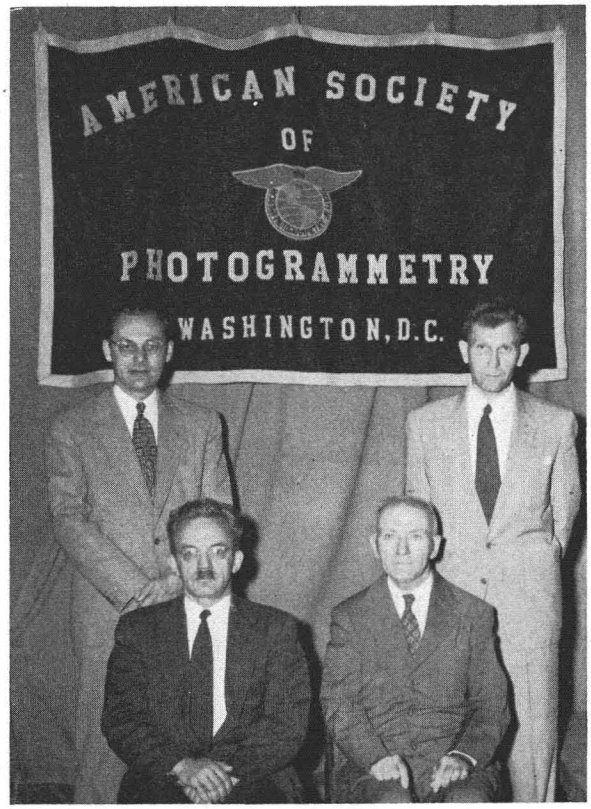
TO MOST of those who are familiar with the word photogrammetry, this word means a method of making topographic maps of the ground from aerial photographs. This application of photogrammetry is however only a comparatively small part of the general concept of photogrammetry. As a matter of fact, there is a tremendous number of possible applications of the science of measurements from photographs and most definitely all of them are not yet recognized.

In some sciences, for instance astronomy, photogrammetry has played an important role for a long time; perhaps it can be stated that an astronomer always is a photogrammetrist, at least a single-eyed photogrammetrist. In many other sciences, promising attempts have been made to introduce photogrammetry as a measuring tool but, except in the case of geodesy, the practical use is



SYMPOSIUM—NON-TOPOGRAPHIC PHOTOGRAMMETRY

Front row—Left to right—Prof. K. B. Jackson, Dr. C. B. Watts.
Back row—Left to right—Frederick J. Doyle, Bertil Hallert (chairman).

still very limited. It is certainly difficult to see the reasons for the slow development of the use of photogrammetry in the great number of possible applications where it would doubtless serve as a powerful tool. Maybe one reason is that the principles of photogrammetry are too little known except among the photogrammetrists themselves. This would mean that there is need to advertise the science and engage in a program of education. Maybe the reason is that the necessary instruments are difficult to obtain or are too expensive. This would mean that the factories making photogrammetric equipment must be encouraged to increase the production of suitable instruments for different purposes, and to make the instruments as simple and cheap as possible.

At the same time we must insist that such simple instruments can be used with good results and we must also show the real quality of the results.

Maybe the reason for slow development in the use of photogrammetry is that our use of time and efforts in producing photogrammetric topographic maps is so great that we have no time to pay attention to measuring problems within other sciences where photogrammetry can be applied. This would mean that we must increase the number of photogrammetrists and particularly give them a broader education than up to now.

In the resolution of Commission V at the International Congress for Photogrammetry in Washington D. C. in 1952, similar recommendations were made. We certainly should go from words to actions in this case; much can be done by combined efforts. I know that this meeting has been organized in order to stimulate such a development.

In this symposium we have tried to collect a number of papers which cover several different aspects of photogrammetry. The paper entitled "Application of Photogrammetry in Structural Research" will show how useful photogrammetric measurements can be in engineering research.

"Photogrammetric Measurements of Spectrograms" may give an impression of high specialization but it is a paper of great general interest since there are many measuring problems that can be treated with the methods described in the paper. Of particular interest is the fact that very good precision can be obtained with such simple instruments as the mirror stereoscope and parallax bar. The old trick of measuring differences as x-parallaxes has again proved to be very useful. The results we have obtained at Ohio State University with similar methods in research and training of students are very promising, as well as for use in aerial as for terrestrial photogrammetry.

The third paper is devoted to "Photogrammetry in Astronomy." Photographic techniques have frequently been utilized in obtaining measures of the distance of the sun and stars. More recently they have been applied to problems relating to the position and figure of the moon, and extensive studies in these fields are now in progress. This paper is certainly of the greatest interest to all of us.

Finally we have a paper concerning theory of errors, which may sound as a dull subject but nevertheless it is of importance for all measuring procedures. We certainly have to know not only the procedures, but also their quality.

There is also a fifth paper, which was not announced in the program. I regret that it is not yet available for reading. The paper demonstrates very well the need for photogrammetric methods for the determination of the shape of rapidly changing features such as shorelines, waterwaves, etc. The paper is by Dr. H. Pincus at Ohio State University; he has made very promising attempts to use photogrammetry in connection with his research work at Lake Erie.

In general I believe that we should pay much more attention to the possi-

bility of using photogrammetry in preserving geometric data of features for future research.

By the way, how about that historically interesting steeple in Boston, that was recently destroyed by a hurricane. Are there good drawings available for the reconstruction? If not, it will probably be very difficult to determine the real geometric shape of the steeple. If good photogrammetric pictures and the necessary control data are available, the reconstruction can be considerably facilitated.

Under present circumstaces, we should set out to establish, as quickly as possible, archives containing photogrammetric data of at least the most important cultural monuments. In this connection, it would be of undisputed value to maintain similar records of the human face.

We cannot prevent the present tendencies of general destruction in this way, but we certainly can give later generations important information about our own age. In this respect, photogrammetry has very much to offer.

AN APPLICATION OF PHOTOGRAMMETRY IN STRUCTURAL RESEARCH*

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IT IS not surprising that those of us who use photographs for only one purpose lose sight of the *basic advantage of the photographic method of analysis* in the maze of accessories which we have accumulated to serve that purpose, and so fail to appreciate how radically *our* standard methods may be modified to meet very different requirements.

The *basic advantage* to which I refer lies in the capacity of a single photograph to provide a record of a multitude of simultaneous events. Whenever this is desirable the photographic method in one form or another is indicated.

The *accessories* may involve an aeroplane at 50,000 ft. or a collimated beam from a spark for a microsecond, or as in the case to be described, merely a few stretched wires. They enable us to obtain the particular kind of photograph we require; while other devices (from Multiplex projectors to micro comparators) may facilitate interpretation, it is the means adopted in *obtaining* the photograph that determine its significance in the solution of the problem in hand.

The problem to be described arose in a research project entitled "Curved Plates in Compression" which was carried out at the National Research Council, Ottawa, during the war. The purpose of the research was to *compare the performance* of curved plates subjected to axial loads, *with the predictions of various mathematical solutions.*

Probably the *only* simplicity in the mathematical approach lies in the assumption that the nominal dimensions of the "test specimens" do actually pertain. *Mathematically*, therefore, for one case there is *only one answer. Experimentally*, however, there will be a *different answer for each specimen* of the same case, due to unavoidable variations from the nominal dimensions and shape of the mathematician's prototype. It will be readily appreciated, for example, that the load carried by a slender column will be seriously affected by the slightest deviation from its nominal straightness.

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