

a world devastated by a cruel war. Let us use this tool which God has given us to the welfare of mankind.

To conclude, I would like to read the pledge made for you by Mr. Leon Eliel.

"I have cast into words for you a pledge for 1941. True democracy has no better example than the International Society of Photogrammetry. A self-governing international organization, it has surmounted the pitfalls of language and race differences; of commercial competition and professional jealousies. Today it is prostrate. We in the American Society of Photogrammetry hold in trust some of the dormant seed from which the future harvests of such democracy may germinate. With the soils of the earth despoiled and turned to desert wastes, we here constitute one of the few oases in which this seed may be preserved and propagated. We shall preserve this seed in readiness for the rich soils of some as yet undiscovered land, to be turned by the share of some mysterious plow, forged, we know not when, nor where, nor how. WE DO PLEDGE OURSELVES."

The time has now come for the fulfillment of this pledge.

PHOTOGRAMMETRY IN THE NETHERLANDS DURING THE OCCUPATION

Mr. B. Scherpbier

REPARCELLATION PLANS

VERY soon after the occupation of our country the normal work of the photogrammetric division of Public Work Survey in Delft (Geodetic Institute) which consisted mainly of making large scale maps for road construction, river improvements, etc. and of aerial triangulation work for mapping of areas outside Europe had to be heavily reduced.

The war brought, however, other work for this department. In 1939 part of our country had been covered by photographs in scale 1:20,000 in order to prepare controlled mosaics in scale 1:10,000. These pictures were used to prepare maps 1:2,500 for cadastral use in connection with reparcellation activities. That is, the exchange and recombination of very small parcels of land subdivided because of inheritance, into larger more efficiently workable parcels.

The maps were made with the aid of the stereoplanigraph and the A5, enlarging optically about $3\frac{1}{2}$ times and $2\frac{1}{2}$ times mechanically by the drawing table gears.

The maps were checked by the cadastral service and accepted by them, the errors not being larger than 0.2 mm. on the map. We had to have a rather large number of ground control points. As a matter of fact, we usually did not succeed in getting the whole model to scale in one setting but had to carry out the scaling for each of the quadrants of the model separately. The greatest trouble we had was with the definition of the ground control points which consisted of ditch crossings, etc. We would have been much better off if we could have had pre-laid markers.

DETERMINATION OF THE HEIGHTS OF HOUSES

We also did work on the determination of the heights of houses of the bombarded sites in Rotterdam and Eindhoven. The compensation of this war damage to the owners was quite a problem. In order to come to a correct figure for the value of the buildings, the Reparation Council used all kinds of information it could get. In instances, the rent paid, the insurance policy, and the tax paid on the property gave average figures.

The Public Work Council in Rotterdam and Eindhoven also had collected over a long time the average price per cubic meter of the various classes of buildings. We had some pre-war large scale pictures of Rotterdam and Eindhoven. The ground plan of the buildings could be measured from the cadastral maps. The heights were measured from the photographs with the aid of a mirror stereoscope with stereometer, and sometimes the stereoplanigraph was used. This gave the cubic measurement of the buildings and produced another figure with which to arrive at the value of the buildings.

A great deal of research work has been done on the stereoplanigraph and the autograph. The results will be published as they become available.

PREPARATION OF DRAWINGS OF BUILDINGS OF HISTORICAL OR ARCHITECTURAL INTEREST

Another work which will also be of use for peacetime problems in our country is the preparation of drawings of buildings of historical or architectural interest. In the 19th century the application of photogrammetry for the preparation of drawings of buildings of historical or architectural value started soon after the invention of the art of photography. It is, of course, attractive to be able to prepare drawings of these buildings without the necessity of building high scaffolds.

The development of stereophotogrammetry opened wide perspectives for this method. Notwithstanding this, the application of stereophotogrammetry for the above purposes has been rather limited. The reason for this is probably that in most of the applications the camera axis has been held nearly horizontal, thereby limiting the possibilities offered by the method. In the scanty literature on this subject, I have found no instance where the exposures were made with a great elevation of the camera axis. By applying these great elevations the possibilities of the methods have been greatly increased. The difficulties which these great elevations entailed were solved in Delft after some troublesome days of work.

In 1939 a camera-theodolite was constructed by order of the Geodetic Institute of the Bureau of Public Works in consultation with the Director of the Bureau of Monuments.

The idea was to photograph those buildings of historical or architectural value in the Netherlands of which no accurate drawings existed, in order to be able to rebuild or repair these buildings in case of damage by accident or acts of war. A start was made with those buildings which were situated in the area where the risk of damage by acts of war was deemed the greatest, namely in the western provinces. In addition, the remnants of the Laurens church in Rotterdam, which was damaged severely by the bombardment of Rotterdam in 1940 by the Germans, were photographed, as it was hardly possible to prepare drawings of the remaining parts in any other way.

The advantage of the photogrammetric method appeared very clearly for this work, for it was not necessary to elaborate the photographs directly. All photographs were taken and ground surveys were made of these buildings, but the making of the drawings could be put off until a later date. Of the photographs, glass copies were made and these were stored in fire- and bomb-proof cellars together with the copies of the ground surveys.

PHOTOGRAPHING APPARATUS

The photographing apparatus consisted of a photogrammetric camera mounted on a theodolite. The camera which was provided with a vertical circle,

could be replaced by a telescope with vertical circle. The pictures were taken on glass plates which were pressed against a focal frame with fiducial marks during the exposure.

Before photographing a building a traverse system was surveyed around and within the building to the exposure points of the camera which were tied in by measurement of direction and distance.

On each photograph a number of control points had to be determined and these points were also tied in by measurement of directions from at least two stations. The coordinates of the points were computed in a special coordinate system based on the planes through the main axis of the building. The orientation of the camera axis at each exposure was also determined by reading the horizontal and vertical circles.

The coordinates of the control points and the orientation of the camera were thus obtained in one system, to be used for the three projections of the building. The surveying of control points had to be done very accurately, in fact, it was a 5 millimetres business. The orientation data of the camera were used when orienting the pictures in the stereoplanigraph or the autograph as a rough guide in order to obtain stereoscopy quickly for the final relative orientation.

ORIENTATION OF THE PICTURES

The orientation of the pictures caused many difficulties, especially owing to the great elevations of many pictures and the depth great of the picture which was very often of the order of 50% of the flying altitude, speaking in terms of aerial survey.

It appeared to be necessary to have in each plane of the stereomodel a sufficient number of control points so that absolute orientation could be effected, one plane of the stereomodel after the other. The number of control points was on an average 4 per picture or about 8 per stereomodel.

Of those buildings of which drawings were required immediately by the Directorate of Monuments, drawings were prepared on a scale of 1:100. Plans as well as elevations and cross-sections can be prepared from the photographs.

The stereoplanigraph was used for the pictures with large elevation of the axis and both the Wild A5 and the stereoplanigraph were used for the other pictures.

The scale of the pictures varied from 1:400 to 1:50. In all, about 14 buildings were photographed during the war period, for which 1,400 pictures were taken.

The method was also used to make drawings of the frontviews of rows of houses along canals and streets. These drawings were prepared in order to judge whether any proposed alteration or new building would not spoil the architectural beauty of the street. In the future a large field of work may be opened for the application of photogrammetry for this latter purpose.

PROSPECTS FOR PHOTOGRAMMETRY IN HOLLAND

The prospects for photogrammetry in Holland are favorable. We expect to have quite a lot of work in large scale mapping for reconstruction of the devastated areas, for the improvement of the dikes along the rivers, for planning and also for the above architectural drawings. Of the areas photographed in the Netherland East Indies, contour maps will be needed for which the A6 will be employed largely.

PHOTOGRAMMETRIC WORK DONE IN THIS COUNTRY DURING
THE LAST FIVE YEARS

I have been asked to say a few words regarding my impression of the photogrammetric work done in this country during the last five years.

We have been starved for news on new developments in photogrammetry during these years and without having gone through such starvation, you cannot imagine how we devoured the *Manual* and the PHOTOGRAMMETRIC ENGINEERING which reached us a couple of months ago.

The developments I saw here during my visit were quite spectacular, that is, trimetrogon, the large number of multiplex plotters, and the large area covered. In one way, I was a bit disappointed. In 1931 I made a trip through this country for the study of road building equipment. I felt quite amazed when seeing the work done by bulldozers, trail-builders, carryalls, and draglines, in eliminating most of the spade and wheelbarrow work. I was not astonished to hear of the great work done by this equipment in all the theaters of war. What I expected when coming to this country this time was a similar development of photogrammetric equipment, but you will forgive me in saying that quite a lot of spades and wheelbarrows are still applied.

I trust you will find more time for scientific development for peacetime work. With all the possibilities of the use of radar, electronics, etc. and the great number of able scientists at your disposition, and your penchant for practical application, you'll surely give us something in the near future of which we will be amazed in the same way I was at your road building equipment in 1931.

I gladly make use of this opportunity for thanking you for all the kindness shown to me during my visit by all photogrammetrists I have met and for the valuable information I obtained from you which will be of great help for the reconstruction work we have to carry out in my country.

ANNOUNCEMENT

All dues payments and all subscription payments for the year 1946 are due not later than July 30, 1946. Members whose dues are *not* paid by that date will revert to an inactive status and their names will be removed from the mailing list. The same applies to subscribers. Restoration to the active list can then only be accomplished through application for reinstatement.

It is hoped that all those who have not already done so will forward their payment in the near future, so that no one's name will have to be removed from the active roster on July 30.