

in obtaining it. The methods of extending ground control should be understood and problems in radial plots should be worked by the student.

The uses and limitations of mosaics should be pointed out. The student should have practice in laying both uncontrolled and controlled mosaics. The various techniques of laying mosaics should be pointed out and methods of "dressing up" the mosaic illustrated.

Photo interpretation should be covered sufficiently to enable the student to readily identify terrain features, type of vegetation and construction by man. He should be able to identify various types of road surfaces. Some work on soil identification is desirable.

In many cases mapping work may involve the revision of existing maps. For this reason it is believed advisable to give the student some practice in revising existing maps from aerial photographs with the view of teaching him how to take advantage of the existing information on the map as control. The methods of transferring the detail from the photograph to the map and correcting for displacement due to tilt and relief should be understood.

It is not necessary for the student to have a detailed knowledge of the problems involved in taking the photographs. He should know the standard type cameras in use and sufficient understanding of procedures and methods to enable him to make cost estimates. He should know what qualities are desired in the final product to enable him to write specifications for photo coverage.

In a limited course it is not believed advisable to spend much time on ground photogrammetry or mapping from high oblique photographs; while both are important, their use is limited.

In the study of the theory the practical applications should be pointed out and wherever possible the theory taught by the use of practical problems.

## PHOTOGRAMMETRY OFFERED AT PURDUE UNIVERSITY

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SOME interest has been expressed with regard to the background or reasons for offering a course in photogrammetry at Purdue University for the academic year 1948-49. The interest has taken the form of several direct questions. My answers to those questions are perhaps as good a way as any to tell about the course.

One of the leading questions was "Why was it decided to inaugurate the course?" Strictly speaking, the course is not being inaugurated this year, since the foundation was laid several years ago by Professor M. C. Todd. Considerable appropriate elementary equipment is on hand: Professor Todd had received instruction at the plant of the Abrams Instrument Company in Lansing, Michigan; and, in general, the course had been started in a small way, when ill health overtook him and brought about the abandonment of the course. Since that date, it has been the intention of the Civil Engineering Department to get the course under way, as soon as someone on the staff was in position to go ahead.

Upon retirement from the U. S. Coast and Geodetic Survey a year ago, I returned to my Alma Mater with a background of 33 years of field work in most of the branches familiar to all Coast and Geodetic Survey officers. It was understood that my employment contemplated making some practical use of my experience. Since Indiana is an interior state, geodesy was the obvious outlet, particularly as the U. S. C. & G. S. has increased the intensity of the control net of the State in the past few years. It was felt that if this net were to be made

useful, the engineering students should at least understand what it is all about; and, since a high percentage would eventually return to their local communities, they would become the instruments for making better use of that control. Also, with the U. S. Geological Survey engaged in a stepped-up program of topographic surveys over the state based upon this geodetic control, and using aerial photography very largely in the process, there was a corresponding need for instruction in photogrammetry. To this there may be added the particular application of aerial photography to the study of soil erosion, in which branch the Civil Engineering Department has been doing work for several years. Furthermore, many students had already obtained some knowledge of aerial photography during the war and were interested in it as a part of their surveying equipment.

These factors, therefore, led the Civil Engineering Department at Purdue to decide to unite the geodesy course with one in photogrammetry, as an elective course for seniors; geodesy to be taught in the first semester, or half a year, to be followed by an equal amount of photogrammetry in the second half year.

Since the course is, at present, an elective one, approximately the same amount of time and credit are devoted to it as accrue to other elective courses, namely, one hour of lecture on theory, together with a three-hour laboratory (field) period each week. The future will determine if the course justifies an increase in this stated time and credit. We hope that, as the importance of the control net and its accompanying topographic surveys become more familiar to the graduates and the people generally throughout the state, there will be an increased demand for such instruction. With so many colleges offering photogrammetry in their curricula, the consensus seems to be that this demand in Indiana, as well as elsewhere, will increase as time goes on.

There was no opposition to starting the course so far as is known, and since it seems a natural supplement to the first semester course in geodesy (or higher surveying), there were no scheduling difficulties.

As to special equipment, enough is already on hand to effect a good start. If the course does develop as hoped, it is anticipated that there will be little difficulty later in acquiring some more complicated instruments, although it is not to be expected that the highest type will be used due to the cost and the relatively elementary nature of the course.

If it is available, it is expected that the *MANUAL OF PHOTOGRAMMETRY*, published by Pitman, will be used as a textbook, supplemented by other comprehensive works including the War Department *Aerial Phototopography* (TM 5-240). Purdue, like all colleges at present, receives material assistance from the G. I. Bill of Rights in providing textbooks for its G. I. students, who constitute about half of the student body.

An element of added interest to the Photogrammetry Course at Purdue is the prospect of making a practical application of what is learned. By arrangement with the Division of Geodesy of the U. S. C. & G. S., two first-order triangulation stations will be established in the autumn of 1948 at widely separated points on the campus, supplementing one station already available. These three basic control stations are to provide a basis for a local scheme of triangulation covering the Purdue property. It is the intention to have the class in Geodesy execute this scheme as a part of its instruction. In the succeeding semester, these same men will take up photogrammetry and, using this control, together with aerial photographs taken a few years ago, it is hoped that a map of the campus will result, though no doubt several years will be consumed in the process.

The instructor, meanwhile, is fortunate in having the encouragement of a sympathetic Civil Engineering Department.