thanks to his wife for her help in compiling the data from the questionnaires. Thanks are also due to Mr. Fred Doyle, Prof. Robert Brock and Mr. C. E. Palmer for their help and suggestions during the performance of this survey.

BIBLIOGRAPHY

1. Brinker, R. C. "A Study of the Status of Photogrammetry in the Engineering Schools of the United States and Canada," PHOTOGRAMMETRIC ENGINEERING, Vol. XVII, No. 3 (June, 1951).
2. McEntyre, J. G. "The Status of Photogrammetry in the Educational Institutions of the United States," PHOTOGRAMMETRIC ENGINEERING, Vol. XXIV, No. 2 (April, 1958).
3. Turpin, R. D. "Some Trends in Photogrammetric Education in the United States," PHOTOGRAMMETRIC ENGINEERING, Vol. XXVI, No. 1 (March, 1960).

*A New Approach to Surveying Education**

J. E. COLCORD,
Assoc. Prof. of Civil Engineering,
Univ. of Washington, Seattle 5, Wash.

THERE is continued interest in surveying education if recent articles in the professional journals are true indicators. This interest has ranged from the number of hours available in the curricula, also what is wrong or right with our teaching, and furthermore where surveying education should be taught. One of the best résumés of this total problem was presented in abstract to the 22nd Annual Meeting of the ACSM by Professor K. S. Curtis of Purdue in his paper entitled, "The Case of the Missing Curriculum."

The author prepared this paper for this ASP meeting only because there is now a working plan under his direction to assist in solving the serious problem of the best possible instruction in this subject area under current curricula.

J. E. COLCORD

One of the deficiencies attributable directly to the decline in quality of the surveying offering in the 1940's is the lack of solid theoretical background material available to the instructor who now finds himself placed in charge of instruction in this area. There is a current trend toward resurgent strength in the graduate area as shown in the offerings at The Ohio State University, Cornell, University of Illinois, Purdue, and other forward-looking schools. However, these programs require a supply of good, interested students with sufficient background to begin true graduate work in Geometronics. Thus, it is obvious that there is need for competent and informed instruction in the undergraduate offerings whether it be given in Forestry, Geology, Civil Engineering, or in a separate department of Surveying. For this reason the University of Washington, in cooperation with the National Science Foundation, is offering an eight weeks Summer Institute in Geometronics for college teachers of Surveying and Photogrammetry.

The Institute objectives are obvious—that is to *advance the theoretical training of teachers* who are specializing in teaching of surveying and photogrammetry so that they will be familiar with the current research and the

* Presented at March 24–30, 1963 ASP-ACSM Convention, Hotel Shoreham, Washington, D. C.

EDITOR'S NOTE: The Abstract for this paper is in the YEARBOOK, page 478.

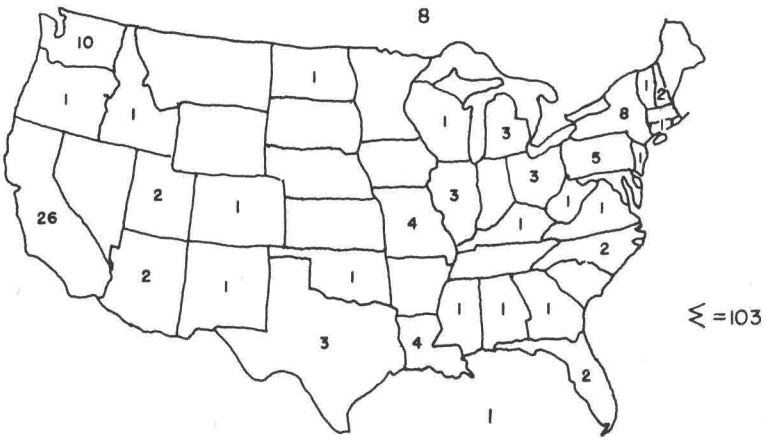

FIG. 1. Inquiry distribution.

changing emphasis in these disciplines due to the requirements brought on by developments in space science and the basic control problems encountered by our country's global humanitarian commitments.

The Institute plans to have a *program* divided as follows:

1. *Geodesy*—first four weeks
2. *Photogrammetry*—second four weeks

Included in these sessions will be lecture material on statistics and error analysis, electronic measurements and data processing, and discussions of recent research and development as it applies to both geodesy and photogrammetry. The *planned course descriptions* are as follows:

1. *Geodesy*—Instructors deJong, Colcord, Veres
   Introduction to the problems of physical and geometric geodesy; the potential attraction and gravity observations; reconnaissance for triangulation, trilateration and traverse; computations in plane coordinate systems, on the sphere, and on ellipsoids of reference; elements of adjustment computations, including formation of observation and condition equations and their solution by matrices; methods and analysis of data from electronic measurement techniques. The basic text will be *Geodesy*, Hosmer, 2nd Edition.
2. *Photogrammetry*—Instructors Moffitt, Colcord, Veres
   The geometrical characteristics of photographs and photogrammetric equipment, including problems of flight planning and control considerations, measurements in photogrammetry and computations for position determination; consideration of accuracies and errors; introduction to the basic principles of air-photo interpretation, including techniques of study of landform and the evaluation of terrain for engineering and scientific purposes; the application of photogrammetric principles to plotting instrument design and usage, model deformation errors of X and Y and the relationship of aerial triangulation to current control. The text will be Moffitt, *Photogrammetry*.

These courses will be offered as lecture lab courses. The lectures will be conducted in the mornings and early afternoon followed directly by a carefully supervised laboratory session, at which time the students will apply the principles of the lecture to actual problems, either computational or field, or gather data for future problems. Incidentally, there has been wonderful cooperation with the equipment manufacturers and there will be available many of the latest designs in geodetic and photogrammetric equipment.

One of the real problems of any institute, as the Director soon learns, is the *selection of participants*. This institute used the following as a guide in selection:

> The criteria of eligibility to be used in selecting participants has no limitation on age, sex, or geography. Specifically, the selected persons satisfy the following minimum conditions:
>
> 1. They have taught for three years or more at their institution.
> 2. They have at least a Bachelor of Science degree with the emphasis on engineering or physical sciences.
> 3. They have deficiencies in their theoretical background for teaching in the area of surveying, photogrammetry, or geodesy.
> 4. They have a prime interest in continuing their teaching in these areas, and will be teaching at their institution in 1963.

The institute received 103 inquiries for data on the courses and application forms. These inquiries have an excellent geographical distribution as shown in Figure 1. The program was advertised through the general National Science Foundation brochure, various profes-

FIG. 2. Participant distribution.

sional newsletters and through the Institute brochure, prepared at the University of Washington and distributed to all engineering colleges in the United States and Canada and to members of ASEE, ASP, ACSM, and CIS who appeared to be interested in surveying education. This mailing list totaled about 800 of which 382 were addressed to specific individuals.

The next step for the participant was to submit formal application and references. Our institute had 49 faculty who were formally considered for participation in the course. Of these, I had to pick only 24 to best serve all interests in surveying education. Formal offers and acceptances have been received from 24 faculty having the geographical distribution shown in Figure 2. The author, of course, hopes that all these will be able to attend and was very pleased with the high percentage of acceptances.

It may be of interest to those who have under consideration future offerings of similar institutes to take a look at our "average" participant. He is 44 years old with about 10 years of college teaching experience, and has had about 12 semester hours of undergraduate surveying and three of graduate training in this area. Incidentally, he will travel over 1800 miles one way and bring 2.9 dependents.

The Institute staff, Syb deJong (UBC), Frank Moffitt (U. of Cal.), Sandy Veres (Purdue) and the author, are really looking forward to this summer and hope it will be an informative and productive session for all concerned. The author personally plans to gain a great amount of knowledge from sharing personal experiences. This knowledge will assist all of us in offering stronger required undergraduate courses in Geometronics, and thus provide the good students for graduate work needed to become truly professionally qualified in Surveying, Geodesy and Photogrammetry. There will also be some "experts" available as guest lecturers in their specialty area; it is hoped this important part of the program will be developed fully. In addition to the formal course work and lecture-problem sessions, there will be some fine educational field trips planned to facilities such as the Pacific Science Center and local photogrammetric and surveying organizations. In addition, the possibilities of pure recreation found in abundance in the Evergreen State will not be forgotten.