

GEOLOGICAL SURVEY
CIVIL WORKS PHOTO-MAPPING PROJECT F-58

by
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This was a mapping project having for its primary object the employment of men. The secondary objective was the production of maps showing the physical features of the area mapped together with property lines, ownership names and the acreage of each, in selected counties of nine States. The maps were plotted to the scale of 1:24,000 on seven and one half minute sheets. They were for the most part assembled in the form of controlled photographic mosaics.

The project was approved December 8, 1933. Actual work was commenced December 13. It was concluded July 1, 1934. Approximately 700 men were given employment for that period. Property maps or rather mosaics were completed covering 5,900 square miles and topographic maps, without property data, covering 350 square miles; a total of 6,250 square miles.

Where existing aerial photographs were available, these were used. Where this was not the case, contracts were let to commercial firms for the necessary aerial photography. Both single lens and five lens photographs were used.

The existing horizontal control of both the U.S. Coast and Geodetic Survey and that of the U.S. Geological Survey was supplemented by transit traverse circuits having a specified limit of closure error upon the existing Government control points of 1:5,000, except in Leak County, Mississippi, where approximately 80 miles of traverse have an accuracy of closure of 1:10,000.

Two thousand, three hundred and thirty lineal miles of transit traverse were run, controlling 8,030 square miles of area, giving a ratio of 3.5 square miles controlled for each lineal mile of traverse. Four hundred and seventy-six permanent monuments were set, or one monument for each 4.7 miles of traverse. Geodetic position for the traverse monuments was computed.

The average cost of the control traverse was approximately \$19.00 per lineal mile or \$5.42 per square mile controlled. The average cost of the property map was \$25.00 per square mile, exclusive of control. This includes the field work of getting the property lines, ownership names, laying the mosaic, computing the acreage and the drafting. These costs are given as a matter of interest rather than with the thought that they may be of any real value. My experience has been that average costs have very little value when applied to some other job. Each mapping job is a particular problem with such widely differing requirements that average costs of some other job are of very little real value. Control traverse costs vary greatly with the different character

of the country and conditions of the roads; property data costs vary widely, dependent upon the nature of the land use and the condition of the land records, and finally, but not least, upon the intelligence of the occupants of the land. For example, on this particular project, the control traverse costs are admittedly higher than they should be due to the fact that the primary object of the project was to get men to work as rapidly as possible. The result was that we started men to running traverse without any coordinated plan as to just where the traverse should be run to best control the aerial photographs. To have waited for the photographs and then plan the traverse as best suited to control that particular photograph, would have delayed for many months getting a majority of the men to work. We had to run the traverse first, hoping that it would serve to advantage. I am convinced that, in many cases, there was 50% more traverse run than there would have been if it had been properly planned.

This project was carried on under the supervision of the U.S. Geological Survey. One man was detailed from the U.S. Geological Survey for this purpose. He was not, however, relieved from his regular duties with the Survey and was a busy man working overtime, day and night. All other men engaged on the project were taken from unemployed rolls.

The organization for planning and supervising this work was as follows: 1 General Supervisor, 1 General Supervising Engineer, 9 Supervisory Engineers, one for each State with headquarters located within the State. The State Supervisory Engineers selected by giving weight only to the following qualifications; honesty of purpose, executive ability, knowledge and experience in mapping work.

Upon the folding up of the C.W.A on July 1st, the project was stopped, all traverse data and computations, all completed maps or mosaics and all photographs were shipped to the U.S. Geological Survey in Washington where they now repose, rapidly getting out of date and their usefulness gradually becoming less and less. There has been no money allotted for their reproduction and distribution to those persons in the different counties to whom they would be of great value. The project was sponsored by the Agricultural Adjustment Administration and the Bureau of Census and never contemplated reproduction and distribution to the various counties involved nor to the general public.

The project is especially interesting in that it shows that with proper supervision by men experienced in mapping, mapping projects can be carried forward using unemployment relief workers at very slight increase in cost over that where previously trained workers are employed. Such mapping projects are well suited to unemployment relief, in that approximately 90% of the money spent goes direct in salaries. The value of these maps to the public lies in their use as tax maps, forming an accurate basis for tax assessment; to the highway department, to the land owner and the general public as a basis for formulating any plans pertaining to the development and use of the land. The monumented system of horizontal control can be made

of great use to the land surveyors and the highway department if their position is computed in reference to a rectangular system of coordinates constant for each county or convenient group of counties, and also if at each monument bearing or azimuth is read and recorded to one or more prominent objects, or to reference monuments from 200 to 500 feet distant. Such azimuths were read at each traverse monument. Where there were no existing suitable natural objects, reference monuments were set for this purpose.

There is some danger of discredit to the photo-mapping industry where such projects are attempted without proper direction and supervision by men trained in the use of aerial photographs and their application to mapping. Such work requires special training and experience, absence of which means either failure of the project or added expense in acquiring the training. In this connection, I would like to mention one proposed mapping project of this character where it was proposed to make a map of a county on the scale of one inch equals 400 feet, using aerial photographs, in which after putting on the property data, the contours were to be put on by enlarging the mile-to-the-inch U.S. Geological Survey map of the area and transferring the contours from this enlargement. Supervision of this project was to be by a man who had never had any previous mapping experience.

In conclusion I desire to express the belief that in the execution of mapping projects, the object of relief employment can be best served, at the same time insuring to the public a better product, if the Federal Agency in charge will have proper specifications drawn and let the work by contract to the existing qualified private mapping agencies. I believe such a procedure entirely practical and in the best interest of all persons concerned. I put forward this statement in the hope that it will arouse wide discussion of the reasons for and against such a proposal.

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LESSONS OF THE EXPANDED PHOTO-MAPPING WORK OF THE COAST AND GEODETIC SURVEY IN RELATION TO PLANS FOR ACCELERATED MAPPING

by O. S. Reading

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About a year and a half ago, I was ordered to New York City on what seemed at the time a rather doubtful mission. It was to organize a small photo-compiling party from unemployed engineers. After looking over the many applicants, the prospect seemed still more dubious, for there was not a single topographer or full-time surveyor among them. But I still have a hollow feeling around the diaphragm when I think of those men. Clean-cut, intelligent engineers who had been earning three hundred to a thousand dollars a month before the depression. There were also some youngsters, a couple of years out of college, with Phi Beta Kappa keys, all facing a world that had no use for their services. They did not say so at the time, but I learned from later questions that all had long since given up their telephones, and most had seen their