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THE NEED FOR COMPLETING OUR WISCONSIN TOPOGRAPHIC MAPPING

by

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THE NEED FOR COMPLETING

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WISCONSIN TOPOGRAPHICAL MAPPING

for

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By. E.F. Bean, State Geologist

The uses of topographic maps are so apparent that it seems unnecessary to discuss that subject before an audience of engineers. A few of these uses will, however, be outlined.

1. Highway construction. A good topographic map makes it possible to determine the most feasible route between two points thus greatly reducing the cost of preliminary surveys. Building on the proper route will effect large savings in the construction cost. Each topographic map available in advance of construction in the rougher parts of Wisconsin will save its cost in the one item of highway surveys and construction. We have felt the need of this information so keenly that an arrangement was made whereby a strip along a highway was mapped first in order that the strip map could be made available before the completion of the quadrangle.

2. Railroads. We are not building many railroads at present, but the railroads do use the existing maps for determining drainage areas when placing drainage structures.

3. Hydraulic engineering. Topographic maps are useful in the planning of dams, and of transmission lines. If maps are not available, the increased surveying cost must eventually be borne by the public.

4. Drainage engineering. Good topographic maps are of great value in the consideration of drainage projects. If maps are not available, a reconnaissance survey must be made before the feasibility of the project can be determined.

5. Soil surveying. Having a good topographic base, the making of a soil map proceeds much more rapidly than in an area where the surveyor must make his own base. The topographic data renders the completed soil map far more useful.

6. Geological work. Topographic maps are very useful to the geologist. When making a search for road materials, the geologist is enabled to concentrate his search upon definite areas where he may expect to find quarry sites in shale or limestone; upon an outwash terrace, a glacial lake beach, or a ridge where gravel may be found. In all other types of geological work, the topographic map is a very useful and in many cases absolutely essential base.

7. Sanitary engineering. In planning a sewage or water supply system a topographic map is necessary.

8. Forestry. In planning any system of reforestation, topographic maps will be of great use.

9. Educational uses. Teachers having a good topographic map of their area are able to arouse far greater interest in the study of local physiography, geology, and geography. The student soon learns to make a wide use of the map not only in the classroom but also on field excursions, and pleasure trips. At the present time but four of the Normal Schools have a topographic map of their vicinity.

10. Tourist uses. Wisconsin has been properly entitled the "Playground of the Middle West," yet large areas of this playground have never been adequately mapped. Such maps would have great value to the vacationist in planning hunting, fishing, hiking, auto, and canoe trips.

11. Use by state commissions. One instance will illustrate this great need for topographic maps. There is a problem of flood control in the Wolf River valley. No topographic maps of this area are available. Without such maps it is impossible for the Railroad Commission to determine what relief measures are feasible.

The discussion of uses indicates clearly that maps are necessary; that in many cases maps will be made at private or public expense; in some cases several maps will be made of the same area. The public ultimately pays the bill and does not have a map to show for the outlay. The American Society of Civil Engineers has made the following statement: "The saving in cost of projects to be constructed in the next decade will more than offset the expense of making standard topographic maps."

What progress has been made in completing the topographic map of the state? The first topographic maps in Wisconsin were completed in 1887. Up to the present time, 53 standard 15 minute, 1 inch to the mile quadrangles and five thirty minute half inch to the mile quadrangles have been completed. The latter are not very useful and should be re-mapped on the standard scale. For some time work has been concentrated in the Western Upland, where there is immediate need for topographic maps for highway construction and for soil mapping. The average cost,

exclusive of engraving and printing of the last ten quadrangles is $8,237.98. Of this the field work is 88%, the office work 12%. The average cost per square mile is $37.91. When it is considered that the topography is difficult, that the work on some quadrangles was spread over several seasons in order to serve urgent needs of the Highway Commission, that the quality of the work is excellent, these figures appear reasonable.

There remains an unmapped area of over 200 quadrangles. If we proceed at the same rate as we have during the last few years, the topographic map of the state will be completed in about 55 years. In the meantime, the public will have paid for an enormous amount of necessary mapping and still have no map.

We have been interested in aeroplane mapping. This method appeared to have several advantages:

1. Wooded or swampy areas, and those with few roads could be more easily mapped.

2. We believe this would be an economical means of revising old topography.

3. This seemed a convenient method of getting data needed on very short notice.

4. We believe this method might effect a considerable reduction in the cost of the topographic map. The plan was to use an Army plane with an Army aviator and a trained U.S.G.S. photographer.

We found that the U.S.G.S has a hard and fast agreement with the Army Air Service that they will not furnish aerial photographs to anyone outside the Geological Survey. The reason for this is that private aerial picture companies have criticised the Army Air Service as competing with private companies. A private company made an estimate

of $60 per square mile for an aerial mosaic of a region in which we were interested. An aerial survey of 513 square miles in the Mississippi delta was made by the Coast and Geodetic Survey at a cost of $25.93 per mile. During the past season an aerial survey of the Mississippi River above La Crosse was made. We believe this will reduce the cost of mapping the channels and marshes along the Mississippi and result in a more accurate map.

Topographic mapping is carried on in cooperation with the United States Geological Survey each paying one half of the field and office expense of preparing the maps for the engraver. The expense of engraving and printing is borne entirely by the United States Geological Survey.

The Temple Bill which passed Congress in 1924 provides a definite program for the completion of the topographic map of the United States in 20 years. The estimated federal expenditure is $57,200,000. With $12,000,000 estimated as the state cooperation, the total cost will be $49,200,000. The present status of affairs is that the Director of the Budget opposed the scheduled appropriation of $950,000 for the next fiscal year. He recommended that but $477,000 be appropriated to the United States Geological Survey for topography. On January 9th the House passed the Appropriations Bill carrying an item for topographic surveys of $525,000. Unless the Senate helps to save the situation, the twenty year plan contemplated by the Temple Bill will be nullified by lack of appropriations. We are all in favor of true economy, but cutting this appropriation will not result in ultimate saving for the people of this country.

The State Geological Survey is alloted not to exceed $15,000 per year for topographic mapping. This appropriation should be increased to at least $25,000 by the next legislature. It would be of great assistance if this body went on record -

first - as favoring federal appropriations to carry out the provisions of the Temple Bill.

second - as favoring an increased state appropriation for topographic mapping so that this state can keep pace with the rest of the country in the twenty year program.