

PREPARATION OF GEOLOGIC MANUSCRIPT MAPS FOR REPRODUCTION IN SEVERAL COLORS ¹

F. J. Buckmeier
State Geological Survey, Vermillion

INTRODUCTION

This paper is presented to explain the procedure used by the South Dakota State Geological Survey in preparing geologic manuscript maps for reproduction. By definition, a geologic map is a representation on a plane surface, at a given scale, of the geologic and artificial features of a part of the earth's surface by means of signs, symbols, and patterns.

DRAFTING TECHNIQUES

The geologist uses air photos in his geologic mapping. He plots his field data on these photos and later transfers this information to a manuscript map at the scale of the photos (1:20,000). After the field work has been completed and plotted on the manuscript map, the latter is ready to be drafted for reproduction. These manuscript maps cover an area of 15 minutes latitude by 15 minutes longitude, and contain 212-219 square miles; the size increases across the State from north to south.

The method of drafting used by the State Geological Survey is color separation drafting with overlays. The geologic maps are published in five or more colors. For each color a separate tracing is drafted with black ink on sheets of white tracing cloth. As the first step for each color sheet, registration marks are inked on each of the corners. This is done to enable the printer to aline the various plates so that the colors register perfectly, without overlapping.

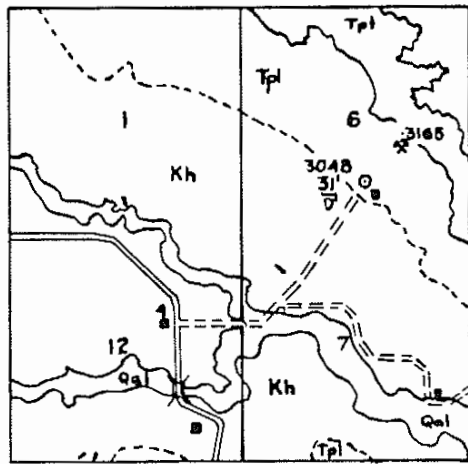
All information to be printed in black is drafted in black on the first (or black) sheet. This includes the borders of the quadrangle; the section lines; cultural features such as roads, houses, railroads, schools, and churches; the lettering; and most important, the geologic features (Fig. 1a).

The second (or blue) sheet, drafted in black, is the drainage, including all features that are to be printed blue on the finished map, such as rivers, streams, lakes, and intermittent lakes (Fig. 1b).

The next (or yellow) sheet, drafted in black, represents recent deposits. This is printed in yellow on the final map and patterns show alluvium, loess, terrace gravels, and dune sand (Fig. 1c).

The next (or orange) sheet, drafted in black, represents deposits of Tertiary age (Fig. 1d).

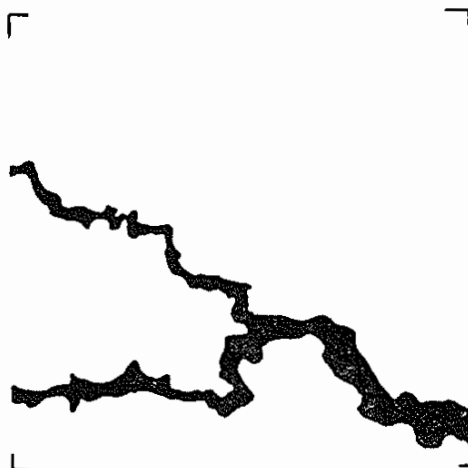
¹Publication authorized by the State Geologist.



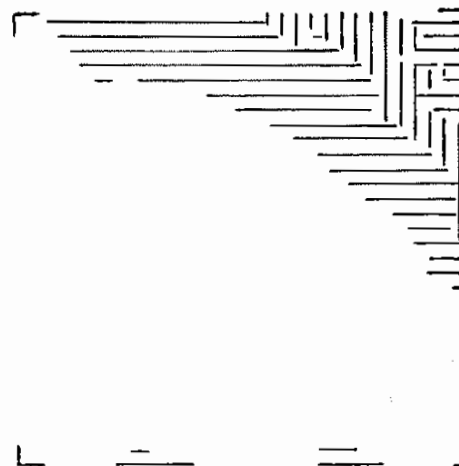
a. Black



b. Blue



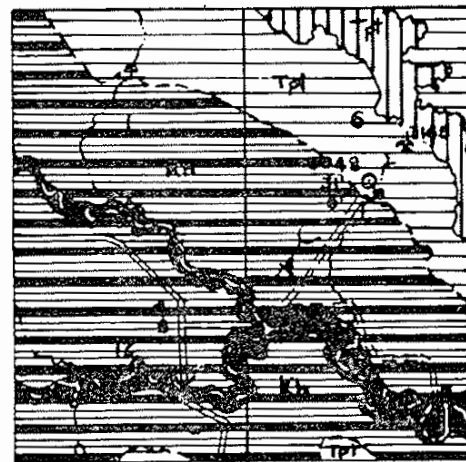
c. Yellow



d. Orange



e. Green



f. Composite

Figure I. Color Separation Sheets

The fifth (or green) sheet drafted in black, represents all Cretaceous geology, which will be printed in green. The patterns represent mapped units of the Cretaceous system (Fig. 1e).

LEROY drafting instruments (supplied by Keuffel and Esser Company) are used for the speed and accuracy required by the South Dakota Geological Survey. Lines of nearly any weight, of uniform width, can be drawn with the different sizes of LEROY pens. With LEROY templates and scribes, uniformly neat letters of the desired size are produced.

MAP EDITING

When all the sheets have been drafted they are ready to be edited. The sheets are placed together on a light table and alined with their registration marks. A re-edit is made by another person to provide a double check. The sheets are then sent to a lithographic company for reproduction at a scale of 1:62,500 or approximately one inch to the mile (Fig. 1f).

CONCLUSION

This process used by the South Dakota State Geological Survey is unique in that any number of colors desired on a map or report can be reproduced.

Drafting is one of the most important phases in the preparation of a geologic map, because the appearance and accuracy of the final map depend on the draftman's skill and his attention to detail.

ACKNOWLEDGMENTS

The writer is indebted to Fred V. Steece for the encouragement and aid given in completing this paper.

BIBLIOGRAPHY

1. "A Guide to the Compilation and Revision of Maps," Department of the Army Technical Manual TM5-240 (1955).