Cartographic Generalization

Cartographic generalization consists of simplification, classification, symbolization, and induction.

Simplification involves omitting details that will clutter the map and confuse the reader. The degree of simplification depends on the purpose and scale of the map. If the cartographer is creating a detailed map of Canada and merely wants to show the location of the United States, he or she can draw a simplified outline of the country. However, if the map requires a precise identification of the states in New England and the Great Lakes region, the mapmaker will have to draw a more detailed outline, still being careful not to distract the reader from the main features of the Canadian map.

Classification of data is a way of reducing the information to a form that can be easily presented on a map. For example, portraying precise urban populations in the United States would require using as many different symbols as there are cities. Instead, the cartographer groups cities into population categories and assigns a distinct symbol to each one. With the help of a legend, the reader can easily decode the classifications.

Symbolization of information depends largely on the nature of the original data. Information can be nominal (showing differences in kind, such as land versus water, grassland versus forest); or ordinal (showing relative differences in quantities as well as kind, such as major versus minor ore deposits); or interval (degrees of temperature, inches of rainfall) or ratio (population densities), both expressing quantitative details about the data being mapped.

Cartographers use various shapes, colors, or patterns to symbolize these categories of data, and the particular nature of the information being communicated often determines how it is symbolized. Population density, for example, can be shown by the use of small dots or different intensities of color. However, if nominal data is being portrayed—for instance, the desert and fertile areas of Egypt—the mapmaker may want to use a different method of symbolizing the data, perhaps pattern symbols. The color, size, and style of type used for the different elements on a map are also important to symbolization.

Induction is the term cartographers use to describe the process whereby more information is represented on a map than is actually supplied by the original data. For instance, in creating a rainfall map, a cartographer may start with precise rainfall records for relatively few points on the map. After deciding the interval categories into which the data will be divided (e.g., thirty inches or more, fifteen to thirty inches, under fifteen inches), the mapmaker infers from the particular data points that nearby places receive the same or nearly the same amount of rainfall and draws the lines that distinguish the various rainfall regions accordingly. Obviously, generalizations arrived at through induction can never be as precise as the real-world patterns they represent. The map will only tell the reader that all the cities in a given area received about the same amount of rainfall; it will not tell exactly how much rain fell in any particular city in any particular time period.