Geographical data bases are those where the primary item of information is the spatial location of the data. The primary retrievals are concerned with the spatial relationships between objects. Conventional data bases, hierarchal or otherwise, are not appropriate tools for asking most questions of this type.

One example of the use of a geographical data base in the resource industries is contour map production from data such as geological formation picks derived from drill holes. Major issues are data quality, data base construction, spatial interrogation of the data base, ease of interactive interrogation and modification, and form of the desired output.

Data quality is a major limiting factor in such applications because the spatial distribution and density of drill holes may prevent meaningful interrogation of an over-simplistic data base, and the reliability of formation picks within drill holes is frequently erratic.

Most contouring packages are based on gridding systems or a triangulation system. It is the author's contention that, despite the occasional relative complexity of algorithmic design, the triangulation technique approaches the goal and flexibility of a true geographical data base. For example, questions concerning “neighboring” and “surrounding” points may be readily addressed. With current techniques, the generation of the triangular network is almost linear with the number of points input, and interrogation is entirely a local process. Thus, contouring itself reduces to a local interrogation for each point of interest, together with an output step that is primarily a function of contour density.

Nevertheless, problems remain concerning the utility of machine contouring. The high potential for data error and subsequent editing by the geologist, together with the fact that hand contouring is an interpretive procedure intimately tied to understanding of geological processes, leave many important questions to be answered in the design of a truly useful and interactive geological mapping system.