reviewing the earlier limitations of computers in map production.

The body of the paper is devoted to an explanation of how, in the 1980s, it "has become technologically feasible and cost-effective to assemble and use the data required to automate the mapping process." The application of graph theory to the creation of digital maps is outlined and the use of this digital data in the production of perspective views is graphically illustrated. Practical applications of this cartographic database, in the form of geographic information systems, are noted.

The paper is well illustrated by both color and black and white photography, and by a table on "Digitizing a map." The titles listed in the "Suggested reading" range from the general to the scholarly level. This article could be used in an introduction to cartography class that is aimed at an undergraduate or an adult education audience.

Bylinsky, Gene (1989). Managing with electronic maps.
Fortune, April 24, p. 237-254.
reviewed by Don E. Kiel
East Tennessee State University

It isn't often that cartography and geography have been featured in a leading business magazine. In a recent issue of *Fortune* magazine, however, electronic maps and geographic informationsystems (GIS) were reviewed and characterized as revolutionizingthe way many governments and businesses operate. Illustrative,diverse examples of use of this technology include: a largeforestry company managing 600,000 acres and 4,900 timber standsusing GIS; researchers predicting the effects of an earthquake onrescue vehicle response times; transportation planners calculatingeffects of new roads and traffic signals on travel times; and adepartment store chain

determining new store locations based uponpopulation, income, and other computerized demographic data. Perhaps most revealing about the growth of the automated mapping/GIS industry is a prediction by one market research analystthat sales of such systems will reach $590 million by 1992 andpotentially be expanding by as much as 35% annually.

The article also highlights the availability of previouslydigitized maps and associated databases. In addition to well-knowndigital products from the U.S. Census Bureau and U.S. Geological Survey, mention is made of a private firm, Etak, Inc., which will bemaking available digital electronic maps to be used as automatednavigational aids in automobiles. General Motors expects to beginequipping its luxury cars with "moving maps" in the next two years.

Fortune also profiles a few of the key figures in the GIS and automated mapping industry, most notably Jack Dangermond of theEnvironmental Systems Research Institute (ESRI) firm. The company's ARC/INFO software is the most advanced and widely usedGIS package in the world, with reported sales of $40 million for1988. Other companies' strong sales are cited and the article focuses on the fact that automated cartography and GIS are becoming big business indeed.

The decade of the 1980s has seen an unprecedented cahnge take placein the usage of computers in geography and cartography. The far-ranging application of automated mapping and GIS software in suchfields as profiled in this article indicates that a new preeminenceis being achieved by these disciplines. Continued development ofthis trend will positively affect collegiate geography and cartography programs and the number of professionals in these fields. As the article sums up,

"Geography has come a long waysince you memorized the state capitals for Miss McGonagle in the fifth grade." It's good to see the business world recognize that fact.

Ganter, John (1989). CAD for cave mapping: a cautious assessment.
Compass & Tape, Spring 1989

Abstract:
It has been suggested that CAD packages may reduce the burdens of cave map drafting. I constructed some simulated caves and performed timing tests to investigate the suitability of CAD for cave map compilation and drafting. I discovered dramatic increases in processing time as the maps increased in complexity. While vector (line drawing) approaches have inherent limitations for present cave maps, some methods of breaking down large cave maps into parts (tiling, Blocks) may apply. It appears that CAD cave mapping is only practical with very fast microcomputers, and that a number of conceptual and practical problems remain. In particular the issue tends to highlight the distinctions between sophisticated tools and skilled tool users.

Abel, Robert and Kulhavy, Raymond (1986). Maps, mode of text presentation, and children's prose learning
American Educational Research Journal 23:2, pp. 263-274.
reviewed by Jeffrey C. Patton
University of North Carolina—Greensboro

A study undertaken to determine the effectiveness of reference maps in aiding children in the recall of prose presented either orally or in written form.

The authors, both educational psychologists, proposed two basic