"select all" and copy it to the clipboard with Command-C (⌘ C). You can now exit *Sigma Edit*, and, using paste, dump the text into *Textmaker* using Command-V (⌘ V).

When in *Textmaker* click on the Do Illustrator button and save your file (perhaps with a unique extension such as "xxx.Ill" to mark it as an *Illustrator* file). You can now open it from within *Illustrator* as you would an ordinary *Illustrator* document. (If you prefer to work in *FreeHand*, save the *Illustrator* document as an Adobe 1.1 file, quit *Illustrator* and open your 1.1 file from *FreeHand*.) The Temple Cart Lab recommends keeping the names off to one side of your map and grabbing them as needed for placement on the map.

In summary, *Textmaker* is an easy to use and straightforward way of converting text done in a word processing package into something that *Illustrator* or *Freehand* can handle. While it cannot handle formatting or editing at this time, these operations can be performed in your word processor or in *Illustrator/FreeHand* without too much trouble.

Cartographers who wish to obtain Textmaker can download it from the publicly available Macintosh archives maintained at Stanford. You will need to "anonymous" **FTP** to **sumex-aim.stanford.edu** and change directories to the info-mac/card directory and download it using "get." The file will be in binhex format and must be converted before use.

cartographic artifacts

BOOK REVIEW

Tufte, E. R. (1990) *Envisioning Information.* Graphics Press, Cheshire, CT 126 pp. (Hardcover $48)

Reviewed by Mark C. Detweiler
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Penn State University

With the publication of his 1983 book, *The Visual Display of Quantitative Information*, Edward Tufte established himself as a sharp critic of poorly designed quantitative information graphics and a champion of graphical excellence. By assembling and displaying an impressive range of representational artifacts — maps, tables, graphs, diagrams, and illustrations — Tufte gave his readers/viewers numerous opportunities to visually experience how graphics can show data clearly, as well as how they can obscure and distort. This book broke new ground; it was neither another how-to book on charts and graphs, or a mere collection of graphic examples. Rather, it was an attempt to help readers acquire principles to grapple with the task of portraying complexity effectively.

In *Envisioning Information*, Tufte takes an approach similar to his earlier book; graphics spill off nearly every page and delight the eye with invitations to view, interpret, and consider a broad range of ways to present graphic information. This is a gorgeous book to view and to hold. The printing and typography are extraordinary. Works by some of the great masters of graphic design have been sampled and served up in page after page of graphical excellence. And, Tufte has even daringly ventured into territories seldom considered by information designers, such as architectural design and music and dance notation. Simply put, this is a "must-have" book for anyone interested in developing better skills at communicating information graphically.

The book is divided into six chapters. In the first chapter, "Escaping Flatland", Tufte argues that the essential task of envisioning information is to recognize that all of the interesting physical, biological, imaginary, and human worlds we wish to represent are multivariate in nature, and that the real challenge is to escape two-dimensionality in favor of greater dimensionality and data density. Drawing upon examples as diverse as a 3-D model of our solar system, an Indonesian railroad plan, and a plot of pollutants emitted over southern California, Tufte argues against cosmetic decoration and chartjunk, and for taking the audience seriously while demonstrating the value of multivariate representations.

In the second chapter, "Micro/Macro Readings", Tufte showcases numerous examples of graphic design in which viewers are invited to read/interpret graphics on multiple levels — with the aid of vast detail that helps to organize complexity in multi-layered displays. The emphasis here is on demonstrating the value of high information displays, and showing how they can help viewers see visual contrasts and comparisons, and make choices. Tufte argues that such displays "allow viewers to select, to narrate, to recast and personalize data for their own uses. Thus control of information is given over to viewers, not to editors, designers, or decorators" (p. 50)

In the third chapter, "Layering and Separation", Tufte demonstrates how by visually stratifying aspects of data one can reduce noise and enrich the context of displays. Rather than expressing graphic elements at the same visual level, for example, with the

same values, textures, colors and shapes, elements can be differentiated in layered surfaces that provide structure and order.

In the fourth chapter, "Small Multiples", Tufte shows how quantitative reasoning can be facilitated by using series of gradually changing small designs that are both multivariate and data rich. By presenting the small multiples within a restricted eyespan, Tufte argues that the viewer is able to make comparisons at a glance that would be difficult to apprehend otherwise.

In the fifth chapter, "Color and Information", Tufte raises a number of important issues related to how color can be used effectively (for example, to label, measure, represent, and decorate) without doing harm. Here he casts a wide net, and finds color at work in maps, diagrams, and computer displays, and seeks to sensitize the reader to its power and potential abuses.

And finally, in the last chapter, "Narratives of Space and Time", Tufte presents a fascinating collection of display strategies that tell a number of different multivariate stories, for example, as timetables and route maps.

Despite its many virtues, I did have a few problems with this book. First, as in his earlier book, Tufte often seems to take the act of representing the world of interest for granted. On this view, the process of constructing a graphic reality appears to be largely unproblematic, and Tufte seems to suggest that the real action is in the production/execution of the data graphic itself — rather than in the decision processes about what to represent, and the rationale behind those processes. For while a viewer may indeed be invited to make comparisons and find patterns in a graphic, it is a truism that those patterns are only as good as the data used — especially if one has no recourse to discovering when, where, and how the data represented were gathered. These are non-trivial issues for designers and interpreters of data graphics and deserve greater attention. For example, Tufte himself routinely fails to provide readers with information about: 1) the relative scales (original sizes) of the graphics he so beautifully depicts; 2) their real contexts of use; and 3) characteristics of their users.

Simply put, graphics are situated in a cultural/social context, and that context plays an enormous role in determining not only the kinds of devices we encounter, but our attitudes toward and skills at using them. It is these conventions and rules that allow us to make inferences from the marks on paper. Put differently, graphic meaning is not inherent in the representational device itself, but emerges only in a social context of use. Unfortunately little is known about how people develop flexibility in interpreting and molding such rules and conventions to communicate graphically. Tufte's style tends to encourage the belief that graphics can be portrayed, unproblematically, as disembodied artifacts, and that agreement about excellence in information graphics can be judged largely apart from the characteristics of prospective users and the kinds of tasks they want to perform.

Thus despite its admonition to take the audience seriously, I was often left wondering whether Tufte hadn't trailed Robert Venturi (author of *Complexity and Contradiction in Architecture*, New York, 1966) too closely in the latter's search for richness of meaning rather than clarity of meaning. In effect, this book takes a *graphic-centered* rather than a *user-centered* approach to information graphics. For while Tufte indeed recognizes the importance of perceptual issues in drawing a viewer's/interpreter's attention in making comparisons and avoiding non-informative noise and clutter, I believe he often underplays the extent of learning involved in knowing the rules and conventions of information graphics and the motivation required to engage them.

Although I believe nearly anyone motivated to improve his/her knowledge of information graphics will learn something useful from *Envisioning Information*, I believe one should be clear about Tufte's implicit instructional message. First, this is not a book well suited to apprenticeship learning. One never gets a chance to view an information graphic in the process of being constructed, or to witness the many critical points where a work could have branched off into any one of several different directions. Rather, one is served up polished presentation graphics that only occasionally make reference to the characteristics of potential users or the purposes they are designed to serve. Thus, the implicit pedagogic message is that one should be able to see good exemplars of graphic design and incorporate them. Unfortunately this isn't how experts acquire their expertise. Rather, they must practice making compromises between a client's needs and preferences, and realistic constraints on time, money, and technical feasibility. It is one thing to aspire to excellence; it is quite another to understand excellence without the hands-on tinkering that must be experienced and molded into personalized rules of thumb about what works and doesn't work for particular clients, projects, and contexts.

Finally, I would argue that this book tends to regard data graphics as presentational devices only, ignoring a whole range of important exploratory uses. I would urge tolerance for "scruffy" exploration in addition to "neat"

presentation. For we still need considerable innovation in developing new ways to discover patterns and address questions of multi-perspective viewing. I believe we need not slavishly adhere to Tufte's principles and exhortations regarding presentation graphics if they impede progress at exploring such innovations.

Let me close by saying that the foregoing issues should not be regarded as diminishing Tufte's accomplishments in this book. This is a graphic tour de force, and a joy to read! By all means get a copy and read, experience, and think about it; *Envisioning Information* is a challenge to graphic excellence and a source of inspiration.

NIFTY MAP DISPLAYS

Barbara Fine, President of The Map Store in Washington, DC, recently sent photos and descriptions of map displays done in their display windows. Barbara's background in Art History and Studio Art have given her a different perspective on creating map displays, something from which we can all learn.

When constructing displays with maps, Barbara likes to add "props" to call attention to the main theme. For example, origami birds and toy airplanes suspended from nylon strings were used to compliment aeronautical charts. Dried flowers, moss and branches were used to compliment a display of antique maps. Other examples of props includes newspapers, colored tissue paper, toy trains, buses and cars.

The photos sent were of three separate displays. The first was a display of maps drawn by a local third grade class as a project related to Geography Awareness Week. This kind of display is great outreach for public libraries. Academic libraries could consider displaying "mental maps" drawn by students in social geography classes. The second photo was of a Christmas tree decorated with miniature globes and fan-folded maps. The last photo was a spectacular award winner. A likeness of Queen Elizabeth I was created using a mannequin dressed with sixty Ordnance Survey Landranger series maps. The tight-waisted hooped skirt and cape were very realistic.

Although not as fancy as Barbara's creations, I recently put together a display on bird's-eye views of the city of Philadelphia from its early years to today. Construction paper silhouettes of the city's taller buildings were glued on the sides of the display case.

If anyone would like to share display ideas with others, please write me, Andrew Johnson, in care of the Map Collection, Free Library of Philadelphia, Logan Square, Philadelphia, PA 19103.
base line 12:3, June 1991

NTIS CITATIONS

ARC Digitized Raster Graphics and Their Application. D. H. Foley, and J.R. Cadoret. Defense Mapping Agency Systems Center, Fairfax, VA. 20 November '90, 13pp.
AD-A231 370/8/WNR.
Price code: PC A03/MF A01.

ARC Digitized Raster Graphics (ADRG) are digitized replicas of hard copy source maps and charts that the Defense Mapping Agency produces on CD-ROM (compact Disc-Read Only Material) for distribution. The ADRG process converts the hard copy source, datum, and projection to WGS84 and the Equal ARC-Second Raster Chart/Map (ARC) projection which permits a worldwide seamless data base for map data of a given scale. Products currently available are: Operational Navigation Charts (ONC) at 1:1,000,000, Tactical Pilotage Charts (TPC) at 1:500,000, Joint Operations Graphics (JOG) at 1:250,000, Topographic Line Maps (TLM) at 1:50,000 and Jet Navigation Charts at 1:2,000,000. Many are available for public sale. ADRG data is best suited for use as raster background images for GIS applications. Within DOD, ADRG currently supports the Navy's AV8B program and the Army's Maneuver control System.

Digital Production of Landsat Image Maps in the Map Publishing Environment.
R. F. Seebald. Defense Mapping Agency Systems Center, Reston, VA. 9 November '90, 15 pp.
AD-A230 558/9/WNR.
Price code: PC A03/MF A01.

In support of counter narcotics activities the Defense Mapping Agency has begun production of a series of Landsat image maps. Produced at a scale of 1:100,000, these Landsat image maps are compiled from recent Landsat Thematic Mapper scenes. Bands 7, 4, and 2 are combined in a false color composite. Intensification of selected features provides improved topographic detail. The enhanced Landsat imagery is combined with a UTM grid and margin information and compiled and color separated in a digital environment. The Map Publishing Environment (MPE) output is film separates, printed via a large format laser filmwriter. In support of this new production system, a unique development/production environment was created to bring the Government cartographers into direct contact with the system developers in order to facilitate rapid modifications and changes to the application software as necessary.

Earth Data and New Weapons
J. L. Larson, and G. A. Pelletiere. National Defense University, Washington, DC 1989, 145 pp. Availability: Superintendent of Documents, GPO, Washington, DC 20402. PC $2.75. Microfiche furnished to DTIC and NTIS users. AD-A229 584/8/WNR. Price code: MF A01.

Many modern weapons require detailed information about the earth to guide them to target. This 'earth data' is also necessary for training those who will man the weapons. The authors believe inadequate data now mars the early, critical stages of weapons development and acquisition. In this study, they catalog a history of bureaucratic omissions, contradictions, and funding disputes that have hampered earth data programs. They recommended system improvements under the general aegis of the Department of Defense, with the Defense Mapping Agency taking a leading role. They suggest specific ways to clarify existing regulations, standardize earth data products, identify earth data requirements early in the weapons acquisition process, and adequately fund development. Keywords: Guidance/data bases.

GIS USE IN THE FEDERAL GOVERNMENT
In December 1990, the Federal Interagency Coordinating Committee on Digital Cartography (FICCDC) published an updated *Summary of GIS Use in the Federal Government*. The summary, expanded from the 1988 edition, includes responses from 110 Federal organizations about their use of geographic information systems. Of the 110 organizations responding to the survey, 95 reported that they now use GIS or planned to use GIS next year.

The summary contains information about the organization's GIS activities, including primary applications of GIS, GIS policies and guidelines, data categories used in GIS applications, data sources, data dissemination activities, cooperative activities, hardware and software used in GIS activities, and GIS funding and expenditures. For the purposes of the summary, a GIS was defined as a computer hardware and software system designed to collect, manage, analyze, and display spatially referenced data. Automated map and chart production systems were excluded from the summary.

In addition to the survey results, the summary contains a list of individuals who may be contacted for further information about GIS activities in their agencies. To obtain a free copy of the summary request an order form from FGDC Publications, U.S. Geological Survey, 590 National Center, Reston, VA 22092.
FGD Newsletter 1, Spring 1991

CARTOGRAPHY AND GIS CAREER GUIDE
The American Cartographic Association recently released its new Career Guide *Cartography and Geographic Information Systems*. It discusses cartography, GIS, types of maps, making of maps, where cartographers work, etc. To obtain a copy write to the American Congress on Surveying and Mapping, Suite 100, 5410 Grosvenor Lane, Bethesda, MD 20814 or call (301) 493-0200, fax (301) 493-8245. Costs: 1-5 are free; 5+ are $.75 each.
Wisconsin Mapping Bulletin 17:30, May 1991

map librarian bulletin board

Geographic Name Server
Tom Libert of the University of Michigan has implemented a TCP-based geographic name server. The server retrieves a variety of data from a database containing information on US cities. The geographic names database contains state, county, latitude and longitude information. It also contains 1980 census population, (an update based on the 1990 census is likely), elevation, area code, and ZIP code for a large subset of U.S. cities, as well as a small number of foreign cities. Information about other geographic features such as counties, states, rivers and lakes are also available. For more information, contact the author by email at libert@eecs.umich.edu; phone (313) 662-6520.

Top 10 Maps
OCLC provides its members with the world's largest bibliographic database. This database grows by some two million records a year, totalling since its inception in 1971 to over 23 million records in eight formats and some 375 million location listings for those records. Most bibliographic records in the database are held by several or many libraries. The ten top map titles, according to OCLC's location holdings data, are ranked as follows:

1. Magnetic anomaly map of North America
2. Southern Lebanon border area
3. Potential natural vegetation of the conterminous United States
4. Iraq
5. Distribution of religions
6. Middle East area oil fields and facilities
7. North Korea
8. Gravity anomaly map of North America