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Great Books to Inspire Your Next Masterpiece of Visual Explanation

*By Nathaniel G. Pearlman,
Founder and President, Graphicacy*

creative analytic design
GRAPHICACY

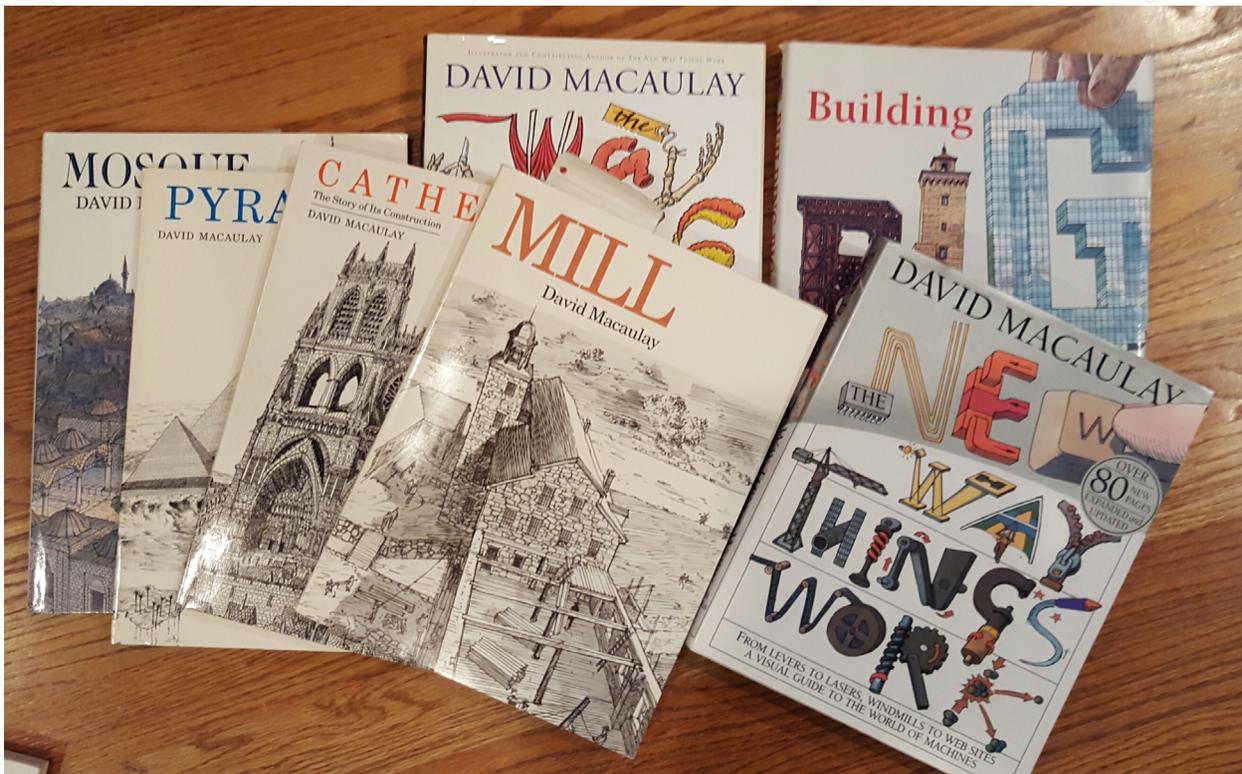
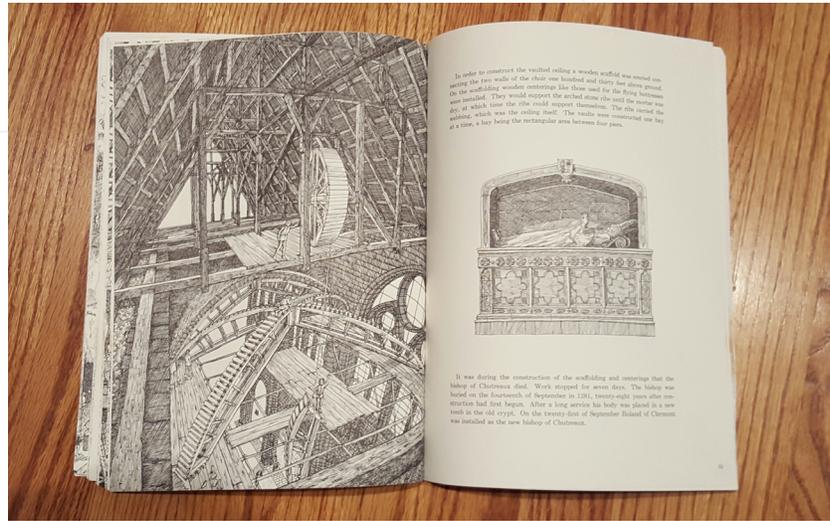
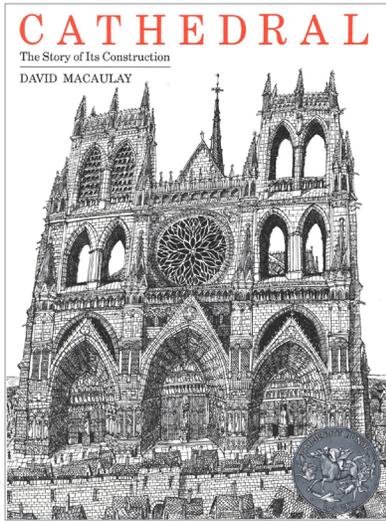


TIMEPLOTS
information graphic products

With data visualization and information graphics generating so much buzz online, it's easy to forget about a core source of inspiration and best practice: visual literature. At Graphicacy, we have accumulated an extensive library of books which inspire our [interactive visualizations](#) and data-rich [Timeplots prints](#).

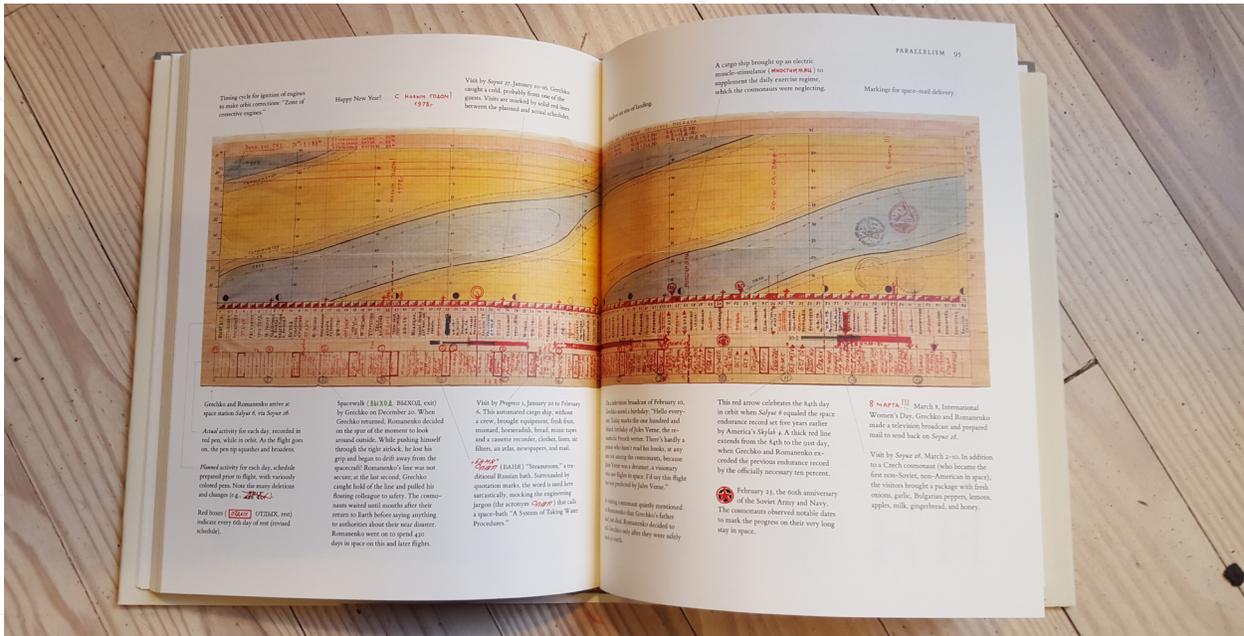
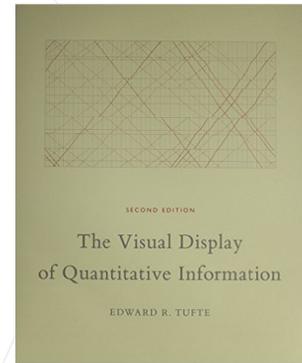
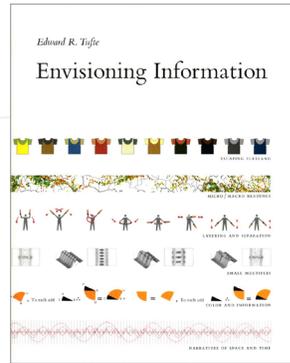
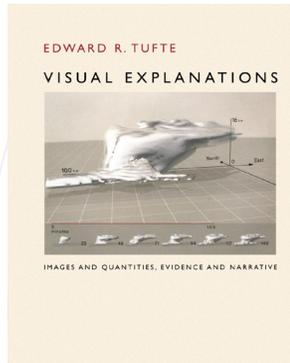
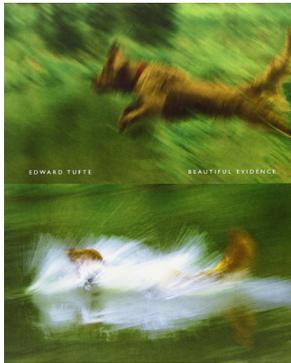
A well-read visualizer will recognize many of these titles, but some are outside the standard canon of works on information graphics and data visualization.

If you admire creative and effective works of information design as much as we do, these books are a necessary part of your collection.



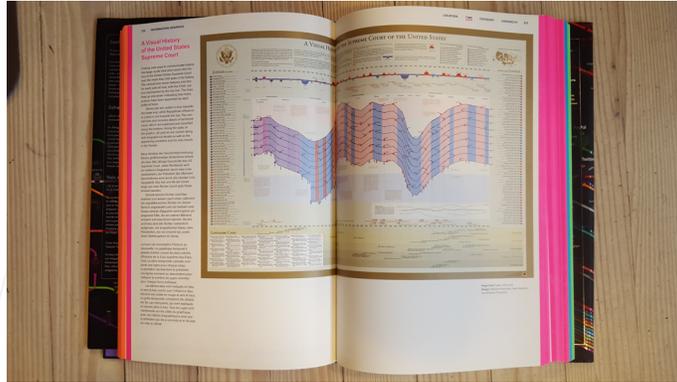
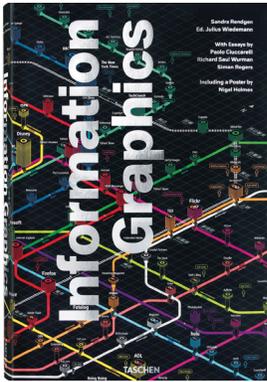
David Macaulay / *Cathedral*

If you don't know his famous works like *Cathedral* (1973), *Castle*, *Mosque*, *Pyramid*, *Building Big*, *Mill*, *The New Way Things Work*, etc., you are in for a treat: his illustrations do excellent work to explain architecture, design and engineering. My parents bought me *Cathedral* when I was a kid living in England and since then I've marveled at and learned from most of his other works. Macaulay's detailed treatment of castles and cathedrals teaches not only about the fascinating subject matter, but also how careful and well-chosen illustrations can enhance the transfer of knowledge and improve the effectiveness and joy in the learning experience. They provide wonderful lessons about the integration of text and visual explication.



Edward Tufte / *Visual Display of Quantitative Information, Envisioning Information, Visual Explanations, Beautiful Evidence*

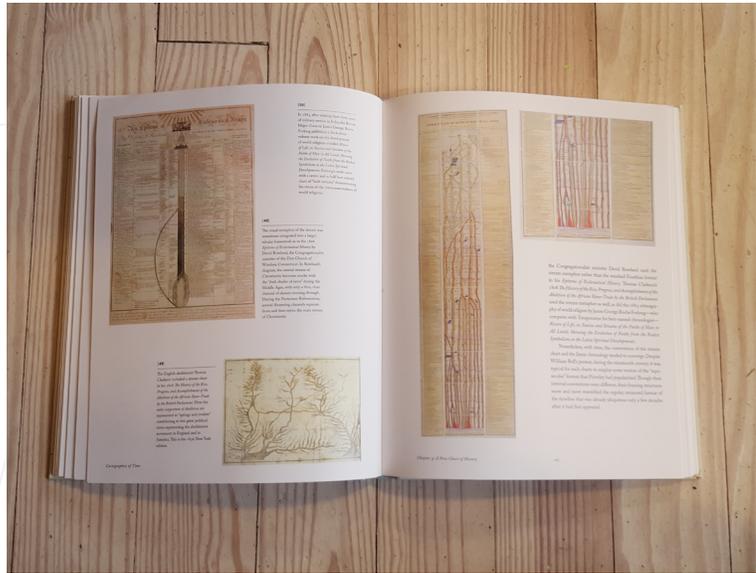
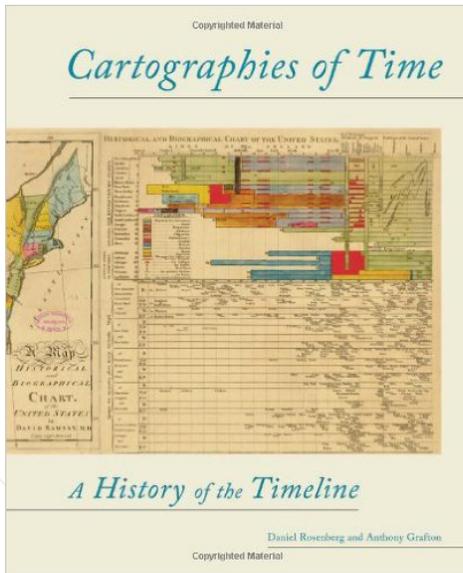
Edward Tufte's lectures and first book kindled my interest in this field when I took his semester-long course in 1988; I don't think you can be an educated person without reading *The Visual Display of Quantitative Information*. Why? Because being able to distinguish graphical excellence and identify graphical integrity and understand and create visual explanations is crucial to modern communication. And it is vital to being a good citizen. One of the assignments in his class was to find examples of great information graphics in the Yale libraries. I wandered the stacks at Sterling library looking at charts that showed age distributions over time, weather history and the like. This opened my eyes to how difficult the craft was and how valuable it could be when well done. Tufte's series of books provide many examples and explications of graphical excellence. Collectively, they are both beautiful and useful; they are themselves superb examples of how to explain concepts visually. It is worth noting as well the entrepreneurship involved in the endeavor; Tufte created his own Graphics Press to self-publish his books to the quality that he sought. You don't need to take all his pronouncements as gospel to learn a great deal, but his influence on me, and many others, is profound.



Sandra Rendgen / Information Visualization

The biggest and best collection of information graphics. As with many Taschen books, it is impressively huge (in both weight and size) and well-done. Introduction by Richard Saul Wurman, founder of Ted.com and inventor of the term “information architect.” Contains essays on how data changed journalism by Simon Rogers and on turning visualizations into stories by Paolo Ciuccarelli. The information graphic projects in the book are grouped by location, time, category, and hierarchy. Two of our posters, the “Visual History of the American Presidency” and “A Visual History of the United States Supreme Court,” made it in. I’ve looked at numerous collections of information graphics and this is the most ambitious and the most diverse of the lot.

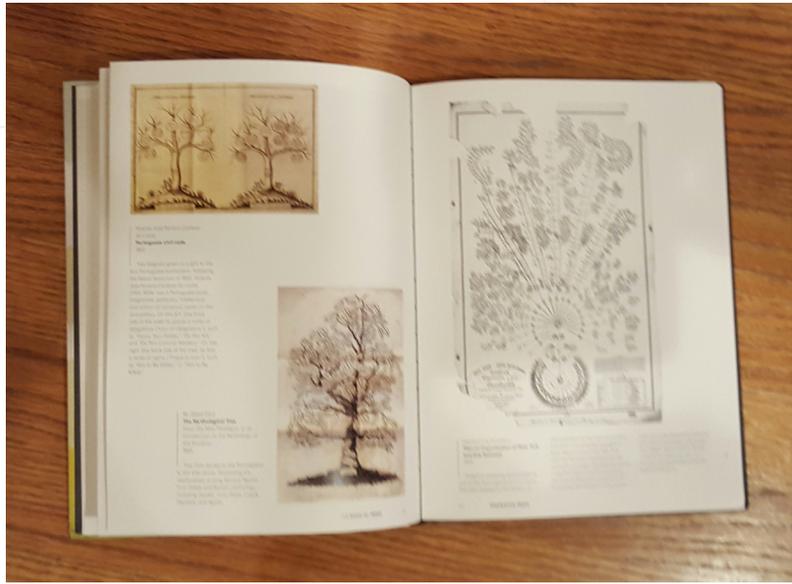
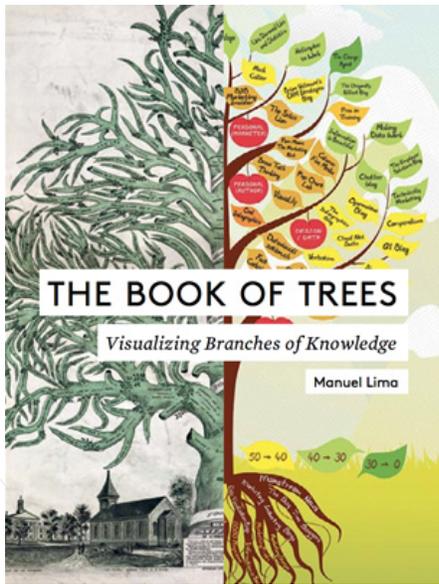
“Communication is shifting towards generally shorter texts in combination with charts and images; hence information graphics are taking center stage.”



Daniel Rosenberg and Anthony Grafton / *Cartographies of Time*

Cartographies of Time is a lovely, scholarly book with an endless collection of images depicting historical timelines. I have my own strange obsession with the timeline and this is one of those rare books I wish I had written myself, though it represents a level of excellence tough to achieve. This book is a tour de force combination of research, discovery of wonderful visual examples, and learned exposition of their history. It is a comprehensive history of graphic representations of time. As someone who has put considerable time and effort into building large and complicated multivariate historical timelines, this book provides humbling context through which to see and learn from the efforts of others over time. Professor Anthony Grafton of Princeton University (well-named in this context) is one of the foremost historians of early modern Europe, and Professor Daniel Rosenberg is an intellectual historian at Oregon who specializes in questions of historical representation. The book was extremely well-reviewed and garnered lots of awards. It contains everything from extracts of medieval manuscripts to a chronological board game developed by Mark Twain. The timeline, we learn, is a relatively modern invention, at least in the form of a single axis and regular distribution of dates, going back less than 250 years. As Maria Popova writes about it on the website Brainpickings, “*Cartographies of Time* offers a fascinating and dimensional lens on what it means to peer from a single moment of time outward into all other moments that came before and will come after, and inward into our own palpable yet subjective perception of permanence and its opposite.” Highly recommended.

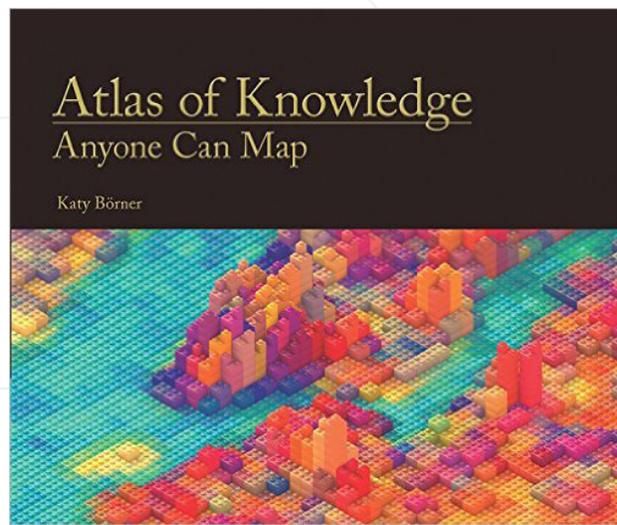
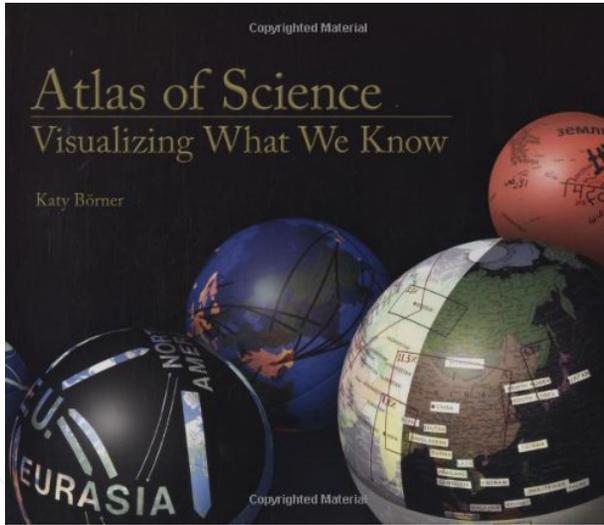
“Graphic representation is among our most important tools for organizing information.”



Manuel Lima / *The Book of Trees: Visualizing Branches of Knowledge*

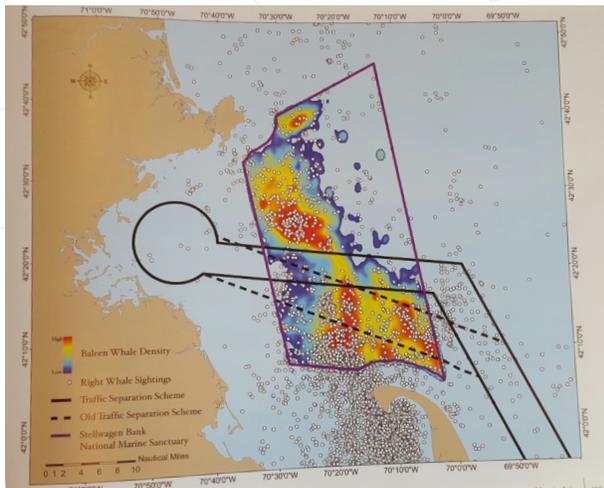
This book assembles and examines scores of diagrams from the more than eight hundred year history of the tree diagram from medieval monasteries to current uses. The book of trees reminds me that each of the important, but now basic, tools that we have to visualize data — in this case those from tree diagrams to treemaps — are built on the shoulders of centuries of trial and error as well as the inspiration of key innovators. Respect and knowledge about the use and history of these tools improves our ability to depict new concepts usefully and beautifully. Lima sorts the various examples into figurative trees, vertical trees, horizontal trees, multi-directional trees, radial trees, hyperbolic trees, rectangular treemaps, Voronoi treemaps, circular treemaps, sunbursts, and icicle trees. Not since my senior project in computer science in 1988, when I used Voronoi diagrams to try to abstract concepts relevant to legislative redistricting, had I thought about trees and their data representations this much.

“A visualization can become an immensely powerful tool and an enduring, contagious meme.”



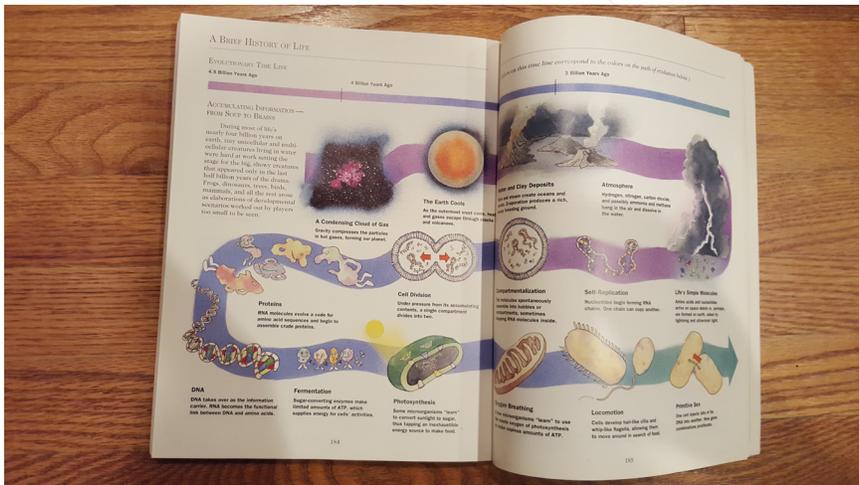
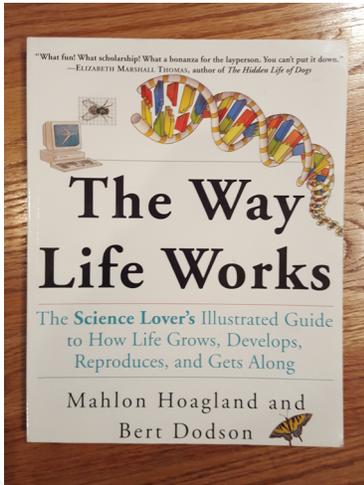
Katy Börner / *Atlas of Science* and *Atlas of Knowledge*

Katy Börner is a serious student of data visualization, especially as it is used to map science and knowledge. “Science maps show us the landscape of what we know.” Her books *Atlas of Science* and *Atlas of Knowledge* provide two main things: first, a theoretical framework and terminology and collection of elements and



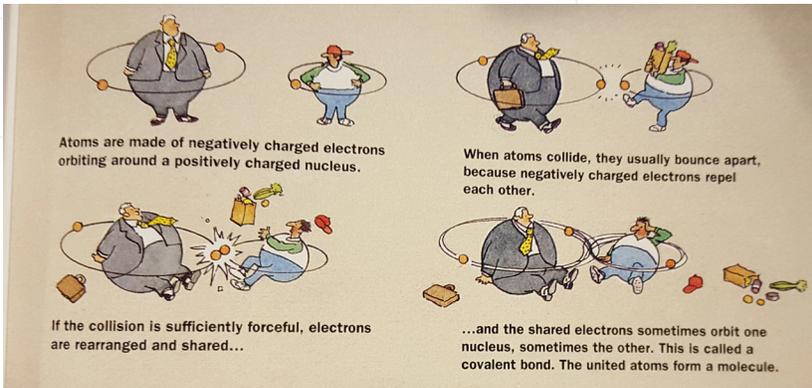
visualization types that are meant to guide readers in employing data visualization. And second, an extension collection of significant and excellent data visualization projects organized historically across many fields. The examples range from “Examining the Evolution and Distribution of Patent Classifications,” to “Networks of Scientific Communications,” to (as pictured here) “Realigning the Boston Traffic Separation Scheme to Reduce the Risk of Ship Strike to Right and other Baleen Whales.” I believe that I first became acquainted with Börner’s work through my wife, who heard her give a talk more than a decade ago.

“You don’t just have to use maps to find your way home. They can be ways to get global overviews on topics.”



Mahlon Hoagland and Bert Dodson / *The Way Life Works*

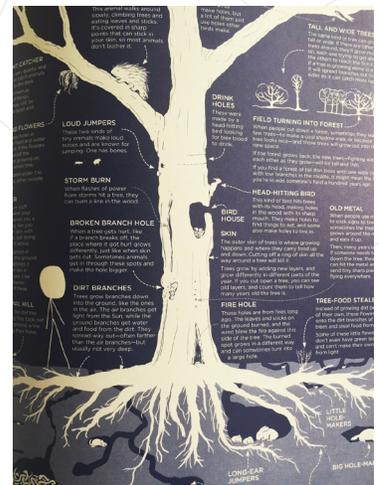
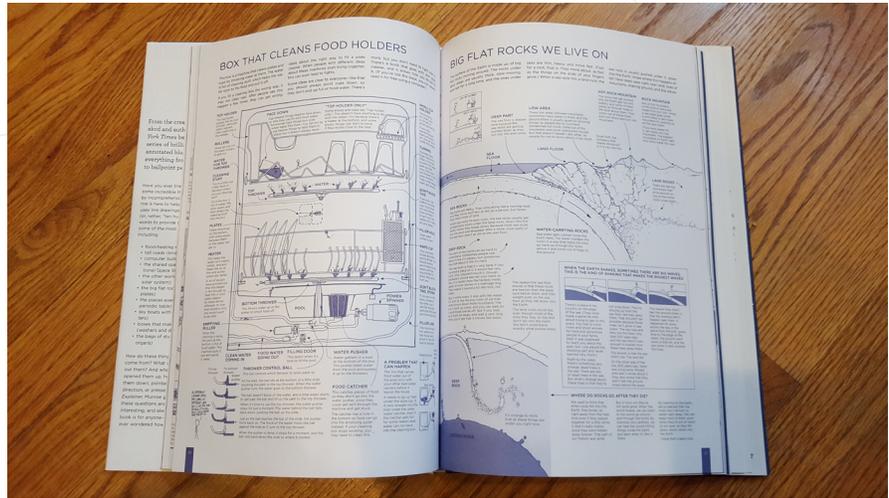
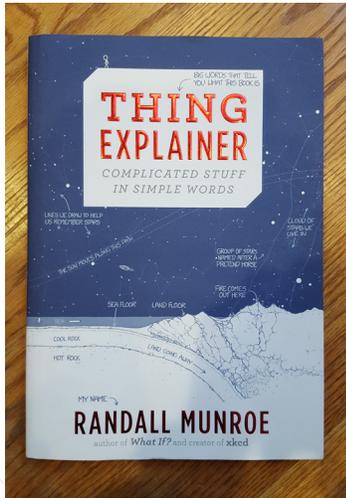
This book is a wonderful visual explication of biology. Like Macaulay's works about engineering and architecture (cited earlier), this book is a great and light-hearted example of the power of illustration to explain complicated material. The theme of the book is unity; it celebrates the things common to all forms of life, everywhere on the earth. As the authors write: "The beauty of living things becomes every more breath-taking as you come to appreciate the patterns that bind them all together." Nearly every page is brought to life with amusing illustrations that dovetail with the text to advance the explanation of difficult concepts. For example,



atoms colliding or bonding are pictured as the bumping together of overweight cartoon humans. As the authors write in the accompanying text, "When atoms collide, like the Grand Central commuters, their orbiting electrons push them apart, because like charges repel." How did this book come to my attention? I

believe I heard about it originally because I know the excellent illustrator, Bert Dodson, from time I've spent in his hometown of Bradford, Vermont.

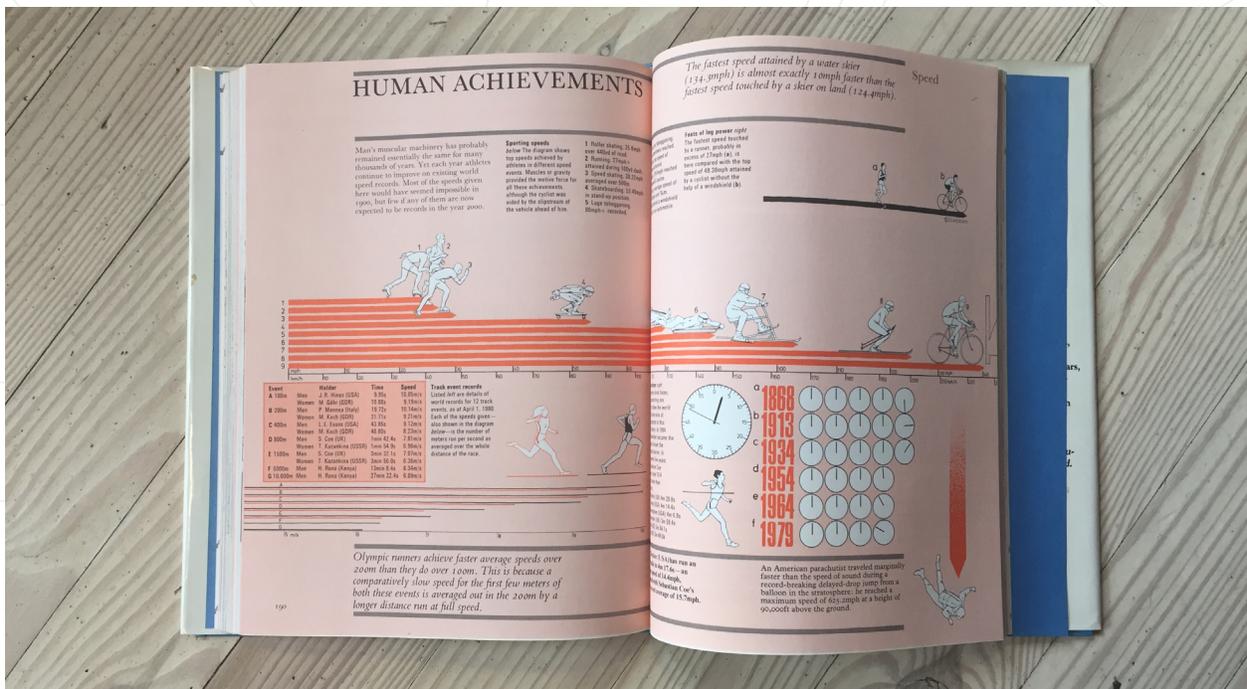
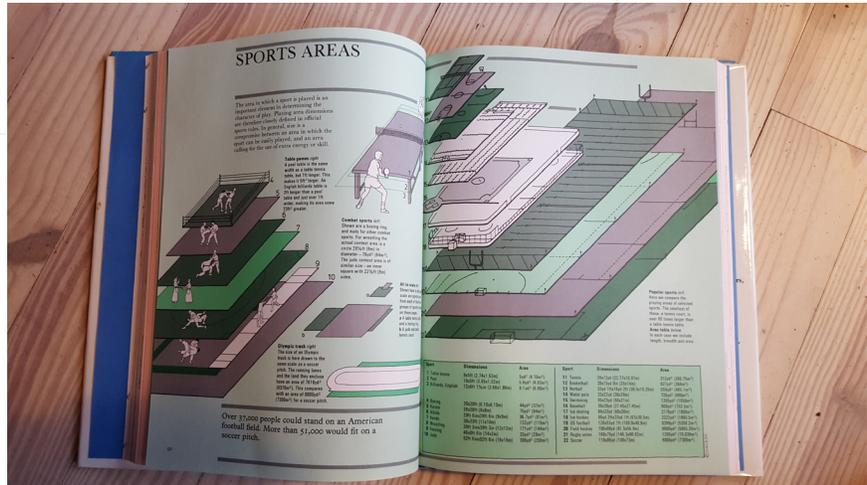
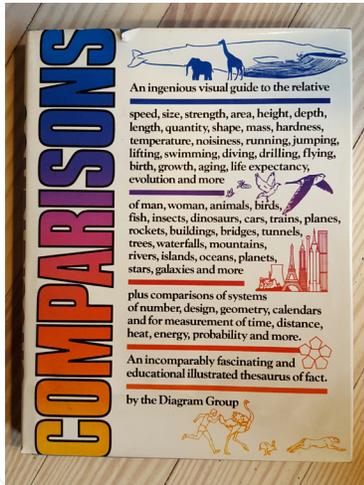
"An intimate merging of science and art."



Randall Munroe / *Thing Explainer*

Randall Munroe, best known for his online comic book XKCD (which is genius), released a book that attempts to explain complicated stuff with simple words. He limits himself to the 1000 — or as he says, ten hundred — most common words and the use of illustrations. In the book, he tackles things like submarines (“boat that goes under the sea”), the microwave (“food heating radio box”), and animal cells (“tiny bags of water you are made of”). It’s quirky, but sometimes constraints lead to brilliance. I challenge you to read this book of visual explanation and verbal gymnastics without picking up a lot of knowledge. Well worth the time.

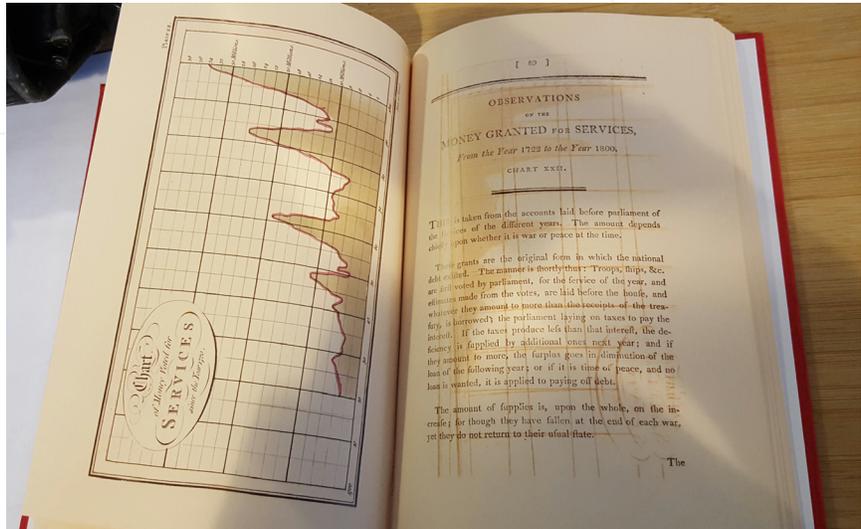
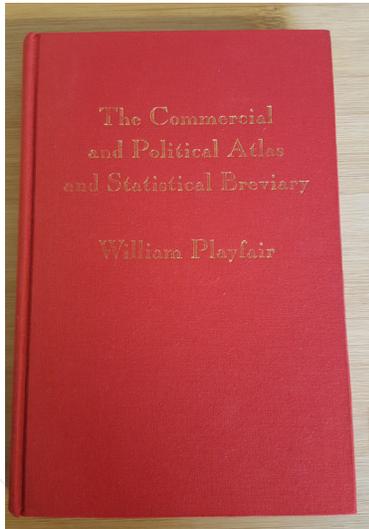
“To really learn things, you need help from other people, and if you want to understand those people, you need to know what they mean by the words they use.”



The Diagram Group / Comparisons

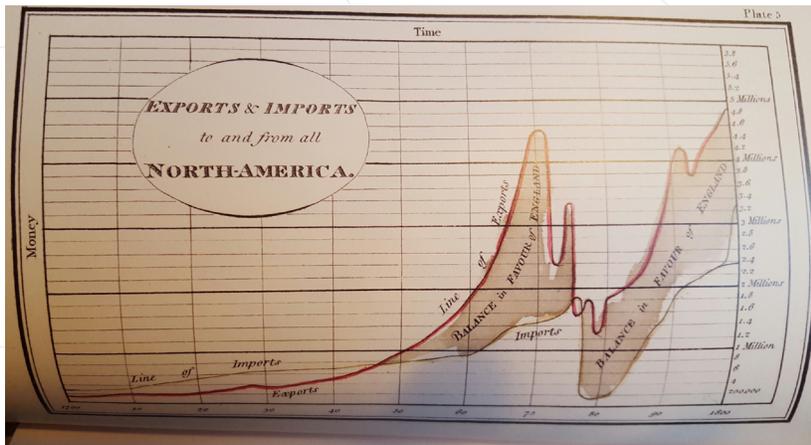
Comparisons takes theoretical or somewhat difficult to understand concepts and visualizes them in a way that's easy to understand. This is done by using visuals to juxtapose things you wouldn't normally think to compare. For example, the Diagram Group measures speed by showing a baby crawling versus a turtle walking. While the graphics are simple and basic, it is a good example of how much better you can convey comparisons visually than you can with words.

“The length of a person’s life does not necessarily affect the measure of his achievement.”



William Playfair / *The Commercial and Political Atlas*, 1786

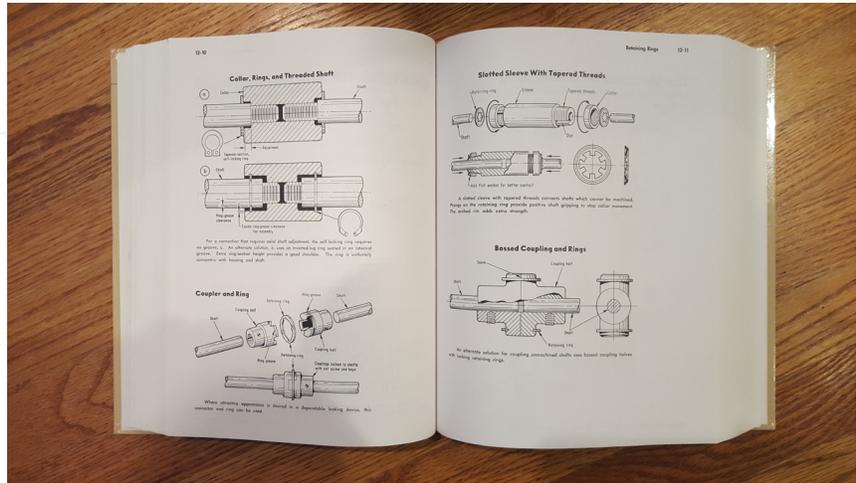
William Playfair was a Scottish political economist and the founder of many graphical methods of statistics like the line, area, pie and bar charts. If you work in or have interest in information graphics, you should know this part of the history of the development of the field. Playfair's *Commercial and Political Atlas* was highly innovative in inventing visual displays for data. The sorts of graphs and charts he used apparently did not grow up alongside advances in science, business and government. Rather, the new medium seems to have emerged to a great degree in Playfair's works (and a measure of their influence is that the 18th century book is still available today in reprint). Playfair writes with respect to his Chart 5 on Exports and Imports to and from all North



America: "There seem to have been three causes for the rapid increase of American imports: - The actual wealth and capital of this country, paper credit, and the increased population of American." The disruption in the balance of trade caused by the revolution is obvious visually, as is the continuity with which trade picked up afterwards. I was first introduced to Playfair

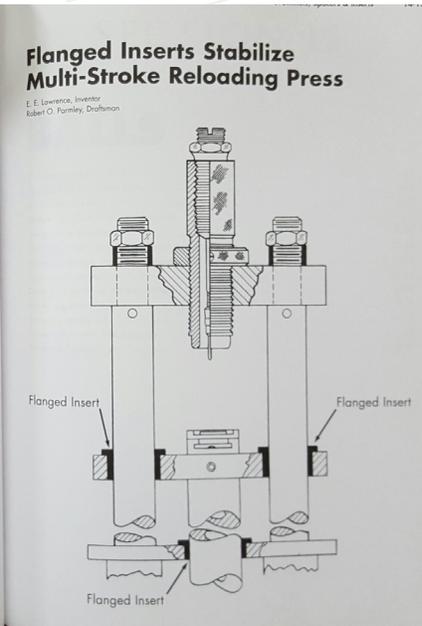
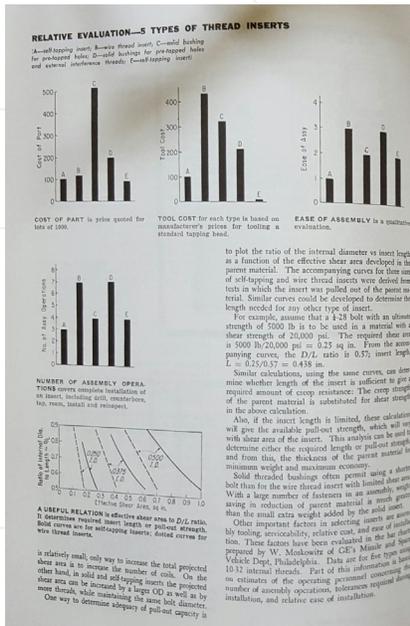
through its inclusion in Tufte's *Visual Display of Quantitative Information*, which devotes multiple pages to its examination of Playfair's work.

"The Atlas showed, for the first time, how economic data could be represented by charts."



Robert Parmley / *Illustrated Sourcebook of Mechanical Components*

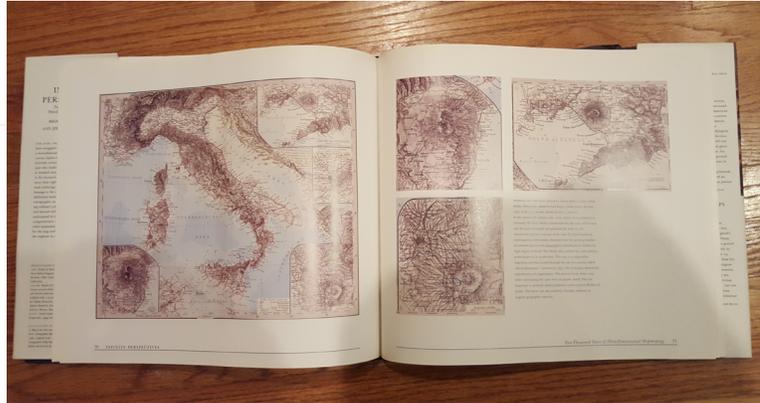
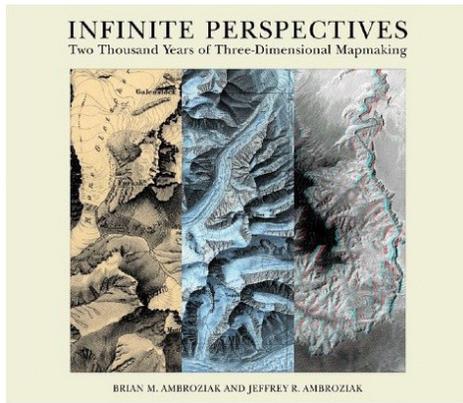
The art of good mechanical design is not often discussed by non-engineers. I am curious enough about how things work to be awed by modern wonders of design like the jet engine or industrial robot, and the parts that must be combined to make them. It took centuries of engineering genius to produce the components of these modern mechanical wonders. It must have taken forever to collect and illustrate them as well. As Robert



Parmley writes in *The Illustrated Sourcebook of Mechanical Components*, an exhaustive three inch thick illustrated tome, “The ability to visualize a mechanical device, containing various individual components arranged in position to perform a task, and then accurately record that idea on paper in graphic form, is apparently not a common skill. One must be naturally able to think in pictures and either through training or inherited talent sufficiently skilled to draft the device on to paper.” I love

the vocabulary: gears, sprockets, ratchets, belts, shafts, couplings, clutches, seals, packings, bushings, bearings, clamps, cables, washers, rings, grommets, spacers, inserts, balls, springs, pins, cams, fasteners, linkage, valving, pumps, etc. But the words fall far short without the visual component to both illustrate and explain.

“A graphic kaleidoscopic view of mechanical components.”



Brian and Jeffrey Ambroziak / *Infinite Perspectives: Two Thousand Years of Three-Dimensional Mapping*

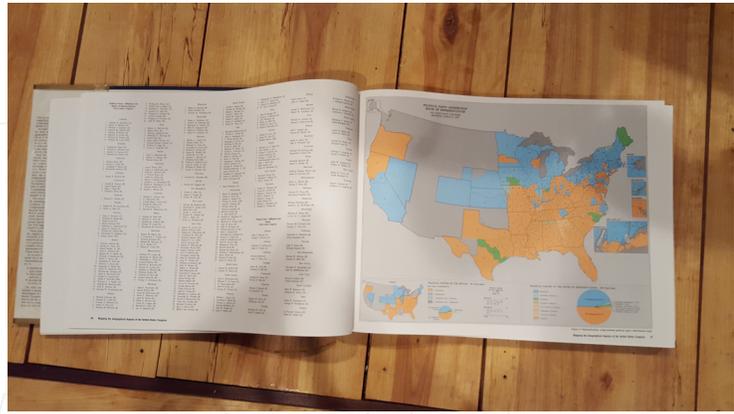
There are many excellent books on cartography, but this is the one to look at if you are interested in mapping the vertical. A great book on illustrated portrayals of spatial phenomena throughout history. It's inspiring to see



great examples from the work of early map artists to the incorporation of modern technology to similar mapping problems today. What does mapping the vertical mean? It means, for example, relief maps, like the one pictured on the left, which is called: *Detail of a Map of Eastern Tuscany by Leonardo Da Vinci circa 1502*. It means illustrated portrayals of spatial phenomena throughout history, like the only surviving Roman manuscript map with the imperial highways of Rome. Or Carta Marina (a marine chart) from 1516 or from 1802 depictions of mountain slopes by “hachure: in Atlas de La Suisse (Switzerland). The Ambroziak's end with their own

work, for example a map of San Francisco with “orthorectified, high-resolution SPOT Image imagery in true three dimensions.” Mapmaking may be the most advanced arena for data visualization.

“It is widely hypothesized that our need to map and spatially delineate our environs co-evolved with our developing minds and cultures.”



Kenneth Martis / *The Historical Atlas of United States Congressional Districts*

There may not be that many political districting nerds, but I am one of them. This is the huge and definitive work that shows how congressional districts changed decade by decade in the United States. I bought it years ago when I was a graduate student in political science and have lugged it around ever since. I find this congressional boundaries book valuable because it encapsulates so much about the United States; with some background you can flip from page-to-page and see a battleground of congressional politics play out visually through the lens of congressional district boundaries, driven by fights about slavery, economics, the size of government and the astonishing growth of the nation in area and population. I am sure that I was influenced by this when I included series of electoral cartograms in several of our Timeplots posters.

“It is logical to map the various aspects of congress for analysis and illustration.”

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