(Edward Tufte) Beautiful Evidence: How observation turns into explanations and evidence.
The metaphor for **evidence presentations** is analytical thinking.
                            -> how to produce them and how to consume them.

Mapped Pictures: Image as Evidence and Explanation

Sparklines: Intense, Simple, Word-Sized Graphics
*Sparklines: small, high-resolution graphics usually embedded in a full context of words,
numbers, images. Looks like--
*/are **datawords**: data-intense, design-simple, word-sized graphics.
Sparklines' wordlike quality-> bc/ intense visual distinctions comparable to words and letters.
                                words, sparklines : present overall shape + pattern w/ local details.
                                    -> read more carefully and slowly than words.
*Sparklines have obvious application for financial, economic data.
(tracking and comparing changes over time): provide a nuanced analysis-> recent changes in
relation to many past changes.
*Medical monitoring tech — sparkline-like graphics perform an essential role
        : help identify and contextualize clinically relevant events from a vast amount of data.
                (traces of empirical경험적 measurements)
        Required high-resolution displays-> Cartography지도작성, DNA mapping: big data sets
*Efficiently display and narrate (sequential) binary data.
                            ex) Baseball season-long history of wins(upward whisker) and
                            losses(downward) -> competitive comparisons and win/loss sequences.
*Artists have used these high-resolution precise lines -> 3d visual information (engraving line)
*Dos and Don'ts
*So, sparklines provide a straightforward, contextual look at intense evidence.

Links and Casual Arrows: Ambiguity in Action

Words, Numbers, Images — Together
Displaying evidence— multimodal: verbal, visual, quantitative elements together.
 let me touch on the history of Bond btw verbal(word, numbers..)-nonverbal(images..) evidence
-> (how it has been presented on paper to computer screens)
        ex) Galileo's manuscript(*manus* hand+ *scriptus* write), Centaur   from 9th century
        Unification of text and image/ portrays constellations as word-pictures. Hand integrates.
The words outline the legs and body-> links 44star dots.
the visual meaning of this Centaur: a narrative metaphor grouping the stars into a constellation.
                            By outlining two-space projections ->
                            contoured shape reading as three-space.
ex) Early printing. **Hypnerotomachia Poliphili (in E: *Poliphilo's Strife of Love in a Dream*)**
It's a forever beauty bc/ harmonious combining type & woodcut illustrations.

A page from the book— generous margins/ a narrative drawing/ a title-summary in
capital letters/ floriated initial capital letters/ similar visual texture of all elements.
*Hypnerotomachia has been studied for centuries by design students//
unreadable(Italian-Latin-Greek) -> some books are beautiful simply as pure art objects.
                                    **also teach *content indifference*(in text/image relations)
(English translated ver.) Nearly always(73%), the words and images closely follow each other.
The <u>relevant texts surround its image,</u> the texts always apply fully to images.
        => this arrangement maintains a reasonable unity of narrative.
*The illustrations(flat, medieval woodcuts)— verbal-visual story linked like a <u>storyboard</u>
*The typography of Hypnerotomachia is imaginative, confident, and self-conscious
        : words decorate illustrations, generate patterns.
*Side note
Each chapter starts w/ decorative characters and once they collected, it creates a sentence.
POLIAM FRATER FRANCISCUS COLUMNA PERAMAVIT
="Brother Francesco Colonna loved Polia tremendously."

ex) Galileo's *Sidereus Nuncius:*   <u>To show the results of intense seeing.</u>
        Nonfiction, "The wonder of the Spectacle and the Accuracy of the Expression"
Describe engraved images of the moon, innumerable stars,
He mentioned "visible certainty"(oculata certitudine)
For science to be credible, -> be based on publicly displayed evidence of seeing and reasoning.
-> be liberated from merely wordy arguments.

*Reports the discovery of Jupiter's 4 satellites.
Visual / verbal narrative presents the evidence of sequential images of
                                Jupiter(capital letter O) and the moons(****)   w/ words.
Record the time and date of observation, distances btw M-J
/redesign: brings together all 65 of Galileo's published observations of Jupiter-Satellites.
                    Overlapping (O)s: multiple viewings made by G during a single night.

When and How should data points-labeled w/ words?
        In *The Elements of Graphic Data,* William Cleveland suggests: Labelings may interfere
w/ assessment of the quantitative data. -> Ex) noisy, cluttered scatterplot.
        So, ->Redesign needed
    1. Clutter is a failure of design, not an attribute of info.
    2. Visual problems shouldn't be fixed by reducing content-resolution. (discarding words that
       label data)
    3. Instead, fix the design.

Corruption in Evidence Presentation: Effects Without Causes, Cherry Picking, Overreaching, Chartjunk, and the Rage to Conclude

Making a presentation is a moral act. (as well as an intellectual activity.)
Some examples that produce anti-evidence, which corrupts reasoning.
          Often used as strategies in political speeches, marketing, internet rants,...
-Promote Effects without Causes: ex) Report of the 9/11 Commission -> use passive voice,
                                        Vague words such as "domestic agencies"...
                                        Agency without agents, actions without actors.
 -Cherry-picking: The presenters pick and choose, select and reveal only the evidence that
advances their POV.   ex) Branden research on NASA page: some dead astronomers
weren't labeled by nation/ and for the achievements of the nation: mentioned, or emphasized.
-Punning, Overreaching, and Economisting
-Chartjunk -> Content-free stuff replaces Evidence.
These all lessen the credibility of the evidence.

The Cognitive Style of PowerPoint

Sculptural Pedestals: Meaning, Practice, and Depedestalization

Pedestals may help conserve outdoor bronzes.///But
Pedestilization is Sculture's equivalent of Data Graphic's chartjunk and Powerpoint's Phluff.
-> 20th Century: Being replaced by grounded abstract pieces. : the biggest break in the history
of sculpture.

We'll end the presentation by showing the Landscape Sculptures. (removed pedestals.)