Self-Illustrating Phenomena

Pat Hanrahan

Two Points

1. Visualization adds observation to computational experiments
2. Photography and imaging play a major role in scientific imagery
Early Photography

Talbot

http://www.foxtalbot.arts.gla.ac.uk/resources/seeds.html
Talbot

http://www.foxtalbot.arts.gla.ac.uk/resources/ferns.html

Daguerre

Graphical Methods

Watt Indicatrix
Chart Recorders

Marey’s sphygmograph
1860

2D electrophoresis

Cloud/Bubble Chamber

Discovery of the charmed baryon
http://www.bnl.gov/bnlweb/history/charmed.htm

Herschel Discovery of Infrared
Photograph of a Spectrum

John Draper, Experimental spectrum, Daguerrotype, 1842

Beams of Light

Berenice Abbott
Beams of Light Through Glass, about 1960
The Minneapolis Institute of Arts, Gift of William R. Hibbs Family
Rolling

Berenice Abbott
_Cycloid: A Light Trace by Time Exposure_, about 1960
National Gallery of Canada, Ottawa

Energy

Berenice Abbott
_Transformation of Energy_, about 1960
National Gallery of Canada, Ottawa
Slit-Scan Photofinish

Self-Illustrating Phenomena
Chladni Diagrams


Modes of a Violin

Solar Corona

http://sci.esa.int/content/doc/1b/13851_-1.jpg

http://www.hao.ucar.edu/public/education/slides/slides.html

Photoelasticity
Golgi Stain – Cajal Drawing

Santiago Ramon Y Cajal (1894)
Cell Types in the Cerebellum
From Robin, p. 44
Ocular Dominance Columns

2-deoxyglucose with 1 eye open
From Hubel
Retinal Mapping

Striate cortex w/ 2-deoxyglucose with radial target
DaValois and DaValois, From Hubel

Shock Wave

Ernst Mach
Shock waves from Bullets, 1888
Turbulence

Final Thoughts

- Instrumentation and photography
- Continuum between question, hypothesis, experiment, analysis, visualization and conclusion
- From measurements to phenomena to illustration
- One image = One answer
- All visualizations involve context, manipulation and interpretation