

## Biomedicine and Visual Culture HHS 201

Dr. Brian Dolan & Dr. John Tercier

Fall Term

This course examines objective and subjective interpretations of biomedical images. It ranges from radiological images intended for expert viewing (for diagnosis, legal testimony) to representations of disease and the body for a general public (documentaries, public health films, advertisements). Across this spectrum we seek to determine what gives images credibility and authority by looking at the technologies of their production and social diffusion, and how images give meaning to biomedicine.

### READINGS

All required course readings are listed in the course timetable (with full titles in the course schedule) and will be provided. Suggested readings are optional and are recommended for further information on that topic. General background readings that are not required but are very useful as overviews or insightful investigations of some of the main themes include:

Lorraine Daston and Peter Galison, *Objectivity* (London: Zone, 2007) – an elaboration on the article assigned as required reading

Caroline Jones and Peter Galison, eds, *Picturing Science, Producing Art* (London: Routledge, 1998) – a superb collection of essays that combines history and philosophy of science and art

Anthony Brinton Wolbarst, *Looking Within: How X-Ray, CT, MRI, Ultrasound and other Medical Images are Created* (Berkeley: University of California Press, 1999) – if you are not familiar with the basic technological side of medical imaging, this is a useful, brief book

ALSO, might want to check out the following short video on medical imaging from Nobel institute:

[http://nobelprize.org/educational\\_games/physics/imaginglife/index.html](http://nobelprize.org/educational_games/physics/imaginglife/index.html)

### MOVING PICTURES (films are listed in red below)

The documentaries and films that are referred to below for the second half of the course are available to you and many will be viewed in class.

### Film Net Resources

Annenberg Center: <http://www.annenberg.edu/>

American Film Institute: <http://www.afi.com/>

Berkeley Media Resource Center: <http://www.lib.berkeley.edu/MRC/>

British Film Institute: <http://www.screenonline.org.uk/index.html>

CDC Media Center: [http://www.cdc.gov/communication/entertainment\\_resources.htm](http://www.cdc.gov/communication/entertainment_resources.htm)

Documentary Works: <http://www.documentaryworks.org/>

Early Visual Media: <http://www.visual-media.be/aims.html>

Early Motion Picture Collections: <http://memory.loc.gov/ammem/paprquery.html>

Film & History Center: <http://www.filmandhistory.org/>

Internet Movie DataBase: IMDB <http://imdb.com/>

Lear Center: <http://www.learcenter.org/html/about/?cm=manifesto>

Library of American Broadcasting: <http://www.lib.umd.edu/LAB/>

March of Time: <http://www.thoughtequity.com/video/home.do?forward=mot>

Movietone: <http://www.sc.edu/library/newsfilm/> <http://www.sc.edu/library/newsfilm/>

Museum of the Moving Image: <http://www.movingimage.us/>

The Moving Image Archive: <http://www.archive.org/details/movies>

National Archives of the United Kingdom: <http://www.nationalarchives.gov.uk/>

National Archives US: <http://www.archives.gov/research/arc/>

National Library of Medicine US: <http://www.nlm.nih.gov/hmd/collections/films/index.html>

Prelinger Archives: <http://www.archive.org/>

<http://www.archive.org/movies/movieslisting-browse.php?collection=prelinger&PHPSESSID=2af3549f7c284b5f9fbfc7c7800c1b1a>  
 Screenonline: The Definitive Guide to Britain's Film and TV  
 History: <http://www.screenonline.org.uk/>  
 University of Chicago, "Chicago School of Media Theory"  
<http://www.uni-koeln.de/~ame02/pppf.htm#F1>  
 Yale Film Studies Film Analysis Web Site: <http://classes.yale.edu/film-analysis/>

**Other background:**

Conversations with Hitchcock  
 The Perfect Man  
 Dark Days (Marc Singer)  
 Healing Words (David Watts)

| Meeting & Date  | Topic                          | Readings at a glance  | Case Study   |
|-----------------|--------------------------------|---|--|
| 1. September 16 | Theory-laden Observation       | Hanson: "Observation"<br>Winkler and Van Helden, "Galileo"<br>Galison and Daston, "Objectivity"<br>Beaulieu, "Voxels in the Brain"<br>Kemp, "William Hunter"<br>Jordanova, "William Hunter" | What makes for a discerning eye? A brief history of anatomy  |
| 2. September 23 | The Politics of Representation | Shapin, "Edinburgh Phrenology"<br>Bastide, "Iconography of Scientific Texts"<br>Dumit, "Ways of Seeing Brains"<br>Simon, "Images and Image"   | Evidential authority   |
| 3. September 30 | Technique and Technology       | Lynch, "Scientific Visibility"<br>Latour, "Drawing Things Together"<br>Alpers, "The Studio, The Laboratory"<br>Barley, "Social Construction of a Machine"                                   | How does a technology of representation gain credibility?  |
| 4. October 7    | Photo-ethnography              | Rothermel, "Images of the Sun"<br>Schonberg & Bourgois 2002<br>Schonberg & Bourgois 2007<br>Newman, "Stories and Statistics"  | Empathy and pictures as propaganda   |
| 5. October 14   | Artifacts                      | Prasad, "Making Images/Making Bodies"<br>Radda, "From Molecules to Human Disease"<br>Dolan, "CAD in Mammography"<br>Wright, "Computer Graphics"<br>Amann and Cetina, "Image Dissection"     | What is the epistemological status of a computer pixel? Is pathology differentiated from artifact? |

| Meeting & Date | Topic                       | Readings at a glance  | Case Study   |
|----------------|-----------------------------|---|--|
| 6. October 21  | Experiments In/On/With Film | Marey – Chronophotographs – 1860-70<br>The Sneeze - 1894<br>Blood circulation in the frog – 1920<br>The heart and how it works – 1924<br>The human body: a visual text of anatomy and physiology – 1920 | What were the early relations between the moving picture, science, and medicine? |

|                 |  |   |   |
|-----------------|--|---|---|
|                 |  | <p>Boon, "Science, Nature and Filmmaking Cartwright "Experiments of Destruction"<br/> de Chadarevian, "Graphical method"<br/> Gunning, "An aesthetic of astonishment"<br/> Lederer, "Hollywood and Human Experimentation"<br/> Starr, "The Framing of the Movies"</p>   |   |
| 7. October 28   | Knowing Disease: Mad Dogs and Englishmen       | <p><b>Striking Back Against Rabies - 1950</b><br/> <b>Life of Louis Pasteur - 1939</b><br/> <b>Clinical Rabies - 1929</b></p> <p>CDC, "Rabies for Kids"<br/> Barthes, "Camera Lucida"<br/> Bazin, "Evolution"<br/> Deren, "Cinematography"<br/> Dobson "Empathy"<br/> Dyer, "Film studies"<br/> Easthope, "Contemporary Film Theory"<br/> Foucault, "The Clinical Gaze"<br/> Hall, "The work of representation"<br/> Kracauer, "Physical existence"<br/> Kracauer, "Basic Concepts."<br/> Loughlin, "Audiovisual Sources"</p> | What are the special relations between photography, film, and disease?                  |
| 8. November 4   | Disease as Metaphor: Visualizing the Invisible | <p><b>How Disease Is Spread – ca. 1920</b><br/> <b>Enemy X– 1942 – 1942</b><br/> <b>The Silent Invader – 1957</b><br/> <b>Panic in the Streets – 1950</b></p> <p>Douglas, "Secular Defilement"<br/> Hudson, "Concepts of Disease in the West"<br/> Ostherr, "Invisible Invaders"<br/> Pappas, "Infectious diseases in cinema"<br/> Sontag, "Illness as Metaphor"</p>  | What are the visual means of perceiving health and illness?                             |
| 9. November 11  | Documentary: The Medium is the Message         | <p><b>Men and Dust – 1939</b><br/> <b>Sicko – 2007</b></p> <p>Boon, "Films of fact"<br/> Comolli, "Cinema / Ideology / Criticism"<br/> Eisenstein, "Beyond the Shot"<br/> Eisenstein, "Statement on Sound"<br/> Izod, "The documentary"<br/> Kolker, "The film text and film form"<br/> Kracauer, "Basic Concepts"<br/> Winston, "The Documentary Film"</p>   | How does film relate form to function to meaning?                                       |
| 10. November 18 | Constructing Disease: The Madness of War       | <p><b>War Neuroses: Netley - 1917.</b><br/> <b>Seale Hayne Military Hospital – 1918</b><br/> <b>Let There Be Light – 1947</b></p> <p>Bracken, "Hidden Agendas"<br/> Geertz, "Religion as a Cultural System"<br/> Gilman, "Depicting Disease"<br/> Good, "How medicine constructs its objects"<br/> Edgar, "War syndromes"</p>   | What role does film & cinema play in linking war with disease, soldiers with pathology? |

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|  |  | Lerner, "Trauma, Psychiatry and History"<br>Morgan, "Let There Be Light"<br>Young, "Suffering & Traumatic<br>Memory" |  |
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### **1. Theory-Laden Observation**

Hanson, N. R. (1958). Patterns of Discovery: An Inquiry into the Conceptual Foundations of Science. Cambridge, Cambridge University Press.

Winkler, M. G. and A. V. Helden (1992). "Representing the Heavens: Galileo and Visual Astronomy." Isis **83**(2): 195-217.

Daston, L. and P. Galison (1992). "The Image of Objectivity." Representations(40): 81-128.

Kemp, M. (1992). "True to Their Natures: Sir Joshua Reynolds and Dr William Hunter at the Royal Academy of Arts." Notes and Records of the Royal Society of London **46**(1): 77-88.

Beaulieu, A. (2001). "Voxels in the Brain: Neuroscience, Informatics and Changing Notions of Objectivity." Social Studies of Science **31**(5): 635-680.

In the 1990s, the 'Decade of the Brain', a number of digital and electronic resources have been created to enable the rationalization and integration of the various sub-fields of neuroscience. This approach has been described as 'neuroinformatics'. An important subset of tools (atlases of the brain) developed in the Human Brain Project is examined in detail in order to understand how the use of these tools changes the practice of science. In the course of the development of atlases, what constitutes 'objective' neuroscientific knowledge is redefined in important ways, according to both technological possibilities built into these tools and to the constraints of standardization inherent in projects that involve multiple measurements. The constitution of objectivity is examined across a number of levels (ontological, epistemic, pragmatic) and the concept of 'digital objectivity' is suggested as a label for a particular configuration of ideals, techniques and objects of knowledge in cyberscience.

### **2. The Politics of Representation**

Shapin, S. (1979). The Politics of Observation: Cerebral Anatomy and Social Interests in the Edinburgh Phrenology Disputes. R. Wallis. Keele, Staffordshire.

Bastide, F. (1990). The Iconography of Scientific Texts: Principles of Analysis Representation in Scientific Practice. M. Lynch and S. Woolgar. Cambridge, MA and London, MIT Press: 186-229.

Dumit, J. (2004). Picturing Personhood: Brain scans and biomedical identity. Princeton University Press.

#### **Other**

Desmond, A. J. (1979). "Designing the Dinosaur: Richard Owen's Response to Robert Edmond Grant." Isis **70**(2): 224-234.

### **3. Technique and Technology**

Lynch, M. (1985). "Discipline and the Material Form of Images: An Analysis of Scientific Visibility." Social Studies of Science **15**(1): 37-66.

This paper is about how natural objects are made visible and analyzable in scientific research. It is argued that the objects scientists actually work upon are highly artificial, in that their visibility depends upon complex instruments and careful preparatory procedures. Instruments and

laboratory procedures do more than provide a window to the world; they lay the groundwork for specific analytic operations which utilize literary resources to represent phenomena graphically. Two specific cases from biology are discussed. The first is from a popular field manual, and is used to introduce themes for analyzing a more complex case, a neuroscience project using electron microscopy of brain tissue. The discussion of both cases concerns how specimens are modified into 'docile objects' for purposes of investigation. These modifications are summarized under the headings of 'marking', 'constituting graphic space', and 'normalizing observations'. Finally, it is claimed that these practices make up an 'externalized retina' for scientific perception - a 'retina' that depends upon disciplined conduct within the laboratory setting.

Latour, B. (1990). Drawing Things Together. Representation in Scientific Practice. M. Lynch and S. Woolgar. Cambridge, MA and London, MIT Press: 19-68.

Alpers, S. (1998). The Studio, the Laboratory, and the Vexations of Art. Picturing Science, Producing Art. C. A. Jones and P. Galison. London, Routledge: 401-417.

Barley, S. (1988). The Social Construction of a Machine: Ritual, Superstition, Magical Thinking and Other Pragmatic Responses to Running a CT Scanner. Biomedicine Examined. M. Lock and D. Gordon, Kluwer Academic Publishers: 497-539.

**Other:**

Brian Dolan, "Pedagogy through print: James Sowerby, John Mawe, and the problem of colour illustration in early nineteenth-century natural history", *British Journal for the History of Science*, **31** (1998), 275-304.

**4. Photo-Ethnography**

Rothermel, H. (1993). "Images of the Sun: Warren De la Rue, George Biddell Airy and Celestial Photography." The British Journal for the History of Science **26**(2): 137-169.

Schonberg, J. and P. Bourgois (2002). "The Politics of Photographic Aesthetics: Critically documenting the HIV epidemic among heroin injectors in Russia and the United States." International Journal of Drug Policy **13**: 6.

Bourgois, P. and J. Schonberg (2007). "Intimate Apartheid: Ethnic dimensions of habitus among homeless heroin injectors." Ethnography **8**(1): 25.

**5. Artifacts**

Prasad, A. (2005). "Making Images/Making Bodies: Visibilizing and Disciplining through Magnetic Resonance Imaging (MRI)." Science Technology Human Values **30**(2): 291-316.

This article analyzes how the medical gaze made possible by MRI operates in radiological laboratories. It argues that although computer-assisted medical imaging technologies such as MRI shift radiological analysis to the realm of cyborg visibility, radiological analysis continues to depend on visualization produced by other technologies and diagnostic inputs. In the radiological laboratory, MRI is used to produce diverse sets of images of the internal parts of the body to zero in and visually extract the pathology (or prove its nonexistence). Visual extraction of pathology becomes possible, however, because of the visual training of the radiologists in understanding and interpreting anatomic details of the whole body. These two levels of viewing constitute the bifocal vision of the radiologists. To make these levels of viewing work complementarily, the body, as it is presented in the body atlases, is made notational (i.e., converted into a set of isolable, disjoint, and differentiable parts).

Amann, K. and K. Knorr Cetina (1990). The Fixation of (Visual) Evidence. Representation in Scientific Practice. Cambridge, MA and London, MIT Press: 85-121.

**Other:**

Thomas Csordas, "Computerized Cadavers: Shades of Being and Representation in Virtual Reality", in Paul Brodwin, ed., *Biotechnology and Culture: Bodies, Anxieties, Ethics* (Bloomington: Indiana University Press, 2000), 173-192.

**6. (October 21) Experiments In/On/With Film**

What were the early relations between the moving picture, science, and medicine?

**Films:**

Marey – Chronophotographs – 1860-70

The Sneeze - 1894

Blood circulation in the frog – 1920

The heart and how it works – 1924

The human body: a visual text of anatomy and physiology – 1920

**Readings [120]**

Boon, Timothy "Chapter 1. Science, Nature and Filmmaking", *Films of fact: a history of science in documentary films and television*, London and New York, Wallflower Press, 2008. pp. 7-32 [26]

Cartwright, Lisa. "'Experiments of Destruction': Cinematic Inscriptions of Physiology. *Representations*, 40 (1992), 129-152. [24]

de Chadarevian, Soraya: Graphical method and discipline: self-recording instruments in nineteenth-century physiology. *Studies in History and Philosophy of Science* 24: 267-291, 1993. [25]

Gunning, Tom. "An aesthetic of astonishment: early film and the (in)credulous spectator" In *Film Theory and Criticism*. New York: Oxford University Press, 1999. pp. 818-832. [14]

Lederer, Susan. "Hollywood and Human Experimentation: Representing Medical Research in Popular Films" In *Medicine's Moving Pictures*. Eds. L. Reagan, N. Tomes, P. Treichler. Rochester: University of Rochester Press, 2007. pp. 282-306. [21]

Starr, Pal. "The Framing of the Movies: The Path to the Nickelodeon" In *The Creation of the Media: Political Origins of Modern Communications*. New York: Basic Books, 2004, pp. 295-305. [10]

**7. (October 28) Knowing Disease: Mad Dogs and Englishmen**

What are the special relations between photography, film, and disease?

**Films**

Striking Back Against Rabies - 1950

Life of Louis Pasteur - 1939

Clinical Rabies - 1929

**Readings [268]**

CDC: Rabies for Kids: <http://www.cdc.gov/ncidod/dvrd/kidsrabies/>

Barthes, Roland. *Camera Lucida*. 1980 tr. R. Howard. London: Vintage, 2000. (119)

Bazin, A. 1999. "The evolution of the language of cinema" 43-56; "The ontology of the photographic image / The myth of total cinema / De Sica: Metteur-en-scene" 195-211; Theater and cinema" 408-418. In *Film Theory and Criticism*, eds L. Braudy and M. Cohen. New York: Oxford University Press. [25]

Deren, M. "Cinematography: The Creative Use of Reality" In *Film Theory and Criticism* eds. L. Braudy and M. Cohen, New York: Oxford University Press, 1999. pp. 216-7. [2]

Dobson, Roger. "Can medical Students learn empathy at the movies?" *BMJ*, 329, 2004, 1363. [1]

Dyer, R. 1998. "Introduction to film studies." *The Oxford Guide to Film Studies*, ed. J. Hill, J. and P. Gibson. Oxford: Oxford University Press. 3-10. [8]

Easthope, A. "Introduction", In *Contemporary Film Theory* ed. A. Easthope, London: Longman, 1993, pp. 1-23. [23]

- Foucault, Michel. "The Clinical Gaze" In *The Birth of the Clinic: An Archaeology of Medical Perception*, in *Medicine and Western Civilization*, pp. 376-79. [4]
- Hall, S. "The work of representation." In Representation: Cultural Representations and Signifying Practices. ed. S. Hall. London: Sage, 1997. 13-74. (61)
- Kracauer, S. "The establishment of physical existence." In *Film Theory and Criticism*. New York: Oxford University Press, 1999. 293-303. [11]
- Loughlin, K. "The History of Health and Medicine in Contemporary Britain: Reflections on the Role of Audiovisual Sources" *Social History of Medicine*. 13, 1. pp 131-145. 2000. [14]

## **8. (November 4) Disease as Metaphor: Visualizing the Invisible**

What are the visual means of perceiving health and illness?

### **Films**

- How Disease Is Spread – ca. 1920  
 Enemy X– 1942 – 1942  
 The Silent Invader – 1957  
 Panic in the Streets – 1950

### **Readings [228]**

- Douglas, M., "Secular Defilement", In *Purity and Danger*. London: Routledge, 1966. pp. 30-41. [12]
- Hudson, R., 'Concepts of Disease in the West', in *The Cambridge World History of Human Disease*. ed. K. Kiple. Cambridge University Press, 1993, 45-51. [6]
- Osther, K. "Invisible Invaders: The Global Body in Public Health Films." In *Cultural Sutures: Medicine and Media*. ed. L. Friedman. Durham: Duke University Press, 2004. 299-314. [15]
- Pappas G, Seitaridis S, Akritidis N, Tsianos E. "Infectious diseases in cinema: virus hunters and killer microbes." *Clinical Infectious Diseases*. 2003 Oct 1;37(7):939-42. [3]
- Sontag, S., *Illness as Metaphor and AIDS and Its Metaphors*. 1978, 1989. New York: Doubleday, 1990.[192]

## **9. (November 11) Documentary: The Medium is the Message**

How does film relate form to function to meaning?

### **Films**

- Men and Dust – 1939  
 Sicko – 2007

### **Readings [222]**

- Boon, Timothy "Chapters 2,3,4,5" *Films of fact: a history of science in documentary films and television*, London and New York, Wallflower Press, 2008. pp. 7-32 [150]
- Comolli, J and J. Narboni. "Cinema / Ideology / Criticism (1)" *Cahiers du Cinema* 216, 1969, pp. 11-15. [4]
- Eisenstein, S. 1999. "Beyond the Shot: The Cinematographic Principle and the Ideogram." In *Film Theory and Criticism*, eds L. Braudy and M. Cohen. New York: Oxford University Press. 15-25. [11]
- Eisenstein, S., V. Pudovkin, and G. Alexandrov. 1999. "Statement on Sound." In *Film Theory and Criticism*, eds L. Braudy and M. Cohen. New York: Oxford University Press. 360-362 [3]
- Izod, J. and R. Kilborn. 1998. "The documentary." *The Oxford Guide to Film Studies*, ed. J. Hill, J. and P. Gibson. Oxford: Oxford University Press. 426-433.[8]
- Kolker, R. 1998. "The film text and film form." *The Oxford Guide to Film Studies*, ed. J. Hill, J. and P. Gibson. Oxford: Oxford University Press. 11-23. [13]
- Kracauer, S. "Basic Concepts." In *Film Theory and Criticism*. New York: Oxford University Press, 1999. 171-182. [12]
- Winston, Brian. "The Documentary Film as Scientific Inscription." In *Theorizing Documentary*. Edited by Michael Renov. New York: Routledge, 1993. pp. 37-57. [21]

## **10. (November 18) Constructing Disease: The Madness of War**

What role does film & cinema play in linking war with disease, soldiers with pathology?

## **Films**

War Neuroses: Netley - 1917.

Seale Hayne Military Hospital – 1918

Let There Be Light – 1947

## **Readings [251]**

Bracken, P. "Hidden Agendas: Deconstructing Post-Traumatic Stress Disorder" In *Rethinking the Trauma of War* (eds) London: Free Association Books, 1998, pp. 38-59. – ON INTRANET [22]

Geertz, C. "Religion as a Cultural System" [21]

Gilman, S. "Depicting Disease: A Theory of Representing Illness" In *Disease and Representation: Images of Illness from Madness to AIDS* Ithaca: Cornell University Press, 1988, pp.1-50, 127-140, 202-245. [106]

Good, B. "How medicine constructs its objects" In *Medicine, Rationality and Experience*, Cambridge: Cambridge University Press. 1990, 65-87. [22]

Jones, Edgar and Simon Wessely. 'War syndromes: the impact of culture on medically unexplained symptoms.' *Medical History*, 2005, 49: 55-78. [23]

Lerner, Paul and Micale, Mark. "Trauma, Psychiatry, and History: A Conceptual and Historiographical Introduction" in *Traumatic Pasts: History, Psychiatry and Trauma in the Modern Age, 1870-1930*. (eds) M. Micale and P. Lerner, Cambridge: Cambridge University Press, 2001. pp. 1-27. [27]

Morgan III, C. A. "From Let There Be Light to Shades of Gray: the construction of authoritative knowledge about combat fatigue (1945-48)", in *Signs of Life: Medicine and Cinema*, eds. G. Harper and A. Moor, London: Wallflower Press, 2005, pp.132-152. [21]

Young, Allan. "Suffering and the Origins of Traumatic Memory," *Daedalus*. 125:1 (1996), 245-253. [9]