The Artificial and the Natural
Prof. Myles W. Jackson
IDSEM-UG 1720
Fall 2013
M,W 12:30-1:45 pm
Gallatin 527
NYU-Gallatin

When we hear the story about molecular biologists inserting a gene responsible for luminosity taken from a lightning bug into a tobacco or strawberry plant, we tend to be repulsed, declaring that such a move is ‘unnatural.’ Yet when we see cows grazing on the Great Plains, or a beautiful array of flowers at the Brooklyn Botanical Garden, we praise the beauty of nature. Upon initial glance, this seems intuitive and obvious; however, it is not that straightforward. Flowers and cattle are just as ‘artificial’ as the genetically modified tobacco or strawberry plant. After all, they are the products of centuries of breeding, artificially selecting for traits, which nature itself did not. Likewise, why should a chemical polymer or dye derived from a natural substance, such as carbon, be any more (or less) artificial than a genetically modified mouse programmed to succumb to cancer? Finally, why are we awestruck when we hear about IBM’s Big Blue defeating one of the greatest chess player of the century (if not of all time), Gary Kasparov, yet we are deeply concerned with the attempts of Carnegie Mellon University’s scientists and engineers who are devising computers, which may one day mimic human attributes, such as consciousness, rendering them into a machine-readable matrix? The boundary between the natural and artificial is blurred, and indeed enjoys a rather impressive history. The goal of this course is to study the debate in the West from Aristotle to the present and explore its socio-political, philosophical, economic and scientific ramifications.

We start the course by reading Aristotle’s *Physics* and *Meteorology*, stressing that there are two sorts of arts: those that imitate nature, and those that are employed to perfect it. That distinction will subsequently be applied to the use of techne in Greek medicine and the role of automata in Greek culture. We then proceed to investigate the natural/artificial distinction during the Renaissance period, specifically with respect to alchemy. Here techne was viewed rather positively, as alchemists attempted to improve upon nature’s handiwork. We shall also discuss the theories of art and nature employed by Jesuit Aristotelians. The views of the Jesuits stood in sharp contrast to Descartes’ work on the mechanical. Descartes rather famously argued that not only was the mechanical not antithetical to nature, but indeed that nature in its very essence was mechanical.

Descartes’ work then leads us to the Scientific Revolution where the artificial was privileged over the natural. English experimental natural philosophers believed that scientific instruments, such as telescopes, microscopes, and air pumps, enabled humans to glean more information about how nature worked than observations based on the human senses alone. Artificial instruments could discipline the unruly senses of the

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1 The term ‘art’ can, of course, refer to either the fine arts (painting, the plastic arts, and literature) or the mechanical arts, or what we would now call engineering.
experimenters. And mathematics was now seen to be an important tool for investigating nature.

The next section of the course concerns itself with the fascination of Enlightenment savants with automata. How did automata change the way philosophers viewed nature? How did the artisans producing these machines challenge the very definition of being human? We shall specifically look at Vaucanson’s automata and the infamous Turk, the chess-playing ‘automaton.’ We shall also explore the responses of the Romantics to the mechanical world of the French Enlightenment and discuss those responses with an eye toward Freud’s notion of the uncanny. The nineteenth century will discuss the replacement of unskilled laborers with machines during the Industrial Revolution and ask if musicians were replaceable as well during that period.

As we move into the twentieth century, we shall see how the mechanical attempted to replace human labor (much along the lines of Babbage in the 19th century) with the rise of Taylorism and human thought, with the work of the brilliant British mathematician, Alan Turing, who wondered if one could differentiate between a machine and a human being via his renowned Turing Test. We conclude the course with how the artificial-natural distinction continues to be blurred by the biological sciences. The invention of genetically modified organisms (GMOs) starting in the 1970s, and the patenting of genes and artificial forms of life dating back to the 1980s have challenged the boundary. How may one patent GMOs if they are natural? And conversely, if they are artificial, why does the U.S. government treat them as natural when dealing with issues of regulation and labeling? What are the socio-economic and political implications of such an inconsistency? As we shall see, this distinction has profound legal implications. How are genes, which are clearly products of nature, patentable? Finally, we shall see how this distinction is often politically charged. For example, is race a natural category, an artificial construct, or both? If it is an artificial construct, does that mean that affirmative action programs are misguided? If it is a natural category, will the specter of eugenics resurface? Clearly much is at stake.

As the ethical, philosophical, political, economic and scientific implications of the natural-artificial debate are historically rooted, to dismiss this distinction as mere nostalgia or popular prejudice would be to ignore a critical historical point and would result in the inability to intervene in the present. This course may be counted toward the science requirement.

Late papers, which are not accompanied by a physician’s note, will not be accepted, and you will reserve a 0 (zero) for that assignment. Also note that it is neither in your interest nor mine for you to ask for an incomplete; however, if there is a family emergency, or you have been ill, we can certainly discuss the possibility of you receiving an incomplete.

Note on plagiarism: “As a Gallatin student you belong to an interdisciplinary community of artists and scholars who value honest and open intellectual inquiry. This relationship depends on mutual respect, responsibility, and integrity. Failure to uphold these values will be subject to severe sanction, which may include dismissal from the University. Examples of behaviors that compromise the academic integrity of the Gallatin School include plagiarism, illicit collaboration, doubling or recycling
coursework, and cheating. Please consult the Gallatin Bulletin or Gallatin website [www.gallatin.nyu.edu/academics/policies/policy/integrity.html] for a full description of the academic integrity policy.”

Goals:

*To understand the historical relationships between socio-cultural context and science
*To appreciate the social, economic, political, and ethical implications of science
*To read critically and carefully primary and secondary literature
*To develop writing skills relevant to science studies

Week 1 (9/2):

W: Introduction to Course

Week 2 (9/9):


Week 3 (9/16):

M: Scientific Revolution and the Artificial. Reading: Steven Shapin, The Scientific Revolution, pp. 15-64 (on electronic reserve)

Week 4 (9/23):

M: Movie: Ancient Inventions
W: Movie: Ancient Inventions

Week 5 (9/30):

M: Student Presentations 1 (Ancient Science and Medicine, Christian Aristotelianism, Scientific Revolution)
Week 6 (10/7):


Week 7 (10/14):

**M: No Class, Columbus Day**

W: The Organic and the Mechanical in Music, II. Reading: Myles W. Jackson, *Harmonious Triads*, chapters 7 and 8

Week 8 (10/21):

**M: No Class**


Week 9 (10/28):

**M: Student Presentations 2 (automata, science and music)**

**W: Student Presentations 3 (automata, science and music)**

Week 10 (11/4):


Week 11 (11/11):

Week 12 (11/18):

**M: Student Presentations 4 (biomimetics, synthetic biology, GMOs)**
**W: Student Presentations 5 ((biomimetics, synthetic biology, GMOs)**

Week 13 (11/25):

M: Gene Patenting I. BRCA 1 and 2 patents Reading:
http://www.cbsnews.com/video/watch/?id=6362525n
W: Gene Patenting II. The CCR5 patent and HIV/AIDS. Reading: S. Parthasarathy, *Building Genetic Medicine*, chapter 3 (on electronic reserve)

Week 14 (12/2):

**M: Students Presentations 6 (Gene Patenting)**
**W: Race I: Natural or Artificial? Reading: Ann Morning, *The Nature of Race*, chapters 1 and 2**

Week 15 (12/9):

**W: Course conclusion and evaluation. Paper Three due in class, 5-6 pages**

**Grade Calculation:**

3 papers, 5-6 pages each, 20% each= 60%
Class Presentation: 20%
Class Participation: 20%

**Required Texts:**

Myles W. Jackson, *Harmonious Triads: Physicists, Musicians, and Instrument Makers in 19th-Century Germany*

Reserve texts link: [http://tinyurl.com/n5d3nhk](http://tinyurl.com/n5d3nhk)

**Office Hours:**

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