Who Won the Scientific Revolution?

> I have been saying that modern science broke down the barriers that separated the heavens and the earth, and that it united and unified the universe. And that is true. But, as I have said, too, it did this by substituting for our world of quality and sense perception, the world in which we live, and love, and die, another world—the world of quantity, of reified geometry, a world in which, though there is place for everything, there is no place for man.
>
> — Alexandre Koyré, *Newtonian Studies*

The Scientific Revolution marks a watershed in the history of human thought and action. It divided knowledge from common sense and severed practice from received mores. This transition has led to tremendous progress in our understanding and control of the natural world as manifested through technology. But in every struggle there are losers as well as winners. Humanity has gained enormous benefits by means of modern science, but has it lost something in the process? Far less obvious than the victories are the real losses—losses that reveal themselves when one contrasts natural science's brilliance at manipulating nature with its inability to speak to the questions that should be central to any study of the material world: What exactly *is* nature? And what is the place of humankind within it?

The Revolution swept away the vibrant world of form and meaning and replaced it with a plastic but desiccated world of mathematical abstractions. Value and meaning were banished from the material, "real" world of "extended things" to the shadowy world of "thinking things." Soon enough the ephemeral world of *res cogitans* was put under interdict, since it was in principle inaccessible to the power of the method. Now modern neuroscience is making the final assault on the "ghost in the machine," hoping at last to retire our final questions by a fully adequate mechanistic explanation of self-awareness in us "meat machines."

But can our fundamental questions truly be answered by reducing everything—including the questioner—to particles and proteins, efficient causes and mathematical laws? Or are the principles and methods of the Revolution such that the knowledge they provide always falls short of *knowledge of the full truth* of things? Predicting and manipulating is not the same as understanding, no matter how convenient it may be to believe so. The problem is not so much the hostility of the Revolution and resulting scientific worldview to traditional conceptions of the cosmos and of human nature, but rather the possibility that the scientific worldview has produced a radical misunderstanding of the very thing it seeks to explain: the material world and what it contains, including in the end the act of human understanding itself. In every struggle there are winners and losers, but when humanity itself is absorbed into the reductive and closed causal system of modern science, who is left to win?

We must begin to ask the fundamental questions again. Does the knowledge we have gained by modern science truly exclude qualities, forms, ends, and meaning from the natural world? Or have we allowed a set of useful methodological choices artificially to restrict our range of reasoning about nature? Might it be possible to recover a rational grasp of the qualitative depth and beauty in nature while retaining the manifold achievements of the Revolution? Are we willing to open ourselves to the risk of discovering that the pre-modern understanding of nature is not only reasonable and defensible, but consistent with the best scientific evidence? Above all: regardless of its convenience or inconvenience to humans, what is the full *truth* about the natural world?

The Institute for the Study of Nature invites you to join us in a Summer Seminar the week of June 9th-13th, 2008, on the campus of MIT to begin considering these questions with the care they deserve. A tentative study and discussion plan follows, with more logistical details (p. 6) and an application form (p. 8). Follow the application directions at the end to confirm your place. (We will soon be sending out more detailed information about the related academic conference that will begin at the end of the seminar on Friday, June 13th and continue on Saturday the 14th. We encourage students to plan to stay for that conference.)

Summer Seminar Schedule

Monday

3:00-3:30pm	Preliminary Discussion (tea)
3:30-4:30pm	WELCOME AND INTRODUCTION by Mark Ryland: *Plan and Purpose of the Summer Seminar* READING: Alexandre Koyré, "The Significance of the Newtonian Synthesis," *Newtonian Studies* (chapter 1). (tentative)
4:30-5:00pm	Extended Break
5:00-6:20pm	SESSION 1, SEMINAR Led by Lee Perlman: *What Is Nature in Aristotle?*

	READING: Aristotle, *Physics* II.1-3. (tentative)
7:00pm	DINNER gathering for fellowship and discussion in location TBA.

Tuesday

9:00-10:20am	SESSION 2, LECTURE by Lee Perlman: *Greek Mathematics and Plato's Conception of Knowledge* READING: Plato, "Theaetetus" (tentative)
10:20-10:40am	Break
10:40am-12:00n	SESSION 3, SEMINAR Led by Michael Augros: *What Is a Cause? What Is an Explanation?* READING: Aristotle, *Physics* II.1-9. (tentative)
12:00n-3:00pm	Lunch and study break
3:00-3:30pm	Pre-session discussion (tea)
3:30-4:50pm	SESSION 4, SEMINAR Led by Bernhardt Trout: *How Do Bacon and Descartes Conceive Nature?* READING: TBA
5:00-7:00pm	Dinner break and unstructured discussions
7:00-9:30pm	PUBLIC LECTURE by TBA: Title: TBA MIT Location: TBA

Wednesday

9:00-10:20am	SESSION 5, SEMINAR Led by Lee Perlman: *How Do Galileo and Newton Depict Motion?* READING: TBA
10:20-10:40am	Break
10:40am-12:00n	SESSION 6, LECTURE by Michael Augros: *Limits and Perennial Truths within Classical Thought* READING: TBA

12:00n-3:00pm	Lunch and study break
3:00-3:30pm	Pre-session discussion (tea)
3:30-4:50pm	SESSION 7, LECTURE by James Barham: *Whispers of Aristotle: Emergentism from Physics to Biology* READING: Margaret Morrison, "Emergence, Reduction, and Theoretical Principles: Rethinking Fundamentalism," *Philosophy of Science*, 73 (December 2006): 876–887 (tentative)
5:00-7:00pm	Dinner break and unstructured discussions

Thursday

9:00-10:20am	SESSION 8, LECTURE by Mark Ryland: *Standard Neo-Darwinism and Intelligent Design Theory: A Thoroughly Modern Debate* READING: TBA
10:20-10:40am	Break
10:40am-12:00n	SESSION 9, LECTURE by Joseph Audie: *Natural Specified Complexity: The Curious Case of Nylonase* READING: TBA
12:00n-3:00pm	Lunch and study break
3:00-3:30pm	Pre-session discussion (tea)
3:30-4:50pm	SESSION 10, LECTURE by James Barham: *Lessons from Slijper's Goat: On the Convergence of Classical and Modern Biology* READING: West-Eberhard, "Phenotypic Accommodation: Adaptive Innovation Due to Developmental Plasticity," *Journal of Experimental Zoology* (2005). (tentative)
5:00-7:00pm	DINNER at local restaurant.

Friday

9:00-10:20am	SESSION 11, LECTURE by Mark Ryland: *Do Laws of Nature Really Govern Material Reality?* READING: Readings: Cartwright, "Introduction" and "Essay 2: The Truth Doesn't

	Explain Much," from *The Laws of Physics Lie* (tentative).
10:20-10:40am	Break
10:40am-12:00n	SESSION 12, LECTURE by Joseph Audie: *Prediction and Explanation in Science: A Scientist's View* READING: TBA
12:00n-2:00pm	Lunch and discussion break
2:00-3:20pm	CONCLUSION Led by Staff (Mike, Joe, James, Lee, Bernhardt, Mark): *Closing Remarks and Discussion*

Summer Conference Schedule (tentative)

Friday, June 13th

4:00-4:20pm	INTRODUCTORY REMARKS by ISN staff
4:20-6:30pm	PRESENTATION OF INITIAL PAPERS
7:00-9:00pm	Informal dinner at conference location

Saturday, June 14th

9:00-9:10am	INTRODUCTORY REMARKS by ISN staff
9:10am-12:30pm	PRESENTATION OF PAPERS
12:45-1:30	Lunch
2:00-5:00pm	PRESENTATION OF PAPERS
5:10-5:30pm	CLOSING REMARKS by Mark Ryland
6:30-9:00pm	CONFERENCE DINNER at nearby restaurant

Seminar: Who Won the Scientific Revolution?

What: Four days of study and dialog on questions of science, natural philosophy, and their intersection following an historical outline. We begin with the beginnings of science in the ancient Greeks, Plato and Aristotle, and then follow the moderns in their turn with Galileo, Newton, Descartes and Bacon. Finally we arrive at more recent results that indicate the limits of the modern project and intimate the start of something new, something that combines the breadth and detail of the moderns with the depth and insight of the ancients to bring forth a new synthesis that promises to be both deep and wide, both wise and powerful.

In order to maximize the value of the week, students will be expected to read and assimilate approximately 250 pages of materials from scientific, philosophical, modern, and classical sources in the months leading up to the Summer Seminar. Those readings will be available on our website by April 15, 2008. Careful reading of the materials in advance will vastly increase the value and quality of the Seminar for all concerned.

Who: Approximately 30-40 graduate and advanced undergraduate students currently studying within a modern scientific discipline or related fields. Post-docs and young (at heart) scientists are also welcome. Applications from students in other disciplines with a deep interest in science, history and philosophy of science, and/or natural philosophy will be seriously considered.

Tutors: ISN Fellows Michael Augros, Lee Perlman, Joe Audie, and James Barham, as well as Mark Ryland and Bernhardt Trout; other lecturers and guest speakers TBA.

When: The Summer Seminar begins on Monday afternoon, June 9th, at 3:00pm, and ends on Friday afternoon at 3:30 pm. Students are encouraged to stay and participate in the Summer Conference, which will bring together a number of scientists and philosophers around a theme related to the Seminar. The Conference begins Friday afternoon and ends Saturday evening, and the Seminar board fee covers food through Saturday.

Where: The Massachusetts Institute of Technology, Cambridge (near Boston), Massachusetts

How: The fee for the Summer Seminar and Conference is $200. Board will cost $175 and includes lunch and dinner for the week and at least one special group dinner at a nearby restaurant. Room rates are set by MIT and have not yet been posted. They are expected to approximate last year's rates, which means six nights in a single room will cost about $318, and in a double about $222.

The fee and room and board costs can be reduced or waived on show of need. Students are expected to cover their own travel expenses, but exceptions will be considered on a case-by-case basis.

Neighboring airports:

Airport	Code	Distance (miles)
Logan International Airport, Boston	BOS	4.8
Manchester, NH	MHT*	54
Providence, RI	PVD†	62
Portland, Maine	PWM	106

We recommend taking the subway ("the T") to campus (Red Line, Kendall Square). For more information about getting to the campus, please follow this link: *web.mit.edu/visit/get-around.html*.

Public transportation around Boston is probably the most efficient way to get around, but if you are planning to bring a car, you need to tell us as soon as possible. Parking in the vicinity is troublesome and MIT parking permits are in high demand.

On the following page is the application form (in PDF), which you can also download from the ISN website in Word format. Please complete the application and send it to us by email (preferred and easiest in Word), mail, or fax. The application must be returned by Thursday, May 1st, 2008.

Institute for the Study of Nature

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* A shuttle, free to ticketed passengers, runs every two hours between Manchester and Logan: *www.flymanchester.com*.
† About 11 miles from Boston commuter rail.

The Institute for the Study of Nature

"Who Won the Scientific Revolution?"

June 9th to June 13th, 2008
Massachusetts Institute of Technology

Please type your information directly into this file, save it using your name in the file name, and e-mail it and supporting materials to *jkeck@isnature.org*.

Name:
E-mail Address:
Phone Number:
Mailing Address (school year):

Alternative Mailing Address (summer):

Alternative Mailing Address (permanent):

Education

What type of degree are you pursuing?

What is your area of concentration or major?

What year are you at school?

What school do you attend?

What are your future educational plans?

What are your future career plans?

Name and e-mail address of your faculty/mentor reference:

How does he or she know you?

In what capacity does he or she serve at the university?

In addition to this document, kindly send us (in PDF, HTML, or Word .doc format):

- a *curriculum vitae* or resume
- a 250-500 word essay explaining why you wish to attend the seminar
- A letter of recommendation from a professor or mentor

Please request that the person recommending you send their letter of recommendation in PDF, HTML, or Word format directly to John Keck.

All application materials must be received by Dr. Keck no later than Thursday, May 1st, 2008. You can contact him by email at *jkeck@isnature.org* or by telephone at: 202-640-2720.