History of Science 100
Fall 2001
Course Syllabus

Instructor: Blair Nelson
Office: Social Sciences 7142
Office Hours: Tues. and Thurs., 4:00-5:00 p.m. and by appointment.
I will usually be available after lectures, as well.
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Objectives: One of the distinctive features of our time is the powerful role science has come to play in western (and non-western) culture. More resources, attention, and expectations are focussed on the study of nature today than any period in history prior to the past two centuries. With this dominance of science as a feature of modern culture comes an image of "the scientist" as the one who produces this knowledge. We lionize the "great scientists" whose acheivements have helped to shape our world. The purpose of this course is to examine this notion of "greatness" and the image of science it assumes by evaluating it with respect to five "great" scientists. Three of these are names you would expect: Isaac Newton, Charles Darwin, and Albert Einstein. Through historical investigation, we will attempt to assess their contributions to science and their relation to western culture in general. In order to push on our received notions of scientific "greatness" (or perhaps to indulge your instructor's own view of things) we will also study two scientists who may well be counter-examples to our popular notions of "greatness." Louis Agassiz (who?!) and Barbara McClintock (well, at least she won a Nobel Prize) are perhaps new names to you, but they have their own claims to our attention and will help us to critically assess how we view science and its "great" practitioners.

Requirements:

Attendance	10 %
Weekly Quizzes	20 %
Papers	70 %

Attendance: a sign-in sheet will be circulated in Tuesday class meetings and your quiz papers will indicate your presence on Thursdays.

Quizzes: Each Thursday, beginning Sept. 13, there will be a 10-question quiz at the end of the period using True/False and multiple-choice formats. Each quiz will cover the lecture and reading material of the week ending the previous Tuesday's lecture. The three lowest scores will be dropped from your grade. If you are forced to be absent on a quiz day, that quiz will be counted as one of the dropped scores unless you have already missed three. If for legitimate and pressing reasons you have to miss more than three quizzes, please talk to the instructor.

Papers: The course is divided into five units dealing with one of our five specimen scientists. At the end of each unit you will write a paper examining the notion of "greatness" with respect to that unit's scientist and comparing him or her with the other individuals we have studied to that point. Your paper on Newton will, of course, be exclusively about him, but your paper on Louis Agassiz will discuss both scientists, and so on until the final paper covering all five. These papers will build on each other. You do not need to completely rewrite old material for each new installment, though some revision may be necessary, especially as you develop new insights that may apply to scientists from completed units. Of course, I highly recommend doing this on a computer. Remember to save all your work! For example, if you are using a friend's computer be sure to keep your work on your own disk. No extra research is required for these papers beyond the course readings and lecture material.

The length and relative weight of each paper:

Unit 1, Newton	2-3 pages	10%
Unit 2, Agassiz	4-5 pages	10%
Unit 3, Darwin	6-7 pages	15%
Unit 4, Einstein	8-9 pages	15%
Unit 5, McClintock	10-11 pages	20%
		70% of the total grade.

Please keep to the length limits. If you find you cannot, then you have not understood the assignment. Final papers longer than 12 pages will be assessed a penalty.

Readings:

A. Course Reader – available in the History of Science Dept. office, 7143 Soc. Sci.
The office is open from 7:30 to 3:15. Cost is $11.00.

The following are available in the bookstore:

B. Betty Jo Teeter Dobbs and Margaret Jacob, *Newton and the Culture of Newtonianism.*
C. David Cassidy, *Einstein and Our World.*
C. Evelyn Fox Keller, *A Feeling for the Organism: The Life and Work of Barbara McClintock.*

All are required.

Due dates: Attached is a schedule of lectures and assignment due dates. The quizzes will be on Thursdays as in the schedule, but there is a possiblity that the due dates for the paper may change. Each paper is due one week after its unit is finished. Therefore, if we get behind or I change the lecture schedule such that the last lecture on a unit is not as scheduled, the due date for that unit's paper will change.

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Lecture and Assignment Schedule

T	9/4	Introduction	Great Science	
R	9/6	Newton A	The Life and Times of Isaac Newton	
T	9/11	Newton B	Science and Newton in English historical context	
R	9/13	Newton C	Gravity and Mechanics Before Newton	*Quiz 1*
T	9/18	Newton D	Newton's Achievement: The *Principia*	
R	9/20	Newton E	The Marketing of Newton: Religion and Public Science	*Quiz 2*
T	9/25	Newton F	Industrial Mechanics and the Father of Progress	
R	9/27	Agassiz A		*Quiz 3*
T	10/2	Agassiz B		**Paper 1 Due**
R	10/4	Agassiz C		*Quiz 4*
T	10/9	Agassiz D		
R	10/11	Agassiz E		***Quiz 5***
T	10/16	Darwin A		
R	10/18	Darwin B		*Quiz 6*
T	10/23	Darwin C		**Paper 2 Due**
R	10/25	Darwin D		*Quiz 7*
T	10/30	Darwin E		
R	11/1	Darwin F		*Quiz 8*
T	11/6	Einstein-A		
R	11/8	Einstein-B		*Quiz 9*
T	11/13	Einstein C		**Paper 3 Due**
R	11/14	Einstein D		*Quiz 10*
T	11/20	Einstein E		
R	11/22	THANKSGIVING No Class.		
T	11/27	Einstein F		
R	11/29	MacClintock A		*Quiz 11*
T	12/4	MacClintock B		**Paper 4 Due**
R	12/6	MacClintock C		*Quiz 12*
T	12/11	MacClintock D		
R	12/13	MacClintock E LAST CLASS		*Quiz 13*
T	12/18	Final paper is due. There is no inclass final.		**Paper 5 is due**

Isaac Newton: A chronology of his life

Dec. 25, 1642: Born at the Woolsthorpe manor house, Lincolnshire, the year the English civil war began.
Father: Isaac Newton dies two months before his son's birth
Mother: Hannah Ayscough.

Youth

1645 Isaac's mother marries Barnabus Smith and moves away, leaving Isaac in the care of his grandparents.
1649 Charles I is executed and Puritan rule under Oliver Cromwell begins.
1653-4 Barnabus dies and Hannah returns with three half-siblings for Isaac.
1655 Off to King's School, Grantham, for a classical education.
1659 Returns to Woolsthorpe to learn to run the farm. Nine months later returns to Grantham to prepare for University.
1660 The Restoration of the English monarchy: Charles II is placed on the throne.

Cambridge Years

1661 Begins at Cambridge University
1663 Lucasian chair in mathematics established: Isaac Barrow, first professor.
1664 Scholarship: First crisis averted.
1664-6 *Anni Mirabiles*
1665: B.A. and return to Woolsthorpe due to the plague.
1667 Fellowship: Second crisis averted.
1669 Some of Newton's mathematical work is circulated by John Collins. Beginning of a reputation.
1669 Barrow resigns and Newton is made Lucasian Prof.
1670 Work on optics is finished.
1672 Paper on colors sent to and published by Royal Society. Reputation as a natural philosopher begins and disputes with Robert Hooke. Newton becomes a member of the Royal Society.
1675 Royal dispensation exempting Lucasian professor from ordination requirements: Third crisis averted. Newton is now secure at Cambridge.
1679 Whig and Tory parties formed in Parliament.
1684 (summer) Edmund Halley's visit: Newton begins work on the *Principia.*
1685 James II succeeds Charles II and attempts a Catholic restoration.
1687 *Principia* published.
1687 Represented Cambridge in dispute with James II
1688 Glorious Revolution: Parliament declares William III (of Orange) king, removing James II from the throne. Beginning of a constitutional monarchy.
1689 Member of Parliament for Cambridge University.

London Years

1696 Appointed Warren [later Master] of the Mint and moves to London
1701 Member of Parliament for Cambridge and resigns his professorship.
1702 Queen Anne succeeds William III.
1703 Elected President of the Royal Society, a position he holds until his death.
1704 *Opticks* published.
1705 Knighted (for political activities, not his scientific).
1714 Hanoverian succession: George I, (Elector of Hanover), becomes kind. Beginning of government by Party and role of Prime Minister.
1727 Newton dies a national hero and is buried in Westminster Abbey.