

May 2002

PRINCETON UNIVERSITY
Department of History

Senior Comprehensive Exams

HISTORY OF SCIENCE AND TECHNOLOGY

Please answer each question separately. Your answer to each question must not exceed five double-spaced typewritten pages. On the cover of each question be certain to indicate your name, the appropriate comprehensive field (i.e., The United States, The United Kingdom) as well as the number of the question you have answered. Your answer should be written in your own words and include the correct citations for any sources you use, as in any paper or final exercise. Be sure to include at the end of your essay the statement "This paper represents my own work in accordance with University Regulations" and to sign your name.

All answers must be turned in at the History Department Office by 3:00 p.m. Wednesday, May 15. There will be no extensions. Late papers will not be accepted. For further explanation of the grading of Departmental Comprehensive Examinations, see page 5 of "Information for Majors."

Answer **TWO** of the following five questions of continuing interest and importance to historians of science. Bear in mind that the essay should reflect your general command of history of science, medicine, and technology and hence should not be a research paper, but rather a discussion based on what you have learned in your course work, independent work, and general reading. Since history is rooted in the concrete, however, you should take care to base your discussion on specific examples chose, where possible, to illustrate the practice of science at different times and places.

1. "Big science' --science as it has been pursued during the past fifty years-- has brought out, through its sheer magnitude if nothing else, the extent to which science is fundamentally a *social* enterprise, requiring the collaboration of many different people who know many different things. As historians and sociologists of science probe big science, they are revising their understanding of little science." What is the nature of big science, and what have we learned from examining it?

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2. Langdon Winner has asserted that "we do not use technologies so much as live them." Bearing in mind the terms of his analysis of the politics of artifacts, discuss his claim with comparative reference to a specific example of 19th-century industrial technology and a specific example of 20th-century consumer technology. To what extent does his claim extend to science as well?
3. Discuss the role of the military in fostering innovation in science, technology, and medicine. Be sure you consider different times and places.
4. There is no obvious link between the common sense experience on which Aristotelian science was based, and the "experiments" that characterize the emergence of modern science. In fact, these modes were sometimes in conflict. Discuss the difficulties faced and resources utilized by Bacon, Galileo, Descartes, Boyle, and Newton in establishing a new science. Consider both the intellectual and social challenges these men faced. What was the attitude of each to Aristotelian "experience"?
5. By one estimation the major European powers, Russia, and the United States together held more than 84% of the earth as protectorates, colonies, or dependant territories in 1914. This is a significant and curious fact, one that has shaped the contemporary world. What role did science and technology play in bringing about this strange state of affairs?

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