

Department of the History of Science

Plan for Assessment of the Undergraduate Major

1 November 1995

A. Introduction

What follows is a pilot plan for the assessment of the major in History of Science. The Department presents it to the College of Letters and Science after thoughtful consideration, not as a final plan, but in the spirit of an open-ended experiment.

The selection of the History of Science Department for this project has given us an opportunity to evaluate, clarify, and reaffirm our goals for not only the undergraduate major in History of Science, but also our primary foci—graduate education (which we discuss in a second plan for assessment) and our undergraduate teaching in General Education.

We therefore emphasize that the following remarks about our major must be seen in the context of our larger teaching mission. At the undergraduate level, the Department contributes predominantly to service teaching at the interface of the humanities and the sciences. We do so not only in our own courses, but also in Integrated Liberal Studies courses, which account for approximately one half of the student credits taught on our budget. In addition, our faculty members make regular departmental contributions to undergraduate education in History of Medicine, Women's Studies, and Medieval Studies as well as (in recent years) occasional ones in Astronomy, History, CALS, and International Studies.

These involvements are but a few signs of the Department's interdisciplinary outlook, which we have long nurtured and consider to be one of our preeminent contributions to the mission of the university. This is manifest in our close association with the History of Medicine Department (Medical School), with which we share a graduate program and faculty, and in our formal arrangements for Ph.D. degrees in History of Science and History, and in History of Science and Philosophy. Although most of our faculty have come up for tenure in the Humanities Division, the History of Science Department is a member of all four divisions of L&S. This interdisciplinary outlook also permeates our undergraduate major: no other humanities major requires twenty hours of science (eight of them intermediate or advanced). It is therefore very difficult for us not to think of our Department as the crossroads, if not the very epitome, of the liberal arts.

Our major therefore offers the alert undergraduate an unusual opportunity to examine the changing historical content of the sciences as well as their interaction with a variety of cultures and societies using the methods of the humanities and—to a lesser extent—the social sciences. The number of majors is small, with room for modest growth within the bounds of our present resources. We are not, however, equipped for a large-scale enterprise, nor could we offer the quality of advising and atmosphere that we prize if our major were to grow significantly larger. Our present undergraduate community of majors, while modestly sized, benefits from a graduate faculty whose range and collective expertise (seven in History of Science, four in History of Medicine, and one in Memorial Library) are matched by no other program in the field.

In the remarks that follow, we specify a few of the pedagogical opportunities and goals that underlie the undergraduate major in History of Science; we describe some of the tools and structures that have allowed, and will allow, us to assess our majors' understanding, their progress toward the

mentioned goals, and the extent of their own participation in efforts to reach them.

This plan has been developed by an Assessment Committee consisting of Professors Tom Broman (History of Science and History of Medicine), Lynn Nyhart (History of Science, ILS, and Women's Studies; director of undergraduate studies and honors advisor) and Mike Shank (History of Science, ILS; chair). The committee solicited additional advice from Professors Hal Cook (History of Medicine and History of Science) and Dan Siegel (History of Science and ILS). The full report was then discussed and improved in full faculty meeting. In short, it has benefited from broad consultation and involved the Department as a whole.

B. Educational Goals of the Undergraduate Major

In 1993, the Department articulated, and renewed its commitment to, its mission, which was expressed most recently in the Strategic Plan submitted to the College of Letters and Science.

Our longstanding goal is to introduce students to the sciences both as ways of knowing and as multifaceted and changing cultural phenomena. We aim to implement this goal in several ways:

(1) At the level of content and basic knowledge,

(a) we seek to introduce our students to a range of courses that, in the aggregate, offer a broad historical understanding of how different facets of the scientific enterprise emerged, grew, thrived (and in some instances stagnated and fizzled) in specific historical and cultural contexts;

(b) we seek to expose our students to the detailed investigation of specific case studies in the history of science, technology, and medicine.

(2) At the affective and esthetic levels,

(a) we seek to foster an appreciation for the great variety of approaches to the inquiry into nature, a variety that ranges across time, from one culture to another, and from scientific discipline to scientific discipline;

(b) we seek to stimulate in our students an appreciation for the various historical roots of contemporary scientific activity and its place in modern society;

(c) we seek to communicate to our students the pleasure and excitement that we, as teachers and researchers dedicated to our field, derive from the framing of new questions about the historical development of science, medicine, and technology.

(3) At the level of skills,

(a) we seek to develop our students' use of critical and analytical skills when reading primary and secondary sources in the history of science and other texts. Specifically, this includes the ability

- *to present fairly the argument of another;
- *to ferret out its implicit assumptions and commitments;
- *to evaluate its cogency and its flaws, its implications and limitations;

(b) we seek to teach students to assess and use historical evidence, to formulate carefully thought-out interpretations, to write about them clearly, and to defend them persuasively and honestly;

(c) we seek to help students see that these are the very skills that active citizens need in a participatory democracy, particularly when asked to make decisions at the interface of science and society, but in many other aspects of life as well.

The major offers excellent training to students interested in medical school and to students who seek an intellectually stimulating liberal arts education (our main clientèle). It is also admirably suited to the very small number of students who intend to pursue a graduate education in the history of science.

C. Plan for Assessment

History of Science has been working on improving the undergraduate major for several years now. That process has drawn upon information and feedback derived from the Director of Undergraduate Studies' personal acquaintance with our majors, and from departmental reflection on our goals and aspirations. It is important to emphasize the thoroughness of Nyhart's advising: every major is required to see her every semester.

In such a context, formal means of assessment may give us tabular knowledge of the health of our undergraduate forest. But there is no substitute for knowing every tree.

Since our department is understaffed,¹ our faculty already carries not only the usual internal committee and meeting loads, but also those generated by our cooperation with and teaching in other programs. Of necessity, therefore, our formal assessment techniques must generate as much information as possible, as efficiently as possible.

1. Areas of Assessment

The distribution of history of science courses prescribed in our requirements for the major was devised for the purpose of reaching Goal 1--survey courses (1a) and courses at the 300-500 level (1b). Our success in attaining it is monitored by the excellent advising that our Director of Undergraduate Studies provides every one of our undergraduate majors every semester.

In addition to prescribed coursework, Goals (1b) and (3) can be monitored more specifically in History of Science 555, currently a spring-semester "capstone" seminar. This course is the only one specifically required for graduation, and it is intended primarily for seniors. It is currently writing-intensive--devoted to a major research paper focused on a theme chosen for its potential to raise pointed questions about issues in the history science, medicine, and technology.

The paper that majors write for 555 implicitly requires that the student draw upon most of the skills, techniques, and competencies that we see as the core of our undergraduate major. Among these are the framing of interesting historical questions, the competent and critical handling of research tools and methods, the construction of coherent arguments backed by evidence, and the effective

¹The Department does not even have student hourly help, which we lost during an earlier budget-cutting exercise not quite ten years ago.

presentation of the whole in clear English prose. This paper therefore provides an excellent gauge of individual student achievement in integrating the goals of the major.

The Department will form an assessment committee to read these papers anonymously and collectively with the aforementioned goals in mind, and will report in writing to the Department and Director of Undergraduate Studies.

Finally the Department will develop by the end of the year a survey instrument to gauge students perceptions of the major in all of the above areas, particularly in the area of Goals 2a-c and 3c. The instrument will be tested by the end of the year on a few current majors, improved, and sent out to undergraduate alumni. It will then be given to the new graduates on a yearly basis. This information will also become part of the Assessment Committee's dossier.

2. Timetable

For mnemonic reasons, this assessment will be carried out in May of Year (n+1), where n is an integer multiple of 5.

3. Suggestions

It would be helpful if L&S would provide resources for the collection of statistical data that regular assessment presupposes, for example, data from the Registrar's office on median and average grades in Department courses, for all students, and for majors, etc; up-to-date Registrar's Office data on our graduates, etc. (We have just become billed \$100 for an 8.5" x 11" sheet containing the names of our PhDs. It is not clear that we can afford to learn what the Registrar thinks the names of our B.A. and M.A. alumni are.)

4. Cautions

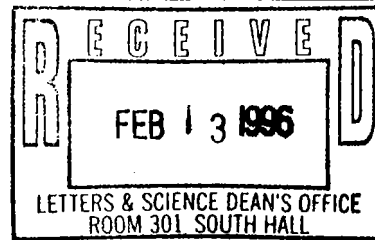
It is not clear that "time to graduation," although easy to tabulate, provides a meaningful measure of success in our major. The reason is simple. The History of Science was not, until the Unabomber, a household word. It is scarcely surprising, therefore, that many of our eventual majors discover the field late in their academic careers and need time to meet our requirements (which include two intermediate or advanced courses in science, towards which calculus does not count). Our development of a full-fledged honors curriculum with freshman and sophomore courses may improve our "time-to-degree" statistics. Our statistics would also look "better" if we discouraged second-semester juniors and seniors from joining our major. But by what conceivable educational criterion would this be a laudable goal?

5. Budget

If funds are available (see C3 above), we request support to offset the following estimated expenses of assessment of our undergraduate and graduate programs:

programming/computer charges	\$300
postage	\$ 50
Student hour	\$150

Total	\$500



8 February 1996

Dean Alex Nagel
South Hall

Dear Alex,

After considerable reflection and departmental discussion, I am pleased to submit our plan for assessment of our graduate program. I apologize for the time it took, but not for the plan itself nor for the reflection that went into it. As part of its discussion, the History of Science Department considered most of the measures of departmental success mentioned in the "charge" document.

My colleagues have in turn charged me to express to you our concerns about some of the measures that the Graduate School either plans to use, or is already using, to monitor the success of graduate programs. We thought about these measures, and while some make sense, we noted some problems in others.

Quality of Applicant Pool

We are keenly aware of the high quality of our applicant pool. Indeed, since some of our best applicants usually do not come to Wisconsin, we conclude that they are going elsewhere and infer that our pool is at the top of the national crop. The most frequently cited reason for not coming to Wisconsin is, as you might guess, financial. (Typical anecdote: a few years ago, when I chaired the admissions committee, three applicants whom we had wait-listed on grounds of quality but eventually admitted and called, told me they had already accepted fellowships from Penn and Harvard; one of them offered her regrets, because Wisconsin was still her first choice.)

We would welcome an assessment of the comparative quality of our applicants. While difficult to measure under the best circumstances, this quality could be gauged by a combination of indicators, none of which may be useful singly:

- a) Placement in the general pool of university fellowships (short-term and erratic committee criteria) ;
- b) Competing offers (information either anecdotal or difficult to obtain in the short-term; relatively easy to obtain within a year);
- c) Verbal, quantitative, and analytical GRE scores. For all of their problems and detractors, still provide the least idiosyncratic basis for cross-disciplinary comparisons of quality.

Quality of Incoming Students

The quality of incoming students is limited by an uncompetitive fellowship program, particularly in the humanities. It is further limited in a department such as History of Science, in which entering students frequently have almost no training in the field. First-year students are therefore never offered teaching assistantships at the time of admission. This is a harsh constraint. But we consider it both unethical to use a one-semester TAship to lure first-year students here if we cannot support them later, and also counterproductive to rely on untrained students to provide the excellent teaching on which the department insists.

Time to Prelims and Time to Degree

In addition, the time to prelims and time to degree have been mentioned as means that the

Graduate School uses to evaluate the success of a graduate department. To be sure, these data are easy to compile and to tabulate. But what do they signify in terms of quality?

Narrowly-conceived dissertations, highly specialized dissertations, very short dissertations, and dissertations that advance the advisor's own research program can be completely more quickly than their opposites. It is highly doubtful that such projects will serve the best interests of the recent Ph.D. in a tight job market. Which qualities are we trying to maximize?

Students on fellowships can complete their dissertations more quickly than students who are constantly worried about their support, who must scrounge teaching jobs in other departments, or work outside the university. But fellowships are few and very inadequate. Note the recent disturbing letter from the Office of International Students, warning that a UW fellowship provides insufficient funds to guarantee to the Department of State the solvency of foreign students.

Attrition Rates

Again, the ratio of entering students to finishing students is a dubious measure of departmental "success." There is no necessary connection between a superb intellect on the one hand, and stable emotions, or stick-to-it-iveness, or organizational acumen on the other. This means that risks are involved in admitting some very promising students. Should we eliminate those risks? It would be a shame to enshrine a measure of success that rewards departments for systematically selecting safe, workaday candidates, and systematically weeding out the more brilliant, creative, and (often) riskier individuals. Every department can lower its attrition rate by selecting "safe finishers" and it will soon have "good" statistics to prove it. But why should such a department be deemed more successful than one that admits a higher proportion of live-on-the edge, creative types, only half of whom (let's say) may complete their degree, even in a nurturing environment? On the contrary, we argue, such a department should not be deemed more successful. The creative half that finishes may well be expected to make a greater contribution to the field than those who have been rewarded for playing it safe. Before encouraging our graduate programs to improve statistics such as these, we ought to be clear about the kind of "success" we hope to achieve.

Indeed, if improving statistics such as these becomes our goal, one might well ask where our applicants will come from. On the one hand, we have an uncompetitive fellowship program that is unattractive to the most desirable candidates. On the other hand, we should not take risks. The admissions policy that results from such constraints is bleak indeed.

Finally, my conversation with Cynthia Verba from the GSAS at Harvard (see the footnote to the assessment plan) proved much more enlightening than I anticipated. She emphasized the fact that from the point of view of the Graduate School, the visiting committee reports yield the single most informative assessment of departments. (I was interviewed by two such visiting committees, once as a graduate student, and once as an assistant professor; the results were apparently so sensitive that the senior faculty did not allow assistant professors to see them).

Since some good field-tested assessment wheels are already rolling out there, L&S, the Graduate School, and UW departments could save much time by redesigning rather than reinventing our own. I realize that this was one of the goals of the pilot assessment plan. Might it be possible to have someone collect a range of specific assessment tools already used by our peers? This would greatly facilitate our collective task.

Yours,



Michael H. Shank
Chair

Enc.