

will certify that a student has approximately ten general skills; in our department it means that, to fulfill the university and college's goals for learning outcomes, our courses' places in the undergraduate curriculum will be assigned on the basis of how their learning outcomes complement those skills for a BA, not the courses' chronology or geography. For our majors, similar reforms emphasizing skills and thematic connections will be stressed.

While I have mixed feelings about this process and am suspicious that "learning outcomes" may have more to do with careers in education than pedagogical effectiveness, the process of curriculum revision has forced me to reassess what I want our students to achieve and how our institutional structures help or hinder these goals. It has made me painfully aware of the persistence of nationalist determination even in departments like ours that hire to develop thematic strengths as much as chronological or geographic ones and that urge students to pursue transnational, thematic fields at both the undergraduate and graduate levels. In this case, institutional pressure from both our university and national accrediting agencies may achieve what sincere intellectual support has not: curriculum reform that subverts national paradigms and forces departments to think thematically. For early modernists it may actually broaden both institutional and student perceptions of our relevance. As faculty are hired to fit such thematic programs, challenges to national paradigms may seem less like career suicide—or at least career complications. It will also minimize the structural pressure for faculty teaching about early modern Europe to think nationally, although it will probably cause difficulties for those who do. If all history truly does become local, institutionally and intellectually, early modernists may finally be able to escape the burden of our Wilhelmine forefathers. ❧

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The Lone Digital Scholar

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The future of early modern studies is likely to follow the path of humanities research generally, and opinions on that vary. A view popular with governments is that the humanities will become like the sciences, and lone researchers will be replaced by large groups of collaborators. Those who promote this view note that science was largely done by loners and small groups until about fifty years ago and is now almost entirely collaborative on a large scale, and they assume that the same change must occur in the tardy humanities. Leaving aside the matter of whether this view is strictly true of science—nuclear physics, for example, seems to have been done in teams since its inception—the motivation for doing research in large-scale collaborations is to attract the capital investment without which most branches of science cannot continue. This principle does not apply to early modern studies: many years ago investments were in libraries and archives that pre-

serve the materials we use, and lone researchers simply having a look at them will continue to publish as much new knowledge as they find the free time to generate and write up.

In forty years' time, this probably will not require traveling to the library or archive since for most purposes digital surrogates are as good as or better than the real thing. Surrogates are clearly better when one wants to compare, say, all the surviving exemplars of an early book or manuscript. One might (just) persuade Cambridge to send its book to Oxford, or the Huntington to send its book to the Folger, but to persuade all these institutions to let just one of them be a collating point is beyond the powers of persuasion of most of us. By 2049, we will be freed to work just about anywhere using digital surrogates. The creation of large-text corpora of the raw materials for early modern research is beginning to lead to new insights. With around 12 percent of the Early English Books Online now keyed as searchable full text by the Text Creation Partnership, it is becoming possible to answer almost instantly questions that used to take up a whole PhD dissertation, such as "how often and in what contexts did early modern writers refer to the behavior of cows?" The kinds of questions we have thought to ask are, necessarily, shaped by the limitations of our still burdensomely paper-centric minds. With all the surviving books and manuscripts scanned and keyed (and forty years should be enough for doing that), and armed with the new techniques of data mining exquisitely refined, we will start to think of new kinds of questions that hitherto were scarcely conceivable because the means to approach an answer did not exist. It is easy to think of digitization giving us only ever more fancy ways of indexing, but of course in forty years the computers will be doing for themselves something close to what we call reading. Complex as it is, human language is not the most intractable phenomenon to analyze and automate.

Will our outputs remain the same? Writing is likely to remain essential to the dissemination of new knowledge, but it can be supplemented greatly by other media. Why give someone a description of something when you can give them a model of it? Three-dimensional modeling is currently difficult to do, but it is the preferred way of articulating certain kinds of knowledge. If computer applications transformed modeling into something easy for anyone to do (as in the 1980s they transformed the early modern art of typesetting) then our preferred way to explain how a painting was made might be to construct a virtual model comprised of layers that can be peeled away. Rather than describe the likely staging of a moment in a play, it might be more convenient to take an existing model of the theatre in which it was performed, populate it with avatars dressed as one thinks the actors were dressed, and to animate them. The beauty of descriptions so comprehensively illustrated will hasten the demise of the book, and the graduate students of 2049 will marvel that in the early twenty-first century scholars persisted in calling the codex a "technology" and predicting its survival.