

Essay Review

A Choice of Companions by J. L. Heilbron

Bernard Lightman (Editor). *A Companion to the History of Science*. xvi + 601 pp., illus., figs., tables, bibl., index. Chichester, West Sussex: Wiley-Blackwell, 2016. £120 (cloth).

Georgina M. Montgomery; Mark A. Largent (Editors). *A Companion to the History of American Science*. (Wiley Blackwell Companions to American History.) xvii + 692 pp., bibl., index. Chichester, West Sussex: Wiley-Blackwell, 2015. £120 (cloth).

Judging from the number of companions and similar cicerones composed by them over the last twenty years, Anglophone historians of science should know by now where they are headed. The *Companion to the History of Modern Science* published by Routledge in 1999 and Oxford's competitor volume, which appeared under the same title in 2002, may sufficiently indicate previous destinations. The Routledge volume presents, in some 500,000 words, 67 substantial independent articles of roughly equal length distributed into two parts, each with three subdivisions: "Study of the History of Science" (relations with neighboring disciplines, analytical perspectives, philosophical problems), in 13 articles; and "Selected Writings in History of Science" (turning points, topics and interpretations, themes), in 54 articles. The format allowed a systematic introduction to the discipline and an unsystematic collection of representative topics the editors deemed central to it. The result is a true companion, offering a "compendium of approaches" (p. xxv)—intellectual, cultural, sociological, and philosophical—and privileging none. The treatment is designed to acquaint students of the history of science with its content, challenges, and methods, to link it with other scholarly disciplines, and to show its interest, importance, and potential to wider audiences. All the contributors, most of them British and the rest American, were established, well-placed scholars. Their coverage is almost entirely Anglo-American.

Oxford's *Companion* is arranged systematically, hierarchically, and alphabetically; contains articles of quite different lengths, the longest giving accounts of major sciences (astronomy, botany, chemistry) or institutions (academies, universities) over the *longue durée*, from which devolve shorter articles on subdisciplines, ideas, societies, instruments, and so on. Cross-cutting concepts like "evolution" and "Science and X," where X = religion, literature, and so on, tie the material together. Although the main emphasis is on Europe and on subject rather than method, the penetration of Western science into other cultures and new approaches (feminism,

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environmentalism) receive attention; and representative biographies, some comparative in the manner of Plutarch, help to make the whole more companionable. The Oxford volume had 217 contributors from several countries and degrees of seniority; some of them wrote articles totaling 20,000 words or more, providing further integration of a volume of some 650,000 words.

Taken together, the Wiley-Blackwell companions to the history of American science (“AS”) and science elsewhere (“ES”) are smaller and less analytic than Oxford’s, although they exceed it in lists of literature. AS has some 280,000 words distributed into 44 articles ranging between 6,000 and 7,000 words each. Like the Routledge volume, it divides into two parts: “Disciplines,” containing expected branches of astronomy, biology, chemistry, and physics and less obvious ones like medical genetics and sociology; and “Topics,” which range widely (biotechnology, science education, field and laboratory, gender and science, science and postcolonialism, science and religion, etc.) without explicit criteria of choice.

ES is slightly roomier than AS (though far less so than its coverage of all times and places deserves), with 40 articles in 290,000 words. It comes in four parts: “Roles” (learned people in antiquity and the Renaissance, go-betweens, the alchemist, natural philosopher, natural historian, invisible technician, illustrator, human subject, amateur, man of science, professional scientist); “Places and Spaces” (medieval university, observatory, court, museum, botanical garden, domestic space, commercial space, laboratory, field, modern university); “Communication” (manuscript, printing, correspondence, translation, journals, textbooks, lectures, film, radio, and television); and “Tools of Science” (the usual instruments and also weights and measures, specimens and collections, three-dimensional models).

It appears that AS works with traditional subject divisions and that ES avoids contamination with the concept and content of scientific disciplines. This sophistication is reflected in the status of the editor, Bernard Lightman, a former editor of *Isis*, and of the author of the keynote article, “Historiography of the History of Science,” Lynn Nyhart, a former president of the History of Science Society. Further to ES’s credentials, twenty of its contributors are senior members of the profession, a further seventeen have reached the associate professor level, and only five, of whom three work outside the United States, are juniors. In these respects AS does not score so well. Its editors, Georgina Montgomery and Mark Largent, an associate and full professor, respectively, at Michigan State University, have not been high officers of the History of Science Society. They have been able to capture only eight senior and eight midcareer people, four of them from Michigan State and few of the others from first-tier research universities. The main body of contributors, twenty-five in all, consists of assistant professors, postdocs, and graduate students, including five attached to Michigan State. When to this inexperience and inbreeding is added the traditional weakness of the historiography of American science compared with that of European science, one might expect ES to wipe the floor with AS. And yet, in almost every relevant way, AS, the companion from Michigan State, is better than ES, the companion of the Establishment. It is a sign of the times.

The main faults of ES come where contributors follow the party line of Nyhart’s ungenerous “Historiography.” In contrast to the methodological essays in the Routledge and Oxford companions, which open out to various views and audiences, Nyhart’s narrows to people who pirouette to the “social constructionist turn” (p. 7). In olden times, historians regarded science as something “arrived at through an increasing recognition of truths,” whereas since the Turn we “treat science as something that has been produced historically and contingently” (p. 16). That is neither profound nor logical. What, created by humans, has not been produced historically and contingently? And it is a *non sequitur* to judge the product by the process. It may be true, as many people believe, that eclipses of the sun are caused by predictable interpositions of the moon, even though in reaching this candidate truth human beings have entertained the idea that a dragon is responsible.

To continue with *ES* historiography: since the happy turn from truths, the task of the historian “is to tease out how certain forms of knowledge and practice . . . came to be understood as science” (p. 7). This is the only task that Nyhart mentions and, apparently, considers legitimate. Taken literally, her proscriptive assignment would forbid much of the work that built our profession after World War II and continues to be productive. I do not object to the sorts of studies she authorizes and even admire them when they are not silly or sloppy. Our common professional interest must not be to impose a particular approach to a particular subject matter but to insist that, whatever its content and direction, the work be carried out to the highest standards of historical scholarship.

A few specimens of silliness and sloppiness in the articles that incorporate the Lightman-Nyhart line may serve as a flag to people not able to pirouette without stumbling. “Alchemy today is as vibrant as it has ever been . . . its complete elimination . . . from modern scientific discourse . . . offers a powerful example of the capacity of linguistic, social, and cultural forces to redraw maps of knowledge” (pp. 58, 67); “the Victorian period did not accommodate easily the view that knowledge was embodied in its instruments” (p. 101); “Who was authorized to speak for nature?”: the man able to draw “scientific authority from his gentlemanly manners” (pp. 144, 157); “scientists might occasionally address the public, but they have lost [among other things. . .] the gentlemanliness and masculinity . . . that were defining features of their predecessors” (p. 161); “the shared middle-class background of scientists such as Hermann von Helmholtz and Max Planck allowed them to ground physical arguments in the piano-playing and concert-going expected of any good bourgeois” (p. 166); “The key is our new understanding of science as practice. All evidence from the past is in the form of material things” (p. 290); “The science lecture, then, can be understood as a dynamic and at times unstable collection of communicative practices that were informed [by] and in turn helped to transform a wider set of (inter-) cultural domains” (p. 426). Like howling at a football game.

Those who like this drivel reinforce it by citation of a few favorite authors, by incantation (“science is practice”), by special use of terms of art, and, sometimes, by naked politics. “[We must] break with the positivist-idealist mode of classical history of science . . . and pick up the gauntlet of critical engagement with . . . the history, sociology, and anthropology of intercultural encounter, and gender studies” (p. 52). Here we have intolerance in the guise of outreach and a special interest posing as inclusiveness.

Two contributors, Donald Opitz (De Paul University) and Jeremy Vetter (University of Arizona), appear in both *AS* and *ES*. For *AS* Opitz wrote an excellent review in the positivist-idealist classical mode of the distinctions between sex and gender as developed by psychologists. In contrast, his *ES* article, “Domestic Space,” a subject inspired by the Turn, peers into bedrooms, kitchen sinks, and home studies and remarks that gentlemanliness, emotional support at home, and the work of wives and menials might signify. Thus we need “deeper analysis of scientific households, especially the interplay between family dynamics, gender, and scientists’ careers” (p. 262). Why? These aspects of the lives of scientists would not seem to differentiate them from more ordinary mortals like lawyers and gentlemanly historians.

Vetter collaborated with Robert Kohler in *ES* on a useful if overly conceptualized analysis of “Field Science.” Their treatment has a whiff of the underdog (field science not being as prestigious as lab science) characteristic of much post-Turn writing in history of science. Since new knowledge has to be created by someone somewhere sometime (an insight of the 1980s they commend), all science is field science and no science universal. Everything is situated. “Place becomes the one attribute that makes science credible” (p. 290). The places they have in mind are not minds. They are spots in the field. So also the laboratory: “exposing the placelessness of labs as a discursive fiction was the acid test of deconstruction” (p. 286). (Of course it does not follow that the knowledge created in one of them does not apply elsewhere.) In contrast, Vetter’s

article on “Field and Laboratory” in *AS* gives examples of the field without fussing about underdogs or placelessness. *ES* conditioning will out, however, and in a bibliographical note Vetter toots that “the historiography of labs and fields as places” emerged just after the Turn because of “cross-fertilization between the history of science and interdisciplinary scholarship in STS” (p. 383). This is certainly not true of several of the histories of physics labs Vetter cites.

Whereas *ES* takes the Turn as the beginning of historiographical time, *AS* dates its Big Bang to 1979, to *The Sciences in the American Context*, edited by Nathan Reingold. The editors of *AS* also praise two later seminal documents, an *Osiris* volume of 1985, edited by Sally Gregory Kohlstedt (who is to *AS* what Steve Shapin and Simon Schaffer are to *ES*) and Margaret Rossiter, and *The American Development of Biology* (1988), edited by Ronald Rainger, Keith Benson, and Jane Maienschein, which claims to describe a science with a distinctive American character. Although this pedigree omits such pioneering works as Hunter Dupree’s *Asa Gray* (1959) and *Science in the Federal Government* (1957), it supports a better cause than the foundation myth of *ES*: for *AS* asserts an expansion, the formation of a major new subdiscipline, whereas *ES* tries to impose a contraction on the discipline as a whole.

Both volumes provide good bibliographical access to their subjects. Many of the articles are in effect bibliographical essays, which, though a convenient way to convey information, can distort historiography by making assertions without qualifications, merely as pegs to hang literature on. Each article in *ES* has its own bibliography, some of them with more than 50 entries. Each article in *AS* ends in a bibliographical paragraph or two and all references in the text are printed together in a grand list of 1,400 items. Both accounts of recent literature will be valuable for work in the immediate future. More enduringly, both companions will serve as benchmarks for the state of our discipline around 2015, just as the Routledge volumes now do for the situation in 2000. Does the fact that the contributors to *AS* are more youthful and more likely to give science a place in their historiography than the older and better established contributors to *ES* augur a re-Turn toward the modes of “classical history of science”? Stick around for the companions of 2030.

I hope it is unnecessary to state that my description of *ES* does not apply to all the articles in it. Those in the section on “Tools” stay away from deconstruction. The material bases of science—or anyway their historians—apparently do not lend themselves to it. I apologize to the authors of these articles and to other meritorious contributors for not pointing out the parts of *AS* and *ES* that seem to me the most useful. But that would be both gratuitous and unnecessary for readers of *Isis*. Anyone knowledgeable can see which articles provide more or better coverage than their counterparts in Wikipedia and which suffer from following a party line.