BOOKS: HIGHER EDUCATION

Balancing Research and Teaching

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Gone for Good
Tales of University Life After the Golden Age
by Stuart Rojstaczer
Oxford University Press, New York, 1999. 299 pp. $22. ISBN 0-19-512682-3.

The American research university is one of the great success stories of this century. The United States educates more people in more disciplines than any other country, and it does so while generating an astonishing amount of knowledge. The reasons for the overwhelming predominance of U.S. research universities are complex, but a prime factor is undoubtedly the money invested by the federal government since Sputnik. That the public is well aware of the benefits of these universities is evident in the ever-increasing number of applicants seeking admission to such institutions and in the willingness of parents to spend huge sums to finance the education they provide. Given this general climate, now would seem an ideal time to be a tenured professor at a research university. What other occupation pays a decent salary, with lifetime security to do pretty much as one wants with minimal interference from external forces?

Stuart Rojstaczer's book *Gone for Good: Tales of University Life After the Golden Age* assesses life in the modern research university from the perspective of an associate professor recently granted tenure. Rojstaczer was hired at Duke University after spending 10 years in a government geological agency. I suspect that this hiatus from the academic world provided him with a fresh outlook and an unusual willingness to question and analyze the day-to-day workings of the university. His book provides candid accounts of experiences new faculty face: teaching that first undergraduate course; getting grant proposals submitted on time and, eventually, funded; choosing graduate students; attending professional meetings; dealing with colleagues, administrators, and staff; and, perhaps most important of all, establishing a successful strategy for getting tenure. Anyone interested in what it is like to be a faculty member at a major American university will enjoy this book, and I particularly recommend it to those applying to graduate school with the goal of a career in academia. Rojstaczer's observations are keen and his opinions on topics ranging from student-athletes to political correctness are entertaining, even if one disagrees with his viewpoints. The author's intention, however, is not simply to chronicle such everyday events of academic life. Rather, he uses them to illustrate what he perceives to be wrong with the contemporary academic world.

In Rojstaczer's view, research universities are no longer focused on what should be their most important objective: providing an educational experience that enhances the intellectual talents of all students. He sees these universities as instead concerned primarily with obtaining outside funding,

much of which comes from the overhead charged to government agencies. This preoccupation pressures faculty to obtain extramural funds. To keep the students happy, both the severity of grading and the rigor of course work have been decreased. Everyone seems to come out ahead: Students are assured better grades for less work. Faculty spend less time in the classroom, so they have more time for research and writing grant proposals. Successful proposals result in more overhead funds for administrators to allocate in making their budgetary decisions. What concerns Rojstaczer is that under the current system, students are not learning what they could be learning. Thus they and their tuition-paying parents are being short-changed despite generally being pleased with the existing situation.

This assessment calls into question the mainstream position that research and teaching are synergistic activities that benefit both students and their professors. In an eloquent account of why undergraduates might want to attend a research university, the former Harvard dean Henry Rosovky wrote that one of the factors uniting such institutions is the belief that "university-level teaching is difficult without the new ideas and inspiration provided by research" (*1*). To be fair, Rojstaczer is not opposed to research. He would, however, like to shift the balance so there is less emphasis on research—particularly on the time and effort spent in seeking grants—and more on undergraduate education.

Rojstaczer's assessment of research universities is not novel, although it is uncommon for a junior faculty member—one who has attained early success in his field—to write about this issue. The major shortcoming of his effort is that Rojstaczer offers no solutions to the problems he perceives in the academic world. On the contrary, his response is to acquiesce to the system. For instance, in response to disappointing student evaluations he intentionally decreased the difficulty of his own course. Although such behavior is perhaps understandable for an untenured faculty member, therein lies the crux of the problem. Who is going to fix the research university if almost everyone appears satisfied with the current situation and critics like Rojstaczer choose to go along with the status quo?

Is Rojstaczer's analysis correct? Are research universities short-changing their students because of faculty pursuit of grants? Rojstaczer does not provide supporting evidence for his position, other than his own experiences. Indeed, his book is entirely devoid of documentation, perhaps because the relevant empirical evidence is lacking or difficult to interpret. But let us assume, for the sake of argument, that Rojstaczer is correct. If he were appointed president of Duke University, what would he do to fix the problem? One thing is certain: if a new rule appeared stipulating a decreased commitment to research, the majority of the most marketable faculty would be gone in record time. The prestige of the university would then plummet, and the best undergraduates would no longer apply for admission. Still, there are less drastic things that could be done. At my institution, for instance, nine different teaching awards are bestowed annually, with the most generous currently offering the recipient $30,000. Although the impact

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of such awards on teaching commitment and quality are difficult to gauge, they do make a public statement that excellence in teaching is a valued commodity.

Rojstaczer calls attention to a long-standing concern of professors and administrators, but he offers no new insights into how to establish a better balance between research and teaching. He makes no attempt to define what would constitute a more appropriate relationship between these two activities at a research university. And he chooses to ignore the obvious point that there are plenty of excellent colleges and universities where the emphasis is not on grant-funded research. For the research universities themselves, the challenge has always been to develop the full capabilities of students while staying at the cutting-edge of scholarship. How best to meet that challenge remains an open question.

References
1. H. Rosovsky, *The University: An Owner's Manual* (Norton, New York, 1990), p. 309.

BOOKS: CHEMISTRY

Reacting to History

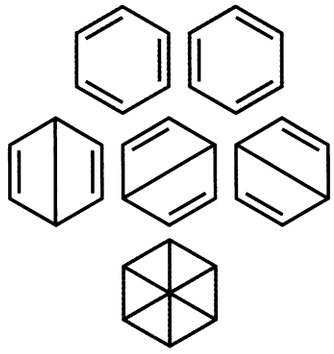
Jay Labinger

A couple of years ago, at a history of science conference, I heard the following story: A heart surgeon and a historian of science meet at a party, and start chatting. "You know," says the surgeon, "I've always been interested in history of science, and I'm planning to take it up when I retire in a couple of years." The historian replies, "Funny you should say that; I've always been interested in heart surgery, and when I retire...."

This anecdote makes a valid point: as in other disciplines, doing history of science well requires skill and training. Surely, though, neither the historian who told the story nor his highly appreciative audience (also mostly historians) would have any hesitation in deciding which of these two transoccupationals they would be willing to consult professionally. Studying the history of science serves a variety of purposes, some of which may be accomplished as well by a practicing scientist as by a professionally trained historian. Furthermore chemistry, compared to physics and biology, has been a relatively neglected subject of "metascientific studies" (the history, philosophy, and sociology of science). Hence a new book on history of chemistry by a practicing chemist is most welcome, at least to this chemist reviewer.

Chemical Creativity
Ideas from the Work of Woodward, Hückel, Meerwein, and Others
by Jerome A. Berson
Wiley-VCH, Weinheim, Germany, 1999. 207 pp. Paper, $54.95. ISBN 3-527-29754-5.

In *Chemical Creativity*, Jerome Berson, a professor at Yale University, presents several case studies in 20th-century chemistry. Most are drawn from physical organic chemistry, Berson's own field of research. He discusses such questions as how problems are selected and attacked, and why one researcher's experiment is accepted as convincing while another's falls into neglect. He argues that an examination of how earlier chemists have gone about their activities can provide useful lessons for today's chemists. For example, Berson traces several decades of work on the so-called "dienone-phenol rearrangements" to demonstrate how a set of apparently closely related reactions can proceed by a variety of quite different mechanisms. The research, which developed from efforts toward the synthesis of steroidal hormones, shows that the specific mechanism depends crucially on the fine details of structure and reaction conditions. This story is a useful cautionary tale, particularly for those of us who are quick to wield Occam's razor as an intellectual weapon.



Ring representations. The valence bond method approximates the ground state of benzene (purple) from the superposition of the two Kekulé (blue) and the three Dewar (red) forms.

Other chapters aim at getting beyond narrow technical content to address broader issues. One such study examines Erich Hückel's contributions to the molecular orbital theory of unsaturated and aromatic compounds. It explains their limited initial impact on the organic chemistry community, and Hückel's virtual abandonment of the field, in terms of his personality, his competition, and even his involvement with the Nazi party. The longest and most ambitious chapter begins as a lengthy commentary on the "Special Convictive Power of Symmetrization Experiments," Berson's characterization of mechanistic tests that distinguish whether a reaction pathway proceeds via a symmetric intermediate. The author then shifts to a much more general problem: in trying to account for the reception of new ideas, scientists often appeal to aesthetics, as in a "beautiful theory." How are we to understand why one theory or experiment, rather than another, is perceived as beautiful? Berson suggests that our innate attraction to symmetry is a factor. His discussion of symmetry ranges over widely diverse topics, from Kepler's model of the heavenly spheres to the neuroanatomy of human vision. Even if its relevance to the experiments under question is not convincingly demonstrated, it is an interesting speculation.

Berson is sensitive to the concern that he is practicing history without a license, but his experience and expertise give him a special perspective that compensates. The anecdote above implicitly asks whether history of science should be done by historians or scientists; this book helps make a case for answering, simply, "Yes." Beyond its specifically stated purpose of improving the minds of practicing chemists, it provides an alternative, complementary perspective to history by historians. It is instructive, as a sort of second-order metascientific study, to compare Berson's take on Hückel with that offered by a professional historian, Mary Jo Nye (*1*). The facts presented in the two accounts are much the same, but the emphasis and interpretation they receive are significantly different.

Berson anticipates that professional chemists will constitute the bulk of his audience, but he hopes that others will read *Chemical Creativity* as well. Those who do—out of interest in how chemists think and in what ways they are typical of or different from scientists in other fields—will at least be entertained and, hopefully, also enlightened. Even though much of the technical material presented is highly specialized, Berson generally does a good job of clarifying concepts and terms that will be unfamiliar to the non-chemist and of explaining the key issues in the evolution of each case (there are only a few lapses). At this point, however, I cannot refrain from complaining about the price of the volume: $55 for a paperback of 200 pages. Perhaps the production costs were high because of the liberal offering of reaction schemes and photos; despite an annoying number of typos, the book is rather attractive. But such pricing is self-defeating for a book that strives to attract readers by appealing to general interest rather than professional needs.

References
1. M. J. Nye, *From Chemical Philosophy to Theoretical Chemistry* (University of California Press, Berkeley, 1993), chap. 9.

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