

CUTTING-EDGE CHEMISTRY: SOME 19TH-CENTURY RUSSIAN CONTRIBUTIONS

Introduction

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The four papers and commentary on 19th-century Russian chemistry in this issue of the *Bulletin for the History of Chemistry* constituted the session "Cutting-Edge Chemistry: Some 19th-Century Russian Contributions" at the Semisesquicentennial Anniversary Meeting of the History of Science Society (HSS) in November 1999 in Pittsburgh. This was the first session officially sponsored by the Mendeleev Interest Group, which developed as a result of another recent HSS session devoted to the great Russian chemist.

At the 1996 HSS Meeting in Atlanta, the session "Dmitrii Mendeleev: New Perspectives" was chaired by Loren Graham, the dean of Russian science studies (1). Besides Nathan Brooks and me, the other two speakers were the only American historians who had at that time written doctoral dissertations specifically on Mendeleev: Beverly Almgren (2) and Francis Stackenwalt (3). Also present were Masanori Kaji, author of a book on Mendeleev and his law of periodicity (4), and Michael Gordin, a graduate student in Harvard's Department of History of Science, who was planning to write his dissertation on Mendeleev (5). Thus, most of the world's non-Russian scholars with an interest in Mendeleev were assembled at that session.

Following the formal portion of the session, we all participated in an informal roundtable discussion of Mendeleev and the state of historical studies of Russian science in general. Graham suggested that the timing of the session was propitious in that he believed Mendeleev studies would soon experience the same kind of surge in popularity that Newton and Lavoisier studies, for example, had in recent years. We all agreed,

however, that a blossoming of Mendeleev studies would face the additional problems of an unfamiliar language that English and French do not pose for most historians of science in the West. Even for those who know Russian, there are still obvious difficulties in visiting the archives with material on Mendeleev and other Russian scientists.

The papers from that 1996 session, along with an additional paper by Michael Gordin, were subsequently published in a special issue of *Ambix* in July 1998 (6). That session was also the impetus for organizing the Mendeleev Interest Group (MIG) under the aegis of HSS. We wanted this group to serve as a focal point not just for Mendeleev studies, but for the history of Russian science, particularly chemistry, more broadly. Thus, this first HSS session under MIG sponsorship focused on some important Russian contributions at the forefront of 19th-century chemical knowledge.

The first two papers examine particular aspects of the work of several chemists at Kazan' University, including Zinin, Zaitsev, Vagner, and Reformatskii. Kazan' was the incubator for a number of great 19th-century Russian organic chemists. This may be surprising in view of the fact that the provincial city of Kazan' is located some 500 miles east of Moscow, virtually the easternmost outpost of European civilization in early 19th-century Russia. The third paper examines the interplay of Mendeleev's famous textbook, *The Principles of Chemistry*, and his development of the periodic law in the late 1860s. The final paper of the session looks at two young Russian chemists, attracted to the "new" physical chemistry in Leipzig in the late 1880s, in spite

of the opposition of chemists in St. Petersburg, particularly Mendeleev.

These four papers are ordered chronologically by their topics, from the 1840s to the 1890s, but they also represent two other important trends, one in Russian chemistry specifically and the other in chemistry more broadly. Although Kazan' was an important center of Russian chemistry—perhaps the most important—in the 1840s and 1850s (7), this center moved west as the century progressed, eventually reaching St. Petersburg. Many of the major chemists of Kazan' eventually moved to other universities. Zaitsev moved to St. Petersburg in 1848, and Butlerov, the most eminent chemist from Kazan', went there in 1868. Markovnikov left for Odessa in 1871 and then moved to Moscow in 1873. In addition, these papers mirror the global shift in focus from organic chemistry in mid century to the inorganic and theoretical chemistry of the time of Mendeleev and finally to the new physical chemistry of Ostwald and his disciples in the late 1880s.

Our hope is that readers of the *Bulletin* will find this an interesting and thought-provoking set of papers, along with the commentary by Seymour Mauskopf that generated discussion at the session and should provide a counterpoint for readers' responses to these papers as well. We also hope that this issue will spark further interest in the chemical heritage and history of a fascinating country, which are still not well known (8).

Finally, I want to point out that all of us involved with the two HSS sessions and subsequent publications in both *Ambix* and the *Bulletin* are especially proud of the fact that these endeavors have all along been collaborative efforts between professional historians and professional chemists with similar interests. Our work together has been harmonious and mutually beneficial. We hope that we are a model for other collaborations.

REFERENCES AND NOTES

1. Graham is the author of many outstanding books on Russian and Soviet science. See, e.g., L. R. Graham, *Science in Russia and the Soviet Union: A Short History*, Cambridge University Press, Cambridge, 1993.
2. B. S. Almgren, Mendeleev: The Third Service, 1834-1882, Ph.D. Thesis, Brown University, 1968.
3. F. M. Stackenwalt, The Economic Thought and Work of Dmitrii Ivanovich Mendeleev, Ph.D. Thesis, University of Illinois at Urbana-Champaign, 1976.
4. M. Kaji, *Mendeleev's Discovery of the Periodic Law of the Chemical Elements—The Scientific and Social Context of His Discovery* [in Japanese], Hokkaido University Press, Sapporo, Japan, 1997.
5. He has since done so. M. D. Gordin, The Ordered Society and its Enemies: D. I. Mendeleev and the Russian Empire, 1861-1905, Ph.D. Thesis, Harvard University, 2001.
6. N. M. Brooks, (Guest) Ed., "Mendeleev: Beyond the Periodic Table," *Ambix*, **1998**, *45*, 49-128. This special issue (No. 2, July 1998) includes the four papers from the 1996 Atlanta HSS Meeting by B. S. Almgren, "D. I. Mendeleev and Siberia," pp 50-66, F. M. Stackenwalt, "Dmitrii Ivanovich Mendeleev and the Emergence of the Modern Russian Petroleum Industry, 1863-1877," pp 67-84; R. E. Rice, "Mendeleev's Public Opposition to Spiritualism," pp 85-95; and N. M. Brooks, "Mendeleev and Metrology," pp 116-128; along with one paper not presented at that meeting, M. D. Gordin, "Making Newtons: Mendeleev, Metrology, and the Chemical Ether," pp 96-115.
7. D. E. Lewis, "The University of Kazan—Provincial Cradle of Russian Organic Chemistry: Part I. Nikolai Zinin and the Butlerov School," *J. Chem. Educ.*, **1994**, *71*, 39-42; "Part II. Alexandr Zaitsev and His Students," *J. Chem. Educ.*, **1994**, *71*, 93-97.
8. N. M. Brooks, "The Evolution of Chemistry in Russia During the Eighteenth and Nineteenth Centuries," in D. Knight and H. Kragh, Ed., *The Making of the Chemist: The Social History of Chemistry in Europe, 1789-1914*, Cambridge University Press, Cambridge, 1998, 163-176.

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