

of Chemical Manipulation", *Bull. Hist. Chem.*, 1991, 11, in press.

23. W. B. Jensen, *Two Centuries of the Chemistry Set*, to be published.

24. For a study of the organization of Liebig's laboratory, see M. W. Rossiter, *The Emergence of Agricultural Science: Justus Liebig and the Americans, 1840-1880*, Yale, New Haven, CT, 1975, Part II, and, more recently, F. L. Holmes, "The Complementarity of Teaching and Research in Liebig's Laboratory", *Osiris*, 1989, 5, 121-164.

25. For a current description of the Liebig laboratory and museum, see S. Heilenz, *Das Liebig-Museum in Giessen*, Feuer'schen Universitäts-Buchhandlung, Giessen, 1986.

26. Quoted in H. B. Good, "On the Early History of Liebig's Laboratory", *J. Chem. Educ.*, 1936, 13, 557-562. I have edited parts of the translation for greater clarity.

27. O. P. Krätz and C. Priesner, eds., *Liebigs Experimentalvorlesung*, Verlag Chemie, Weinheim, 1983.

28. K. Heumann, *Anleitung zum Experimentieren bei Vorlesungen über anorganische Chemie*, 2nd ed., Vieweg, Braunschweig, 1893.

29. For background on Hofmann and his book, see W. B. Jensen, "Reinventing the Hofmann Sodium Spoon", *Bull. Hist. Chem.*, 1990, 7, 38-39.

30. R. Arendt, *Technik der anorganischen Experimentalchemie*, 4th ed., Voss, Leipzig, 1910.

31. For biographical details on Arendt, see F. Etzold, "Rudolf Arendt", *Berichte*, 1902, 35, 4542-4549 and N. Just, "Rudolf Arendt (1828-1902): Chemiker und Lehrer - sein methodisches Unterrichtswerk im Spiegel der Zeitgenossen", *Mitteil. Fachgr. Gesch. Chem. GDCh.*, 1988, 1, 70-78.

32. S. P. Sadtler, *Chemical Experimentation, Being a Handbook of Lecture Experiments in Inorganic Chemistry*, Morton, Louisville, KY, 1877.

33. G. S. Newth, *Chemical Lecture Experiments*, 2nd ed., Longmans, Green, London, 1896. An earlier example may be E. Frankland, *How to Teach Chemistry. Hints to Science Teachers and Students*, London, 1872.

34. F. G. Benedict, *Chemical Lecture Experiments*, Macmillan, New York, NY, 1901.

35. L. Wright, *Optical Projection: A Treatise on the Use of the Lantern in Exhibition and Scientific Demonstration*, Longmans, Green, London, 1890, Chap. 16.

36. W. H. Chandler, *The Construction of Chemical Laboratories*, Government Printing Office, Washington, D.C., 1893.

37. W. A. Tilden, *Chemical Discovery and Invention in the Twentieth Century*, Routledge, London, 1916.

38. The Oesper Collection of Prints and Portraits in the History of Chemistry, University of Cincinnati.

39. L. Figuier, *Vies des savants*, Vols. 4 and 5, Hachette, Paris, 1870.

William B. Jensen is Oesper Professor of the History of Chemistry at the University of Cincinnati, Cincinnati, OH 45221.

HENRY MARSHALL LEICESTER (1906-1991)

A Memorial Tribute

George B. Kauffman, California State University - Fresno

Henry Marshall Leicester, Professor Emeritus of Biochemistry at the Dental School of the University of the Pacific and an internationally renowned authority on the history of chemistry and the biochemistry of teeth, died peacefully in his sleep at his home in Menlo Park, California on 29 April 1991 at the age of 84. He had suffered from Parkinson's disease for almost two decades, but he remained active and alert until the end.

Born in San Francisco, California on 22 December 1906 (the year of the earthquake and fire), Henry was the youngest of the three children of self-taught tax attorney John Ferard Leicester, formerly from England, and Elsie Hamilton Allen Leicester, a secretary and later an heiress, formerly from Virginia. His talent for self-expression probably derived from his father's influence, while his patience and quiet courtesy were due to his mother's influence. His interest in hiking, especially in the Sierras, stemmed from his parents, who were both among the earliest members of John Muir's Sierra Club.

A precocious youth, he graduated early from San Francisco's Lowell High School and at the age of 16 entered Stanford University, from which he received his A.B. (1927), M.A. (1928), and Ph.D. degrees (1930, in organic chemistry), the last at the age of 24. Because of the scarcity of permanent positions during the Depression he spent the next eight years in a variety of activities - travel in Europe (including research in Zürich and London), a year as Instructor at Oberlin College, part of a year at the Carnegie Institution in Washington, and one and three years as Research Associate at Stanford and the Midgley Foundation at Ohio State University, respectively.

During this period he published six articles on selenium compounds (two with F. W. Bergstrom, based on his dissertation research) (1, 2, 5, 7, 9, 10), one on carotene (with Harry N. Holmes) (3), one on betulin derivatives (with 1939 Nobel chemistry laureate Leopold Ruzicka) (4), one on polystyrene (with Thomas Midgley Jr. of tetraethyllead and CFC fame) (6), and two on organic fluorine compounds (with Albert L. Henne) (8, 11).

While at Ohio State University, Henry found a complete set of the *Journal of the Russian Physico-Chemical Society*, which aroused his interest in the lives and works of Russian chemists, an area in which he became the undisputed American authority. He corresponded actively with colleagues in the Soviet Union, and he amassed a unique collection of Russian books on the history of science, which he later donated to the Stanford Library. In 1971, when I attended the XIIIth International Congress of the History of Science in Moscow, all the Russians asked where Henry was, and it was then that I was surprised to

learn that he had never visited the Soviet Union.

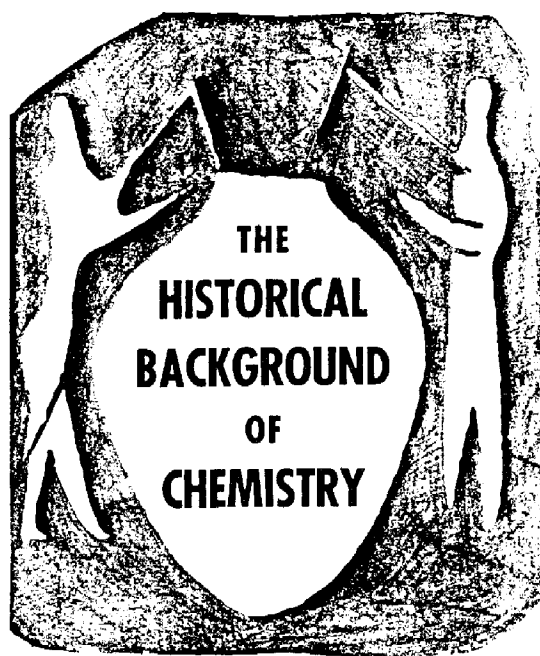
His first contribution to the history of chemistry, a study of Aleksandr Mikhailovich Butlerov, a pioneer in structural organic chemistry (12), was the first of his 17 articles in the *Journal of Chemical Education* (12-14, 18, 19, 23, 29, 32, 33, 36, 39, 46, 50, 61, 65, 73, 88), all but six on Russian chemists such as Butlerov (12, 65), Nikolai Nikolaevich Zinin (13), Vladimir Vasil'evich Markovnikov (14), Tobias Lowitz (19), Max Abramovich Blokh (23), Dmitri Ivanovich Mendeleev (33,61), Germain Henry Hess (50), and Mikhail Vasil'evich Lomonosov (88). Henry served as a member of the journal's Editorial Board from 1949 to 1959. He also contributed biographies of Lomonosov (69), Butlerov (70), and Mendeleev (71) to 1964 Dexter awardee Eduard Farber's *Great Chemists* (Interscience: New York, 1961). In 1962 he received the Seventh Dexter Award in the History of Chemistry; his acceptance address was entitled "Some Aspects of the History of Chemistry in Russia" (73).

In 1941 Henry began his permanent association with the College of Physicians and Surgeons, San Francisco (now the Dental School of the University of the Pacific), where he was Professor of Biochemistry, a position that he held until his retirement in 1977. He served as Chairman of the Department of Physiology and the Department of Biochemistry and as Head of the Research Program, and he was honored for excellence in teaching in 1972. Since the 1940s he was active



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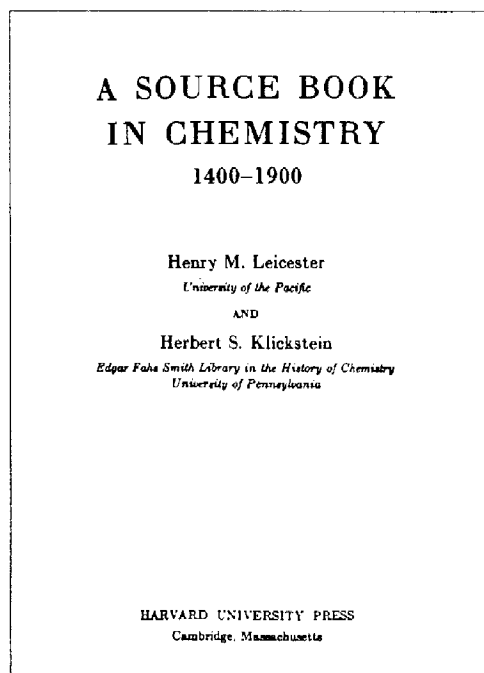
HENRY M. LEICESTER



An interesting history of the development
and interrelation of chemical concepts

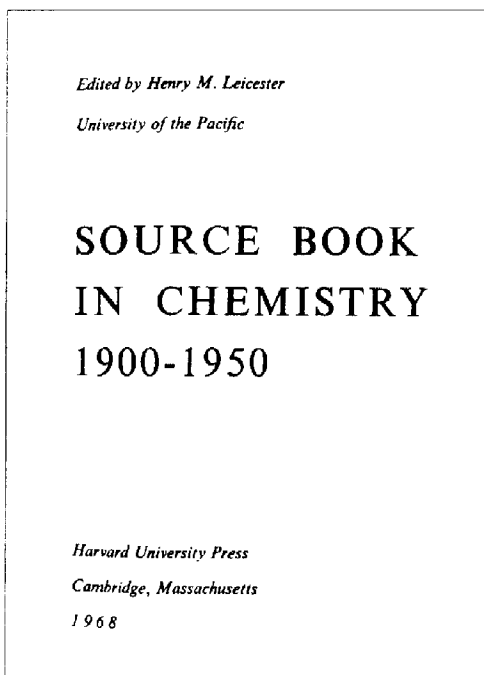
in the American Chemical Society's Division of History of Chemistry, presenting numerous papers, serving as Chair (1947-1951), and being involved in divisional affairs until his retirement. He was one of the founders and a member of the Editorial Board of *Chymia: Annual Studies in the History of Chemistry*, to which he contributed four articles. These dealt with Mendeleev and the periodic law (31), a biographical tribute to Tenney L. Davis (with longtime friend Herbert S. Klickstein) (42), the spread of Lavoisier's "new chemistry" in Russia (63), and biochemical concepts among the ancient Greeks (68). He served as Editor-in-Chief for Volumes 3 (1950) through 12 (1967), the final volume of this journal in book format.

Henry was the author, editor, or translator of seven books, several of which I have been privileged to review - *Biochemistry of the Teeth* (35) - the standard textbook on the subject for two decades; *A Source Book in Chemistry 1400-1900* - with Herbert S. Klickstein (51); *The Historical Background of Chemistry* (57) - his most popular book; *Discovery of the Elements*, 7th ed. (85); *Source Book in Chemistry, 1900-1950* (86); *Mikhail Vasil'evich Lomonosov on the Corpuscular*

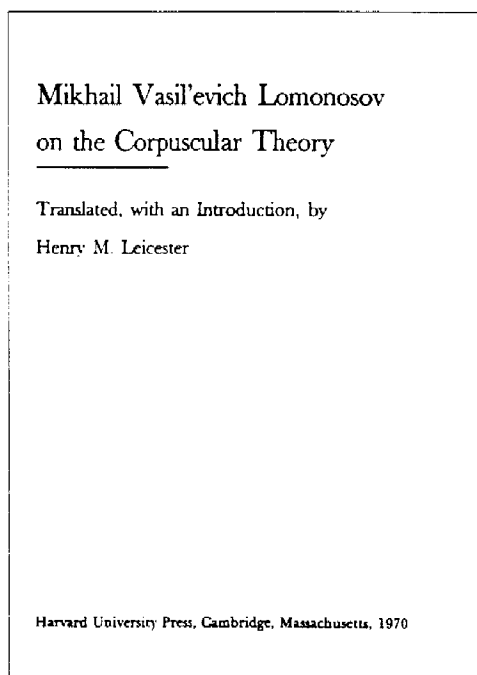


Theory (89); and *Development of Biochemical Concepts from Ancient to Modern Times* (104).

Henry also contributed one article to *Collier's Encyclopedia Americana* (74), seven articles to the *Encyclopaedia Britannica* (76-82), 21 biographies to the *Dictionary of Scientific Biography* (1970-1978) (90-99, 101-103, 105, 106, 108, 116-118, 121, 122), seven biographies to Wyndham Miles' *American Chemists and Chemical Engineers* (109-115), and a



number of articles to the *Academic American Encyclopedia* (124, 125) and other books (45, 58, 60, 66, 83). In addition to his historical studies, he was an authority on caries (16, 17, 25, 26, 40, 43, 44, 48, 59) and the biochemistry of teeth (21, 24, 28, 52, 53, 56, 62, 75). An active advocate of water fluoridation (20, 37, 54) during the 1950s and 1960s, he traveled around California to speak on the subject at community meetings. He was the author of a book (89) and eight articles on Lomonosov (69, 72, 84, 88, 100, 107, 119, 126); the last of his 118 articles, "The Scientific Poetry of Lomonosov," appeared in 1987 (126).



A patient, tolerant, and easily approachable man with a delightful sense of humor, Henry bore his immense erudition without a trace of pretentiousness. During the more than three decades that I knew him, I had numerous occasions to make use of his expertise. As a young novice in the history of chemistry, before embarking on my study of Alfred Werner and coordination chemistry in the early 1960s, I consulted Henry about the feasibility of my project, and I benefited greatly from his sage advice and warm encouragement. When I needed an English translation of Il'ya Il'ich Chernyaev's long article on the trans effect for Volume 3 of my *Classics in Coordination Chemistry, Part III* (123), I naturally turned to Henry and was delighted with the result (pp. 151-195). And before beginning an article on Lomonosov (*J. Chem. Educ.* **1988**, 65, 953), I asked Henry for reprints of his pertinent papers, for he was the universally acknowledged American expert on this founder of Russian science.

In 1941 Henry married Leonore Azevedo (1914-1974), whom he had met at the International Students' House at

Stanford (both were members of the Stanford International Club). Their interest in people from other lands endured throughout their 33-year marriage. They participated in pot-luck dinners for international guests, and they took Chinese lessons together. Henry had taken courses in Russian while still a student, and Leonore took Spanish lessons. The couple went folk dancing every Friday night with a group of close friends. Henry was fond of travel, and he took his family on trips through the United States as well as to Canada, Alaska, Australia, New Zealand, and Hawaii. After his retirement he made a trip around the world with his younger daughter.

Never an extrovert and somewhat shy, Henry, nevertheless, loved teaching and interacting with young people, and he and his wife opened their home to friends, guests, colleagues, and students. After his retirement he presided over a rather unusual household of one very imperious cat (named Amy after Amelia Earhart because she fearlessly liked to sit on shoulders and high places), various comings and goings of his children, and a series of boarders and later, caregivers and companions who became part of his extended family. During this time he took walks, built intricate paper models, arranged photograph albums, read science fiction and mysteries, planted flowers, tended his garden, and enjoyed good food and trips to the California coast. He is survived by his children - Henry M. Leicester, Jr. (b. 1942), Professor of Literature at the University of California, Santa Cruz; Martha (b. 1950), a superintendent with the National Park Service; and Margaret ("Guida") (b. 1957), a communications consultant, who cared for her father during his final years. His legacy endures in the hearts and minds of his students, colleagues, friends, and family and in his books and articles that have enriched the science of chemistry and its history.

A Bibliography of the Publications of Henry Marshall Leicester

1929 - 1939

1. "Salts of Triphenyl Selenonium Hydroxide" (with F. W. Bergstrom), *J. Am. Chem. Soc.*, **1929**, *51*, 3587-3591.
2. "Salts of the Toly and Mixed Phenyl Toly Selenonium Hydroxides" (with F. W. Bergstrom), *J. Am. Chem. Soc.*, **1931**, *53*, 4428-4436.
3. "The Isolation of Carotene" (with Harry N. Holmes), *J. Am. Chem. Soc.*, **1932**, *54*, 716-720.
4. "Polyterpene and Polyterpenoide. LXXXVII. Dehydrierung des Betulins. Abbauersuche in der Allobetulin- und Dihydrobetulinreihe. Inhaltsstoffe der Betulinrinde" (with L. Ruzicka, G. F. Frame, M. Liguori, and H. Brünger), *Helv. Chim. Acta*, **1934**, *17*, 426-442.
5. "The Reactions between Mercury Diaryls and Diaryl Selenium Dihalides", *J. Am. Chem. Soc.*, **1935**, *57*, 1901-1902.
6. "Natural and Synthetic Rubber. XVI. The Structure of

Development of Biochemical Concepts from Ancient to Modern Times

Henry M. Leicester

Harvard University Press
Cambridge, Massachusetts
1974

Polystyrene" (with Thomas Midgley, Jr. and Albert L. Henne), *J. Am. Chem. Soc.*, **1936**, *58*, 1961-1963.

7. "The Reactions between Mercury Diaryls and Selenium Tetrabromide", *J. Am. Chem. Soc.*, **1938**, *60*, 619-620.

8. "Fluorinated Derivatives of Methane Bearing Phenyl Groups" (with Albert L. Henne), *J. Am. Chem. Soc.*, **1938**, *60*, 864-865.

9. "Diphenyl Selenide", *Org. Syn.*, **1938**, *18*, 27-29.

10. "Diphenyl Selenium Dichloride and Triphenyl Selenonium Chloride", *Org. Syn.*, **1938**, *18*, 30-32.

11. "Aliphatic Difluorides" (with Albert L. Henne and Mary Renoll), *J. Am. Chem. Soc.*, **1939**, *61*, 938-940.

1940 - 1949

12. "Alexander Mikhailovich Butlerov", *J. Chem. Educ.*, **1940**, *17*, 203-209.

13. "N. N. Zinin, An Early Russian Chemist", *J. Chem. Educ.*, **1941**, *17*, 303-306.

14. "Vladimir Vasil'evich Markovnikov", *J. Chem. Educ.*, **1941**, *18*, 53-57.

15. "Effects of Sodium Bisulfite in Local Anesthetic Solutions" (with M. L. Tainter and A. H. Thronson), *J. Am. Dent. Assn.*, **1941**, *28*, 1604-1613.

16. "Experimental Studies on Caries. I. A Technic for Cleaning Teeth" (with Harvey M. Schamp), *J. Am. Dent. Assn.*, **1942**, *29*, 1649-1651.

17. "Experimental Studies on Caries. II. A Rat Caries Index" (with Harvey M. Schamp), *J. Am. Dent. Assn.*, **1943**, *30*, 1046-1051.

18. "The New Almaden Mine, The First Chemical Industry in California", *J. Chem. Educ.*, **1943**, *20*, 235-238; published separately,

College Park, MD, 1943.

19. Tobias Lowitz - Discoverer of Basic Laboratory Methods", *J. Chem. Educ.*, **1945**, *22*, 149-151.

20. "Backgrounds of Fluorine Therapy in Dentistry", *J. Calif. State Dent. Assn.*, **1946**, *22*, 73-76, 103-104.

21. "Chemical Changes in the Teeth after Eruption" *J. Am. Dent. Assn.*, **1946**, *33*, 1004-1011.

22. "Dental Journalism Twenty-Five Years Ago", *J. Am. Coll. Dentists*, **1946**, *13*, 112-114.

23. "Max Abramovich Blokh. His Contributions to the History of Chemistry" (with Herbert S. Klickstein), *J. Chem. Educ.*, **1946**, *23*, 451-453.

24. "The Biochemistry of Teeth", *Ann. Rev. Biochem.*, **1946**, *15*, 361-374.

25. "The Effect of Cadmium on the Production of Caries in the Rat", *J. Dent. Research*, **1946**, *25*, 337-340.

26. "Recent Developments in the Treatment of Dental Caries", *Stanford Med. Bull.*, **1947**, *5*, 8-12.

27. "Philately - A Chapter in the History of Chemistry" (with H. S. Klickstein), *J. Hist. Med.*, **1947**, *2*, 237-278.

28. "Amelogenesis. An Integration of the Known Factors Concerned with the Development, Formation, and Mineralization of Enamel" (with James Nuckolls and Benjamin Dienst), *J. Am. Coll. Dentists*, **1947**, *14*, 118-153.

29. "The History of Chemistry in Russia Prior to 1900", *J. Chem. Educ.*, **1947**, *24*, 438-443.

30. "Charles Albert Browne, 1870-1947", *The Register of Phi Lambda Upsilon*, **1948**, *33*, 56-58.

31. "Factors Which Led Mendeleev to the Periodic Law", *Chymia*, **1948**, *1*, 67-74.

32. "Charles Albert Browne as an Historian of Chemistry" (with Herbert S. Klickstein), *J. Chem. Educ.*, **1948**, *25*, 315-317, 343.

33. "Mendeleev and the Russian Academy of Sciences", *J. Chem. Educ.*, **1948**, *25*, 439-441.

34. "Interrelations between Chemistry and World History", *The Vortex*, **1949**, *10*, 32-40.

35. *Biochemistry of the Teeth*, C. V. Mosby Co., St. Louis, MO, 1949 (book).

36. "Chemistry in Early California", *J. Chem. Educ.*, **1949**, *26*, 403-406.

37. "Fluorine - The New Hope", *California Parent-Teacher*, **1949**, July-Aug., 6-7, 32.

1950 - 1959

38. "A Suggestion for the Standardization of Dental Nomenclature", *J. Calif. State Dent. Assn.*, **1950**, *26*, 74-75.

39. "Tenney L. Davis and His Work in the History of Chemistry" (with Herbert S. Klickstein), *J. Chem. Educ.*, **1950**, *27*, 222-224.

40. "Introduction and Summary to the Symposium, Sugar and Dental Caries", *J. Calif. State Dent. Assn.*, **1950**, *26*(3), Supplement, 5-6.

41. "The Application of Biochemical Methods to Dental

Research", *J. Am. Dent. Assn.*, **1950**, *41*, 169-172.

42. "Tenney Lombard Davis and the History of Chemistry" (with Herbert S. Klickstein), *Chymia*, **1950**, *3*, 1-16.

43. "Caries Research: Its Present Position and Future Trends", *J. Am. Coll. Dentists*, **1950**, *17*, 376-379; reprinted in *J. Calif. State Dent. Assn.*, **1951**, *27*, 75-76, 87.

44. "The Mechanism of Recent Methods for Caries Control", *Dent. J. Australia*, **1950**, *22*, 619-624.

45. "History of Chemistry", *Ind. Eng. Chem.*, **1951**, *43*, 1053-1056; reprinted in *Chemistry - Key to Better Living*, American Chemical Society, Washington, DC, 1951, pp. 173-176.

46. "Dumas, Davy, and Liebig", *J. Chem. Educ.*, **1951**, *28*, 352-354.

47. "A Tracer Study of Distribution of Iodoacetate in Fat Tissues" (with Paul H. Thomassen), *Proc. Soc. Exper. Biol. Med.*, **1951**, *77*, 622-624.

48. "Mecanismo de la caries y su prevención", *A. D. M. Rev. Ass. Dental Mexicana*, **1951**, *8*, 227-232.

49. "Applied Science in Chemical Industry", *Am. J. Pharmaceutical Educ.*, **1951**, *15*, 308-318.

50. "Germain Henry Hess and the Foundations of Thermochemistry", *J. Chem. Educ.*, **1951**, *28*, 581-583.

51. *A Source Book in Chemistry 1400-1900* (with Herbert S. Klickstein), McGraw-Hill, New York, 1952; Harvard University Press, Cambridge, MA, 1963 (book, edited).

52. "The Biochemistry of the Teeth", *Ann. Rev. Biochemistry*, **1953**, *22*, 341-350.

53. "Biochemistry of Teeth", *J. Applied Nutrition*, **1953**, *6*, 279-281.

54. "Water Fluoridation Forum", *J. Applied Nutrition*, **1953**, *6*, 294-295.

55. "Dentistry", *Ann. Rev. Medicine*, **1954**, *5*, 405-414.

56. "Nutrition and the Teeth", *J. Am. Dent. Assn.*, **1956**, *52*, 284-289; *J. Am. Osteopath. Assn.*, **1956**, *55*, 45-50.

57. *The Historical Background of Chemistry*, Wiley, New York, 1956; paperback ed., 1965; Hebrew transl., Tel Aviv, 1966; Spanish transl., Madrid, 1967; Dover paperback ed., New York, 1971; Italian transl., Milan, 1980; Japanese transl., Tokyo, 1981 (book).

58. "Elements Discovered by Atomic Bombardment". in M. E. Weeks, *Discovery of the Elements*, 6th ed., Easton, PA, 1956, pp. 859-885.

59. "Recent Methods for the Prevention of Dental Caries", *J. Chem. Educ.*, **1957**, *54*, 96-98; *J. Calif. State Dental Assn.*, **1957**, *35*, 190-192; reprinted in W. F. Kieffer and R. K. Fitzgerald, eds., *Selected Readings in General Chemistry*, Journal of Chemical Education, Easton, PA, 1959, pp. 18-20.

60. "Atoms, Molecules and Reactions: Books on Chemistry" in *The First One Hundred and Fifty Years. A History of John Wiley and Sons, Inc.*, Wiley, New York, 1957, pp. 43-50.

61. "Mendeleev's Visit to America", *J. Chem. Educ.*, **1957**, *35*, 381-383.

62. "The Mineral Metabolism of Bones and Teeth", *J. Applied Nutrition*, **1957**, *10*, 478-481.

63. "The Spread of the Theory of Lavoisier in Russia", *Chymia*, **1959**, 5, 139-144.

64. "Recent Russian Research in Metabolism and Endocrinology", *Ann. Rev. Physiology*, **1959**, 21, 475-498.

65. "Contributions of Butlerov to the Development of Structural Theory", *J. Chem. Educ.*, **1959**, 36, 328-329; reprinted in A. J. Ihde and W. F. Kieffer, eds., *Selected Readings in the History of Chemistry*, Journal of Chemical Education, Easton, PA, 1965, pp. 245-246.

66. "Chemistry of Specialized Tissues", "Digestion", and "Urine", in J. C. Muhler, ed., C. V. Mosby, St. Louis, MO, 1959, pp. 128-143, 159-168, 313-317; 2nd ed., 1964, pp. 141-156, 174-183, 338-343.

1960 - 1969

67. "Chemistry, Chemical Technology, and Scientific Progress", *Technology and Culture*, **1961**, 2, 352-356.

68. "Biochemical Concepts Among the Ancient Greeks", *Chymia*, **1961**, 7, 9-35.

69. "Mikhail Vasil'evich Lomonosov", in E. Farber, ed., *Great Chemists*, Interscience, New York, 1961, pp. 201-210.

70. "Alexander Mikhailovich Butlerov", in E. Farber, ed., *Great Chemists*, Interscience, New York, 1961, pp. 687-696.

71. "Dmitri Ivanovich Mendeleev", in E. Farber, ed., *Great Chemists*, Interscience, New York, 1961, pp. 717-732.

72. "Znakomstvo Uchenykh Severnoi Ameriki Kolonial'nogo Perioda s Rabotami M. V. Lomonosova i Peterburgskoi Akademii Nauk" (Knowledge of the Work of Lomonosov and the Academy of Sciences in Colonial North America), *Voprosy Istorii Estestvoznaniya i Tekhniki*, **1962**, 12, 142-147.

73. "Some Aspects of the History of Chemistry in Russia" (1962 Dexter Award Address), *J. Chem. Educ.*, **1963**, 40, 108-109; reprinted in A. J. Ihde and W. F. Kieffer, eds., *Selected Readings in the History of Chemistry*, Journal of Chemical Education, Easton, PA, 1965, pp. 47-48.

74. "History of Chemistry", in *Colliers Encyclopedia Americana*, P. F. Collier, New York, 1963 ed., Vol. 6, pp. 401-408.

75. "Uptake of Radioactive Beryllium, Vanadium, Selenium, Cerium, and Yttrium in the Tissues and Teeth of Rats:", (with Paul R. Thomassen), *J. Dental Research*, **1964**, 43, 346-352.

76. "Alchemy", in *Encyclopaedia Britannica*, 1964 ed., Chicago, IL, Vol. 1, pp. 534-537.

77. "History of Chemistry", in *Encyclopaedia Britannica*, 1964 ed., Chicago, IL, Vol. 5, pp. 388-394.

78. "Geber", in *Encyclopaedia Britannica*, 1964 ed., Chicago, IL, Vol. 10, p. 46.

79. "Nernst", in *Encyclopaedia Britannica*, 1964 ed., Chicago, IL, Vol. 16, pp. 229-230.

80. "Kekulé von Stradonitz", in *Encyclopaedia Britannica*, 1965 ed., Chicago, IL, Vol. 13, pp. 270-271.

81. "Liebig", in *Encyclopaedia Britannica*, 1965 ed., Chicago, IL, Vol. 13, pp. 1077-1078.

82. "Ostwald", in *Encyclopaedia Britannica*, 1965 ed., Chicago,

IL, Vol. 16, pp. 1151-1152.

83. "Kekulé, Butlerov, Markovnikov: Controversies on Chemical Structure from 1860 to 1870", in O. T. Benfey, ed., *Kekulé Centennial*, Advances in Chemistry Series No. 61, American Chemical Society, Washington, DC, 1966, pp. 13-23.

84. "Boyle, Lomonosov, Lavoisier, and the Corpuscular Theory of Matter", *Isis*, **1967**, 58, 240-244.

85. M. E. Weeks, *Discovery of the Elements*, 7th ed., completely revised and new material added by H. M. Leicester, Journal of Chemical Education, Easton, PA, 1968 (book).

86. *Source Book in Chemistry, 1900-1950*, Harvard University Press, Cambridge, MA, 1968 (book, edited).

87. "Chemistry Requirements for the Dental School", *Proc. Two-Year College Chemistry Conference, 1967-1968 Academic Year*, pp. 36-37.

88. "Mikhail Lomonosov and the Manufacture of Glass and Mosaics", *J. Chem. Educ.*, **1969**, 45, 295-298.

1970 - 1979

89. *Mikhail Vasil'evich Lomonosov on the Corpuscular Theory*, Harvard University Press, Cambridge, MA, 1970 (book translation and introduction).

90. "Berzelius, Jöns Jacob", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1970, Vol. 2, pp. 90-97.

91. "Cannizzaro, Stanislao", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1971, Vol. 3, pp. 45-49.

92. "Clark, William Mansfield", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1971, Vol. 3, p. 290.

93. "Deville, Henri Etienne Sainte-Claire", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1971, Vol. 4, pp. 77-78.

94. "Fittig, Rudolph", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1972, Vol. 5, pp. 12-13.

95. "Folin, Otto", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, New York, 1972, Vol. 5, p. 53.

96. "Hess, Germain Henri", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1972, Vol. 6, pp. 353-354.

97. "Jones, Harry Clary", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1973, Vol. 7, pp. 161-172.

98. "Kolbe, Adolph Wilhelm Hermann", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1973, Vol. 7, pp. 450-453.

99. "Kopp, Hermann", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1973, Vol. 7, pp. 463-464.

100. "The Electrical Theories of M. V. Lomonosov", *Ann. Sci.*, **1973**, 30, 299-310.

101. "Lebedev, Sergei Vasilievich", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1973, Vol. 8, p. 108.

102. "Le Bel, Joseph Achille", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1973, Vol. 8, pp. 109-110.

103. "Le Châtelier, Henry Louis", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1973, Vol. 8, pp. 116-120.

104. *Development of Biochemical Concepts from Ancient to Modern Times*, Harvard University Press, Cambridge, MA, 1974 (book).

105. "Muir, Matthew Moncrieff Pattison", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1974, Vol. 9, p. 557.

106. "Müller, Paul", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1974, Vol. 9, pp. 576-577.

107. "Lomonosov's Views on Combustion and Phlogiston", *Ambix*, 1975, 22, 1-9.

108. "Sørensen, Søren Peter Lauritz", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1975, Vol. 12, pp. 546-547.

109. "James Blake", in Wyndham Miles, ed., *American Chemists and Chemical Engineers*, American Chemical Society, Washington, DC, 1976, p. 36.

110. "Tenney Lombard Davis", in Wyndham Miles, ed., *American Chemists and Chemical Engineers*, American Chemical Society, Washington, DC, 1976, pp. 112-113.

111. "Edward Curtis Franklin", in Wyndham Miles, ed., *American Chemists and Chemical Engineers*, American Chemical Society, Washington, DC, 1976, pp. 158-159.

112. "Gilbert Newton Lewis", in Wyndham Miles, ed., *American Chemists and Chemical Engineers*, American Chemical Society, Washington, DC, 1976, pp. 296-297.

113. "Harry Wheeler Morse", in Wyndham Miles, ed., *American Chemists and Chemical Engineers*, American Chemical Society, Washington, DC, 1976, pp. 350-351.

114. "Willard Bradley Rising", in Wyndham Miles, ed., *American Chemists and Chemical Engineers*, American Chemical Society, Washington, DC, 1976, pp. 410-411.

115. "John Maxon Stillman", in Wyndham Miles, ed., *American Chemists and Chemical Engineers*, American Chemical Society, Washington, DC, 1976, pp. 457-458.

116. "Virtanen, Artturi Ilmari", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1976, Vol. 14, pp. 45-46.

117. "Wallach, Otto", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1976, Vol. 14, pp. 141-142.

118. "Windaus, Adolf Otto Reinhold", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1976, Vol. 14, pp. 443-446.

119. "The Geochemical Ideas of Mikhail Lomonosov", *Ann. Sci.*, 1976, 33, 341-350.

120. "The Mystique of Vitamins", *Scientia*, 1977, 112, 361-370.

121. "Fischer, Hans", in C. C. Gillispie, ed., *Dictionary of Scien-*

tific Biography, Scribner's, New York, 1978, Vol. 15, pp. 157-158.

122. "Karrer, Paul", in C. C. Gillispie, ed., *Dictionary of Scientific Biography*, Scribner's, New York, 1978, Vol. 15, pp. 257-258.

123. Translation of I. I. Chernyaev, "The Theory of Complex Compounds: Article I", in G. B. Kauffman, ed., *Classics of Coordination Chemistry, Part III: Twentieth Century Papers (1904-1935)*, Dover, New York, NY, 1978, pp. 151-152.

1980 - 1989

124. "Electron Configuration", in *Academic American Encyclopedia*, Aretê, Princeton, NJ, 1980, Vol. 7, p. 120.

125. "Periodic Table", in *Academic American Encyclopedia*, Aretê, Princeton, NJ, 1980, Vol. 15, pp. 166-169; and a number of short biographical notes scattered throughout the various volumes.

126. "The Scientific Poetry of Lomonosov", in H. M. Said, ed., *Essays on Science: Felicitation Volume in Honour of Dr. S. Mahdihassan*, Hamdard Foundation, Karachi, Pakistan, 1987, pp. 167-173.

Dr. George B. Kauffman is Professor of Chemistry at California State University - Fresno, Fresno, CA 93740. A Past Chair of the Division and recipient of the 1978 Dexter Award, he is the author of 15 books and more than 970 papers, reviews, and encyclopedia articles on chemistry; chemical education; and the history of chemistry, science, and technology.

SOME EDGAR FAHS SMITH MEMORABILIA

William D. Williams, Harding University

Edgar Fahs Smith is recognized as the Dean of American chemical historians. His papers and books have inspired many of us to study early chemistry. His influence in establishing the Division of the History of Chemistry of the American Chemical Society has promoted research in that field and his wonderful collection of early chemical books, portraits and memorabilia, still housed at the University of Pennsylvania, has preserved for all of us a tangible and irreplaceable link with our professional past.

I certainly cut my history-of-chemistry teeth on Smith's works and have tried to emulate his writing and collecting. In this process, I became a close friend of Wyndham Miles, another chemical historian and "old chemistry" collector. Dr. Miles has spent 40 years supplementing Smith's work on early American chemistry. Over the years he has accumulated a large rare chemistry collection, including some interesting Smith memorabilia. As a regular visitor to the Smith Collection, Miles became well known to Eva Armstrong and Robert Sutton, who were its curators. In the 1950s, when the Smith