

Chemical Genealogy Database

Introduction

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A professional genealogy is a tracing of one's intellectual line of descent, from student to teacher back through the decades. Many chemical genealogies have been generated over the years that have traced the lines of descent for individuals or for groups of individuals such as are found in chemistry departments.¹ The exercise of constructing such genealogies is a rewarding and informative experience.

In our view, however, previous genealogies share two common drawbacks: they lack consistency in the criteria used to construct the lines of descent and the sources of the information used to generate them are usually never stated. For example, whereas most people in previous chemical genealogies are traced to their PhD advisor, other people are traced to the most famous mentor the person worked with even if that connection was little more than perfunctory or occurred long after the younger person had already reached maturity as a scientist. A notable illustration of this tendency is the case of Liebig: his scientific progenitor is almost always taken to be the famous French chemist Gay-Lussac, but his actual PhD research advisor was a German chemist named Kastner, who greatly influenced Liebig's early development but who is usually never mentioned. To be sure, there are as many ways to assign lines of descent in an intellectual genealogy as there are people who build them, but if the lines are to have real meaning, the criteria used to make such decisions should be stated and should be consistently followed.

In the present Chemical Genealogy, we have tried to be consistent in our construction of the genealogical "family trees": our criterion for deciding scientific progenitors has been to choose the research advisor for the highest non-honorary degree. If a person did not receive a degree in a scientific field, we tried to identify the mentor or mentors who influenced him the most scientifically during his formative years (usually early twenties in age).

In addition to our attempts to construct a set of family trees based on well-defined criteria, we have also tried to trace the trees back as far as possible. This is an interesting exercise, because it illuminates the roots of our chemical profession in the medical, pharmaceutical, and philosophical doctrines of the 16th-17th centuries.

A further goal of this genealogical research was to generate more than the familiar tree showing the lines of descent. In particular, we wished to compile all the data used to build the tree and to make the data available in an easily searchable format. In addition, all the references used to decide the lines of descent, to derive the biographical information, and to construct the scientific summaries are listed in the database.

We hope that this database will serve as a reference source for others interested in constructing a chemical genealogy. It is particularly useful for this purpose because it includes complete citations to original biographical articles about the scientists included in the family trees.

Compiling the Database

The starting points for the present Chemical Genealogy are the current faculty at the Department of Chemistry at the University of Illinois and nine other departments. These other schools include the University of California at Berkeley, the California Institute of Technology, the University of Chicago, Columbia University, Cornell University, Harvard University, the Massachusetts Institute of Technology, Stanford University, and the University of Wisconsin - Madison.

The process of tracing the connections can be summarized as follows:

1) Living persons were contacted and asked to specify the name(s) of their PhD research advisor and the date and place of their own degree. If the person received no PhD degree, then they were asked if they had an advisor for some other highest non-honorary degree. Similar information about the advisor was also solicited and used as the starting point tracing the line of descent to the previous "generation".

2) If the person was no longer living, biographical data was obtained from published obituaries and biographies, if available. Some of the more common resources used in compilation of the present database are given in references 2-102. For American chemists of the 20th century, we checked the current edition of *American Men & Women of Science* or the *American Chemical Society Directory of Graduate Research* to find out whether the person was listed. These are both good sources for living scientists or chemists, and both give current contact information for the person. The *Directory of Graduate Research*, which has been published every two years from 1953 to date, also lists the names of recent PhD graduates and their thesis titles. Note that there is no index to these dissertations or students, so possible advisors must be looked up to see whether the person being traced appears in the list of recent PhD students from that group. *American Men & Women of Science* (and its predecessor, *American Men of Science*) gives a cumulative career summary (education, work history) to the date of the listing. If the person was not listed in either of the current volumes, we checked the cumulative index for *American Men & Women of Science* to see if there was a listing in a previous edition.

3) For chemists active before 1950, we checked *J. C. Poggendorff's Biographisch-Literarisches Handwörterbuch zur Geschichte der Exacten Wissenschaften*. *Poggendorff's* contains biographical information for scientists throughout the world in all disciplines. It gives a comprehensive listing of a person's publications by journal, and lists biographies and obituaries about the person. NOTE: *Poggendorff's* lists many obituary and biographical references that are not indexed in *Chemical Abstracts*. Other references that were useful for finding information about chemists of all nationalities were references 3, 19, 33, 43, 46, 47, and 71. References 6 and 7 were particularly useful for American chemists, reference 32 for English chemists, references 4, 19, 29, 52, and 64 for German chemists, and references 17, 62, and 69 for French chemists.

4) If we could not find sufficient information in the above sources but suspected that the person was deceased, we checked the cumulative index of *Who Was Who In America* for a listing. We also checked under the Obituaries and Biographies headings in the Subject Index of *Chemical Abstracts* (either on-line or the old-fashioned way). Once a death date was available, we checked the appropriate yearly index of *Chem. Eng. News* under Obituaries or the person's name.

5) If published information could not be located (unfortunately, a common situation for 20th century scientists), we contacted and requested biographical information from the alumni relations office or chemistry department of the institution from which the person obtained his highest degree. Often, biographical information can also be obtained from the BS granting institution or from the institution(s) where the person was employed.

6) To find information about the identity of a person's research advisor, we checked *Dissertation Abstracts*. For participating institutions (essentially all US universities except MIT and Harvard), this reference provides the following information about PhD recipients: the thesis title, subject area, date, and institution it was granted by. Since around 1990, the thesis advisor and a thesis abstract are also included. If the thesis title and date but not the name of the advisor was listed, we searched in the Author Index of *Chemical Abstracts* for the years around the thesis date for the person's name and looked for a paper with a title similar to that of the thesis. Checking this reference usually confirmed who the advisor was. If it was not obvious who the advisor was, or if there might be more than one, we either called the appropriate library of the institution and asked them to check the acknowledgment page of the thesis or requested a copy of that page through InterLibrary Loan.

7) Scientists who received their degrees before the founding of *Chemical Abstracts* (1906) and who are not listed in *Poggendorff's* can present special problems. The *Catalog of Papers Collected by the Royal Society of London*, which covers the years 1800-1900, lists the papers published in these years by scientists of all disciplines. It also includes references to obituaries for specific authors. We sometimes used the *Catalog* to find an author's earliest publications, and then consulted these publications to see if an advisor was mentioned. We know of no good single source of similar information covering the years 1901-1906 between the end of the *Catalog* and beginning of *Chemical Abstracts*, with the possible exception of *Chemisches Zentralblatt*.

The Family Trees

The drawings of the family trees were accomplished using the AutoCAD program on a PC. The main lines in each tree are the lines of "direct" descent, and these are indicated by solid lines. There are many cases, however, in which an individual was strongly influenced by someone other than the research advisor for the highest degree (e.g., a post-doctoral advisor). These connections are shown using dashed lines on the trees, and are usually noted in the comments for each database entry as a footnote.

Besides trees for individual faculty members (mostly at the Department of Chemistry of the University of Illinois), there are trees for the four main areas within the Department (analytical, inorganic, organic, and physical). In order to simplify the drawings, dashed connections were included only for those people who did not have direct connections. The tree for the entire Illinois Department of Chemistry was formed by combining the divisional trees. The individual, area, and departmental trees can be manipulated via AutoCAD to form new trees as desired.

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References

- 1a) Bartow, V. *J. Chem. Ed.* **1939**, *16*, 236-238.
- 1b) McCarty, C. N. *J. Chem. Ed.* **1969**, *46*, 317-318.
- 1c) Graham, R. P. *J. Chem. Ed.* **1948**, *71*, 632-633.
- 1d) Stone, D. B.; Schweitzer, G. K. *Chemistry* **1976**, *49*(5), 10-11.
- 1e) Rocke, A. J.; Ihde, A. J. *J. Chem. Ed.* **1979**, *56*, 93-95.
- 1f) Miller, C.; Kauffman, G. B. *Chemistry Department Newsletter, California State University, Fresno Summer 1984*, *2*(1), 23.
- 1g) Mainz, V. V.; Girolami, G. S. *A Database for the University of Illinois Chemical Genealogy; Privately published: 1992*.
- 2) *A Biographical Dictionary of Eminent Scotsmen*; Chambers, R., Ed.; Blackie & Son: 1854.
- 3) *A Biographical Dictionary of Scientists*; Williams, T. I., Ed.; Wiley: 1969.
- 4) *Allgemeine Deutsche Biographie*; Duncker & Humblot: 1967-1971 Reprint.
- 5) *American Chemical Society Directory of Graduate Research*; American Chemical Society: Volumes published every two years from 1953 to date.
- 6) *American Chemists and Chemical Engineers*; Miles, W. D., Ed.; American Chemical Society: 1976; vol. 1.
- 7) *American Chemists and Chemical Engineers*; Miles, W. D., Gould, R. F., Eds.; Gould Books: 1994; vol. 2.
- 8) *American Men of Science*; The Science Press: 1st Ed. - 1906, 2nd Ed. - 1910, 3rd Ed. - 1921, 4th Ed. - 1927, 5th Ed. - 1933, 6th Ed. - 1938, 7th Ed. - 1944, 8th Ed. - 1949, 9th Ed. - 1955.
- 9) *American Men & Women of Science (10th Ed.)*; Jacques Cattell Press, Inc.: 1960.
- 10) *American Men & Women of Science (11th Ed.)*; R. R. Bowker Co.: 1966.

- 11) *American Men & Women of Science (12th Ed.)*; Jacques Cattell Press/R. R. Bowker Co.: 1973.
- 12) *American Men & Women of Science (13th Ed.)*; R. R. Bowker Co.: 13th Ed. - 1976, 14th Ed. - 1979, 15th Ed. - 1982, 16th Ed. - 1986, 17th Ed. - 1989.
- 13) *An Eighteenth Century Lectureship in Chemistry*; Kent, A., Ed.; Jackson, Son & Co.: 1950.
- 14) Asimov, I. *Asimov's Biographical Encyclopedia of Science and Technology (2nd Ed.)*; Doubleday: 1982.
- 15) *Biographie Medicale*; Bayle, G.-L.; Thillaye, J. B.-J., Eds.; B. M. Israel: 1967 Reprint.
- 16) *Biographie Nationale publiée par L'Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique*; Établissements Émile Bruylant: 1866-1986.
- 17) *Biographie Universelle*; Chez Michaud Freres, Imprim.-Libraires: 1811-1827.
- 18) *Biographisch Woordenboek der Nederlanden*; J. J. van Brederode: 1852-1878.
- 19) *Biographisches Lexikon der hervorragenden Ärzte*; Urban & Schwarzenberg: 1962.
- 20) *Biographisches Lexikon zur Geschichte der Böhmisches Länder*; R. Oldenbourg: 1979-1989.
- 21) *Biographiskt Lexicon öfver Namnkunnige Svenska Män*; Leffler & Sebell: 1835-1857.
- 22) *British Chemists*; Findlay, A., and Mills, W. H., Eds.; The Chemical Society: 1947.
- 23) Campbell, E. D. *History of the Chemical Laboratory of the University of Michigan 1856-1916*; Michigan University Press: 1916.
- 24) Campbell, W. A.; Greenwood, N. N. *Contemporary British Chemists*; Taylor & Francis: 1971.
- 25) Cap, P. A. *Etudes Biographiques pour servir a l'Histoire des Sciences*; Masson et Fils: 1857-1864.
- 26) Chittenden, R. J. *History of the Sheffield Scientific School of Yale University 1846-1922*; Yale Univ. Press: 1928.
- 27) Cuvier, G. *Eloges Historiques*; E. Ducrocq: 1834.
- 28) *Dansk Biogradisk Leksikon*; Glydendalske Boghandel, Nordisk Forlag A/S: 1979-1984.
- 29) *Das Buch der Grossen Chemiker*; Bugge, G., Ed.; Verlag Chemie: 1929-1930.
- 30) *Dictionnaire des Sciences Medicales Biographie Medicale*; C. L. F. Panoucke: 1820-1822.
- 31) *Dictionary of American Biography*; Malone, D., Ed.; Charles Scribner's Sons: 1936.
- 32) *Dictionary of National Biography*; Smith, Elder & Co.: 1908-1986.
- 33) *Dictionary of Scientific Biography*; Charles Scribner's Sons: 1970-1990.
- 34) *Dictionary of South African Biography*; Beyers, C. J., Ed.; Human Sciences Research Council: 1968-1987.
- 35) *Dictionnaire de Biographie Francaise*; Librairie Letouzey et Ane: 1933-1989.
- 36) *Dictionnaire Historique de la Médecine*; Bechet Jeune: 1828-1839.
- 37) *Dictionnaire Historique et Biographique de la Suisse*; Neuchatel Administration du Historique et Biographique de la Suisse: 1921-1933.
- 38) *Dizionario Biografico degli Italiani*; Istituto della Enciclopedia Italiana: 1960-1998.
- 39) Dumas, J. B. *Discours et Eloges Academiques*; Gauthier-Villars: 1885; vol. 1 and vol. 2.
- 40) Elliott, C. A. *Biographical Dictionary of American Science*; Greenwood Press: 1979.
- 41) *Encyclopedia of American Biography (New Series)*; American Historical Company, Inc.: 1942.
- 42) Farber, E. *Nobel Prize Winners in Chemistry 1901-1961*; rev. ed.; Abelard-Schuman: 1963.
- 43) Ferchl-Mittenwald, F. *Chemisch-Pharmazeutisches Bio- und Bibliographikon*; Arthur Nemayer: 1937.
- 44) Figuier, L. *Vies des Savants Illustres*; Hachette & Co.: 1876-1879.
- 45) Fontenelle, B. *Eloges des Academiciens avec l'histoire de l'Academie Royale des Sciences en 1699*; I. van der Kloot: 1740; vol. 1.
- 46) Fruton, J. S. *A Bio-Bibliography for the History of the Biochemical Sciences since 1800*; American Philosophical Society: 1982.
- 47) Fruton, J. S. *A Bio-Bibliography for the History of the Biochemical Sciences since 1800 Supplement*; American Philosophical Society: 1986.
- 48) *Grande Encyclopédie Inventaire Raisonné des Sciences, des Lettres et des Arts par une Société de Savants et de Gens de Lettres*; Berthelot, C., Ed.; Société Anonyme de la Grande Encyclopédie: 1886-1902.
- 49) *Great Chemists*; Farber, E., Ed.; Interscience: 1961.
- 50) *Great Soviet Encyclopedia (3rd Ed.)*; Macmillan: 1973-1983.
- 51) Hinsdale, B. A. *History of the University of Michigan*; Demmon, I. N., Ed.; Michigan University Press: 1906.
- 52) Hufbauer, K. *The Formation of the German Chemical Community (1720-1795)*; University of California Press: 1982.
- 53) *J. C. Poggendorff's Biographisch-Literarisches Handwörterbuch zur Geschichte der Exacten Wissenschaften*; Johann Ambrosius Barth: 1863-1904; vol. 1-4; Verlag Chemie: 1926-1940; vol. 5-6; Akademie Chemie: 1956-1996; vol. 7A-7B.
- 54) Jaffe, B. *Crucibles*; Tudor Publ. Co.: 1930.

- 55) *Jöcher's Allgemeine Gelehrten Lexicon*; Johann Friedrich Gleditschen: 1750-1787; vol. 1-4, vol. 1-2(suppl.); Georg Jöntzen: 1810-1813; vol. 3-4(suppl.); Johann Georg Heyfe: 1816-1819; vol. 5-6(suppl.); Georg Olms: 1961; vol. 7(suppl.).
- 56) Jolly, W. L. *From Retorts to Lasers*; University of California: 1987.
- 57) *Macmillan Dictionary of Canadian Biography*; Wallace, W. S., Ed.; McKay, W. A., rev.; Macmillan of Canada: 1978; p480.
- 58) Mangin, A. *Les Savants Illustres de la France*; Ducrocq: 1865.
- 59) *McGraw-Hill Modern Men of Science*; McGraw-Hill: 1966.
- 60) *McGraw-Hill Modern Scientists and Engineers*; McGraw-Hill: 1980.
- 61) McGrayne, S. B. *Nobel Prize Women in Science .. Their Lives, Struggles, and Momentous Discoveries*; Birch Lane Press: 1993.
- 62) *Michaud Biographie Universelle (2nd Ed.)*; Delagrabe: 1843-1865.
- 63) *National Cyclopaedia of American Biography*; James T. White & Co.: 1921-1984.
- 64) *Neue Deutsche Biographie*; Duncker & Humblot: 1953-1998.
- 65) *Nieuw Nederlandsch Biografisch Woordenboek*; A. W. Sijthoff's Uitgevers-Maatschappij: 1911-1937.
- 66) *Nobel Laureates in Chemistry 1901-1992*; James, L. K., Ed.; American Chemical Society: 1993.
- 68) *Norsk Biografisk Leksikon*; H. Aschehoug: 1954.
- 69) *Nouvelle Biographie Generale*; Firmin, Didot Freres: 1852-1866.
- 70) *Österreichisches Biographisches Lexikon 1815-1950*; Hermann Boehlaus Nachf.: 1957-1991.
- 71) Partington, J. R. *A History of Chemistry*; Macmillan: 1961-1964.
- 72) Prandtl, W. *Deutsche Chemiker in der Ersten Hälfte des Neunzehnten Jahrhunderts*; Verlag Chemie: 1956.
- 73) *Les Prix Nobel*; P. A. Norstedt & Soener.
- 74) *Prominent Personalities in the USSR*; Crowley, E. L.; Lebel, A. I.; Schulz, H. E., Eds.; Scarecrow Press: 1968.
- 75) *Prominent Scientists of Continental Europe*; Turkevich, J.; Turkevich, L. B., Eds.; American Elsevier: 1968.
- 76) Pütter, J. S. *Versuch einer akademischen Gelehrten-Geschichte von Georg-Augustus-Universität zu Göttingen*; Vandenhoeck-Ruprechtisch: 1765-1788; vol. 1-2; Saalfeld, F.; Hannover: 1820; vol. 3.
- 77) Rothsuh, K. E. *History of Physiology*; Risse, G. B., transl.; Krieger Publ. Co.: 1973.
- 78) Schiffner, C. *Aus dem Leben alter Freiburger Bergstudenten*; Ernst Mauckisch: 1935.
- 79) *Science, Medicine and History*; Underwood, E. A., Ed.; Oxford University Press: 1953.
- 80) *Selected Readings in the History of Physiology (2nd Ed.)*; Fulton, J. F.; Wilson, L. G., Eds.; Charles C. Thomas: 1966.
- 81) Servos, J. W. *Physical Chemistry from Ostwald to Pauling The Making of a Science in America*; Princeton University Press: 1990.
- 82) Seymour, R. B.; Fisher, C. H. *Profiles of Eminent American Chemists*; Litarran Enterprises Pty. Ltd.: 1988.
- 83) Sigerist, H. E. *The Great Doctors*; Paul, E.; Paul, C., transl.; W. W. Norton & Co.: 1933.
- 84) Stirling, W. *Some Apostles of Physiology*; Waterlow & Sons: 1902.
- 85) Struthers, J. *Historical Sketch of the Edinburgh Anatomical School*; Maclachlan and Stewart: 1867.
- 86) *Svenskt Biografiskt Lexikon*; Albert Bonniers: 1918-1985.
- 87) *Swedish Men of Science 1650-1950*; Lindroth, S., Ed.; Almqvist & Wiksell: 1952.
- 88) *The Development of Harvard University*; Morison, S. E., Ed.; Harvard University Press: 1930.
- 89) *The Harvard Book*; Vaille, F. O.; Clark, H. A., Eds.; Welch, Bigelow & Co.: 1875.
- 90) *The International Who's Who*; Europa Publications Ltd.: 1982.
- 91) *The New Encyclopaedia Britannica Micropaedia*; Encyclopaedia Britannica Inc.: 1989.
- 92) Thomson, T. *History of Chemistry*; H. Colburn & R. Bentley: 1830-1831.
- 93) Thorndike, L. *A History of Magic and Experimental Science*; History of Science Society Publications: 1941.
- 94) Thorpe, E. *Essays in Historical Chemistry*; Macmillan: 1923.
- 95) Tilden, W. A. *Famous Chemists*; Routledge & Sons: 1921.
- 96) University of California *In Memoriam*; University of California Press.
- 97) Weeks, M. E. *Discovery of the Elements (7th Ed.)*; Leicester, H. M., Ed.; J. Chem. Ed.: 1968.
- 98) *Who Was Who In America*; A. N. Marquis Co.: Historical Volume (1607-1896) - 1967; vol. 1 (1897-1942) - 1967; vol. 2 (1943 - 1950) - 1950; vol. 3 (1951-1960) - 1963; vol. 4 (1961-1968) - 1968; vol. 5 (1969-1973) - 1973; vol. 6 (1974-1976) - 1976; vol. 7 (1977-1981) - 1981; vol. 8 (1982-1985) - 1985; vol. 9 (1985-1989) - 1989; vol. 10 (1989-1993) - 1993.
- 99) *Who's Who in Science in Europe (4th Ed.)*; Longman: 1984.
- 100) *Who's Who in Science in Europe (6th Ed.)*; Longman: 1989.

- 101) *Who's Who in World Jewry*; Karpman, I. J. Carmin, Ed.; Olive Books of Israel: 1978.
102) *World Who's Who In Science*; Debus, A. G., Ed.; Marquis-Who's Who Inc.: 1968.