

# Named Things in Chemistry: A New On-line Database for Research and Teaching

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Named Things in Chemistry & Physics  
**<http://www.chem.yorku.ca/NAMED>**  
**<http://www.careerchem.com/NAMED/Homepage.html>**

*"Scire ubi aliquid invenire possis, ea demum maxima pars eruditionis est."  
("To know where you can find anything, that in short is the largest part of learning.")*

-- Anonymous

*"Knowledge is of two kinds: we know a subject ourselves, or  
we know where we can find information upon it."*

Samuel Johnson (1709 - 1784)

*"History is a thing scientists do when they can't do science anymore."*

-- *Oxygen*, a play by Profs. Roald Hoffmann and Carl Djerassi

*"If [this were] true, then there is little chance of the younger generation ever following us and becoming chemists themselves."*

-- Colin Russell, Prof. Emeritus at Open University, UK

**Current challenges:**

- => minimal referencing to original work in undergraduate texts
- => breeding of misconceptions and incorrect associations between people and ideas
- => students feel detached from subject
- => perception of passive spectators
- => lack of inspiration
- => desensitized to self-discovery approach which is the drive of research
- => human dimension is lost in a deluge of facts that need to be memorized in a short time
- => professors become interested in history of science in "swansong" of their careers

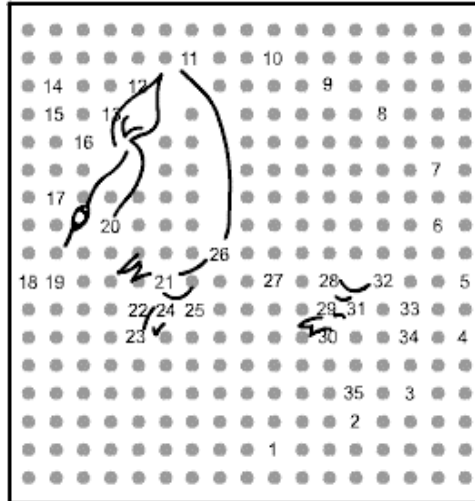
**Why bother with "history"?**

- => science is a human activity

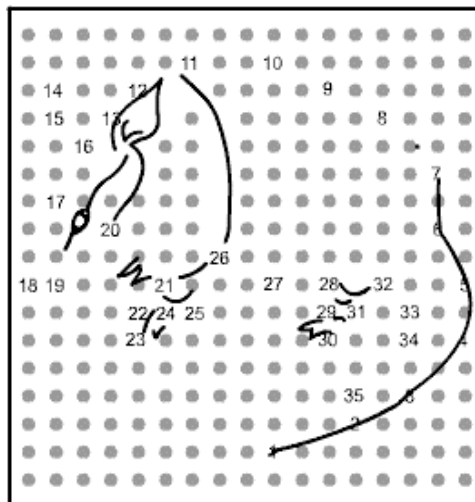
**Tradition of naming & scientific genealogies**

- => signposts of important events and ideas in a field
- => connections between ideas are revealed
- => connections between people are revealed
- => order of development of ideas is revealed
- => patterns of success in career development are revealed
- => identifying major players in a field
- => identifying innovators and followers
- => how ideas are generated
- => how discoveries are made
- => how to decide which ideas are worth pursuing and which are not
- => how to ask the "right" questions

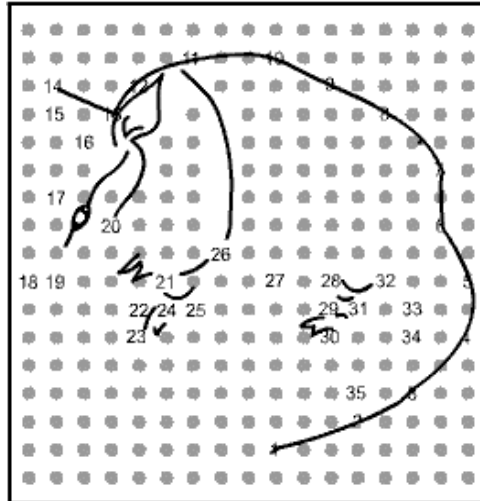
**Getting the “Big Picture”:** Dot-to-Dot Diagram



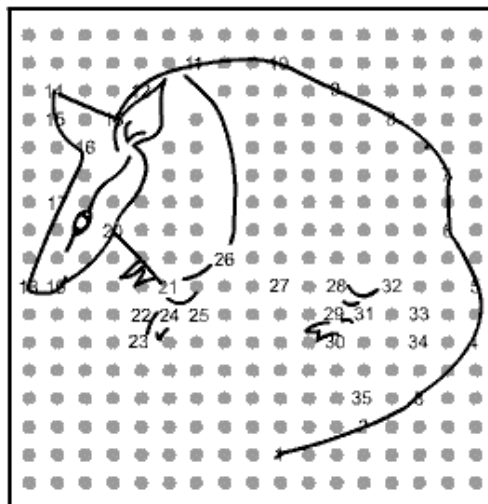
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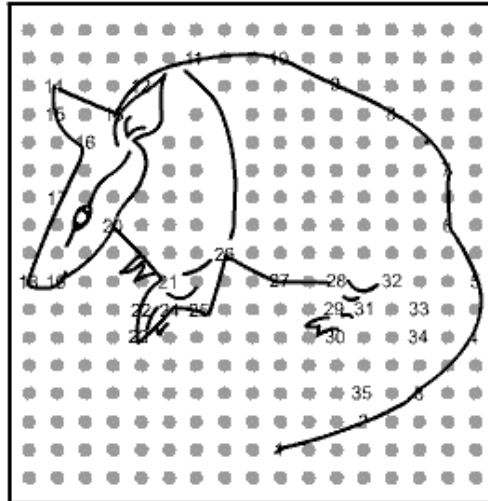
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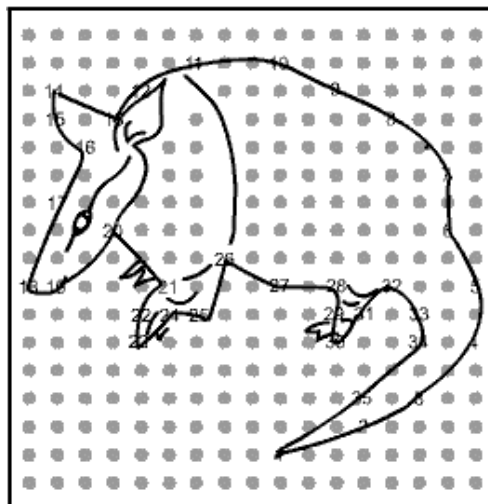
**Getting the “Big Picture”:** Dot-to-Dot Diagram

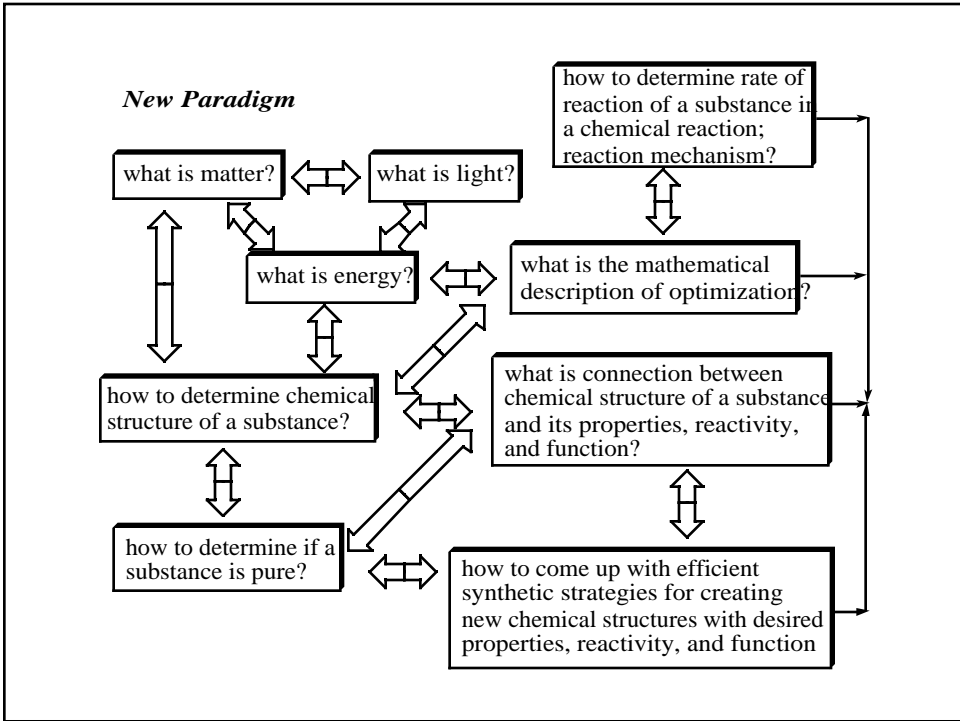
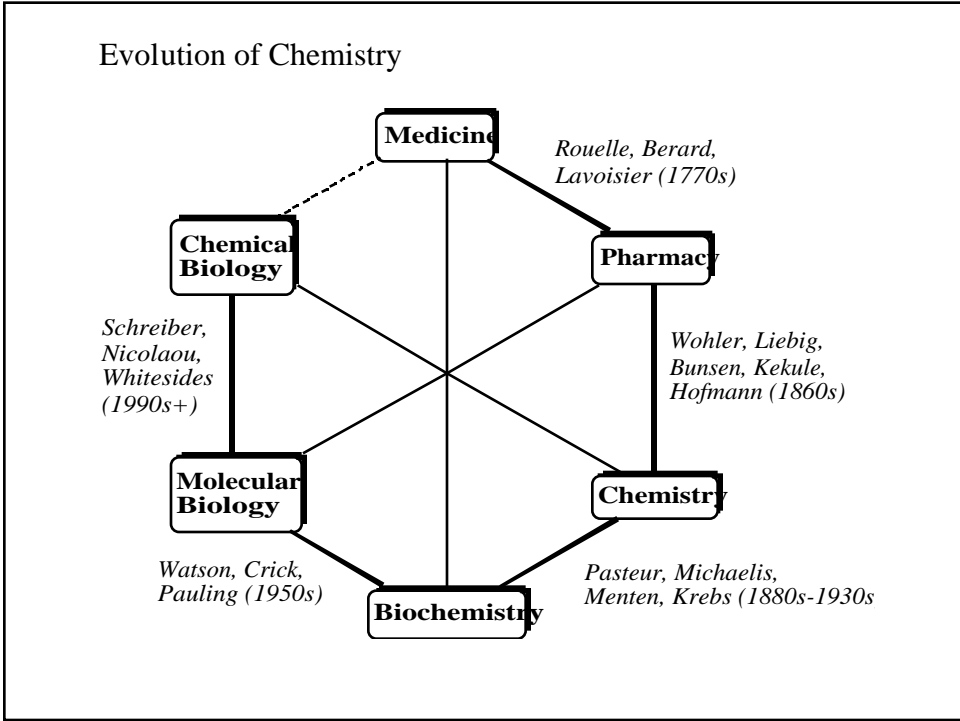


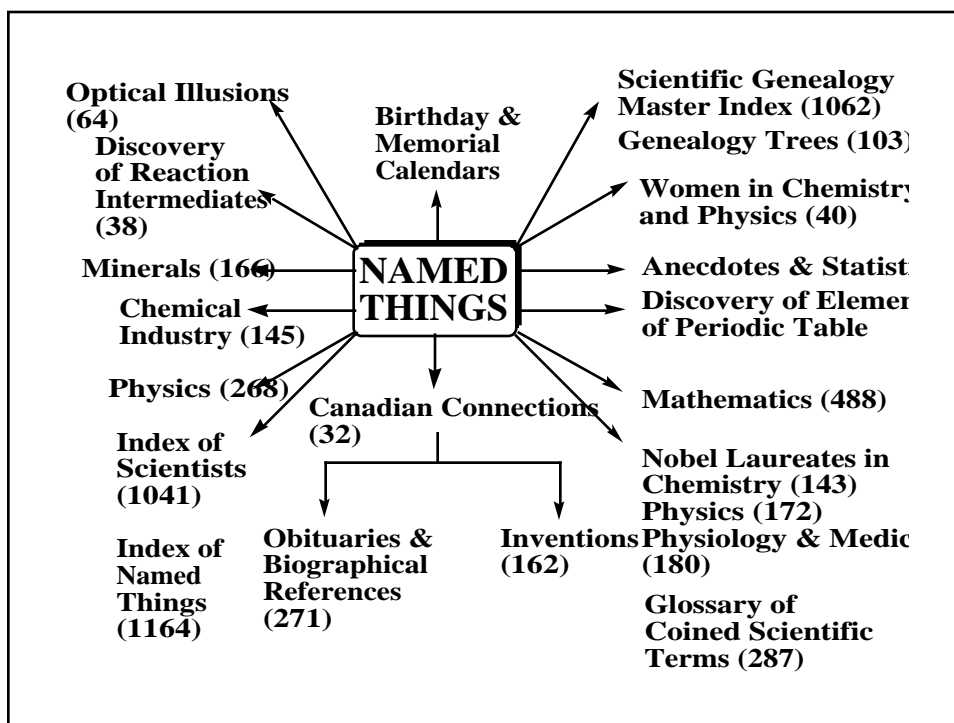
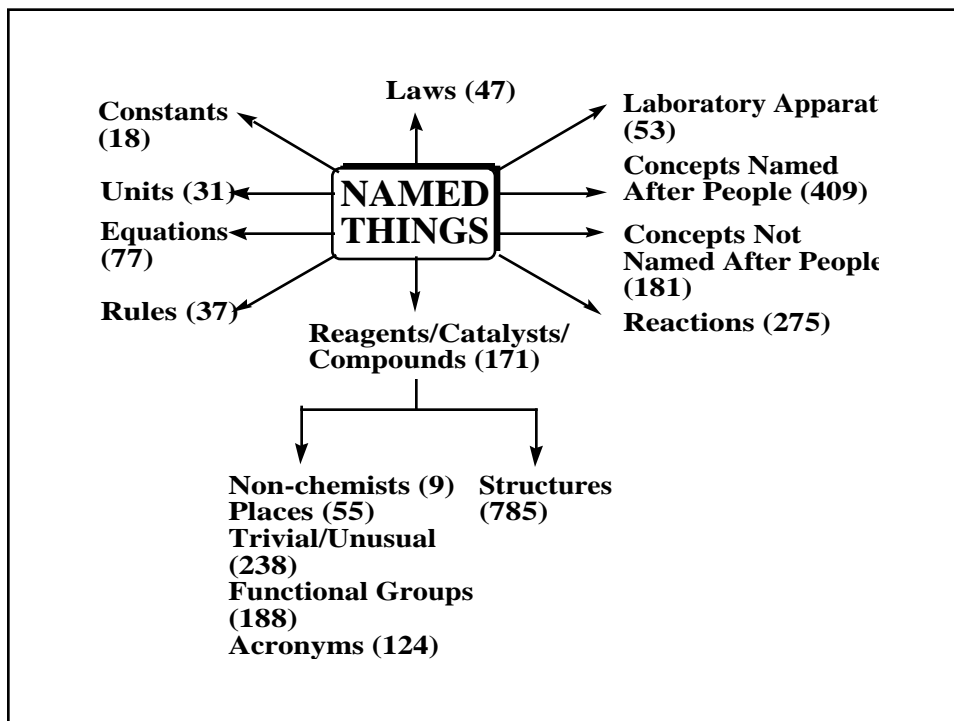
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**Getting the “Big Picture”:** Dot-to-Dot Diagram







## Maud Leonora Menten



20 March 1879 - 20 July 1960  
Canadian, b. Port Lambton, Ontario, Canada

### Michaelis-Menten equation

Henri, V. *Lois générales de l'action des diastases*, Paris, 1903  
Michaelis, L.; Menten, M.L., *Biochem. Z.* **1913** 49, 333

### Biographical References:

Rayner-Canham, M.; Rayner-Canham, G., *Women in Chemistry*, ACS: Washington, 1998, p. 157  
Stock, A.H.; Carpenter, A.M., *Nature* **1961**, 189, 965  
Smith, D.B. *Trends Biochem. Sci. (Pers. Ed.)*, **1979** 4, N150  
Ogilvie, Marilyn; Harvey, Joy (eds.) *The Biographical Dictionary of Women in Science*, Routledge: New York, 2000, p. 882

## Where to find biographical information about scientists?

**Gillispie, Charles (ed.)** *Dictionary of Scientific Biography*  
*Obit. Not. Fellows Roy. Soc.; Biog. Mem. Fellows Roy. Soc.*  
*Biog. Mem. Natl. Acad. Sci. USA; Current Biography*  
*Profiles, Pathways, and Dreams Series, ACS: Washington, D.C.*  
*Candid Science series* *The Road To Stockholm*

**Ogilvie, M; Harvey, J. (eds.)** *The Biographical Dictionary of Women in Science*

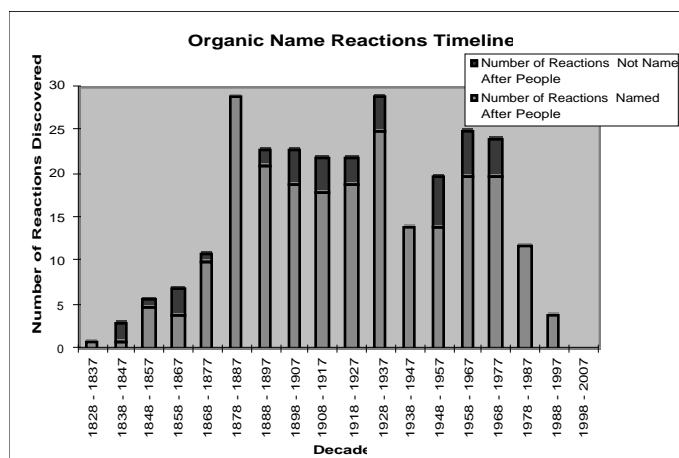
**Websites:** Nobel Academy, Named Things in Chemistry & Physics

General: <i>The Chemical Intelligencer</i> (1995-2000) <i>Eur. J. Org. Chem.</i> (1998)	Swiss: <i>Helvetica Chimica Acta</i> (1918+)
British: <i>Chemical Society Reviews</i> (1972+), <i>Journal of the Chemical Society</i> (1849), <i>Green Chemistry profiles</i> (1999+), <i>Organic and Biomolecular Chemistry</i> profiles (2003+)	American: <i>Chemical Reviews</i> (1980+), <i>Accounts of</i> <i>Chemical Research</i> (1972+), <i>Journal of</i> <i>Physical Chemistry</i> Festschrift issues, <i>Chemical &amp; Engineering News</i> obituaries and profiles
German: <i>Chemische Berichte</i> (1868 - 1997), <i>Angewandte Chemie</i> (1888+)	Canadian: <i>Canadian Journal of Chemistry</i> dedication issues (1988+)
French: <i>Bulletin de la Société de Chimie de</i> <i>France</i> (1889+)	Japanese: <i>Bulletin of the Chemical Society of</i> <i>Japan</i> (Accounts)



**"Named" things: signposts of what ideas are important and which stand the tests of experimentation, verification, and reproducibility over time**

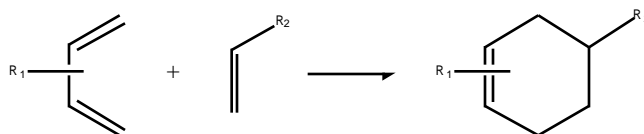
*Good nomenclature elicits images and aids reasoning by analogy; it is the organic chemists' best friend. -- Donald J. Cram*



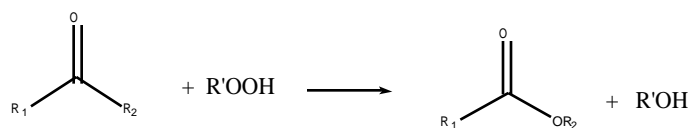
### Survey of Connections Between People and Ideas

**Type 1: Named thing shared between student and advisor**

**Diels-Alder reaction (O. Diels, K. Alder, 1928)**

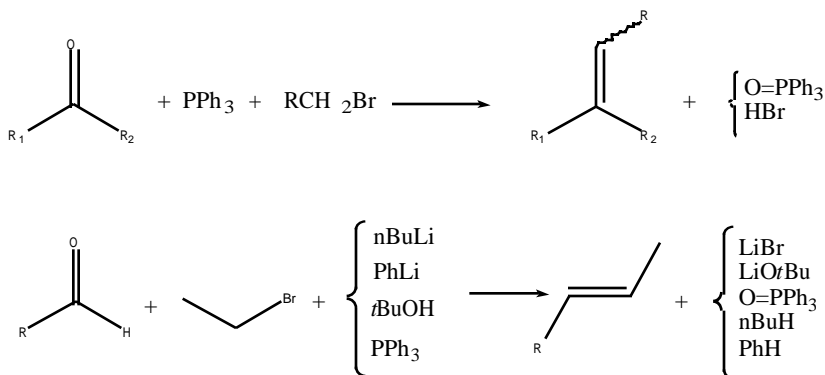


**Baeyer-Villiger oxidation (A. von Baeyer, V. Villiger, 1899)**



## Survey of Connections Between People and Ideas Type 2 Evolution of ideas from advisor to student (innovator-follower)

Wittig reaction (G. Wittig, 1954) ->  
Schlosser modification of Wittig reaction (M. Schlosser, 1971)

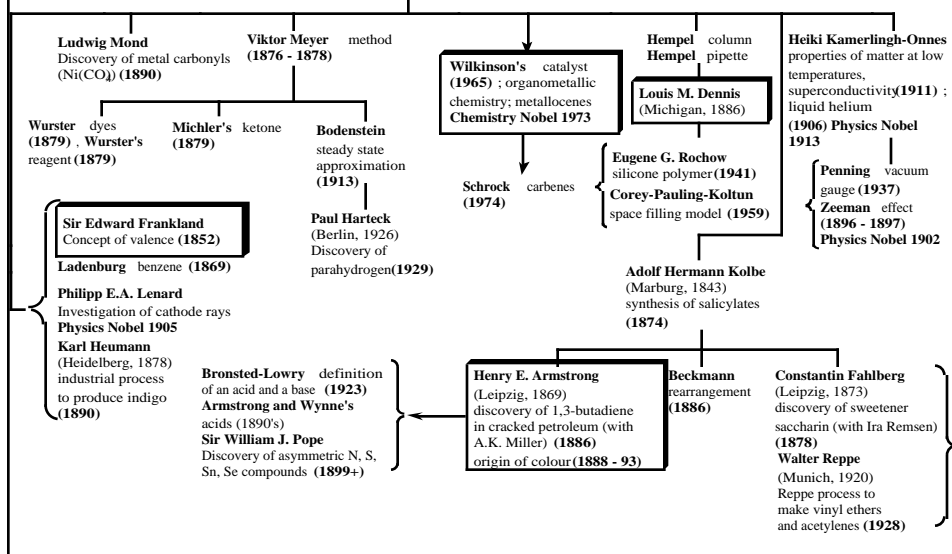


## Example Genealogy Trees

Type 3 Novel ideas and discoveries through generations

### BUNSEN

Bunsen burner, actinometry (1855) (with Sir Henry Roscoe)  
 elemental spectrum analysis (1860) (with Gustav R. Kirchhoff)  
 Discovery of element 37, rubidium (1861) (with Gustav R. Kirchhoff)  
 Discovery of element 55, cesium (1860) (with Gustav R. Kirchhoff)

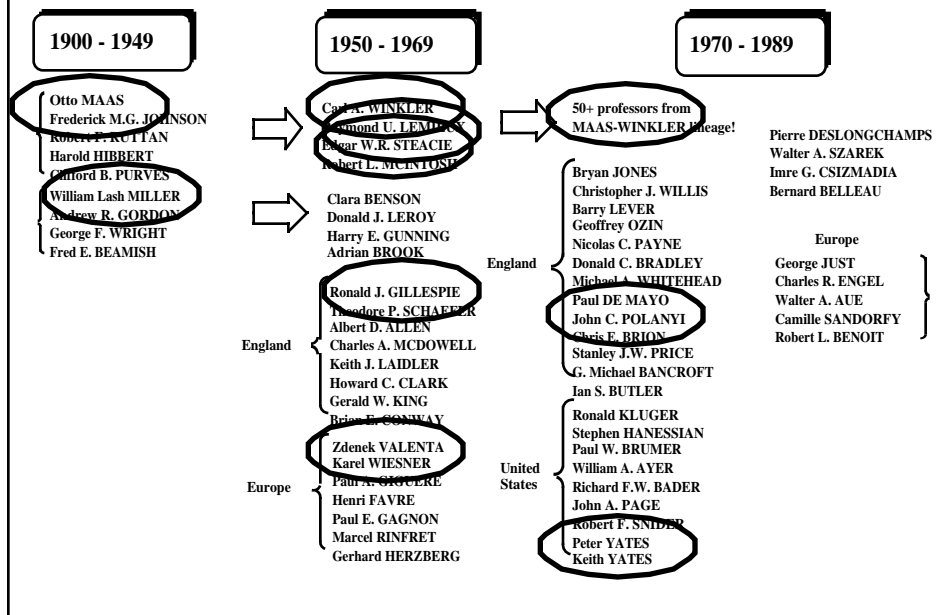


### “Unknown” Canadian Scientists

SCIENTIST	DATES	BIRTHPLACE	SCIENTIFIC ACHIEVEMENT
<b>Avery</b> , Oswald Theodore MD 1904 Columbia	1877 - 1955	b. Halifax, Nova Scotia	DNA as source of heredity ( <b>1944</b> )
<b>Brooks</b> , Harriet T. MA 1901 McGill (Lord Ernest Rutherford)	1876 - 1933	b. Exeter, Ontario	Transmutation of the elements ( <b>1904</b> )
<b>Eadie</b> , George Sharp Ph.D. 1927 Cambridge (J.B.S. Haldane)	1895 - 1976	b. Toronto, Ontario	Eadie plot applied to Michaelis-Menten equation (rate of reaction, $v$ , vs. $v/[S]$ ) ( <b>1942</b> )
<b>Giauque</b> , William Francis <b>Chemistry Nobel 1949</b> Ph.D. 1922 UC Berkeley (George E. Gibson)	1895 - 1982	b. Niagara Falls, Ontario	Absolute zero temperature Measurements ( <b>1927+</b> ) Partition functions ( <b>1930</b> )
<b>Good</b> , Norman Everett Ph.D. 1951 Cal Tech (Hershel K. Mitchell)	1917 -	b. Brantford, Ontario	Good buffer solutions ( <b>1966</b> )

SCIENTIST	DATES	BIRTHPLACE	SCIENTIFIC ACHIEVEMENT
<b>Kamen</b> , Martin Ph.D. 1937 Chicago (William D. Harkins)	1913 -	b. Toronto, Ontario	Discovery of carbon-14 isotope ( <b>1941</b> )
<b>Menten</b> , Maud Leonora Ph.D. 1916 Chicago (Albert P. Mathews)	1879 - 1960	b. Port Lambton, Ontario	Michaelis-Menten kinetics ( <b>1913</b> )
<b>Moffatt</b> , John Gilbert Ph.D. 1956 UBC (Har G. Khorana)	1930 -	b. Victoria, British Columbia	Pfizer-Moffatt reagent (DMSO-dicyclohexylcarbodiimide) ( <b>1963</b> )
<b>Patterson</b> , Arthur Lindo Ph.D. 1928 McGill (Arthur S. Eve)	1902 - 1966	b. Nelson, New Zealand	Patterson functions ( <b>1934</b> )
<b>Saunders</b> , Frederick A. Ph.D. 1899 Johns Hopkins (Henry A. Rowland)	1875 - 1963	b. London, Ontario	Russell-Saunders spin-orbit coupling ( <b>1925</b> )
<b>Winstein</b> , Saul Ph.D. 1938 Cal Tech (Howard J. Lucas)	1912 - 1969	b. Montreal, Quebec	Anchimeric assistance ( <b>1939</b> ) Normal salt effect ( <b>1940</b> ) Grunwald-Winstein equation ( <b>1948</b> ); intimate and solvent separated ion pairs ( <b>1952</b> ); special salt effect ( <b>1954</b> ); Winstein-Holness equation ( <b>1955</b> )

## Leaders in Canadian Chemistry Over the Years

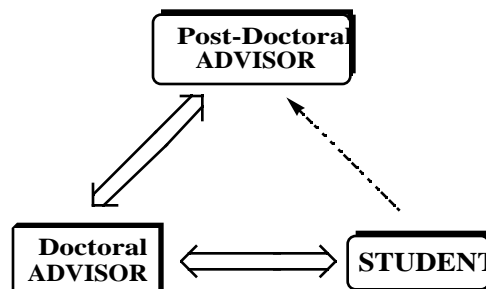


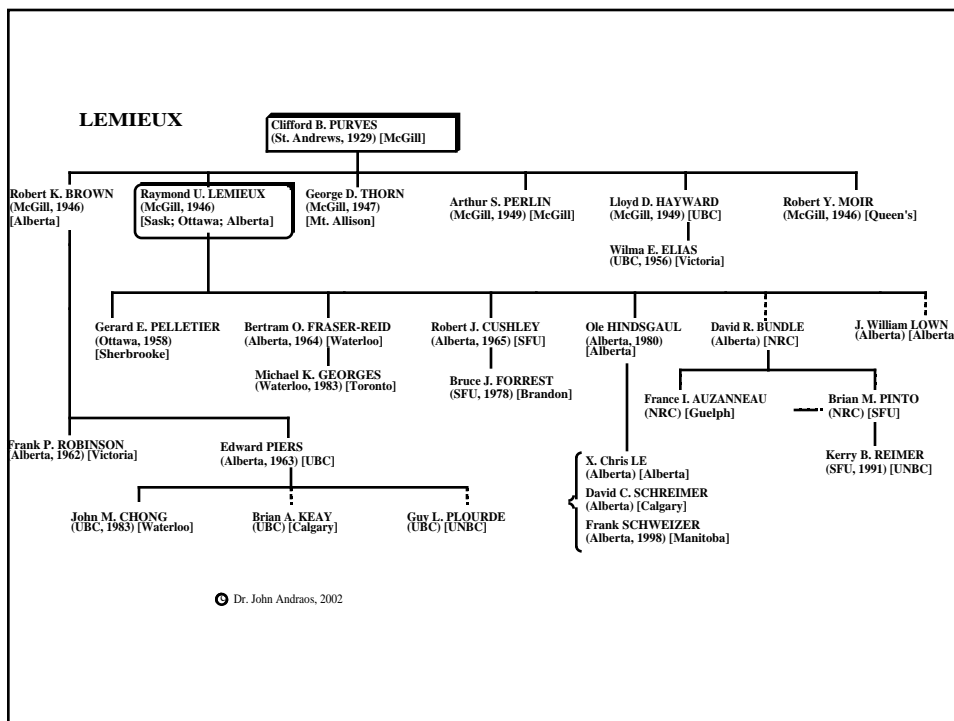
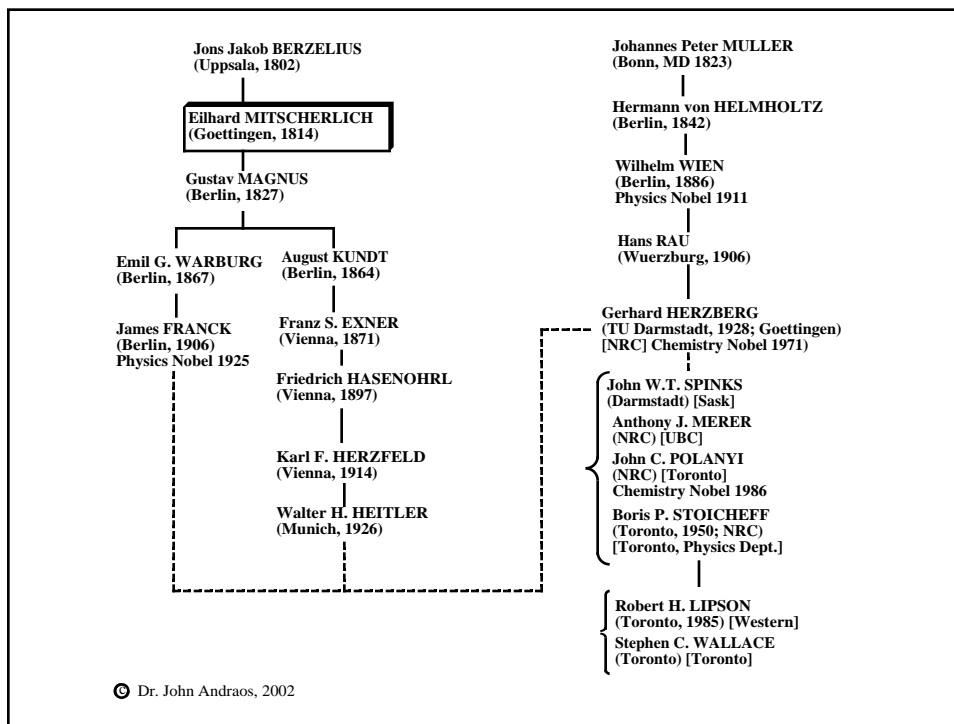
## Culture of "Academia"

### Professional goals of academics

- (1) To be recognized for their contributions to a field of study
- (2) To propagate and perpetuate those contributions through their students

**Triangulation Principle and Rank-to-Rank Flow**  
**Selling yourself** versus **someone else selling you**





Acknowledgements

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**Contributions from famous chemists:**

Jacob Bigeleisen, Joseph Bunnett, Greg Choppin, Wallace Cleland, Jack Dunitz,  
William H. Graham, Ernest Grunwald, Edward Kosower, Barry Lever,  
Elmer C. Lupton, Jr., Alfred Redfield, Jeff Schwartz, Robert Shapiro, Akira Suzuki,  
Jiro Tsuji, Edwin Vedejs, Robert M. Williams

**Library Staff at University Libraries around the World**

**Contributions from relatives of famous chemists:**

Bill Langmuir, great grandnephew of Irving Langmuir  
Linda Erdmann Brown, great grandniece of Hugo Erdmann  
Dr. Lourens Penning, son of Franz Michel Penning  
Walter H. Ehrenstein, son of Walter Ehrenstein