LIEBIG TREE #4 © Dr. John Andraos, 2002

Liebig condenser
benzilic acid
rearrangement **(1838)**

Joseph Redtenbacher
(Vienna, MD 1834; Giessen)

Carl Schmidt
(Giessen, 1844)

Ostwald dilution law **(1888),** concept of catalysis **(1894)**
rates of chemical reactions; chemical equilibrium **Chemistry Nobel 1909**

Georg Bredig
(Leipzig, 1894)

Otto Meyerhof
Concept of energy rich pyrophosphate bonds **(1931);**
discovery of relationship between oxygen
consumption and lactic acid metabolism in muscle
Physiology & Medicine Nobel 1922

Lineweaver-Burk
plot **(1934)**

Karl Lohmann
Concept of energy rich pyrophosphate bonds **(1931)**
Discovery of ADP **(1934)**, ATP **(1929)**

Severo Ochoa
Discovery of mechanisms
for biosynthesis of
ribonucleic and deoxy-
ribonucleic acids
Physiology &
Medicine Nobel 1959

Hermann Braune
(Heidelberg, 1911)

Fritz Strassmann
concept of nuclear
fission**(1934 - 45)**

Fajans rules on bonding
(1915); Discovery of
element 91 protactinium **(1917)**
group displacement law **(1913)**

Odd Hassel
Conformational analysis
Cyclohexane structures
Chemistry Nobel 1969

Evans-Polanyi relationship **(1938)**
Bell-Evans-Polanyi principle **(1936/8)**

Ernest Warhurst
(Manchester, 1936)

James W. McBain
(Heidelberg, 1906)

Jerome R. Vinograd
(Stanford, 1940)

John E. Hearst
(Cal Tech, 1961)

Thomas R. Cech
Discovery of catalytic
properties of RNA
Chemistry Nobel 1989

Fritz Lipmann
Discovery of coenzyme A
Physiology &
Medicine Nobel 1953

George Wald
Discovery of primary
physiological and chemical
visual processes in eye
Physiology & Medicine
Nobel 1967

Eugene Wigner
Discovery and application of fundamental
symmetry principles to atomic nuclei and
elementary particles, **Wigner** spin rules **(1926/7)**
Physics Nobel 1963

John Charles Polanyi
Infrared chemilumiscence;
chemical lasers
Chemistry Nobel 1986

Daniel Nathans
Discovery of restriction
enzymes
Physiology & Medicine
Nobel 1978

More O'Ferrall-Jencks
diagram **(1977)**; **Jencks**
clock **(1977 - 1984)**

Francois Jacob
Andre Lwoff
Discoveries concerning
genetic control of enzymes
and virus synthesis
Physiology & Medicine
Nobel 1965

Shannon-Jaynes
maximum entropy function
(1948/1957)

Hillard B. Huntington
(Princeton, 1941)

John Bardeen
BCS theory **(1957)**, semiconductors
discovery of transistor effect **(1948)**
Physics Nobel 1956,
Physics Nobel 1972

Meredith G. Evans
Be-Ma-Ha-Po-Th-Le
principle **(1938)**
Evans principle **(1939)**

Marcus-Hush relationship
(1964 - 7)

Ivar Giaever
Discoveries regarding
tunnelling phenomena in
semi and superconductors
Physics Nobel 1973

John Robert Schrieffer
BCS theory of superconductivity
(1957) Physics Nobel 1972

Anthony J. Leggett
(Oxford, 1964; Illinois)
Developed theories for
superconductivity **Physics Nobel 2003**

Gottfried Landwehr
(TH Braunschweig, 1956;
Illinois)

Klaus von Klitzing
Discovery of quantized
Hall effect
Physics Nobel 1985