

## August

1

**b. 1817 Joseph H. Gilbert**, researcher on nitrogen fertilizers.



**b. 1885 Georg von Hevesy**, researcher in radioisotopes; discovered hafnium (Hf, 72) 1923 with Dirk Coster; Nobel Prize, (1943) for his work on the use of isotopes as tracers in the study of chemical processes.

**b. 1897 Charles R. Harington**, researcher in biochemistry; synthesized thyroxine with George Barger.



**b. 1921 George H. Büchi**, researcher in organic photochemistry; determined structure of 55 and syntheses of 75 complex natural products.

- Joseph Priestley's discovery of oxygen, 1774.
- US Atomic Energy Commission established, 1946.
- Centennial of Chemistry Celebration, Northumberland, Pennsylvania, 1874.

2



**b. 1776 Friedrich Stromeyer** discovered cadmium (Cd, 48) 1817; analysis of metals; He was the first to recommend starch as a reagent for free iodine and he studied chemistry of arsine and bismuthate salts.



**b. 1788 Leopold Gmelin** discovered potassium ferricyanide (Gmelin's Salt), 1822, & other organic substances; test for bile pigments; his *Handbuch der anorganischen Chemie*, 1819, is standard reference work.

- Benjamin Rush, Professor of Chemistry, signs Declaration of Independence, 1776.
- Albert Einstein sends letter to President Roosevelt concerning military potential of atomic energy, 1939.

3

- Isaac Adams' patent on nickel plating issued, 1869.
- U.S. nuclear powered submarines, Nautilus & Skate, crossed under polar ice cap, 1958.

4



**b. 1859 William Sutherland**, research on relationship between viscosity of gas and temperature using Sutherland Constant and dissolution of strong electrolytes; viscosity of gases and liquids, molecular attraction, valency, ionization, ionic velocities, atomic sizes and an electronic theory of matter.

**b. 1928 Jeanette Grasselli Brown**, researcher on vibrational spectroscopy; Garvan Medal (1985). ACS added.

- U. S. Department of Energy created, 1977. (ACS)

5

- Robert R. Williams & J. K. Cline synthesized vitamin B<sub>1</sub>, 1936.
- Exxon incorporated as Standard Oil Co. of New Jersey, 1882.

6



**b. 1766 William H. Wollaston** discovered palladium (Pd, 46), 1803, & rhodium (Rh, 45), 1804; developed method for making platinum (Pt, 78) malleable & produced platinum wire 1/10,000 cm in diameter.



**b. 1881 Alexander Fleming** discovered penicillin, 1929; Nobel Prize in Medicine (1945) for the discovery of penicillin and its curative effect in various infectious diseases with Ernst B. Chain & Howard W. Florey.

- The first publication on the first working laser was published in the paper, Simulated optical radiation in ruby by Theodore H. Maiman in *Nature*, 197, 494 (1960).

7

**b. 1853 Arthur Michael** developed entropy-based theory of organic reactions; Michael addition reaction.

- George C. Pimentel announced evidence of methane & ammonia detected by Mariner 7 near Mars, 1969.

8



**b. 1779 Benjamin Silliman**, noted teacher; founder & editor of *American Journal of Science*. He founded the oldest continuing journal of natural science in the United States, the *American Journal of Science*, familiarly called "Silliman's Journal". In 1807, a meteorite fell with spectacular sound and light effects in Weston, Connecticut. This was the first documented fall of a meteorite in the New World--only 25 miles from New Haven. He published an analysis of the meteorite.



**b. 1901 Ernest O. Lawrence** built the first cyclotron; Nobel Prize in Physics (1939) for the invention and development of the cyclotron and for results obtained with it, especially with regard to artificial radioactive elements.



**b. 1902 Paul A. M. Dirac**, researched relativistic quantum mechanics including electron spin (Dirac equation); Nobel Prize in Physics with E. Schrödinger (1933) for the discovery of new productive forms of atomic theory.

9



**b. 1776 Amadeo Avogadro** theorized that the number of particles in any gas is always the same for equal volumes.



**b.1896 Erich Armand Arthur Joseph Hückel**, developed the Hückel method of approximate molecular orbital (MO) calculations on p-electron systems; developed Debye-Hückel theory of electrolytic solutions with Peter Debye.

10



**b. 1902 Arne W. K. Tiselius**, researcher on electrophoresis & adsorption analysis; Nobel Prize in chemistry (1948) for his research on electrophoresis and adsorption analysis, especially for his discoveries concerning the complex nature of the serum proteins.

• Felix Hoffman improved manufacture of acetylsalicylic acid, *aspirin*, for use in treatment of arthritis, 1897.

11

**b. 1852 Harold B. Dixon**, researcher on explosion of gases & combustion.



**b. 1905 Erwin Chargaff** elucidated base pairing in deoxyribonucleic acid (DNA), 1950 - 53.



**b. 1926 Aaron Klug** developed crystallographic electron-microscopic technique for elucidation of nucleic acid protein complexes; Nobel Prize (1982) for his development of crystallographic electron microscopy and his structural elucidation of biologically important nuclei acid-protein complexes.

- Bristol-Myers incorporated, 1933.

12



**b. 1793 James Muspratt** improved methods of manufacture of acids & other chemicals.



**b. 1887 Erwin Rudolf Josef Alexander Schrödinger**, researcher in quantum mechanics; formulated Schrödinger Wave Equation; Nobel Prize in Physics (1933) with Paul Adrien Maurice Dirac for the discovery of new productive forms of atomic theory. (1887-1961).

13



**b. 1872 Richard M. Willstätter** studied aliphatic amines and alkaloids; Nobel Prize (1915) for his researches on plant pigments, especially chlorophyll.



**b. 1912 Salvador Luria**, researcher on microbial genetics, Nobel Prize in Physiology or Medicine (1969) with Max Delbrück and Alfred D. Hershey for their discoveries concerning the replication mechanism and the genetic structure of viruses.



**b. 1918 Frederick Sanger**, researcher on structure of proteins & insulin; base sequences of nucleic acids; Nobel Prize in Chemistry (1958) for his work on the structure of proteins, especially that of insulin and (1980) with W. Gilbert for their contributions concerning the determination of base sequences in nucleic acids and Paul Berg for his fundamental studies of the biochemistry of nucleic acids, with particular regard to recombinant-DNA.

- Olin incorporated as Mathieson Alkali Works, 1892.

14



**b. 1777 Hans C. Oersted**, first to isolate aluminum; pioneering studies in electromagnetism.



**b. 1933 Richard R. Ernst**, NMR development; Nobel Prize in Chemistry (1991) for his contributions to the development of the methodology of high resolution nuclear magnetic resonance (NMR) spectroscopy.

## 15

**b. 1842 William A. Tilden**, researcher on organic bases, alkaloids, & specific heats of elements.

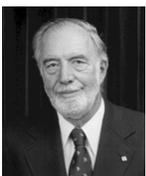
**b. 1875 Charles A. Kraus**, researcher on electrolytes.



**b. 1874 Johannes Stark**, researcher in electric currents in gases, spectroscopic analysis, and chemical valency; Nobel Prize for Physics (1919) for his discovery of the Doppler effect in canal rays and the splitting of spectral lines in electric fields.



**b. 1896 Gerty T. Cori** discovered how glycogen is catalytically converted; Nobel Prize in Physiology or Medicine (1947) with husband, Carl F. Cori for their discovery of the course of the catalytic conversion of glycogen and Bernardo A. Houssay for his discovery of the part played by the hormone of the anterior pituitary lobe in the metabolism of sugar.



**b. 1919 Arthur W. Adamson**, researcher in photochemistry of coordination chemistry and surface chemistry; "Father of inorganic photochemistry". (d. 7/22/04)

## 16

**b. 1845 Gabriel Lippmann**, developer of capillary electrometer; general theory of his process for the photographic reproduction of color; Nobel Prize in Physics (1908) for his method of reproducing colors photographically based on the phenomenon of interference.



**b. 1904 Wendell M. Stanley**, researcher on chemical nature of viruses; crystallized tobacco mosaic virus; Nobel prize in Chemistry 1948) with John H. Northrop for their preparation of enzymes and virus proteins in a pure form and James B. Sumner for his discovery that enzymes can be crystallized.

## 17

**b. 1893 Walter K. F. Noddack** co-discovered rhenium (Re, 75), 1925, with his wife, Ida E. Noddack & Otto Berg.

• Aldrich Chemical Co. established 1951 by Alfred Bader, which later became part of Sigma-Aldrich Corporation.

18



**b. 1916 Walter J. Kauzmann** (27 January 2009) research on the hydrophobic effect in the three-dimensional structure of proteins; nature of supercooled liquids (Kauzmann's paradox).

• The manuscript, "The determination of Enzyme Dissociation Constants", by Hans Lineweaver and Dean Burk was received by the *Journal of the American Chemical Society* on this date, 1933.

• Hewlett Packard incorporated, 1947.

19



**b. 1745 Johan G. Gahn** discovered & isolated manganese (Mn, 25) 1774; discovered phosphoric acid in bones with Karl W. Scheele, 1770.



**b. 1830 Lothar Meyer** developed periodic table independently of Dimitri Mendeleev at same time, 1869; showed the dependence of atomic volume on atomic weight, 1870.

20



**b. 1779 Jöns Jacob Berzelius** discovered selenium (Se, 48) 1817, silicon (Si, 14) 1817, & thorium (Th, 90) 1828; introduced name halogen; represented elements by initial letter(s); introduced allotropy, catalytic action & isomerism; used Dalton's atomic theory & composed the first accurate table of atomic weights.

• B. B. Cunningham & L. B. Werner isolated first macroscopic amount of plutonium (Pu, 94) at wartime Metallurgical Laboratory, University of Chicago, 1942.

21

**b. 1813 Jean S. Stas** developed methods for determination of atomic weights & analysis;



His aim to prove the hypothesis of Prout, that all atoms were conglomerations of hydrogen atoms, could not become achieved; he and Dumas determined the atomic weight of carbon.

**b. 1816 Charles F. Gerhardt**, researcher on theories of homologous series.



**b. 1882 Warren K. Lewis**, researcher in thermal properties of materials & colloids; MIT chemical engineer; invented the GEM lamps

22



**b. 1868 Willis R. Whitney**, first Director of GE research laboratories, 1900-1932. invented the GEM lamps.

23

**b. 1887 Bradley Dewey**, "Czar" of synthetic rubber production in WW II.



**b. 1933 Robert F. Curl, Jr.**, researcher in microwave and infrared spectroscopy; Nobel prize in Chemistry (1996) with Harold W. Kroto and Richard E. Smalley for their discovery of fullerenes. (ACS)

24



**b. 1895 Morris S. Kharasch** developed synthetic applications of free radical chemistry.

• PPG Industries incorporated 1883.

25

**b. 1812 Nicolai N. Zinin** discovered reduction of aromatic nitro compounds to amines, 1842, & benzidine rearrangement; founded and was first president of Russian Chemical Society, 1868-77.



**b. 1918 Hans A. Krebs** discovered the urea cycle, 1932, citric acid cycle or Krebs Cycle, 1937, & the glyoxylate cycle, 1957; Nobel Prize in Medicine (1953) for his discovery of the citric acid cycle with Fritz Albert Lipmann for his discovery of co-enzyme A and its importance for intermediary metabolism.

**b. 1916 Frederick C. Robbins**, researcher on growth of viruses in tissue culture; Nobel Prize in Medicine (1954) with John F. Enders & Thomas H. Weller for their discovery of the ability of poliomyelitis viruses to grow in cultures of various types of tissue.

26



**b. 1743 Antoine L. Lavoisier**, "founder of modern chemistry"; stated the law of conservation of matter; determined the composition of nitric & sulfuric acids; made 'water-gas'; invented the gasometer; introduced new chemical nomenclature with Claude L. Berthollet, Antoine François de Fourcroy, and Louis-Bernard Guyton de Morveau;. In the picture, there is his wife and collaborator, Marie-Anne Pierrette Paulze,

- Texaco incorporated as The Texas Corp., 1926.

27



**b. 1874 Carl Bosch**, commercial production of ammonia; Nobel Prize in Chemistry (1931) with Friedrich Bergius in recognition of their contributions to the invention and development of chemical high pressure methods.



**b. 1913 Martin Kamen**, codiscoverer of carbon-14 with Samuel Rubin (1940).

- Edwin Drake discovered petroleum in Pennsylvania, 1859.

28



**b. 1878 George H. Whipple**, researcher on pernicious anemia & diabetes; Nobel Prize in Physiology or Medicine (1934) with George R. Minot & William P. Murphy for their discoveries concerning liver therapy in cases of anaemia.

29

**b. 1834 Hermann J. P. Sprengel**, researcher in discharge tube mp.es, invented vacuum pump.

- Observation of first atom of element 109 at GSI Laboratory, Darmstadt, 1982.

30



**b. 1852 Jacobus H. van't Hoff**, researcher in physical chemistry of reaction velocity, thermodynamics, theory of dilute solutions & osmotic pressure; proposed the tetrahedral carbon, 1874; first Nobel Prize in chemistry (1901) in recognition of the extraordinary services he has rendered by the discovery of the laws of chemical dynamics and osmotic pressure in solutions



**b. 1871 Ernest Rutherford** formulated theory of radioactive decay, 1903; discovered the atomic nucleus, 1911; made first nuclear transmutation, 1919; Nobel Prize in Chemistry (1908) for his investigations into the disintegration of the elements, and the chemistry of radioactive substances.



**b. 1884 Theodor Svedberg**, researcher on ultracentrifuge for determining molecular weights & sizes of proteins; Nobel Prize in Chemistry (1926) for his work on disperse systems.

31



**b. 1786 Michel E. Chevreul**, researcher on dyes & physics of color; discovered stearin & margarine; lived to over a hundred years.



**b. 1887 Frederick A. Paneth**, researcher on age of rocks by measuring helium formed.