

July

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b. 1740 Müller von Reichenstein discovered tellurium (Te, 52) 1782.



b. 1929 Gerald M. Edelman, researcher in structure of antibodies; Nobel Prize in Physiology or Medicine with Rodney R. Porter for their discoveries concerning the chemical structure of antibodies (1972); "Father of Experimental Medicine".

- J. T. Baker incorporated originally as Vick Chemical, 1919.
- First nuclear rocket engine successfully tested, 1959.
- Office of Standard Weights and Measures became National Bureau of Standards, 1901; renamed National Institute of Standards and Technology, 1988

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b. 1841 Alexandre M. Zaitsev introduced the Zaitsev or [Saytzeff's rule](#), which predicts the product composition of an [elimination reaction](#), for example, elimination of hydrogen halides from alkyl haloanhydrides & water from alcohols; first synthesized secondary alcohols.



b. 1862 William H. Bragg, researcher in x-rays & crystal structure; Nobel Prize in Physics (1915) with son, W. Lawrence Bragg for their services in the analysis of crystal structure by means of X-rays.

- Fritz Haber demonstrated process of nitrogen fixation to Badische Aniline und Soda-Fabrik, 1909.
- Naval Research Laboratory founded as the Naval Experimental and Research Laboratory, 1923.

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b. 1876 Sergei S. Nametkin, researcher in terpene chemistry & rearrangement of camphenes.



b. 1919 Samuel P. Massie, Jr., research on environmental agents; encouraged disadvantaged students into science careers.

- Antoine-Jerome Balard announced discovery of bromine (Br, 35) to Académie de Sciences, Paris, 1826.

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b. 1888 Selman A. Waksman isolated streptomycin, 1943; Nobel Prize in Physiology or Medicine (1952) for his discovery of streptomycin, the first antibiotic effective against tuberculosis.



b. 1906 Vincent Joseph Schaefer, invented "[cloud-seeding](#)," artificially causing rain or snow using dry ice pellets; investigated the physics of precipitation; died 25 Jul 1993.

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b. 1853 Hendrik A. Lorentz, researcher in kinetic theory and thermodynamics; explained the Zeeman effect; shared the Nobel Prize in Physics (1902) with Pieter Zeeman in recognition of the extraordinary service they rendered by their researches into the influence of magnetism upon radiation phenomena.



b. 1891 John H. Northrop, researcher on purifying enzymes; discovered fermentation process for manufacture of acetone; Nobel Prize in Chemistry (1946) with Wendell M. Stanley & James B. Sumner for their preparation of enzymes and virus proteins in a pure form.

- Announcement of synthesis of vitamin B₁ by Robert R. Williams of Merck, Sharp & Dohme Research Laboratories, 1936.
- American Cyanamid Company organized, 1907.

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b. 1810 James C. Booth devised methods for refining gold-silver bullion at U. S. Mint, Philadelphia; one of the founding members of ACS and served as President from 1883-1884.



b. 1903 Axel Hugo Theodor Theorell, researched oxidation enzymes; Nobel Prize in Physiology and Medicine (1955) for his discoveries concerning the nature and mode of action of oxidation enzymes.

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b. 1843 Camillo Golgi researcher in structure of the nervous system; Nobel Prize in Physiology or Medicine (1906) with Santiago Ramon y Cajal in recognition of their work on the structure of the nervous system.

- Robert Goddard obtained patent for liquid fuel rocket, Patent #1,102,653 liquid-fuel gun rocket, 1914.

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- Jason Cardell reported in *Science* (1994) that interstellar abundances of the elements including thallium and lead are detected in interstellar gas.

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- Ford Motor Co. incorporated, 1919.

10



b. 1902 Kurt Adler developed the diene synthesis; Nobel Prize in Chemistry (1950) with Otto P. H. Diels for their discovery and development of the diene synthesis (Diels-Alder reaction).

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b. 1811 William Robert Grove created forerunner of modern fuel cells (“gas voltaic battery”); first to demonstrate the thermal dissociation of molecules; crater on moon named after him.



b. 1927 Theodore Harold Maiman, invented the first operable laser; **Ruby Laser Systems Laser**, Patent Number 3,353,115.

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b. 1635 Robert Hooke, researcher on the theory of gases & combustion. for his law of elasticity ([Hooke's Law](#)). "the father of [microscopy](#)" — it was Hooke who coined the term "cell" to describe the basic unit of life assisted [Robert Boyle](#) and built the vacuum pumps used in Boyle's [gas law](#) experiments.

b. 1810 Henri V. Regnault, researcher in thermometry, specific heats & expansion of gases; found carbon tetrachloride.



b. 1813 Claude Bernard discovered glycogen (1855); researched the digestion of food and the formation of glycogen in the liver; demonstrated that the digestion of glycogen begins in the stomach and continues in the intestine.



b. 1854 George Eastman invented Kodak & transparent film, Brownie camera, 1888, daylight loading film, 1891, & color film, 1928; manufacturer.



b. 1861 George Washington Carver isolated & synthesized over 400 products from peanuts & sweet potatoes.



b. 1928 Elias J. Corey, researcher in organic chemical synthesis & computers in chemistry: Nobel Prize in Chemistry (1990) for his development of the theory and methodology of organic synthesis.

- Launching of first atomic powered merchant ship, 1959.
- Discovery of xenon (Xe, 54) by William Ramsay & Morris W. Travers, 1898.

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b. 1527 John Dee, English alchemist.



b. 1826 Stanislao Cannizzaro convinced chemists of Avogadro's hypothesis; researcher in organic chemistry producing benzyl alcohol & benzoic acid from benzaldehyde.

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b. 1800 Jean-Baptiste A. Dumas, researcher on organic compounds; isolated methanol, 1834, & anthracene with Peligot, 1831, from coal tar; researcher on the composition of water & vapor density; made accurate measurement of nitrogen in compounds (Dumas Method).



b. 1863 Paul Walden, researcher on electrical conductivity & electrolytic dissociation; discovered Walden inversion; Walden's rule relates the conductivity and viscosity of nonaqueous solutions. .

b. 1921 Geoffrey Wilkinson research in transition metal complexes such as carbonyls and olefin complexes, particularly compounds of ruthenium (Ru, 44), rhodium (Rh, 45), & rhenium (Re, 75), in compounds of unsaturated hydrocarbons & with metals to hydrogen bonds; metallocenes, complex hydrides, and mechanism of homogeneous catalysis. Nobel Prize in Chemistry (1973) with E. O. Fischer for their pioneering work on chemistry of organometallic "sandwich" compounds.

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b. 1887 Edward R. Weidlein invented hydrometallurgical processes for treatment of low-grade copper ores.

b. 1903 Jasper H. Kane developed mass production processes for citric acid and antibiotics.



b. 1915 Albert Ghiorso, researcher in transuranic elements & codiscovered americium (Am, 95), berkelium (Bk, 97), californium (Cf, 98), curium (Cm, 96), einsteinium (Es, 99), fermium (Fm, 100), hahnium (Ha, 105), lawrencium (Lr, 103), mendelevium (Md, 101), nobelium (No, 102), rutherfordium (Rf, 105), & seaborgium (Sg, 106).



b. 1921 Robert B. Merrifield developed solid-phase peptide synthesis; Nobel Prize (1984) for his development of methodology for chemical synthesis on a solid matrix.

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• Explosion of first atomic bomb at Trinity Site, Alamogordo Air Force Base, New Mexico, 1945.

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b. 1827 Frederick Augustus Abel, chemist to the war department and ordnance committees in England (1854-1888); invented (with Sir James Dewar) the smokeless explosive known as cordite; pioneered a new way of manufacturing gun-cotton (a nitrated form of nitrocellulose); invented the Abel tester, which determines the flash-point of petroleum.

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b. 1853 Hendrik A. Lorentz, researcher in thermodynamics & kinetic theory; explained the Zeeman effect; Nobel Prize in Physics (1902) with Pieter Zeeman in recognition of the extraordinary service they rendered by their researches into the influence of magnetism upon radiation phenomena.



b. 1906 Allene R. Jeanes, researcher on dextran; developed a blood-expander; first woman to win USDA Distinguished Service Award, 1953.



b. 1937 Roald Hoffmann applied molecular orbital theory to organic chemical reactions with Robert B. Woodward (Woodward-Hoffmann Rules); Nobel Prize in Chemistry (1981) with Kenichi Fukui for their theories, developed independently, concerning the course of chemical reactions; Poet.



b. 1948 Hartmut Michel determined 3-dimensional structure of photosynthetic proteins; Nobel Prize in Chemistry (1988) with Johann Deisenhofer and Robert Hubert for the determination of the three-dimensional structure of a photosynthetic reaction centre.

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b. 1910 Paul J. Flory researcher in physical chemistry of macromolecules; Nobel Prize in Chemistry (1974) for his fundamental achievements, both theoretical and experimental, in the physical chemistry of the macromolecules.



b. 1921 Rosalyn S. Yalow developed technique of radioimmunoassay. Nobel Prize in Physiology or Medicine (1977) for the development of radioimmunoassays of peptide hormones shared with Roger Guillemin and Andrew V. Schally for their discoveries concerning the peptide hormone production of the brain.

• Eleuthère I. Dupont began construction, 1802, of a gunpowder factory, that became E. I. DuPont de Nemours.

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- Neil Armstrong said first words on lunar soil "*That's one small step for man, one giant leap for mankind*", 1969.
- James Woodhouse elected Professor of "Chymistry", University of Pennsylvania, 1795.

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b. 1694 Georg Brandt, who discovered cobalt (Co, 27), 1735 and was one of the first chemists to abandon alchemy as a science.



b. 1923 Rudolph A. Marcus, helped develop RRKM (Rice-Ramsperger-Kassel-Marcus) theory of unimolecular reactions; Nobel Prize in Chemistry (1992) for contributions to theory of electron-transfer reactions.

• Navy asks Thomas Edison to organize keenest, most inventive minds to find defense against submarines, 1915.

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b. 1853 Ernst Beckmann, discovered the rearrangement of oximes of ketones into acid amides or anilides (Beckmann Molecular Transformation), 1886; invented Beckmann differential thermometer for the determination of boiling & freezing points of solutions.

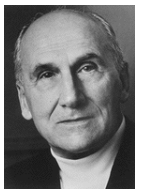
b. 1888 Herbert S. Gasser, researcher on electrophysiology of nerves; Nobel Prize in Physiology or Medicine (1944) with E. Joseph Erlanger for their discoveries relating to the highly differentiated functions of single nerve fibres.

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b. 1717 Joseph M. F. Lussone discovered carbon dioxide, 1776.



b. 1880 Emma P. Carr, researcher on ultraviolet spectra of hydrocarbons; first recipient of ACS's Francis Garvan Medal, 1937.



b. 1906 Vladimir Prelog, researcher on stereochemistry of organic molecules & reactions; Nobel Prize in Chemistry (1975) for his research into the stereochemistry of organic molecules and reactions with John W. Cornforth for his work on the stereochemistry of enzyme-catalyzed reactions.

• A human entered the Three Mile Island Unit-2 containment building for the first time since the partial meltdown on March 28, 1979, 1980.

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b. 1843 William de Wiveleslie Abney investigated color photography and color vision; pioneered a method to measure the relative proportions of the primaries in a sample color; first to take infra-red photographs, and study the solar infra-red spectrum; introduced hydroquinone (1880) as an effective photograph developing chemical; measured infra-red spectra of organic compounds (1885); studied how sunlight is altered in passing through the atmosphere; invented the [abney level](#).

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b. 1920 Rosalind Franklin, researcher in x-ray crystallography of deoxyribonucleic acid (DNA).

- Colgate-Palmolive incorporated, 1923.
- The communication, Vicinal Proton Coupling in Nuclear Magnetic Resonance by Martin Karplus (*J. Am. Chem. Soc.*, **1963**, 85, 2870) that related molecular geometry to coupling constants was received, 1963.

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b. 1799 Isaac Babbitt, invented an anti-friction metal (Babbitt Metal).

27



b. 1881 Hans Fischer, researcher on organic chemicals including hemin, chlorophyll & porphyrins; Nobel Prize (1930) for his researches into the constitution of haemin and chlorophyll and especially for his synthesis of haemin.

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b. 1842 Albert Ladenburg synthesized coniine, piperidine, pyridine & other compounds.

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b. 1910 Heinz Frenkel-Conrat separated viral RNA from protein and showed that RNA was the active agent.

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- The ship Charles of Antwerp (Belgium) was first oil tanker (1869) carrying oil to Europe.

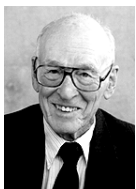
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b. 1800 Friedrich Wöhler, researcher in isomerism; synthesized urea from ammonium cyanate challenging the vitalistic theory that organic compounds can be produced only by living organisms, 1828; isolated aluminum (Al, 13) 1827, & beryllium (Be, 4) 1828; discovered calcium carbide & the preparation of acetylene from it.



b. 1728 August Beer discovered that absorption of light is related to amount and length of absorbing material (Beer's Law).



b. 1918 Paul D. Boyer, Nobel Prize (1997) for elucidation of the enzymatic mechanism **b** underlying the synthesis of adenosine triphosphate (ATP), he shared Nobel Prize in Chemistry (1997) with John E. Walker for elucidation of the enzymatic mechanism underlying the synthesis of adenosine triphosphate (ATP) and Jens C. Skou for the first discovery of an ion-transporting enzyme, Na^+ , K^+ -ATPase.



b. 1923 Stephanie Kwolek, inventor of [Kevlar](#); monomers 1,4-phenylene-diamine (*para*-phenylenediamine) and terephthaloyl chloride; 1965.

- The first U. S. patent awarded was for a process for making potash, an ingredient used in fertilizers, soap, and gunpowder and was issued to Samuel Hopkins, born in Pittsford, VT, but residing in Philadelphia, PA, 1790.

