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Review Article

**REVIEW ON MAJOR MILDSTONES BY VARIOUS
SCIENTISTS IN RECORDED HISTORY OF
PHARMACEUTICAL FIELD****Varsha P. Rathod^{1*}, Nishan N. Bobade², Abhishek Barahate³, Sampada Shelke³,
Tanushri Bawane⁴, Vedashri Umap⁴**^{1,3,4}Vidhyabharati College of Pharmacy, C.K Naidu Camp Amravati, India 444602²Vidhyabharati College of Pharmacy, C.K Naidu Camp Amravati, India 444602**Abstract:**

Indian civilization developed a strong system of traditional medicine and was one of the first nations to develop a synthetic drug. In the postindependence era, Indian pharmaceutical industry developed a strong base for production of generic drugs. Challenges for the future are to give its traditional medicine a strong scientific base and develop research and clinical capability to consistently produce new drugs based on advances in modern biological sciences. Indian civilization is one of the few in the world that developed a full-fledged system of traditional medicine. The approach of Indian traditional medicine, e.g., the ayurvedic system, is herbal based in general and is more effective for chronic diseases and prevention. Although modern medicine has found its own niche in India, traditional formulations are still widely used, and more and more scientifically validated formulations are appearing in the market. In recent times, many plants used in Indian system of medicine have been analyzed by modern analytical methods and active components have been isolated. Significant amount of medicinal chemistry efforts are going on around these molecules in an attempt to develop more potent leads. These include curcumin from turmeric,¹ Bacosides from Brahmi (Bacopamonnieri),² and Forskolin from Coleus forskohlii. The first modern synthetic drug to be developed in India was Urea Stibamine in 1922 by UN Brahmachari against visceral leishmaniasis.³ Visceral leishmaniasis was a severe health burden during the early part of the 20th century, and it was a lifesaving drug for a large section of the population. Historically, it was the second drug developed against an infectious disease after Salvarsan (against Syphilis) and well before penicillin or sulfa drugs. It is still in use in many countries in a modified form.

Keywords: Medicine, vaccine, History, Invention, Pharmacology**Corresponding author:****Varsha P. Rathod,**
Vidhyabharati College of Pharmacy,
C.K Naidu Camp Amravati, India 444602

QR code



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INTRODUCTION

Guided by different scientist in the pharmaceutical filled are invented the drugs and medicines according to the sign and symptoms of the disease.

Pharmaceutical research in the past has played a crucial role in the progress of development of pharmaceutical. The contribution of chemistry, pharmacology, microbiology and biochemistry has set a standard in the drug discovery where new drugs are no longer generated only by the imagination of chemists but these new drugs are the outcome of exchange of ideas between biologists and chemists.

The process of research in the pharmaceutical field according to the innovation of a drug molecule that has showed therapeutic value to battle, control, check or cure disease.

The various scientist is discovered the medicines in pharmaceutical field according to the drug therapeutic efficiency and efficacy.

History:

The history of medicine is both a study of medicine throughout history as well as a multidisciplinary field of study that seeks to explore and understand medical practices, both past and present, throughout human societies.

History of medicine. From top-left to bottom-right:

- (1) a prehistoric terpaned skull of a woman (c. 3500 BCE),
- (2) a Byzantine copy of the Hipocratic oath (c. 12th century CE),
- (3) *Studies of Embryos* by Leonardo da vinci (1510-1513),
- (4) *The Bloodletting* by Quirjin van brekelenkam (c. 1660),
- (5) a copy of Hua Shou's *Routes of the Fourteen Meridians and their Functions* (1716),
- (6) an operating theatre in New Zeland (1916),
- (7) Joycelyn elders, the first Black American to serve as Surgeon general of the United state (1993-1994),
- (8) President joe biden of the United State visiting the National Institute of Health. vaccine research center (2021),
- (9) an example of a public outdoor Aotomated External Defibrillator (AED) (2022).

More than just history and medicine, this field of study incorporates learnings from across disciplines such as anthropology, economics, health sciences, sociology and politics to better understand the institutions, practices, people, professions, and social systems that have influenced and shaped medicine throughout the ages.

As a documentation of medicine over time, the history of medicine shows how societies have changed in their approach to illness and disease from ancient times to the present. Early medical traditions include those of Babylon, China, Egypt and India... The Hipocratic Oath was written in ancient Greece in the 5th century BCE, and is a direct inspiration for oaths of office that physicians swear upon entry into the profession today. In the Middle Ages, surgical practices inherited from the ancient masters were improved and then systematized in Rogerius *The Practice of Surgery*. Universities began systematic training of physicians around 1220 CE in Italy.

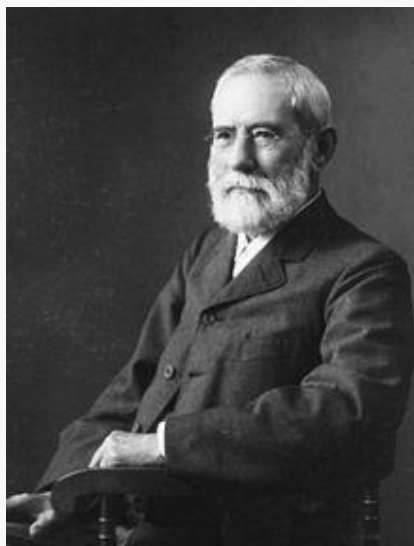
Invention of the microscope was a consequence of improved understanding, during the Renaissance. Prior to the 19th century, humorism (also known as humoralism) was thought to explain the cause of disease but it was gradually replaced by the germ theory of disease, leading to effective treatments and even cures for many infectious diseases. Military doctors advanced the methods of trauma treatment and surgery. Public health measures were developed especially in the 19th century as the rapid growth of cities required systematic sanitary measures. Advanced research centers opened in the early 20th century, often connected with major hospitals. The mid-20th century was characterized by new biological treatments, such as antibiotics. These advancements, along with developments in chemistry, genetics, and radiography led to modern medicine. Medicine was heavily professionalized in the 20th century, and new careers opened to women as nurses (from the 1870s) and as physicians (especially after 1970)

Hans Horst Meyer

Meyer in Vienna about 1930

Born	17 March 1853 Insterburg, East Prussia
Died	6 October 1939 (aged 86)
Known for	Meyer Overton Hypothesis
Scientific career	
Fields	Pharmacology

Hans Horst Meyer (17 March 1853 – 6 October 1939) was a German pharmacologist. He studied medicine and did research in pharmacology. The Meyer Overton hypothesis on the mode of action on general anesthetics is partially named after him. He also discovered the importance of glucuronic acid as a reaction partner for drugs, and the mode of action of tetanus toxin on the body.

Johann Ernst Oswald Schmiedeberg

Born	10 October 1838 Courland
Died	12 July 1921 (aged 82) Baden-Baden
Alma mater	University of Dorpat

Scientific career

Influences	<ul style="list-style-type: none"> • Rudolf buchheim • Carl ludwig
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Johann Ernst Oswald Schmiedeberg (10 October 1838 – 12 July 1921) was a Baltic German Pharmacologist. In 1866 he earned his medical doctorate from the University of Dorpat with a thesis concerning the measurement of chloroform in blood, before becoming the first professor of pharmacology at the University of Strasbourg, where he remained for 46 years.

In 1911, he testified in the *United states v 40 barrels and 20 kegs of coca cola* trial, and later, was a major factor in the success of the German pharmaceutical industry prior to the Second world war, having trained most of the European professors at the time.

Sir

Henry Dale

Born	Henry Hallett Dale 9 June 1875 Islington, London,England
Died	23 July 1968 (aged 93) Cambridge,Cambridgeshire,England
Nationality	United Kingdom
Education	Tollington School The Key School
Alma mater	University of Cambridge St Bartholomews Hospital
Known for	Acetylcholine Dales principle

Sir Henry Hallett Dale OM GBE PRS(9 june 1875-23 july1968) was an English pharmacologist and physiologist. For his study of acetylcholine as agent in the chemical transmission of nervepulses (Neurotransmitter) he shared the 1936 Nobel Prize in Physiology or medicine with Otto loewl{4}{5}{6}{7}{8}

Yellapragada Subba Rao



Commemorative postage stamp celebrating the birth centenary of Dr. SubbaRao (anglicized version)

Born	12 January 1895 Bhimavaran, Madras Presidency, British India (now in Andhra Pradesh, India)
Died	8 August 1948 (aged 53) New York City United
Nationality	Indian
Alma mater Medical	Harvard School

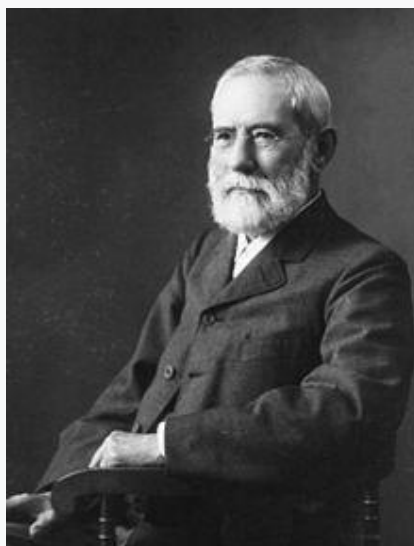
Yellapragada Subba Rao (12 January 1895 – 8 August 1948) was a pioneering Indian biochemist who discovered the function of adenosine triphosphate (ATP) as an energy source in the cell (1). He developed methotrexate for the treatment of cancer and led the department at Lederle laboratories in which Benjamin Minge Duggar discovered chlortetracycline (Aureomycin) in 1945.

	College
Known for	Discovering the role of phosphocretine and adenosine



“I did not invent penicillin. Nature did that. I only discovered it by accident.”

Alexander Fleming was a Scottish physician-scientist who was recognised for discovering penicillin. The simple discovery and use of the antibiotic agent has saved millions of lives, and earned Fleming – together with Howard Florey and Ernst Chain, who devised methods for the large-scale isolation and production of penicillin – the 1945 Nobel Prize in Physiology/Medicine.

Johann Ernst Oswald Schmied**eberg**

Born 10 October 1838
Courland

Died 12 July 1921 (aged 82)
Baden-Baden

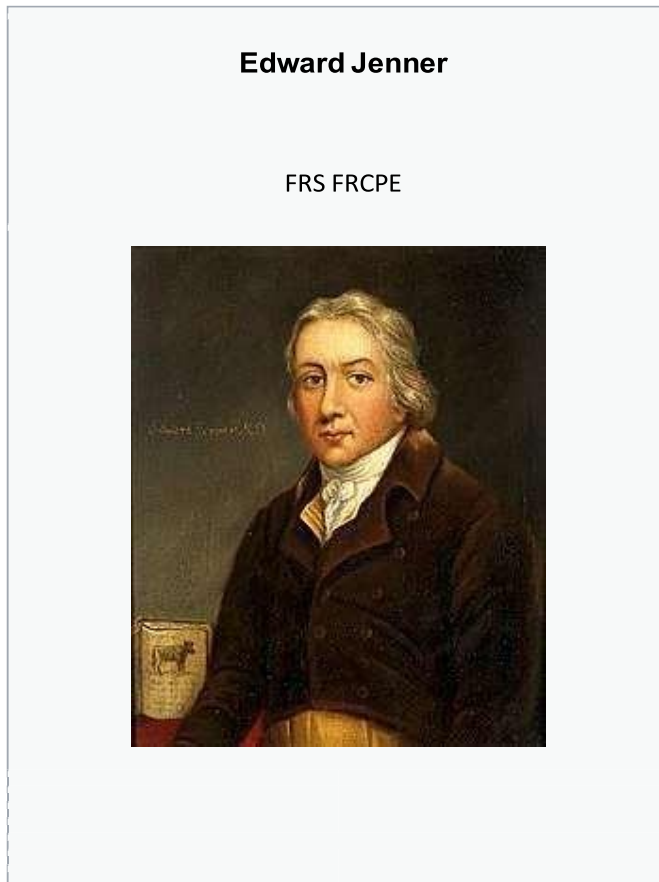
Alma mater University of Dorpat

Scientific career

Influences

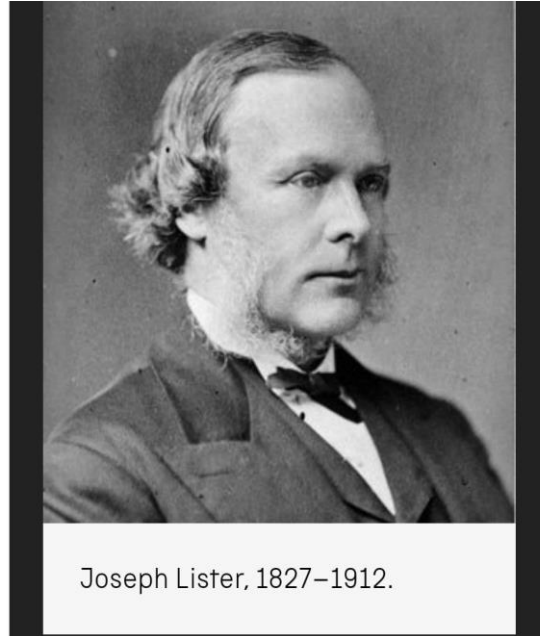
- Rudolf Buchheim

Johann Ernst Oswald Schmiedeberg (10 October 1838 – 12 July 1921) was a Baltic German pharmacologist. In 1866 he earned his medical doctorate from the University of Dorpat with a thesis concerning the measurement of Chloroform in blood, before becoming the first professor of pharmacology at the University of Starsburg, where he remained for 46 years.



Edward Jenner, FRS FRCPE (17 May 1749 – 26 January 1823) was a British physician and socialist who pioneered the concept of vaccine, and created the smallpox vaccine the world's first vaccine. The terms *vaccine* and *vaccination* are derived from *Variolae vaccinae* ('pustules of the cow'), the term devised by Jenner to denote cowpox.. He used it in 1798 in the title of his *Inquiry into the Variolae vaccinae known as the Cow Pox*, in which he described the protective effect of cowpox against smallpox.^[4]

In the West, Jenner is often called "the father of immunology and his work is said to have saved "more lives than any other man".^[6] Jenner's time, smallpox killed around 10% of global population, with the number as high as 20% in towns and cities where infection spread more easily.^[7] In 1821, he was appointed physician to King George IV, and was also made mayor of Berkely and justice of the peace. A member of the Royal Society In the field of zoology, he was among the first modern scholars to describe the blood parasitism of the cuckoo (Aristotle also noted this behaviour in his *History of Animals*). In 2002, Jenner was named in the BBC's list of the 100 Greatest Britons.



Antiseptic is the method of using chemicals, called antiseptics, to destroy the germs that cause infections. It was developed by the British surgeon Joseph Lister.

Joseph Lister found a way to prevent infection in wounds during and after surgery.

He was the first to apply the science of Germ Theory to surgery. Lister's Antisepsis System is the basis of modern infection control. His principles made surgery safe and continue to save countless lives.

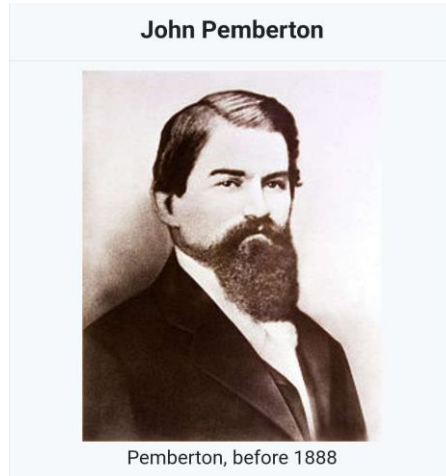


Heinrich Anton de Bary (26 January 1831–19 January 1888) was a German surgeon, botanist, microbiologist, and mycologist (fungus systematics and physiology).

He is considered a founding father of plant pathology (phytopathology) as well as the founder of modern mycology.

His extensive and careful studies of the life history of fungi and contribution to the understanding of algae and higher plants were landmarks of biology.

Known For: demonstrating sexual life cycle of fungi; study of plant disease; coining the term symbiosis



John Stith Pemberton (July 8, 1831–August 16, 1888) was an American pharmacist and Confederate State Army veteran who is best known as the inventor of Coca-Cola.

In May 1886, he developed an early version of a beverage that would later become Coca-Cola, but sold his rights to the drink shortly before his death.

He suffered from a sabre wound sustained in April 1865, during the Battle of Columbus.

His efforts to control his chronic pain led to morphine addiction. He began to experiment with various painkillers and toxins.

In the end, after development of an earlier beverage blending alcohol and cocaine, this led to the recipe that later was adapted to make Coca-Cola.



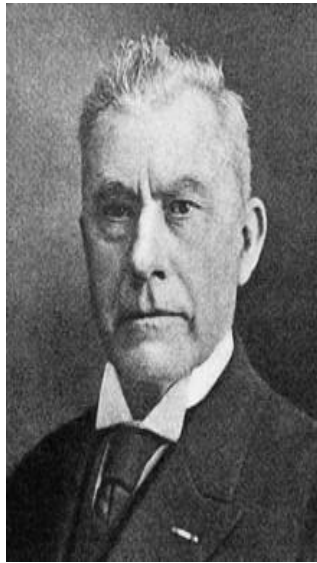
(24 October 1632–26 August 1723) was a Dutch microbiologist and microscopist in the Golden Age of Dutch science and technology.

A largely self-taught man in science, he is commonly known as the Father of Microbiology, and one of the first microscopists and microbiologists.

Van Leeuwenhoek is best known for his pioneering work in microscopy and for his pioneering work in microbiology and for his contribution towards the establishment of microbiology as a scientific discipline.

In the 1670s, he started to explore microbial life with his microscope.

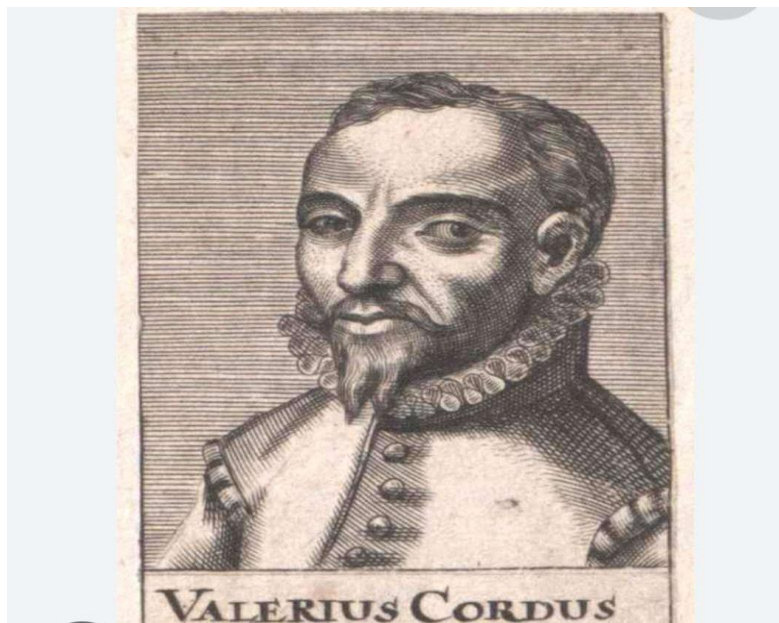
He was also the first to document microscopic observation of muscle fibres, bacteria, spermatozoa, red blood cells, crystals in gouty tophi, and among the first to see blood flow in capillaries.



Bor	16 March 1851 Amsterdam,,
Die	1 January 1931 (aged 79)
Alma	Leden
Known	One of the founders of virology, environmental

Martinus Willen Beijerinck (16 March 1851-1January1931) was aDutch microbiologist and botanist who was one of the founders ofvirology and environmental microbiology.

He is credited with the discovery of viruses, which is calledContagium vivum fluidm.



In 1561 physician, botanist, bibliographer, and naturalist Konrad Gesner (Gesner) published in Strasbourg at the press of I.

Rebelius *In hoc volumine continentur Valerii Cordi Simesusij annotationes in pedacij Dioscordis . . . Stirpium lib. III. posthumi . . . Sylva . . . De artificiosis extractionibus liber . . . Compositiones medicinales. His accedunt Stocchornii et Nessi in Bernatium Helvetiorum ditone montium . . . Conradi Gesneri de hortis germaniae liber recens . . . omnia summo studio atque industria doctis. atque excellencies. viri Conr. Gesneri medici Tigurini collecta, & praefationibus illustrata.*

Containing descriptions of about 500 plants, Valerius Cordus's

Historiae stirpium was the earliest effort to systematize botanical description; Cordus has been called the inventor of phytography. "To read [Cordus's] description of plants after those of his predecessors and contemporaries is like entering a new world. Each description follows a regular pattern and almost always includes, in this order, the characteristic features of stem and leaves, the flower and time of flowering, the fruit and seeds, the number of loculi in the fruit, the lines of dehiscence, the appearance and the number of rows of seed, the root, whether annual or perennial, taste and smell, and habitat.

Cordus thus established in principle the basis for scientific plant description and his transforming influence is evident in most of the leading botanists who followed him" (Morton, *History of Botanical Science*, p. 126). Gesner, who was sent the manuscript of *Historiae stirpium* several years after Cordus's death, recognized the revolutionary nature of Cordus's work, describing it as "truly extraordinary because of the accuracy with which the plants are described" (Greene, *Landmarks of Botanical History*, 373).



The founding father of the Bayer Group was born in the Barmen-Heckinghausen district of the present-day city of Wuppertal in 1825. As the son of a silkworker, Friedrich Bayer grew up at a time when the textile industry was flourishing. At the age of 14 he joined the chemicals dealer Wesenfeld und Co. in Barmen as an apprentice. During his apprenticeship, Bayer became familiar with both the fundamentals and the problems of the dyeing trade.

By the age of 20 he had already begun to deal in natural dyes. Three years later he founded his first sales company and established a European distribution network. The natural dyestuffs initially offered by Bayer were extracted from dyewoods. Due to their high quality, Bayer did brisk business with these products in the European capitals of London, Brussels and St. Petersburg, and even as far afield as New York.

The discoveries of inorganic chemistry in the field of dyestuff manufacturing and the market potential associated with these advances prompted Friedrich Bayer to expand his distribution program. The first artificial dyes imported by Bayer — aniline and fuchsine — were superior to natural dyes in terms of purity and brightness. Together with his future business partner Friedrich Weskott, Bayer experimented with production and testing of these dyes by his own company. They ultimately succeeded in producing dyes that were of far better quality than the first generation.

The successful partnership between Bayer and Weskott led to the establishment of a first small production facility. The seed for what would later become Bayer AG was planted on August 1, 1863, with the entry of "Friedr. Bayer et comp." into the commercial register.

In the wake of further dyestuff developments based on aniline, fuchsine and alizarin, the company's founders managed to considerably expand production capacities despite the now tense economic situation. When Friedrich Bayer died in 1880 at the age of 54, he left behind a flourishing family business. The founders' sons and sons-in-law, who had been integrated into the company as partners, created an important foundation for Bayer's future success by transforming it into a joint stock company.

Banting & Best:**July 27, 1921**

July 27 marks one of the most important days in diabetes treatment history. On that date in 1921, Dr. Frederick Banting, a Canadian surgeon and Charles Best, a medical student, successfully isolated the hormone insulin for the first time.

The breakthrough research took place at the University of Toronto, where Banting and Best successfully isolated insulin from dogs, produced diabetes symptoms in the animals, and then provided insulin injections that produced normal blood glucose levels. Dr. Banting shared his success with Professor John Macleod.

Insulin treatment begins for humans

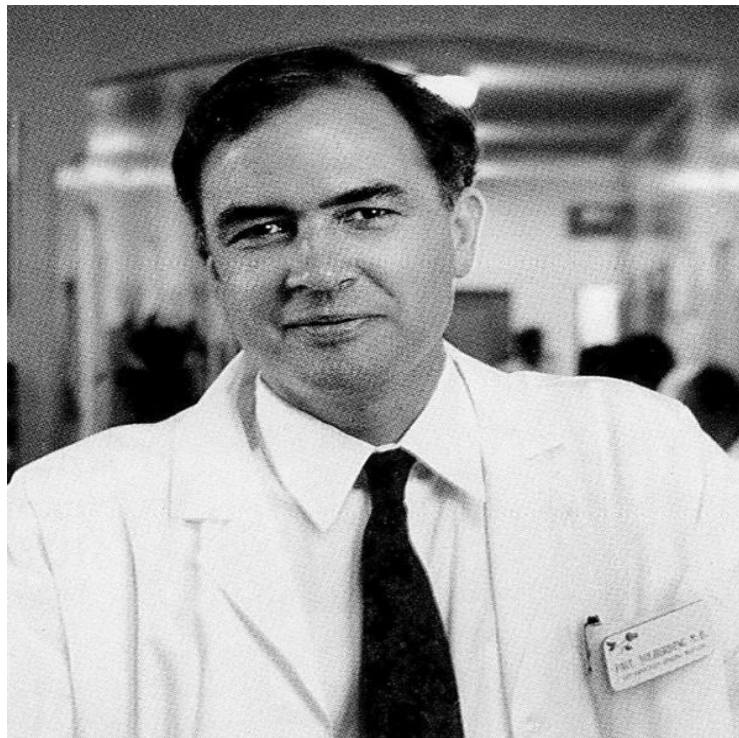
Plans were quickly underway for an insulin treatment for people. Next, they extracted insulin from the pancreases of cattle from slaughterhouses. On January 11, 1922, **14-year-old Leonard Thompson became the first person to receive an insulin injection**

as treatment for diabetes. The first caused an allergic reaction. A refined process was quickly developed to improve the cow pancreas from which the insulin was derived, and Thompson's second dosage was successfully delivered twelve days later on January 23. The teenager's condition improved dramatically. Diabetes, which had been regarded as a fatal disease, could finally be managed!



Charpentier and Promethazine

The story of chlorpromazine begins in 1937 when Daniel Bovet and a colleague at the Pasteur Institute in Paris created the first synthetic antihistamine. Though too toxic to be used as a drug to alleviate allergic symptoms, it was a major pharmaceutical breakthrough. Subsequently, the pharmaceuticals division of the French company Rhône Poulenc (later Sanofi-Aventis) began cooperating with scientists at the Pasteur Institute on developing new antihistamines. One research group at Rhône Poulenc, headed by the chemist Paul Charpentier (n.d.), was trying to create an improved antihistamine loosely modeled on diphenhydramine, which was already known and is today the active ingredient in such drugs as Benadryl, Dramamine, and Sominex.



Volberding's

memories share space with a number of other oral histories and upward of 50 collections at the AIDS History Project. These include the diary of Bobbi Campbell, who, as the first person to come out publicly as having AIDS, appeared on the cover of *Newsweek* in August 1983; the papers of Jay Levi, the UCSF virologist who independently discovered the AIDS virus in 1983; the papers of Michael Gottlieb; the papers of Selma Dritz of the San Francisco Department of Health; AIDS-related ephemera; and a strong collection of materials from many community-based organizations such as the Shanti Project, Act-Up Golden Gate, and numerous others.

Recent grants, including \$300,000 from NEH to digitize 150,000 pages of materials at UCSF, the San Francisco Public Library, and the Gay, Lesbian, Bisexual, Transgender Historical Society, have elevated the profile of the AIDS History Project and led to a snowball effect in newly donated collections, says archivist Polina Ilieva.

Clayton Koppes, history professor emeritus at Oberlin College, who has been using the archive as he works on a book about AIDS in the United States, praises the unique assets of the AIDS History Project, its well-organized collections, and its knowledgeable staff.

The AIDS crisis, says Koppes, led to “one of the most profound social upheavals in American society since World War II. Erupting in the middle of the culture wars of the 1980s, the pandemic created huge challenges for the queer community, stimulated divisive political battles, transformed medical research, and generated one of the most consequential activist movements in the past half century: the HIV/AIDS empowerment movement.”

Conceived in 1987 and supported early on by a grant from the National Archives, the archive at UCSF specializes in the history of AIDS in San Francisco, where many early cases were discovered and key medical breakthroughs took place. Its oral histories are cross-referenced with many papers and oral histories within the same archive, such as those of Marcus Conant, another leading figure in the city's response to the epidemic.

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