JOKICHI TAKAMINE (1854-1922) AND

CAROLINE HITCH TAKAMINE (1866-1954):

BIOGRAPHY AND BIBLIOGRAPHY

Compiled

by

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Biography of Charles Beach (1889-1967)
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DEDICATION AND ACKNOWLEDGMENTS

This book is dedicated to Jokichi Takamine, Caroline Takamine, and Charles P. Beach. And to J.W. Bennett, PhD - the dean of American Takamine scholars - with the strong wish that she may be able to write her book-length biography of Jokichi and Caroline Takamine.

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This book, no doubt and alas, has its share of errors. These, of course, are solely the responsibility of William Shurtleff.

■ This bibliography and sourcebook was written with the hope that someone will write a detailed and well-documented history of this subject.

INTRODUCTION

Brief chronology of Jokichi Takamine.

1827 June 18 – Seiichi Takamine, his father, is born in Takaoka city, Kaga-han (feudal domain), Etchū province, Japan. His family were samurai physicians (*Kanazawa Furusato Ijinkan*).

1835 March 25 – Yukiko Tsuda, his mother, born in Takaoka, Kaga-han, Etchū province, Japan. Her family owned and operated a sake (rice wine) factory; sake is made from rice koji.

1853 July 8 – Commodore Matthew C. Perry first arrives in Japan, in Edo (today's Tokyo) harbor with his heavily armed and menacing fleet of tall black ships. Japan has been closed to virtually all European contact since 1639 (214 years). The Japanese ask him to kindly move on to Nagasaki. He refuses and forces them to take a letter from American president Willard Fillmore which demands that ports be opened to American trade, that prisoners be treated well and given back, etc. The Japanese reject his demands and Perry withdraws from Japan knowing he would return.

1854 March 31 – Commodore Perry returns to Edo Harbor, Japan, in Feb. 1854, more heavily armed than before. After long and tense negotiations, on 31 March 1854, the Japanese sign the Treaty of Kanagawa, which "opens" Japan to the West. This ended Japan's 200+ year policy of isolation, ushering in a new era.

1854 Nov. 3 – Jōkichi Takamine born in Takaoka (a small town on the west coast of Japan), Kaga-han (feudal domain), Fuchū province, Japan. The eldest child of a family with 6 brothers and 7 sisters, he will soon become an important part of Japan's new era (*Kanazawa Furusato Ijinkan*).

1855 – When Jokichi is one year old, his mother brings him to the castle town of Kanazawa. His father, a samurai, has worked there. "Through his mastery of the Dutch language, Seiichi Takamine acquired knowledge of European modern medicine and chemistry, and was one of the few medical doctors in Japan at the time who knew both Western and traditional Japanese medical practices (Yamashima 2003, p. 95).

1862 – Jokichi enters the Merindo school of the Kaga domain. He also starts to receive calligraphy lessons from Shundai Nakamura (Iinuma 1993, Chronological record of Dr. Jokichi Takamine).

1865 – Aware of increasing pressure from the West, the samurai lord of the Kaga domain decides to send promising boys from his province to Nagasaki, which at time was the only place in Japan where fleeting glimpses of the West could be obtained. Jokichi (age 12) is one of those sent to Nagasaki (600 miles away) where he is taken into the home of Portuguese Consul Lorero to learn basic English. When the Consul was found to be more or less versed in Japanese, in 1866 Jokichi was sent to Missionary Fulbenchy's English School in Nagasaki (Kawakami 1928, p. 6; Iinuma 1993).

1866 Aug. 5 – Caroline Field Hitch, Jokichi's wife to be, is born in Falmouth, Massachusetts. Her parents are Ebenezer Vose Hitch and Mary Beatrice Field.

1867 – The Imperial Court and the new Meiji government move from the ancient city of Kyoto to Tokyo (formerly Edo), the new capital of Japan.

1868 – Jokichi (age 15) moves to Kyoto where he studies military science at Yukinosuke Ando's private school. Soon he moves to Osaka, where he enters the Ogata private school (Iinuma 1993).

1869 – In Osaka, he enters the Osaka Medical School. Also receives analytical chemistry lessons under Prof. Litter of Osaka Chemistry School, and learns English from Prof. Osborne at Nanao Language Institute, under a Kaga domain scholarship. Soon, however, he finds chemistry more fascinating than medicine, causing him to change his original intention of succeeding his father as a practicing physician (Kawakami 1928, p. 6; Iinuma 1993).

1872 autumn – Jokichi, age 19, moves to Tokyo, the new seat of government. One of 23 students on a government scholarship, he begins to major in applied chemistry at the Imperial College of Engineering / Kobu Technical School (today's Faculty of Engineering, Tokyo University) (Kawakami 1928, p. 7; Iinuma 1993).

1879 – He graduates at age 25 with the first graduating class from Kobu University and becomes one of the first Japanese university graduates. At the graduation ceremony, Henry Dyer, first head of the college, gives some parting words of advice. "Never forget that you live not only for yourself but also for society." At that time, young people like Jokichi were filled with a sense of mission – to serve their country. He is soon selected by the Ministry of Engineering as a full-scholarship student (one of 11) to study abroad in Great Britain (Kawakami 1928, p. 7; Daiichi-Sankyo 2012, Part 1).

1880 – Now age 27, Jokichi is sent on a government scholarship for three years of postgraduate study in Britain. This is his first trip outside of Japan. He is admitted to Glasgow University in Scotland and the Andersonian University (now Strathclyde University) where he masters industrial chemistry and electro-chemistry. During vacations he visits various chemical plants in Liverpool and Manchester and studies actual manufacturing processes for chemical fertilizers and soda products (Kawakami 1928, p. 7-9; Iinuma 1993).

1883 – Jokichi returns to Japan and joins the Ministry of Agriculture and Commerce. His job here is to study some of Japan's traditional industries, such as the manufacture of *saké* (Japanese rice wine, including koji), *washi* (Japanese rice paper) and indigo, with the goal of improving them. This special work of investigation was initiated by Takamine himself. He believed such industries could be improved by the application of modern science and technology (Kawakami 1928, p. 11-12).

1884 – He visits the United States as one of two Japanese commissioners to the New Orleans World's Fair and Cotton Centennial. Intrigued by phosphatic fertilizer on display, he brings back a sample of superphosphate of lime for his research in Japan. He meets Caroline Hitch, age 18, born on 5 Aug. 1866.

1884 Dec. 14 – Earliest known U.S. article that mentions Jokichi Takamine (in the *Daily Picayune* {New Orleans}), titled "Society," says: "A very enjoyable affair was given last Thursday evening at the residence of Capt. E.V. Hitch by a number of young gentlemen in compliment of charming young ladies who had a week previously acted as hosts." Among the "pretty young ladies" at the soirée were Carrie Hitch. The many gentlemen hosts included "J. Takamini" [sic].

"A party of young ladies and gentlemen, chaperoned by Mr. and Mrs. Ralston, of California, witnessed the performance at the St. Charles Theatre last Friday evening." Included in the party were "Mr. J. Takamine, a distinguished Japanese nobleman now on a mission to the Exposition;" and "Miss Carrie Hitch."

1885 Feb. 8 – Second U.S. article that mentions Jokichi Takamine (in the *Daily Picayune* {New Orleans}) says at the "World's Exposition" the "event of the day was the opening of the exhibit of the Kingdom of Belgium to public investigation." Invited guests in attendance were "Hon. J. Takamine and K. Tamari, Commissioners, of Japan;…"

1885 – Back in Japan, he becomes temporary Chief of the Patent Office for one year. He helped to lay the foundations of patent administration in Japan.

1887-89 – Takamine is given leave from his official duties in Japan to establish the Tokyo Artificial Fertilizer Company, a factory for the manufacture of superphosphates, the first of its kind in East Asia. His partners are Eiichi (Yeji) Shibusawa, Kiyonari Yoshida, and Takashi Matsuda; he becomes technical director of the company.

He begins by importing large amounts of phosphate rock from Charleston, South Carolina; he and his bride had visited that city on their honeymoon. His first order, from the Farmer's Phosphate Company through Major Willis, is for more than 2,100 tons (*Daily Picayune* 30 Aug. 1887, 26 Feb. 1889; *Japan and America*, Jan. 1903, p. 69-73). Previously most of Japan's fertilizer had been partially defatted soybean cake imported from Manchuria.

Considering himself now financially established, he is ready to go to the U.S. to marry Caroline Hitch (Miles 1976, p. 468; *Mainichi Shimbun* 1994 March 25, History of Takamine).

1887 Aug. 10 – He and Caroline are married in New Orleans in a French Quarter wedding. He is age 32 years and 9 months; she is just 21. The next day the *Daily Picayune* (p. 8) runs a long article headlined "A Brilliant Wedding… The sequel to a happy love affair."

"It was an unconventional match for the era but one that would eventually cement Takamine's ties to the USA. On their honeymoon the young couple visited fertilizer manufacturing plants in the Carolinas and then to Washington, DC, where Takamine studied U.S. patent law. Finally they traveled west to California and then sailed to Japan, where the young couple established housekeeping near the Tokyo Artificial Fertilizer Company. In short order, two sons were born" (Bennett 2002, p. 6).

1888 Aug. 28 – Jokichi Takamine, Jr. is born in Tokyo, Japan, the first child of Caroline and Jokichi.

1889 Aug. 31 – Ebenezer Takashi Takamine is born in Tokyo, Japan. Note that he was born almost exactly one year after his elder brother.

1890 – For a complex (and as yet unclear) combination of reasons, J. Takamine decides to move to the U.S. with his wife and children. According to Yamashima (2003): After putting his fertilizer company on a sound financial basis, Takamine "received a telegram from his mother-in-law informing him that a large Chicago [Illinois] distillery was interested in applying his diastase to the manufacture of whiskey. She had already been instrumental in marketing his scientific discoveries to the American business community and in founding a new company to hold the patents."

Three days after the Takamine family sailed from Yokohama to the United States, Jokichi became seriously ill

from liver trouble. At one point he prepared for the worst by writing his will. "Fortunately, by the time the ship reached Seattle Takamine's condition had materially improved, and he was able to go ashore, though not without difficulty. A good rest in Seattle and in San Francisco refreshed him, and when he arrived in Chicago he was able to proceed with the demonstration of his distilling process…" (Kawakami 1928, p. 28)

In Dec. 1890 he arrives in Chicago, Illinois, and (working closely with both his wife's parents), establishes the Takamine Ferment Co. and becomes involved in a project (with the "whisky trust") to replace malt with koji in the manufacture of whisky in order to increase the yield of whisky per bushel of corn and decrease the cost of making whisky.

1891 Feb. 18 – Joseph Greenhut, president of the massive whisky trust (whose headquarters are in Peoria, Illinois), hires Jokichi Takamine to apply his new koji process to making whisky (Klein 1985, p. 89).

1891 Feb. 20 – The first article about Jokichi Takamine's work with koji appears in the *Chicago Daily Tribune*. Titled "Whiskey to be cheaper. Discovery of a new and better process of manufacture. From 12 to 15 per cent can be saved over the old method – Takamine a Japanese, the inventor – He sells his secret to the trust – It will be immediately utilized. Prospect of a reduction of the retail price," it explains that he wants to replace malt with koji in the process of making whiskey in Peoria, Illinois. He is now a resident of Chicago. He has made tests of his new process at the Phoenix and other distilleries in Peoria. The Takamine Ferment Company is mentioned.

1891 Feb. 28 – The first article about the work of Jokichi Takamine that mentions "diastase" (a starch-digesting enzyme now, called amylase) or "koji" (the source of enzymes in making Japanese sake, soy sauce, miso, and amazake) is published. These enzymes "convert starch into sugar," which (in the absence of salt) can then be fermented into alcohol.

It also states that "Mr. Takamine has patented his new process in Europe and the United States" and that he has just entered into a contract with the Distillers' and Cattle Feeders' Company (whisky trust) of Peoria, Illinois (*Peoria Herald*, p. 8).

In Peoria, Illinois, Mr. Takamine lives in a house at 2111 N. Jefferson St. Next to this house he builds his first laboratory in the USA in an old carriage house, which he calls "The White House"; here he would work late into the night, for he "was a hard, self-imposed taskmaster, who scarcely knew the meaning of rest" (Henry George III, 1937. *Coronet*, p. 168-70; East 1952, p. 111-15; Eslinger 1992).

After leaving the home on North Jefferson Ave., the Takamine family lived for some years in the old National Hotel at Jefferson and Hamilton in Peoria (Smith 1943).

1891 March 6 – "At a meeting of stockholders of the Takamine Ferment company held yesterday in the company's offices, Room 907 Chamber of Commerce Building [Chicago], the capital stock of the company was increased from $1,000 to $10,000,000 (*Chicago Daily Tribune*, p. 9). Note: In 1891 the Takamine's home in Chicago was at 255 Ontario.

1891 March 7 – A major front-page article, by the Associated Press, appears in the *Los Angeles Times*. Titled "'Microbe straight.' The new drink that barkeepers will serve," it begins: "Chicago, March 6. The Takamine Ferment Company, organized by the Whiskey Trust to exploit a new process of whisky-making invented by the Japanese chemist Takamine, has increased its capital stock to $10,000,000."

1891 June 17 – Jokichi Takamine, a Japanese chemist residing in Chicago, applies for his first U.S. koji patent. However he has already secured patents in Canada, Belgium, France, and Austria-Hungary.

1891 Sept. 24 – Another major article about Jokichi Takamine appears in the *Chicago Daily Tribune* (p. 7). Peoria – "For several months the Distillers and Cattle Feeders' company [whisky trust] has been experimenting with the Takamine process of making whiskey." Takamine "has been here personally conducting the experiment. The distillers are so well pleased that they have decided to fit up the Manhattan distillery with new machinery. The new plan greatly reduces the cost of manufacture. A queer feature is that a species of bugs found on the rice is used instead of yeast for the fermenting process." No: A species of mold is used instead of malt.

Takamine's work was strongly opposed by the maltsters, who made malt by sprouting barley as a source of enzymes in the manufacture of whisky. If Takamine's work succeeded, they stood to lose their jobs - and their companies.

1891 Oct. 8 – A fire of unknown origin, which started shortly after midnight, burns one building at the Manhattan Distillery (3 story brick building at South Water St., Peoria), which "was being fitted for experiments in the manufacture of Tackimine [sic, Takamine] whiskey." (*Peoria Transcript*, p. 8, col. 3).

Peoria fire department records show that there was no major fire in 1893 – as was later often reported in literature about Takamine.

The building that was burned down was soon rebuilt (Kawakami 1928, p. 30).

1891 Oct. 12 – Takamine applies for a key British koji

patent, No. 17,374. A fungus of the genus *Aspergillus* is grown on steamed rice to make Taka-Moyashi and pure Taka-Moyashi. "Tané-Koji (or seed koji) or Moyashi, is a term that as been heretofore applied to a yellowish green mouldy mass, consisting of steamed rice covered by a Mycelial fungus, bearing yellowish green spherical cells, and has the property of producing both diastase and ferment cells. It has not heretofore been designated by any specific name and, and I call it 'Aspergillus Koji.'" This is the earliest document seen in which Dr. Takamine mentions the word *Aspergillus* (a genus of molds / fungi) or the terms "Tané-Koji" or "ashes of trees" in connection with koji. This patent was issued on 12 Oct. 1892.

1891 – In Chicago, the Takamine family resides at 255 Ontario. The Takamine Ferment Company has an office in the Chamber of Commerce Building, room 907. J. Takamine is president of the company, Edward Moore is secretary, and E.W. Hitch is treasurer (*Chicago City Directory*, p. 2241).

1892 April 17 – Yet another major article about Jokichi Takamine appears in the *Chicago Daily Tribune* (p. 6). He has survived the fire and now, for the first time, we learn that his koji is made from "wheat bran" which is much less expensive than other substrates for producing koji.

1894 Feb. 23 – Jokichi Takamine applies for his earliest patent (U.S. Patent No. 525,823) which contains the word "enzyme" (or enzymes") or the terms "diastatic enzyme" or "taka-koji" or "tane-koji" in connection with koji. This is the first patent on a microbial enzyme in the United States. This enzyme "possesses the power of transforming starch into sugar." This patent was issued on 11 Sept. 1894. It was the key patent in the production of Taka-diastase, a digestive enzyme.

"Takamine, in 1894, was probably the first to realize the technical possibilities of enzymes from molds and to introduce such enzymes to industry" (Underkofler 1954, p. 98).

1894 May 25 – The directors of the Distillers and Cattle Feeders' Company [whisky trust] have decided to adopt the Takamine process for making whisky and signed a contract with the Takamine Co. The trust, which now owns over 20 distilleries, expects to save $1,500,000 a year using the Takamine process (*Chicago Daily Tribune*, p. 2; *Wall Street Journal*, p. 1; *Washington Post*, May 26, p. 5).

1894 Aug. 16 – The International Takamine Co. is incorporated in Chicago, Illinois, with a capital stock of $5,000,000 to control the use of Taka-Diastase. The incorporators are Jokichi Takamine (president), Mary B. Hitch and E.V. Hitch (*The North American*, Aug. 18, p. 5).

1894 Dec. – "Takamine's process was put into production in December, 1894 at the Manhattan distillery in Peoria, which was equipped with new machinery for that purpose. The scientist's triumph was short lived. Within two months the Distilling and Cattle Feeding Company was in the hands of receivers appointed by the United States Circuit Court in Chicago. The receivers changed the distillery back to the old process and at Takamine's request his contracts with the trust were cancelled without remuneration to him" (East 1952, p. 111-15).

"Ultimately, the whisky trust collapsed because of trust-busting legislation enacted by the Illinois General Assembly in 1891 and the depression of 1893. The trust, for all practical purposes, ended in 1895 (Klein 1987, *Journal Star* {Peoria}, 10 May 1987, p. C12).

Note: This is one unglamorous reason for the end of Takamine's experiments in Peoria, and not because of a fire. Yet another key reason may have been that he had to be rushed to Chicago by train for an emergency liver operation. Unfortunately we do not know the date of this emergency (see Kawakami 1928, p. 30-33). It was probably after he sued the whisky trust in March 1895. After the operation, with great help from his wife, he slowly recovered. Although his future did not look bright, he refused to give up.

1895 Feb. 16 – By this time the whisky trust is in receivership – which is now in charge. The receivership is being moved from the United States court at Peoria to the office in Chicago.

1895 March 6 – "Takamine sues whisky trust. Declares it has not kept a contract and wants a remedy" – is the title of an article in the *Chicago Daily Tribune*. He "filed a petition yesterday in the United States Court against the receivers of the whisky trust. He alleges that in 1891 he entered into a contract with the officers of the trust…" which they have not honored.

1895 July – Parke, Davis & Company (a pharmaceutical company in Detroit, Michigan) is now aggressively marking (and perhaps making) Taka-Diastase in powder form as a digestive drug, under license from Dr. Takamine (*Therapeutic Notes*, ad on unnumbered page; Mahoney 1959, p. 73).

Kawakami (1928, p. 26) states: "At first Taka-Diastase was made by the Takamine Ferment Company on a comparatively small scale. Later, when its efficacy became more widely known, Parke, Davis & Company of Detroit undertook, as it still does, to manufacture it and put it more extensively on the market."

The royalties from this product, based on koji, soon make him a wealthy man.

Taka-Diastase was probably the first microbial enzyme to be made commercially in the United States. Several plant

enzymes were sold commercially before microbial enzymes (Dr. J.W. Bennett Sept. 2012, personal communication).

1895 – Back in Chicago, Takamine and his family reside at 6641 Woodlawn Ave. The Takamine Ferment Company has an office in the Chamber of Commerce Building, room 511. J. Takamine is president of the company, John White is secretary. (*Chicago City Directory*, p. 1701).

1896 May 23 – J. Takamine, still residing in Chicago, applies for a U.S. patent on a process for removing glycerin from used printers' rollers.

1897 Dec. – With Parke, Davis & Co. as his patron, Takamine moves his family to New York and establishes an independent laboratory on East 103rd Street in Manhattan [New York] (Bennett 1988, p. xi).

1897 – John Jacob Abel, a researcher at Johns Hopkins University, announces the discovery and isolation of crystalline "epinephrine." A year later Otto von Furth in Europe announces the discovery of "suprarenin" (Kawakami 1928, p. 41-42; Bowden et al. 2003, p. 49). Yet neither of these relatives of adrenaline is isolated in its pure form.

1898 Feb. 28 – Takamine's most important (and most brilliant) scientific article to date, titled "Diastatic substances from fungus growths," is published in the *Journal of the Society of Chemical Industry* (London) (p. 118-20).

1899 – J. Takamine applies, in Japan, for the degree of Doctor of Chemical Engineering. He receives this doctoral degree the same year (W.W. Scott 1922, p. 371). From now on he may be called "Dr. Takamine."

1899 – Sankyo Shoten is founded in Japan to distribute Taka-Diastase, imported from the USA.

1900 – The Takamine Ferment Company still has an office in Chicago at 138 Washington, room 1011. J. Takamine is still president and Edward Moore is secretary (*Chicago City Directory*). The Takamine family now lives in New York City and no longer has a residence in Chicago.

1900 summer – Takamine begins his research on adrenalin (*American J. of Pharmacy*, 1901, p. 525).

1900 June – Keizo Uenaka (first misspelled Wooyenaka by Dr. Takamine in April 1901) succeeds in crystallizing adrenaline. Uenaka is a young chemist Takamine had hired from Japan to work in his private laboratory at East 103rd St., Manhattan, New York City, on a project to isolate the active principal of the adrenal glands of sheep, suggested to Takamine by Parke, Davis & Co. (Bennett 1988, p. xi; Yamashima 2003, p. 98-99).

It is widely stated in academic works that John Jacob Abel (of Johns Hopkins University) and Jokichi Takamine discovered epinephrine (adrenaline) independently; some give credit to Abel for discovering it first, but to Takamine for isolating the pure substance (Bennett 2001; Yamashima 2003).

1900 Nov. 5 – Takamine first applies for a patent on his process for the isolation of adrenalin, the active principle of the suprarenal glands (U.S. Patent Nos. 730,196 to 730,198; Yamashima 2003, p. 98-99).

This is the first hormone to be isolated in pure form, and is thus a landmark in the history of medicine, biochemistry, and physiology (Lehninger 1975, p. 1059).

This patent process for adrenalin becomes very complex; it is the first natural substance (a substance found in nature) ever to be patented. In one lawsuit (Parke-Davis v. Mulford) in April 1911, Judge Learned Hand expressed his perplexity as a non-scientist in having to rule in such a precedent-setting case. He ruled in favor of Takamine (Mahoney 1959, p. 74). Yet intense debate still swirls on the central question decided by Hand: Can an isolated or purified natural substance be patented? (Harkness 2011, p. 363-99).

1901 March 19 – Takamine applies for a trademark on "Adrenalin" (Yamashima 2003, p. 98-99).

1901 April 15 – Takamine's first scientific paper on Adrenalin, titled "The blood-pressure-raising principle of the suprarenal glands – A preliminary report," is published in *Therapeutic Gazette* (Detroit) – a journal published by Parke, Davis & Co.

1901 June 6 – Dr. Takamine first formally announces the discovery of Adrenalin in a scientific paper read before a convention of the American Medical Association in St. Paul, Minnesota. The paper is titled "The Active Principle of Suprarenal Glands."

1901 Nov. – Takamine publishes his findings on adrenalin in an article titled "Adrenalin the active principle of the suprarenal glands and its mode of Preparation," in *The American Journal of Pharmacy. Nov.* p. 523-31.

Also in 1901 Parke, Davis & Co. introduced adrenaline to the medical profession (Bett 1954, p. 523).

The combined royalties from Taka-Diastase and Adrenalin, plus the income from his growing businesses in Japan, will soon make Dr. Takamine an increasingly wealthy man. He begins to look for creative ways to use his wealth to help others and to promote friendship and understanding between Japan and the United States.

1901 Nov. 29 – On his way to Japan, Dr. Takamine begins a

speaking tour of the British Isles. He is lauded everywhere he goes for his good humor, interesting talks, and scientific ability (*Chemist and Druggist* {London}, Dec. 7, p. 911).

1902 Jan. 18 – In an article about adrenaline titled "The blood-pressure-raising principle of the suprarenal gland" published in the prestigious *Journal of the American Medical Association*, Takamine gives his title and address as: M.D., 475 Central Park West, New York City.

1902 May 17 – Dr. Takamine, with his wife and sons, departs from Japan for San Francisco on the Japanese steamer *America Maru* (*Japan Weekly Mail*, p. 550).

1902 Aug. 14 – Caroline Takamine buys the Takamine family's first land at Merriewold Park (Sullivan County, New York). She buys many parcels but the actual acreage is not show on the land deed. The family bought land here and was admitted to the Park community largely because Caroline's younger sister, Marie Morelle Septima Hitch, had married Henry George, Jr., an early Merriewold member. Note that this land was purchased a little more than 2 years before Jokichi Takamine was given Sho-Foo-Den (Shofu-Den).

1903 Jan. – The first significant biography of J. Takamine is published – from a Japanese viewpoint (*Japan and America*, Supplement, p. 69-73).

1904 April 30 – The Louisiana Purchase Exposition (informally known as the "St. Louis World's Fair") opens in St. Louis, Missouri, continuing until Dec. 1. Japan has a major pavilion. Dr. Takamine is a member of the jury.

1905 March 15 – Dr. Takamine establishes The Nippon Club, a gentleman's club for Japanese Americans and Japanese nationals in New York City. Initially it occupies a townhouse at 334 Riverside Drive. In 1908 it was at 44 W. 85th St. In 1912 it moved into a Renaissance Revival building at 161 West 93rd St., designed for the Club by the architect John Vredenburgh Van Pelt and erected in 1912. After the Japanese attack on Pearl Harbor (Dec. 1941), the building was seized by the federal government (*Japan in New York*, 1908; Wikipedia, at Nippon Club).

1904 Nov. 25 – Dr. Jokichi Takamine, who now resides at 45 Hamilton Terrace in New York City, is given three Japanese buildings which were brought to this country and formed the main Japanese pavilion at last year's world's fair in St. Louis, Missouri, as a reward from the Emperor for his service to the Imperial Japanese Commission. The buildings will be re-erected at Dr. Takamine's summer home at Merriewold, Sullivan County, about 75 northwest of Manhattan. The foundations for the buildings have already been laid (*Republican Watchman* {Monticello, New York}, p. 1; *New-York Tribune*, 27 April 1905, p. 11). He renames the buildings Sho-Foo-Den, which means "Pine Maple Hall."

1906 Sept. – J. Takamine applies, in Japan, for the degree of Doctor of Pharmacology by presenting a thesis of his and his curriculum vitae (Miles Laboratories 1988, p. 1). He is awarded this doctoral degree the same year (W.W. Scott 1922, p. 371).

1907 May 19 – The Japan Society is organized in New York at a gathering where General Kuroki, hero of the Russo-Japanese War, was visiting. Its goal was to "facilitate personal contact and mutual understanding between the Americans and the Japanese." Dr. Takamine was the "moving spirit" and the Society's first vice-president. (Kawakami 1928, p. 55).

1908 – Dr. Takamine gives the address of his residence as 45 Hamilton Terrace, New York City. Telephone: 1309 Audubon; his office address as 521 W. 179th St. Telephone: 95 Audubon (*Japan in New York*, Japanese Directory).

1909 – Jokichi Takamine and his family move into an elegant six-story (including basement) beaux-arts townhouse at 334 Riverside Drive, between 105th and 106th streets, on the upper west side of Manhattan, New York City. This townhouse was occupied until 1908 by the Nippon Club, which Dr. Takamine founded in 1905. A photograph of this house, taken in 2001, is posted at www.flickriver.com.

1909 Sept. 19 - Prince and princess Kuni of the Japanese Imperial family visit *Sho-Fu-Den* on their way from Europe back to Japan. Princess Kuni was pregnant at the time with Princess Nagako Kuniyoshi, who later married Emperor Hirohito on 24 Jan. 1924 inside the Imperial Palace in Tokyo. Caroline found the formal visit exhausting; although she spoke very little Japanese, she was expected to play the role of accomplished hostess to the royal couple (*New York Times*, 20 Sept. 1909; de Mille 1978, p. 123-26).

Note: The date of this visit is often given incorrectly as 1907.

1910 Sept. 30 – Jokichi Takamine and a committee of Japanese residents give 2,100 cherry trees and a memorial bronze tablet to the city of New York. They are to be planted around Grant's Tomb on Riverside Drive to commemorate the Hudson-Fulton Celebration. But the trees are infested and have to be destroyed. So the committee tries again, hoping the trees will arrive in the spring of 1912 (Fairchild 1938, p. 410-15; National Park Service 2006).

1910 – The Takamine Ferment Company still has an office in Chicago at 138 Washington, room 703. (*Chicago City Directory, p. 1659*).

1912 March 28 – The first of thousands of cherry blossom trees is planted in the West Potomac Park surrounding the Tidal Basin in Washington, DC. The funding for the trees came from Dr. Takamine. "But, as a private businessman, scientist, and goodwill ambassador, Dr. Takamine didn't think he should be 'out front' on this, so he and Japan's Consul General in New York agreed that the gift should be made through official channels… (*Washington Post*, p. 2; Bennett 2001; Malott 2012).

Also in 1912, Dr. Takamine gave 50 cherry trees to Parke-Davis in Detroit in token of his appreciation for the kindness and good-will the company had shown him during the past seventeen years (Mahoney 1959, p. 64-81).

1913 – Takamine travels to Japan. Sankyo Shoten in Japan, now growing rapidly, is reorganized as a joint stock company and incorporated under the new name Sankyo Co., Ltd. Dr. Jokichi Takamine, living in the United States, becomes the company's first president (Iinuma 1993; Yomiuri Shinbun 25 March 1994).

1913 – Takamine is awarded the Imperial Academy Prize for his discovery of Adrenaline. He is also elected a member of the Imperial Academy.

1913 – Dr. Takamine lists the address of his office and laboratory as "550 W. 173rd St., N.Y.C. (*American Political Science Association*, "List of members," p. 37; *Physicians' Who's Who*, p. 332).

1915 – For his scientific and entrepreneurial accomplishments, the emperor of Japan decorates Dr. Takamine with the Order of the Rising Sun, Fourth Class (*New York Times* 23 July 1922, p. 19).

1915 Sept. 29 – Ebenezer "Eben" Takashi Takamine marries Ethel Johnson in New York City (*New York Times*, Sept. 30). By marrying a non-citizen, Ethel gives up her U.S. citizenship. Eben's second marriage was to Odette Jean on 25 July 1928. His third marriage was to Catherine McMahon on 2 Oct. 1943. Eben had no children.

1915 Nov. – Takamine Laboratory, Inc. is moved to (or established at) Clifton, New Jersey. It does both manufacturing and research (Scott 1922, p. 370-72).

1917 June 4 – Jokichi "Joe" Takamine, Jr. is married to Hilda Petrie. The place of marriage is unknown. They have two children: Caroline Yuki Takamine (born 20 May 1923 in New Jersey) and Jokichi Takamine III (born 6 Feb. 1924, in Passaic County, New Jersey).

1919 July – Caroline Takamine (residing at 334 Riverside Dr.) sells what was her husband's laboratory and office at 553 West 173rd St. He apparently no longer needs it (*Real Estate Record and Builders' Guide*, July 26, p. 67).

1921 May 17 – Jokichi Takamine writes his last will and testament. He asks that his body either be dissected for the advancement of science or cremated and the ashes buried partly in the USA and partly in Japan (*New York Times* 1922 Aug. 4).

1921 June - Jokichi Takamine and his wife move out of their six-story townhouse at 334 Riverside Drive, Manhattan, New York City. They move to 93 Boulevard, Passaic, New Jersey (*New York Times* 1921 June 24; www.flickerriver.com).

1922 June 14 (approx.) – Jokichi Takamine converts to Catholicism, from Buddhism, the religion of his birth, while in the hospital only 6 weeks before his death. He told his wife, Caroline, who had converted to Catholicism before he did, that "the one thing missing in his life he felt could be supplied only in a belief in God" (*New York Times* 1922 July 26, p. 13).

1922 July 22 (Saturday) – Jokichi Takamine dies in New York City at age 68. He died at Lenox Hill Hospital of a complicated kidney disease – chronic nephritis (death certificate). His death warranted a full-column obituary in the *New York Times.* He was "perhaps the best known Japanese in this country." He and Caroline had been married for nearly 35 years. His body was taken to his home at 93 Boulevard, Passaic, New Jersey, where it remained until Monday afternoon (July 23, p. 19).

1922 July 24 (Mon.) – This afternoon his body is taken to the Nippon Club (which he founded and was for 18 years the president) at 161 West 93rd St., where a memorial service is held at 6 o'clock in the evening. His coffin is "surrounded by more than 300 floral pieces from prominent Japanese and American friends… An American and a Japanese flag were crossed on his breast, symbolical of his efforts to cement the friendship between the two countries." A moving tribute to Dr. Takamine is published today in the *New York Times* (July 23, p. 19; July 24. p. 14).

1922 July 25 (Tues.) – His body is taken to St. Patrick's Cathedral where funeral services are held at 10:30. Rev. Father William B. Martin, acting rector of the Cathedral and Master of Ceremonies at the funeral, tells how six weeks earlier he had converted to Roman Catholicism from Buddhism (*New York Times* July 26, p. 13).

1922 – After August 3, when his will is filed for probate in Paterson, New Jersey, he is buried in a stately Takamine family mausoleum that his wife established at Woodlawn

Cemetery, Bronx, New York. The Catholic church bars cremation and there is no interest among physicians in dissection (*New York Times* Aug. 4).

1923 June 17 – Caroline Takamine first tries to sell the Takamine land and buildings at Merriewold via three large display ads in the *New York Times* real estate section. The ads begin: "Cost over $250,000. For sale $70,000. Sho-Foo-Den, Merriewold Park, Sullivan County. Twenty acres in restricted preserve of fifteen hundred acres…" But no buyer is found.

1926 Aug. 16 – Caroline Hitch Takamine and Charles Pablo Beach are married at St. Augustine Cathedral (the main Catholic church) in Tucson, Pima County, Arizona (marriage certificate). Caroline had gone to Vail, south of Tucson, Arizona, to be with her youngest son, Eben, who was there for health reasons, recovering from the breakup of his first marriage, and staying with Charles P. Beach, a ranch hand living on a ranch in or near Vail (De Mille 1978, p. 256-57).

1926 Aug. 22 – The first, best, and most important biography of Dr. Takamine ever written is published in Japan. The title is *Takamine hakase* [Dr. Takamine], by Matasaku Shiobara (Tokyo: Ozorosha; 244 p.). Shiobara was Takamine's close friend and business associate.

1928 – *Jokichi Takamine: A Record of His American Achievements*, by K.K. Kawakami is published (New York, NY: William E. Rudge, x + 74 p.). This is the first English-language book-length biography about Dr. Takamine and it contains a wealth of valuable information. Yet the lack of many key dates is frustrating. Agnes de Mille (1978, p. 126) says: "It was written under the supervision and at the request of Caroline and it reads like a public relations tract."

1928 Dec. 8 – Charles and Catherine Beach, after having been married for more than 2 years, make their first land purchase – 320 acres southwest of Vail, Arizona. At some unknown date they build a very nice ranch which they call "El Rancho de los Ocotillos" (land deed).

1930 Feb. 22 – Jokichi ("Jo") Takamine, Jr. dies of a skull fracture in New York City. He fell (or was pushed), while intoxicated, from a 14th floor hotel window. He is buried in the family mausoleum established by his father at Woodlawn Cemetery, Bronx, New York (*New York Times*, Feb. 23).

His brother, Eben, takes over as president of the Takamine Laboratory in Clifton, New Jersey.

1930 June 16 – Caroline H. Beach (formerly Caroline Takamine Beach) sells most of her land and Sho-Fu-Den at Merriewold to John Moody through his Moodyson Corporation. On 3 May 1939 she sells two remaining parcels (Lots 13 and 14) to Anna A. Moody.

1935 March 6 – Charles P. Beach makes his biggest land transaction to date. He swaps his homestead land near the Navajo reservation to the north for 1,987.43 acres of equivalent value in Township 17S Range 15E south of Vail, Arizona (land patents and deeds).

1935 March 31 – Santa Rita in the Desert, a small but exquisite Roman Catholic chapel at Vail, Arizona, is dedicated by the bishop of the Tucson diocese to the memory of Jokichi Takamine. A gift from Caroline Takamine Beach, it was conceived of and designed by Caroline and her husband Charles and constructed during 1934-35. Rita is the saint of the impossible (Consulich 1935; Grigsby 1996). The chapel is active to this day.

1946 Feb. 20 - John Moody sells his land and Sho-Fu-Den at Merriewold (Sullivan County, New York) to Melvin Chester Osborn – who proceeds to commercialize and desecrate it.

1953 Feb. 16 – Ebenezer "Eben" Takashi Takamine becomes a U.S. citizen under the terms of the McCarran-Walter Act, which went into effect in Dec. 1952. Unfortunately, his father was never able to become a U.S. citizen (*The Call* {Paterson, New Jersey}, Nov. 4). Prior to about 1952 Japanese were generally considered to be "unassimilable."

1953 Aug. 28 – Ebenezer Takashi Takamine, Dr. Takamine's youngest son, dies at Passaic, Bergen County, New Jersey. He was age 63. He is buried in the family mausoleum at Woodlawn Cemetery, Bronx, New York City (*New York Times*, Aug. 29).

His wife, Catherine McMahon Takamine takes over as president of the Takamine Laboratory in Clifton, New Jersey.

1953 Nov. 3 – Kanazawa, Japan, holds a four-day celebration to commemorate the centennial of Jokichi Takamine's birth. The U.S. Ambassador to Japan and the executive vice-president of Parke, Davis & Co. (Homer C. Fritsch) were among those who gave addresses. Catherine McMahon Takamine (wife of Eben) presents a large portrait of Dr. Takamine (*The Call* {Paterson, New Jersey}, Nov. 4, 1953).

Note: This four-day celebration was held in 1953, not in 1954 as was often reported subsequently

1954 Nov. 25 – Caroline Takamine Beach, age 88, dies in Arizona. She is buried in the family mausoleum established by her first husband, Jokichi, at Woodlawn Cemetery, Bronx, New York (*Tucson Daily Citizen*, 27 Nov. 1954).

1956 Feb. 21 – Charles P. Beach, "well known Southern Arizona cattleman," announces the sale of his 33,000-acre ranch near Mt. Fagan to Mrs. Star G. Simpson. The property was listed at $200,000 (*Tucson Daily Citizen*, Feb. 21, p. 8).

The "Mt. Fagan ranch" ranch is sold again on 27 April 1959 for $1.25 million to a developer who plans to subdivide it (*Tucson Daily Citizen*, p. 1).

1956 March 7 – Miles Laboratories, Inc. purchases Takamine Laboratory, Inc. at Clifton, New Jersey (Mahoney 1959, p. 75, 154; *News* {Paterson, Jersey}, 3 Feb. 1956).

1967 Nov. 25 – Charles P. Beach, husband of Caroline Takamine Beach, dies at his home (at 2153 Juanita St.) in Vail, Colorado (*Tucson Daily Citizen*, Nov. 27, p. 48). On 11 July 1968 his estate was valued at $487,548.

1970 – Parke, Davis & Co. is acquired by Warner-Lambert (Wikipedia at Parke-Davis).

1984 Sept. 17 – Elinor W. Osborn (widow of Melvin Chester Osborn) of Monticello, New York, sells her land and Sho-Fu-Den (Sullivan County, New York) to Japanese Heritage Foundation for $600,000.00.

1987 – Major structural repairs are made to Shofu-Den in Merriewold, New York, and a new copper roof is put on (Colson & De Mille 1989).

1988 – *Takamine: Documents from The Dawn of Industrial Microbiology* is published by Miles Laboratory (Elkhart, Indiana). The Preface, a biography of Jokichi Takamine by Joan W. Bennett, is especially interesting. The first such biography published since 1928, it introduces Takamine to a new generation of readers.

1988 – The enzyme plant in Clifton, New Jersey, is closed (Dawson 1994).

1990 June – Solvay Enzymes Inc. (Elkhart, Indiana) purchases the enzyme business (started by Dr. Takamine) from Miles Laboratories (Dawson 1994).

1994 – Japanese Heritage Foundation, Inc. publishes an artistic booklet titled Shofu-Den (19 pages), designed to find a source of funding for restoration or a buyer for this very beautiful and valuable Japanese palace. It is also a marvelous source of images (many color) of and information about Shofu-Den and Dr. Jokichi Takamine.

2000 June – Warner-Lambert (which owns Parke-Davis) is acquired by Pfizer (Wikipedia at Parke-Davis).

2002 Jan. – "Takamine Jokichi and the transmission of ancient Chinese enzyme technology to the West," by H.T. Huang is published as a book chapter in Chan et al. Huang observes: "When we talk of technology transfer in the last hundred years, we tend to think of the traffic as flowing entirely from West to East."

2002 May 14 – Japanese Heritage Foundation, Inc. sells its land and Sho-Fu-Den (Sullivan County, New York) to Sho-Fu-Den LLC. The land is owned by Osamu ("Sam") Ikeda and Mr. Tomio Taki.

2003 May – Tetsumori Yamashima of Japan, writing in the *Journal of Medical Biography* (p. 95-102), gives the best description seen to date of Dr. Takamine's route to the discovery of adrenaline, together with an excellent biography.

2005 – Sankyo Co. Ltd. is acquired by Daiichi to form Daiichi Sankyo Co., Ltd.

2012 – Daiichi Sankyo Co., Ltd. makes an excellent online color English-language 47-minute documentary titled "The Story of Jokichi Takamine: Japan's Goodwill Ambassador" to celebrate the centennial of the planting of Japanese cherry trees in Washington, D.C.

ABOUT THIS BOOK

This is the most comprehensive biography or bibliography of Jokichi Takamine ever published in English. It has been compiled, one record at a time, over a period of 25 years, in an attempt to document the life of this remarkable man and his wife. It is also the single most current and useful source of information on this subject.

This is one of more than 100 books compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyinfo Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features detailed information on:

- 42 different document types, both published and unpublished.
- 545 published documents - extensively annotated bibliography. Every known publication on the subject in every language.
- 18 original Soyinfo Center interviews and overviews never before published.
- 61 unpublished archival documents.

Thus, it is a powerful tool for understanding the development of this subject from its earliest beginnings to the present.

Each bibliographic record in this book contains (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English language publications together with an English translation of the title, month and issue of publication, and the first author's first name (if given). For most books, we state if it is illustrated, whether or not it has an index, and the height in centimeters.

A complete subject/geographical index is also included.

ABBREVIATIONS USED IN THIS BOOK

A&M = Agricultural and Mechanical
Agric. = Agricultural or Agriculture
Agric. Exp. Station = Agricultural Experiment Station
ARS = Agricultural Research Service
ASA = American Soybean Association
Assoc. = Association, Associate
Asst. = Assistant
Aug. = August
Ave. = Avenue
Blvd. = Boulevard
bu = bushel(s)
ca. = about (circa)
cc = cubic centimeter(s)
Chap. = Chapter
cm = centimeter(s)
Co. = company
Corp. = Corporation
Dec. = December
Dep. or Dept. = Department
Depts. = Departments
Div. = Division
Dr. = Drive
E. = East
ed. = edition or editor
e.g. = for example
Exp. = Experiment
Feb. = February
fl oz = fluid ounce(s)
ft = foot or feet
gm = gram(s)
ha = hectare(s)
i.e. = in other words
Inc. = Incorporated
incl. = including
Illust. = Illustrated or Illustration(s)
Inst. = Institute
J. = Journal
J. of the American Oil Chemists' Soc. = Journal of the American Oil Chemists' Society
Jan. = January
kg = kilogram(s)
km = kilometer(s)
Lab. = Laboratory
Labs. = Laboratories
lb = pound(s)
Ltd. = Limited
mcg = microgram(s)
mg = milligram(s)
ml = milliliter(s)
mm = millimeter(s)
N. = North
No. = number or North
Nov. = November
Oct. = October
oz = ounce(s)
p. = page(s)
photo(s) = photograph(s)
P.O. Box = Post Office Box
Prof. = Professor
psi = pounds per square inch
R&D = Research and Development
Rd. = Road
Rev. = Revised
RPM = revolutions per minute
S. = South
SANA = Soyfoods Association of North America
Sept. = September
St. = Street
tonnes = metric tons
trans. = translator(s)
Univ. = University
USB = United Soybean Board
USDA = United States Department of Agriculture
Vol. = volume
V.P. = Vice President
vs. = versus
W. = West
°C = degrees Celsius (Centigrade)
°F = degrees Fahrenheit
> = greater than, more than
< = less than

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At "Results" click any line that interests you.

For those using a Mac without Acrobat Reader: Safari is often the default browser. Click "Edit" in the toolbar at top. In the dropdown click "Find," then click "Find..." again. A search bar will open across top of screen with a search box at right. In this box type a word or phrase you would like to search, such as Merriewold or Nippon Club. Click "Done" then scroll through the various matches in the book.

Chronological Order: The publications and products in this book are listed with the earliest first and the most recent last. Within each year, references are sorted alphabetically by author. If you are interested in only current information, start reading at the back, just before the indexes.

A Reference Book: Like an encyclopedia or any other reference book, this work is meant to be searched first - to find exactly the information you are looking for - and then to be read.

How to Use the Index: A subject and country index is located at the back of this book. It will help you to go directly to the specific information that interests you. Browse through it briefly to familiarize yourself with its contents and format.

Each record in the book has been assigned a sequential number, starting with 1 for the first/earliest reference. It is this number, not the page number, to which the indexes refer. A publication will typically be listed in each index in more than one place, and major documents may have 30-40 subject index entries. Thus a publication about the nutritional value of tofu and soymilk in India would be indexed under at least four headings in the subject and country index: Nutrition, Tofu, Soymilk, and Asia, South: India.

Note the extensive use of cross references to help you: e.g. "Bean curd. See Tofu."

Countries and States/Provinces: Every record contains a country keyword. Most USA and Canadian records also contain a state or province keyword, indexed at "U.S. States" or "Canadian Provinces and Territories" respectively. All countries are indexed under their region or continent. Thus for Egypt, look under Africa: Egypt, and not under Egypt. For Brazil, see the entry at Latin America, South America: Brazil. For India, see Asia, South: India. For Australia see Oceania: Australia.

Most Important Documents: Look in the Index under "Important Documents -."

Organizations: Many of the larger, more innovative, or pioneering soy-related companies appear in the subject index – companies like ADM / Archer Daniels Midland Co., AGP, Cargill, DuPont, Kikkoman, Monsanto, Tofutti, etc. Worldwide, we index many major soybean crushers, tofu makers, soymilk and soymilk equipment manufacturers, soyfoods companies with various products, Seventh-day Adventist food companies, soy protein makers (including pioneers), soy sauce manufacturers, soy ice cream, tempeh, soynut, soy flour companies, etc.

Other key organizations include Society for Acclimatization (from 1855 in France), American Soybean Association, National Oilseed/Soybean Processors Association, Research & Development Centers (Peoria, Cornell), Meals for Millions Foundation, and International Soybean Programs (INTSOY, AVRDC, IITA, International Inst. of Agriculture, and United Nations). Pioneer soy protein companies include Borden, Drackett, Glidden, Griffith Labs., Gunther, Laucks, Protein Technologies International, and Rich Products.

Soyfoods: Look under the most common name: Tofu, Miso, Soymilk, Soy Ice Cream, Soy Cheese, Soy Yogurt, Soy Flour, Green Vegetable Soybeans, or Whole Dry Soybeans. But note: Soy Proteins: Isolates, Soy Proteins: Textured Products, etc.

Industrial (Non-Food) Uses of Soybeans: Look under "Industrial Uses ..." for more than 17 subject headings.

Pioneers - Individuals: Laszlo Berczeller, Henry Ford, Friedrich Haberlandt, Artemy A. Horvath, Englebert Kaempfer, Mildred Lager, William J. Morse, etc. Soy-Related Movements: Soyfoods Movement, Vegetarianism, Health and Dietary Reform Movements (esp. 1830-1930s), Health Foods Movement (1920s-1960s), Animal Welfare/ Rights. These are indexed under the person's last name or movement name.

Nutrition: All subjects related to soybean nutrition (protein quality, minerals, antinutritional factors, etc.) are indexed under Nutrition, in one of more than 70 subcategories.

Soybean Production: All subjects related to growing, marketing, and trading soybeans are indexed under Soybean Production, e.g., Soybean Production: Nitrogen Fixation, or Soybean Production: Plant Protection, or Soybean Production: Variety Development.

Other Special Index Headings: Browsing through the subject index will show you many more interesting subject headings, such as Industry and Market Statistics, Information (incl. computers, databases, libraries), Standards, Bibliographies (works containing more than 50 references), and History (soy-related).

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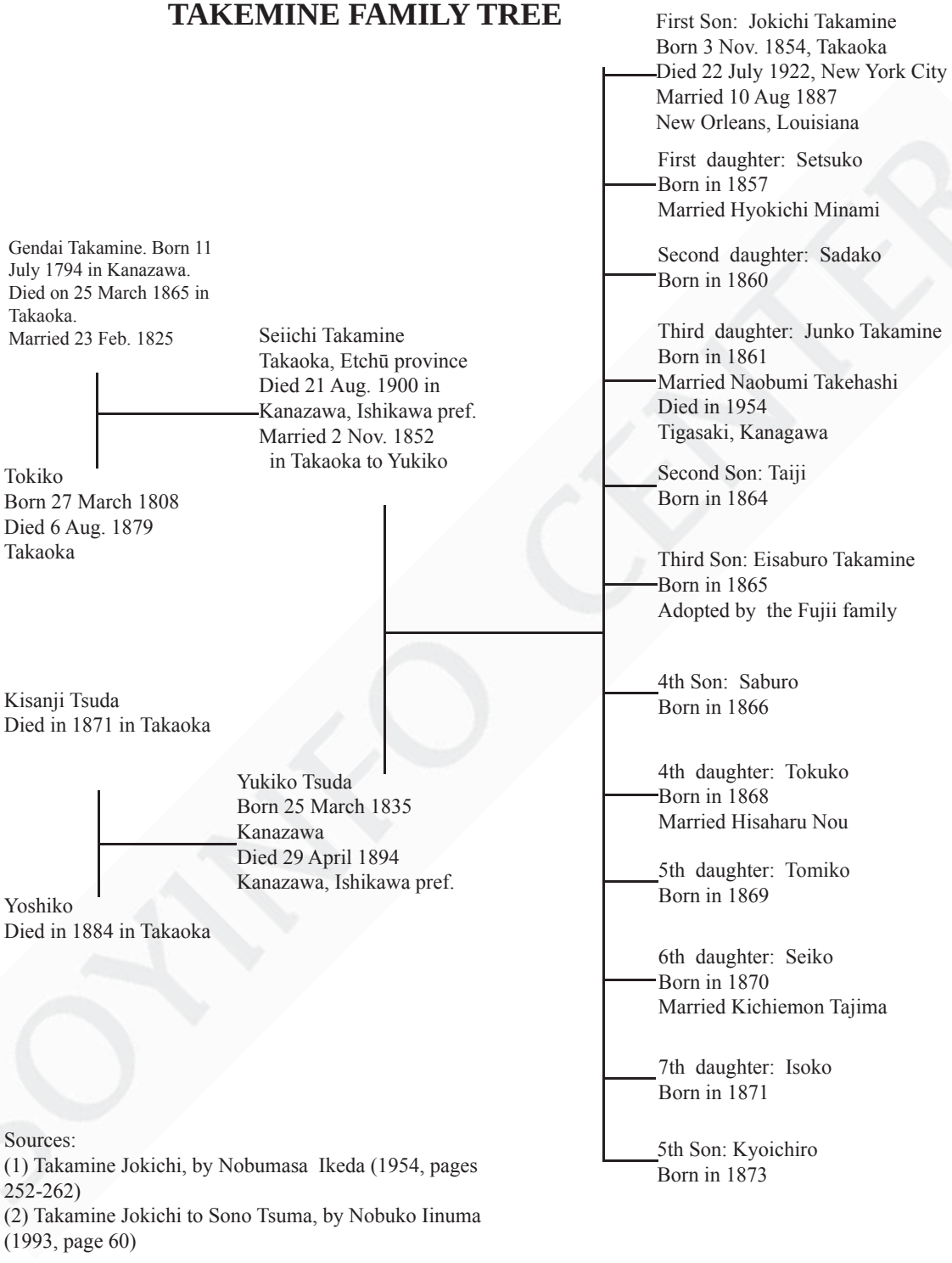
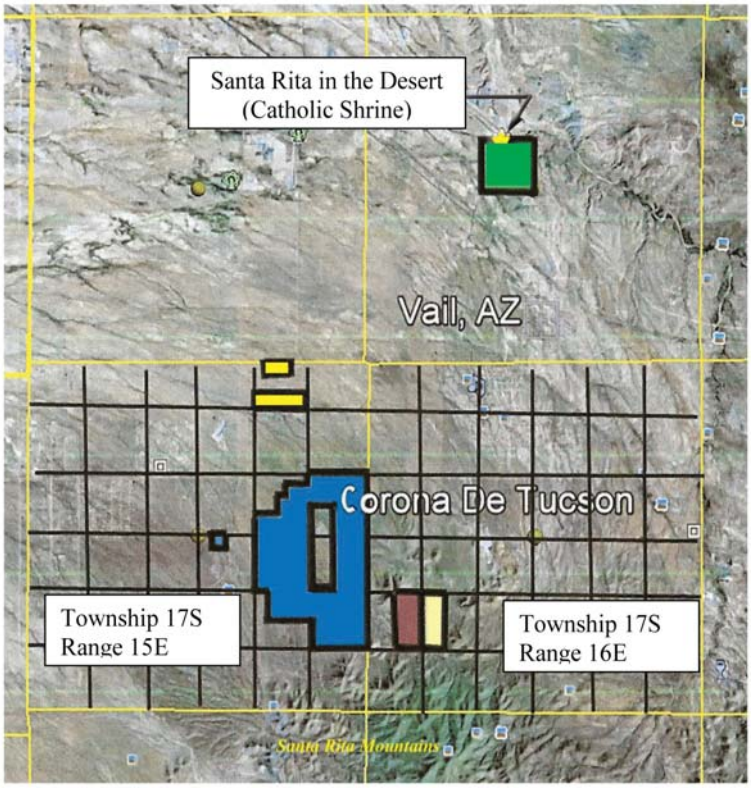
TAKEMINE FAMILY TREE



Sources:
(1) Takamine Jokichi, by Nobumasa Ikeda (1954, pages 252-262)
(2) Takamine Jokichi to Sono Tsuma, by Nobuko Iinuma (1993, page 60)

Charles P. and Caroline Beach Lands in Pima County, Arizona



Earliest Purchase
December 9, 1928

Purchased from Estrada Heirs - July 30, 1932

Patented - US Government
Patent 1068047
Dated: February 14, 1934

And

Patent 1074701
Dated: March 6, 1935

Patented - State of Arizona
Patent #1986
Dated: October 14, 1937

Patented - US Government
Patent #1106536
Dated: January 22, 1940

JOKICHI TAKAMINE AND CAROLINE TAKAMINE

1. Seiichi Takamine's home in the city of Kanazawa, Province of Kaga, Japan (Photograph). 1860.

• ***Summary:*** Two views of the house in which young Jokichi Takamine grew up until age 12. It was located close to the castle where his father, Seiichi, was a practicing physician for the Maeda lord and his family.

Reprinted in Tetsumori Yamashima, 2003, by courtesy of the Great People of Kanazawa Memorial Museum, Kanazawa City, Japan.

Note: This is the earliest photo seen (July 2012) in connection with Jokichi Takamine.

2. Civil war soldier: Ebenezer Vose Hitch enlists as a private in Fairhaven, Massachusetts. 1861. Sept. 27.

• ***Summary:*** U.S. Civil War soldier records and profiles: Name: Ebenezer Vose Hitch. Residence: Fairhaven, Massachusetts. Occupation: Clerk. Age at enlistment: 20. Enlistment date: 27 Sept. 1861. Rank at enlistment: Private. State served: Massachusetts. Survived the war? Yes. Service record: Enlisted in Company Read's, Massachusetts 3rd Cavalry Regiment on 27 Sept. 1861. Mustered out on 27 Aug. 1863. Birth date: About 1841.

Sources: Massachusetts soldiers, sailors and marines in the Civil War. Was a private–3rd Mass. Cavalry–27 Sept. 1861 Capt. 2nd, Louisiana Cavalry–July 4, 1864. Reg. consolidated with 1st Louisiana Cavalry Set. 7, 1864. Mustered out Dec. 18, 1865. See Vol. 2–Mass., in Army and Navy.

Note: This record was added by Kathleen_Cramer500 on 7 Oct. 2011. Address: Fairhaven, Massachusetts.

3. Jokichi Takamine (3rd from left), about age 10, in Japan in

traditional samurai dress with two swords, accompanied by two samurai with swords and another young man about his age (Photograph). 1864.
• ***Summary:*** Sent by and reprinted with permission from *Kanazawa Furusato Ijinkan* (Great People of Kanazawa Memorial Museum) in Kanazawa, Japan.

4. Capt. Ebenezer Hitch and wife Mary Field Hitch, the parents of Caroline Field Hitch (Photograph). 1865.

• ***Summary:*** In Mississippi, shortly after the Civil War.

This photo is from the book "Where the Wings Grow," by Agnes De Mille (published by Doubleday, 1978).

5. Jokichi Takamine (right) as a boy, about age 12, with a samurai bodyguard (Photograph). 1866. (See next page).
• ***Summary:***"At this age, young Jokichi was sent (by the samurai lord of Kaga) to Nagasaki, the only port open to the West at that time, as a member of a group of ambitious and promising young men of his province, to study basic English in the home of the Portuguese ambassador" (Yamashima 2003, p. 96).

Note: He may have actually learned English from a Dutch speaker, because the Dutch were the only country with a real presence in Nagasaki at that time. Many later sources say that he spoke English with a slight Dutch accent throughout his life. Some also add that he sometimes has a slight Scottish accent–from his years studying in Scotland.

Sent by and reprinted with permission from *Kanazawa Furusato Ijinkan* (Great People of Kanazawa Memorial Museum) in Kanazawa, Japan.

6. U.S. Department of the Interior, Census Office. 1870. Charles T. Beach (father of Charles P. Beach) in the 1870 U.S. Census in Montgomery County, Kansas. Washington, DC. Aug. 6.
• ***Summary:*** Charles is living in Montgomery City P.O., Sycamore Township (twp), Montgomery Co., Kansas. Image 9, 83/83.

Beach, Charles T., age 25, born in 1845. Farmer. No real

property (land). $300 personal property. Born in Connecticut.

Note: This is a single family household.

7. U.S. Department of the Interior, Census Office. 1875. Charles T. Beach and Lizzie A. Bridgman (parents of Charles P. Beach) in the 1875 Kansas State Census in Montgomery County, Kansas. Kansas. March 1.

• ***Summary:*** Bingo! Now we know how the parents of Charles P. Beach met. They were neighbors in Sycamore Township (twp), Montgomery Co., Kansas. This record confirms that the Charles T. Beach of the 1870 census is the right guy. There are two, likely related, Bridgman families at #9 and #10 in this 1875 Kansas census, and Lizzie is a teacher! This confirms the importance of education for her children. Charles T. (#11) also a teacher, eight years Lizzie's senior.

So, they haven't married yet by 1875 census, but they surely knew each other. Wesley, their eldest child, was born late Aug. 1878, so they almost surely married before Dec. 1877.

In family #9 (of only peripheral interest to us): John Bridgman is the head of household, age 34, born in 1841, a farmer with no real property and $250 in personal property. Born in Indiana, from Iowa. His wife is Barthema [?], age 31, born in 1844, a housekeeper, born in Indiana. They have 5 children, the first 3 born in Illinois. Ella Bridgman, age 9, born in 1866. Martha Bridgman, age 8, born in 1867. Fannie Bridgman, age 6, born in 1869. Jennie Bridgman, age 4, born in 1873 in Iowa. Charles Bridgman, age 1, born in 1874 in Kansas.

In family #10, the family in which Lizzie Bridgman, the mother of Charles P. Beach, is a child, we find:

Michael Bridgman, head of household, age 54, born in 1821, $2,000 worth of real property (land), and $400 in personal property. Born in Indiana. To Kansas from Iowa.

Mary Bridgman, his wife, age 49, born in 1826, housekeeper, born in Indiana.

Lizzie Bridgman, age 20, born in 1855, teacher, born in Indiana.

Sarah M. Bridgman, age 17, born in 1858, help, born in Iowa.

Michael J. Bridgman, age 15, born in 1860, help, born in Iowa.

Peris Bridgman, age 12, born in 1863, help, born in Iowa.

Note: Lizzie and her family moved from Iowa to Indiana between 1855 and 1858 inclusive.

Household #11 is a single person household consisting of Charles T. Beach, age 28, a teacher, with $2,000 in real property (land) and $200 in personal property. He was born in Connecticut, then moved to Kansas from Ohio.

8. Charles T. Beach and Lizzie Bridgman (parents of Charles P. Beach) are married on 5 Dec. 1876 in Radical City, Montgomery Co., Kansas. 1876. Kansas. Dec. 5.

• ***Summary:*** Charles T. Beach, age 30, was born in 1846. Lizzie Bridgman, age 22, was born in 1854.

The source of this information is "Kansas, Marriages, 1840-1935." Retrieved from Ancestry.com by Bonnie Meyer of Oakland, California (24 Aug. 2012).

9. U.S. Department of the Interior, Census Office. 1880. Ebenezer Vose Hitch and his daughter, Carrie Hitch, in the 1880 U.S. Census in New Orleans, Louisiana. Washington, DC. June 4.

• ***Summary:*** Enumeration district 003, image/ page 16. 392 Magazine St.

E.V. Hitch, head of household, age 39, married. Employed at U.S. Customs Office. Born in Massachusetts. Both of his parents born in Massachusetts.

Mary Hitch, age 35, wife. Born in Louisiana. Father born in Massachusetts. Mother born in Louisiana.

Carrie Hitch, age 13 [born 5 Aug. 1866 in Falmouth, Mass.], daughter, at school. Born in Massachusetts. Father born in Massachusetts. Mother born in Louisiana.

Kittie Hitch, age 8. Born in Louisiana. Father born in Massachusetts. Mother born in Louisiana.

Lizzie Hitch, age 3. Born in Louisiana. Father born in Massachusetts. Mother born in Louisiana.

Marie Hitch, age 1. Born in Louisiana. Father born in Massachusetts. Mother born in Louisiana.

Lever Pointer, age 18, nephew, single, at home. Born in Louisiana. Father born in Tennessee. Mother born in Louisiana.

Kate Devine, age 29, boarder.

Margaret Hall, age 35, servant.

10. U.S. Department of the Interior, Census Office. 1880. Charles T. Beach and Lizzie Beach (parents of Charles P. Beach) in the 1880 U.S. Census in West Cherry, Montgomery County, Kansas. Washington, DC. June 17.

• ***Summary:*** District 161, image 18, household No. 147.

Charles T. Beach, head of household, age 34, born in 1846. School teacher. Born in Connecticut. Both of his parents born in Connecticut.

Lizzie Beach, age 25, born in 1855, wife, born in Indiana. Both parents born in Indiana.

Wesley H. Beach, age 1, born in 1879, son, born in Kansas. Father born in Connecticut. Mother born in Indiana.

Infant Beach, age 1 month, born in May 1880. Born in Kansas. Father born in Connecticut. Mother born in Indiana.

11. *Daily Picayune* (*New Orleans*, *Louisiana*). 1884. Society. Dec. 14. p. 9, col. 3.8.

• ***Summary:*** "A very enjoyable affair was given last Thursday evening at the residence of Capt. E.V. Hitch by a number of young gentlemen in compliment of charming young ladies who had a week previously acted as hosts.

Notwithstanding the inclement weather the attendance was quite fashionable and large. The pretty young ladies, in whose compliment the soirée was given, were as follows: Misses Louise De Gray, Carrie Hitch, Laurence Hacker, Edda Tourtarel, Louise Morel, Louise Faisans, Georgine Theard, Eva Olivera, Janne Faisans, Marie Brocard, Sophie Oriol, Josephine and Estelle Lion and others. The gentlemen hosts were Messrs. Wm. A. Fourterel, J. Takamini [sic, Takamine], K. Tamari, Jules Morel, Geo. De Russy, H. Rhodes, Adrian Oriol, Charles Labrancho, Theard, Hardy, Connor, William Mchio [?], Brown and a few others.

"A party of young ladies and gentlemen, chaperoned by Mr. and Mrs. Ralston, of California, witnessed the performance at the St. Charles Theatre last Friday evening. The persons who composed the party were as follows: Miss Edda Tourtarel and Mr. J. Takamine, a distinguished Japanese nobleman now on a mission to the Exposition; Miss Jeanne Faisaus and Mr. K. Tamari, Miss Louis Morel and Mr. Wm. A. Tourarel and Miss Carrie Hitch and Mr. W. Allstrom."

12. Dec. 16–The 1884 World's Fair opens in New Orleans, Louisiana. It is also known as the World's Industrial and Cotton Centennial Exposition, and the World Cotton Centennial (Important event). 1884.
• ***Summary:*** At a time when nearly one third of all cotton produced in the United States was handled in New Orleans and the city was home to the Cotton Exchange, the idea for the fair was first advanced by the Cotton Planters Association. The name World Cotton Centennial referred to the earliest surviving record of export of a shipment of cotton from the United States to England in 1784. The Fair closed on 2 June 1885, with large financial losses. The planning and construction of the fair was marked by corruption and scandals, and state treasurer Edward A. Burke absconded abroad with some $ 1,777,000 dollars of state money including most of the fair's budget.

Source: Wikipedia, at World Cotton Centennial, July 2012.

13. Caroline Field Hitch about three years before her marriage to Jokichi Takamine on 19 Aug. 1887 in Orleans Parish, New Orleans (Photograph). 1884. (See above).
• ***Summary:*** This photo is from the book "Where the Wings Grow," by Agnes De Mille (published by Doubleday, 1978).

14. *Daily Picayune* (*New Orleans, Louisiana*). 1885. World's Exposition: A large attendance–opening of the Belgian section. Feb. 8. p. 10, col. 1.2.
• ***Summary:*** "The event of the day was the opening of the exhibit of the Kingdom of Belgium to public investigation... a large number of invited guests were present... There were noticed, among others, Hon John Krottschnitt, Consul of the German Empire; Hon. E.G. Gillow, Commissioner General

of Mexico; Hon. J. Takamine and K. Tamari, Commissioners, of Japan;..."

15. *Daily Picayune* (*New Orleans, Louisiana*). 1887. A brilliant wedding. The nuptials of Mr. Jokichi Takamine of Tokio, Japan, and Miss Carrie Hitch of New Orleans–The sequel to a happy love affair. Aug. 11. p. 8. col. 1.
• ***Summary:*** "A romantic courtship, rich in devotion and constancy, last evening dawned into a wedded life, on the path of which love's golden radiance will fall and love's dreamy music fill the scented air around. For a number of years past there resided in the vieux carre ["old square"] an interesting family which day by day became more so, owing to a gentle little maiden who was blooming into womanhood. She was of graceful frame, stately bearing and captivating address. Eyes reminding one of the skies above, hair where the sunshine was wont to linger, features as classic as those of the nymphs in the ancient masters' paintings and an expression which told of the goodness devotion and love hidden within her heart. It was thus that Miss Carrie Hitch appeared to Mr. Jokichi Takamine, the talented Japanese commissioner to the World Exposition; and in fact the jeunesse doree ["gilded youth"] who attended the receptions given at her residence.

"The spark which originated at the first meeting soon kindled into a spreading fire, and in a cool, quiet and manly way he entered the contest for the prize. It was on him that the bright eyes of the little lady looked with most favor, for him the smiles were more sunny and more frequent. Acquaintance ripened into friendship into a warmer feeling and finally they were lovers. Prior to his departure for Japan at the close of the Exposition he asked her hand and it was accorded to him. The courtship was ardent and lasted, notwithstanding the broad continent and deep ocean which separated them. The coming of every mail was anxiously expected on both sides, and the billet doux which crossed the seas were many. Handsome presents, tokens of an unforgotten friendship and undiminished love, found their way to New Orleans, to be looked upon with blue eyes and

prized–prized not on account of their richness, but owing to the spirit which they were sent. The day was fixed, True to his promise as to his love the Japanese gentleman arrived in the city several weeks ago, and last night stood hand in hand with his bride.

"At about 9 o'clock last night the residence of Captain and Mrs. E. V. Hitch looked like fairyland. The spacious parlor was beautifully decorated with flowers and ferns. From the center of the arch hung a large wedding bell. The tables and mantels in the apartment had been transformed into beds of roses. As a wedding march was being played on the piano the bridal party entered the parlor, the bride leaning on the arm of her father and the groom escorting Mrs. Hitch. The bride wore a beautifully designed costume of white crepe de chine embroidered with white chrysanthemum flowers. It was the handiwork of Japanese ladies and a token of their esteem for the American girl who was to become their friend and companion. Rev. Dr. Fergerson, of the Prytania Street Presbyterian church, performed the ceremony and preached an eloquent sermon.

"Mr. Takamine is 33 years of age, of the medium height, and of very pleasing address. He was educated in his native country and in England, and is quite a scholar. He was the pupil of Dr. Mills, the distinguished fellow of the Royal Society in London, and made chemistry his special study. He has held many positions under the government of Japan. Recently he represented that country at the New Orleans World's Exposition, and now occupies the position of director general of the patent office in Japan, which entitles him to audiences with the emperor.

"At the close of the Exposition he returned to Japan and interested himself in the firm of Mitsui & Co. of Tokio, a commercial enterprise which has already established agencies all over the world. Mr. Takamine traveled extensively in Europe during the past year with the interest of his new business and with his wife proposes to make a tour of the United States.

"Miss Hitch is the daughter of Captain E.V. Hitch, a native of New York, a captain in the federal army, who married a daughter of Mr. Field, at one time one of the largest sugar planters in St. Mary parish, Louisiana. Captain Hitch was for a number of years one of the most reliable employees in the customs office at this port, and is now representing the firm of J.L. Phipps & Co. in Honduras.

"The ceremony was witnessed by a number of friends of the contracting parties. The broad verendas of the house were tented and illuminated with Japanese lanterns and palms.

"A supper was served in princely style by John T. Shaw, the Canal street confectioner, and the health of Mr. and Mrs. Takamine was frequently toasted with bumpers of champagne. Among the guests were General and Mrs. A.S. Badger, Dr. J.G. Belden, Mr. George Le Sassier, Mr. A.W. Cockerton, Mr. F.F. Parmele, Mr. and Mrs. Geo. Demontrond, Mrs. Eugene Soniat, Mrs. Parmele, Mrs. Garvey, Miss Aline Belden, Miss Viola Stinson, Miss Louise Morel, Mr. Henry Ginder, Misses Bertha and Rosie Winterhaller, Miss Oliveira, Miss Katie Devine and Mr. J. Moore Soniat.

"After super the guests were repaired to the parlor, where delightful musical performances were listened to and the happy couple were congratulated de novo. Many handsome presents were bestowed on them. They will remain in the city for about ten days and will then make a tour of the United States, visiting Niagara and all points of interest; after which they will sail from San Francisco for Tokio, Japan."

Note: This exact same article, with the same headline, appeared in the *Galveston Daily News* (Houston, Texas), Aug. 14, p. 5, Col. 4.

16. *Daily Picayune* (*New Orleans, Louisiana*). 1887. Personal and general notes. Aug. 30. p. 4, col. 1.2.
• ***Summary:*** From Charleston [South Carolina] News and Courier, Aug. 26: "Prince Takamine and his bride, an account of whose marriage in New Orleans was published in the News and Courier on the 11th inst. [instant = of the present month] arrived in the city last night and are staying at the Charleston Hotel."

17. Caroline Field Hitch as a young lady, probably in New Orleans (Photograph). 1887. Undated. (See next page)
• ***Summary:*** Sent by and reprinted with permission from *Kanazawa Furusato Ijinkan* (Great People of Kanazawa Memorial Museum) in Kanazawa, Japan.

18. Jokichi Takamine as a newly-wed young man, age 33 in New Orleans (Photograph). 1887. Undated. (See next page).
• ***Summary:*** Sent by and reprinted with permission from *Kanazawa Furusato Ijinkan* (Great People of Kanazawa Memorial Museum) in Kanazawa, Japan. Also in the booklet "Shofu-Den" by the Japanese Heritage Foundation (1994, p. 13–Gives date as 1887, says he is newly wed and age 33).

19. Caroline Takamine as a young lady, probably in New Orleans, Louisiana (Photograph). 1887? Undated.
• ***Summary:*** "During his stay in New Orleans as a commissioner to the International Cotton Exposition, Jokichi Takamine (age 30) fell in love with and became engaged to Caroline Field Hitch (age 18), the eldest daughter of a prominent Southern family. (See next page).

Reprinted in Tetsumori Yamashima, 2003, by courtesy of the Great People of Kanazawa Memorial Museum, Kanazawa City, Japan.

20. Marie Beatrice Field Hitch, mother of Caroline Hitch, and wife of Ebenezer Vose Hitch (1841-1914) (Photograph). 1887? Undated.
• ***Summary:*** Here she is wearing her white French house

cap. Marie was born in 1850 in Louisiana. She was married to Ebenezer Vose Hitch in Louisiana in about 1865 in Louisiana. The remarkable meeting during the Civil War of this Yankee captain with this brave young Louisiana belle is told at the start of Chapter 5 of "Where the Wings Grow" (p. 129-30).

This photo is from the book "Where the Wings Grow," by Agnes De Mille (published by Doubleday, 1978).

21. *Daily Picayune* (*New Orleans, Louisiana*). 1889. Personal and general notes. Feb. 26. p. 4.
• ***Summary:*** "The following, taken from a Charleston, South Carolina, paper, will prove interesting to the friends of Mrs. Takamine, formerly Miss Carrie Hitch, of this city. About a year ago Takamine, a Japanese prince from Tokio, visited Charleston for the purpose of studying up the subject of phosphates with a view to establishing manufacturing mills, the first of the kind, in Japan. While here he was shown every attention by Major Willis, a local expert in phosphates, by whom he was given every facility for his investigations. As a result of his trip, on his return to Japan Prince Takamine ordered two cargoes of rock from the Farmers' Phosphate Company through Major Willis. The latter has received advices of the arrival at Yokohama of the Belle of Oregon and the Lizzie O. Troop, both American barks, which has been chartered for the purposes mentioned. The former vessel carried 1900 tons and the latter 230 tons of high grade hot-air dried river rock. It was learned, also, from Major Willis that Prince Takamine has built a mill for the manufacture of this rock at Tokio, all the machinery, washers, crushers, acid chambers, etc., having been bought in this country. These shipments are only the first of what promises to be a new field for the distribution of the South Carolina rock, and the mill as Tokio will undoubtedly be followed by the erection of other mills in the empire of Japan. The establishment of the trade with Japan is a noteworthy piece of enterprise, and especially in the view of its probabilities in the near future."

22. State of California. 1890. Charles Timothy Beach (father of Charles P. Beach) in the Great Register (California registry of voters) in 1890. Sacramento, California.
• ***Summary:*** For the first time we find his middle name spelled out. And we learn he was still alive in 1892–assuming he had to register in person.

Charles Timothy Beach, age 45, born in Connecticut. Teacher. Residing in Colton, San Bernardino County, California.

This same man also appears in the California's 1892 Great Register. Charles T. Beach, age 47, born in 1845, residing in San Bernardino County, California.

23. *Chicago Daily Tribune.* 1891. Whiskey to be cheaper. Discovery of a new and better process of manufacture. From 12 to 15 per cent can be saved over the old method–Takamine a Japanese, the inventor–He sells his secret to the trust–It will be immediately utilized. Prospect of a reduction of the retail price. Feb. 20. p. 8.
• ***Summary:*** Col. P.J. Hennessy, the new Secretary of the [whiskey] trust replied: "'There is a 'new process' which in my judgment and the judgment of our officers will materially reduce the cost of manufacture. This is the discovery of a Japanese chemist named Takamine, now a resident of Chicago. He came to this country some years ago as the representative of the Government of his nation at the New Orleans Exposition [Louisiana]. He fell in love with an American girl. After having visited his native country, and after having reported the success of his mission here to the Mikado's council, he returned, married the American girl, and immediately set up in business as a expert chemist.

"'His attention was turned early to the process of distillation from corn. He thought that the yield under the prevailing process was inadequate and rather too expensive. He set about to correct the matter.'" He succeeded by discovering a process which does away with the use of small grain or malt to bring about the conversion of the corn mash. The process, which is Takamine's secret, reduces the cost of production and increases the quantity of the spirits obtained from the corn–by 10 to 15%.

"'We have made tests of the new process at the Phoenix and other distilleries which we control, and are so well satisfied that we have entered into a contract with Takamine for the use of his process in our distilleries. The contract was made Wednesday evening [Feb. 18], and we control the process throughout the United States.'" The spirits will be as good under the new process as they were under the old.

"It appears that Takamine, the inventor of the process, was obliged to sell a part interest in his new invention to a capitalist who carried him through. It is now controlled by the Takamine Fermenting company, which has disposed of the right to use it in the United States to the trust, or as Col. Hennessy will insist on calling it, the Distilling and Cattle Feeding Company of Illinois.

"It is understood that Takamine first opened negotiations with the Shufeldt company. He obtained better terms from the trust, and acted according to his interests."

Note 1. This is the earliest publication seen (Aug. 2012) that mentions Jokichi Takamine.

Note 2. This is the earliest document seen (Aug. 2012) that mentions Chicago in connection with Mr. Takamine, who is now a resident of Chicago.

Note 3. This is the earliest document seen (Aug. 2012) that mentions the Takamine Fermenting Co. [probably a misspelling of the Takamine Ferment company / Co., as it was given in all subsequent articles]. It was probably established in 1890 in Peoria, Illinois (J.W. Bennett, p. x, in Miles 1988; Bill Adams 1990), In 1894 or 1895 it was probably moved to Chicago (W. Scott 1922, p. 370-72).

It was still producing dividends in 1921 when Jokichi Takamine mentioned it in his well.

24. *Peoria Transcript* (*Illinois*). 1891. Tests by the Trust. A Japanese still being erected in Wollner's lower house–The new process and what is claimed for it. Feb. 26. p. 8, col. 4.
• ***Summary:*** A large room at Woolner (Grove Distillery) is being set aside for J. Takamine. "The Wollner Bros.' lower distillery, situate [sic] at Bridge Junction, is now the scene of very interesting operations, the outcome of which is watched with keen interest, especially by the [whiskey] Trust men. One corner of the huge building has been set apart as the scene of the test, which is about to be made for the first time, and for several days men have been erecting one of the Japanese stills. The test if successful will revolutionize the manufacture of high wines and alcohol. The still which is now in process of construction is in itself a miniature distillery.

"Emanuel H. Kanits, the Trust chemist, who lives on Fifth street, has charge of the experiments. The still or process was invented some time ago by a Japanese named Tachimene [sic, Takamine]. Its prime importance is its cheapening of the product, no barley or malt being used and the services of the yeast maker and others being dispensed with.

"Corn alone is used, and the great secret is the preparation of the corn. Some substance is sprinkled on the corn, which causes it to sprout and grow. The corn is not ground fine as it now is, but is merely broken. The time of fermentation is also considerably reduced from seventy-two hours, as now, and no yeast maker is required to assist the fermentation. It is also claimed that a half gallon more spirits can be secured to the bushel of corn."

"The cheapening of the product is thus easily to be seen." A brief analysis of the cost savings from barley, malt, and corn is given. "A Chicago member of the trust says if successful 10 cent whiskey will soon be a thing of the past.

"Tests of the process which have been made in chemist's laboratories have been highly successful, but this is the first actual test. Everything is nearly in readiness and the still is expected to be in shape for operation by the last of the week. The inventor is close at hand and will be here to explain things. The trust has either purchased or has an option on the process and should it prove satisfactory, will be the gainers."

Note 1. This is the 2nd earliest document seen (June 2012) that mentions Mr. J. Takamine.

Note 2. In the earliest Takamine patent seen related to fermentation (British patent no. 5,700. 8 p. Application filed 2 April 1891. Accepted 17 Oct. 1891) he states on page 2, line 20, that corn may be used as a substrate in the koji process, although rice was traditionally used in Japan.

25. *Peoria Herald* (*Illinois*). 1891. Japanese whiskey. Feb. 28. p. 8. Saturday.

• ***Summary:*** "The following interesting description of Japanese whiskey and its manufacture is an extract from an article in the *Chicago Herald* of recent date. It will be more interesting for that [sic] it is said the Peoria distillers will enjoy a monopoly of its manufacture in the civilized world."

"Delights of this new whiskey: Japanese whiskey, they say, will make a man indifferent to dragons or anything else. It has been invented by Jokichi Takamine. This young Jap is a scientist, and has a new method of fermenting alcoholic liquors. The discovery is an important one, and may revolutionize the distillation of whiskey. Mr. Takamine has patented his new process in Europe and the United States, and has engaged such lawyers as Ben Buttersworth and Messrs. Hale and Brown. He has also organized the Takamine Ferment Company, with a capital stock of $1,000,000, which will be increased to $10,000,000 March 5. This corporation, through its attorney, C.B. Matthews, of Cincinnati, has just closed a contract with the Distillers' and Cattle Feeders' Company, of Peoria, Illinois, granting to the latter the right to use the patent process."

"After several weeks' trial it has become satisfied of the value of the Japanese discovery and is to adopt it.

"The chief value of Mr. Takamine's new process is that in the manufacture of spirits [distilled alcoholic beverages] it saves 7 cents on each bushel of corn. The calculation is based on the present price of that grain, 50 cents, which is about 15 cents higher than the average for ten years past. The new process promises, it is said, to support the previous methods in the manufacture of liquors, and to produce especially a superior quality of high wines [the product of the first distillation in a batch or pot still process]. It is also calculated to reduce the cost of labor and fuel and to increase the capacity of the machinery now in use. Under the new process one tub may be used instead of three, as the old method, thus saving two-thirds the present cost of labor, fuel and plant investment.

"Who Mr. Takamine is: Mr. Takamine is the eldest son of a distinguished physician at Tokia [Tokio]. At fourteen years of age he was sent to Glasgow, Scotland, to receive a European education. By birth he belongs in the rank of the privileged few who are permitted to talk familiarly to the Mikado [emperor of Japan]. He was graduated with high honors at Glasgow and removed to London, where he completed a post-graduate course, becoming a pupil of Prof. Mills. While there he became a member of the London board of trade. In 1884 he was sent by the Japanese government as commissioner to the Universal Exposition at New Orleans. While there he met one of the belles of that city. In due time a wedding occurred. Soon after, the happy couple crossed the seas to the groom's home.

"They came to Chicago a few weeks ago, and are now visiting the bride's parents, Mr. and Mrs. E.A. Hitch. They are accompanied by two young sons. Mr. Takamine is about 33 years of age, of medium size, prepossessing [attractive

or appealing], has complete command of the English language, and, although quiet and reserved in manner, is a delightful companion. He came here to demonstrate the practical workings of his theory, and these demonstrations, conducted under his direction during several weeks in one of the distilleries of the Distillers' and Cattle Feeders' Company, have abundantly satisfied and even delighted the businessmen who have examined the operations.

"What his new process is: The process Mr. Takamine has discovered consists principally in the selection of a microbe or ferment cells of superior power which can be preserved dormant for any length of time, and vitalized and multiplied under certain conditions whenever required for use. A distinctive feature of the new ferment is that, having done away with the use of malt and small grain in conversion, it proceeds directly to complete the process of fermentation without the use of vinous yeast [yeast associated with wine] or any other fermenting agent. Under the old methods the yeast would occasionally lose its strength and become putrescent. The new process, however, is always able to cause a ferment by its powerful diastase.

"Malt is dried barley containing very little starch, which has been exhausted to produce the germ for diastase. The malt but slightly contributes to the production of alcohol and is far more expensive than corn, costing twice or three times as much. In dispensing with malt and substituting corn by the use of the new ferment, not only is much cheaper material employed, but a much greater proportion of starch secured. The gain by substituting corn for malt and small grains is estimated to amount to from 7 to 10 cents per bushel. When the starch is converted by the rapid power of this ferment into sugar, the solution shows by actual test twenty pounds to a bushel of corn. as against fourteen pounds by the former methods. There is also a resultant production of twenty-one and ninety-six one hundredths quarts of spirits to the bushel, against nineteen quarts, the maximum quantity obtained in any other way.

"He talks about his discovery: 'The object of this invention,' Mr. Takamine said the other day, 'is to ferment liquor of greater percentage of alcohol than has hitherto been done, and to make it of any desired strength under 20 per cent of alcohol. Liquors fermented by European yeast vinous produce no more than 5 or 6 per cent of alcohol for every hundred parts of fermentable liquor. Therefore, in the manufacture of whiskey, in order to obtain six parts of alcohol ninety-four parts of liquor have to be dealt with all through the process. By my new process I produce by direct fermentation a liquor containing 15 to 20 per cent of alcohol...'"

"This superior ferment cell, discovered by Takamine, is called 'moyashi' in the Japanese language. He claims to have attained perfect success in preparing moyashi in an absolutely pure and healthy condition, far superior to that made by the old process, and he can preserve it in this new form in a healthy condition for a much longer period than heretofore. Moyashi contains a seed which will grow on any starch substance in air or water. The germs growing in air produce a plant called 'koji,' which converts starch into sugar and acts as a diastase in place of malt. The same plant raised on starch matter under water acts as yeast with the exception that the fermentation is three times as strong as yeast. It is able to live in a solution which is from 18 to 20 per cent alcohol, making a ferment termed 'mote,' which completes fermentation within a period of forty-eight hours, a much briefer time than permitted by government regulations of seventy-two hours."

Note 1. Much of the detailed description of how the Takamine process works is summarized from his patent applications. Note 2. Line 2 says that this article is "an extract from an article in the *Chicago Herald* of recent date. So we tried to find the original article. Elaine Sokolowski, of Reference Services, Peoria Public Library (Peoria, Illinois) ordered a microfilm copy of the *Chicago Herald.* When she searched the microfilm for articles in early 1891 she found that the reel started in April 1890 and then had only a few scattered issues in 1890, then jumped to 5 May 1891; therefore the issue we were trying to find was not included. Moreover, most of the film was in very bad condition with torn edges. The film came from the Illinois State Library in Springfield, which usually has the best copies available. We decided to give up looking for the original article.

Note 3. This is the earliest English-language document seen (Aug. 2012) in which the word "diastase" (or "diastatic" etc.) or the word "moyashi" or the word "koji" is used in connection with Mr. Takamine.

26. *Peoria Journal* (*Illinois*). 1891. The Whiskey Trust. March 1. p. 8. Sunday.
• ***Summary:*** "The late flurry over the Whisky Trust has almost subsided. The members now walk the streets like ordinary men, and are no longer interested in the price of dynamite, the beauties of an antiseptic fluid or the possibilities of gin. Instead they are rejoicing that the new Japanese process of making whiskey will give them the market anyway. Then there will be no further trouble."

27. *Chicago Daily Tribune.* 1891. Worth lots of money. Jokichi Takamine's discovery of a process of fermentation. Capital stock of the company increased from $1,000,000 to $10,000,000–The process discovered while the Japan was studying chemistry–How it differs from all previous methods–Being introduced in this country. March 6. p. 9.
• ***Summary:*** "At a meeting of stockholders of the Takamine Ferment company held yesterday in the company's offices, Room 907 Chamber of Commerce Building [Chicago], the capital stock of the company was increased from $1,000 to $10,000,000. Among the directors present were: George T. Burrows, E.V. Hitch, John Waltz, E. Moore, Jokichi

Takamine, George D. Hart, C.B. Matthews, William George Gardner, Dr. M.A. Spencer, and T.B. McFarlan of Cincinnati."

"Mr. Takamine is the eldest son of a distinguished physician of Tokio. He graduated with distinction from the University of Edinburgh, Scotland, and afterwards continued his post-graduate course in Chemistry applied to the practical arts under Prof. Mills, F.R.S., of London, one of the foremost chemists of the age. It was while pursuing these studies that Takamine discovered the active principle contained in this new ferment. In connection with Prof. Mills he conducted a series of experiments in the laboratory, extending over several years, and upon his return to Japan three years ago [i.e., about 1888] made practical tests on a large scale, which confirmed the results of his laboratory work and established the commercial value of his discovery.

In 1884 Mr. Takamine was sent by his Government as Commissioner to the World's Cotton Exposition, held in New Orleans [Louisiana], and on his return to Japan was appointed Director General of the Patent Office and Commissioner of the Technical Department of Agriculture and Commerce of Tokio. While in New Orleans he was married to Miss Carrie Hitch, one of the belles of that city.

"Introducing the process: During the last four years he has traveled all over the United States and Europe, visiting the principal distilleries of those countries with a view to the introduction of his new process of fermentation. Takamine is a Fellow of the Royal Society of Engineers and a member of the Royal Society of Chemists of London.

"The salient point in the process Mr. Takamine his discovered is the selection of a microbe or ferment cell of superior power. This microbe of single cell organism is produced by a fungus growth on rice, and is termed en masse 'moyashi.' Moyashi contains a seed which will grow on any starch substance in air or water. The germs of air growth are called 'Koji,' and will convert starch into sugar and act as a diastase in place of malt. The same plant raised on starch matter under water acts as yeast,... It is able to live in a solution which is from 18 to 20 per cent alcohol as against the usual 4 per cent, making a ferment termed 'moto,'..."

"A calculation based on the output of maltsters, brewers, distillers, manufacturers of vinegar, and others using ferments makes the yearly value of the Takamine discovery equivalent to $23,000,000."

28. *Daily Picayune* (*New Orleans, Louisiana*). 1891. Cheapening the manufacture of whisky. March 6. p. 4.
• ***Summary:*** "Yankees will have to hold their inventive laurels with both hands or the Japanese will soon bear off the crown. A Jap. is ahead again with a new and improved method of making whisky. His name is Takamine. He has been but a short time in the country, but he has used the time to good advantage, and now, by his process, whisky can be made some 15 per cent more cheaply than heretofore, and a considerably larger quantity can be made from a bushel of 'mash.' The whisky trust have the new process in their hands, and it is to be adopted in all the distilleries under their control. This new invention may not prove to be public blessing; and it is not yet determined whether the whisky it produces contains as many headaches and attendant evils as the old article."

29. Associated Press (AP). 1891. "Microbe straight." The new drink that barkeepers will serve. *Los Angeles Times.* March 7. p. 1.
• ***Summary:*** "Chicago, March 6. The Takamine Ferment Company, organized by the Whiskey Trust to exploit a new process of whisky-making invented by the Japanese chemist Takamine, has increased its capital stock to $10,000,000."

Note: This is the earliest document seen (Aug. 2012) that mentions the "Whiskey Trust" in connection with Mr. Takamine.

30. *Washington Post.* 1891. Saves $23,000,000 a year. The Takamine process of whiskey making–Preparation of the mash. March 7. p. 1.
• ***Summary:*** This is a summary of: *Chicago Daily Tribune.* 1891. "Whiskey to be cheaper." Feb. 20. p. 8.

31. Distilleries. 1891. Peoria, Illinois: Peoria Public Library Peoriana Notebooks. See p. 683. Scrapbook clipping.
• ***Summary:*** This unpublished scrapbook clipping reads: "March 21, 1891–Takamine, a Japanese distiller at the Wollner still house, announced an improved method by which 21 quarts of proof spirits could be produced from one bushel of grain instead of the standard output of 18 quarts."

Letter from Elaine Pichaske, Reference Dept., Peoria Public Library, Peoria, Illinois. 1995. Feb. 7. Dallas Sweeney (who died in Oct. 1958) compiled the Peoriana Notebooks from articles taken from the *Peoria Daily Record* of the 1930s and 1940s. They are chronology and subject notebooks [actually scrapbooks]. This article is from Volume 5, page 700, under the subject of Distilleries. There is no index to the *Peoria Daily Record* so there is no easy way to find when this article was originally published. Address: Peoria, Illinois.

32. *Chicago Daily Tribune.* 1891. Takamine Ferment Company directors. April 14. p. 3.
• ***Summary:*** "A meeting of the stockholders of the Takamine Ferment company was held yesterday in the rooms of the company in the Chamber of Commerce Building. It was decided to increase the number of directors from three to nine. An election to choose the six new members will probably be held April 27.

Note: Where did Takamine get the money in April 1891 to have permanent offices in the Chamber of Commerce Building?

33. *Chicago Daily Tribune.* 1891. Gleanings in local fields: Items. May 7. p. 3.
• ***Summary:*** "The directors of the Takamine Ferment Company met yesterday and elected the following officers: Jokichi Takamine, President; D.E. Sibley, Vice-President; Edward Moore, Secretary; George D. Hart, Assistant Secretary; E.U. Hitch, Treasurer."

34. Associated Press (AP). 1891. Cheaper whiskey. What the Japanese process may accomplish. *Los Angeles Times.* June 7. p. 7.
• ***Summary:*** "Chicago, June 6. A local paper this evening says: The whiskey trust is figuring on a reduction of the prices of spirits. The Japanese process of distilling, called Takamine, will be adopted immediately by the companies in the combine and in consequence of the great saving resulting from the new system the expense of distilling will be reduced about 15 cents per bushel of mash. This makes it possible for producers to cut the old price of whiskey 3 or 4 cents per gallon."

"The adoption of the Takamine process is the direct result of the deal made by the trust the other day by which it got possession of the Shufeldt and Calumet distilleries."

35. *Chicago Daily Tribune.* 1891. Plans of the "trust." Price of whiskey more liable to come down than go up. President Greenhut talks of certain rumors in circulation–Dividends not to be reduced not prices inflated–No foundation for talk of a new anti-trust distillery–The Takamine process–What Greenhut thinks of the Gibson case. June 14. p. 17.
• ***Summary:*** J.B. Greenhut of Peoria, Illinois, President of the Distilling and Cattle Feeding Company (whiskey trust) stated yesterday: "Our experiments with the Takamine process have been carried out on the Wollner distillery in Peoria. We are now putting in a complete plant there and expect to use the Takamine process for purposes of production within two weeks at the Wollner distillery. It will then be rapidly placed in the other distilleries owned by our company." Lower prices are expected, in keeping with a "legitimate margin of profits."

36. *New York Times.* 1891. The whiskey interests. July 25. p. 5.
• ***Summary:*** The "Whiskey Trust has decided to concentrate the whisky-producing interests of the West at the headquarters of the trust, which are now in Peoria, Illinois, by disposing of the distilleries at outside points and increasing the capacity of Peoria distilleries."

These moves, with reduction of the number of employees, "together with use of the Takamine process, will, it is thought reduce the cost of production to the minimum."

37. *Chicago Daily Tribune.* 1891. Business. Financial. Sept. 17. p. 11.
• ***Summary:*** "There was a conference Tuesday between the directors of the Takamine Ferment company and Mr. Greenhut of the distillers' trust at which it was agreed to fit up an entire distillery at Peoria with the new [Takamine] process. There have been demonstrations on a small scale which have satisfied the distillery company that a saving of something like $3,000,000 can be made on the year's product. The work... will begin immediately. The relations between the whisky trust and the Takamine company are very cordial."

38. *Chicago Daily Tribune.* 1891. Distillers to use the Takamine process. Sept. 24. p. 7.
• ***Summary:*** "Peoria, Illinois. Sept. 23–For several months the Distillers and Cattle Feeders' company [whisky trust] has been experimenting with the Takamine process of making whiskey." Takamine "has been here personally conducting the experiment. The distillers are so well pleased that they have decided to fit up the Manhattan distillery with new machinery. The new plan greatly reduces the cost of manufacture. A queer feature is that a species of bugs found on the rice is used instead of yeast for the fermenting process."

Note 1. This is the earliest document seen (Aug. 2012) concerning Mr. Takamine and the Manhattan Distillery.

Note 2. This is the earliest document seen (Aug. 2012) that mentions "bugs" in connection with the Takamine process. There are no "bugs" in the process, only microorganisms.

39. *Peoria Journal* (*Illinois*). 1891. The whiskey process. Sept. 27. p. 8, col. 3.
• ***Summary:*** "Those people who had faith in the Takamine process of making whiskey are now about to reap a rich harvest. The stock that was at fifteen cents has now suddenly jumped to par. Captain Zeller was lucky enough to pick up five thousand dollars of it last week at the former figure and he is rejoicing to-day over his good luck. The Takamine process is simply introducing the Asiatic method of ceaseless work into the Saxon home of prosperity and independence. Long ago Hepworth Dixon said: 'That the meat eater would in the coming conflict stand no chance with the rice eater.' What he has predicted of men has actually come true of whiskey.

"The bacillus of the vine that has hitherto made alcohol stands no chance with the bacillus of rice that has hitherto made 'sake.' Here on the banks of the Illinois the whole tremendous problem is to be wrought out. We can imagine the vine bacillus looking with consternation at the work of this former rival, and, in the words of Bill Nye, saying: 'We are ruined by Chinese cheap labor' for this is what it amounts to. The foreign emissary is driving out the European product. However, we must even grin and bear it, and take it with

what grace we can. We are assured that the price of whiskey is not to be increased, but only the quantity; and this, of course, is a boon in itself."

40. *Chicago Daily Tribune.* 1891. Bugs in the whisky: They will hereafter be used to ferment it–Liquor may be cheaper. Sept. 29. p. 9.
• ***Summary:*** "Peoria, Illinois. Sept. 26–The Distilling and Cattle Feeding company [whisky trust] of this city, which controls the whisky manufacture of the world, has adopted a new process in the manufacture of spirits which will yield better returns than a gold mine.

"About eight months ago a Japanese named Takamine announced that he had discovered a new process of fermentation which would lessen the cost of production several cents a gallon, and at the same time cause a bushel of grain to yield two quarts more of spirits.

"He was at once taken in hand by the distillers of this city, and since that time daily experiments have been conducted at one of the Wollner distilleries on a mash of 150 bushels a day. The experiments have been so successful that the plan has been adopted by the whisky trust and orders issued to place the Manhattan distillery, with a daily capacity of 3,000 bushels, in shape to use the Takamine process."

"A curious about it is that the fermenting agent, yeast, is dispensed with altogether, and in its stead a sort of fungus growth, found on rice stalk is used. Under the microscope this fungus is shown to be swarming with animiculæ–little red and black bugs–which multiply very rapidly in a warm place."

Takamine will receive "one-fifth of all profit arising from the process. The whisky trust furnishes machinery and every expense and gets four-fifths."

41. *Peoria Transcript* (*Illinois*). 1891. A hard fight. Everything against the firemen at the Manhattan fire. Oct. 8. p. 8, col. 3.
• ***Summary:*** A fire of unknown origin, which started shortly after midnight, burned one building at the Manhattan Distillery (3 story brick building at South Water St., Peoria), which "was being fitted for experiments in the manufacture of Tackimine [sic, Takamine] whiskey."

"The fire at the Manhattan malt house early yesterday morning was a most peculiar one and it is only by sheer luck that other buildings were not destroyed. When Hose Co. No. 6, at whose house the alarm was turned in, reached the scene the fire, though blazing brilliantly, was confined to a small frame tower, and under favorable circumstances could easily have been extinguished. They laid a line of hose, but so great was the distance from the burning building to the nearest hydrant that the hose would not reach, and the crew had to stand about until the arrival of Hose No. 4, who completed their line. The water was then turned on, but to their extreme disgust the firemen found there was no pressure." Many other problems with the Peoria fire system that prevented the fire from being extinguished promptly are also described.

"The building will be rebuilt at once, though the fire is a great inconvenience to the company, for the house was being fitted for experiments in the manufacture of Tackimine [sic, Takamine] whiskey."

Note: This is the earliest document seen (Aug. 2012) that mentions a fire in connection with Jokichi Takamine.

42. Takamine, Jokichi. 1891. Improvements in the production of alcoholic ferments and of fermented liquids thereby. *British Patent* 17,374. 13 p. Date of application, 12 Oct. 1891. Accepted 12 Oct. 1892.
• ***Summary:*** This patents offers improvements to the author's British Patent 5,700, which was accepted on 17 Oct. 1891. "I first proceed to describe my process of preparing, developing and manufacturing what I shall term Taka-Moyashi and pure Taka-Moyashi.

"Tané-Koji (or seed koji) or Moyashi, is a term that has been heretofore applied to a yellowish green mouldy mass, consisting of steamed rice covered by a Mycelial fungus, bearing yellowish green spherical cells. This particular fungus belongs to the class *Aspergillus*, and has the property of producing both diastase and ferment cells. It has not heretofore been designated by any specific name, and I call it 'Aspergillus Koji.'

"In preparing Tané-Koji or Moyashi (as above defined) by the old process, hulled semi-cleaned rice is first steamed until the starch cells are opened; it is then mixed with the ashes of trees (camelia Japonica and Kashi [oak tree])." Details of the improved process are then given, followed by an improved method for making "taka Koji."

At very end of patent: "By L.W., per F.B."

Note 1. This is the earliest document seen (Aug. 2012) in which Mr. Takamine mentions the word *Aspergillus* (a genus of molds / fungi) or the term "Taka-Moyashi" (regardless of hyphenation or capitalization) or the term Tané-Koji (regardless of hyphenation or capitalization or accents). Address: Chemist, 25 & 26 Honore Buildings, Chicago, Illinois.

43. Takamine, Jokichi. 1891. Improvements in the production of ferments and of fermented alcoholic liquors. *British Patent* 5,700. 8 p. Date of application, 2 April 1891. Accepted 17 Oct. 1891.
• ***Summary:*** "The object of this invention is to prepare active ferment cells, known as Moto and Moyashi, in a healthier condition than by the old process, and also to preserve moyashi...; and, further, to ferment alcoholic liquors of a greater percentage of alcohol than has hitherto been done, and of any desired strength under twenty *per cent.* of alcohol."

In preparing moyashi by the old process, the semi-cleaned steamed rice is mixed with ash of a certain before

adding seed ferment and the subsequent processes. The object of adding tree ash is to supply the want of nourishing ingredients necessary for the growth of the ferment; but the composition of the ashes being variable (differing with the different parts of the tree) a healthy growth of ferment could not be depended upon.

"I discovered that the ferment cells grow and flourish to their highest stage by supplying the proper ingredients for their nourishment in proper quantities and proportions." The author lists exactly which chemical ingredients should be added in what range of amounts; they include ammonium salts, potassium salts, magnesium sulphate, calcium sulphate or calcium phosphate, potassium phosphate, potassium hydrate or carbonate, etc. The main salts are 22.7% potassium sulphate, 20.5% mono-calcic phosphate, 24.4% magnesium sulphate, 27.8% tri-sodic phosphate, and 4.6% ammonium sulphate.

"Any grain may be used for cultivating moyashi, but the proportions of the ingredients in the above formula may be varied somewhat depending upon the particular grain used... For rice, the first column of figures in the above formula set out represent the proper proportions. Corn requires a greater proportion of phosphoric acid..."

Moyashi refers to the koji starter culture. This was traditionally "a grain or cereal, with a green mould, and this was the form in which it was used both in the manufacture of koji and alcoholic liquors." It was stored in paper bags and the green powdery substance on the grain [mold spores] was not separated from the substrate. By Takamine's new process, the moyashi is first dried (a desiccating substance may be used) at a temperature below 15º Centigrade. "Then it is sifted through a fine sieve, and the grains separated from the green powder, which constitutes the seed ferment cells.

"The green powder thus prepared is again dried by the above process, and is then sealed in an air tight vessel, or is mixed with inert, and at the same time hygroscopic substances, such as roasted starch, or anhydrous calcium sulphate." The objects of mixing these ingredients are: "1st. To increase the volume so as to be convenient for sprinkling over cereals in koji making. 2nd. To keep the ferment cells always dry..."

"Moto (a liquor containing active ferment cells, which is used in the process of alcoholic fermentation) in the ordinary way, is made by using steamed rice and rice koji..."

He then describes his new and improved method for making koji and moto. "Koji may be made from any grains, cereals, or other starch-containing substances, or substances which supply the necessary ingredients for the growth of the ferment."

"Koji has a diastatic power, or the power of converting starch into sugar in the process of making alcohol. It may be used in combination with malt and the small grains, as the latter are now employed, as a diastase in making the conversion, but koji possesses the diastatic power or quality of making the conversion without the aid of, or combination with, malt and the small grains, and it may be used alone, without reference to them or either of them.

"Instead of preserving the koji ferment cells, supported upon the gelatinized particles of grain as above stated, the mass may, after the ferment cells have been properly treated, as set forth, steeped in water for from three to twelve hours... the temperature of the water being not over 20º Centigrade, and the proportion of water being three times the weight of the mass employed."

At very end of patent: "By L.W., per F.B."

Note 1. Neither the word "enzyme" nor the word "Aspergillus" nor the word "spores" are mentioned.

Note 2. In this process, Takamine describes physical separation (by sifting) of the mold spores from their grain substrate, but he does not describe isolation of enzymes from the substrate or the mold.

Note 3. This is the earliest patent seen issued to Takamine.

Note 4. At the top of the first page of the patent is written: "No. 5700. A.D. 1891." After the number is the British patent seal. On the second line: "Date of Application, 2nd April, 1891–Accepted, 17th Oct., 1891." On the third line: "Complete Specification." On the fourth line is the title of the patent.

Note 5. This is the earliest document seen (Feb. 2006) indicating that Takamine had an office or residence in Chicago. The address given is for an office; it is not clear where his wife and family lived from 1890 to 1894. Address: Chemist, 25 & 26 Honore Buildings, Chicago, County of Cook, Illinois.

44. Associated Press (AP). 1891. Cheaper whisky: What the trust expects to do by the Takamine process. *Los Angeles Times.* Nov. 11. p. 1.

• ***Summary:*** "Chicago, Nov. 5–Jacob Wollner, one of the directors of the whisky trust, today said that the company had made all preparations to begin distilling spirits at Peoria next week by the Takamine process... He added that Takamine would at no distant day demonstrate that he could make beer, ale, and other fermented liquors by his process and much cheaper.

"Mr. Wollner declared that the trust would not buy any more distilleries as it now has 90 per cent. of the customers, and is securing those of its rivals by offering goods at lower prices. The Takamine process, Wollner believes, will eventually give the trust complete control [a monopoly] of the whisky output."

45. *Chicago Daily Tribune.* 1891. Koji lessens the cost of whiskey: But the retail price will remain 51 cents for one drink, 25 for two. Nov. 19. p. 9.

• ***Summary:*** "The Manhattan Distillery at Peoria, the first to be equipped for the fermentation of spirits by the Takamine

process, was run on its full capacity yesterday, and to the entire satisfaction of the whiskey trust and the company controlling the patents... The Manhattan has a capacity of 2,500 bushels and 12,000 gallons of spirits a day.

"Under the new process a saving of nearly or quite $1 is made in the cost of koji, the fermenting agent, over the cost of malt or small grain, and the yield from a bushel is increased three quarts on an average.

"The koji is a growth of fungi propagated on the slops from distilleries or on any starchy matter... It may be used wherever a diastase or ferment is required."

46. Jokichi Takamine (center) with his two young sons, Jokichi, Jr. and Ebenezer (Photograph). 1891. Undated.
• ***Summary:*** This photo is from the book "Where the Wings Grow," by Agnes De Mille (published by Doubleday, 1978), and in the booklet "Shofu-Den" by the Japanese Heritage Foundation (1994, p. 12–which gives the date as 1891).

47. Lakeside Annual Directory of the City of Chicago. 1891. Chicago, Illinois: Chicago Directory Co. See p. 2241
• ***Summary:*** The two consecutive entries on page 2241 read: "Takamine Ferment Co. Jokichi Takamine, pres; Edward Moore, sec; E.W. Hitch, treas; 907 chamber commerce bldg.

"Takamine, Jokichi, pres. Takamine ferment co. 907 chamber commerce bldg. h [home] 244 Ontario." Address: Chicago, Illinois.

48. Associated Press (AP). 1892. Fighting a trust. The whisky combine not to have the entire field. *Los Angeles Times.* March 27. p. 17.
• ***Summary:*** Peoria, Illinois, March 26. Samuel Wollner is said to have sold stock in the Distillers' and Cattle Feeders' Company [whisky trust] with plans to erect new distilleries for the purpose of fighting the trust. Wollner told a reporter that the rumors are correct; that he has "associated himself with others for the purpose of building two distilleries–each of about 5,000 bushels capacity."

He is "trying to get possession of a new process recently discovered in Hungary. It does away with the use of malt..." "It will be a great deal cheaper than was first claimed for the Takamine process."

49. *Los Angeles Times.* 1892. Flashes from the wires. April 16. p. 4.
• ***Summary:*** "At Peoria, Illinois, yesterday twenty-two and one-fifth quarts of alcohol to a bushel of corn were made in a large mash at the Woolner distillery by the Takamine process. The predictions of the inventor were verified. An increased yield of over two quarts of alcohol to the bushel was obtained."

Note: A similar story, titled Takamine's method of distilling, appeared in the *New York Times* on April 17, p. 16.

50. *Chicago Daily Tribune.* 1892. All ready to apply. Takamine's whisky distilling process complete. April 17. p. 6.
• ***Summary:*** Jokichi Takamine "claims that at last his process has reached a state of perfection which makes it ready for application, and he has served notice to the Distillers' and Cattle Feeders' company that it must carry out its contract with the Takamine Ferment company, of which he is president."

The full text of the communication he sent to the whisky trust is given. The yield of alcohol is enormous. "Koji is the seed which Mr. Takamine uses in his process to cause growth and consequent fermentation. It is produced by sowing in wheat bran a microbe of superior strength, known as moyashi, and the product is cheap."

So far the trust "has expended about $15,000 mainly in

fitting up a plant in the Bush & Brown distillery at Peoria for fermentation by the Takamine process.

"In conducting his experiments at Peoria Mr. Takamine claims he was greatly delayed by the action of persons connected with the Wollner house." Mr. Wollner is planning to erect anti-trust distilleries and says he has "unlimited capital" behind him. He expects to have two Peoria distilleries ready for operation by Nov. 1.

Note: This is the earliest document seen (Aug. 2012) stating that Mr. Takamine uses "bran" or "wheat bran" as the substrate on which he grows his koji microbe [mold].

51. *Chicago Daily Tribune.* 1892. Takamine's process to have a show. May 20. p. 1.
• ***Summary:*** The directors of the whiskey trust "finally decided to give up the Northern Distillery at Peoria to the Takamine process and the necessary alterations will be made at once." It has a capacity of "3,000 bushels a day and will be operated a full capacity under the immediate supervision of Mr. Takamine." This will be the first large scale test of the Takamine process.

Whisky trust stock rose a little to about 47-48 on the announcement. Some time ago, President Greenhut and Nelson Morris dumped great blocks of stock they owned on the market just before they offered their resignations–which were not accepted.

52. Franks City Directory of Peoria. 1892. Peoria, Illinois: J.W. Franks and Sons, printers and binders. 1052 p. See p. 633.
• ***Summary:*** Title page: "For the year ending June 1893." This is the 11th volume of this Peoria directory. Signed and dated, July 1892.

The entry for Takamine reads: "Takamine, Jokichi, chemist, 2111 N. Jefferson St."

There are also two entries in this directory for the year 1894-5 (see p. 710), which read as follows: (1) Takamine Ferment Co., Jokichi Takamine, president, 2111 and 2113 N. Jefferson Ave. (2) Takamine, Jokichi, president, Takamine Ferment Company. Residence 2111 N. Jefferson.

Note: There is no listing for Takamine in this directory for 1895-6. Address: Peoria, Illinois.

53. *Chicago Daily Tribune.* 1892. Japanese in Chicago: They form a club for mutual benefit and assistance. Dec. 11. p. 41.
• ***Summary:*** "There are now in Chicago and its immediate vicinity twenty Japanese who are more or less permanent residents... First and foremost is Jokichi Takamine, chemist, inventor, and World's Fair Commissioner. he was born in Tokyo while it was still called Yedo and is thirty-seven years old. He left Japan at the age of 14, studied in the University of Glasgow, and took a post-graduate course in chemistry in London under Prof. Mills, F.R.S. He passed a number of years in England, Scotland, and on the continent; and on his return to Japan was made Councilor of the Societies of Chemistry and Engineering in Tokyo and Director of the Technical College of the Department of Agriculture. He served with ability as Commissioner to the New Orleans Exposition [Louisiana], and at that time visited the phosphate mines of South Carolina and arranged for the first shipment of phosphate rock ever made from the United States to Japan. He also organized in Japan a company with a capital of $1,000,000 and built a factory operated by Japanese for the manufacture of fertilizers, which have renewed the lands exhausted by centuries of cultivation. Mr. Takamine has also served his native country as Director-General of the Patent Office, which he remodeled after that of the United States and thus made much more efficient.

"Mr. Takamine's fame rests entirely upon his inventive genius, which has made a mark in many improvements in the arts and sciences in Japan, but especially in the new ferment process which bears his name. While he was engaged in his scientific studies in London he began to direct his attention to the subject of fermentation, and after several years of patient research he discovered a new process for the production of alcoholic liquors, and of yeast, vinegar, glucose, sugar, etc.

"Married a New Orleans girl: While in New Orleans, Mr. Takamine made the acquaintance of Miss Carrie Hitch, one of the belles of that city, and they were married. They have two children, Jokichi Takamine Jr., born Aug. 28, 1888, and Ebenezer T. Takamine, born Aug. 31, 1889.

"Associated with Mr. Takamine as assistants in chemical work are two other Japanese who spend most of their time in Peoria, and whose names are Shimizu and Yamada. Mr. Tetsukichi Shimizu took a special course in chemistry under Dr. Divers in what is now the Imperial University of Tokyo. Both he and Mr. Yamada are thorough, practical chemists, and well-educated, clever men."

Illustrations (line drawings) show: (1) Mr. Takamine and his two children (sons). (2) Mrs. Carrie H. Takamine.

54. Takamine, Jokichi; et al. 1892. Tane-koji [Koji starter culture]. *Japanese Patent* 1,748. [Jap]*
• ***Summary:*** The microorganism used for making koji was called *Eurotium oryzae.* Address: Japan.

55. City of Peoria (Illinois). 1892. City clerk's report: Statement of the finances of the City of Peoria. Peoria, Illinois. See p. 66.
• ***Summary:*** In this report is a detailed listing of all fires in the city of Peoria during the year 1891. In October 1891 there were 34 fires. On October 8 there was a fire at 12:30 a.m. [shortly after midnight] in the malt house of the Manhattan Distillery, a 3 story brick building at South Water St. Cause: Dry kiln. Loss: $5,000. Insurance: $10,000. Address: Peoria, Illinois.

56. *Chicago Daily Tribune.* 1893. Demand for whiskey:

Increase in price said to be on that account. Jan. 11. p. 12.
• ***Summary:*** "P.J. Hennessy, manager of the Distilleries and Cattle Feeding company, said that the present advance [in price] of five cents a gallon on whiskey was a legitimate result of the great demand," and not an attempt to corner the market. He said the cause of the great demand is expected legislation by Congress to increase the tax on whiskey.

"Of the Takamine process he spoke most approvingly. He was satisfied of its success and the great saving it would effect in the production of whiskey would seem to make competition impossible. The experiments made with it in the distillery at Peoria had proved so satisfactory that it would have been... and this applied in many of their plants had they not been so busy to supply the demand so suddenly sprung up... Jokichi Takamine, the inventor, claims it will revolutionize the manufacture of distilled spirits, and as a company with $10,000,000 to back it up has, Mr. Hennessy says, been formed."

"The whiskey trust controls the use of the new or "Koji" process, and a statement made at a meeting of the Takamine company yesterday that the process would be applied as rapidly as possible in all the distilleries of the combine was received with decided satisfaction."

57. *Chicago Daily Tribune.* 1893. Koji plant process: Meeting of the Takamine Fermenting company–Savings in distilling. Jan. 11. p. 12.
• ***Summary:*** The annual meeting of the Takamine company was held yesterday. Directors and officers for the coming year were elected as follows: Jokichi Takamine, President. M.B. Hitch, Vice-President. E.V. Hitch, Treasurer. M. Moore, Secretary. George D. Hart, C.B. Mathews, M.A. Spencer, Atwood Violett, L. Pincoth.

President Takamine reported "that the most effective way of using the koji was in the form of a water extract."

58. *Chicago Daily Tribune.* 1893. Denies there is an advance. A member of the trade says the price of whisky has not increased. Jan. 12. p. 3.
• ***Summary:*** The price increase of 5 cents made by the whisky trust is upon spirits, not upon whisky. Wholesale dealers buy spirits. The advance is not due to an increased demand, as stated, for demand has not increased. The Takamine process has not been a success as claimed by the trust. If it were a success, why would the trust have recently purchased competing distilleries?

59. *Wall Street Journal.* 1893. Not all that is claimed. Jan. 12. p. 1.
• ***Summary:*** This article is very similar to (but shorter than) the one titled "Denies there is an advance" that appeared today in the *Chicago Daily Tribune* (page 3).

60. *New York Times.* 1893. Financial affairs. Jan. 18. p. 6.
• ***Summary:*** "50 shares Takamine Ferment Company, $100 each, hypothecated, 115 for the lot."

61. *Chicago Daily Tribune.* 1893. Will run on the Takamine process: The Manhattan Distillery to use it–Agreement with the whisky trust. March 3. p. 2.
• ***Summary:*** "The directors of the Takamine Ferment company have issued a circular to the stockholders of the company defining the relations existing between the company and the whisky trust. A committee, the circular states, visited Peoria and Feb. 20 signed an agreement with President Greenhut of the whisky trust in which, says the circular, the following points were established:

"The Manhattan distillery is going to be run without any delay on the Takamine process.

"After the distillery has been running for thirty days without interruption the net saving will be established, according to the existing contract between the two parties interested.

"After the results of the process of the Manhattan distillery shall have established the saving as satisfactory to both parties the existing contract between the parties will be carried out to its full extent."

62. Dillon, M.P. 1893. Wives of distinguished Japanese: American beauties in the aristocracy of old Japan. *Atlanta Constitution* (*Georgia*). March 12. p. 19.
• ***Summary:*** The section titled "Met at the New Orleans Exposition" states: "Of all the foreign ladies who have married into the aristocracy of Japan, Mrs. Jokichi Takamine is perhaps the most interesting. She was Miss Hitch, a society girl of the Crescent City [New Orleans, Louisiana], and met her future husband during the New Orleans exposition six or seven years ago, where he was a Japanese commissioner."

"He is called 'the alchemist' by his Tokio friends because of his life-long study of chemistry." "Mrs. Takamine is about twenty-five years old, is beautiful, vivacious, and the proud mother of two fine boys." Her union has proved a very happy one.

Of the four attractive illustrations, one shows "Mrs. Takamine, formerly Miss Hitch of New Orleans." She is dressed in a Japanese kimono, kneeling on a Japanese floor cushion (*zabuton*), and holding two chopsticks. A tea set is on a tray on the floor in front of her to the right.

63. *Daily Picayune* (*New Orleans, Louisiana*). 1893. Society. April 2. p. 13.
• ***Summary:*** "A recent letter in a northern newspaper, in writing of foreign wives of Japanese, has included among the American beauties in the aristocracy of old Japan, a former New Orleans girl, and has this to say about her: Of all the foreign ladies who have married into the aristocracy of Japan, Mrs. Jokichi Takamine is perhaps the most interesting.

She was Miss Hitch, a society girl of the Crescent city, and met her future husband during the New Orleans exposition, six or seven years ago, where he was Japanese commissioner. He had always been a high official in the department of agriculture and commerce, and has been decorated by the mikado.

"He is called the alchemist by his Tokio friends, because of his life-long study of chemistry, which has resulted in the discovery of the method of distilling and fermenting spirituous liquors now being perfected by the Takamine Company, of Chicago. Mrs. Takamine is about 25 years old, is beautiful, vivacious and the proud mother of two fine boys. In a few cases foreign brides in Japan have gone to live in Japanese houses and in Japanese style. In fact they all insist upon doing this at first; afterward, more from the husband's preference than from their own, they go back to their own foreign ways."

64. *Chicago Daily Tribune.* 1893. Whiskey trust watching "the Jap." It eagerly awaits the results of his experiments at Peoria, Illinois. June 1. p. 11.
• ***Summary:*** The "managers of the Distilling and Cattle Feeding company [the Whiskey Trust] are keeping a sharp eye on the Manhattan distillery these days. The reason is that Jokichi Takamine, the Jap, is engaged in an endeavor to prove to them that he has the best process for whiskey manufacture. It is by means of his koji, which he claims will cause an entire revolution in the manufacture. The Manhattan Distillery, one of the 'seeding' houses, has been given over to his control, and he has made preparations accordingly. The first mash was made Monday. It consisted of 750 bushels,... The first spirits will be drawn off tomorrow and a record will be kept from now on. Takamine claims that in thirty days his process will be adapted or rejected,... If the koji can be produced cheaper than the malt all argument will be set at rest..."

65. *New York Times.* 1893. The whisky trust business. July 4. p. 4.
• ***Summary:*** Peoria, Illinois, July 3–There was a meeting of the Board of Directors of the Whisky Trust and representatives of Fleischmann & Co. here today to consider the compressed yeast business, in which both are interested.

"The Manhattan Distillery, which has been operating under the Takamine process, has closed, and it is expected that the statement will be ready in a few days."

66. *Chicago Daily Tribune.* 1893. Directors of whisky trust meet. They decide to thoroughly test the Takamine process. Oct. 27. p. 3.
• ***Summary:*** After the 4-hour meeting at the Grand Pacific Hotel, President Greenhut said: "We have determined to give the Takamine process a trial which shall thoroughly test it. The Manhattan distillery at Peoria has been equipped with the machinery for that purpose and it will be started up Nov. 1. If the process succeeds it will of course make a difference in the cost of manufacture."

67. *Chicago Daily Tribune.* 1893. To decide on Takamine process. Directors of the whisky trust will finally settle the question. Dec. 11. p. 9.
• ***Summary:*** "Peoria, Illinois, Dec. 10–The approaching meeting of the directors of the Distilling and Cattle Feeding Company to be held about the middle of the month will, in all likelihood, be one of the most important sessions of that body ever held. They will then be called on to make a decision one way or the other in reference to the Takamine process of making spirits and alcohol. This process has been on trial for more than three years under the direction of the patentee, Jokichi Takamine, a native of Japan.

"Innumerable tests and experiments have been conducted, most of them in this city, but the thirty days' trial concluded this afternoon at the Manhattan Distillery is pronounced final. Both Mr. Takamine and the trust people who have a contract with the inventor agree on this point." The trust people declined to comment. "Mr. Takamine was seen last evening and was enthusiastic over the results," which he summarized.

68. *Chicago Daily Tribune.* 1893. Will not decide on Takamine. Dec. 12. p. 4.
• ***Summary:*** "Peoria, Illinois, Dec. 11–A prominent trust distiller this afternoon stated that it was not likely the trust would take any action whatever on the Takamine process at the meeting of directors to be held Wednesday. The experiments had not as yet proven the process was practicable. The Manhattan Distillery has been run at a capacity of 2,000 bushels a day, one-third of which was by the Takamine process. The yield had not been a great deal larger than by the old way and there had been no reduction in cost."

69. *Chicago Daily Tribune.* 1893. Whisky trust directors meet. At a protracted session in Peoria matters of importance are discussed. Dec. 14. p. 10.
• ***Summary:*** "Peoria, Illinois, Dec. 13–The directors of the Distilling and Cattle Feeding company met here this morning in regular monthly session." After adjournment, President Greenhut "stated that the officers had been utterly unable to dispose of the business on hand and that the business would be continued through tomorrow. There was nothing he could give out for publication. The business on hand is most important. The trust, after disposing of the routine matters incident to a meeting of this character, will consider the Takamine process and the proposition to increase the internal revenue tax. They will also outline plans for the future."

70. *Chicago Daily Tribune.* 1893. Trust's directors hear

Takamine. The distillers, however, come to no conclusion on the new process. Dec. 15. p. 1.
• ***Summary:*** "Peoria, Illinois, Dec. 14–The whiskey trust directors were in session all day, but were unable to dispose of the business before them... Trust headquarters were surrounded by an anxious crowd of distillers all day. Mr. Takamine was closeted for a long time with the directors, and it is presumed he was telling about his recent experiments at the Manhattan distillery."

71. Peoria Women's Club register. 1893. Peoria, Illinois. Unpublished manuscript.
• ***Summary:*** Mrs. Jokichi (Caroline) Takamine. Residence: 2100 N. Jefferson.
Joined the Club in 1892-1893 year.
March 1893 on Education Committee.
Gave program: Life in Japan.
Was a member in 1894-95 and resigned in 1896.
Note: These notes were copied from the Peoria Women's Club register by Leona Smith of the Peoria Public Library on 8 July 1992. Address: Peoria, Illinois.

72. *Peoria Transcript* (*Illinois*). 1894. Work has commenced. The new Wollner factory below the city. It will be either a distillery or a glucose factory–Nothing to say. March 20. p. 2, col. 5.
• ***Summary:*** "Peoria is to have a new factory, but whether it will be a glucose factory no one except Samuel Wollner knows." And he will not say. Work has already commenced. "It is proposed to spend some $300,000 in the improvement. If it should turn out to be a distillery, it is safe to say that it will be the largest in the world, and in addition will be constructed for the express purpose of combatting the trust... The progress of the building, and the statement of Mr. Wollner will be awaited with a great deal of interest."

73. *Chicago Daily Tribune.* 1894. Distilling tests Peru [sic, Peoria], Illinois. Experiments made to reduce the present cost of production. April 2. p. 4.
• ***Summary:*** "Peoria, Illinois, April 1.–Jokichi Takamine has just concluded a fifteen days' test of his process of distillation at the Manhattan Distillery, during which time the house was operated at 1,500 bushels a day. The figures have not yet been compiled and it is impossible to secure any details as to the test. It cannot be regarded as entirely satisfactory, however, as Mr. Takamine is arranging for another test, which will be commenced this week, the house to be run at the same capacity.

"Heretofore all his spirits have been manufactured with the aid of koji extract, but the present test will be made with the solid koji. Its object is to see if a reduction cannot be made in the cost of production. The test just concluded was the most extensive ever made and it required a great deal of time and expense to fit up the distillery, which was turned over to Mr. Takamine exclusively during its continuance. The stockholders will meet here in annual session this month and reports will be submitted to them."

74. *Chicago Daily Tribune.* 1894. Trust to try the Takamine system. By its use the combination expects to control the whiskey business. April 23. p. 7.
• ***Summary:*** "Peoria, Illinois, April 22.–One of the most important matters before the Distilling and Cattle Feeding company last week,... was the making of spirits and alcohol by the Takamine process. The inventor, Jokichi Takamine, has been claiming much for the invention for three years, during which time innumerable experiments have been made in this city. He has always claimed progress, and some time ago added a number of improvements to his process and was granted exclusive control of the Manhattan distillery to demonstrate what he claimed. It is said that the directors were so favorably impressed with the results of a thirty-days' test that steps have been taken to fit up a number of houses, and Mr. Takamine has been directed to have the necessary plans made. He is now engaged in this work. The saving as shown by this report is 15 cents a bushel or three cents a proof gallon. An important item is the claim that the spirits are much purer and smoother and can be finished and refined at a still further reduced cost. This would give the company an advantage over all other distilleries and it expects, as soon as arrangements can be completed, to control the business of the country."

75. *Milwaukee Sentinel.* 1894. To adopt Takamine's process. Whisky trust satisfied with the tests made. April 23. p. 1, col. 7.8.
• ***Summary:*** "Peoria, Illinois, April 22.–News of the result of the experiments of Jokichi Takamine at Manhattan distillery, which was suppressed on the occasion of the annual meeting of the Whisky trust, was made public to-day. Reports of the recent extensive tests at the Manhattan distillery were submitted to the directors, who carefully reviewed them. The tests were the most extensive yet made, and the figures show a saving of 16 cents a bushel of grain or 3 cents a proof gallon, with a still further saving in refining and finishing. The product is claimed to be much purer and better. Several of the company's distilleries will be fitted up for the process as soon as practicable, and the company is now having Mr. Takamine draw up plans. These patents are expected to prove of great value to the company, which controls them."

76. *Wall Street Journal.* 1894. Distillers. April 23. p. 4.
• ***Summary:*** "Chicago special–President Greenhut says it is true that extensive experiments made by Distillers have demonstrated the fact that by the Takamine process a saving of three cents per gallon can be effected in the manufacture of spirits. This is a big margin. The process will soon be used in a 5,000 bushel distillery." It is not yet known whether it

will be adopted in all distilleries of the company.

77. *Wall Street Journal.* 1894. The Takamine process adopted. May 24. p. 1.
• ***Summary:*** "Cincinnati special–There is no question but that the Takamine process is successful in making a saving in the cost of distilling. The directors of Distillers at their meeting here decided to introduce the process in all of their plants and estimate that it will result in a savings of upwards of $1,500,000 per annum and at the same time overcome competition."

78. *Chicago Daily Tribune.* 1894. To make whiskey by Takamine method: Big trust finally decides to adopt the famous Japanese idea. May 25. p. 2.
• ***Summary:*** "Cincinnati [Ohio]. May 24.–The directors of the Distillers and Cattle Feeders' company have decided to adopt the Takamine process for making whiskey. President Greenhut says that the saving will be 15 cents a bushel and that a better product will result."

79. *Wall Street Journal.* 1894. Distillers. May 25. p. 1.
• ***Summary:*** "Cincinnati special to P.J. Goodhart & Co.–The D.C.F. Co. [Whiskey Trust] has closed a contract with the Takamine Co. to use the new process. The papers here have a long article about the new agreement and processes, and the plan adopted, it is said, will bring about an enormous saving.

"Chicago special–President Greenhut says while the Trust is preparing to close down its houses after the 1st of June, when feeding cattle is finished, I am confident they will have to start up long before fall. If business improves as it should, all the trials and tribulations that are causing so much fretting now will disappear and the whiskey business will be harmonious. As long as western distributors do not unite we will treat them individually. The rebate system will not be abandoned."

80. *Washington Post.* 1894. Whiskey trust plans. President Greenhut thinks an additional tax will be levied for its benefit. May 26. p. 5.
• ***Summary:*** "Cincinnati, May 25.–The meeting of the directors of the whiskey trust adjourned at noon to-day. President Greenhut left for New York to-night. Before leaving he said he thought an additional tax would be put on whiskey."

"'The trust now owns over twenty distilleries, and in June several more will probably be added to the list. The trust will save annually $1,500,000 by the new takamine [sic, Takamine] process of distilling.'"

81. *Wall Street Journal.* 1894. Distillers. May 29. p. 4.
• ***Summary:*** "President Greenhut, of Distillers, was down town to-day. He speaks in a very hopeful way of the business outlook and is enthusiastic over the Takamine process. He repeats what he said West that it will save the Distillers Co. $1,500,000 annually."

Also discusses two lawsuits concerning rebates brought by and against the company.

82. *Wall Street Journal.* 1894. The Takamine process. May 31. p. 2.
• ***Summary:*** "President Greenhut of Distillers talks freely about the Takamine process. One of the owners of the process tells us that the Whiskey company has made a contract with the Takamine people for the alcohol process only, and that it is true that the Distillers' company can save $1,500,000 annually by using it. The Takamine company however expects its largest revenue to come from the brewers, and estimates that it can save over $10,000,000 to the beer interests of the country. A sub-company for the handling of the process in this State is being brought out in New York.

"The inventor of the process, Jokichi Takamine, is a Japanese scientist, who was Japanese commissioner to the World's Fair. He met an American lady by the name of Hitch, and married her. Her parents assisted in forming the Takamine company, which has been trying for a long time and has finally secured the co-operation of the Distillers' company. Outside distillers and others have been very skeptical about the process, but the Distillers company, after careful trial, has adopted it."

83. *New York Times.* 1894. To fight the Whiskey Trust: Independent distillers organizing opposition. Arbitrary exactions of the Trust to be tolerated no longer. President Greenhut's speculations in Wall Street. The story of his operations on both sides of the market. Strange things which happened during a bear campaign. Aug. 3. p. 1, 5.
• ***Summary:*** "A new company for the distribution of spirits in competition with the Whiskey Trust has been organized and will be in operation without delay. Several large distillers outside of the trust have come together in this combination. The new company will have its headquarters in this city and branches in the principal cities of the Eastern and Western states."

"The importance of this move will be more fully appreciated when it is explained that jobbers in buying from the trust are compelled to do so through the American Distributing Company, which has been receiving 2 cents a gallon for its services, and which, of course, is collected from the jobbers. The new company will have no rebate system, so the product will reach the consumer without an additional tax for its distribution."

A table shows the names of the independent distillers and the capacity of each in bushels / day. A sordid history of the whiskey trust from 1892 is given.

84. *North American* (*The*) (*Philadelphia, Pennsylvania*).

1894. The International Takamine Co. It is incorporated with a capital stock of $5,000,000. Aug. 18. p. 5, col. 5.7.
• ***Summary:*** "Springfield, Illinois, August 17.–The International Takamine Company, Chicago, with a capital stock of $5,000,000, was incorporated yesterday. The incorporators are Jakishe [sic, Jokichi] Takamine, Mary B. Hitch and E.V. Hitch. The company has been organized to control through Europe a new process in the manufacture of fermented liquors, beers, vinegars, yeast and other diastatic substances. The process is comparatively new, having been introduced into the United States about three years ago by the inventor, Jakishe Takamine. He is at the head of the Takamine Ferment Company that controls the right of the use of the invention in this country.

"About three months ago the Whisky Trust adopted the process and purchased the exclusive rights for its use in the manufacture of its product in the United States."

85. *Chicago Daily Tribune.* 1894. Begins to pay its tax: Whisky trust now actively withdrawing Peoria goods. Northern and Manhattan distilleries take out spirits, doubling the highest collection record in the district–The trust receives money and makes a heavy deposit–Evidence that it will pay out all of its goods on time–New York people in ignorance. Aug. 23. p. 5.
• ***Summary:*** The whisky trust began "withdrawal of its immense amount of goods from the bonded warehouses in Peoria." The taxes collected today "amounted to $531,921, or twice the largest collection in the history of the Peoria revenue district... A considerable quantity was also withdrawn from the Manhattan distillery, at which Takamine has been engaged with his experiments for the last three years. It will require nearly $1,000,000 to pay the tax on the goods stored at the Manhattan." President Greenhut is making great efforts to negotiate deals whereby he can secure the money he needs. The first deal which had "was endeavoring to negotiate in New York City [from a trust company] has been abandoned..." The officials of the whisky trust "now have three days in which to pay $4,500,000 and release their Peoria goods from bond."

86. *Chicago Daily Tribune.* 1894. Men have a quarrel. Aug. 25. p. 3.
• ***Summary:*** "A broil in the Chamber of Commerce Building between Charles H. Holm, employed by the Equitable Life Insurance company, and Edward Moore, Secretary of the Takamine Ferment company, occupied Justice Foster's attention yesterday morning. Moore claimed..."

87. Takamine, Jokichi. 1894. Preparation and making fermented alcoholic liquors. *U.S. Patent* 0,525,819. Sept. 11. 4 p. Application filed 17 June 1891.
• ***Summary:*** The author has "secured patents in foreign countries as follows: Canada, Nos. 37,961 and 37,962, dated December 12, 1891; Belgium, No. 94,522, dated April 14, 1891, and No. 96,937, dated October 24, 1891; France, No. 214,033, dated April 13, 1891, and No. 216,840, dated October 19, 1891; Austria-Hungary, No. 40,399, dated July 2, 1892, and No. 16,519, dated September 28, 1892; and Great Britain, No. 5,700, dated April 2, 1891, and No. 17,374, dated October 12, 1891."

"In describing my invention I shall apply the term 'tane-koji' or 'moyashi' to a mass of steamed rice permeated with matured or ripe microscopic mycelial fungus, *Eurotium oryzæ* (Ahlburg), which was sown on steamed rice and developed to a certain stage acquires both diastatic and fermenting properties. It has a yellowish moldy appearance."

"I shall apply the generic term 'taka-moyashi' to a mass of nourishing substances such as brans of cereals or other substances, fertilized by a defined artificial compound and containing fully matured or ripe microscopic mycelial fungi, such as the species *Eurotium oryzæ* (Ahlburg), genus *Aspergillus*, and the genera *Mucor* and *Penicillium* having diastatic and fermenting properties." Address: Chicago, Illinois; Citizen of Japan.

88. Takamine, Jokichi. 1894. Preparing and making moto. *U.S. Patent* 0,525,821. Sept. 11. 4 p. Application filed 18 June 1891.
• ***Summary:*** The author has developed a new process for making moto (the basis of sake), which he calls "taka-moto." It is a "liquor containing alcoholic ferment cells, developed and multiplied in suitable nourishing solution, and similar to the substance known as moto, for use in the arts, in a healthier, and of longer keeping qualities, more active and concentrated condition; and to mature the same in a shorter period, and more economically, than by the old process of making moto."

"Taka-moto corresponds to the article known as yeast in its use in the arts, such as alcoholic fermentation, bread making, &c."

At very end of patent: "Witnesses: E.V. Hitch, E. Moone." Address: Chicago, Cook County, Illinois; Citizen of Japan.

89. Takamine, Jokichi. 1894. Process of making diastatic enzyme. *U.S. Patent* 0,525,823. Sept. 11. 4 p. Application filed 23 Feb. 1894.
• ***Summary:*** "The object of this invention is to prepare and manufacture diastatic enzyme, or soluble ferment in a concentrated form which possesses the power of transforming starch into sugar for use in various industries, by a process not hitherto practiced, and in a very economical and practical manner."

"For the purpose of my invention, I use the microscopic fungus, *Eurotium oryzæ*, with the best results, but other fungi belonging to the genus *Aspergillus*, and to the genera *Mucor*, and *Penicillium* may also be used. I use as the raw material

on which to grow the fungus, the comminuted or broken grains of cereals from which the greater part of starchy matter has been removed. The reason why I use this branny part of grain is, that they not only are materials practically and economically suited for the purpose of my invention, but they also have the following merits, viz: First. Being of a loose and coarse nature, they afford a large surface for the growth of the fungus, and a ready access of air, one of the necessary conditions to its growth. Second. Being rich in albuminoids and phosphates, they supply the most necessary ingredients for the production of the enzyme. Third. They contain a large percentage of woody fiber, which renders their use of special advantage in the process of extraction, as described below. Fourth. They are cheap and abundant, and in constant supply at all seasons of the year.

"In carrying out my invention the bran is first moistened with water, so as to have from thirty to fifty per cent of moisture."

"From the dried or undried mass thus obtained, the diastatic enzyme is extracted by treating the same with water or water mixed with alcohol."

At very end of patent: "Witnesses: M.I. Cavanagh, S.E. Darby."

Note 1. This is the earliest English-language document seen (Aug. 2012) that uses the word "enzyme" (or "enzymes") in connection with koji or soy, or with the word "enzyme" in the title in this connection. According to *Webster's Dictionary* the word "enzyme" was first used in English in about 1881.

Note 2. This is the earliest English-language document seen (June 2012) in which Jokichi Takamine uses the word "enzyme" (or "enzymes").

Note 2. The Deerland Enzymes website (www.deerland-enzymes.com) says of this patent: "It was the first patent on a microbial enzyme in the USA. Further Takamine recognized that the diastatic properties of the Aspergillus enzyme had potential medical applications and he licensed his enzyme preparation to Parke, Davis & Company of Detroit, Michigan, under the brand name 'Taka-diastase.' Parke-Davis aggressively marketed it as a digestive aid for the treatment of dyspepsia said to be due to the incomplete digestion of starch. Takadiastase was enormously successful and Takamine became a consultant to the company. With Parke, Davis as his patron, he moved his family to New York and established an independent laboratory on East 103rd Street in Manhattan" [New York]. Address: Peoria, Peoria County, Illinois; Citizen of Japan.

90. Takamine, Jokichi. 1894. Preparing and making taka-koji. *U.S. Patent* 0,525,820. Sept. 11. 5 p. Application filed 23 Feb. 1894.

• ***Summary:*** Describes a new process for making diastase [an enzyme] using improvements on the Japanese koji process. "Be it known that I, Jokichi Takamine, a subject of the Emperor of Japan, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in preparing and Making Taka-Koji..." The author has obtained foreign patents on this process in Canada, Belgium, France, Austria-Hungary, and Great Britain; each is listed.

"The object of my invention is to manufacture and develop mold fungi in form of taka-koji, possessing the properties of diastase and containing also ferment cells, for use in the arts such as alcoholic fermentation, beer brewing, yeast making, glucose making, &c., in a more active and appropriate, efficient and concentrated condition and more economically than by the old process of making ordinary Japanese koji."

Note: This is the earliest English-language document seen (Aug. 2012) in which Takamine uses the term "taka-koji" or "tane-koji" (regardless of hyphenation or capitalization).

After defining the term "tane-koji" or "moyashi," he describes very precisely the current conventional method of making koji in Japan. He then points out six "defects" with this process which are remedied by his patent. He uses broken grains and especially wheat bran, instead of the traditional whole rice, on which to grow his koji mold. He says the only fungus used to make koji in Japan is *Eurotium oryzae* (Ahlburg). Takamine calls his koji "taka-koji," which he describes as a "ferment." Inasmuch as taka-koji "possesses two distinct properties, namely diastatic property or the property of converting starch into sugar, and fermenting property, it is exceedingly important from an economic stand-point to separate these two properties from the taka-koji, and also from each other, a separation that has never before been successfully accomplished on a commercial scale. The object of this separation is to produce without waste each property by itself so that when conversion is desired the ferment property is not wasted as in the old process of using ordinary Japanese koji. On the other hand, when fermentation is desired, only the ferment property of the taka-koji may be employed without waste of the diastatic property. This I consider a most important feature of my invention for where a conversion is desired a purer product is obtained... This separation may be accomplished in any one of several ways. For instance, the dry taka-koji may be separated by sifting through a sieve or otherwise, into two parts, one, containing in the form of a fine powder, the ferment cells possessing the fermenting property, and the other part the comminuted or broken grains or brans, which contain the diastatic properties of the taka-koji, and from which, said diastatic property may be separated or extracted with water." "I Propose to apply the term 'taka-koji diastase' to the diastatic property when separated out, and the term 'taka-koji ferment' to the ferment portion when separated." The taka-koji diastase is a yellowish-brown liquid. While "possessing in a powerful

degree the property of converting gelatinized starch into sugar, it differs from malt extract in the remarkable fact discovered by myself that it does not give the Lintner's characteristic reaction of malt diastase of an intense blue color when treated with the tincture of guaiacum mixed with hydrogen peroxide; but instead thereof it gives a slightly milky coloration when so treated."

At very end of patent: "Witnesses: E.V. Hitch, E. Moone."

Note: Neither the word "enzyme" nor the word "enzymes" is used in this patent. Address: Chicago, Cook County, Illinois; Citizen of Japan.

91. Takamine, Jokichi. 1894. Alcohol-ferment mash. *U.S. Patent* 0,525,825. Sept. 11. 2 p. Application filed 23 July 1892. [1 ref]

• ***Summary:*** "The object of my invention is to prepare an alcoholic ferment mash for developing active alcoholic ferment cells possessing fermenting properties similar to but more effective than those of the substance commonly known as yeast mash for use in the arts, in a more effective condition and more economically than by the old process of making yeast mash.

"In the old process of making yeast mash ground rye, &c., and ground malt are heated with water to a proper temperature and consistency, and yeast then added for multiplication.

"In my process of preparing alcoholic ferment mash I use brans of different cereals, including shorts, middlings, &c., (which are cheaper and more efficient than whole or comminuted grains of cereals) and taka-koji or taka-koji diastase, thus enriching the mass with nitrogenous ingredients, or ferment cell-forming ingredients to an extent of from four to six times, and with comparatively small but sufficient quantity of saccharine matter."

At very end of patent: "Witnesses: E.V. Hitch, S.R. Yamada." Address: Peoria, Peoria County, Illinois; Citizen of Japan.

92. Takamine, Jokichi. 1894. Means for and method of converting starchy material into sugar. *U.S. Patent* 0,525,971. Sept. 11. 2 p. Application filed 24 March 1892.

• ***Summary:*** "I employ the term taka-koji to designate a mass of comminuted or broken grains of cereals, upon which and throughout which is grown and developed to a certain extent a fungus growth, possessing both diastatic and fermenting properties.

"I employ the term taka-koji diastase to designate the solution or extract obtained by dissolving out from taka-koji with water, the diastatic property thereof."

Note: Takamine plans to use koji or the diastase produced by koji to convert wheat bran, shorts, or middlings into alcohol, especially whiskey. Address: Chicago, Cook County, Illinois; Citizen of Japan.

93. Takamine, Jokichi. 1894. Preparing and making taka-moyashi. *U.S. Patent* 0,525,822. Sept. 11. 4 p. Application filed 18 June 1891. [10 ref]

• ***Summary:*** This is a "Specification forming part of Letters Patent No. 525,822, dated September 11, 1894."

"I... have invented a new and useful Improvement in Preparing and Making Taka-Moyashi, of which the following is a specification, and for which the following is a specification, and for which I have secured patents in foreign countries as follows: Canada, Nos. 37961 and 37962, dated December 12, 1891; Belgium, No. 49,522, dated April 14, 1891, and No. 96,397, dated October 24, 1891; France, No. 214,033, dated April 13, 1891, and No. 216,840, dated October 19, 1891; Austria-Hungary, No. 40,399, dated July 2, 1892 and No. 16,519 dated September 28, 1892, and Great Britain, No. 5,700, dated April 2, 1891, and No. 17,374, dated October 12, 1891."

"Tane-koji (or seed koji) or moyashi is a term that has been heretofore applied to a yellowish green moldy mass, consisting of steamed rice covered with a microscopical mycelial fungus (*Eurotium oryzae*, Ahlburg), which sown on steamed rice and developed to a certain stage, produces both diastatic and fermenting properties. It has a yellowish green moldy appearance. Sometimes, though rarely, the yellowish green powder shaken off from the above mentioned mass is also called tane-koji.

"In preparing tane-koji or moyashi (as above defined) by the old process, hulled semi-cleaned rice is first steamed until the starch cells are open. It is then mixed with the ashes of trees. The rice thus mixed with tree ashes is thoroughly mixed with a proper quantity of tane-koji or moyashi at a temperature of from 20º to 30º centigrade, and bedded up and allowed to remain for from twenty-four to thirty-six hours, when it is divided into small portions and placed in trays and kept under proper manipulation, temperature and humidity, until the fungus is abundantly reproduced and sufficiently matured. The yellowish green moldy substance thus obtained is the tane koji or moyashi of commerce. For transportation this article is simply placed in paper bags and for preservation it is kept in a cold dry place in paper bags and sealed pots."

Takamine then lists four objections and disadvantages of the old process, including: (1) The composition of tree ashes is variable, "varying even with the different parts of the same tree." (2) "Tree ashes are wholly deficient in nitrogenous substances, which are the most essential for the healthy and abundant growth of the fungus..." (3) Tane-koji is grown only on rice and the only fungus used has been *Eurotium oryzae* (Ahlburg). (4) During preservation and transportation, the moisture in the article and that absorbed from the surrounding air cause it to decay / spoil, making it unfit for use.

Takamine then explains how he has solved each of these

problems.

At very end of patent: "Witnesses: E.V. Hitch, E. Moone." Address: Chicago, Illinois; A subject of the Emperor of Japan.

94. *Peoria Transcript* (*Illinois*). 1894. Big improvements. Oct. 8. p. 2, col. 6.
• ***Summary:*** "The work of remodeling the Manhattan distillery so that it can be used for the Takamine process is going ahead at a lively rate. New buildings are being constructed and new and improved machinery placed in position. The house will be ready for operation within a few weeks. The cost of the buildings and extensive alterations will be about $12,000 with considerably more machinery and appliances. This will be the only Takamine house in the country, but it is the intention to chance [change?] others. When it starts the Manhattan will probably be run at a capacity of 2,000 bushels of grain per day, though this amount can be increased to 3,000 without difficulty."

95. *Chicago Daily Tribune.* 1894. Gives the whisky trade a boom. Abolition of rebates proves of advantage to sales in Omaha, Nebraska. Oct. 9. p. 3.
• ***Summary:*** "Omaha, Nebraska, Oct. 8.–The trade in whisky and other distillery products has decidedly increased since the whisky trust last week acted on the distributors' advice to do away with rebates."

"Peoria, Illinois, Oct. 8–The Atlas distillery will commence yeast-making tomorrow, to be followed Thursday by the mashing of grain... This is the new distillery just completed by the Wollners, and which is by long odds the largest and most complete in the world. It has a capacity of 8,000 bushels a day. Adolph Woolner Jr. is the manager of the new concern... The new distillery is an anti-trust house, and while it is not intended to combat the trust expects to receive its full share of business. No word has been received as to when the trust house [whisky trust] will resume and the Atlas will be the only distillery in Peoria in operation.

"At the Manhattan [distillery] an addition costing $12,000, without the machinery, is just being completed. This is for the Takamine process, and when this house starts up it will be at a capacity of 2,000 bushels per day, with Takamine in charge of affairs."

96. *Wall Street Journal.* 1894. Distillers. Oct. 9. p. 1.
• ***Summary:*** "Messrs. Hollister & Babcock have received the following from their Chicago correspondent:

"The D. & C. F. Co. [Distilling and Cattle Feeding = whisky trust] is in sore straits to raise money to meet its rebate vouchers.

"That the company has no money to pay them is well known by those familiar with its affairs. There are now on deposit with the Central Trust Company of New York, $2,500,000 first mortgage bonds to secure payment of the rebate, and the company would be glad to raise 50 cents on the dollar for them and apply the proceeds towards the payment of these rebates. The fact is, an effort has been quietly made among friends of the company to dispose of these bonds, but without success.

"The company is unwilling to advertise for bids for fear of hurting its credit, and is thus handicapped in its efforts to raise the necessary money."

"These facts would indicate that the D. & C.F. is not in the best financial condition..."

97. *Wall Street Journal.* 1894. Distillers. Nov. 12. p. 4.
• ***Summary:*** "Treasurer Hobart, of the Distillers Company, says: It has been decided to start up two Peoria distilleries, the Manhattan and the Monarch, about December 1. The Manhattan has been fitted up for using the Takamine process, which will now be properly tested for the entire season. None of the other houses will be started until more of the present stock of spirits has been worked off."

98. *Chicago Daily Tribune.* 1894. Trust distilleries to start up. The Monarch and the Manhattan will operate under the Takamine process. Nov. 27. p. 1.
• ***Summary:*** "Peoria, Illinois, Nov. 26.–There is greatly increased activity in distilling circles here. The Monarch and Manhattan, which have been ordered by the trust to start up, to-day commenced receiving grain, and will resume business Dec. 1. The Monarch will commence with a capacity of 3,000 [bushels] a day and the Manhattan with 1,500. This will be under the Takamine process. It is further stated that trust officials have ordered one of the Cincinnati [Ohio] houses to start at once. The revenue collections here increased until they now average more than $50,000 a day."

99. *Peoria Transcript* (*Illinois*). 1894. Distilleries to start: There will be a resumption of business at once. Nov. 27. p. 2, col. 5.
• ***Summary:*** "Last Saturday the Monarch distillery received a large consignment of cattle, and yesterday grain was shipped to both the Monarch and Manhattan. These houses are preparing to start in the next few days. The Monarch will be operated at a capacity of 3,000 bushels per day and the Manhattan at 1,500 bushels. At the latter house the Takamine process will be tested with further improvements made during the season. The distilling business is now looking up.

"One of the Cincinnati [Ohio] houses will start in a few days. There is a visible improvement in the collections. The Atlas yesterday shipped three car loads of spirits, while there were large shipments from trust houses."

Note: This is the last article seen (July 2012) about the work of Jokichi Takamine with koji and whiskey in Illinois.

100. *Chicago Daily Tribune.* 1894. Much more whiskey to be made. Trust orders houses in many cities to start in

business. Dec. 16. p. 9.
• ***Summary:*** "Peoria, Illinois, Dec. 15.–The Board of Directors of the whisky trust at its meeting just ended in this city ordered houses in Peoria [Illinois], St. Louis [Missouri], Chicago, Cincinnati [Ohio], and Terre Haute [Indiana] to resume operations." They "ordered an increase in the daily consumption of grain of 12,000 bushels a day. The company is already grinding 8,000 bushels, which will make the total capacity after the first of the year more than 20,000 bushels a day, equivalent to nearly 100,000 gallons of spirits. This will enable Mr. Morris to feed a greatly increased number of cattle [in his feedlots]. The first run of sprits under the Takamine process took place yesterday at the Manhattan. Mr. Greenhut could not give the exact figures, but declared the run was in every way satisfactory."

101. Takamine, Jokichi. 1894. Crystallized diastase from Eurotium oryzae. *Country Brewer's Gazette.* Dec. 20. p. 316. *
• ***Summary:*** In German, this article is cited in *Jahresbericht über die Fortschritte in der Lehre von den Gährungs-Organismen,* Volume 5 (p. 307) as *Krystallisirte Diastase aus Eurotium Oryzae.*

The *Country Brewer's Gazette* is not held by the Library of Congress, but it is held by the British National Library, so it may well have been published in the United Kingdom.

102. *Daily Picayune* (*New Orleans, Louisiana*). 1895. A new method of preparing diastase,... Jan. 10. p. 4, col. 5.5.
• ***Summary:*** "... the ferment which produces malting, and some other substances, has been discovered by Jokichi Takamine, a Japanese who studied at Glasgow and Tokio Universities. By cultivating eurotium oryzae, a mushroom growth on wheat bran, he has found that at an early stage it bears on its roots minute crystals of diastase, while the unripe spores contain a powerful ferment. By washing the bran and crystallizing the solution he produces diastase of considerable purity in commercial quantities..."

103. *Chicago Daily Tribune.* 1895. Takamine makes another discovery. Jan. 20. p. 26.
• ***Summary:*** From New York Sun: "A new method of preparing diastase, the ferment which produces malting, and some other substances, has been discovered by Jokichi Takamine, a Japanese, who has studied at Glasgow and Tokio universities. By cultivating eurotium oryzæ, a mushroom growth, on wheat bran, he has found that an early stage of it bears on its roots minute crystals of diastase, while the unripe spores contain a powerful ferment. By washing the bran and crystallizing the solution he produces diastase of considerable purity in commercial quantities."

104. *Chicago Daily Tribune.* 1895. Receivers to borrow $50,000: Judge Grosscup allows whisky trust officers to pay a note. Feb. 14. p. 9.
• ***Summary:*** The whisky trust is now in receivership.

105. *Chicago Daily Tribune.* 1895. Receivership is now in charge: Whisky trust business transferred here on a creditors' petition. Feb. 16. p. 8.
• ***Summary:*** The whisky trust is now in receivership. The receivership is being moved from the United States court at Peoria, Illinois, to the office in Chicago.

106. *Atlanta Constitution* (*Georgia*). 1895. Whistling market. Feb. 21. p. 6.
• ***Summary:*** "Receivers of Distilling and Cattle Feeding have thrown out Takamine and his process. It has cost the company $50,000 a year and always was a failure."

Note: A receiver is a person appointed to settle the affairs of a business involving a public interest or to manage a corporation during reorganization.

107. *Daily Picayune* (*New Orleans, Louisiana*). 1895. Takamine to meet trust receivers. He will probably make a new proposition to the whisky men. Feb. 22. p. 7, col. 4.8.
• ***Summary:*** "Peoria, Illinois, Feb. 21.–*Special Telegram.*– Jokichi Takamine, the Japanese chemist who invented the Koji process of distilling, went to Chicago today, accompanied by Colonel Hitch, his father-in-law, and president of the Takamine Ferment Company, to consult with the directors of the company and the receivers of the whisky trust. It is learned that Feb. 11 the receivers stopped work at the Manhattan Distillery under the Koji process, where it has been in use for some months. Their action was not known to the trust headquarters, but this explains the persistency with which Takamine has haunted the trust headquarters whenever the receivers have been there.

"They instructed him to make a new proposition under which his system could be used by them, but he did nothing. It is understood that after consulting with the directors of the company he will make a proposition to the receivers which will allow the further use of the Koji system."

108. *Chicago Daily Tribune.* 1895. Takamine sues whiskey trust: Declares it has not kept a contract and wants a remedy. March 6. p. 2.
• ***Summary:*** "Jokichi Takamine, President of the Takamine Ferment company, filed a petition in the United States Court yesterday against the receivers of the whisky trust. He alleges that in 1891 he entered into a contract with the officers of the trust for experiments with his fermentation process, and if it caused a saving he was to receive 20 per cent of the amount saved. Last July [1894] the trust was satisfied that the process was an improvement, and contracted to fit up the Manhattan Distillery for the use of the process. In December he began operations. When the receivers were appointed they caused the distillery to be changed back to the old process.

The petitioner asks that the receivers be compelled to either carry out the contract or release the petitioner.

"Threatened trouble between the receivers of the whiskey trust and the distributors of the product has been averted" by allowing the distributors one cent a gallon on carload lots. The members of the Stockholders' Reorganization committee and their attorneys have reached New York and will meet this morning. The fact that no assessment is levied on the stock is expected to cause something of a sensation. "The stock yesterday sold up to 13, somewhat higher than it has been since before the receivers were appointed."

109. *Daily Picayune* (*New Orleans, Louisiana*). 1895. Business. The Takamine process. March 6. p. 2, col. 2.8.
• ***Summary:*** "Chicago, March 5.–The trouble between the receivers of the whisky trust and the distributors of their product has been averted.

"At the conference this afternoon it was decided to allow the men who handle the spirits 1 cent a gallon, car loads. This was entirely satisfactory to both parties.

"The members of the stockholders reorganized and their attorneys will meet in New York to-morrow. It is expected that the fact that no assessment will be levied on the stock will be satisfactory. J. Takamine, the president of the Takamine Fermenting Company [sic, Takamine Ferment Company], has filed a petition in the United States court against the receivers of the whisky trust. Takamine alleges that in 1891 he entered into a contract with the officers of the trust for the experimentation of his fermenting process and in the event that the process caused saving over the old method he was to receive 20 per cent of the amount saved. In July last the trust was satisfied that the process was an improvement over the old method and contracted to fit up the Manhattan Distillery for the use of the process.

"In December last he began operations in the distillery named. When the receivers were appointed they caused the distillery to be changed back to the old process. The petitioner asks that the defendant receivers be compelled to either carry out their contract or release the petitioner. Counsel for the receivers were served with notice to answer the petition before the court within the next ten days."

110. *New York Times.* 1895. The financial world. March 10. p. 5.
• ***Summary:*** "The plan of reorganization of the Distillers' Company is published, and should meet with hearty support by the stockholders... It has been found that in the past four years the company has been run in a way which may be mildly called, extraordinary. It paid out enormous sums to purchase properties it really did not need, but with the idea of securing a monopoly, which it failed to secure.

"A mysterious item entered as 'Gibson' is credited with $510,000. This item is so suggestive, when we consider the rôle played by Mr. Gibson, it is a question whether the receivers ought not to follow along the track thus exposed, which might lead to surprising disclosures. It was found that about $600,000 was spent as lobby expenses, mainly connected with the effort to get the tax increased. The annual losses on contracts for slop feeding, on barrels, grain, coal, Takamine process, and other various 'divvies,' foot up about $400,000 per year. Legal fees aggregate about $500,000." A table shows the company's balance sheet. "This will give a good idea of how profitable the business must have been." It paid out $6.1 million in dividends.

111. *Boston Daily Globe.* 1895. Frauds found. Whisky trust's books tell the story. Nearly $2,000,000 missing from the treasury. Receiver will try to get some of it back. Officers accused of making false entries. Helped themselves to stock t their own prices. March 26. p. 1.
• ***Summary:*** "The experts' report covers a period ending March 31, 1892... It is in 1893 and 1894 that the greatest irregularities are expected to be discovered." Suits will be filed against Greenhut and Morris.

"An answer was made today in the US circuit court by Sec. Hennessey of the whisky trust to the bill of the Takamine ferment company, which had a contract with the trust for the use of the Takamine process of distillation.

"The contract providing that the Manhattan distillery should be equipped for the operation of the patent process was being carried out when the receivers were appointed and the operations stopped.

"The Takamine company demands a fulfillment or abrogation of the contract, which is admitted by Sec. Hennessey. The receiver has not filed an answer yet."

112. *Chicago Daily Tribune.* 1895. Secretary Hennessey files answer. March 26. p. 8.
• ***Summary:*** The Takamine Ferment company had a contract with the whisky trust "for experimenting with the new process of cheap distilling of spirits. The Manhattan Distillery was fitted up for that purpose, and the receivers discontinued the methods. The Takamine company demands a fulfillment or damages. Secretary Hennessey admits the contract and the conditions named by the Takamine company. No answer has been filed by the receiver."

113. Saare, Oskar. 1895. Das Takamine-Verfahren [Takamine's experiments]. *Zeitschrift fuer Spiritusindustrie* 18(14):109-10. April 3. [3 ref. Ger]
• ***Summary:*** Discusses Takamine's experiments with koji in a distillery at Peoria, Illinois. A large illustration shows Takamine's equipment and its layout. This is one in a series of articles about the manufacture of distilled spirits and pressed yeasts in the United States. Address: PhD.

114. *Chicago Daily Tribune.* 1895. Fourth assessment due

Monday. No movement in Distillers' stock due until then–Talk of arbitration. April 24. p. 3.
• ***Summary:*** "Peoria, Illinois. April 23–Receiver McNulta is transacting business at distilling headquarters... Jokichi Takamine has announced his intention of removing to Chicago this month. He expects to sign a new contract with the reorganization committee of the whisky trust, when he will continue his experiments in this city."

115. *Chicago Daily Tribune.* 1895. Takamine company gets a release. Judge Showalter annuls its contract with the trust–Stockholders meet. May 16. p. 5.
• ***Summary:*** "Judge Showalter of the Federal Court yesterday heard the petition of the Takamine Ferment company against Receiver McNulta of the whisky trust. Takamine and his company had a contract with the old trust for experimenting with the ferment process, and the experimenting was stopped by the receiver on taking charge of the trust. An annulment of the contract was asked. The counsel for the receiver yesterday made no objection to releasing the Takamine company, and the court made an order to that effect.

"Stockholders of the whisky trust met yesterday at the Great Northern Hotel." The names and positions of those present are listed. "It is said no important no action of importance was taken."

Note: This is the last document seen (Jan. 2007) concerning the work of Jokichi Takamine in Peoria, Illinois, or with the whisky trust.

116. Parke, Davis & Company. 1895. Taka-Diastase: An isolated ferment in powdered form for the treatment of amylaceous dyspepsia (Ad). *Therapeutic Notes* (*Parke, Davis & Co., Detroit, Michigan*) 2(2):First unnumbered page at front of issue. July.
• ***Summary:*** This full-page ad, printed with black ink on a bright red background, begins: "One of the most important needs of the materia medica for years has been the possession of a concentrated diastatic ferment [enzyme] which should afford an efficacious means of combating amylaceous dyspepsia. In Taka-Diastase we present on a practical scale for the first time in the history of pharmacy, such a product."

"Superior to malt extract:

"1. Taka-Diastase will convert at least 100 times its weight of dry starch. The best malt extract will not convert more than five times its weight under same conditions.

"2. Taka-Diastase is absolutely permanent. All malt extracts deteriorate with age.

"3. Taka-Diastase is in powdered form, dose from 1 to 5 grains. Malt extracts contain a preponderance of foreign inert matters, necessitating large doses.

"4. Taka-Diastase is free from sugar. Malt extracts are heavily loaded with sugar and are apt to exaggerate already present pathological conditions.

"5. Taka-Diastase is perfectly soluble, and is compatible with other medicaments in neutral or slightly alkaline media. Malt extracts, owing to their viscosity, are difficult to handle and to incorporate with other ingredients in prescriptions.

"6. Taka-Diastase is economical, owing to its small dosage. Necessarily large dosage renders malt extracts expensive in comparison.

"Correspondence upon this subject is respectfully solicited."

Note: This is the earliest document seen (Aug. 2012) showing that Parke, Davis & Co. was marketing [and almost certainly manufacturing] Taka-Diastase. Address: Detroit, Michigan.

117. Lascar, Ferdinand. 1895. Taka Diastase. *American Druggist and Pharmaceutical Record* 27(3):74-75. Aug. 10. Whole No. 332.
• ***Summary:*** "Conversion of starch into sugar: The changing of amylaceous food into dextrose and maltone is the beginning of digestion. All will have observed that bread, crackers or potatoes, not being sweet in themselves, very soon become so when masticated and thoroughly mixed with saliva in the mouth, and that their taste becomes sweeter the longer it is continued. This sweet taste is due to the conversion of the hydrated starch by the action of the saliva upon it, the saliva containing an enzyme called ptyalin, which, by its presence splits up the starch into soluble products..."

"The avoiding of all undue heat in preparing diastase may be one of the reasons why the diastase which is now manufactured by Parke, Davis & Co., under Mr. Takamine's discoveries, is so perfect in its action in converting starch into maltose and dextrose."

"That the new diastase is destined to become a favorite with the profession I have no doubt, having acquainetd myself with its potency in converting starch in a minimum of time into a form ready for absorption by the system, and I think it will be found the very remedy for which we have waited so long."

118. Takamine, Jokichi. 1895. Umwandlung von Staerke in Zucker und die alkoholische Gaehrung [Transformation of starches into sugar and in the alcoholic fermentation]. *German Patent* 79,763. Patetbl. 16(1895), 254. [Ger]*

119. Lakeside Annual Directory of the City of Chicago. 1895. Chicago, Illinois: Chicago Directory Co. See p. 1701.
• ***Summary:*** The two consecutive entries on page 1791 read: "Takamine Ferment Co. Jokichi Takamine, pres; John J. [?] White, sec; yepst [?] 511 Chamber commerce bldg.

"Takamine, Jokichi, pres. Takamine ferment co. 511 Chamber commerce bldg. h [home] 6641 Woodlawn Ave." Address: Chicago, Illinois.

120. *Daily Picayune* (*New Orleans, Louisiana*). 1896. Takamine's new ferment. March 7. p. 6, col. 5.7. News section.
• ***Summary:*** "Taka Diastase is the name given to a new ferment discovered by a Japanese chemist named Jokichi Takamine, says *Scalpel.* It is sometimes called Taka Koji. The history of the discovery is a most interesting one. Takamine, whilst studying in Glasgow under Prof. Mills, thought he could obtain a better ferment than the one usually employed for brewing or distilling, and on returning to Japan he continued his studies, with Prof. Atkinson, of Tokio University on mold growths. After many researches on many kinds of bacteria [sic, molds], Takamine discovered what he required in the mycelium of one of the *Aspergillus* family. Takamine's discovery proves to use what modern chemistry can do, and we have Taka Koji a remedy possessing two distinct properties, viz, the property of converting starch into sugar and a fermenting property, These two properties may be separated. What we want in medicine is, of course, the diastatic property. The Taka Diastase will digest nearly a thousand times its weight in starch. The new ferment promises to become a remedy for amylaceous indigestion. It may be taken in doses of one to five grains, either immediately before or after meals. Taka Diastase has now passed the experimental stage and many excellent reports have been made from physicians of repute on its value.

Note: It seems that Taka Diastase is now (March 1896) a commercial product.

121. *Chicago Daily Tribune.* 1896. Jokichi Takamine is not dead. Trick of the types substitutes his name for Tetsukichi Shimidzu's. May 11. p. 3.
• ***Summary:*** An error was made yesterday when the *The Tribune* said that Jockichi [sic, Jokichi] Takamine had died at No. 6641 Woodlawn avenue.

"The man whose death should have been recorded was Tetsukichi Shimidzu, the Japanese resident and inventor,... at one time an official of the Imperial court at Tokyo. Consumption was the cause of death. Mr. Shimidzu was chief chemist of the Takamine company at Peoria until a short time ago, when he moved to Chicago."

122. Takamine, Jokichi. 1896. Process of converting starchy material into sugar. *U.S. Patent* 0,562,103. June 16. 3 p. Application filed 21 Nov. 1894. [1 ref]
• ***Summary:*** "This invention relates to new and useful improvements in means for and method of converting starchy material into sugar, and it is designed as an improvement upon my prior patent, No. 525,971, granted September 11, 1894."

This improved method also used "taka-koji, either in the dry form or in the form of an extract therefrom,..." The process relates to the alcoholic industry and the use of different substrates and temperatures. Taka-koji and taka-koji diastase are mentioned throughout the patent. Address: Peoria, Peoria County, Illinois; Citizen of Japan.

123. *Chicago Daily Tribune.* 1896. Japanese again a Good Samaritan. Sept. 8. p. 1.
• ***Summary:*** "George Schuyler, a machinist, living on North Clark street, near Division, met Jokichi Takamine, the wealthy Japanese merchant, at the Woodlawn Police Station after two years' separation and under extraordinary circumstances.

"Schuyler several years ago was employed as chief engineer in the mail steamers belonging to the Nippon Yusa Kuieka company. While lying in Japanese waters the boiler of one of the boats blew up, injuring Schuyler severely. His life was given up, but Takamine, an officer of the company, had him removed to his home in Tokio and cared for.

"Last night Schuyler started to visit his old-time friend at his residence, Sixty-sixth street and Woodlawn avenue [6641 Woodlawn Ave.]. He proceeded as far as Sixty-third street when, in front of the home of William Launderers, No. 6334 Woodlawn avenue, he stopped, leaned his wheel against a tree, and fell to the ground, apparently dead. He was removed to the Woodlawn station, where he was given medical treatment. Takamine was summoned and later Schuyler was taken to the home of the Japanese.

"His collapse was due to brain trouble, resulting from the injuries received while in the Japanese mail service."

Note 1. This document shows that Takamine was still residing in Chicago on 8 Sept. 1896. He is said (by Kazumasa Iinuma 2000) to have relocated to New York in about Dec. 1897.

Note 2. Takamine is now being described as "wealthy."

124. Takamine, Jokichi. 1896. Verfahrung zur Herstellung von Maische bzw. [beziehungsweise] Wuerze mittels Taka-Koji und zur alkoholischen Gaehrungszellen [Process for the production of mash, especially a seasoning using Taka-Koji and the breeding of alcoholic fermentation cells]. *German Patent* 84,588. [Ger]*
• ***Summary:*** Source: *Zeitschrift für Spiritusindustrie* (1896), 18.

125. Parke, Davis & Co., Purchasing Department. 1897. Re: Purchase order for Taka-Diastase Form filled and sent to Takamine Ferment Co., 6641 Woodlawn Ave., Chicago, Illinois, Jan. 9. 1 p. Typed, without signature on letterhead.
• ***Summary:*** This said to be is the earliest known order for Taka-Diastase. The document appeared in the color online documentary "The story of Jokichi Takamine: Japan's goodwill ambassador," by Daiichi Sankyo Co. We do not know in which archival collection the document is kept.

Note 1. The Takamine Ferment Co. was apparently making Taka-Diastase at this time. Were they making it at

Woodlawn Ave. in Chicago?

Note 2. Since Taka-Diastase was being widely advertised by Parke-Davis in July 1895, how could their first purchase order be about 18 months later? Address: Detroit, Michigan.

126. Takamine, Jokichi. 1897. Verfahrung zur Herstellung eines diastatischen Enzyms bzw. einer Enzymmischung [Process for the production of a diastatic enzyme, and especially a mixture of enzymes]. *German Patent* 90,465. [Ger]*
• ***Summary:*** Source: *Zeitschrift für Spiritusindustrie* (1897), 27.

127. Takamine, Jokichi. 1897. Verfahrung zur Verzuckerung staerkehaltigen Materiales [Process for saccharification of starch-containing materials]. *German Patent* 90,464. [Ger]*
• ***Summary:*** Source: *Zeitschrift für Spiritusindustrie* (1897), 27.

128. Parke, Davis & Company. 1897. Taka-Diastase: The new digestive ferment. Detroit, Michigan: Parke, Davis & Co. 6 p. *
Address: Detroit, Michigan.

129. Takamine, Jokichi. 1898. Diastatic substances from fungus growths. *J. of the Society of Chemical Industry* (*London*) 17(2):118-20. Feb. 28. German summary in Chemisches Central-Blatt 1898(1):993-94.
• ***Summary:*** This paper by Takamine is presented as part of the "New York Section" of the Society. "Meeting held at the College of Pharmacy on Friday, January 21st, 1898. Prof. Charles F. Chandler in the chair." The paper begins:

"Most alcoholic beverages are made from cereals. The starch of the cereals is converted into sugars by diastase, and the resultant sugars are changed into alcohol by yeast. The production of diastase constitutes the most expensive part of this big industry. In America and Europe the germination of cereals is used as the only source of diastase. In Japan, however, a totally different process is in use for its production. A certain kind of microscopic plant, which his the property of generating diastase during its growth, has been utilised for this purpose. This diastatic substance (corresponding to the malt of this coutry) is known as koji, and the material bearing the matured spores of this plant is called tane-koji, or moyashi. The natures of these products have been studied by several investigators, such as Prof. Atkinson, Korscheldt, and others, and methods of manufacture have been described in detail in various modern literatures.

"The process of making koji is as follows: -

"The whole, unbroken grains of rice, which have been first cleaned of the outer bran, are steeped in water for from 10 to 20 hours, in order to thoroughly soak them. This soaked rice is then drained, and steamed until the starch cells of the grains of rice are opened. The mass is then cooled down to a temperature of 30ºC, and about one thousandth part, by weight, of the rice employed, of tane-koji is added and thoroughly mixed with the steamed rice. The mass is then bedded up and allowed to remain for about six hours, at the expiration of which time the same amount of tane-koji is added as before. At the expiration of about 20 hours the mass is divided into small portions and placed in trays, which are then left in the growing-room under proper manipulation, temperature, and humidity for about 50 hours, or until the fungus growth has sufficiently matured. It is then taken out of the growing-room and is ready for immediate use. Koji thus prepared has an opaque, white, velvety appearance, and is employed in the process of making 'sake,' as a converter of starch into sugar. The diastatic power of koji thus produced is only ½ or ¼ that of malt. I have observed that while the rice koji converts a considerable amount of starch into sugar, yet it is incapable of converting thoroughly its own starch. This is proved from the fact that the main part of the starch contained in 'sake' residue is derived from rice koji.

"There are various other drawbacks in the method of manufacture; and closer study of this subject gave me sufficient encouragement to devote my attention to it with a view to its improvement. In the course of experiments I have found out that various kinds of fungi have the property of generating diastase; and thus *Eurotum Oryzae* is not the only one. It became therefore necessary to select the best kind, and keep it free from other weaker and non-diastatic growths. The nutriment in the soil on which it is grown was found to have great influence on the diastase-producing property of the plant. This fact naturally led me to use an artificial fertiliser to give the plant a healthy and abundant growth.

Phosphate, potash, and nitrogen are the principal ingredients, and particularly is the former essential for producing healthy seeds of the matured fungus. In preparing the matured spores, a carefully-selected species of the fungus, which was cultivated on a culture medium with usual precautions, is now sown in a suitable material which has been thoroughly sterilised, treated, and artificially fertilised. The mass is then put into the growing-room, allowed to grow for five to seven days, and then thoroughly dried and preserved. The product thus obtained contains matured spores of the fungus, and is called taka-moyashi, and is used for producing the diastatic substance called taka-koji.

"Careful observations have shown that the amount of diastase generated is directly proportional to the density of the growth on a given area, provided there is supplied a sufficient amount of nutriment in the soil; that is, the closer the fungus is planted, the greater the quantity of diastase produced on a given area. It was also found out that the thickness, or depth, of the soil required for the growth is

extremely thin. Therefore, in the case of this fungus growth the possibility of increasing the diastatic power on a given weight or area of substance is very great, while in the case of malt the maximum possibility is limited, and we are producing nearly its maximum now. By keeping the above points in view, I have succeeded, at times, in producing a mass whose diastatic power is twice that of the best malt. The product obtained by this improved process is called taka-koji. (The prefix 'taka' means 'strong' in Greek, 'high' in Japanese.)

"In making taka-koji, various articles can be used with success, but for ordinary purposes I use wheat bran as a basis for growing the fungus. The bran, being of a loose and coarse nature, affords a large surface for the growth of the fungus, and a ready access of air–one of the necessary conditions to its growth. Being rich in albuminoids and phosphates, it supplies the most necessary ingredients for the production of the enzyme. It contains a large percentage of woody fibre, which renders its use of special advantage in the process of extraction, as described below.

"It is cheap and abundant, and in constant supply at all seasons of the year. The wheat bran is moistened with water so as to give the mass 30 to 40 per cent. of moisture, and then live steam is passed through it, in order to sterilise the mass as well as to gelatinise the starch cells. After the mass is cooled below 40ºC, a small quantity of the taka-moyashi (varying in quantity from 1 in 100 to 1 in 1,000) is added and thoroughly mixed.

"The mass is spread out in thin layers of 1 to l½ inches. on a cemented floor, or on shelves in a growing-room, where the temperature of the air is kept about 25ºC., and humidity near saturation. It will be observed that the temperature of the mass will gradually rise as the growth of the fungus advances. This should not be allowed to rise above 40º or 41ºC. This is regulated by adjusting the thickness of the layer and the temperature of the room. After about 24 hours the growth becomes visible to the naked eye, and the mass will begin to acquire the diastatic power. Both the growth and diastatic power increase rapidly after 36 hours, and the latter reaches its maximum point at about 48 hours, when the mass is taken out of the growing-room and cooled to the atmospheric temperature.

"Taka-koji, thus obtained, has a light yellowish, velvety appearance, and can be used in the green state as a diastatic agent, or, when it is thoroughly dried, can be kept indefinitely, as is malt or other grain. It is highly diastatic. Some was found to possess twice the diastatic power of the best malt. Taka-koji can be used as it is in solid form, or, more frequently, the diastase may be dissolved out with water by percolation, and the extract thus obtained used as the diastatic agent. About 20 per cent, of the dried taka-koji is soluble in water, and the extract contains all the diastase generated by the growth. In the case of alcohol distilleries, the extract containing 4 to 5 per cent, of the soluble matter of taka-koji is employed." Continued. Address: New York.

130. Takamine, Jokichi. 1898. Diastatic substances from fungus growths. *J. of the Society of Chemical Industry* (*London*) 17(2):118-20. Feb. 28. German summary in Chemisches Central-Blatt 1898(1):993-94.
• ***Summary:*** Continued: "When it is to be transported, or to be preserved, the extract containing 2.5 per cent, of solid can be obtained by percolation, and then evaporated in a vacuum pan to a thick syrup, or even to a solid. The concentrated extract thus obtained is of a dark brown colour, similar to that of malt extract, and has strong diastatic power, a half-gallon being about equal in diastatic power to one bushel of best malt. The extract of taka-koji, either fresh or in concentrated form, is used as a converter of starch into sugars in various industries, such as alcohol distilling, beer brewing, the manufacture of grain-vinegar, &c. In fact, wherever malt is used, this product can be used with advantage.

"The residue of taka-koji, alter it is extracted with water, when pressed and dried, can be used over and over again for making taka-koji, or it can be used as cattle feed. About 40 per cent. of the original weight of the bran is lost during the growth of the fungus and extraction. This diminution of the weight is chiefly due to the elimination of the carbohydrates of the bran. Consequently, this treatment increases the percentage of protein in the residual bran. On one occasion, at one of the Western distilleries, a 50-ton lot of bran had been used four times in making taka-koji, and the residue, amounting to about three carloads, was assayed at one of the Western agricultural colleges for protein, and found to contain a little over 21 per cent. of protein, while the original fresh bran contained only 12 per cent. This cattle feed was shipped to Europe at the time, owing to the fact that it contained a high percentage of protein, and therefore it could stand the expense of longer transportation than bran.

"While the above-mentioned taka-koji extract is stronger in its diastatic power, many times, than anything that has been manufactured on a commercial scale, yet it still contains a good deal of foreign matter; some small quantity of sugars and mineral matters give it a hygroscopic property, and make it difficult to keep in solid form.

"Various methods have been tried, such as dialysis, precipitation with various agents, &c., with a view to isolating the diastase from the extract. The simplest and most practical one is the precipitation by alcohol. An aqueous extract containing 18 to 20 per cent. of the extractive matter of taka-koji is made, and four to five times its own volume of strong alcohol is added slowly with vigorous agitation; a white, flocculent precipitate is formed. After the supernatant alcohol is decanted, the milky liquid is put into a centrifugal machine (cream separator) and further separated from the mother-liquid. This thick paste is then washed with strong alcohol to dehydrate it, and then the mass is pressed

under a hydraulic press to squeeze out as much alcohol as possible. The precipitate is now broken, air-dried, and, when powdered, forms the taka-diastase of commerce."

Note: This is the earliest English-language document seen (June 2012) in which Takamine uses the term "taka-diastase" (regardless of hyphenation or capitalization).

"Taka-diastase thus obtained is a yellowish-white amorphous powder, perfectly odourless, possessing a pleasant, nutty taste. It is readily soluble in water, with little or no sediment; it is non-hygroscopic. It possesses a remarkably strong diastatic power, or power of converting gelatinised starch into soluble starch, dextrins, and sugars. Its diastatic power, unlike other diastatic substances, is perfectly stable for all practical purposes. This property is particularly valuable for use as a standard for comparison of the diastatic power in the assays of the other diastatic substances. If the diastatic power of the given taka-diastase be once determined by any of the known methods, it can he depended upon as such for future comparison.

"The taka-diastase now on the market is capable of converting at least 100 times its own weight of dry starch into sugars in 10 minutes, as determined by modified Junk's test. Taka-diastase may be purified further by reprecipitation or other methods. By such means diastase of wonderful strength has been obtained.

"The diastase obtained from this fungus growth differs from malt diastase in the fact that it does not give Lintner's characteristic reaction of malt diastase, that is, giving an intense blue colour when treated with the tincture of gum guaiacum mixed with hydrogen peroxide, but, instead, it gives a milky coloration when so treated. I am inclined to believe that the Lintner's guaiacum hydrogen peroxide test above referred to is not the test for diastase, but it is the test for a certain albuminoid substance which coexists with diastase in malt. I found that an aqueous extract of any of the cereals which have not been germinated, and therefore, in the ordinary sense of the term, are non-diastatic, gives this blue coloration. At all events, the above test is not necessarily indicative of the diastase formed by the germination of the cereals.

"Another characteristic difference between this taka-diastase and malt diastase is the fact that for a given amount of sugar-forming power in both kinds of refined and isolated diastase, the taka-diastase has at least three or four times the starch-cell-breaking, or starch-liquefying, or dissolving power, compared with the diastase of malt. This fact is better understood by the following examples:– Suppose we take a refined and purified malt diastase, and its diastatic power is tested by Lintner's method, i.e., its starch-saccharifying power is determined. The same is done with the taka-diastase. And suppose that both (weight for weight) were found to have the same diastatic power, or same saccharifying power. Now take the same weight of each diastase, and let each act upon a great excess of known quantity of starch paste for a given time. On testing the quantity of the sugar formed, both will naturally be the same. But a remarkable difference will be observed in the consistency of the starch. While the contents of the vessel containing malt diastase may still be thick, the contents acted upon by taka-diastase will be very thin. This, along with other facts hereafter referred to, indicates that there seem to exist at least two kinds of diastases, viz., one a starch-liquefying diastase, the other a starch-saccharifying diastase, and the speculation may be made that intermediate kinds are starch-dextrifying diastases.

"In the practical application of the diastase–whether it is in the manufacturing industries, such as distilling, brewing, &c., or in its physiological uses, viz., the digestion of starch foods, &c.–this starch-liquefying properly of diastase is just as important as its starch-saccharifying property. In my opinion, in the future, the artificial production of starch-liquefying property will become of more technical importance than that of the saccharifying power. I have found that all cereals, and in fact all starch-containing crops, in their ordinary, natural condition (without undergoing germination), contain a large quantity of starch-saccharifying diastase which could be utilised in the arts; that is to say, all starch-containing crops naturally and without germination contain almost enough starch-saccharifying diastase to convert their own starch into sugars, provided the starch be made soluble by some other liquefying diastase.

"In the case of malt diastase, these two kinds of action seem to be in such proportion that neither of them is in excess, and consequently the quantitative measure of one is naturally the measure of the other; i.e., the diastatic power of malt is measured by its saccharifying power, which is determined by the sugar formed.

"This kind of test answered the practical purpose as far as malt is concerned. But now, as another kind of diastase comes into the field, the determination of the liquefying power of diastase became of practical importance, or, at least, the commercial value of the diastase must not be dependent upon its saccharifying power alone; that is to say, the Lintner's method of determining diastatic power, which is now very extensively adopted, and other similar methods, where the soluble starch prepared by acid is acted upon by the diastase to be tested, are not applicable for the valuation of the diastase like taka-diastase, which has extra virtue over that of malt diastase." Address: New York.

131. Takamine, Jokichi. 1898. Diastatic bodies in cereals, and their utilisation. *J. of the Society of Chemical Industry* (*London*) 17(2):120-23. Feb. 28. German summary in Chemisches Central-Blatt 1898(1):994.

• ***Summary:*** This paper by J. Takamine (which immediately follows his previous paper) is presented as part of the "New York Section" of the Society. "Meeting held at the College of Pharmacy on Friday, January 21st, 1898. Prof. Charles

F. Chandler in the chair." The paper begins: "During the course of numerous experiments with diastatic substances generated by fungus growth, I discovered in the early part of 1892, that a certain constituent of cereals, which is itself has no disatatic power, possesses the property of acquiring a remarkably augmented and increased diastatic power when used in conjunction with diastase of taka-koji. I have found that the said peculiar constituent is soluble in water, and can be dissolved out from the grain. For instance, make an aqueous extract of comminuted wheat or corn. This extract will be found to possess no diastatic power. Now mix it with a known quantity of taka-koji diastase of known determined diastatic strength. Then the diastatic power of the mixture will be found very much more than the sum of the diastatic strength of each constituent; in fact, the diastatic power of the mixture in some instances is augmented more than three times.

"For example, the water extract from one part of wheat flour, which has practically no diastatic power, is mixed with the aqueous extract from one part of taka-koji, the diastatic power of which is taken as a unit; then the diastatic power of this mixture will be found to be more than three, instead of only one.

"My explanation of this remarkable phenomenon is as follows:–The natural ungerminated cereals contain in soluble form a large quantity of starch-saccharifying diastase. This saccharifying diastase, however, has no action on raw or gelatinised starch, but it has strong power of converting soluble starches and dextrins into sugars. Now the starch that has been made soluble by the starch-dissolving power of taka-diastase is acted upon by the saccharifying diastase existing in cereals, forming, as a result, as much more sugars as there were formed soluble starches by the starch-dissolving diastase of taka-diastase. The following graphical illustration will make the explanation clearer:" Four figures are shown and explained.

After Takamine's basic presentation, he invites questions. These questions and his answers run from the bottom of page 121 (left column) to page 123 (about half way down the left column).

132. *New York Times.* 1898. Japanese chemist lectures: Jokichi Takamine explains at the College of Pharmacy a fungous ferment discovered by himself. March 10. p. 7.
• ***Summary:*** He devoted "part of the evening to an explanation of diastase and an alcoholic ferment from fungi, a process discovered by himself after long research." "He employed the English language in a naive but easily intelligible fashion that pleased his hearers." The ferment [enzyme] diastase converts into sugar in the human system.

In the West, the germination of cereal grains has long been the only source of diastase known. "But in some Oriental lands malt was unknown. In Japan, a microscopical plant, a fungous growth resembling ordinary mold in appearance, had been used for 200 or 300 years. After exhaustive studies and experiments, Mr. Takamine found a mold growth that possessed the two qualities of converting the starch in cereals into sugars, and the sugars so obtained into alcoholic spirits. This plant is a fungus of the species *Eurotium oryzae*, a mycelium of the Aspergillus family, the nature and characteristics of which were almost unknown. When grown for commercial purposes without being fertilized, it is known as taka koji. When fertilized with certain chemical salts it grows with great rapidity and matures in about 5 days.

"Hydrolized wheat bran, Mr. Takamine says, is an excellent medium [substrate] for the culture of taka koji... By a mechanical process the diastase portion and the ferment portion are separate for commercial use."

"Mr. Takamine also explained a fungous growth he had discovered that would act on nitrogenous matter [a protease]. Its general action is similar to pepsin, which is now obtained at slaughter houses from the stomachs of pigs... A vegetable ferment similar to pepsin would be gladly exchanged for it almost universally."

133. Takamine, Jokichi. 1898. Diastatic fungi and their utilization. *American J. of Pharmacy* 70:137-41. March.
• ***Summary:*** "Up to the present time the germinating of cereals has been the only source of diastase of any practical importance known in America and Europe. It is true that there is a diastase of animal origin, such as ptyalin and pancreatic diastase, but their sources are limited and their potency unstable... In Japan, and some other Asiatic countries, certain kinds of fungi are used in the production of diastase. The fungus that is used in Japan is called *Moyashi*, which was named by Ahlburg *Eurotium Oryzae.* It belongs to the genus Aspergillus, and is distinguished from ordinary fungus by its remarkable power of generating diastase during its growth. It is a perfectly harmless plant, as proven by the fact that it has been used in Japan for several centuries in the manufacture of the various daily beverages. The accompanying micrograph shows the form of its beautiful growth." The author describes the manufacture of Taka-Moyashi [koji starter culture or spores], Taka-Koji, and Taka-Diastase, using the fungus moyashi. This is cultivated in a starchy material such as ground corn, which has been steamed to gelatinize the starch. The spores resulting from the growth of the fungus are separated by sifting. This product is known as Taka-Moyashi. Taka-Koji results from mixing the spores with steamed wheat bran and allowing the culture to grow until a maximum diastatic value is reached. Taka-Diastase is precipitated from the aqueous extraction of Taka-Koji by addition of alcohol.

The amount of diastase secreted on average in human saliva each day is roughly equivalent to "5 to 8 grammes of Taka-Diastase, or about ½ pound of the best malt extract."

134. Takamine, Jokichi. 1898. A simple and accurate method of testing diastatic substances. *American J. of Pharmacy* 70:141-43. March. [3 ref]

• ***Summary:*** "There are various methods known for determining the diastatic power of substances, as Lintner's, Junk's, and others. While some of these are very reliable in many respects, they are complicated, and require specially trained hands to get reliable results. They are not, therefore, applicable when quick, simple and accurate testing is desired, as in diagnosing a certain form of amylolitic [amylolytic] dyspepsia by determining the diastatic power of the patient's saliva. My proposed test is based upon the stable diastatic property of Taka-Diastase."

This apparently a rapid procedure is based on the assumption that Taka-Diastase does not lose its diastatic power on standing, as do other forms of this ferment. The diastatic action of the material to be measured is compared with the action of Taka-Diastase, the actual comparison being made between the color produced by iodine in starch paste hydrolyzed by the sample ferment and shades, or colors, produced when Taka-Diastase is used.

135. Petit, P. 1898. Quelques procédes nouveaux en distillerie [Some new processes related to distilleries]. *Moniteur Scientifique de Quesneville* 51(1):244-48. April. Whole No. 676. (4th Series Vol. 12). [Fre]

• ***Summary:*** Koji is mentioned many times on page 244 and twice on page 245. Tané koji (koji starter, literally "seed koji") is mentioned on page 244.

Koji is used in Japan for saccharification–the transformation of starch in steamed rice into sugars–using the molds *Amylomyces rouxii* and *Aspergillus oryzae.*

At the 2nd Congress on Applied Chemistry, Mr. Sorel presented a very interesting study / paper on koji. He arrived at important results that we will summarize here: (1) While making koji, the temperature rises but its rise must be carefully monitored as explained by Mr. Takamine, author of a patent at a distillery in Peoria [Illinois], USA. (2) Rice is transformed by the enzyme (ferment) diastase in the koji mold. As products of saccharification, koji provides dextrin, glucose, and maltose in proportions that vary with the temperature.

Page 245: The mold *Amylomyces rouxii* was first studied by Mr. Calmette, who was interested in obtaining alcohol from rice using the Chinese method for saccharification and fermentation.

136. Takamine, Jokichi. 1898. Simple quantitative determination of diastatic power. *J. of the Society of Chemical Industry* (*London*) 17(5):437-38. May 31. German summary in Chemisches Central-Blatt 1898(2):51.

• ***Summary:*** A simple and quick quantitative determination of diastatic power is of considerable importance in the various industries such as in the manufacture of alcohol and alcoholic beverages; especially when diastatic substances are used in a green condition, such as green malt and green taka-koji, a quick method of determination becomes imperative.

"There are various methods of determining diastatic power in use, such as Lintner's, Junk's, O'Sullivan's, and others. While each method has its merits, yet, on the whole, they are complicated and require trained hands, and take a long time in their execution. The method I propose is one that I have been daily using with good results in the distillery, &c., where diastatic substances are used in green condition and quick method only is practical. While this is probably not as accurate as some of the known methods, yet it is delicate enough for all practical purposes, in fact it is remarkably accurate compared for its simplicity.

"This method firstly, is based upon the remarkable stability of the diastatic power of taka-diastase. A sample of taka-diastase probably over four years ago was tested from time to time up to the present by Junk's test, and its diastatic power was found practically permanent and stable. Secondly, this method is based upon the fact that (within certain limits) the speed of the diastatic transformation of starch paste is directly proportional to the quantity of the diastatic substance used. Or, in other words, time taken for diastatic transformation varies inversely as the quantity of enzine [enzyme].

The first step in the method consists in standardising or determining the diastatic power of a given sample of taka-diastase by a known established method once for all; or still better prepare a batch of taka-diastase whose diastatic strength represents an even number of diastatic units by known method, such as say 300 or 500 times its own weight of starch in thirty minutes according to modified Junk's test (modified Junk's, *Bull. of Pharm.*, 52-54, Feb. 1898), or say 800 or 500 diastatic units by Lintner's test (Lintner's *J. für Prakt. Chem.* (2), 34, 378-394).

"The second step in the method consists in making a color; metric scale of diastatic strength, which is done by allowing different volumes of solution of taka-diastase of known strength to act upon equal quantity of starch paste and comparing the diastatic power of the substances to be tested to the scale thus formed by the colorimetric indications produced by the action of iodine solution upon the converted starch paste.

"The diastatic power thus comparatively tested can be expressed by simple calculation in the terms of standardised take-diastase, or Lintner's or Junk's terms, or any other terms that may be desired."

There follows (including calculations): Standard taka-diastase solution. Starch solution. Iodine solution. Apparatus required. Materials to be tested. Process of testing. Discussion (one question and one answer).

137. Stone, W.E.; Wright, H.E. 1898. Notes on taka-diastase. *J. of the American Chemical Society* 20(9):639-47. Sept. [1

ref]
• ***Summary:*** "There has recently come into notice, chiefly through its industrial applications, a starch-saccharifying enzyme of apparently unusual value. This substance, called taka-diastase, has been in use in Japan for an indefinite time in the production of alcoholic beverages in much the same capacity as that for which we employ malt. Its introduction to America is due to Mr. Jokichi Takamine, who for some years has been occupied in furthering its application in the distilling industry in the United States. Pharmaceutical preparations of this enzyme intended for the relief of amylaceous indigestion, are also on the market. So far as the writers are informed neither the material itself nor its action on starch has been much studied from the purely scientific side or, if such investigations have been made, they have not been generally published." Taka-diastase is produced as a result of the growth of a species of mould (*Eurotium Oryzae* Ahlburg), upon rice, maize, wheat bran, etc." It is presently grown on wheat bran in the USA. The bran felted together with the fungus mycelium is called "taka-koji." Taka-diastase is made by Messrs. Parke, Davis & Co. of Detroit, Michigan; they furnished samples for these experiments.

For a given short time the actual saccharifying power of taka-diastase is decidedly superior to that of malt-diastase. However, malt-diastase causes the more complete conversion of starch into other forms. However isolated malt-diastase is unstable, and such preparations "rapidly deteriorate and lose their value."

Conclusion: "It is certain... that in gross industrial operations the cheapness and stability of taka-koji and taka-diastase will commend it while its ability to convert a very large proportion of the starch present in a grain into sugar within a very short time should render it a very valuable substitute for malt. The application of taka-diastase as an aid to starch digestion is doubtless of high value by reason of its convenience, its notable saccharifying power, and its permanent keeping qualities."

Note 1. This is the earliest document seen (Feb. 2006) that mentions Parke, Davis & Co. in connection with Jokichi Takamine. It states that they are making taka-diastase. As far as we have been able to determine, Parke, Davis & Co. was the first company, worldwide, made and sold a purified enzyme product–Taka-diastase. Jokichi Takamine licensed them the rights to make and market the product. It was being sold commercially by Sept. 1898. It probably consisted of a mixture of purified diastatic / amylolytic enzymes. A fungal enzyme, it was produced by growing pure-culture *Aspergillus oryzae* on wheat bran, extracting the enzymes using water, then precipitating them using ethanol to create a white to yellowish-white powder, the form in which the product was sold. Its first main application was as a digestive aid. Address: Chemical Lab., Purdue Univ. [Indiana].

138. Takamine, J. 1898. Substances diastasiques des moissures [Diastatic substances from fungus growths (Abstract)]. *Moniteur Scientifique de Quesneville* 51(2):744-45. Sept. Whole No. 681. (4th Series Vol. 12). [Fre]
• ***Summary:*** This is a French-language summary of the following English-language document: Takamine, Jokichi. 1898. "Diastatic substances from fungus growths." *J. of the Society of Chemical Industry* (London) 17(2):118-20. Feb. 28.

139. Takamine, J. 1898. Substances diastasiques dans les céréales et leur utilisation [Diastatic bodies in cereals, and their utilisation (Abstract)]. *Moniteur Scientifique-Quesneville* (*Moniteur Scientifique du Docteur Quesneville*). *4th Series.* 51(2):745. Sept. Whole No. 681. (4th Series Vol. 12). [Fre]
• ***Summary:*** This is a French-language summary of the following English-language document: Takamine, Jokichi. 1898. "Diastatic bodies in cereals, and their utilisation." *J. of the Society of Chemical Industry* (London) 17(2):120-23. Feb. 28.

140. Distilleries. 1898. Peoria, Illinois: Peoria Public Library Peoriana Notebooks. Vol. 5, p. 700. Or page 101 in the Peorian notebook (under Peorians (T)). Scrapbook clipping.
• ***Summary:*** This unpublished scrapbook clipping reads: "October 17, 1898–Jokichi Takamine, the Jap chemist, was back in town with his pet microbe, 'Koji,' looking for a prosperous distillery where he might go to work making more and better whiskey out of less and cheaper rice. Takamine said his new bug was much more efficient than the old one with which he derived alcohol from corn.

"The distillers remembered the Jap as the chemist who was an important man back in the days of the Whiskey Trust. His secret process for converting corn into liquor was of great value but the owner was smart enough to keep it to himself. It was said that he was even able to control the price of whiskey certificates on the exchange by announcing that his bug felt like putting in a full week's work or that it was sulky and wanted a layoff.

"Now his return with a new and reputedly more high powered bug for rice distillation made the corn liquor makers fear for their markets."

A similar article appeared in the same publication two days later, on October 19, 1898 (see Peoriana scrapbook, p. 691, under Distilleries).

Letter from Elaine Pichaske, Reference Dept., Peoria Public Library, Peoria, Illinois. 1995. Feb. 7. Dallas Sweeney (who died in Oct. 1958) compiled the Peoriana Notebooks from articles taken from the *Peoria Daily Record* of the 1930s and 1940s. They are chronology and subject notebooks [actually scrapbooks]. This article is from Volume 5, page 700, under the subject of Distilleries. There is no index to the *Peoria Daily Record* so there is no easy way to find when this article was originally published. Address:

Peoria, Illinois.

141. Kawakita, T. 1898. Taka-kôji narabini Takadaiasuteesu [Taka koji and Takadiastase]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 1:183-85. Summarized from J. of the Society of Chemical Industry (London). Vol 17. [Jap]

142. Jokichi Takamine's first chemical laboratory in New York City (Photograph). 1898? Undated.

• ***Summary:*** This photo (undated) is from the booklet "Shofu-Den" by the Japanese Heritage Foundation (1994, p. 13). The caption states that this laboratory was located at 109th Street in Manhattan. However Dr. Joan Bennett (1988, p. xi) says that Takamine's first laboratory in New York was located on East 103rd Street.

Note: Judging from the cars parked on the street, this photo was taken in the late 1950s or early 1960s.

143. *Medicine* (*Detroit, Michigan*). 1899. Honorary degrees conferred by the University of Japan on Sho Watase and Jokichi Takamine. 5(5):388. May.
• ***Summary:*** Jokichi Takamine, a resident of Chicago, received the degree of Doctor of Engineering, from the Imperial University of Japan.

"Jokichi Takamine was born in Tokyo, Japan, forty years ago. After he had finished his common school education he entered the Tokyo University, where he became deeply interested in the study of chemistry and engineering. After graduating he went to Scotland to pursue his specialties at the University of Glasgow. Here he formed the acquaintance of Professor Mills and studied with him for several years. During this time he discovered a way to obtain pure diastase by sowing the seeds of microscopic fungus and procuring the diastase from the precipitation of the extract. Takamine was sent to the World's Cotton Exposition, which was held in New Orleans in 1883, as a commissioner from Japan. While in this country he formed a company with himself as head for the manufacture of diastase. He then returned to Japan for a visit of four years. At present he is on a lecture tour through the East."

Note: This is the earliest English-language document seen (Aug. 2012) in which the word "Doctor" or "Dr." or "PhD" is used in connection with Jokichi Takamine. In 1899 he received the degree of Doctor of Chemical Engineering from the Imperial University of Japan, and in 1906 the degree of Doctor of Pharmacy (W.W. Scott 1922, p. 371).

144. Takamine, Jokichi. 1899. Process of utilizing waste portions of printers' ink rollers. *U.S. Patent* 635,821. Oct. 31. 3 p. Application filed May 23, 1896. [4 ref]
• ***Summary:*** This is a patent on an process for removing glycerin from used printers' rollers.

Note: This is a "Specification forming part of Letters Patent No. 635,821, dated October 31, 1899." Address: Chicago, Cook County, Illinois.

145. *Chicago Daily Tribune.* 1899. Ask to be relieved of Chicago debts. Nov. 9. p. 5.
• ***Summary:*** "Peter Adrian Pincuffs and Henry Pieters, who composed the firm of Pincuffs, Pieters & Co., dissolved in May, 1896, having filed a petition in bankruptcy with liabilities of $59,343 and assets consisting of stock of the Takamine Ferment company of Chicago, face value $9,000, actual value unknown, and life insurance policies of $1,000. They were formerly in business in Chicago, where the debts were contracted from 1893 to 1896. The largest creditors are the Union National Bank of Chicago, $27,950, and the First National Bank of Chicago, $10,250."

146. Haury, Alfred. 1899. Die Schimmelpilze und ihre industrielle Anwendung [Molds and their industrial application]. *Oesterreichische Chemiker-Zeitung* 2(23):605-11. Dec. Series 2. [24 ref. Ger]
• ***Summary:*** Discusses three genera of molds: *Penicillium, Aspergillus,* and *Mucor.* Gives details and a review of the literature on the use of *Aspergillus* species of mold for the production of saké, koji, soy sauce, miso, and various other East-Asian foods. In 1896 a book titled *Les moisissures* (*The molds*), by Calmette was published in Brussels, Belgium; he discussed sake, the chemical composition of koji, and the action of its diastase enzyme. "It was a Japanese named Jokichi Takamine who first had the idea of using koji in place of malt in American and European distilleries. In 1889 in the USA he was issued a patent on the process for using koji (or a mixture of koji and moto) in a fermentation to make of product containing 15-18% alcohol. The process was first tested in practice at Peoria, Illinois, is a distillery of the Distilling and Feeding Co., but not with the results

that all the world had expected. Both Delbrueck (1894) and Saare (1895) had the opportunity to the process on the spot in 1894; in the opinion of Delbrueck koji is suited for use in place of malt in the saccharification of starches. For the production of koji, Takamine uses an inexpensive wheat bran instead of the typical rice. The process is then described in detail.

Aspergillus oryzae plays a key role in the production of two East-Asian foods: soy sauce (*Shoyu-Sauce*) and miso. The former is made with wheat, soybeans, salt, and water; miso is made from soybeans, koji, salt, and water. For details see Kellner's publication "On Saké, Shoyu and Miso." In Java, another species of Aspergillus, namely *A. Wentii* is used to make their soy sauce (*Sojasauce*), according to Prinsen-Geerligs.

Also discusses the use of Mucor species, such as *Amylomyces rouxii*, in the production of spirits or brandy from dehulled rice. In 1892 Calmette was head of the Pasteur Institute in Saigon; today he is director of the Pasteur Institute in Lille, France. He has taken considerable interest in Mucor species, and published the results of his research in his 1896 book. Colette has a factory at Seclin near Lille. Colette and Boidin have formed the Amylo Society (*Société d'Amylo*) in Lille. Address: Chemist, Austria.

147. Effront, Jean. 1899. Les enzymes et leurs applications The enzymes and their applications]. Paris: G. Carré et C. Naud. 370 p. 22 cm. [Fre]

• ***Summary:*** The work of Jokichi Takamine with diastatic enzymes is mentioned on pages 274-75, 277-81, 283, 368.

Koji is mentioned on pages 259-63, 275-76, 283, and 368. Note: Jean Effront lived 1850-1931.

148. One jar and two packs of Taka-Diastase as sold in Japan (Photograph). 1899. Undated.

• ***Summary:*** The date and place of this photo are unknown. Taka-Diastase was first distributed to Japan in 1899 by Parke, Davis & Co. This Taka-Diastase was first made by Sankyo KK in Japan in 1905 as a digestive enzyme for those who have difficulty digesting starch.

Sent by and reprinted with permission from *Kanazawa Furusato Ijinkan* (Great People of Kanazawa Memorial Museum) in Kanazawa, Japan.

149. Sankyo Shoten (Sankyo Co., Ltd.) founded in Japan (Important event). 1899.

• ***Summary:*** The Japanese word "Sankyo" means "three parts."

1899 (Meiji 32)–Sankyo Shoten is founded in Japan by three Japan men–Matasaku Shiobara, Shotaru Nishimura, and Genjiro Fukui–who each contribute equal amounts of money to the startup capital. Their first product, in 1899, is Taka-Diastase, a digestive enzyme which had been discovered and launched in the USA in 1894 by Jokichi Takamine, who had isolated it from the koji mold *Aspergillus*

oryzae. The first Taka-Diastase they distributed and sold was imported, made in the United States under contract with Parke, Davis & Co., a U.S. pharmaceutical firm in Detroit, Michigan.

1902 (Meiji 35)–Launched Adrenalin, an adrenal cortex hormone, first isolated and patented in the USA by Dr. Jokichi Takamine.

1905–Sankyo establishes the company's first plant at Hakozaki, where Taka-Diastase is first manufactured in Japan.

1908–Sankyo establishes the company's second plant at Shinagawa, Tokyo, to increase their capacity to manufacture Taka-Diastase.

1913–Sankyo Shoten, now growing rapidly, is reorganized as a joint stock company and incorporated under the new name Sankyo Co., Ltd. Dr. Jokichi Takamine, living in the United States, becomes the company's first president.

1915–Sankyo's third plant is established in Osaka.

1918–Daiichi Pharmaceutical Co., Ltd. was established with Seinosuke Shibata as the first president. In 2005 Daiichi, previously a completely separate company, acquired Sankyo.

1920–Dr. Umetaro Suzuki is appointed as a scientific advisor to Sankyo. In 1910 Dr. Suzuki made the world's first discovery of vitamin B-1, from rice bran, thereby establishing the basis for the theory of vitamins.

Note: Thiamine (vitamin B-1) was the first of the vitamins to be described. Its discovery is generally attributed to Christiaan Eijkmann in 1897; in 1929 he was awarded the Nobel Prize in Physiology and Medicine because his observations led to the discovery of vitamins (Source: Wikipedia, at Thiamine, Aug. 2012).

1921–Sankyo starts to manufacture Japan's first synthetic agricultural chemical, the fumigant insecticide Kokuzol (R).

1932–Sankyo starts to manufacture yeast for bread.

1949–Both Sankyo and Daiichi are first listed on the Tokyo Stock Exchange.

1951–Sankyo manufactures Japan's first antibiotic preparation Chloromycetin (R). The same year Sankyo launched the cold medicine Lulu (R).

1961–Sankyo established a U.S. subsidiary in New York City.

1960s early–Japan establishes a National Health Insurance System which is important not only to Sankyo, "but to the Japanese pharmaceutical industry at large. Under the new system patients were required to pay a fraction of prescription fees while the government assumed the majority of costs. Moreover, the system encouraged the generous prescription of medications since doctors profited from the difference between the official reimbursement price set by the Ministry of Health and the actual price for which the drugs were purchased. For this reason, the drug industry became one of Japan's most profitable industries. By 1961 the industry's annual growth rate reached 21 percent."

1976–Patent protection laws are passed in Japan when enable Japanese pharmaceutical companies to invest in research without fear of piracy.

1996–Sankyo Parke Davis is established in a joint venture with Warner-Lambert Co.

Sources: *International Directory of Company Histories*, Vol. 56. St. James Pres. History of Sankyo Co., Ltd. at www.daiichisankyo.com/corporate/history/index.html. Retrieved 2 Aug. 2012. http://www.fundinguniverse.com/company-histories/ sankyo-company-ltd-history/.

150. Stone, W.E.; Wright, H.E. 1899. Bemerkungen ueber Takadiastase [Notes on Taka-diastase (Abstract)]. *Jahres-Bericht ueber die Fortschritte der Tier-Chemie* 28:720. [1 ref. Ger]

• ***Summary:*** This is a German-language summary of the following English-language article: Stone, W. E.; Wright, H.E. 1898. "Notes on taka-diastase." *J. of the American Chemical Society* 20(9):639-47. Sept.

151. Takamine, Jokichi. 1899. Diastatische Substanzen aus Pilzculturen [Diastatic substances from fungus growths (Abstract)]. *Jahres-Bericht ueber die Fortschritte der Tier-Chemie* 28:721. [1 ref. Ger]

• ***Summary:*** This is a German-language summary of the following English-language article: Takamine, Jokichi. 1898. "Diastatic substances from fungus growths." *J. of the Society of Chemical Industry* (London) 17(2):118-20. Feb. 28.

The summary (by Andreasch) begins: *"In Japan, wird statt Malz eine als Koji bezeichnite Substanz verwendet,..."*

152. *New York Times.* 1900. Club pays tribute to Jefferson's work: Single tax men also honor their leader's memories. Mr. Coler on Henry George. His life achievements illustrate the lesson of honesty in politics–Republican party attacked. April 13. p. 3.

• ***Summary:*** "Jokichi Takamine spoke to the toast 'The Orient,' and Congressman Lenz responded to the toast 'Thomas Jefferson.'"

153. U.S. Department of the Interior, Census Office. 1900. Charles P. Beach in the 1900 U.S. Census in Colton, San Bernardino, California. Washington, DC. June 6.

• ***Summary:*** Lizzie A. Beach, head of household, born Feb. 1855, age 45, widow, married 17 years. Five children, all five living. Elizabeth born in Indiana, her parents born in Indiana [spelled out].

Beach, Wesley H, son, born Aug. 1878, age 21, single, born Kansas, father born Connecticut, mother born Indiana; at school.

Beach, Jesse [M?], son, born Dec. 1881, age 19, single, born Kansas, father born Connecticut, mother born Indiana; at school.

Beach, Mary, daughter, born Sept. 1887, age 12, single, born Kansas, father born Connecticut, mother born Indiana; at school.

Beach, Charles P., son, born Sept. 1889, age 10, single, born Kansas, father born Connecticut, mother born Indiana; at school.

Note 1. The 1900 U.S. Census is the only one to give the year and month of birth for each person. Since Lizzie had been married for 17 years in 1900, she was married in about 1883.

154. Takamine, Jokichi; Hitch, Ebenezer Vose. 1900. Filter bag or strainer. *U.S. Patent* 659,041. Oct. 2. 3 p. Application filed June 30, 1900. 3 drawings. [4 ref]

• ***Summary:*** "This invention relates to improvements in filtering or straining devices for separating the liquid constituent from insoluble substances; and the object of our invention is to produce a filter in the form of a bag which will afford about double the filtering-surface of the ordinary filtering-bags which are now in use.

"To this end our invention consists in forming a filter or strainer bag of inner and outer strainer walls or sections, which are separated at the top and connected at the bottom to afford a containing-chamber between the inner and outer walls or sections of approximately annular cross-section."

Note: It is not clear for what purpose Takamine used this bag. Address: 1. New York, N.Y.; 2. Chicago, Cook Co., Illinois.

155. Lakeside Annual Directory of the City of Chicago. 1900. Chicago, Illinois: Chicago Directory Co.

• ***Summary:*** The two consecutive entries read: "Takamine Ferment Co. E.C. Moore, sec; 1011, 138 Washington.

"Takamine, Jokichi, pres. Takamine ferment co. 1011, 138 Washington [which means room/suite 1101 in the 138 Washington building].

Note: No residential address is listed. Address: Chicago, Illinois.

156. Takamine, Jokichi. 1901. The blood-pressure-raising principle of the suprarenal glands–A preliminary report. *Therapeutic Gazette* (*Detroit, Michigan*) 17(4):221-24. April 15. Series 3. Whole Series Vol. 25. [4 ref]

• ***Summary:*** A footnote on the first page states: "Read before the annual meeting of the New York State Medical Society, January, 1901."

Takamine begins by summarizing the history of research on this subject. "Dr. J.J. Abel published his first paper on this subject in 1897 in the July number of the *Bulletin of the Johns Hopkins Hospital*, and his second paper in 1898 in the September and October numbers of the same publication. In the latter he announced that he had isolated the active principle of the gland, and named it 'epinephrin.' Shortly afterwards Dr. O. v. Furth reported the results of his investigation of the gland, and made a severe criticism of Abel's 'epinephrin,' declaring that it is nothing more than an inactive foreign matter contaminated with some of the active principle. Furth claimed to have attained the isolation of the active principle by different methods, and called his product 'suprarenin.' Abel obtained 'epinephrin' by treating, in an autoclave, a benzoyl compound obtained from the gland extract with benzoyl chloride and sodium hydroxide, after the Baumann-Schotten method; while Furth obtained 'suprarenin' from the filtrate in which Abel considered 'epinephrin' did not exist.

"In July, 1899, another paper by Dr. Abel appeared in the *Zeitschrift f. Physiologische Chemie* in which he opposed his opinion to that of O. v. Furth, and gave also a number of results of chemical analyses of 'epinephrin.' Notwithstanding his effort to solve the question, there is still room for controversy, for he could not obtain 'epinephrin' in a chemically pure form. Neither could Furth obtain 'suprarenin' in a pure state.

"Having been interested in this subject for some time I recently commenced to make research along that line. I am now pleased to announce that I have succeeded in isolating the blood-pressure-raising principle of the gland in a stable and pure crystalline form. Although I will not go into the details of the method of preparation, in this preliminary note, I may state that the method I have employed is entirely different from either of those used by Abel and Furth.

"I desire by no means to usurp credit due to the pioneer investigators; yet in view of the facts that neither of the authors quoted has obtained the active principle in pure form, and that there still exists some room for controversy between them, for convenience sake I have termed the blood-pressure-raising principle 'adrenalin.'

The following is a summary of the essence of this paper from the *J. of the American Medical Assoc.* (18 May 1901, p. 1430): "After first noticing the work of Abel and von Furth and their products, epinephrin and suprarenin, neither of which was obtained in the perfectly pure state, Takamine describes his adrenalin, which he considers the isolated active principle of the suprarenal gland. It is a light, white, microcrystalline substance with slightly bitter taste and leaving a slightly numb feeling on the tongue where it has been applied. When dry it is perfectly stable. It shows a slightly alkaline reaction on moistened litmus paper, is soluble with difficulty in cold water, but more readily in hot, the crystals separating after cooling. The colorless aqueous solution is easily oxidized in the air, turning to red and eventually to brown. It is easily soluble in the acids or alkalies, but not in ammonium hydroxide or solutions of the alkaline carbonates. With ferric chlorid a beautiful emerald green color is produced, which by careful addition of caustic alkali becomes purple or even carmin red. Strong acid prevents this reaction, giving only a dirty yellowish-green. It reduces silver salts and gold chlorid very

energetically and turns the liquid red. Oxidizing agents such as ferricyanide and bichromate behave the same way. He has produced three kinds of salts, hydrochlorates, sulphates, and benzoates by dissolving adrenalin with three different acids, and evacuating, in vacuo, over strong sulphuric acid. In the course of time the residues became brown brittle amorphous masses, deliquescent in the air. Its physiologic activity is astoundingly strong. A solution of 1 to 10,000 blanches the normal conjunctiva in thirty to sixty seconds. Intravenous injection produces an enormous rise of blood pressure, and 0.000008 of a gram is equal in its effect to 0.005 of a gram of suprarenal extract. Adrenalin administered in quantity of one fourteen-millionth part of one gram per kilo of body weight will produce distinct physiologic effects. It is the most powerful astringent and hemostatic known, and the strongest stimulant of the heart. It is non-irritating, non-poisonous, and non cumulative, and without injurious effects."

Takamine ends his paper with these words: "It has given satisfactory results in the treatment of the following diseases and conditions: Acute conjunctivitis; some cases of deafness; bloodless operations on the nose and throat; laryngeal phthisis; hay-fever; nasal hemorrhage; 'bleeders;' diseases of the heart; diseases of the nose and throat; asthma; laryngitis; diseases of the urethra; Addison's disease; exophthalmic goitre, etc., etc.

"The therapeutic efficacy of adrenalin has already been established, beyond doubt, in the short time that has elapsed since its first production, and it will unquestionably attain to a prominent place in the materia medica.

"In concluding this paper I desire to state that my thanks are due to Dr. E. M. Houghton, of Detroit, for making the physiological tests, and also my thanks and a large share of credit are due to Mr. Wooyenaka, my associate, for his energetic and able assistance in accomplishing this interesting investigation."

Note 1. This is the earliest scientific journal article seen in which Jokichi Takamine discusses the results of his research on adrenalin. However, since this is a preliminary report intended to establish his claim to priority, he carefully avoids describing the process by which he isolated adrenalin.

Note 2. This journal is published by Parke, Davis & Co., soon to be the manufacturer of adrenalin. Address: Dr., New York City.

157. *J. of the American Medical Assoc.* 1901. Association news. May 25. p. 1510-1517.

• ***Summary:*** Under "Program for the St. Paul meeting" (p. 1511) is a detailed list of all papers to be presented at this major annual meeting of the American Medical Association in St. Paul, Minnesota, from June 3 to 6.

"The section on "Materia Medica, Pharmacy and Therapeutics" will take place in the Senate Chamber of the State Capitol (p. 1516).

Within that section, on Thursday, June 6, starting at 2 p.m. a "Symposium on organotherapy" will be held (p. 1517). Paper No. 32, titled "The active principle of suprarenal glands," will be presented by Jokichi Takamine.

Note: This appears to be the first public presentation of his work on Adrenalin. It is definitely the first mentioned in the *Journal of the American Medical Association.* We can find no earlier presentation at a medical convention at Johns Hopkins University–despite the fact that this is often alleged, based on Kawakami 1928 (p. 43).

158. Schweinitz, G.E. de. 1901. An ophthalmic clinic in the Jefferson College Hospital. *Therapeutic Gazette* (*Detroit, Michigan*) 17(6):367-72. June 15. Series 3. Whole Series Vol. 25.

• ***Summary:*** Case II (p. 369) includes the action of atrabilin and adrenalin, both preparations of the suprerenal gland. The doctor states (p. 369-70): "Still another preparation of this remarkable substance I exhibit in this bottle, and which is an active principle of the suprarenal gland separated by Dr. Takamine, and to which the name adrenalin has been applied. I have two preparations here, which Dr. Hare has been kind enough to give me, one in a strength of 1:10,000 and one in a strength of 1:1000, either of which instilled in the conjunctival sac will blanch it, as did the other preparation which I have shown you, in thirty seconds.

"I have not been able to observe any great difference in the rapidity of the action of the extract of suprarenal gland, atrabilin, or adrenalin, nor have I been able to notice that one is more efficient in blanching than the other. The advantage of adrenalin, however, is that you deal with a clear fluid, the physiological activity of which is very great, so that it may be mixed with sterile water, physiological salt solution, or boric acid, and continue to be potent even in a strength of 1:10,000."

Note: This journal is published by Parke, Davis & Co., soon to be the manufacturer of adrenalin. Address: M.D., Prof. of Ophthalmology.

159. *Therapeutic Gazette* (*Detroit, Michigan*). 1901. Taka-diastase. 17(6):403. June 15. Series 3. Whole Series Vol. 25. [1 ref]

• ***Summary:*** Dr. Arthur Watson (Bellwood, Llanymynech) writes to the *British Medical Journal* of February 2, 1901: "'I desire to bring to the notice of medical men who have not tried it the great usefulness of taka-diastase in many cases of dyspepsia which do not yield to exhibition of pepsin, mineral acids, alkalies, etc. Probably the majority of dyspeptics can fairly digest proteids or albumins, but not starchy foods which bulk so largely in the diet of most, and especially of abstainers from animal food [vegetarians], who I think increase in numbers. The individual may eat too quickly, or his saliva may, as in fevers, be scanty or lack potency; so the buccal digestion [in the mouth] being incomplete, the stomach passes the unchanged starchy food into the

bowel, where the pancreas may fail in effective office, in which case severe lancinating pain in the colon may result. Taka-diastase appears not only greatly preventive of such indigestion, but by digesting the vegetable food, liberates the proteids for their better digestion by gastric acid. Recently I have had a dyspeptic vegetarian patient; but by taking with each meal one of Parke, Davis & Co.'s 2½-grain tablets for two or three weeks he can now take food in comfort, and has better general health. This is but one instance of my success with the ferment. If taken half an hour after the meal it acts apparently equally well, and in an acid medium.'"

Note: This journal is published by Parke, Davis & Co., the manufacturer of Taka-diastase.

160. *Washington Post.* 1901. A new chemical. Sept. 22. p. 25.
• ***Summary:*** From the New York Herald: "The first milestone on the journey toward bloodless surgery has been reached. Its name is adrenalin, that being the title of a chemical composition recently discovered by Dr. Jokichi Takamine, a well known and highly educated Japanese, who is connected with a chemical house that has a local office in this city. Adrenaline is to medicine what liquid air is to science, the only difference being that the chemical is under complete control, with unlimited possibilities before it.

"By the local application of adrenalin, in solution of one part to 5,000, operations may be performed on the nose, ear, and eye without the spilling of a drop of blood."

Adrenalin is also "a most powerful cardiac stimulant." Physicians say it may be use to resuscitate persons who have died of heart failure. In premature childbirth, it may be able to revivify the heart of a dead [stillborn] child.

161. Benedict, A.L. 1901. Suprarenal extract and adrenalin in internal medicine. *Therapeutic Gazette* (*Detroit, Michigan*) 17(10):664-66. Oct. 15. Series 3. Whole Series Vol. 25.
• ***Summary:*** The word "adrenalin" is mentioned six times on page 665. For example: "About fifty cubic centimeters of blood was vomited, and an unknown quantity appeared as tarry stools. Six doses of one-fourth milligramme each of adrenalin, administered during forty-eight hours, stopped the hemorrhage, and after three days' fasting and two weeks of gastric feeding the hemorrhage has not reappeared, though vomiting has occurred several times."

On page 666 we read: "As to choice of preparation, Takamine's adrenalin is far less apt to decompose; it is capable of administration in definite and minute dose; it is unirritating; it introduces no digestible nor fermentable material; it may be given either hypodermically, by mouth, or otherwise; dose for dose, it is at least as cheap as cruder preparations. Whenever an extract of suprarenal gland is indicated as a vasomotor stimulant, adrenalin should be preferred. In the empiric treatment of suprarenal disease, it is probably better to use the cruder extracts as possibly including other active principles."

Note: This journal is published by Parke, Davis & Co., soon to be the manufacturer of adrenalin. Address: M.D., Prof. of Physiology and Digestive Diseases, Dental Dep., Univ. of Buffalo, Buffalo, New York.

162. *Therapeutic Gazette* (*Detroit, Michigan*). 1901. The therapeutic value of adrenalin chloride. 17(10):675. Oct. 15. Series 3. Whole Series Vol. 25. [1 ref]
• ***Summary:*** "Dudley Reynolds, of Louisville, gives us the following results of his use of adrenalin chloride in *American Medicine* of July 6, 1901:

"1. It is a powerful hemostatic, and acts promptly, generally within one minute from the time it is applied locally to mucous surfaces.

"2. Its effects persist from twenty minutes to four hours.

"3. It promptly relieves ciliary pain in all forms of keratitis, iritis, and even the cyclitis of glaucoma.

"4. It reduces ocular tension in glaucoma, and apparently prevents hemorrhage in iridectomy.

"5. It promptly clears up interstitial opacities of the cornea, following contusions, and seems to modify favorably the opacities of punctate keratitis in cases of syphilitic iritis.

"6. It will, in many cases, so reduce the swelling in the tear passage as to allow a stream of fluid to pass from Anel's syringe through the duct, without the use of a probe..."

"7. In all forms of swelling in the lining of the nose, prompt relief follows the application of four or five minims of the adrenalin solution sprayed into the passage. In this way the superior crypts may be readily opened, and medicated fluids sprayed into the passage, or other applications made, where access is otherwise impossible.

"It renders operations in the nasal passages and elsewhere nearly or quite bloodless, and does not, as some claim, predispose to secondary hemorrhage, but has a contrary effect. The 1-to-1000 solution of adrenalin in sodium chloride may be relied upon to relieve any case of epistaxis.

"In cases of secondary hemorrhage, after operations in the nasal cavities, or tonsils, an application of adrenalin solution on a cotton mop [swab], pressed upon the bleeding surface, proves promptly efficient as a hemostatic.

"The adrenalin solutions are in every sense of the word superior to any preparation of the suprarenal extract, or of the desiccated glands, which has yet been procured, and the world is deeply indebted to Takamine for his discovery."

Note: This journal is published by Parke, Davis & Co., soon to be the manufacturer of adrenalin.

163. *Chemist and Druggist* (*London*). 1901. Birmingham notes. 59(18):715. Nov. 2.
• ***Summary:*** "The *Post* gives Messrs. Parke, Davis & Co. a silent advertisement by telling its readers that 'Dr. Jokichi Takamine, a Japanese, claims to have discovered the possibility of bloodless surgery through the medium of a

chemical composition called adrenalin. By its application in solution operations may be performed on the nose, ear, and eye without spilling a drop of blood. It is the most powerful remedy known, and at the same time the most expensive, being 4*s.* [shillings] a grain or 1,400*l.* [pounds sterling] a pound.'"

164. Takamine, Jokichi. 1901. Adrenalin the active principle of the suprarenal glands and its mode of preparation. *American J. of Pharmacy* 73:523-31. Nov. German summary in Chemisches Central-Blatt 1901(2):1355.

• ***Summary:*** Begins with a history of research on the suprarenal glands and adrenalin, including that of Adison (46 years ago he "first observed the certain changes of the suprarenal lands and their relationship to the disease now bearing his name"), Vulpian (he first observed "that ferric chloride and iodine impart characteristic hues to the glandular juice"), Otto von Furth of Germany (has "already written several papers in which a controversy against [Dr. John Jacob] Abel's epinephrin was entertained. Einephrin is a substance in suprarenal glands isolated by Dr. Abel and claimed by him to be the active principle"), Abel (of Johns Hopkins in Baltimore. There "remains a question whether suprarenin be the pure active ingredient or a mixture thereof, with more or less inert matters, as long as von Furth cannot get it in pure, stable, definite forms").

"Last summer I devoted my attention to this subject and am pleased to announce that I have succeeded in isolating the active principle in a pure, stable, crystalline form." Since "there may exist some room for controversy, I have... termed my substance, as I isolated, 'Adrenalin.'

Discusses: The mode of isolation of the active principle of the suprarenal glands. Properties and deportments. Analyses of adrenalin and the probably empirical formula. The work of T.B. Aldrich of Detroit and his formula. The empirical formulas of Furth (2), Abel, Aldrich, and Takamine. Physiological properties. Adrenalin is the strongest hemostatic agent known. "The intravenous injection of adrenalin produced a powerful action upon the muscular system in general, but specially upon the muscular wall of the blood vessels and the muscular walls of the heart, resulting in an enormous rise of blood pressure." Adrenalin "is over one thousand times stronger than the fresh glands."

"The therapeutic efficacy has already been established beyond doubt, and it will unquestionably obtain a prominent place in the materia medica."

"In concluding this paper I desire to state that my thanks are due to Dr. E.M. Houghton, of Detroit, for making the physiological test, and also my thanks and large share of credit are due to Mr. Wooyenaka [Keizo Uenaka], my associate, for his energetic and able assistance in accomplishing this interesting investigation."

Note: Immediately after this article (which has no references), is one titled "The pharmacological assay of preparations of the suprarenal glands," by E.M. Houghton, M.D.–presented at the St. Louis meeting of the America Pharmaceutical Association, September, 1901. Address: Dr.

165. *Chemist and Druggist* (*London*). 1901. Festivities: A Japanese evening. 59(23):911. Dec. 7.

• ***Summary:*** "Last Friday evening, November 29, Dr. Jokichi Takamine, F.C.S., of Detroit, U.S.A., who is on his way to Japan, was entertained to dinner at the Grand Midland Hotel, St. Pancras, amongst those present being Dr. Morley Agar, Mr. L. Bidwell, F.R.C.S., Dr. James Cantlie, Mr. H.P. Dunn, F.R.C.S, Dr. Alfred Gubb, Dr. Wallis Hoare (Borneo), Mr. C.D. Marshall, FRCS., Mr. MacAdam Eccles, F.R.C.S., Dr. Irwin Moore, Dr. George Ogilvie, M.R.C.P., Mr. Chisholm Williams. F.R.C.S, Dr. George Stoker, Dr. S.R. Wells, Dr. O.F.F. Grünbaum, Dr. Russell Wilcox (Minneapolis), and Dr. T. L. Foulds (Alton, Illinois). The exquisite dinner which the hotel *chef* served was a revelation to those who had not been familiar with the *cuisine* of the house.

"After it, in reply to the toast of his health, given by Dr. Gubb, Dr. Takamine made a most interesting statement as to the connection between physic [the practice of medicine] and the new era in Japan. It may be remembered that Dutch traders had so well established themselves at Nagasaki in the seventeenth century that they took over physicians from their own country, whose practice was extended to the Japanese. European methods of treatment were so appreciated that many Japanese went to the Dutch doctors to learn; but they had also to become acquainted with European languages, especially German, so as to read text-books–and, in fact, the study of medicine took them into things European generally. This was especially prominent in the fifties and sixties of last century. The progressive Japanese young man then found it

necessary to become a pupil with one or other of the Dutch doctors, in order to extend his knowledge of Western ideals, and when the revolution took place in Japan the Reform party was very largely composed of those who had come under the Western influence, while many of the leading statesmen and politicians of the country have been trained as physicians; even the Marquis Ito, the Prime Minister, who is now in St. Petersburg, was as a young man the pupil of a Dutch doctor.

"Dr. Takamine is not himself a physician, but a chemist, and it will be remembered that while he was a student at the Glasgow University he entered upon the investigation of the rice ferment, which resulted in his discovery that the preparation of sake (the Japanese rice-beer) does not depend upon a yeast like malt, but is promoted by a micro-organism which produces diastase. As a result of that investigation taka-diastase is manufactured on a commercial scale. After briefly describing how it is prepared, and referring to his recent research on the suprarenal body and the isolation of a definite crystalline active principle, adrenalin, Dr. Takamine greatly delighted the guests by a series of stereopticon views of Japan, the photographs being beautifully coloured, and showing the entrancing beauty of the scenery as well as the characteristics of the Japanese people.

"Dr. Cantlie supplemented Dr. Takamine's modest references to his native country with interesting reminiscences of his association with the people there, and he particularly emphasised the great devotion that Japanese scientific men have for two of the most famous Englishmen, Newton and Darwin, in whose memory they celebrate a Newton mass and a Darwin mass, much as we celebrate Christmas. The pleasure of a delightful evening was not a little contributed to by the excellent music of a select orchestra which performed during the dinner in an adjoining room."

A portrait photo shows Dr. Takamine.

166. *Chemist and Druggist* (*London*). 1901. Personal. 59(24):945. Dec. 14.
• ***Summary:*** Dr. Jokichi Takamine, F.C.S., of New York, spoke at a meeting in the School of Medicine, Minto House, Edinburgh, on Tuesday, December 3, when a representative company of medical men was present. Mr. T. Maben, F.C.S, presided, and introduced Dr. Takamine, who spoke chiefly on adrenalin. Professor T.R. Fraser proposed a vote of thanks to Dr. Takamine, which was cordially awarded.

"On Thursday, December 5, Dr. Takamine addressed a well-attended meeting of medical men in the Grand Hotel, Glasgow. At the close of the address Dr. Henry Dyer, formerly Principal of the Tokio Technical College, made some interesting remarks regarding Japan and its progress since Dr. Takamine commenced his student career in the college."

167. Takamine, Jokichi. 1901. The isolation of the active principle of the suprarenal gland. *Proceedings of the Physiological Society* (*London*) p. xxix-xxx. Dec. 14. Communicated by O.F.F. Gruenbaum. Bound at the back of the *Journal of Physiology* (London). Vol. 27 (1901-02).
• ***Summary:*** "Since Schäfer and Oliver found that the injection of suprarenal extract caused a rise of blood pressure, Cybulski, Scymonowicz, Moore and many others have confirmed this observation."

"J.J. Abel of Johns Hopkins University, announced in 1898 that he had isolated the active principle and named it epinephrine.

"Otto v. Fürth, of Strassburg, questioned Abel's result and prepared a different body, which he called suprarenin. In my opinion neither of these substances is a pure body, but a mixture.

"Last summer I began experiments with the object of isolating the active principle, and am pleased to be able to announce that I have succeeded in obtaining a stable crystalline body of constant composition from the gland; since this body is an extremely potent vaso-constrictor I have been led to believe that it is the active principle, and named it adrenalin.

"Adrenalin is a light, white, micro-crystalline body, showing itself in five or more different forms. It has a slightly bitter taste, and is sparingly soluble in water, but perfectly stable in the dry form. Adrenalin possesses a slightly alkaline reaction, and combines with various acids to form corresponding salts. The solution of adrenalin gives a beautiful green coloration with ferric chloride, and a red coloration with iodine. It is a powerful reducing agent, and may be employed in that capacity in various arts and manufactures, such as a developer of photographic plates. It causes no precipitation with an ordinary alkaloidal reagent, showing that it is not an alkaloid in the common sense of the term. Its ultimate analysis gives the empirical formula as $C_{10}H_{15}NO_3$. While a good many able chemists spent years and years in an investigation to find out the process of isolating the active principle, yet when you once discover how to do it, like a good many other instances, the process of making it is very, very simple.

"The suprarenal gland of sheep or oxen is disintegrated and extracted with water. Such extract is treated with alcohol to throw down the non-active constituents, both organic and inorganic, and the filtrate is then evaporated in a vacuum to proper consistency and treated with alkaline substances, which process throws down the active principle in a crystalline form, which is afterwards purified by repeating a similar method.

"The physiological activity of adrenalin is something astounding. A fraction of one drop of solution of adrenalin, or its salt, in the strengths of 1-50,000, blanches the normal conjunctiva within one minute. It is the strongest haemostatic agent known. The intravenous injection produces powerful

action upon the muscular system in general, but especially upon the muscular walls of the blood vessels and heart, resulting in an enormous rise of blood pressure. The results of various other experiments demonstrate a similar conclusion. Generally speaking, adrenalin when locally applied is the most powerful astringent and haemostatic known; also a very strong stimulant of the heart. It is nonirritating, non-poisonous, and non-cumulative as far as it has been observed. It is indicated in a condition produced by morphine and opium poisoning. It has produced good results in circulatory failure, in the prevention of collapse of anaesthesia and allied conditions. It is invaluable in carrying out bloodless operations in nose, ear, eye, and throat work."

Note: Citing this article, Wikipedia states (June 2012): "In 1901, Takamine successfully isolated and purified the hormone from the adrenal glands of sheep and oxen."

168. *Chemist and Druggist* (*London*). 1901. Winter session: Liverpool Chemists' Association. 59(25):985. Dec. 21.
• ***Summary:*** "A Special meeting of the Association was held on December 10, at the Royal Institution, the President (Mr. Harold Wyatt, jun.) occupying the chair. The meeting had been called with the object of giving the members an opportunity of making the acquaintance of Dr. Jokichi Takamine, F.C.S., who delivered an address upon 'The Digestive Ferments and the Active Principle of the Suprarenal Gland.'

"Dr. Takamine described his experiments in isolating the digestive ferment produced in the fermentation of rice, illustrating his remarks with a series of lantern-views showing the various microscopic organisms in different stages of growth. He had now been able to separate the beneficial germ, which was readily cultivated upon a base composed of wheat-bran. As soon as it was washed out with sterilised water it was treated with spirit, causing the ferment to be precipitated in the form of a stable compound, to which he had given the name of taka-diastase.

"It has been alleged by some that the Eastern mind is incapable of appreciating humour, but the lecturer in this case somewhat startled his audience by telling the story of a certain digestive ferment which had been discovered in the following way: A hunter in Japan, who had been wandering in the hills, came across a huge snake which was in the process of attacking and swallowing a man. When the process had been completed, and the snake was considerably distended after its somewhat abnormal meal, the hunter saw the reptile proceed to a certain patch of grass, which it consumed freely, and to his astonishment he saw that the bulging sides of the snake were rapidly reduced until they had assumed their normal proportions. The hunter, realising that he had made a great discovery, at once went to the patch of grass, secured a quantity, and then retraced his steps to the city. Having reached a restaurant, he ordered a liberal supply of rice-cakes [mochi], which were at once consumed, and calls made for a further supply of the cakes. This was continued until the hunter's friends besought him to stop, otherwise the results might be disastrous. Finally, realising that he bad reached the limit of his gastronomic capacity, he proceeded to demonstrate his power to digest the food, and swallowed a lot of the grass. The result, however, was entirely unexpected, because in a few minutes a pile of rice-cakes was seen on one of the chairs, and the man was nowhere to be seen, the fact being that the man had discovered a powerful flesh-solvent which had not touched the farinaceous food.

"The conclusion of this story was greeted with hearty laughter, the telling of it having been much enhanced by the quaintness of the narrator's language. The latter part of the lecture dealt with the researches made in connection with the suprarenal gland, which led to the discovery of adrenalin.

"At the conclusion of his address Dr. Takamine exhibited a large number of exquisite photographic slides, illustrating scenery, life, and customs of Japan. The photographs, which had been taken by Japanese photographers and coloured by Japanese artists, were lucidly explained by the lecturer, whose views upon the screen and racy description were frequently applauded daring the evening.

"The President, in proposing a vote of thanks to the lecturer, said they were delighted to have the opportunity of listening to a representative of the nation which had made such extraordinary strides during the past few years, and he trusted this would not be the last occasion on which they would have the pleasure of listening to Dr. Takamine.

"Mr. Wardleworth, in seconding the vote of thanks, said the great benefit which they were deriving that night was due to the fact that they were able to see the advantage of bringing minds capable of looking at things from different standpoints upon questions which were perplexing the Western minds, and he trusted that the bond of sympathy and fraternal regard which prevailed as present between Great, Britain and Japan would be deepened and enlarged as the years went on.

"Dr. Symes, Mr. Buck, and Mr. Shacklady supported the vote of thanks, which was carried with acclamation."

169. *Chemist and Druggist* (*London*). 1901. Personalities. 59(25):990. Dec. 21.
• ***Summary:*** "Dr. Jokichi Takamine, F.C.S., left London on Thursday for Genoa [Italy], where he will join Mrs. Takamine and his family, continuing their journey to Japan. He expects to be six months there, and will return to New York via San Francisco."

170. Lafar, Franz. 1901-1907. Technische Mykologie. Ein Handbuch der Gaerungsphysiologie... Zweiter Band: Eumyceten-Gaerungen [Technical mycology. A handbook of fermentation physiology... Vol. 2: Eumycetic fermentations].

Jena: Verlag von Gustav Fischer. x + 507 p. (p. 365-871). See p. 638, 640, 674-76. Illust. No index. 25 cm. Foreword by Prof. Dr. Emil Chr. Hansen (Carlsberg-Laboratorium, Kopenhagen). [5 ref. Ger]

• ***Summary:*** This book is continually paginated with Vol. 1, so the first numbered page is 365. Part 15 (chapters 56-58) is titled "Morphology, physiology, and classification of the technically important higher Ascomycetes and related forms" (p. 627-704). Chapter 56, by Prof. Dr. Carl Wehmer (*Dozent an der Technischen Hochschule zu Hannover* [Germany]), "Morphology and classification of the families of the Aspergilli (*Aspergillaceen*)" discusses (p. 627+): Eighteen illustrations of Aspergillus conidiospores (p. 632-33). *Aspergillus Oryzae* (Ahlburg) Cohn (=*Eurotium Oryzae* Ahlburg), which is widely used in Japan to make saké, soy sauce (*Soja-Sauce*), and miso (p. 638-39, with illust.). *Aspergillus Wentii* (Wehmer), which is used in Java to make Tao-Yu (Chinese-style soy sauce) using cooked soybeans covered with *Hibiscus* leaves (p. 640).

Chapter 57, also by Prof. C. Wehmer, titled "Chemical effects of the Aspergilli (*Aspergillaceen*)," discusses (p. 674+): Saccharification of starches, diastase and diastatic enzymes, Takamine's research using Aspergillus to make diastase (Takadiastase) and its efficiency compared with similar enzymes of different origins, koji extract which contains amylase and other enzymes, use of *A. oryzae* to make saké, shoyu, and miso (p. 675-76).

This book also discusses: Zygospore production (p. 379). Sporulation and Aspergillus (p. 387-89, with illust.). Morphology and classification of the Mucorales, zygomycetes, zygospores (p. 420-21). The genus Mucor, sporangia, Rhizopus (p. 424-27, illust.). Mucorales used in the spirits industry, Mucor rouxii, Chinese yeasts (p. 436-37). Ragi/raggi and tapé (*tapej*) (p. 441). Decomposition of proteins and their derivatives, protease (p. 690-91). Film-forming surface yeasts and their accompanying phenomena, *Mycoderma* (p. 732-33). Invertase (p. 828). Other enzymes discussed in this chapter include maltase, melibiase, lactase, trehalase, raffinase, and amylase. Address: Prof. of Fermentation Technology and Bacteriology at the Imperial-Royal Technical College at Vienna [o. ö. {obiger Oesterreichischer} Professor der Gaerungsphysiologie und Bakteriologie an der k.k. {kaiserlich-königliche} Technischen Hochschule zu in Wien].

171. Takamine, Jokichi. 1901. Verfahrung zur Gewinnung der wirksamen Substanz der Nebenniere [Process for obtaining an efficacious, active substance from the suprarenal or adrenal gland]. *German Patent* 131,496. Application filed 29 Jan. 1901. [Ger]*

172. Caroline (right) and her younger sister, Marie, kneeling at the Takamine's main home on Riverside Drive, New York City (Photograph). 1901.

• ***Summary:*** Each sister is a wearing a kimono and kimono sash (*obi*). They are kneeling behind a round wooden hibachi, and each is holding one hand over it, probably to warm their hands during cold weather. The photo is dated 1901 in the front upper right corner. (See next page).

Sent by and reprinted with permission from *Kanazawa Furusato Ijinkan* (Great People of Kanazawa Memorial Museum) in Kanazawa, Japan. Caroline's obi is presently in the collection at the Museum in Kanazawa.

173. Davis, Nathan Smith, Jr. 1901. Dietotherapy and food in health. Philadelphia, Pennsylvania: P. Blakiston's Son & Co. [ix] + 372 p. Illust. 23 cm. Index. Series: This is Volume VI of A System of Physiologic Therapeutics..., edited by Solomon Solis Cohne, A.M., M.D.

• ***Summary:*** Contents: Part I–General principles of diet and diet in health. Part II–Diet in Disease. In Chapter 3, "The elements of food," the section on "Proteids" states (p. 32): "Meat is not a necessity of life. Nitrogenous food is a necessity, but it can be obtained in sufficient quantities from vegetables. An exclusively vegetable [vegan] diet will enable a person to do as much, at times even more work, as a diet containing an excessively large amount of meat, but it will not fit one to meet sudden demands for great exertion. A mixed diet is undoubtedly the most desirable; one that contains a very moderate amount of meat is best."

In Chapter 4, on the same subject (continued), the section titled "Vegetarianism" states (p. 42): "Those who live chiefly upon cereals, vegetables, fruits, and nuts are called vegetarians. These foods are with rare exceptions supplemented by such animal foods as milk, cheese, and eggs... The nitrogenous matter obtained from vegetables is less easily digested than that which is of animal origin; a much larger percentage passes from the alimentary tract unutilized. Few persons live entirely upon a vegetable diet. Those who attempt it lose vigor and show languor and disinclination for physical and mental work. They become less able to resist disease. Because a vegetable diet is an economical one, it has sometimes been forced upon the bodies of laborers, but uniformly the decrease in the amount of work they are able to perform more than counterbalances the decreased expense of their food." Note: The source of this information is not cited. How about the Chinese laborers who built so much of America's transcontinental railroad? Research by Chittenden at a Yale University [New Haven, Connecticut] soon proved Davis's statements to be incorrect.

In Chapter 6, titled "Animal foods," a table (p. 61) gives the "Comparative composition of various types of milk" (Source: Koenig, *Chemie der menschlingen Nahrungs- und Genussmittel,* 3rd ed. Vol. I, p. 267-362). The sources of milk are: Woman, cow, dog, ewe, buffalo, cat, goat, llama, ass, and mare–all mammals of course. Mare's milk has the lowest total protein (1.3%), followed human milk and ass milk, tied for the 2nd lowest protein content (2.3%). Cow's milk has

3.5% protein (52% more than human milk), and dog's milk has the highest protein content (11.2%).

Chapter 8, titled "Vegetable foods," contains a section on "Peas and beans" (p. 104-05). A table gives the "Composition of fresh and dried legumes..." The dried legumes include navy beans, frijoles, lentils, cowpeas, soy beans, chick-pea, peanuts, and St. John's bread (carob bean).

Taka-diastase is mentioned as a useful aid to digestion (p. 176).

In the section on "Diet in diabetes" (p. 334-44), soya bread, gluten bread, almond cakes, cocoanut, and peanut are listed in a table (p. 340) of important ingredients in diabetic breads. Soya bread is said to contain from 3% to 23% carbohydrate and sugar.

Nathan Smith Davis, Jr. lived 1858-1920. Address: A.M., M.D., Prof. of the Principles and Practice of Medicine, Northwestern Univ. Medical School [Chicago, Illinois].

174. Caroline Hitch Takamine, kneeling, in a traditional Japanese kimono, perhaps in Japan (Photograph). 1901? Undated. (See next page).

• ***Summary:*** This photo is from the book "Where the Wings Grow," by Agnes De Mille (published by Doubleday, 1978).

175. Takamine, Jokichi. 1902. The blood-pressure-raising principle of the suprarenal gland. *J. of the American Medical Assoc.* 38:153-55. Jan. 18.

• ***Summary:*** Another of the many papers by Dr. Takamine about his isolation of adrenaline published in 1901 and 1902.

A footnote (p. 153) states: "Read at the Fifty-second Annual Meeting of the American Medical Association, in the Section on Materia Medica, Pharmacy and Therapeutics, and approved for publication by the Executive Committee:..."

The paper ends as follows: In concluding this paper, I desire to state that my thanks are due to Dr. E.M. Houghton, of Detroit, for making the physiological test, and also my thanks and large share of credit are due to Mr. Wooyenaka, my associate, for his energetic and able assistance in accomplishing this interesting investigation. Address: M.D., 475 Central Park West, New York City.

176. Pozzi-Escot, Emm. 1902. Nouvelle dïastase réductrice extraite du Koji-japonais et secrétée par l'*Eurotium Orizoe*: la Jacquemase [Jacquemase, a new reductive diastase

extracted from Japanese koji and isolated by use of *Eurotium Oryzae*]. *Bulletin de la Societe Chimique de Paris* 27:557-60. Meeting of 9 May 1902. [5 ref. Fre]
• ***Summary:*** Begins by discussing Takadiastase. However a new diastase as has been discovered in the laboratory where the author works. "In order to recall that this diastase has been discovered at the scientific research laboratory of M. Georges Jacquemin, my master, I propose to name it *Jacquemase."* Address: Laboratoires de recherches scientifiques de M. Georges Jacquemin, à Malzéville, France.

177. *Therapeutic Gazette* (*Detroit, Michigan*). 1902. Adrenalin. 18(5):315-16. May 15. Series 3. Whole Series Vol. 26. [1 ref]
• ***Summary:*** The London *Lancet* of December 21, 1901, tells us that adrenalin, the active principle of the suprarenal glands, has been isolated in a pure form by Dr. Jokichi Takamine, who has published an account of his work. This substance has the approximate composition represented by the empirical formula $C_{10}H_{10}No_3$, but its chemistry has not yet been completely worked out by its discoverer. It occurs in light, white, microscopic crystals, has a slightly bitter taste, and leaves a numb feeling on the tongue where it has been applied. In dry form it is perfectly stable. It is soluble with difficulty in cold water but more readily in hot water, forming a slightly alkaline solution. It is easily soluble in acids and in alkali hydroxides, forming salts; such solutions readily oxidize on exposure to the air.

"The physiological properties of adrenalin have been practically tested on dogs by Dr. E. M. Houghton, of Detroit, who finds that a fraction of one drop of aqueous solution of adrenalin, or its salt, in the strength of 1 in 50,000, blanches the normal conjunctiva within one minute. It is a strong hemostatic. The intravenous injection of adrenalin produces a powerful action upon the muscular system in general, but especially upon the muscular walls of the blood-vessels and of the heart, resulting in an enormous rise of blood-pressure..."

Note 1. Note that Takamine has not yet worked out the empirical [chemical] formula for adrenaline. The formula given above is different from the formula eventually established; $C_9H_{13}No_3$.

Note 2. This journal is published by Parke, Davis & Co., the manufacturer of Adrenalin–a hormone.

178. *Japan Weekly Mail* (*Yokohama*). 1902. Departures [ships]. 37(20):550. May 17.
• ***Summary:*** "Per Japanese steamer *America Maru*, for San Francisco."

"Dr. J. [Jokichi] Takamine, Mrs. J. Takamine, Master E. Takamine, Master J. Takamine."

179. Land deed: Caroline Takamine buys the Takamine family's first land at Merriewold Park (Sullivan County, New York). 1902. New York. 7 p. Aug. 14. In Book 132, p. 252-58.
• ***Summary:*** This indenture made the 14th day of August 1902 "between the Merriewold Park Club of Sullivan County, New York, a corporation duly organized under and pursuant to the laws of the State of New Jersey, party of the first part, and Caroline H. Takamine, party of the second part,... and to her heirs and assigns forever, the several lots of land in Merriewold Park in the town of Forestburgh, County of Sullivan and State of New York, which is shown on a map entitled "Merriewold Park Plot Map G' filed in the office of the Clerk of the said County of Sullivan as Numbers fifteen (15), sixteen (16), twenty-one (21), twenty-two (22), twenty-three (23) and twenty-four (24) and which / much [?] containing three (3) acres more or less, all within the boundaries of lot No. 14 of the Minisink patent.

Together with all appurtenances, estate, right, title, interest, property, possessions, claim and demand... every part and parcel thereof.

"And in as much as all of the lots on Plot Map A that have hitherto been conveyed, that is to say lots 1, 2 and 3 to Henry George, Lots 4, 5, 6, 7, and 8 to Read Gordon, lots 10 and 11 to William D. Croasdale, lots 12 and 13 to E. Yancey Cohen, lots 14 and 15 to William F. Wallace, and certain lots on Plot Map B conveyed to Anna C. Post and Charles B. Cooper, are conveyed unto said parties by the Merriewold Park Company, a corporation, which has since been dissolved by order of the Supreme Court of the State of New York, and inasmuch as the deeds by which such conveyances were witnessed contained certain agreements and covenants binding upon the party of the second part [Caroline Takamine] of which the following is an exact transcript."

Caroline and her heirs and assigns agree to obey all the laws, rules and regulations of the Merriewold Park Club. Plus many other legal details.

Note 1. It is unclear how many acres Caroline Takamine acquired at this time.

Note 2. All this land was acquired several years before Dr. Takamine was given Shofu-Den. Address: Sullivan County, New York.

180. *J. of the American Chemical Society.* 1902. Adrenalin: The active principle of the suprarenal glands and its mode of preparation. By Jokichi Takamine. 24(12):1223. In review of American Chemical Research 8(7):362. [3 ref]
• ***Summary:*** This article was published in the *American J. of Pharmacy* 73:523-31; also *Proceedings of the Physiological Society* (London), 1901, xxix-xxx [see *J. of Physiology* (*London*)]. *Abst. J. Chem. Soc.*, 81-82, 217.–"Adrenalin, $C_{10}H_{15}NO_3$, the active principle of the suprarenal glands, is isolated, according to the condition of the solutions from which it is crystallized, in the form of prisms, slender needles, rhombic plates, boat or leaf-shaped, or nodular crystals. An aqueous solution of adrenalin has an alkaline

reaction and rapidly absorbs moisture from the air, the solution becoming pink, then red, and finally brown in color. Ferric chloride colors the solution emerald green, while iodine imparts a vivid pink. On fusion with potassium hydroxide, two crystalline substances were obtained, probably protocatechuic acid and catechol. Adrenalin is the strongest haemostatic [hemostatic; an agent that checks bleeding] agent known and an intravenous injection produces an enormous rise in blood pressure."

181. *Japan and America* (*New York*). 1903. Prominent Americans interested in Japan and prominent Japanese in America. 3(1):1-97. Jan. Supplement. See p. 69-73.

• ***Summary:*** One of the prominent Japanese in America is Dr. Jokichi Takamine, of whom a biography (written from a Japanese viewpoint) is given (p. 69-73).

"Dr. Jokichi Takamine was born in November 5th of Kayei (1852), at Kanazawa, Kaga Province, Japan. At the age of 12 he was selected, and sent to Nagasaki to study there, by order of the provincial authority under the feudal government. He afterward entered the Osaka Medical School. In 8th of Meiji (1875), he began to study applied chemistry in the engineering department of the Tokyo University, graduating from the institution three years after. In the following year he was ordered by the government to study in England. In the spring of 14th, Meiji (1881), he returned to Japan via America, attached as an engineer to the Agricultural and Commercial Department, and engaged in special investigations in chemical technology, especially in sake brewing and indigo manufacturing.

"In 1884 he was appointed as Japanese representative in the New Orleans World's Fair, dispatched to America, and made an especial study of artificial fertilizing. He returned with a view to advance his own country's agricultural enterprise, and carried with him the necessary materials for the purpose. The artificial fertilizer he had brought home was distributed among the farming districts by the Agricultural and Commercial Department, and tested with a successful result. The prospect of manufacturing this important ingredient for farming purposes was at once seen; he resigned the governmental position and entered with Yeiji Shibusawa (now a baron) and Takashi Masuda into a movement for establishing a manufactory.

"The Tokyo Artificial Fertilizer Company resulted. Dr. Takamine again went abroad in 1885 to purchase machinery for the company, and, incidentally, studied the brewing methods of Europe and America. The idea of introducing the Japanese brewing method into theirs occurred to him, and, with this in view, he obtained patents for the sake brewing from the governments of Europe and America. He returned to Japan and devoted himself to the artificial fertilizer work.

"In 1890 Dr. Takamine, on request of his American friends to come and conduct experiments on the brewing in their country, came to America. His experiments proved successful. Whereupon, he made further investigations, which resulted in the discovery of the process of obtaining ferment, the indispensable element in brewing, from the wheat bran waste. Heretofore malt was chiefly used for ferment in Europe and America, and Koji in Japan. But this newly discovered ferment has more strength than either of them. It was desirable to produce this new ferment in a large quantity and to distribute it. The Takamine Ferment Company was established, to which he was elected president. The Takamine Ferment Company entered into a contract with the Whisky Trust, and after a series of experiments with the new ferment, finally succeeded in producing a large quantity of liquor daily. Whereupon, the malt manufacturers of the country began to fear because of the prospect of the new discovery, which may at the end render the old ferment useless. They bitterly criticized Dr. Takamine, and tried indirectly to prevent his further success. But the patience and earnestness of this Japanese scientist pressed him forward in spite of the difficulty. Misfortune was, however, waiting him; the Ferment Company was completely destroyed by fire, and, to add to the misfortunes, the malt manufacturers, who were strongly prejudiced against him, took the opportunity to spread the report that he had himself fired the factory building for the purpose of hiding the traces of his unsuccessful attempts at brewing. Despite of such difficulties the Ferment Company was soon started again, and its work was slowly progressing, when a new trouble

arose, which resulted in the permanent dissolution of the company. The trouble came this time from the Whisky Trust Company, in which disagreements as to the control of the brewing work began to appear. Dr. Takamine was obliged to sever his connection with the Trust Company. But he was still bound to it by the terms of the contract previously entered into, and could not undertake an independent work. He finally instituted a suit against the 'trust,' and recovered his right to the discovery. But owing to the predominating influence of the Trust Company, he could not persuade enough [sic] to assist him in instituting a new company. He abandoned the ferment work. Dr. Takamine had never known despair; for there is always open a new field in the mind of a profound student of nature, such as he is, for investigations. He continued his studies in analytical chemistry, and was rewarded by the discovery in which he succeeded in isolating what is now called 'Taka-Diastase,' from certain ingredients in germinating grain.

"The Taka-Diastase is now extensively used for amylaceous dyspepsia, and is obtained principally from koji, the Japanese ferment. It became an indispensable article of the medical men of the world, and is patented in many countries.

"Another discovery, and perhaps one of the most important of modern times, is the isolation of the active principle of the suprarenal gland known as adrenalin. This discovery had long been sought for by the scientists of Europe and America, but without result. The announcement of the discovery in 1901 by the Japanese chemist was therefore very warmly received by the scientific world. This new drug has a marvelous power on the blood vessels, increasing their blood pressure, and is an indispensable agency in performing surgery operations. It is also a most expensive drug. It is described by the discoverer himself as:"

There follows a long extract from a the *Proceedings of the Physiological Society* (London) (14 Dec. 1901).

"This achievement in modern medical science by Dr. Takamine is only paralleled by the discovery of a remedy for diphtheria by Dr. Kitazato.

"Dr. Takamine, for the purpose of conducting further investigations, has established a chemical laboratory in New York City, where he is conducting experiments with his two assistants. It may be said that he has always succeeded in every attempt in scientific research. The Artificial Fertilizer Company in Tokyo is now in a very prosperous condition, having raised its capital to more than 1,000,000 yen. The agricultural interests of Japan have thus been greatly promoted by him. The Ferment Company which he once had in this country is now being established in his own country. The Japanese Government has already gotten the approval of the Diet for the purpose.

"Dr. Takamine is married to Caroline, a daughter of Col. E.V. Hitch, who was a Southern officer in the Civil War, and has two sons, the elder, Jokichi, and the younger, Eben; the elder sister [sic, younger sister, Elizabeth "Beth" Lean Hitch] of his wife is married to Mr. [William] Atkinson, the Commissioner of the St. Louis World's Fair; her younger sister [Marie] to the son of the late Henry George, the famous expounder of the single tax theory and a candidate for Mayor of New York, and her younger sister is living at present with Dr. Takamine."

An oval portrait photo shows Dr. Takamine in a bow tie.

Note 1. This is the earliest known biography of Jokichi Takamine.

Note 2. The date of Takamine's birth differs from that most widely cited: 3 Nov. 1854.

Note 3. Elizabeth ("Beth") Lean Hitch and William Atkinson had two children: (1) Terrence Atkinson, born 31 May 1901. (2) Margaret Beatrice ("Bea") Atkinson, born 15 Jan. 1904. Elizabeth, who was dangerously attractive, was married four times: (1) To Walter Blanchard. (2) To William Atkinson. (3) To John S. Clark. (4) To William Adler. (Michael G. Hitch, 2007, p. 456).

Note 4. Caroline Hitch, her sisters Marie and Elizabeth, Marie's daughter Jane George, and Elizabeth's daughter Bea Atkinson ("Little Bea"; Beatrice Margaret Atkinson) are all major characters in the book *Where the Wings Grow,* by Agnes de Mille (1978, Doubleday).

182. *Japan and America* (*New York*). 1903. Personals. 3(3):17. March.

• ***Summary:*** "Dr. Jokichi Takamine, for the benefit of his wife's health, has gone to South Carolina with her. They intend to be absent for a few weeks."

183. Takamine, Jokichi. 1903. Process of obtaining products from suprarenal glands. *U.S. Patent* 730,175. June 2. 3 p. Filed Nov. 5, 1900.

• ***Summary:*** "This invention relates to the production of a new product possessing the active blood-pressure-raising astringent and hemostatic characteristics and properties of the suprarenal glands in a concentrated form. This new product possesses a remarkable power of raising blood-pressure of animals when injected into veins and also has the property of contracting blood vessels when applied to the vein either directly or by means of a subcutaneous injection; the invention comprises a process for producing such a product in an economical and practical manner." Address: New York City, NY.

184. Takamine, Jokichi. 1903. Glandular extractive product. *U.S. Patent* 730,176. June 2. 4 p. Original application filed Nov. 5, 1900. Divided and this application filed Jan. 14, 1903.

• ***Summary:*** "The present application is a division of a former application, Serial No. 35,546, filed November 5, 1900, in which is described a process for obtaining the herein-described product. Other applications–viz., Serial 55

Nos. 37,729 and 37,730, filed November 26, 1900, and Serial No. 156,746, filed May 12, 1903–disclose other processes for obtaining the product forming the subject of the present invention.

"According to my application Serial No. 35,546,of November 5,1900, the product is obtained as follows: The clean suprarenal glands or capsules of animals–such as cattle, sheep, &c.–are disintegrated by any suitable means and a fluid extract is made therefrom by treatment of the disintegrated glands with about an equal weight of water and steeping at a temperature of about 60º to 75º centigrade for a period of about five to ten hours in a suitable vessel..." The complex chemical isolation process is described in detail. Address: New York City, NY.

185. Takamine, Jokichi. 1903. Process of isolating the active principle of the suprarenal glands. *U.S. Patent* 730,196. June 2. 3 p. Original application filed Nov. 5, 1900. Divided and this application filed Nov. 26, 1900.
• ***Summary:*** "Original application filed November 5, 1900, Serial No. 35,546. Divided and this application filed November 26, 1900. Serial No. 37,729. (No specimens.)"

"This invention relates to improvements in processes of obtaining a new and useful product possessing in a stable and concentrated form the blood-pressure-raising, hemostatic, and astringent properties and characteristics of the suprarenal glands.

"In my application, Serial No. 35,546, filed November 5, 1900, I have disclosed a process of preparing this substance in a pure state, with several modifications of such process, and the present application relates to one of such modifications." Address: New York City, NY.

186. Takamine, Jokichi. 1903. Process of isolating the active principle of the suprarenal glands. *U.S. Patent* 730,197. June 2. 2 p. Original application filed Nov. 5, 1900. Divided and this application filed Nov. 26, 1900.
• ***Summary:*** "This invention relates to improvements in processes of producing in a pure, stable, and concentrated form a substance possessing the blood-pressure-raising, hemostatic, and astringent principle of the suprarenal glands. This substance is fully described in my application, Serial No. 138,969, filed January 14, 1903. In another application–viz., Serial No. 35,546, filed November 5, 1900–I have described processes for the production of this substance. My present invention relates to a process described but not specifically claimed in said application." Address: New York City, NY.

187. Takamine, Jokichi. 1903. Process of preparing extracts of the suprarenal glands. *U.S. Patent* 730,198. June 2. 2 p. Original application filed Nov. 5, 1900.
• ***Summary:*** "Original application filed November 5, 1900, Serial No. 35,546, Divided and this application filed January 8, 1901. Serial No. 42,550. (No specimens.)

"In my application No. 35,546, filed November 5, 1900, I have described a process for isolating and purifying the extract or active principle of said glands. My present invention relates to a simplified and cheaper process for producing an extract which is not so highly purified as the product of the process therein described, but much purer than the ordinary aqueous extract, and is suitable for some purposes." Address: New York City, NY.

188. *Daily Picayune* (*New Orleans, Louisiana*). 1903. Society. Oct. 18. p. 17-22. See p. 18, col. 6.5.
• ***Summary:*** "Miss Louise Morel, who has been visiting Mrs. Takamine in New York, will return to-morrow on the steamship Proteus."

Note: Louise Morel was at the wedding of Carrie Hitch's / Mrs. Takamine's wedding in New Orleans on 10 Aug. 1887.

189. Chicago securities: A digest of information relating to stocks, bonds, banks and financial institutions of Chicago. 13th annual publication. 1903. Chicago, Illinois: The Chicago Directory Co. 466 p.
• ***Summary:*** Pages 338-39: "Takamine Ferment Company.–Organized under the laws of West Virginia.

"Capital Stock–$500,000, consisting of 125,000 shares of the par value of $4 each.

"Bonds–None.

"Dividends–The income of the company is derived from royalties received under licenses issued under the patents it controls.

"Directors–Jokichi Takamine, Geo. C. Prussing, E. Moore, E.V. Hitch, John Z. White, J.W. Hosmer, H.T. Loomis; A.W. Williamson, C.H. Borgman.

"Officers–President, Jokichi Takamine; Vice-President, Geo. C. Prussing; Secretary, E. Moore; Treasurer, E.V. Hitch.

"This company was organized with a capital stock of $10,000,000, and owns the patents upon certain chemical and mechanical processes known as the Takamine process, all of which relate to the use of a ferment (principally in the place of malt), finding its uses in medicine, food products into which yeast enters, fermentation of liquors, and other like products. In 1896, a reorganization of the company took place, under the laws of the State of West Virginia, reducing the capital stock to $5,000,000, to provide for the issuing of 100,000 shares of a par value of $40 in exchange for 100,000 shares of a par value of $100 each in the old company; and also to provide for a treasury holding of 25,000 shares of a par value of $40 to liquidate certain claims then existing against the old company, and to provide a reserve for future uses of the company.

"The capital stock of the company was reduced to $500,000, its present limit, in accordance with the following resolution, submitted to the stockholders at a special meeting called for that purpose, April 27, 1901:

"Resolved: That the authorized capital stock of Takamine Ferment Company be reduced from 125,000 shares of the par value of $40 each to 125,000 shares of the par value of $4 each, so that the authorized capital stock of said corporation shall be $500,000.

"Upon this resolution 69,603 shares voted aye, and 1,150 shares voted no. More than a majority of the capital stock voting aye, the President declared the resolution carried, and the proper certificates to that effect were filed with the authorities in West Virginia. By this change the State of West Virginia will collect $210 in annual taxes from this company instead of $1,060 which would have been due on the former $5,000,000 capitalization under the state law enacted February 18, 1901."

Page 404 (directory): "Takamine Jokichi, 1101. 138 Washington St., Chicago. Takamine Ferment Company." Address: Chicago.

190. *New York Times.* 1904. Japanese appeal for war fund in America. Feb. 21. p. 3.
• ***Summary:*** Japan says it wants to insure the territorial integrity of China and insure the independence of Corea [Korea], which are essential to Japan's own welfare. Since last year, Japan has tried "every means of peaceful negotiation with the Russian Government, whose aggressive and threatening attitude in the Far East has long been a menace to the peace of the world."

But now diplomacy has failed and Japan "has been driven to take up arms..." Signers of the appeal for funds included J. Takamine, 613 West 142nd Street, New York City.

Note: The Russo-Japanese war started on 4 Feb. 1905 and ended with the Treaty of Portsmouth on 5 Sept. 1905. Japan won, and thereby gained control of Korea.

191. Takamine, Jokichi. 1904. Glandular compound and process of producing same. *U.S. Patent* 753,177. Feb. 23. 3 p. Application filed May 12, 1903. [4 ref]
• ***Summary:*** This is a specification. The last page is a short, technical disclaimer filed by Parke, Davis & Co. on July 18, 1911. Address: New York, N.Y.

192. Scott, Carl. 1904. Clever Japs win wealth in America. The most distinguished of them, Dr. Jokichi Takamine, won fame by discovering Taka-Diastase and Adrenalin. *Daily Picayune* (*New Orleans, Louisiana*). May 15. p. 40.
• ***Summary:*** "(Copyright, 1904, by E.B. Warner.) The adaptability and enterprise of the Japanese are well illustrated by the life stories of some promising merchants, bankers and professional men now practicing in New York, Boston, Philadelphia, Chicago, and other American cities, who owe allegiance to the Mikado. Many of these men could hardly be distinguished, at a first glance, from their American colleagues and competitors, so thoroughly have they adapted themselves to the ways of the West that even their Oriental features seem to have changed, or at least become modified, with the passing of the years.

"This is particularly the case with Dr. Jokichi Takamine, the distinguished chemist and inventor, who next to the Minister at Washington, is the most prominent member of the Japanese colony in America. He would never be taken for a Japanese by a man who does not know him, for he has none of the distinguishable marks of the race.

"Dr. Takamine is an example of the fact that in Japan 'the career is open to the talented.' The Government there selects the brigt [sic, bright] boys, looks after their education, and gives them every chance of winning wealth and fame provided that they show a disposition to 'make good.'\
"Dr. Takamine, who was born in 1852; was selected at the age of 12 and sent to Nagasaki, to study by order of the old feudal Government. He afterwards entered the Osaka Medical School, and, after the Restoration, studied applied chemistry in the newly-established Tokio University. When he graduated from that institution he had been studying for fifteen years, with the one end in view of becoming a great chemist, and had learned everything Japan could teach him. Still, the Government was not satisfied, and ordered him to study in England and America for several years.

"In 1884 he visited America as Japanese representative at the New Orleans World's Fair. On his return to Tokio he speedily became prominent, for he had learned things in America that were of the greatest value in Japan. He introduced American artificial fertilizers for the first time, and the agriculturists of an overpopulated country benefited immensely.

"Dr. Takamine is a businessman as well as a scientist. 'Why import these fertilizers at great expense from America when we can make them in Japan?' he reasoned, and he formed a company in Tokio for the manufacture of fertilizers which has proved one of the most successful enterprises in Japan.

"But that was out [sic, not] all. While he was in America Dr. Takamine used some of his spare time in studying indigo manufacturing and the chemical technology of 'sake' brewing, and when he went back to Japan he was able to introduce vastly improved methods into two of the distinctively national industries.

"In 1900 Dr. Takamine returned to America, at the request of a syndicate of American capitalists, to conduct chemical experiments with a view to finding out better methods of brewing. His experiments proved successful. He discovered the process of obtaining ferment, the indispensable element in brewing, from the wheat bran waste. Hitherto malt had been chiefly used for ferment in Europe and America and 'koji' in Japan. But this newly-discovered ferment had more strength than either of them, and it looked as if it was going to be a great thing financially. A company was formed, with the discoverer at the head, to

produce this ferment in large quantities and distribute it. But here begins the greatest troubles and disappointments of his hitherto successful career.

"'Dr. Takamine's Ferment Company,' said one of his Japanese friends in New York, 'entered into a contract with the Whisky Trust, and, after a series of experiments, with the new ferment, finally succeeded in producing a large quantity of liquor daily. But some of the malt manufacturers began to fear that the discovery would in the end render the old ferment useless. They bitterly criticized Dr. Takamine, and tried, indirectly, to prevent his further success.

"'But the patience and earnestness of the Japanese scientist pressed him forward in spite of all the difficulties. Misfortune was, however, waiting him. The ferment company's property was completely destroyed by fire; and, to add to his troubles, his enemies took the opportunity to spread the report that he himself had fired the factory building for the purpose of hiding the traces of unsuccessful attempts at brewing.

"'But, in spite of fire and calumny, the Ferment Company was soon started again, and was slowly progressing when a new trouble arose which resulted in its permanent dissolution. The trouble came this time from the Whiskey Trust, in which disagreements as to the control of the brewing work came to appear. Dr. Takamine was obliged to sever his connection with the trust, but he was still bound to it by the terms of the contract previously entered into and could not undertake an independent work. He finally instituted a suit against the trust and recovered his right to his discovery. But owing to the predominating influence of the trust, he could not persuade enough capitalists to assist him in forming a new company, and he abandoned the ferment work which he had started with such high hopes.'

"But the 'Edison of Japan,' as he has often been called by his fellow-countrymen, is not the man to despair. He gave up ideas of business, and continued his studies in analytical chemistry from a medical standpoint. He was rewarded by two of the most valuable discoveries made in that field in modern times.

"The first of these discoveries was the method of isolating what is now called 'taka-diastase' from certain ingredients in germinating grain. This is principally obtained from 'koji,' the Japanese ferment, and is now regarded as an indispensable article by medical men all over the world in the treatment of dyspepsia.

"The second and more important discovery was the isolation of the active principle of the suprarenal gland known as adrenalin. This discovery had long been sought by the scientists of Europe and America, but without result. The announcement of the discovery in 1901 by the Japanese chemist was, therefore, warmly received by the scientific world. This new drug has a wonderful power on the blood vessels, increasing their blood pressure, and is an indispensable agency in performing modern surgical operations. It is obtained by treating the disintegrated suprarenal gland of sheep and oxen with alcohol and alkaline substances.

"'Adrenalin, when locally applied,' said Dr. Takamine, speaking of the results of his experiments and the experience of thousands of other doctors, 'is the most powerful astringent and haemostatic known, and also a very strong stimulant of the heart. It has produced good results in circulatory failure, and in the prevention of collapse in anaesthesia and carrying out bloodless operations in nose, ear, eye and throat work.'

"Dr. Takamine has established a laboratory in New York city, where with some assistants, he is conducting further experiments along medical lines. He married Miss Caroline Hitch, a daughter of Colonel E.V. Hitch, who was a Confederate officer in the Civil War, and became related by that marriage, to the late Henry George, the famous expounder of the single tax theory."

Also contains a much shorter biography of Jiro Sakabe who came from a samurai family.

Also mentioned are Daijiro Ushikubo, Gojuro Nagasaki, Gentaro Tanaka, and Takenosuke Furuya.

Note: This is the earliest known biography of Jokichi Takamine from non-Japanese viewpoint. It seems to be taken from a book or article by E.B. Warner, but we have been unable to find that book.

193. *Republican Watchman* (*Monticello, New York*). 1904. Japanese buildings for Forestburgh. 78(47):1. Nov. 25.
• ***Summary:*** "Dr. J. Takamine, a Japanese chemist, who spends his summers in the town of Forestburgh, will move three Japanese buildings from the St. Louis exposition to Merriewold Park at the close of the fair. Dr. Takamine owns six acres at Merriewold Park, of which company he has been a member for three years. He conceived the idea that he would like to own three of the buildings erected by the Japanese government at the fair and bargained for and obtained them.

"Alex Moore, superintendent of the park, on the first of January will go to St. Louis and supervise the removal of the buildings to the foundations already laid at Merriewold. The main building is 43 x 79 [feet], and the others 48 x 51 and 16 x 16. The Doctor will use them for his private dwelling, and as a result will have a handsome Japanese home with a pretty Japanese effect."

194. *St. Louis Republic* (*Missouri*). 1904. Will be used as country home: Japanese government buildings at fair given to Dr. J. Takamine. Recognition from Mikado. Physician rewarded for scientific work in medicine and services to Imperial Commission. Dec. 8.
• ***Summary:*** "The three Japanese Government buildings at the World's Fair will be taken down and sent to New York, where they will be used as a country home by Doctor J.

Takamine.

"This announcement was made yesterday by S. Tegima, Imperial Japanese Commissioner General to the World's Fair.

"The estimated cost of the buildings is $500,000. They were given to Doctor Takamine in recognition of the valuable services he rendered to the World's Fair Japanese Commission in many ways.

"Doctor Takamine served on the Jury of Awards for the Japanese Commission, and was also their acting counsel.

"In recognition of his splendid work in the scientific investigation of medicine, and the aid he has rendered his government in this work, his Imperial Majesty, the Emperor of Japan, has substantially rewarded him.

"Doctor Takamine probably is the wealthiest Japanese living in the United States, as well as one of the most prominent Japanese physicians.

"The buildings represent the pavilion occupied by the offices of the commission, a special exhibit palace, where Japanese armor and historical exhibits were shown, and a smaller structure, a reproduction of one of the old palaces in Japan.

"The material used in their construction is white pine taken from the imperial forests. The buildings were built in Tokio and shipped in sections to St. Louis.

"They will be presented to Dr. Takamine just as they stand, including the rich wall decorations and the Japanese matting which covers the floors.

"Dr. Takamine is building a typical Japanese country home in a suburb of New York [City] and here the buildings that have been the object of such wide and favorable commendation will be erected.

"The teahouses in the Japanese Garden which were built in St. Louis by concessionaires, have not been disposed of."

Note: The Fair closed on 4 Dec. 1904–two days before this article was published.

195. *Republican Watchman* (*Monticello, New York*). 1904. Work of the supervisors. 78(51):1. Dec. 23.
• ***Summary:*** "Mr. Moore, the supervisor of that town [Forestburgh] is in St. Louis supervising the removing of three Japanese buildings recently bought by Dr. J. Takamine, of Forestburgh, to Merriewold Park, the purchase of which was mentioned in the Watchman."

196. Hoshi, Hajime. 1904. Handbook of Japan and Japanese exhibits at World's Fair, St. Louis. n.p. 206 p.
• ***Summary:*** The Preface begins: "Since Commodore Perry, of the United States Navy, opened Japan to the world's commerce [in 1854], the foreign trade of the country has developed with wonderful rapidity. This startling rapid development of Japanese trade is due to the readiness and celerity [swiftness] with which the frank and courageous people of the Empire abandoned their old customs and turned their faces toward a new civilization. There was no hesitation, no halting, no looking backward. The entire nation awoke with a start to the realization that it was moving in the wrong direction, and turned about and dropped easily in the march of modern progress. Foreign ideas were adopted, foreign methods were imitated and frequently improved upon, and the closest commercial relations were sought with the United States and the countries of Europe. With this adoption of foreign ideas came a desire for foreign goods. New methods made necessary the use of Western machinery in factories and on farms. Even Western foodstuffs became popular.

"Japan's total foreign commerce was increased from 26.6 million yen in 1868 to 582.6 million yen in 1902 or 2,219 per cent. The total exports were increased from 15.5 million yen in 1865 to 281.7 million yen in 1903 or 1,811 per cent. During the same period the imports increased from 10.7 million yen in 1865 to 300.9 million yen, or 2,790 per cent."

Baron Masanoho Matsudaira is Vice-President of the Imperial Japanese Commission to the Louisiana Purchase Exposition.

Concerning "Shoyu, or soy.–The shoyu manufactories in 1901 numbered 15,993, producing 68,940,680 gallons annually" (p. 28).

In 1902 Japan's principal exports in million yen were (p. 40-41): Copper, crude and refined–10.3. Rice–6.7. Tea, green (pan fire)–6.2. Tea, green (basket fire)–3.6. Camphor–3.4. Cuttle fish–1.8. Fish oil–1.5. Sake–0.83. Sea weed–0.61. Shoyu (soy)–0.39.

Palace of Agriculture (p. 119). "In the Palace of Agriculture the Japanese Exhibit occupies an area of 8,667 square feet." "Tea, one of the leading products of Japan, forms the most important exhibit of the space." "There is a large exhibit of shoyu or soy, a famous Japanese sauce made from beans. This sauce is in as common use in Japan as salt and pepper are in the United States. It is used as a relish on the table, also for cooking and salad dressing. Soy is wholesome and exceedingly cheap, which qualities, combined with its splendid flavor, make it a most desirable article of diet.

"Sake, the national drink, is also well represented in the exhibit."

The names of the members of the Japanese Commission and of the commissioners now in the United States are given on pages 112-13. he names of the members of the Japan Exhibit Association are given on page 113. Note: Nowhere is this long and detailed book is the name of Jokichi Takamine mentioned.

The Japanese Garden: Area, 150,000 square feet is described in detail (p. 114-15), as are each of the buildings in it. These include the Japanese Pavilion (the building materials for it "were brought from Japan. It was built entirely by native carpenters after the style of Daimyo's garden–Goten, of about 400 years ago. The architectural style of the building is Heike. The artistically curved

roofs, majestically projecting one upon the other...”). Note: This was the building that was renamed Sho-Foo-Den / Sho-Fu-Den by Jokichi Takamine. Other buildings are the Observation Cottage and (standing by the lake) and a reproduction of the Kinkaku Temple in Kyoto (*Kinkaku-ji*, the Temple of the Golden Pavilion).

“The total space occupied by Japan [p. 115] covers 282,455 square feet. he area is three times as great as that covered by Japan at the Paris Exposition in 1900, and three times as large as Chicago in 1893.”

“Soy brewers and trade marks” (p. 161, full page, with the trade mark of each shown large and clear): Kikko Sakai: Brewer K. Toyoda, Sakai, Osaka, Japan. Yamakawa-roku: Brewer R. Wakaye, Osaka, Japan. Kikko Mata: Brewer M. Kawamori, Sakai, Osaka, Japan. Mitsu Uroka: Brewer G. Tagashima, Kaidzuka, Idzumi, Japan. Uyeki: Brewer K. Uyeki, Osaka, Japan. Yama-Ju: Brewer M. Yamamoto, Osaka, Japan. Maruichi Jo: Brewer S. Masuda, Osaka, Japan. Maru Matsu: Brewer Y. Motsutani, Osaka, Japan. Hon Ichi: Brewer K. Yehara, Osaka, Japan. Sun: Brewer K. Shindo, Osaka, Japan.

Across the bottom of this page: “The virtue of the sauce and direction for use. The Japanese Soy with the Trade Marks is brewed from the very best Japanese [soy] bean, wheat and salt. The Soy is of dark brown color and is specially adapted for every kind of boiled, baked and fried fish; for chops, steaks and cutlets and cold meats; also for cooking of vegetables. The article possesses a particular taste and flavor and advances [enhances] the digestion.

“The Japanese Soy with these Trade Marks may be stored for a long period and is guaranteed never to turn bad.

“The article is sold for 6 to 9.60 yen per case of 4 *go* bottles, F.O.B. Osaka. An order to any of the brewers will receive prompt attention.”

Page 166: 1/3 page display ad for Ueki Shoyu, Osaka. Page 180: ½ page display ad for “Best shoyu. Ota Shoyu Brewing Company, (912 Minamiota Machi, Yokohama, Japan) was established in 1850...” Its shoyu is known as “Fuji Shoyu.” “Second medal in 1859 and first Silver Medal in 1903. Exported to Germany, America, Hawaii, Corea, Shanghai, Hong Kong, England, Canada, Australia, India, Singapore, etc., through G. Brandel & Co., No. 41 Yamashita Cho, Yokohama.”

Page 189: Full-page ad for “Shoyu, Japanese sauce. Izumiyama Shoyu Brewing Co., Hachinohe Mutsu, Japan. Its two trade marks are shown.

Page 193: ½ page display ad for “Maru Sen Shoyu. Awarded medals and shohai at the World’s Exhibition, Paris, 1903, and others. Marusen Shoyu is brewed by Sutejiro Hosono, Kinatomura, Kitakanbara, Niigata ken, Japan.

Page 197: Full-page ad for Kameya Shoyu & Company, Nakaidzumi cho, Shidzuoka ken [Shizuoka-ken], Japan. A large photo shows Sokichi Tsukichi, proprietor, standing in a Western-style room with one hand on a chair. This shoyu is exported to the United States, Hawaii, Europe, China, and Corea.

197. *Washington Post.* 1905. Japanese may become leaders in invention. March 19. p. FP5.

• ***Summary:*** Discusses the inventions of Jokichi Takamine, a resident of New York. Chief among these is adrenalin, which “has become one of the emergency life-saving agents in surgery. The most powerful heart stimulant known...”

“With his American wife, lives in a half Japanese, half American house in Hamilton Terrace [in northwest Manhattan near West 142nd st.], and 8 hours a day he toils over his microscopes and chemicals in his laboratory in 142nd street–’prospecting,’ he calls it.”

“Dr. Jokichi Takamine is a product of the new school of Japanese medicine. He studied at the Andersonian College, Glasgow [Scotland], married an American wife while attending the exposition at New Orleans [Louisiana] in 1884, and spent two years in Peoria [Illinois] seeking for the whiskey trust a cheaper process for producing alcohol.

“Dr. Takamine is a man of middle age now. His iron gray hair looks older than his face... He speaks English so well that he dares venture into American slang... He is as Europeanized as a Japanese ever gets. And he has a good sense of humor.

A recent Japanese invention is the “shimose explosive.” Photos show: (1) An oval portrait photo of Jokichi Takamine. (2) The Japanese room of his home in New York City.

Note: This is the 2nd earliest English-language document seen (Aug. 2012) in which Takamine is referred to as “Dr.” Takamine.

198. *New-York Tribune.* 1905. Reward from Emperor. Japanese house to form country place for Dr. Takamine. April 27. p. 11.

• ***Summary:*** The gift, to Dr. Jokichi Takamine, of No. 45 Hamilton Terrace, “consists of three Japanese buildings, which were brought to this country especially for the world’s fair at St. Louis [Missouri] last year. The gift is said to represent an outlay of $50,000.

“The buildings were given to Dr. Takamine in recognition of his service to the Imperial Japanese Commission at the world’s fair, and later because of several important scientific and medical discoveries which have been applied with great benefit in the medical department of the Japanese army.”

“The buildings will be made a part of Dr. Takamine’s summer home in Sullivan County, near Monticello [about 75 miles northwest of Manhattan]. They will be re-erected by Japanese carpenters and artists, for they are built on the Japanese plan, no nails or other American building material being used in their construction.”

“With the acquisition of these buildings Dr. Takamine will convert his home into a Japanese country place. He

has several acres, where he has set out many cherry trees, imported expressly for this purpose, as well as a number of flowering plants of Japan."

Photos show: (1) A circular portrait photo of Jokichi Takamine. (2) The "Japanese house presented" to him by the Japanese government.

Note: The nearest train stop to Dr. Takamine's summer home at Merriewold was probably either Monticello or Gilman's Station–says Mary Ann Toomey (Aug. 2012), Forestburgh Historian.

199. Natsume, Soseki. 1905-1907. Wagahai wa neko de aru [I am a cat]. Tokyo: Okura Shoten. 218 + 20 p. Illust. 23 cm. [Jap]*

• ***Summary:*** One translation: "Since he (the protagonist) had a weak stomach, his skin was a light yellow and showed symptoms of losing its elasticity. And yet he kept on eating, after which he would drink Taka-Diastase and crack open a book." Translation in the color motion picture *The story of Jokichi Takamine: Japan's goodwill ambassador:* "He has a weak stomach and his skin is of a pale, yellowish color, inelastic and lacking in vitality. Nevertheless he is an enormous gormandiser. After eating, he takes some taka-diastase for his stomach."

One of Japan's most famous novelists, Natsume Soseki lived 1867-1916.

200. Bennitt, Mark. 1905. History of the Louisiana Purchase Exposition. St Louis, Missouri: Universal Exposition Publishing Co. 800 p Facsimile edition reprinted in 1976 by Arno Press (New York, NY). *

• ***Summary:*** "Japan spared neither effort nor expense to make the most comprehensive display of her products and resources ever sent to an exposition from an Oriental country. The government of Japan appropriated $400,000 and Formosan Government $50,000 for the exhibit" (p. 372).

"Over 282,455 square feet of space were occupied by Japan" (p. 303).

201. *Washington Post.* 1906. Baron Takaki coming here. Feb. 7. p. 36.

• ***Summary:*** "Baron Takaki, the famous surgeon general of the Japanese army, will arrive in this city on February 13 (18?) and will be the guest of Mr. Hioki, charge d'affaires of Japan, for several days. The baron has been received with great consideration by the medical profession in New York and Philadelphia, where he went by special invitation to lecture upon military sanitation.

"Dr. Jokichi Takamine, an eminent Japanese chemist, will also be Mr. Hioki's guest."

Note: "In 1884, Kanehiro Takaki (1849-1920), a surgeon general in the Japanese navy, rejected the previous germ theory for beriberi and hypothesized that the disease was due to insufficiencies in the diet instead. Switching diet on a navy ship, he discovered that substituting a diet of white rice only, with one also containing meat, milk, bread, and vegetables nearly eliminated beriberi on a 9-month sea voyage. However, Takaki had added many foods to the successful diet and he incorrectly attributed the benefit to increased nitrogen intake, as vitamins were unknown substances at the time. Nor was the Navy convinced of the need for so expensive a program of dietary improvement, and many men continued to die of beriberi, even during the Russo-Japanese war of 1904-5. Not until 1905, after the anti-beriberi factor had been discovered in rice bran (removed by polishing into white rice) and in brown barley rice, was Takaki's experiment rewarded by making him a baron in the Japanese peerage system, after which he was affectionately called 'Barley Baron'" (Sources: (1) E.V. McCollum. 1957. *A History of Nutrition.* (2) Wikipedia, at Thiamine, history, Aug. 2012).

202. Takamine, Jokichi. 1906. Diastatic substance and method of producing same. *British Patent* 12,227. 5 p. Date of application, 25 May 1906. Accepted 31 Dec. 1906. (Chem. Abst. 1:938) (See also 1:920).

• ***Summary:*** "My invention relates to diastatic substances or enzymes having the property of converting starch or starchy constituents of grains, roots, tubers or other portions of vegetable anatomy into sugars."

"A further object of my invention is to produce a new diastatic substance, having liquefying and saccharifying properties in which these properties are adjusted so that the starch liquefied by the liquefying properties may be saccharified by the saccharifying principle; or so adjusted that the saccharifying properties of the diastase are not in excess.

"It is well known that diastatic enzymes in general possess the characteristic property of converting starch into sugars. This conversion passes through various distinctive stages. (1) The first is the liquefying stage, wherein the starch is liquefied or dissolved. (2) The next stage is the dextrifying stage, in which the liquefied or dissolved starch is transformed into dextrin [a carbohydrate of low molecular weight]. This is a transition stage and for the purpose of this specification may be left out of further co consideration. (3) The final stage is the saccharifying stage in which the dextrin is transformed into sugars.

"I have discovered that these separate and distinct stages in the conversion of starch, or at least, the liquefying and saccharifying stages, are produced by separate and distinct enzymatic agents which exist together in varying proportions in diastases heretofore known and used." However "these different enzymes do not occur therein in the most advantageous or desirable proportions for the economic conversion of starch or starchy materials into sugar... By my invention the proportions of the liquefying and saccharifying enzymes may be adjusted" so as to have

the most advantageous proportions. Address: 45 Hamilton Terrace, New York, NY.

203. Takamine, Jokichi. 1906. Verfahrung der Gewinnung eines stark verzuckerenden Enzyms [Process for obtaining an enzyme that saccharifies starch]. *German Patent* 202,952. July 22. (Chem. Abst. 3:501). [Ger]*
• ***Summary:*** A sugar-forming enzyme is obtained by aqueous extraction of starch-containing fruits, potatoes, etc. separating the impurities by acid fermentation or the addition of dilute lactic acid, etc. and finally concentrating the product to a syrupy consistency or precipitating the enzyme with alcohol. Address: New York, NY.

204. Takamine, Jokichi. 1906. Diastatic substance and method of making same. *U.S. Patent* 0,826,699. July 24. 4 p. Application filed 21 Jan. 1905.
• ***Summary:*** "My invention relates to diastatic substances or enzyms having the property of converting starch or starchy constituents of grains, roots, tubers, or other portions of vegetable anatomy into sugars." This whitish powder, which is soluble in water, has practically no liquefying effect upon starch, but has a decided saccharifying action on liquefied starch. Address: Manhattan, New York City, NY.

205. Nishizaki, Kotaro. 1906. Takajiyasutaaze oyobi kôji no denpun tôkaso ni tsuite [On the enzyme of Takadiastase and koji]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 295. p. 983-93. Sept. [Jap; ger]
Address: Yakugaku-shi, Japan.

206. Nishizaki, K. 1906. "Taka jiasutaaze" oyobi kôji no denpun tôkaso ni tsuite [On Taka-Diastase and the starch saccharifying enzyme of koji]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 295. p. 983-993. Sept. [Jap]
Address: Yakugakushi, Japan.

207. Takamine, Jokichi. 1906. Kin no sansei suru "jiasutaaze" ni tsuite [On the diastase produced in microbes]. *Chugai Iji Shinpo* (*Medical News, Foreign and Domestic, Tokyo*) No. 642. p. 57-58. Dec. [Jap]*
• ***Summary:*** Note: This article first appeared in *Kanpo* No. 7002.

208. Takamine, Jokichi. 1906. Kin no sansei suru "jiasutaaze" shitsu ni tsuite [On the diastase produced in microbes]. *Tokyo Iji Shinshi* (*Tokyo Medical Journal*) No. 1487. p. 34-36. [Jap]*
• ***Summary:*** Note 1. This article first appeared in *Kanpo* No. 7002. Note 2. Shin Sekai-sha. 1905. *Zaibei Nippon-jin Kan* (*Directory of Japanese in the USA*). On page 41, listed in New York City is Dr. Jokichi Takamine, 613 W. 142nd St.

209. Takamine, Jokichi. 1906. Kin no sansei suru "jiasutaaze" shitsu ni tsuite [On the diastase produced in microbes]. *Kanpo* No. 7002. [Jap]*

210. Crawford, Albert C. 1907. The use of suprarenal glands in physiological testing of drug plants. *USDA Bureau of Plant Industry, Bulletin* No. 112. 32 p. Aug. 10. [35+ ref]
• ***Summary:*** Contents: Introduction. Suprarenal glands: Separation of the active principle [a history], color tests, principal physiological tests (action on the eye, action on animals, measurement of the rise in blood pressure in higher animals {animals preferred, principal reference literature, apparatus, preparation of animals for testing, results obtained by various investigators}). Toxicity of the active principle. Index.

Dr. Jokichi Takamine, who isolated adrenaline, is cited numerous times in both the text and the footnotes.

The interesting history of the isolation of the active principle states (p. 10): "Takamine simplified the method of isolation and made it commercially available, giving his preparation the name adrenalin, with the formula $C_{10}H_{15}NO_3$.

"Simultaneous with Takamine's paper, Aldrich, Abel's former associate, published his results. His body was evidently much purer than Takamine's, as he purified before precipitating, but his method was not commercially available on account of the necessary purification from the lead. Aldrich adopted Takamine's name adrenalin, although his formula $C_9H_{13}NO_3$ differed by CH, from that of Takamine. These two preparations are often confused. Aldrich pointed out that if the benzoyl group was removed from Abel's original formula, the resultant formula was close to his. All three investigators–Abel, Takamine, and Aldrich–were dealing with the same body, but in varying degrees of purity.

"Abel has compared the analytical data furnished by Aldrich and Takamine, and declares that the analyses do not bear out the empirical formulae deduced." Address: Pharmacologist Drug-Plant Investigations.

211. Japan in New York. 1908. New York, NY: Anraku Publishing Co. ("Japanese American Commercial Weekly"). [xviii] + 113 p. Jan. Illust. No index. (See next page).
• ***Summary:*** Includes: Front view of The Nippon Club (full-page photo). Drawing room of The Nippon Club and Japan Room of The Nippon Club (½-page photos). Dr. J. Takamine, chemist and president of The Nippon Club. Table of Contents (p. 2). Preface (p. 3). Japan and the United States, by Hon. Seth Low. Japan and her People, by Prof. George T. Ladd. America's Place in Japanese Civilization, by Mr. K.K. Kawakami.

Japan Society, 17 State Street (p. 16. "The Japan Society was organized on the happy occasion of General Count Kuroki's visit to this city {New York} May 19th, 1907, by leading Americans and the Japanese of this city. Its chief aim is to promote good feeling and encourage commercial

as well as social relations between the people of this country and Japan. The officers are: President, J.H. Finley... Vice-Presidents... Dr. J. Takamine,...").

Nippon Club, 44 W. 85th St. (p. 20. "The Nippon Club was organized in March, 1905, by the leading Japanese residents of the city and is now presided over by Dr. J. Takamine, which Mr. Rinichi Uchida is looking after the club management. Its constitution, which we are supplementing to our little publication, is self-explanatory...").

Dr. Jokichi Takamine, 521 W. 179th St. (p. 22. "The name of Dr. Jokichi Takamine is known the world over as the discoverer and Manufacturer of Taka-Diastase and Adrenaline, the two wonders of the medical discoveries. Since the time he came to this country in 1885, Dr. Takamine has devoted his entire energy, time and money to his professional studies. One of his greatest achievements was the industry of ferment extracted from wheat hulls. This, however, met with an unhappy fate through an incendiary fire, brought about by the jealousy of his rival malt manufacturers and brewers. Mrs. Carline Takamine is the daughter of Col. E.V. Hitch, who took a conspicuous part in the war of succession. The chemical laboratory is in charge of the doctor's assistant, Mr. Keizo Wooyenaka [Uenaka], an able chemist").

Pages 24-38 are entirely about The Nippon Club. "Organized March 15th, 1905. 44 W. 85th St., New York City. Officers for 1907-1908. Jokichi Takamine, president. Kikusaburo Fukui, Treasurer. Trustees (21 men). Standing committees for 1907-1908: Admission Committee (6). House Committee (7), Library Committee (5). Commitee on Game (5 men). Constitution of The Nippon Club (15 articles, incl. No. 2. "The object of the Club shall be to promote the social enjoyment of its members and to provide them with mental and physical recreation." No. 11. "The members of the Japanese associations in New York, respectively known as the Hinode Club and the Kyodo-Kwai, shall be entitled to membership in this Club without the formality of election and without admission fees, if they desire to join it"). Signed in the City of New York on March 15, 1905. Names of the 19 signers (incl. Jokichi Takamine) and their affiliations are given. By-Laws of the Nippon Club (14 articles, incl. Membership, Admission to membership). Honorary members (13 men, mostly Japanese living in Japan or other countries, also General Stewart L. Woodford, New York). Resident members (186 total, most having Japanese surnames, with the business address of each; R.V. Briesen and Chas. Loechner do not have Japanese surnames. "Takamine, Jokichi, 45 Hamilton Terrace" is listed among the resident members. Addresses ouside of New York City include Tokyo, Japan; London, England; Cambridge, Massachusetts; San Francisco, California).

Japanese Directory, New York City (p. 45-46. Listings for both individuals and companies, with 1-2 addresses each and the telephone number of each).

The rest of the book is in Japanese (without page numbers); it includes some photographs such as: "Dr. J. Takamine's Japanese Villa at Merriewold Park, N.Y."

Note: Most Japanese living in the United States live on the West Coast. However, the Preface states that about 3,000 Japanese live in and around New York. The Preface also strongly suggests that this is the first edition of this book; it adds: "We also supplement the book with the constitution of the Nippon Club as a representative Japanese club in this city, and a directory containing some one hundred and eighty Japanese residents here. This selection out of thirty hundred [3,000] is made for no other reason than that they are perhaps more widely known."

212. *Sun* (*The*) (*New York, NY*). 1908. Japan bumps its nose, says the Consul-General. Whichever way it heads–Must wait for a rating. Feb. 23. p. 5.
• ***Summary:*** "The Nippon Club gave an elaborate banquet on Friday night in honor of the newly-appointed Consul-General, Kokichi Midzuno, and Prof. Sakuye Takahashi of the Imperial University of Tokio. The president, Dr. Takamine, and Prof. Tison delivered the welcoming addresses. Among other things the Consul-General said:..."

"'Our people want to be recognized as a first rate Power too soon after a military victory. We must be patient for thirty or fifty years more to be fully recognized as an undisputed first rate Power socially, politically, and morally. To attain this end we must face many tests, not in the military way but in other directions such as satisfy the Western nations.

"Prof. Takashi said that the anti-Japanese sentiment was now subsiding in the West" [i.e., Western USA].

"Newcomers cannot avoid some ill sentiment. You will remember that the Irish and the Germans were much cursed at the beginning, but now they are the ones who are opposed to the Japanese."

213. Nishizaki, K. 1908. Futatabi Takajiyasutaaze oyobi ni denpun tôkasô ni tsuite [On the amylolytic enzymes in Takadiastase and koji]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 315. p. 423-46. May. [3 ref. Jap; ger]
Address: Yakugaku-shi, Japan.

214. Nishizaki, K. 1908. Untersuchungen uber diastase in takadiastase und kôji [Investigations on the diastase in Takadiastase and koji]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 29:325-. [Jap]*

215. *American Druggist and Pharmaceutical Record.* 1909. Greater New York. Feb. 8. p. 85.
• ***Summary:*** "Directors of the Takamine Ferment Company, of which Dr. Jokichi Takamine is president, declared recently a regular yearly dividend of 7 percent, and an extra dividend of 4 percent., making a total disbursement of 11 percent. for

1908."

216. *Chicago Daily Tribune.* 1909. Society at nation's capital. April 9. p. 11.
• ***Summary:*** "Washington, DC. Baron Takahira, Japanese ambassador, was host at the embassy tonight at dinner for the Japanese Tokio exposition commission. In the company were... P. Sakai, Dr. J. Takamine, and Mr. Matsui,..."

217. *New York Times.* 1909. Kuni in Japanese house: Host of Prince, Dr. Takamine, has Japanese structures from St. Louis Fair. Sept. 19.
• ***Summary:*** "Monticello, New York, Sept. 19. Prince and Princess Kuni of Japan are being entertained for two days at the country home of Dr. Takamine at Merriewold Park, four miles from Monticello [New York]. With the Prince and Princess are Col. Jurita, Mme. Nagasaki, S. Matsui, Japanese Chargé d'Affaires in Washington, and K. Yamasaki, the Japanese Vice Consul in New York. A full retinue of Japanese servants accompanied the party which arrived from New York to-day on a special train.

"Prince and Princess Kuni and their party while they are guests of Dr. Takamine will occupy the former Japanese buildings at the St. Louis Exposition [The Louisiana Purchase Exposition, informally known as the St. Louis World's Fair, an international exposition held in St. Louis, Missouri, in 1904]. These were presented to Dr. Takamine, and he had them taken in sections to his Summer home at Merriewold."

218. Home of Jokichi Takamine and his family (wife Caroline and two sons) from 1909 to 1921, Upper West Side, New York City (Photograph). 1909.
• ***Summary:*** This five-story house is located at 334 Riverside Dr. (Upper West Side), Manhattan, New York City. A Beaux-Arts Townhouse, it was designed by Hoppin & Koen, architects, and constructed in 1901-02. This photograph was taken on 17 April 2001 and posted on www.flickriver.com. (See above and next page).

Note: Dr. Takamine designed this showpiece mansion and home to combine the greatest art and architecture of both East and West. It was originally planned to display a different time period in Japanese history on each floor, and to show the evolution of Japanese art and decoration. This initial plan was too ambitious for a building which must also serve as a comfortable home. In the end, only the first and second floors were decorated with Japanese artwork and designs (Kawakami 1928, p. 57, 63-67).

219. The interior of one room at Dr. Takamine's main residence, Manhattan, New York (Photograph). 1909? Undated. (See p. 74).
• ***Summary:*** The date and place of this photo is unknown.

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Furusato Ijinkan (Great People of Kanazawa Memorial Museum) in Kanazawa, Japan.

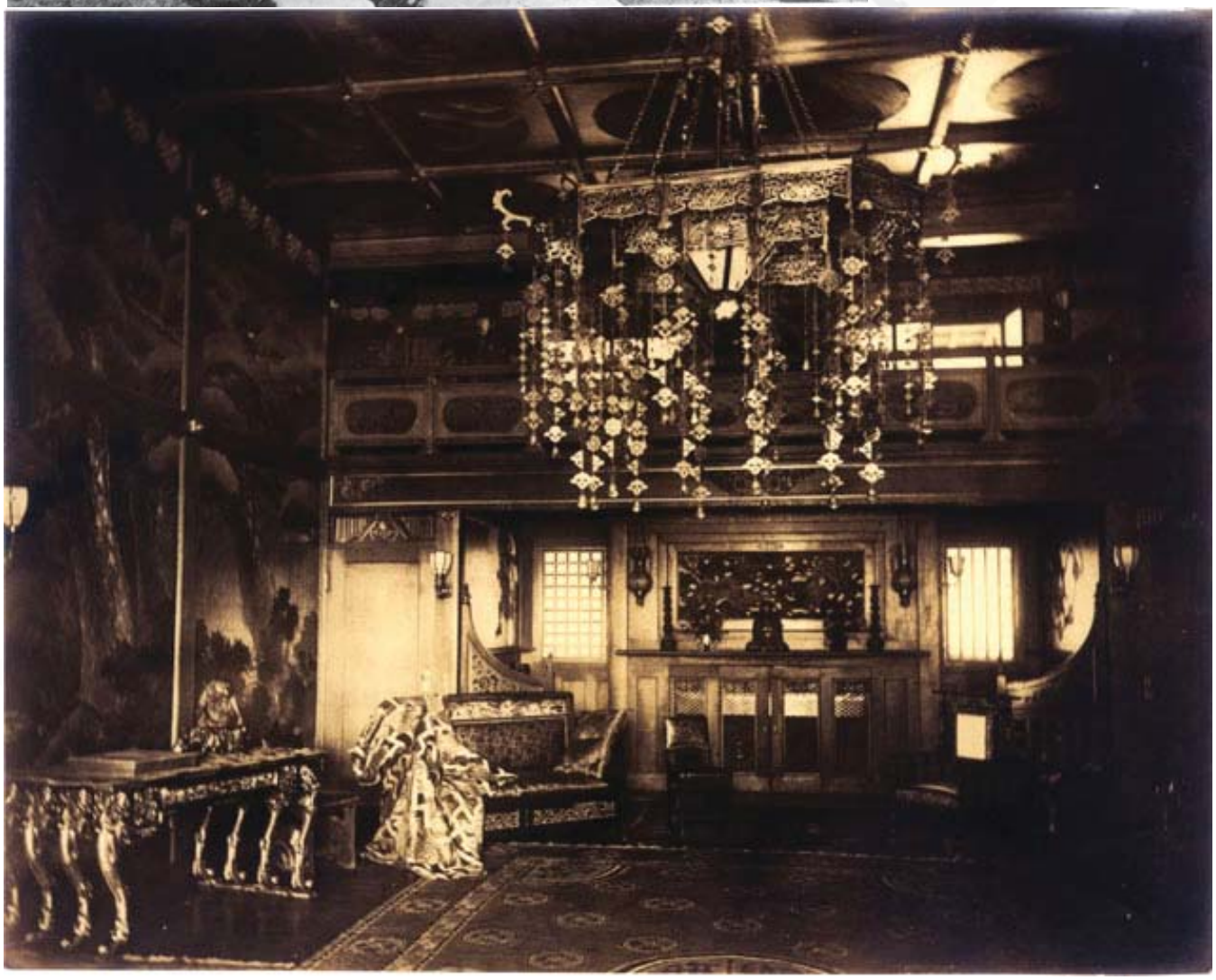
220. Three views of Sho-Foo-Den plus a map, Merriewold, New York (Photograph). 1909? Undated.
• ***Summary:*** The date of these photos is unknown. (1) Dr. Takamine and his wife Caroline standing in front of Sho-Foo-Den. (2) The interior of one room at Sho-Foo-Den. (3) Another view of the front exterior from shofuden.com. (4) Map of Merriewold and Sho-Foo-Den (No. 17).

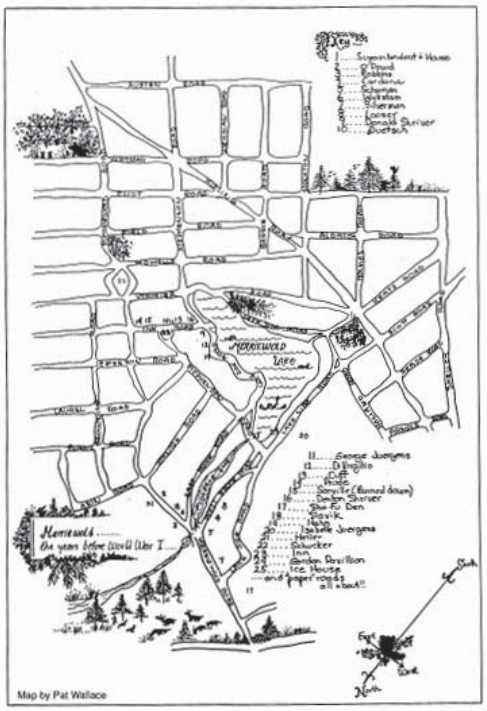
Note: Sho-Foo-Den (also romanized as Shofuden or Shofu-den) is said to mean "Pine and Maple Palace."

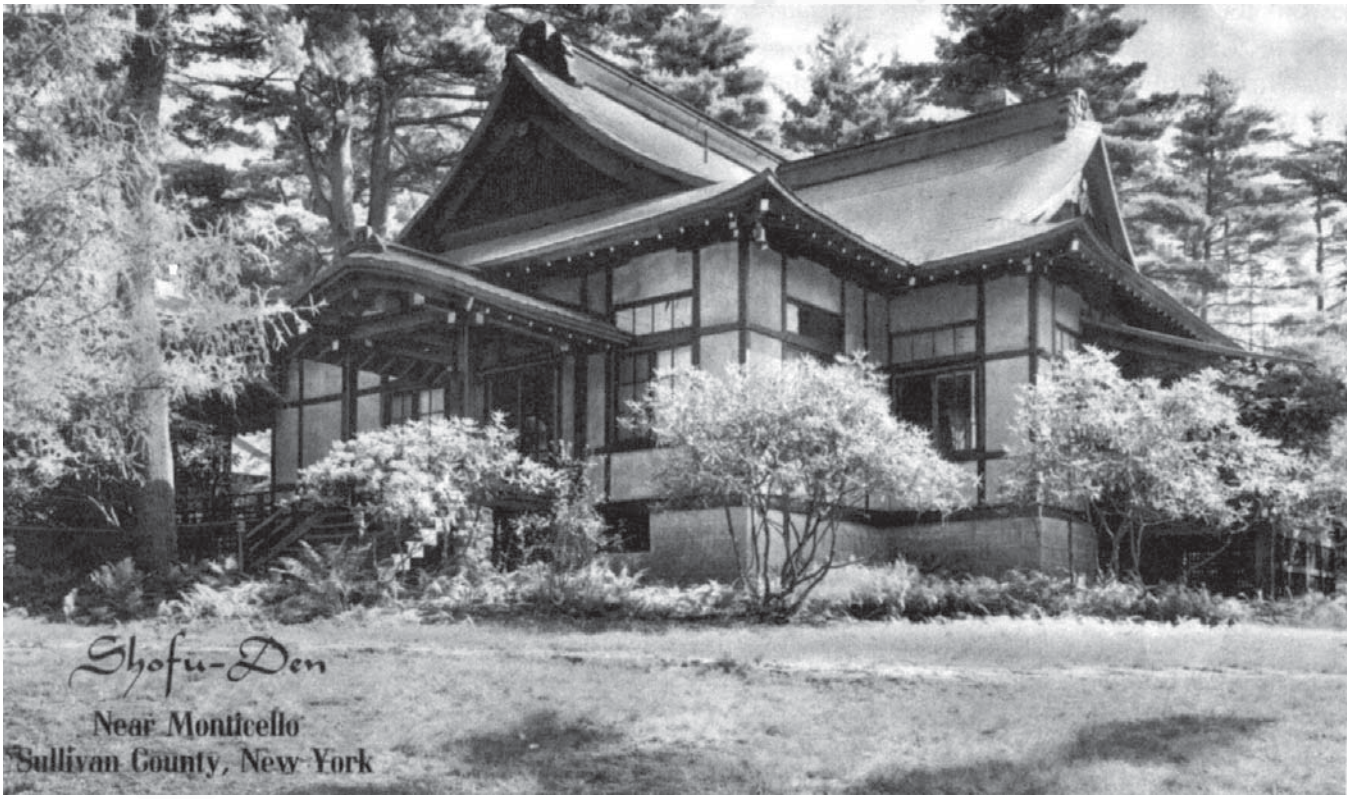
The following history is found at shofuden.com, under "History," written by David Colson, with the assistance of Agnes de Mille:

"Returning to the front of the park, we find Merriewold's finest jewel. Historically, it is the most interesting building in the park and, at its best, certainly the most beautiful. It was erected beginning in 1906 by Jokichi Takamine." A map of Merriewold in the years before World War II shows the location of Sho-Foo-Den and of Merriewold Lake.

"In 1904, the Japanese Government sent an exhibit to the St. Louis World's Fair. It was a complete garden, with stone figures, lanterns, and trees native to Japan. The garden surrounded two large houses, whose design was similar to that of houses of Japanese nobility. At the conclusion of the exhibition, Takamine was given these buildings by the Japanese government. Our [Merriewold's] superintendent, Alexander Moore, Jr., and a team of carpenters, were sent to St. Louis to watch and learn as Japanese craftsmen took the







buildings down. Each piece was numbered and its position diagramed. Then it was all shipped to Merriewold via railroad.

"Arriving in early winter, the crates were transported from St. Joseph Station on thirty-five sleighs. In the spring, Mr. Moore and his carpenters began putting it together–with the help of Japanese workers who had come from Japan (and stayed at the superintendent's house, teaching young Bertha Moore to speak a bit of Japanese). Everything fit perfectly. But it did not happen overnight. This was no 'salt box' house, or even your standard gothic structure. This was a palace. Literally, "Pine Maple Palace". And what must be understood as much as anything is that the grounds and gardens-even the view itself-were all part of the house, part of the "experience".

"The gardens were distinguished by superb stone lanterns and figures. A team of six gardeners, brought over from Japan, took seven more years to complete them. They built a small lake, transplanted trees, twisted and trimmed trees, brought in huge quantities of rhododendrons (fifty wagons: thirty died, twenty lived). But finally they had achieved their goal: a subtly beautiful, traditional Japanese garden. Sho-Foo-Den was complete.

"This was the finest Japanese residence in North America. The family: Dr. Jokichi, his wife, Caroline, and their two sons, Jokichi, Jr., and Ebenezer, lived there in remarkably grand style."

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221. Takamine, Jokichi. Assignor to Parke, Davis & Company of Detroit, Michigan (A Corporation of Michigan). 1910. Glandular compound and process of producing same. *U.S. Patent* 0,945,638. Jan. 4. 2 p. Application filed 4 Feb. 1904.

• ***Summary:*** Discusses an iron compound of the blood-pressure-raising principle of the suprarenal glands.

Note 1. In mid-1900 Jokichi Takamine isolated adrenaline. This was the first isolation of a hormone.

Note 2. The suprarenal glands were later renamed the adrenal glands.

Note 3. This is the earliest adrenalin patent seen that Takamine has assigned to Parke, Davis & Co. Address: New York, NY.

222. U.S. Department of the Interior, Census Office. 1910. Charles P. Beach in the 1910 U.S. Census in Los Angeles, California. Washington, DC. April 25.

• ***Summary:*** Address looks like 604 Belmont Ave., Los Angeles.

Beach, Elizabeth A., head of household, age 55, widow. Five children, all five living. Elizabeth born in Indiana, her parents born in Indiana; [spelled out] no occupation, she rents her home.

Beach, Wesley H, son, age 31, single, born Kansas, father born Connecticut, mother born Indiana lawyer, attorney at law

Beach, Everett [B?], son, age 29, single, born Kansas, father born Connecticut, mother born Indiana, physician, general practice.

Beach, Jesse, son, age 27, single, born Kansas, father born Connecticut, mother born Indiana, mining engineer.

Beach, Mary, daughter, age 22, single, born Kansas, father born Connecticut, mother born Indiana, no occupation.

Beach, Charles P., son, age 20, single, born Kansas, father born Connecticut, mother born Indiana, no occupation.

Note: In *Who's Who on the Pacific Coast, 1913* is an entry for Wesley H. Beach (the eldest son and Charles P. Beach's eldest brother by about 11 years) in which we learn that his father's name was Charles T. Beach, and his mother's maiden name was Lizzie A. Bridgman. Wesley H. Beach, Lawyer, was born 28 Aug. 1878 in Independence, Kansas. He was educated in public schools in Independence. Kansas, and in Colton and San Bernardino, California. Graduated from Stanford University in 1900 with an A.B. degree. Post-graduate degree in 1901. University of California Summer School 1901-02. LL.B. degree from Columbia University Law School, 1907. Asst. Librarian, Stanford Univ., 1898-1901; teacher and vice-principal Colton High School 1901-04. Member: Los Angeles Chamber of Commerce. L.A. County Bar Association, Masons. Republican. Clubs: University of Southern California Rod and Reel. Residence: 918 West 48th St. Office: 732 Title Ins. building, Los Angeles.

223. Nishizaki, Kôtaro. 1910. Takajiyasutaaze oyobi kôji no denpun tôka-so ni tsuite [On Taka-Diastase and on diastase in koji]. *Tokyo Iji Shinshi* (*Tokyo Medical Journal*) No. 1675. p. 1501-02. July 23. [Jap]

• ***Summary:*** This enzyme hydrolyzes or saccharifies starch. On cover of journal: *Tokyoer Medizinische Wochenschrift.*

224. *New York Times.* 1910. Japanese give us a memorial tablet: To commemorate Hudson-Fulton Celebration in Riverside Drive. Cherry trees to come. Twenty-one hundred, growing in Tokio, to be transplanted here–tablet represents them. Sept. 30.

• ***Summary:*** "A bronze tablet has been presented to the city by a committee of Japanese residents and probably will be placed on a boulder adjoining Grant's Tomb on Riverside Drive. The formal presentation was made on Monday night by the Japanese committee at a dinner of the Nippon Club to Park Commissioner Stover, representing the city, and Gen. Stewart L. Woodford, a President of the Hudson-Fulton Celebration, in connection with which the gift is made.

"At the time of the celebration the Japanese residents proposed to present to the city 2,100 cherry trees from their

native land, the number being arrived at by multiplying 300 years which the celebration commemorated by seven, the fortunate number. When the trees arrived, however, it was discovered that they were infected with a botanical disease and harbored noxious insects, and all of them had to be destroyed. The Japanese decided to replace their gift, and now have under special cultivation in the Royal Botanical Gardens, at Tokio, a number of young cherry trees which will be sent to this country probably in the Spring of 1912, after they have been thoroughly inspected, to make sure that they are entirely free from disease or insects.

"As an earnest of the gift, in the meantime, the bronze tablet was wrought in the National Art School of Tokio. It is a fine form of art and displays Grant's tomb with some of the cherry trees surrounding it. It bears this inscription signalizing the gift of the cherry trees:"

The long inscription is given, followed by these names:

"Kokichi Midzuno, Japanese Consul General;

"Jokichi Takamine,

"Rioichiro Arai.

"Daijiro Ushikubo,

"Kikusaburo Fukui,

"Committee of Japanese Residents of New York. Sept. 25, 1909."

Commissioner Stover said he hopes the cherry trees will be planted along Riverside Park between 120th and 129th Streets. "A few of the trees may also be placed about the lawns surrounding Grant's Tomb, in accordance with the view of that monument on the tablet."

225. Takamine, Jokichi. 1910. Process of converting starchy material into sugar. *U.S. Patent* 0,975,656. Nov. 15. 2 p. Application filed 20 Jan. 1906.

• ***Summary:*** "The objects of my invention are to improve the conversion of starchy material into sugar by obtaining a greater yield of saccharine material from a given quantity of starchy material than can be obtained by processes heretofore known and practiced, and to obtain the greater yield at less expense than that of the lower yields at present obtained; to obtain a practically complete conversion of all the starchy material employed, greater rapidity of conversion, and generally greater efficiency and economy in the process."

"In the processes of converting starchy material into sugar at present employed, the converting agent now generally employed is malt or malt diastase. This material, however, is relatively expensive, is not uniform in its character and effect and its saccharifying action is not thorough."

Takamine then explains how he uses acids (he prefers to use hydrochloric acid) "without the disadvantages and deleterious results above mentioned." Address: Manhattan, New York, NY.

226. Lafar, Franz. 1910. Technical mycology: The utilization of microorganisms in the arts and manufactures. Vol. II. Eumycetic fermentation. Part II. Translated from the German by Charles T.C. Salter. London: Charles Griffin & Co. ix + p. 191-748. Illust. Index. 23 cm. [3240* ref. Eng]

• ***Summary:*** An extensive bibliography on mycology and fermentation (3,240 references) for both this volume and volume I appears at the back of this volume (p. 561-695). The first chapter in this volume is Chapter 49, titled Mineral Foodstuffs (p. 191-202).

Chapter 55, titled "Classification of the families Saccharomycetaceæ and Schizosaccharomycetaceæ" is on p. 270-295. Section XVII (starting p. 456) is titled "The enzymes and the enzyme actions of yeast." It begins with Chapter 53, on "Alcoholase," by Dr. Rudolf Rapp, which starts with an historical introduction. Page 506 mentions the "Amylo process."

Chapter 56, by Prof. Dr. Carl Wehmer, titled "Morphology and subdivision of the family Aspergillaceæ" discusses (p. 296-346): Eighteen illustrations of Aspergillus conidiospores (p. 300-19).

"*Aspergillus Oryzae* (Ahlburg) Cohn (=*Eurotium Oryzae* Ahlburg). This species is of practical importance as a saccharification fungus, and has been cultivated for centuries in Japan for the preparation of the rice mash for Saké, as well as for the production of Soja sauce and miso." It was first identified (as *Eurotium oryzae*) by Ahlburg in 1876, and was renamed *Aspergillus oryzae* by Cohn in 1883, though a full morphological description was not given until 1895 (by Wehmer) (p. 308).

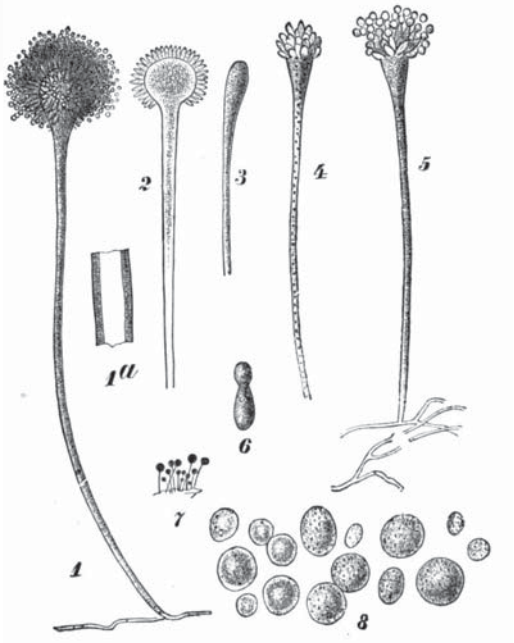


Fig. 166 shows *Aspergillus oryzae* [the koji mold]. "1-2. Conidiophores with clavate and almost spherical glubule. 2. In optical section. 3-5. Development of a small conidiophore, distension of the hypha, protrusion of the sterigmata and

incipient formation of conidia. 1a. Optical section of tough stem. 6. Sterigmata. 7. Conidial herbage, slightly magnified. 8. Conidia. Approximate magnification of 1-5 = 75 times. Of 6 = 400 times. Of 8–900 times. (After Wehmer).

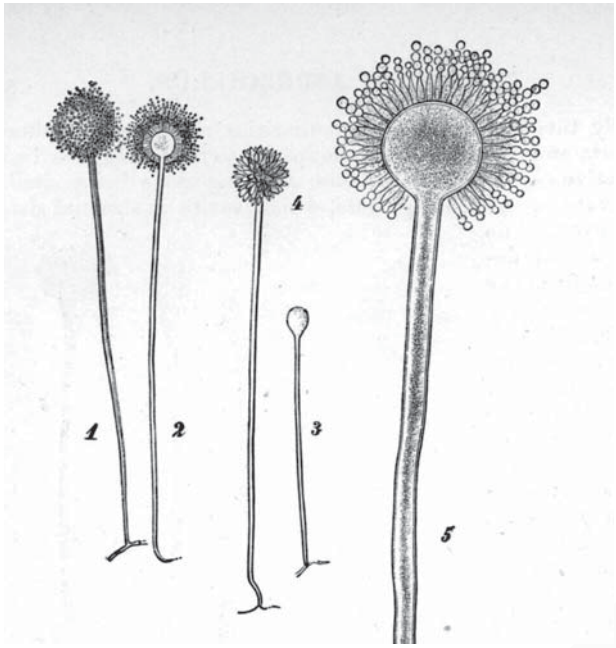


Fig. 167. Conidiophores 1-5, 2 and 5 in optical section. Figs. 3-5, development of the globule (3) and sterigmata (4). The separation of the conidia is beginning in 5. Approximate magnification of 1-4 = 20 times. Of 5 = 120. *Aspergillus Wentii* (Wehmer), which is used in Java to make Tao-Yu (Chinese-style soy sauce). It appears spontaneously on the boiled Soja beans that have been covered with *Hibiscus* leaves, as described by Wehmer in 1896 (p. 311).

Chapter 57, also by Prof. C. Wehmer, titled "Chemical activity of the Aspergillaceæ," discusses (p. 350-74): Saccharification of starch, Takamine's research using Aspergillus to make diastase (Taka-diastase) and its efficiency compared with similar enzymes of different origins, koji extract which contains amylase and other enzymes, use of *A. oryzae* in the preparation of rice-wine, Soya [shoyu], and Miso (p. 352).

This volume also discusses: The degradation of proteids and their derivatives, protease (p. 369-70). Film-forming surface yeasts and their accompanying phenomena, *Mycoderma* (p. 411-15). Invertase (p. 516). Other enzymes discussed in this chapter include maltase, melibiase, lactase, trehalase, raffinase, and amylase. Address: Prof. of Fermentation-Physiology and Bacteriology, Imperial Technical High School, Vienna.

227. Lakeside Annual Directory of the City of Chicago. 1910. Chicago, Illinois: Chicago Directory Co. p. 1659.
• ***Summary:*** The one entry reads: "Takamine Ferment Co. 703, 138 Washington.

Note 1. At the top of this page we read: "1910–Lakeside Classified Directory–1910."

Note 2. Since Jokichi Takamine and his family were now living in New York City, this may be a paid classified listing rather than a free listing for residents. Address: Chicago, Illinois.

228. Portrait paintings of Dr. Jokichi Takamine and Mrs. Caroline Hitch Takamine by Seymour S. Thomas (oil on canvas). 1910? Undated. (See next page).
• ***Summary:*** Each of these two life-size paintings is 73.75 inches by 42.25 inches. As of 1994 they hung in the hallway of the main entrance to Shofu-Den. Seymour S. Thomas (1868-1956) was born in Texas and studied at the Art Students League in New York City, the Julian Academy, and the Ecole des Beaux Arts in Paris. He worked mainly as a portrait artist / portraitist. His "Portrait of a Lady and Dog" is in the Metropolitan Museum of Art (in New York City).

Details and the estimated date of these oil paintings are given in the booklet "Shô-Fu-Den: Jokichi Takamine–Pioneer of cultural relations between the United States and Japan," by Yuki Okamura (1994, p. 19).

229. Takamine, Jokichi. 1911. Enzym. *U.S. Patent* 0,991,560. May 9. 3 p. Application filed 25 Jan. 1907.
• ***Summary:*** "The object of the invention is to prepare and manufacture diastatic enzym in a concentrated form and which possesses the power of transforming starch into sugar for use in various industries, and in an economical and practical manner.

"The invention consists substantially in the mode of operation as will be more fully hereinafter set forth and finally pointed out in the appended claims.

"In my Patent No. 525,823, dated September 11, 1894, I have set forth, described and claimed a process of making diastatic enzym, wherein seed spores of mold fungi, belonging to the genus *Aspergillus*, and to the genera *Mucor* and *Pennecillium* [sic], are propagated upon a bed consisting of the branny parts of grains, cereals or the like, employed as a nutrient medium, after such nutrient medium has been moistened with water, and either before or after having been steamed for the purpose of sterilizing the same. It is also set forth and described that after the medium sown with the seed, spores has been maintained for a suitable length of time, and under proper conditions of humidity and temperature, the fungus develops and grows abundantly to the desired stage, when its growth is arrested and the diastatic enzym, which is soluble in water, is extracted from the mass. It is also described and claimed in said patent that the extract thus obtained may be used as a converting agent for converting starch into sugar, or such extract may be concentrated by being reemployed over and over again as an extracting agent for fresh quantities of the mass on which the fungus has been grown and developed, or by evaporation,

or the diastatic enzym contained and held in solution in the extract may be precipitated by adding thereto alcohol." Address: New York City, NY.

230. Takamine, Jokichi. 1911. Amylolytic enzym. *U.S. Patent* 0,991,561. May 9. 3 p. Application filed 25 Jan. 1907.
• ***Summary:*** Discusses production of a starch liquefying and saccharifying enzyme. Address: New York, NY.

231. Lafar, Franz. 1911. Technical mycology: The utilization of microorganisms in the arts and manufactures. Vol. II. Eumycetic fermentation. Translated from the German by Charles T.C. Salter. London: Charles Griffin & Co. ix + 558 p. Illust. Index. 23 cm. [3240* ref. Eng]
• ***Summary:*** An extensive bibliography (3,240 references) for both this volume and volume I appears at the back of this volume (p. 417-518). The opening chapter begins: "Already in the first volume (sect. 22) the algae and the fungi were arranged in a single group. that of the Thallophytes, in contradistinction to all other plants, the latter being classed in the group Cormophytes." The latter group has "an articulation of the body of the individual organism into leaf and stem."

Chapter 43, titled "Morphology and systematology of the Mucors (p. 48+) contains sections on "Subdivision of the Mucor family" (p. 49-51), "The genus Mucor" (p. 51-53; The genus was established by Micheli as far back as 1729. It contains *Mucor Rouxii* and *Mucor mucedo*), and "Rizopeæ" (p. 53-56). An illustration (p. 55) shows *Rhizopus nigricans* (After Brefeld). *Rhizopus nigricans* is the best and longest known member of this family. In 1818 it was described by Ehrenberg under the name *Mucor stolonifer,* which is still used by several workers." "The name *Rhizopus oryzae* has been given by Went and Prinsen Geerligs (I.) to a fungus discovered by them in Ragi (sect. 241), the sporangia and spore of which organism are considerably smaller than those of *R. nigricans.*

Chapter 44, is titled "Fermentation by Mucors" (p. 57-62). Chapter 45, titled "The use of Mucoreæ in the spirit industry" (p. 63-71) has three sections: Sect. 240. "Mucor rouxii and other species of Amylomycetes" (p. 63-67) states: "For the preparation of rice spirit there is produced in China, Cochin China, and neighboring countries, an article known as Chinese Yeast, and put on the market in the form of flat mealy balls, about the size of a half-crown. Its preparation, composition, and application were first described in 1892 by E. Calmette (I.), whose reports were extended and supplemented by C. Eijkman (II.) in 1894." The method of preparation is given. More important than its bacteria are "the yeast cells, which must be regarded as the exciting agents of the alcoholic fermentation; and certain Mucors, which affect the saccharification of the starch. Of the last-named organisms, which concern us here,. Calmette isolated a species which, in honour of his teacher and colleague, E. Roux, he named *Amylomyces Rouxii."* Two illustrations show this organism, which produces a "diastatic enzyme" (p. 65). The so-called amylo process and the work of Colette and Boidin with *Beta-Amylomyces* and α*-Amylomyces* in this process are discussed (p. 65-66).

Sect. 241 titled "Ragi and tapej" [tapé or tapeh] (p. 67-69) states that "Tapej... is prepared from rice by the aid of a secondary auxiliary material, which the Malay natives of Java term Ragi or Raggi, and the Chinese settlers call Peh-Khah." A.G. Vorderman (1893) describes the preparation of Ragi. According to Eijkman (1894) Tapej, which is also called Tsao, is prepared with the aid of Ragi, by boiling husked Mochigome rice (*Oryza glutinosa* [*Oryzae sativa glutinosa*], known as "Ketan" in Java) in water until soft. The flora of Ragi and Tapej comprises three groups of microorganisms; bacteria, budding fungi, and fungi belonging to the family *Mucoraceæ.*

Sect. 242, titled "The so-called Amylomyces process," (p. 69-71), or Amylo process for short, states that "this is the name given to the process for the industrial utilisation of the diastatic activity of *Mucor Rouxii* and several allied fungi. A company, the '*Société d'Amylo,* was founded by A. Collette and A. Bodin (I, 1897), who also, in 1897, took out in the name of this company a German patent for a 'process for producing alcohol from starchy materials, by means of aseptic saccharification and fermentation with *Mucedineæ,...'"*

Fernbach (II, 1899) has given a lucid description of the practical performance of this process in the patentees' works, the maize distillery at Seclin near Lille, France. This description is summarized. "An English patent for the mechanico-technological modification of the process was also taken out by Collette and Boidin (III.) in 1898." See also two other 1897 English patents by Collette and Boidin No. 19858 and No. 1155. "The reader interested in this matter will find more precise data in the review published by M. Delbrück (III, 1899). The chief advantage of the Amylomyces process is the abolition of the expensive additions of malt requisite in the older method of saccharification, the amount formerly needed being up to 15 per cent. in the case of maize, and 2 to 3 per cent. in the case of potatoes. With regard to the yield furnished by the Amylomyces process, it is stated that in the Seclin works, 37.8 litres of absolute alcohol are obtained per 100 kilos. of maize containing 57.5 p, a yield corresponding to 66.2 litres per 100 kilos of starch. Owing to the large amount of mycelial hyphae, the residue filters easily." "Finally it should be said that, since 1898, the aforesaid patentees have replaced *Mucor* (*Amylomyces*) *Rouxii* by another species, namely, so-called *Beta-Amylomyces,* or *Mucor Beta.* This organism is capable of dealing with more highly concentrated mashes than the other, and enables a charge of 25,000 kilos. of maize to be mashed to 1000 hl (22,000 gallons) of goods. per cent. of starch

Page 213 states that *Pichia farinosa* (Synonym: *Saccharomyces farinosus* Lindner, a film yeast) has been found by K. Saito (II, 1905, *Botanical Magazine*, Tokyo) in Japanese Soja sauce.

Chapter 51 discusses the genus *Aspergillus* (p. 228-31) with many fine illustrations, including conidiophores, conidia, ascospores, different stages of *A. oryzae* and *A. glaucus.* Page 228-29 state: *"Aspergillus Wentii*, Wehmer, was observed by Went in the preparation of Tao Yu (*see* vol. 1, p. 248) according to the method practised in Java, and was described by Wehmer (XIX.) in 1896. It appears spontaneously on the boiled Soja beans that have been covered with *Hibiscus* leaves, and affects a loosening and disintegration of the firm tissue of the bean. The species forms a pale coffee-coloured, dense mold vegetation (Fig. 167)."

In Chapter 57 titled "Chemical activity of the Aspergillaceæ," by Prof. Dr. C. Wehmer, page 270 states: "Two species, *Asp. oryzæ* and *Asp. Wentii* are reported as able to grow through the substance of soft-boiled rice and Soja beans..." The "enzyme mixture from *Asp. oryzae* (the so-called 'Takadiastase')" is also mentioned.

Chapter 62 titled "The Monillæ and Oidia," by Dr. H. Wichmann mentions *Monilia javanica* (occurring in association with others in Ragi, p. 333)., *"Monilia sitophila* (Mont.), Saccardo, is said by Went (IV.; reference missing) to be used by the natives in West Java in the preparation of a sweetmeat known as 'ontjom' composed of the seeds of the ground-nut or earth-nut (*Arachis hypogæa*). The ground-nuts, which are thoroughly permeated by the fungus, are made up in the form of small, orange-colored cakes, the surface of which is covered with the conidia, whilst the interior is both chemically altered and loosened in structure by the mycelium." Sect. 315 (p. 336-39) is titled "Oidium lactis and allied species." Also discusses *Oidium lupuli*, Matthews and Lott (p. 338). Address: Prof. of Fermentation-Physiology and Bacteriology, Imperial Technical High School, Vienna.

232. Marie Morelle Septima Hitch George, younger sister of Caroline Hitch, and wife of Henry George Jr. (Photograph). 1911? Undated. (See above).
• ***Summary:*** Marie was born on 22 Jan. 1879 in Orleans Parish, New Orleans, Louisiana. She was married to Henry George Jr. on 2 Dec. 1897 in Chicago, Illinois. He was born on 3 Nov. 1862 in Sacramento, California, and thus was about 17 years older than his wife. Henry George, Jr. was elected twice to the U.S. House of Representatives and served from March 1911 to March 1915.

This photo is from the book "Where the Wings Grow," by Agnes De Mille (published by Doubleday, 1978).

233. *Daily Picayune* (*New Orleans, Louisiana*). 1912. Dr. Jokichi Takamine–The Nippon Club. Feb. 13. p. 7.
• ***Summary:*** "The Nippon Club in New York is a Japanese

club all the way through and it is also a New York club of the highest type. Its president is Dr. Jokichi Takamine, one of the most distinguished chemists in the world and the discoverer of adrenalin, which made bloodless surgery possible. Since it has been in existence the Nippon Club has entertained at one time or another all the distinguished Japanese who have visited New York from Admiral Count Togo Heihachiro down. It has been housed at 44 West Eighty-fifth Street [44 West 85th St.] for the seven years since its founding, and it bought less than a year ago three houses at 161, 163, and 165 West Ninety-third Street, [161 West 93rd St.; 163 West 93rd St.; 165 West 93rd St.] which are to be altered and connected and refurnished in the Japanese style as a new home for the club at a cost of approximately $71,000. It is planned and carried on in the best style of American clubs. The initiation fee for resident members is $50."

234. Wohlgemuth, J. 1912. Zur Kenntnis der Takadiastase [Toward a knowledge of Taka-diastase]. *Biochemische Zeitschrift* 39:324-48. March 10. [12 ref. Ger]
• ***Summary:*** Takadiastase is a product extracted from Koji yeasts (*Kojihefe*), which yield Japanese rice wine. The koji yeasts originate through the influence of the filamentous mold Aspergillus Oryzae on steamed rice. They contain a number of ferments (*eine Reihe von Fermenten*), of which the amylolytic have already been widely investigated by people such as Atkinson (1881), Kellner, Mori, and Nagaoka (1890), Stone & Wright (1898), Saito (1906), and Takamine (1898). They have found that koji has as broad and strong a diastatic power as malt diastase, and that it can convert dextrin to maltose, and then further to grape-sugar or glucose (*Traubenzucker*).

Gives details on the amylolytic activity, then lipase

and haemolysis. Two photos (p. 339) show helium spectral patterns. Address: Aus der experimentell-biologischen Abteilung des Kgl. Pathologischen Instituts der Universitaet Berlin, Germany.

235. *Washington Post.* 1912. Mrs. Taft plants a tree: Superintends work of beginning cherry grove on the Speedway. March 28. p. 2.
• ***Summary:*** "Mrs. Taft yesterday superintended the planting of a collection of rare Japanese cherry trees on the Speedway, which had been sent to her by the mayor of Tokyo. One she planted herself.

"The planting was unofficial and was attended only by the Japanese Ambassador and Viscountess Chinda, Col. Spencer Cosby and Miss Scidmore. The idea is to have a grove on the Speedway."

Note: The entire article is quoted above. Only five people were there. No photographers, and no other reporters. Mrs. Taft (Helen Herron Taft, better known as "Nellie" Taft) was the wife of U.S. President William Howard Taft–who used to refer to her as "the real President" and "the Commander-in-Chief," even though in those days she couldn't vote because she was a woman. For details see the book "Mrs. Taft Plants a Tree: How the Cherry Blossoms Came to Washington," by John R. Malott (2012).

236. *New York Herald.* 1912. Recorded transfers and mortgages: Manhattan transfers. Aug. 10. p. 13, col. 7.
• ***Summary:*** "173D St. 552 W [552 West 173rd St.], s s, 16.6 x 50: Jokichi Takamine to Ebenezer V. Hitch, 556 W. 173d st. (mtge [mortgage] $7,999); June 29; atty. [attorney] T G Co., 176 Broadway.

"Same Property: Ebenezer V. Hitch to Caroline F., wife of Jokichi Takamine, 334 Riverside Drive (mtge $7,000); July 1; atty, same."

Note: This document appears to show that Ebenezer V. Hitch, Caroline Takamine's father, is alive and living in New York City. The purpose of the transfer is unclear; perhaps for tax reasons.

237. Blakeslee, George H. ed. 1912. Japan and Japanese-American relations: Clark University Addresses. New York, NY: G.E. Stechert and Co. xi + 348 p. See p. 22-31.
• ***Summary:*** This volume contains 22 addresses (speeches), six of which were delivered by Japanese who are very prominent in Japanese-American relations, including Dr. Jokichi Takamine, Sc.D., President of the Nippon Club of New York, formerly chemist to the Department of Agriculture and Commerce, Japan.

His presentation titled "The Japanese in America" begins: "The first Japanese who ever came to America, as far as is known, was Manjiro Nakahama, a fourteen year old lad, who was picked up by the captain of an American fishing vessel, in 1841, twelve years before the coming of Commodore Perry to Japan. Nakahama with four companions had sailed out into the ocean on a fishing expedition; their boat had been wrecked by a storm, and they were finally washed ashore on a desert island in the northern Pacific. Three months of dire privation were passed on the island before the little party was rescued by the American vessel. The other Japanese were left in Hawaii, while Nakahama, who became a favorite of the captain, was brought to the United States, and placed in school. When Commodore Perry came to Japan, Nakahama acted as interpreter in the negotiations carried on between the American envoy and the Japanese government, represented by the feudal officials."

Takamine says in a brief and singularly illuminating manner what many Japanese in America desire to say, what many Japanese in Japan ache to formulate into words but cannot, and this is, as Dr. Takamine says: "You who live in the United States do not know the magic of the word America as the Japanese young men do. There are even at present thousands of Japanese longing for the chance to cross the Pacific, but because they must work in America to live, they are barred from seeing the land of their hopes and aspirations. If they did come, you may be sure they would contribute their full share, as their forerunners have done, to the progress of that wonderful civilization that is American" (p. 27).

"The Japanese in the various American cities have their clubs, but the most important of these is the Nippon Club, of New York, with its dainty Japanese drawing room, and a membership of 130. It has a few American members, General Stewart L. Woodford being one. There is also the Japan Society of New York, established with a view to promoting friendly relations between Japan and America. This society is also seeking to make Americans understand the Japanese through the medium of exhibitions, lectures and dinners. Its membership includes the most prominent figures both American and Japanese, in the financial and social circles of New York" (p. 31). Address: Prof. of History, Clark Univ.

238. Davis, Nathan Smith, Jr. 1912. Food in health and disease. 2nd ed. Philadelphia, Pennsylvania: P. Blakiston's Son & Co. xii + 449 p. Illust.
• ***Summary:*** This book is an extensive and practical guide to general dietetics. It discusses both vegetarian and fruitarian diets. It is divided into two main parts: (1) General principles of diet and diet in health; (2) Diet in disease. The author says that the preservation of health is as important as the treatment of the sick. Nathan Smith Davis, Jr. lived 1858-1920. His father, Nathan S. Davis, lived 1817-1904. Chapter 5, "Quantity and kinds of food needed in health" contains a section titled "Diet, Japanese" which states (p. 60): "The diet of the Japanese has been carefully studied by competent men of that country. Beef, mutton, pork and their products are scarcely eaten and were not at all until very recently, but fish

is eaten by all who can afford it. The laborers in the country, however, do not average a meal of fish oftener than twice a month. They are vegetarians because they cannot afford meat and fish. They derive the protein which they need from cereals, beans and vegetables. Rice, barley and soy-beans are the staple articles of food of all classes. Wheat, millet, buckwheat and vegetables are also eaten but in smaller quantities. Fish is the staple meat, though poultry and eggs are eaten in small amounts and other meats in insignificant quantities."

On page 59, vegetarian and fruitarian diets are compared.

Chapter 8, "Vegetable foods," contains a section titled "Peas and beans" (p. 117-18) with a table showing the "Composition fresh and dried legumes compared with that of other foods." Among the dried legumes are: Soy beans, lima beans, navy beans, frijoles, lentils, dried peas, cowpeas, chick-pea, peanuts, and St. John's bread (carob bean). Soy beans have the highest protein content (34.0%). Peanuts have the highest fat content (38.6%).

In Chapter 12, "Diet in disorders of nutrition," in the section on "Diabetes," a table (p. 411-12) gives the composition (carbohydrates and sugar, fat, protein) of substitutes for flour products, including: Soya bread, gluten bread, almond cakes, cocoanut, and peanut. Also mentions: Sea kale (p. 119). Taka-diastase (p. 210).

Note: The first edition of this book is not listed at OCLC (Sept. 2007). Address: Chicago, Illinois.

239. Jokichi Takamine, Jr., at age 24 (Photograph). 1912.

• ***Summary:*** This photo (with date) is from the booklet "Shofu-Den" by the Japanese Heritage Foundation (1994, p. 13).

240. Kawakami, Kiyoshi Karl. 1912. American-Japanese relations: An inside view of Japan's policies and purposes (Continued–Document part III). New York, Chicago, Toronto, London and Edinburgh: Fleming H. Revell Co. 370 p.

• ***Summary:*** Continued: 1907–Japanese immigration to the USA (Hawaii and mainland) peaks at 30,226 (compared with 1.199 million European immigrants). Of this total, 20,865 (69%) went to Hawaii, 3,691 to California, 3,226 to Washington state, and 447 to Oregon. Statistics show that less than one-tenth of 1% of these Japanese immigrants ever became paupers or public charges. They worked hard in the following fields (1906): Professional, skilled, farmers, farm laborers, merchants, household servants. This large immigration took place when Japanese immigrated *en masse* from the sugar plantations of Hawaii, where the wages were less than half those paid to farm laborers on the Pacific Coast. The great sugar interests of Hawaii tried every means to slow the migration without, of course, increasing wages (p. 301).

1907 Feb. 18–U.S. Congress approves amending existing immigration laws–to go into effect in Sept. 1907; this enables the president to take action. 1907 March 14–President Theodore Roosevelt issues an executive order stopping the migration of Japanese laborers from Hawaii and Mexico.

1907 summer–Governments of Japan and the USA enter into an understanding ("Gentleman's Agreement) to prohibit the immigration of Japanese laborers to the USA–called "the exclusion agreement of 1907." The various actions of 1907 ended Japanese labor immigration to the USA and put labor contractors out of business. This measure was forced upon the administration of Theodore Roosevelt; in his message to Congress in 1906 he "eulogized the Japanese in the most glowing terms, and went so far as to urge that the Japanese should be naturalized" (p. 300). But the united pressure from the Hawaiian sugar growers, Pacific Coast labor unions and newspapers "proved so successful that the government at Washington was obliged to meet their demands" (p. 301).

1907–Frequent riots in San Francisco protest the presence of Japanese. Anti-Japanese riots and demonstrations are also reported in nearby Berkeley and Oakland and in Vancouver, BC, Canada–where Japanese laborers were "mobbed and their houses and stores attacked and burned on 'British soil.'"

1908–The Japanese population of the United States first tops 100,000. But by 1910 it had fallen to less than 90,000.

1908 Feb. 4–The Japanese Association of America is organized in San Francisco. It replaces the disbanded United Japanese Deliberative Council of America (founded in 1900), which had been plagued by financial and other problems.

1909 early–The California legislature approves an appropriation of $10,000 to be utilized for investigating the conditions of the Japanese in that state. The duty of directing the investigation naturally devolved upon the State Commissioner of Labor Statistics, Mr. John D. Mackenzie. The work was begun on April 15, 1909, with the appointment of 9 special agents," 8 men and one women, all white Americans. "There were no Japanese or other aliens employed in any capacity. To this force were

added for the office work two expert statisticians and two stenographers." In early 1910, Mr. Mackenzie submitted to the governor of California (Gov. James Gillett, 1907-1911) a 78-page report (p. 343-44). Mackenzie recommends that Japanese should be admitted to California. He even contends that Japanese laborers are, in some respects, more desirable than their white counterparts. He sets forth this proposition deliberately, systematically, logically and in detail, supporting it with a wealth of statistical evidence (p. 343-47).

1913–The California State Legislature enacts the Heney-Webb Alien Land Act. This Act forbids property ownership by "aliens ineligible for citizenship" (at the time, immigrants from Asia were not permitted to become naturalized citizens). This restriction applies almost exclusively to Japanese immigrants and remains in effect until 1952.

1915–The Hearst newspaper launches its "Yellow Peril" campaign with sensational headlines and editorial series fueling anti-Japanese hostility.

1916–*The Passing of the Great Race*, by Madison Grant is published and becomes very influential. He is a eugenicist and advocates the racial hygiene theory. He data purports to show the superiority of Northern European races.

1921–Emergency Quota Act restricts Asian immigration to a trickle.

1922 Nov. 13–Supreme Court decision in Takao Ozawa v. United States finds that Ozawa, a Japanese man, is ineligible for U.S. naturalization and citizenship because he is not "white." Only Caucasians are considered white. Japanese are considered members of an "unassimilable race" [not capable of being assimilated].

1924–Immigration of Act of 1924 is passed by Congress. It includes the Asian Exclusion Act, which prevents Asians (who are deemed to be of an "undesirable race") from immigrating to the U.S.

1952–Immigration and Nationality Act (also known as McCarran-Walter Act) abolishes all previous racial restrictions but retains a quota system.

1965–Immigration and Nationality Services Act greatly opens U.S. doors to immigration by abolishing the national origin quotas that had been in place since 1924

Also discusses: Number and occupations of Japanese in California on 1 Jan. 1910. The annual report of the Commissioner-General of Immigration (p. 359). The four Japanese consular districts and the "consular census" in the USA: Seattle [Washington], San Francisco [California], Chicago [Illinois], New York (p. 359-61).

Concerning Dr. Takamine (p. 357): "Among the Japanese in America,... are men who, at home, played important parts in the political movement, and who are keenly alive to all vital political issues in this country; among them, such scientists as Dr. Takamine, whose medical discoveries are highly appreciated by all specialists; among them, writers and authors whose names are not only widely known in their native land, but are frequently seen printed in American publications. It is such Japanese as these who are most anxious to see the naturalization law of this country so amended as to qualify them to enjoy the unlimited rights and share the full duties of American citizenship."

It is time that the United States grant citizenship to qualified Japanese (the book's main point, p. 366). Address: Japan.

241. Takamine, Jokichi. 1913. Improvements in and relating to the process of and apparatus for producing diastatic products and the product obtained thereby. *British Patent* 3,096. Application filed 6 Feb. 1913. 11 p. Accepted 16 Oct. 1913. (Chem. Abst. 8:2595). 3 drawings.

• ***Summary:*** "My invention contemplates a malt substitute... My product is produced by the growth under certain conditions of the spores of microscopic mycelial fungi, which, when sown on suitable material, have the property of producing diastase. I employ the genus aspergillus and particularly prefer the species aspergillus oryzae of pure culture because it excels any other species with regard to production of diastase in abundance." When the growth is completed, greenish yellow spores are produced. The words "moyashi" and "koji" are used and defined.

A pure culture of *Aspergillus oryzae*, acclimatized to increasing amounts of antiseptic (such as formaldehyde), is transplanted onto a fresh substrate (sterilized wheat bran) to make a highly diastatic product.

The inventor has discovered a new process and apparatus for producing diastase on a commercial scale. A mass 3-4 feet in thickness may be agitated continually in a way which modifies the character of the mycelial filaments, making them shorter and thicker, and greatly increasing the number of their branches, "thereby increasing the number of ends for heading out into moyashi spores." Drawings show a longitudinal vertical section and a vertical transverse section of this cylindrical drum which revolves on a horizontal axis. The apparatus is described in great detail. Note: This is the earliest patent seen that describes this rotating drum, which (as of 1998) is still used commercially to make koji. Address: 550 West 173rd St., New York City, New York.

242. Takamine, Jokichi. 1913. [Growing fungi which produce starch-hydrolyzing enzymes]. *German Patent* 292,586. Feb. 12. (Chem. Abst. 11:1516). *

• ***Summary:*** A pure culture of *Aspergillus oryzae*, acclimatized to increasing amounts of antiseptic, is transplanted onto a fresh substrate (wheat bran) to make a highly diastatic product. Address: New York, NY.

243. Takamine, Jokichi. 1913. [Manufacture of malt substitute products]. *French Patent* 456,391. Feb. 17. (Chem. Abst. 8:2026). *

• ***Summary:*** A pure culture of *Aspergillus oryzae*,

acclimatized to increasing amounts of antiseptic, is transplanted onto a fresh substrate (wheat bran) to make a highly diastatic product. Address: New York, NY.

244. Takamine, Jokichi. 1913. Process for producing a diastatic product. *U.S. Patent* 1,054,324. Feb. 25. 2 p. Application filed 10 March 1910.
• ***Summary:*** A mixture of 100 parts of wheat bran and 60-80 parts of water is introduced into a shaking device, e.g., a pneumatic malting drum, in quantity sufficient to form a layer 3-4 feet in depth. The mixture is sterilised with steam, after which the drum is rotated and a current of air passed through it until the mixture has cooled to about 30ºC. Moyashi spores (see below) are then added in the proportion of about 1 part of sifted, or 7-8 parts of unsifted spores per 1500 parts of dry bran. The drum is turned sufficiently to insure mixture of the spores and moist bran, and is then left at rest, with the temperature of the mass kept at 30ºC., for 16-20 hours. The temperature then begins to rise, and the drum is turned, at a rate of 1 or 2 revolutions per minute, for 40-50 hours, during which time the temperature is kept at 35º-38ºC. by a current of cold, moist air. The mass of koji thus obtained is dried; the mycelial growth with which it is permeated, exhibits shorter, thicker, and more numerously branched filaments than that obtained on a stationary medium, and the diastatic power of the koji is greater. If acclimatised moyashi spores are used [see Takamine, U.S. Pat. 1,054,626], formaldehyde, in the form of vapour or spray, may be introduced into the drum at any stage should any growth of foreign organisms be observed. If the mass is kept in the drum until the fungus sporulates, the product known as moyashi is obtained. Address: New York, NY.

245. Takamine, Jokichi. 1913. Diastatic product. *U.S. Patent* 1,054,626. Feb. 25. 3 p. Application filed 10 March 1910.
• ***Summary:*** Claim is made for a koji, capable of converting at least 10 times its weight of starch, very resistant to antiseptic agents, and substantially free from fungi or bacteria of comparatively low resistance to antiseptics. To obtain this product, a suitable fungus, preferably *Aspergillus oryzae*, is grown at a temperature of 28º-30ºC. on moistened, sterilised wheat bran to which has been added formaldehyde in the proportion of 1 part per 3000 of moist bran. When the growth has sporulated, a portion is seeded on a fresh portion of the same medium containing the same proportion of formaldehyde, and so on for at least 4 or 5 generations. The same cycle of successive cultivations is then repeated on portions of moist bran containing 1 part of formaldehyde per 2900, and so on until the proportion of formaldehyde has been increased to 1 part per 1500 of moist bran. The final growth (7-8 parts), or the spores (1 part) separated by sifting the dried growth, are introduced upon a fresh portion of the same medium (1500 parts) to which formaldehyde (1 part or less) has been added. The culture is spread on trays to a depth of 1-3 in., and kept in an incubator at about 30ºC. until the white mycelial growth is complete; the mass of koji thus obtained is dried at a temperature not exceeding 40ºC., and may then be powdered. The incubator used should be well ventilated and is so devised that the air contained therein is saturated with moisture. If the growth is continued to a later stage (sporulation), moyashi is produced. Address: New York, NY.

246. Takamine, Jokichi. 1913. Diastatic product; Process for producing–. *J. of the Society of Chemical Industry* (*London*) 32(8):443-444. April. [1 ref]
• ***Summary:*** This is a summary of U.S. Patent 1,054,324 (which see), issued to the author on 25 Feb. 1913. Address: New York.

247. Takamine, Jokichi. 1913. Kôji seizô shinhô [A new method of koji manufacture (Abstract)]. *Kogyo Kagaku Zasshi* (*J. of the Chemical Society of Japan, Industrial Chemistry Section*) 16(188):760. Abstracted from J. of the Society of Chemical Industry (London). 1913. p. 443-44. [1 ref. Jap]

248. *American Political Science Association, Proceedings.* 1913. List of members. 9:37. Held at Boston and Cambridge, Massachusetts Dec. 28-31, 1912.
• ***Summary:*** The top listing on page 37 is: "Takamine, Jokichi, 550 W. 173rd St., New York City."

Note: He must have been living or working at this address in late 1912. Why? When he had a large, elegant home at 334 Riverside Drive? And why did his family keep this address until 1926,–four years after he died?

249. Kolle, Frederick Strange. ed. 1913. Physicians' who's who: New York State section. New York, NY: The Physicians' Who's Who Publishing Company. viii + 374 p. See p. 332.
• ***Summary:*** Note: In the following, we will spell out abbreviations when clear to facilitate reading. Under "T" we read (p. 332):

"Takamine, Jokichi; born Takaoka, Japan, Nov. 3, 1852; parent Seiichi Takamine; married Caroline Hitch, 1885; children Jokichi, Eben; graduated Imperial University Tokyo, University Glasgow, and Andersonian University, Glasgow; degrees E.D. [Doctor of Engineering], Phar.D [Doctor of Pharmacy], Imperial University, Tokyo; member Lotos Club [literary club], New York Athletic Club, Drug and Chem., Chemists' Clubs, Tokyo Chem. Soc. Tokyo Soc. Chem. Engs., Soc. Chem. Indust.; American Electrochemical Society, American Pharmaceutical Association; Mississippi Valley Medical Association, Economic Club, N.Y., New York Peace Society, New York Board of Trade and Transportation; Honorary Vice President Japan Society, N.Y.; President Nippon Club, N.Y., etc., etc. Discovered Takadiastase and

Adrenalin. Residence: 334 Riverside Drive, N.Y. City. Tel. River, 5962. Office and Lab., 550 West 173rd St., N.Y. City' Tel. Aud. 95." Address: M.D.

250. Stevens, Harriet Weeks (Wadhams) (Mrs.). 1913. Wadhams genealogy, proceded [sic, preceded] by a sketch of the Wadham family in England. New York, NY: Frank Allaben Genealogical Company. [xvi] + 652 p. Illust. Index.
• ***Summary:*** Page 245, family No. 324. Heman Beach, son of Heman and Clarissa (Kilbourn) Beach, born 23 June 1813 in Litchfield. Connecticut; died there 25 March 1881; married 1st, 16 Jan. 1837 to Eliza Thomas, born in 1815 in Cornwall, Connecticut, died 10 Dec. 1849 in Litchfield; married 2nd, 2 April 1851, Minerva D. Goslee, daughter of Henry R. and Jerusha (Andrews) Goslee. She died 29 Jan. 1853, aged 24 years. He married 3rd, 21 Feb. 1855, Mary K. Keeler, daughter of Daniel and Hannah (Stocker) Keeler. She died in Plymouth, Conn., 16 May 1888, aged 61 years. Henan Beach was a farmer [and the paternal grandfather of Charles P. Beach].

Children by his 1st wife:

1. Algamon G. Beach, born 23 Oct. 1837; married 13 Dec. 1862 to Jane Keeler. They had one child, Fannie J. Beach.

2. Thomas W. Beach, born 19 Aug. 1839.

3. Eugene I. Beach, born 28 1842; died 21 Oct. 1854.

4. Charles T. Beach, born 22 Sept. 1844.

5. Heman W. Beach, born 24 Nov. 1846.

6. Eliza J. Beach, born 9 July 1849; died 6 Nov. 1877; married ___ Frisbie. Child: Eliza J. Frisbie, d. 18 June 1872, aged 7 months.

By third wife:

7. Edgar D. Beach, born 28 Jan. 1857.

8. Frederick E. Beach, born 29 Aug. 1858.

9. Oscar D. Beach, born 28 Sept. 1860. 10. Mary C. Beach, born 31 Dec. 1865.

The family in which Heman Beach was a child is shown on page 132 (family No. 138). Heman Beach, son of Abner and Beulah (Abernethy) Beach, was born on 25 Jan. 1775 in Litchfield, Connecticut; died 1840; married 1st 27 Oct. 1794, to Clarissa Kilbourn, daughter of Appleton Kilbourn of Litchfield, born 1776, died in Litchfield 20 Sept. 1818. He married a second time. By his 1st wife he had five children, of whom the 5th was Heman Beach (born 23 June 1813). The first four were Marcia, Milo, James, and Clarissa. Address: New York.

251. Two views of portrait of Dr. Jokichi Takamine with ornate vest (Photograph). 1913.
• ***Summary:*** "Takamine photographed in 1913. He was well known in his later years as an unofficial ambassador of the Japanese people to the United States, because he contributed greatly to various public undertakings to promote friendship between the two countries (Yamashima 2003, p. 101).

Sent by and reprinted with permission from *Kanazawa Furusato Ijinkan* (Great People of Kanazawa Memorial Museum) in Kanazawa, Japan.

252. Wilson, James. 1913. Report of the Secretary: Inspection work. *Yearbook of the U.S. Department of Agriculture.* p. 9-259. For the year 1912. See p. 77-78.
• ***Summary:*** "Inasmuch as special mention was made in a previous report of the destruction by experts of this bureau, after inspection, of a large shipment of ornamental flowering cherry trees sent as a gift from the city of Tokyo to the wife of the President, it is a pleasure to announce that among the importations of the past year which have been inspected here in Washington there was another shipment of 3,000 ornamental flowering cherry trees sent by the city of Tokyo to replace the former shipment, and that after inspection these three were found to be free from injurious insects, although examined individually with great care. They have been planted in the District of Columbia." Address: Secretary of Agriculture [USDA], Washington, DC.

253. Takamine, Jokichi. 1914. Enzymes of *Aspergillus oryzae* and the application of its amyloclastic enzyme to the fermentation industry. *Chemical News* 110:215-18. Oct. 30. [11 ref]
• ***Summary:*** Originally published in *Journal of Industrial and Engineering Chemistry* 6:824-28 (Oct., 1914).

254. Takamine, Jokichi. 1914. Enzymes of *Aspergillus oryzae* and the application of its amyloclastic enzyme to the fermentation industry. *J. of Industrial and Engineering Chemistry* 6(10):824-28. Oct. [11 ref]
• ***Summary:*** This is the first review of the early history of the application of East Asian fungal fermentations to modern industrial processing, which began in the 1880s. A principal impetus for the development of the fungal enzyme industry was the discovery that *Aspergillus oryzae*, the fungus involved in the shoyu, miso, and saké industries, produced amylases that could be used to saccharify starch in place of barley malt in the production of distilled spirits. The first commercial enzyme was Takadiastase (a white to yellowish powder rich in amylases) produced by precipitating an aqueous extract of *Aspergillus oryzae* koji with 70% v/v ethanol. The precipitate was then dehydrated with strong alcohol and pulverized.

Though *Aspergillus oryzae* plays an important role in the national economy of Japan, "its utilization in Occidental countries is singularly lacking. Calmette and Bodin's investigation on amylomyces with a view of utilizing it in the spirit industry is an isolated instance in Europe, and their process, known as the amylo-process, has been in operation in France since 1891.

"In 1891, I made an arrangement with the Distilling and Cattle Feeding Co. [popularly known as the "Whiskey Trust"], of Peoria, Illinois, and carried out on a practical scale the application of the *Aspergillus oryzae* to the American Distillery. My experiments, which ran for a couple of months on a 2,000 bushel scale at the Manhattan Distillery, were partially successful, but unfortunately the process did not attain general recognition of its merit..."

Aspergillus oryzae has been used in Japan for many centuries to make products such as Sake or rice beer, Soy [sauce], and Miso. In 1912 the tax on fermented sake in Japan contributed the $41,974,630 to the national treasury. "The tax on the production of Soy (Bean sauce) amounted to $2,048,141" [only about 5% as much as sake]. The total cost of all articles produced with the aid of the *Aspergillus oryzae* fungus is put at roughly $200 million.

"To the growth of *Aspergillus oryzae* on wheat bran as a culture medium I gave the convenient name of Taka-Koji and have employed it for a number of years to distinguish it from that known in Japan as Koji which is a culture on steamed rice.

"Taka-Koji is designed for a substitute for malt as an amyloclastic agent in varied fermentation and other allied industries. Its proposed use is encouraged by the fact that the cost of malt is subject to fluctuations according to the crop conditions of barley while bran is exempt from similar market conditions. Besides, the transformation of bran into Taka-Koji can be accomplished in 48 hours, while malting needs three or four times as long for completion of the process."

The author made his Taka-Koji in a revolving drum with up to 70 kg capacity. Then he ordered a drum of about 4,800 pounds capacity–the size of an 8-ton malt drum. The cylinder turned at 1 revolution per minute. This resulted in an 83% saving in labor costs as well as a considerable saving in space. The "process promises well for furnishing a substitute for malt in alcoholic fermentation and other industries where amyloclastic enzyme is required." The process was tested by Dr. Niels Ortved, Chief Chemist of Hiram Walker & Sons of Walkerville, Ontario, Canada. In his results, which were presented in a paper at the last Congress of Applied Chemistry (held in New York), and published, he noted: "Takamine was the first to introduce the Koji process to America. As far back as 1899 he advocated the use of Koji in the distilling industry... Lately, I understand, he has succeeded in adapting a modification of the Galland-Henning malt drum system to his process. This should be a great improvement over the old floor system..."

"Taka-Diastase: An aqueous extract from the Taka-Koji can be easily made by percolation and an enzyme can be precipitated by adding alcohol to such an extent as to contain 70 per cent by volume of same in the mixture. The precipitate is dehydrated by means of strong alcohol, dried and powdered. It is a white or yellowish white powder or hygroscopic nature. It is marketed in this form for medical use under the name Taka-Diastase. Though known

as an amyloclastic agent, it contains various enzymes; nevertheless, amyloclastic and proteolytic enzymes predominate." Taka-Diastase is a Koji extract whose function is to transform starch directly into glucose.

The paper closes: "The author extends his thanks to Mr. Wooyenaka for his untiring and valuable assistance and to Parke, Davis & Co. for affording every facility for carrying out the 'Drum Experiments." Address: 552 West 173rd St., New York.

255. *Republican Watchman* (*Monticello, New York*). 1914. Ask to have assessment roll amended: Properties left off Forestburgh added to roll. Nov. 27.
• ***Summary:*** "Petition of the assessors for the town of Forestburgh asking that the property of Caroline Takamine. 105½ acres, valued at $800, be put on the roll and by the resolution of Supervisor Galligan it was done."

256. Kawakami, Kiyoshi Karl. 1914. Asia at the door: a study of the Japanese question in continental United States, Hawaii, and Canada. New York, Chicago, Toronto, London and Edinburgh: Fleming H. Revell Co. 269 p. See p. 89-93. Prologue by Doremus Scudder. Epilogue by Hamilton W. Mabie.
• ***Summary:*** Chapter 5, "Their humble achievements," begins with the life and work of Jokichi Takamine. "Of all foreign peoples living under the Stars and Stripes the Japanese are perhaps the youngest. There are only a small number of those Japanese residents whose children have reached maturity. Most Japanese children born in this country are yet in primary schools or kindergartens."

"Attention is first called to the discovery by Dr. Jokichi Takamine, of New York, of a haemostatic agent called Adrenalin. The physiological activity of adrenalin isolated by Dr. Takamine is astoundingly strong. A fraction of one drop of aqueous solution of adrenalin or its salt in strength of 1:50,000 blanches the normal conjunctiva within one minute. Of all the haemostatic agents yet known it is the strongest. The intravenous injection of adrenalin produces a powerful action upon the muscular system in general, but especially upon the muscular wall of the blood vessels and the muscular wall of the heart, resulting in an enormous rise of blood pressure. The result of three intravenous injections of 1 c.c. of the solution of adrenalin chloride of 1:100,000 into a dog weighing 8 kilograms raised the blood pressure corresponding to 30 millimetres of mercury.

"The therapeutic applications of adrenalin are already numerous, while new uses for it are constantly found by specialists. Non-irritating, non-poisonous, noncumulative, and without injurious properties, adrenalin is useful in all forms of inflammation and is the strongest stimulant of the heart. It has been used with good results as an antidote in morphine and opium poisoning, in circulatory failure, in the prevention of collapse in anaesthesia, and in allied conditions. To prevent bleeding in surgical operations, no better haemostatic agent than adrenalin has been found. It has also given good results in some cases of deafness, hay fever, nasal haemorrhage, and various forms of heart disease.

"Adrenalin is prepared by isolating the active principle of the suprarenal glands. Before the discovery of adrenalin, many scholars of Europe and America endeavoured to discover a similar substance. It was forty-six years ago that Addison first observed the certain changes of the suprarenal glands and their relations to the disease now bearing his name. Oliver and Schafer's work on the physiological action of the glandular extract was soon followed by those of Scymonowicz, Cybulski, and later by many others. Thus the suprarenal therapy became not only a subject of scientific interest, but was found invaluable in various branches of medical practice. The marvellous therapeutic value of the suprarenal extract was established and proved beyond all doubt. And, as its use increased, a desire to obtain its active ingredient in pure state was generally felt by medical practitioners. This need was felt all the more keenly because the suprarenal extract, if not pure, is prone to deteriorate very rapidly, thus requiring the preparation of fresh extract for each use.

"Before Dr. Takamine many able chemists devoted their energies to the isolation of the active principle of the suprarenal glands, resulting in J.J. Abel's discovery of epinephrin and Otto Von Furth's discovery of suprarenin. But neither of these authors succeeded in securing the active ingredient in pure, stable, definite forms, and it remained for Dr. Takamine to attain the end long coveted by chemists and physicians throughout the world.

"Another creation of Dr. Takamine is called the Taka-Diastase, now extensively used for amylaceous dyspepsia. This medical matter is the result of an ingenious utilization of microbes. The mere mention of the word microbe or bacterium is enough to horrify the laymen, yet the scientists tell us that no human being can exist without bacteria. The fact is that there are two kinds of microbes, one useful, the other harmful. It is the useful kind of bacteria that Dr. Takamine has captured and utilized for the promotion of human well-being.

"The process of creating this diastase is described by Dr. Takamine as follows:" A long quotation is given.

"Considering that at least two-thirds of our daily food consists of starchy material, and that more than two-thirds of the cases of indigestion are caused by the imperfect digestion of starchy food, the invention of Taka-Diastase is a boon to humanity. This diastasic [diastatic] substance is especially valuable in that it supplies the deficiency of the ptyalin of saliva. While the pepsin-creating organs in the human body are comparatively well protected in the system, the salivary glands are more exposed to abuse. No other medical preparation is more efficient than Taka-Diastase in counteracting this abuse of salivary glands. Because of its

stability, Taka-Diastase is far more useful than other diastasic [sic] preparations so far obtained from other sources.

"In his laboratory in New York, Dr. Takamine, with several assistants, is still engaged in new researches. In private life no one is happier than he. Both to Americans and Japanese his home is synonymous with hospitality. Mrs. Takamine, a cultured American woman, as well understands the Orient as she is at home with the Occident. Their children–bright, healthy, handsome–are typical of children born to American-Japanese families of the better class. Their oldest son, a graduate of Yale, is now in Germany continuing scientific studies." Address: M.A., author of *American-Japanese Relations*.

257. The Japanese Association: To foster friendships and cordial co-operation... 1914. New York, NY: The Japanese Association, Inc. 34 + [2] p. [Eng; jap]
• ***Summary:*** This annual publication is for the period May 1914 to April 1915.

The office of The Japan Association, Inc. (p. 3) is on Wall Street. The officers include: President: Jokichi Takamine, Dr. Pharm., Dr. Chem. Eng., 552 W. 173rd St., New York City.

The Board of Directors (p. 4) includes: Jokichi Takamine, Dr. Pharm., Dr. Chem. Eng.

Contributors: The first category is "Annual contributors of a fixed sum to the Association." These include: "Dr. Jokichi Takamine, 552 West 173rd St., New York."

The long list of members is arranged alphabetically. For each member is given: Name, present address, and home address [in Japan]. Under "T" we read: "Takamine, Jokichi, 552 West 173rd St., N.Y. City–Ishikawa.

"Takamine, Mrs. Caroline, 334 Riverside Drive, N.Y. City–Ishikawa."

All but the last 2 pages of this publication are in English; the latter (unnumbered) are in Japanese.

Note: Why does Dr. Takamine have one address (552 W. 173rd St.) and his wife have another (334 Riverside Dr.)? The former address is Dr. Takamine's office and laboratory. Address: 63-65 Wall Street, New York City. Phone: Hanover 6945.

258. Takamine, Jokichi, Jr. 1915. A study of the ninhydrin reaction in relation to the age and habits of individuals. *J. of the American Chemical Society* 37(4):946-49. April. [3 ref]
• ***Summary:*** Above the title is written: "From the Institute Doyen, Paris." Address: 550 West 173rd St., New York City.

259. *Edison Monthly* (*The*). 1915. The Nippon Club. 7(12):474-76. May.
• ***Summary:*** The Nippon Club was formed about ten years ago and now has about 100 members. "The present house [club building, on West 93rd St. in New York City], begun three years ago, speaks the prosperity of the organization, whose membership has grown proportionately. The present officers are: president, Dr J. Takamine;..." Architecturally, the building and decor combine both Western and Japanese features and styles; in it, East and West meet.

"There remains but to speak of the 'Sukiyaki,' an apartment unknown to Americans in use as in name. This is the chafing-dish room, taking its name from a favorite dish of meats and vegetables prepared, by preference, individually. Ranged on each of five broad tables are a dozen or more of the native chafing-dishes, sufficient to supply an ordinary dinner company. The ingredients, sent up from the kitchens by electric lift, are flavored as each diner–and each an accomplished cook–prefers.

"The club, apropos of ingredients, is itself a glorified Sukiyaki–in substance evident, but in flavor fascinating and indescribable.

Note: This is the 2nd earliest document seen (Aug. 2010) that mentions sukiyaki; it gives only a minimal description.

260. Takamine, Jokichi, Jr. 1915. Note on a new analytical suction filter. *J. of the American Chemical Society* 37(6):1519-20. June.
• ***Summary:*** This ingenious device was invented by Dr. Takamine's eldest son.

"There are, indeed, many suction filters which in certain respects resemble my filter, but owing to their lacking in certain features have not rendered themselves very popular. My filter I find the most simple and natural, and at the same time most convenient for speed, neatness and accuracy, and for that reason have called attention to it and named it the Takamine Analytical Filter (for which a patent is pending)." Address: New York.

261. Takamine, Jokichi. 1915. Diastatic product and process for producing the same. *U.S. Patent* 1,148,938. Aug. 3. 3 p. Application filed 2 Feb. 1910.
• ***Summary:*** "In my Letters Patent of the United States numbered 525820, 525822, and 525823, I have described a diastase producing fungus and my present invention consists of an improvement thereon.

"Heretofore the products described in said patents have not gone into use commercially as malt substitutes in the brewing and alcoholic industries, because the products of said patents have never heretofore possessed a diastatic strength superior to malt.

"The product constituting my present invention possesses a diastatic strength when properly manufactured of from 30 to 50% in excess of malt. Therefore my present invention constitutes a malt substitute as an article of manufacture capable of commercial use in competition with malt.

"My product is produced by the growth under certain conditions of the spores of microscopic mycelial fungi

which when sown on suitable material have the property of producing diastase. I employ the genus *Aspergillus* and particularly prefer the species *Aspergillus oryzae* of pure culture because it excels any other species with regard to production of diastase in abundance. Therefore in the following examples of my invention, I will employ for convenience, *Aspergillus oryzae*, but do not wish to be understood as thereby limiting myself thereto.

Example of acclimatizing the spores."–He then describes this new, important, yet complex and time-consuming process of acclimatizing the spores to a particular proportion of formaldehyde (1 part of formaldehyde {an antiseptic} to 2900 parts of the moist medium) and rendering them immune to its effects.

"Whether the resulting product be a new moyashi (Patent 52822) or a new koji (Patent 52820) depends upon the stage at which the final culture is interrupted." Address: Manhattan, New York, NY.

262. *New York Times.* 1915. Marries a Japanese. Miss Ethel Johnson weds Eben Takashi Takamine, a Yale graduate. Sept. 30.

• ***Summary:*** Miss Ethel Johnson, daughter of the late Dr. and Mrs. William Johnson of Evanston, Illinois, was married to Eben Takashi Takamine yesterday morning [Sept. 29] at 11:30 in this city at the Hotel Vanderbilt. The Rev. Dr. Merle St. Croix Wright of the Lenox Avenue Unitarian Church performed the marriage ceremony in the presence of a few relatives and friends.

Walter Frye, the bride's cousin, gave her in marriage. Miss Ruth Frye of Boston acted as maid of honor. "Jokichi Takamine, Jr., was his brother's best man."

The couple's engagement was announced two months ago, but plans for their wedding were not made known until yesterday. Mr. Takamine is the son of Dr. Jokichi Takamine, who married Miss [Caroline] Hitch, daughter of an old Southern family. He is a graduate of Yale, class of 1913, and has also studied abroad.

A wedding breakfast followed the marriage ceremony. The couple left later on their wedding trip and upon their return they plan to live at 740 West End Avenue in New York City.

263. *Middletown Daily Times.* 1915. Jap who wed American known in Sullivan Co. Oct. 5. p. 10.

• ***Summary:*** "New York, Oct. 5.–Miss Ethel Johnson, the beautiful daughter of the late Rev. Dr. and Mrs. William Johnson, of this city and Evanston, Illinois, has cast aside her American citizenship by marrying Eben Takashi Takamine, a wealthy young Japanese chemist, but she says she has no regrets.

"The bridegroom is 26 years old, a graduate of Yale '13, and connected as a chemist and biologist with the Takamine Laboratory, Inc. He is following in the footsteps of his father, Dr. Jokichi Takamine, a chemist of international fame, who married Miss Hitch, a member of an old southern family. Her sister married Congressman Henry George, Jr.

"The romance which culminated in the wedding began when this young couple met two years ago on a steamer returning from Europe. They were engaged two months later.

"After their wedding the couple will live in New York.

"Dr. Takamine, father of the groom, owned a big estate in Merriewold Park, Sullivan county, and at the time of the World's Fair [in St. Louis, Missouri] purchased a number of Japanese pagodas [sic, pavilions / villas] which he removed to his estate.

"The doctor and his son have been in Middletown on various occasions."

A large photo shows the bride and groom in their formal wedding attire.

Note 1. Middletown is a city in Orange County, New York, in the Hudson Valley, northwest of New York City.

Note 2. This same article. with the same headline, appeared 3 days later (Oct. 8) in the *Orange County Times Press* (p. 2).

264. Land deed: Jokichi Takamine buys two more pieces of land at Merriewold (Sullivan County, New York) from Richard L. Atkinson. 1915. New York. 2 p. Nov. 20. In Book 183, p. 17-18.

• ***Summary:*** "Richard L. Atkinson (bachelor) of the City of Jersey City, County of Hudson and State of New Jersey, party of the first part, and Jokichi Takamine of 334 Riverside Drive in the City, County, and State of New York, party of the second part,... in consideration of the sum of Two Hundred dollars, lawful money of the United States, and other good and valid considerations paid by the party of the second part, does hereby grant and release unto the said party of the second part, his heirs and assigns forever."

Two lots, "tracts or parcels or land and premises, situate lying and being in Merriewold Park, in the Town of Forestburgh, in the County of Sullivan and State of New York, being two in all, and known and designated as Number Seventy four and Ninety, as shown on a map of Merriewold Park, entitled 'map of Plots D, E, F, and a portion of H' July 1909,..." "Lot No. 90 above conveyed has a frontage on Lake side Road a shown on said Map." Address: Sullivan County, New York.

265. *New York Times.* 1915. Japan for peace, Shibusawa says: Baron hopes his country and America may effect end of war. Honored at Lotos Club. Oriental financier pledges friendship of flowery kingdom for United States. Dec. 2.

• ***Summary:*** "Some of America's most prominent men attended a dinner at the Lotos Club last night to meet Baron Ei-ichi Shibusawa, regarded as the leading financier of Japan, as well as that country's greatest patron of science and art." The Baron, now in his 76th year and speaking

in his native tongue, explained to the notable gathering through his interpreter "that he had come voluntarily seeking to strengthen friendship between Japan and the United States and hoping that these two nations could help effect a settlement of the European war that would make for lasting peace."

"The dinner in the Baron's honor was given by Dr. Jokichi Takamine, who invited a score of his fellow-countrymen to join in giving the famous banker of Tokio a hearty welcome. In all there were just fifty-eight guests, and they were seated about a rectangular table on which had been arranged a miniature but very faithful reproduction of Japan's great mountain, Fujiyama, surrounded by little villages."

266. University of Arizona. 1915. The Desert. Tucson, Arizona: Published by the Class of Nineteen Sixteen. [218] p. Illust.

• ***Summary:*** This is the yearbook of the University of Arizona. In the section on "Juniors," on page 41 (unnumbered) is a portrait photo of Charles P. Beach wearing a coat and bow tie. To the right of the photo we read:

"Charles P. Beach. Agriculture. Los Angeles, California.

"Basketball 1912-13, 1913-14; Baseball 1912-1913; 1913-1914; Captain 1914-15. Football 1913-14, 1914-15; 1st Lieut. 1914-15; Jr. Play; 'A' Club. Sigma Phi Alpha.

"Charlie is one of the famous L.A. High bunch who became famous overnight–that historic 'barber'-ous night. He was thought to be an honest man until he joined the bookstore crew.

"If you want to make him sore just say 'Pablo.' An all-around athlete. He has recently taken an interest in the north side and his teeth have been heard to grit at Junior Play rehearsals. Some day he expects to be a 'Thrifty' farmer."

Did Charles graduate from this university? Most likely since his name appeared on some of the teams / activities the next year even though his photo wasn't there. Moreover, his obituary says he graduated. But the University of Arizona Alumni Association does not have the official records of the University of Arizona, yet the Office of the Registrar does. Good luck with the latter! Address: Tucson, Arizona.

267. *New York Times.* 1916. Dance in Japanese woods: Reception for Eben Takamine and bride at Cosmopolitan Club. Jan. 9.

• ***Summary:*** "Mrs. Jokichi Takamine of 334 Riverside Drive gave a reception and dance last evening at the Cosmopolitan Club for her son, Eben Takamine and his bride, who was Miss Ethel Johnson, and whose marriage was celebrated three months ago. Dr. Takamine received with Mrs. Takamine and the young couple. There were nearly four hundred guests.

"The interior of the Cosmopolitan Club was turned into a Japanese woodland scene by Japanese artists. It was lighted in moonlight effects, pine forest filled the corners and a tiny lake with goldfish and aquatic plants reflected the artificial moonlight. Japanese lanterns in pale yellows and greens were suspended from the pine trees and stone lanterns on pedestals furnished the light. The buffet supper was served at a wayside tea house with cherry trees in full bloom outside."

268. *Times-Picayune* (*New Orleans, Louisiana*). 1916. Jap chemical institute. Emperor agrees to donate large sum from own purse. Jan. 30. p. 41.

• ***Summary:*** From Philadelphia Public Ledger: "According to a letter received by Dr. Takamine from Baron Shibusawa, the grand old man of Japanese commerce and banking, the establishment of a chemical institute in Japan has been virtually assured. This institute was proposed by Dr. Takamine during his last visit to Japan in 1912, and since that time Baron Shibusawa, in co-operation with Mr. Nakano, president of the Chamber of Commerce, Dr. Takamatsu and Dr. Sakurai, of the Tokyo Imperial University, have been endeavoring to arouse public interest in it. Finally, Count Okuma, the premier, and Baron Hatano, minister of the imperial household, gave their hearty consent to the plan, and made favorable recommendation to His Majesty, the emperor, with the result that the emperor will donate from his private purse a certain sum of money toward the establishment of the Institute. Encouraged by the gracious interest shown by the mikado, the promoters are confident of

securing ample funds, and they purpose making the institute a memorial of the great Emperor Meiji."

269. Takamine, Jokichi. 1916. Process in making diastatic product. *U.S. Patent* 1,192,584. July 25. 4 p. Application filed 1 July 1912.
• ***Summary:*** Three ways producing koji are described. A fungus such as *Aspergillus oryzae* is grown on a culture medium, such as moistened, sterilized wheat bran, which is free from alkali. The addition of 0.5 to 1% sodium chloride (NaCl, table salt) serves to increase the enzyme yield. Address: Manhattan, New York, NY.

270. Takamine, Jokichi. 1916. Apparatus for producing diastatic product. *U.S. Patent* 1,201,385. Oct. 17. 5 p. Application filed 28 Jan. 1913. 3 drawings. (See next 2 pages).
• ***Summary:*** A cereal bran culture (mixed with *Aspergillus oryzae* spores) is tumbled in a drum that rotates around its horizontal axis and that has baffle plates on its inner surface. The culture is treated with air jets and sprayed with water. The agitation accelerates growth of the mycelium.

"Heretofore, it was supposed that quietude was essential to efficient growth [of koji and moyashi]... I have discovered, however, that a certain amount of motion is not only permissible but very advantageous, since it not only does not interfere with the growth, but actually accelerates it and enables large economies to be had in the operation. I have also discovered that when produced in motion, the mycelial growth is different, the filaments being shorter and thicker and the number of branches being greatly increased, thereby increasing the number of ends for heading out in moyashi spores."

A mixture of 100 parts of wheat bran and 60-80 parts of water is introduced into a shaking device, e.g., a pneumatic malting drum, in quantity sufficient to form a layer 3-4 feet in depth. The mixture is sterilised with steam, after which the drum is rotated and a current of air passed through it until the mixture has cooled to about 30ºC. Moyashi spores (see below) are then added in the proportion of about 1 part of sifted, or 7-8 parts of unsifted spores per 1500 parts of dry bran. The drum is turned sufficiently to insure mixture of the spores and moist bran, and is then left at rest, with the temperature of the mass kept at 30ºC., for 16-20 hours. The temperature then begins to rise, and the drum is turned, at a rate of 1 or 2 revolutions per minute, for 40-50 hours, during which time the temperature is kept at 35º-38ºC. by a current of cold, moist air. The mass of koji thus obtained is dried; the mycelial growth with which it is permeated, exhibits shorter, thicker, and more numerously branched filaments than that obtained on a stationary medium, and the diastatic power of the koji is greater. If acclimatised moyashi spores are used [see Takamine, U.S. Pat. 1,054,626], formaldehyde, in the form of vapour or spray, may be introduced into the drum at any stage should any growth of foreign organisms be observed. If the mass is kept in the drum until the fungus sporulates, the product known as moyashi is obtained. Address: Manhattan, New York, NY.

271. Takamine, Jokichi; Wooyenaka, Keizo. 1916. Aseptic fruit-juice and process of making the same. *U.S. Patent* 1,208,859. Dec. 19. 3 p. Application filed 13 Oct. 1913.
• ***Summary:*** This invention relates to the preservation of orange juice, particularly from California and Florida oranges, so that it will withstand a temperature of 35ºC for a week, with exclusion of air, without fermenting, by the addition of 1g mg/liter of sulfurous acid. It is then placed in a bottle, corked to exclude air, and the bottle is subjected to a temperature of 50 to 55.5ºC for about one hour. Address: New York, NY.

272. Takamine, Jokichi. 1916. Autobiography of Jokichi Takamine. *Saturday Evening Post.* Dec. 30. Japanese supplement. *

273. Richmond's Annual Directory of Passaic (New Jersey). 1916. Passaic, New Jersey: W.L. Richmond, Publisher. 900 p. See vol. 10, p. 580.
• ***Summary:*** The following entries appear in the city of Clifton (New Jersey) under Takamine: (1) Takamine, Eben, treasurer National Enzyme Co. Home: New York. (2) Takamine, Jokichi, president Takamine Laboratory, Inc. Home: New York. (3) Takamine, Jokichi, Jr., president National Enzyme Co. Home: New York. (4) Takamine Laboratory Inc., chemicals, Arlington Ave. at Erie Railroad. Jokichi Takamine, president. Jokichi Takamine, Jr., secretary. Eben Takamine, treasurer.

Note 1. This is the earliest document seen (Aug. 2012) that mentions Clifton, New Jersey, in connection with Jokichi Takamine or his family. The "Historical Register of Chemical Companies" (www.heritageresearch.com) shows that, at some time, Takamine Laboratory was located at 193 Arlington, in Clifton. Address: 223 Main Ave., Passaic, New Jersey.

274. *Brooklyn Daily Eagle* (*New York*). 1917. Red Cross contest at Merriewold Park. Aug. 26. p. 3.
• ***Summary:*** "A concert and dance in behalf of the Red Cross that proved most successful and attracted many Brooklynites was given recently (a week ago Friday night), at Merriewold Park, Sullivan County, the home of Mrs. Jokichi Takamine, Sho-Fu-Den, being the scene. All the cottagers and club-house guests attended and made a pleasing picture on the wide Japanese veranda, against a background of green lawn and giant pines starred with colored Oriental lanterns.

"The concert itself was in the central gold room of the quaint Japanese house with its Japanese frescoes of maple and pine. The program in its entirety was taken from the

J. TAKAMINE.

APPARATUS FOR PRODUCING DIASTATIC PRODUCT.

APPLICATION FILED JAN. 28, 1913.

1,201,385. Patented Oct. 17, 1916.

2 SHEETS—SHEET 1.

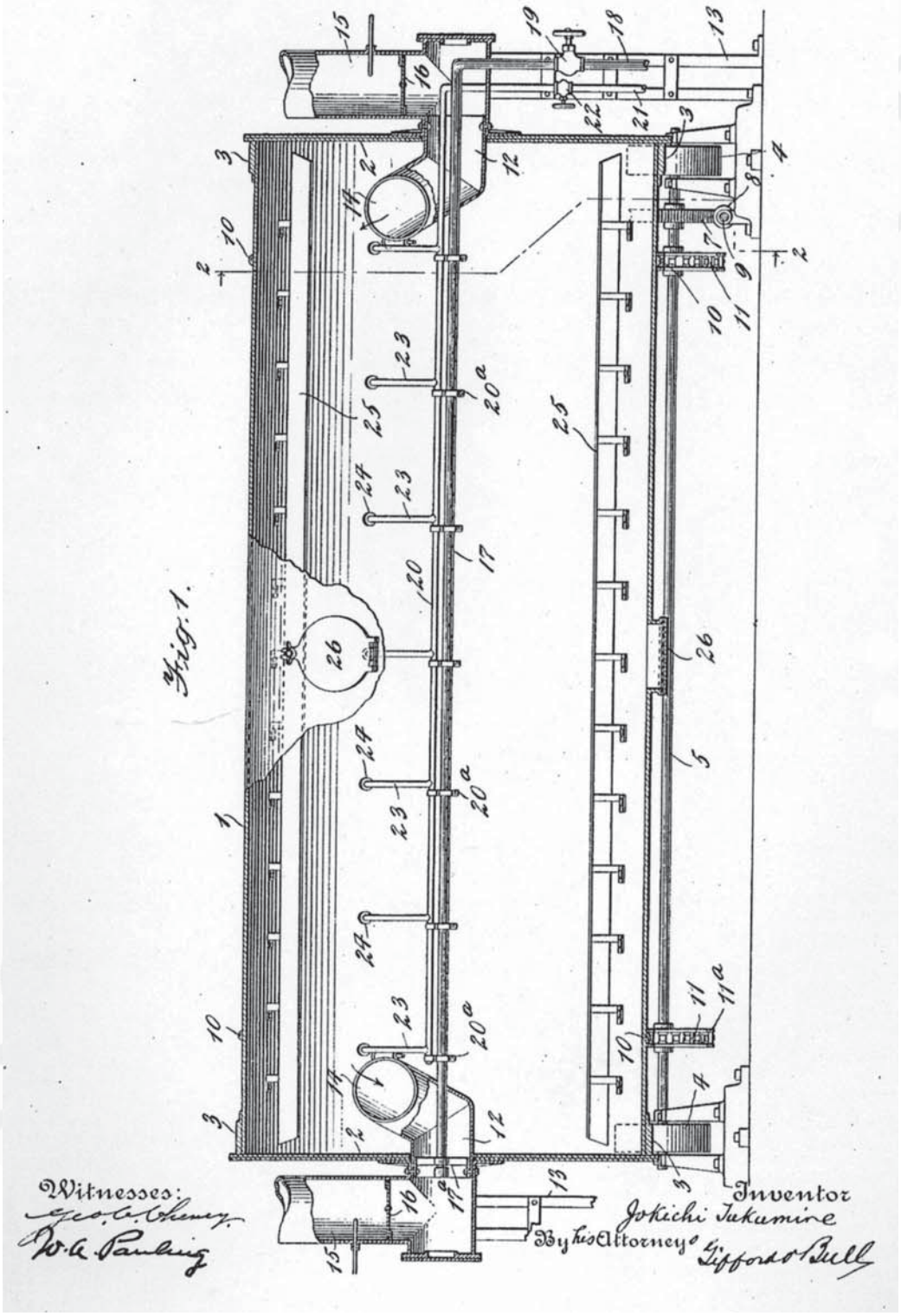


Fig. 1.

Witnesses:
Geo. A. Cheney.
W. A. Pauling

Inventor
Jokichi Takamine
By his Attorneys Gifford & Bull

J. TAKAMINE.

APPARATUS FOR PRODUCING DIASTATIC PRODUCT.

APPLICATION FILED JAN. 28, 1913.

1,201,385. Patented Oct. 17, 1916.

2 SHEETS—SHEET 2.

Fig. 2.

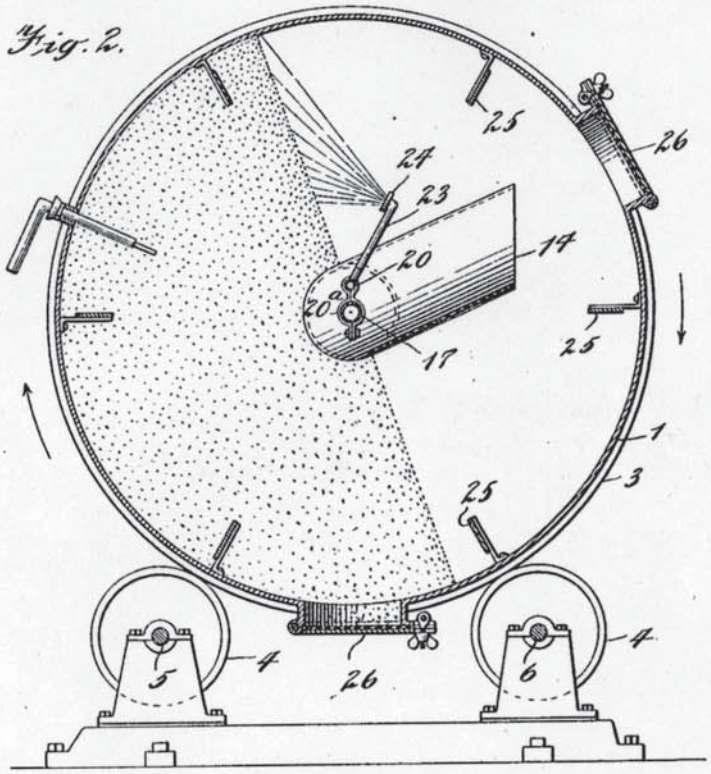
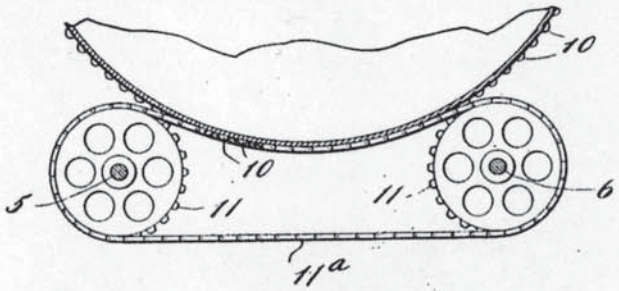


Fig. 3.



Witnesses:
Geo. B. Chenney
W. A. Pauling

Inventor
Jokichi Takamine
By his Attorneys Gifford & Bully

compositions of Miss Fay Foster, Miss Foster herself playing the accompaniments and the numbers being given by George Reinher and Miss Tydeman. Following this was a group of Japanese songs, closing with a new number with its words a translation of a Japanese poem, entitled 'A Nipponese Sword Song.' It was introduced by the playing of the Japanese national anthem and a demonstration in favor of Japan by the audience.

"Later, and as a part of the entertainment, there was a feature dancing, four duo dances, two in the concert room and two on the lawn, the artistes being the Misses Concannon. The lawn dances, 'The Pipes o' Pan,' proved decidedly attractive. The artistes were barefoot, in gossamer white with floating draperies, and artificial moonlight fell upon them as they glided out from the pins, over the grass, only, finally, to vanish again among the trees and reappear beneath the branches against a dark blue, starlit sky. The evening closed with general dancing.

"In connection with the concert a tennis tournament was held at the Merriewold Club, all its proceeds going to the Red Cross. There was excellent work in the tournament by the players of the younger set, but Frederick Alexander (new in Red Cross work), William Clark (now in France) and William de Mille (now on the Pacific Coast) were much missed."

Note: On 6 April 1917 the United States entered the European War (later known as World War I).

275. U.S. War Department. 1917. World War I draft registration card for Charles Pablo Beach. Washington, DC.
• ***Summary:*** This government record (No. 607) shows:

(1) Name in full [signature]: Charles Pablo Beach. Age in years: 27.

(2) Home address: Mineral Hill near Tucson, Arizona.

(3) Date of birth: Sept. 14th, 1889.

(4) A natural born citizen.

(5) Where were you born? Independence, Kansas.

(6) What is your present trade, occupation? Miner.

(7) By whom employed? Self.

(8) Where employed? Mineral Hill near Tucson, Arizona.

(9) Have you a father, mother, wife, child under 12, or a sister or brother under 12, wholly dependent on you for support? No.

(10) Married or single? Single? (11) Race? White.

(11) What military service have you had? None.

(12) Do you claim exemption from draft? No. I affirm that I have verified above answers and that they are true. [Signature]: Chas. P. Beach.

276. Takamine, Jokichi; Satow, Sadakichi. 1917. Process of obtaining proteid matter from corn. *U.S. Patent* 1,245,818. Nov. 6. 2 p. Application filed 25 Nov. 1916.
• ***Summary:*** The resulting protein matter can be used as food. Address: 1. New York City, NY; 2. Sendai, Japan.

277. Dr. Jokichi Takamine in his prime (Photograph). 1917. Undated.

• ***Summary:*** The date and place of this photograph are unknown. If it were taken in 1917 Dr. Takamine would have been about age 63. That year was a founder of the Institute of Physical and Chemical Research and was elected to the board of directors. He also established the Takamine Chemical Laboratory in Clifton, New Jersey.

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278. Takamine, Jokichi; Satow, Sadakichi. 1918. [Extracting vegetable proteins]. *French Patent* 486,195. March 14. (Chem. Abst. 13:1909). [Fre]*
• ***Summary:*** Wheat or other cereal grain containing starch is treated to extract the protein substances for application in manufacturing commercial products. Address: 1. New York City, NY; 2. Sendai, Japan.

279. Takamine, Jokichi. 1918. Process for producing diastatic product. *U.S. Patent* 1,263,817. April 23. 5 p. Application filed 11 Aug. 1916. [1 ref]
• ***Summary:*** Original application filed January 28, 1913, Serial No. 744,609. Divided and this application filed August 11, 1916. Serial No. 114,336.

Aspergillus oryzae is grown on wheat bran. "In the production of koji and moyashi as described in my Letters Patent of the United States numbered 525,820, 525,322 and 525,823, and in my application No. 541,617, filed

February 2, 1910, the *Aspergillus oryzae* spores are mixed with the culture medium such as wheat bran moistened with water. Heretofore, it, was supposed that quietude was essential to efficient growth because it was supposed that the superficially sowed spores would be displaced by movement of the culture medium.

"I have discovered, however, that a certain amount of motion is not only permissible but very advantageous, since it not only does not interfere with the growth, but actually accelerates it and enables large economies to be had in the operation. I have also discovered that when produced in motion, the mycelial growth is different, the filaments being shorter and thicker and the number of branches being greatly increased, thereby increasing the number of ends for heading out in moyashi spores.

"Before my present invention, it was the custom to spread the culture medium loosely to a thickness of not exceeding three or four inches, thereby giving the air access to as large a surface as practicable. This not only required an enormous floor space, but made unavoidable the infection of the mass by foreign fungi and bacteria settling down upon it from the air. The labor and expense of installing and operating the apparatus in consequence of the trays on which the culture medium was spread, were also items in which improvement was urgent.

"By the use of my present invention, the mass may be several feet in thickness–say three or four feet–or even more, while in the old process a thickness of three or four inches was the maximum, and even at that thickness the growth of the fungus was not as satisfactory as that carried on with a thickness of one to two inches.

"In practising my present invention, the mass is agitated continually so that the particles of the mass will be brought to the surface in succession in order to have access to the air. This agitation, however, is not of such violence as to substantially impede the fungus growth though it modifies the character of the mycelial filaments thereof. The agitation is such as to cause the particles to go through a cycle of movement not to exceed about once or twice per minute, by preference, and although this speed of agitation may be increased considerably, I have found that when it reached ten cycles per minute, the growth was materially impeded.

"An apparatus for carrying out the process herein described and claimed is disclosed in my application, filed January 28, 1913, Serial No. 744,609, of which this application is a division. The present invention consists in the improved process which I will now describe." Address: Manhattan, New York City, NY.

280. Takamine, Jokichi; Satow, Sadakichi. 1918. Process of obtaining proteid matter from corn. *U.S. Patent* 1,275,324. Aug. 13. 3 p. Application filed 25 Nov. 1916.
• ***Summary:*** "In carrying out our invention it is desirable, though not essential, to eliminate the bran and it is also desirable and important to remove the oil from the grains of corn. The bran forms the outer shell or skin of the grain, while the oil is carried in the elastic soft germ portion of the grain. In order to reduce the corn grains to a condition which permits the elimination of the bran and the freeing of the oil carrying germs the corn is steeped in water containing a suitable antiseptic, such as a small percentage of sulfurous acid, for a period of time, say two or three days, sufficient to cause the grains to swell up and become soft.

"The swollen and softened grains are then crushed into comparatively small pieces. This can be accomplished by passing the grain through a crushing mill. By thus breaking the grains into small pieces the bran peels off and the oil carrying germs, unbroken by the crushing operation, become detached from the body of the grains.

"The next step in the carrying out of the invention is to separate the oil carrying germs from the crushed mass. This may be accomplished in many different ways..." Address: 1. New York City, NY; 2. Sendai, Japan.

281. Jokichi Takamine (left) Caroline (his wife), and Jokichi Takamine II (their eldest son) (Photograph). 1918. See next page).
• ***Summary:*** This photo is from the book "Where the Wings Grow," by Agnes De Mille (published by Doubleday, 1978).

282. Cohen, E. Yancey. 1919. To Dr. Takamine: Friends dedicate poetry to celebrated chemist. *Republican Watchman* (*Monticello, New York*). Feb. 28. p. 6.
• ***Summary:*** "The following poetical verses were written some time ago by a friend and admirer of Dr. Takamine, the celebrated Japanese chemist, who has a magnificent summer home at Merriewold Park, near Monticello:

"Right welcome to your home again,
"O wanderer bold, yet not too bold.
"Crossing the great Pacific main
"To your dear house near Merriewold.
"Right welcome to our open hearts,
"O peer of Metchnikoff and Soddy
"O man of international parts,
"Of germ and antibody.
"O prince of chemistry and gasses,
"Of test-tubes, tanks and sundry vats,
"O peerless measurer of masses
"Of diastase and fats"
"Returning to old comforts true
"Of fireside rest and simple life,
"Where nought can cast a bomb twixt you
"And your sweet radiant wife.
"Safe from all fear of war's alarm.
"Rich in Love's priceless treasure trove
"Retir'd like Pliny to his farm
"Or Plato to his grove.
"Hither you come from toil and duty

"And all the falsities of men.
"Eager to breathe the dream'd of beauty
"Of you dear Sho-Fu-Den."
"War is the poison of the soul;
"The anti-toxin can we find?
"It has been found, and soon mad whole
"Will burgeon forth mankind -
"And soon will bloom the flowers of Peace
"And Justice rule the chasten'd world,
"And sorrows find at length surcease,
"And God's flag be unfurl'd."

283. Takamine, Jokichi. 1919. Diastase; yeast foods. *British Patent* 131,579. May 9. (Chem. Abst. 14:303). *
• ***Summary:*** A solution of ordinary starch dissolving enzyme is neutralized with sodium bicarbonate or other alkali and precipitated with calcium chloride or magnesium chloride. The precipitate is said to have powerful diastatic properties, which also stimulate the growth of yeast. When it is used in making bread, it can replace sugar or malt extract. Address: New York, NY.

284. Oka, Takeo. 1919. Nippon in New York. *New York Times.* July 6. p. 34.
• ***Summary:*** An estimated 5,000 to 7,000 Japanese now live in New York City, including about 300 Japanese women. "Dr. Jokichi Takamine of the Takamine Industrial Company has broken into the company of 'Who's Who.'"

"The metropolis boasts no less than a dozen Japanese restaurants. Your casual visit will introduce you to fresh sliced fish taken raw [sashimi], seasoned bamboo shoots, and lotus root and pickled radish served on the same table with 'sukiyaki,' palatable at least to the Japanese. 'Sukiyaki,' a compound word still unauthorized in any standard English dictionary, is the Japanese 'quick lunch,' eaten while being cooked on a small charcoal table stove.

"Beef, onions, cabbage, beancurd [tofu], and other vegetable additions, not forgetting Japanese soy [sauce], sugar, and a little sake, are ready to be prepared in a shallow pan à la japonaise on the fire. The rest devolves upon you and your company, ladies not honorably excluded! A great time saving it is for the proprietor, this having his guests prepare their own meals!"

Note: This is the earliest document seen (Aug. 2010) stating correctly that the basic ingredients in sukiyaki include tofu and soy sauce.

285. Takamine, Jokichi; Takamine, J. 1919. Process for the making of enzyme extracts. *British Patent* 152,792. July 24. (Chem. Abst. 15:1544). *
• ***Summary:*** Enzyme extracts were prepared by growing microscopic fungi, such as *Aspergillus, Mucor,* or *Eurotium oryzae,* on suitable culture media such as cereals, then extracting with water and filtering. The extracts are sterilized by the joint action of heat and an antiseptic such as H_2S0_3. The product has diastatic, proteolytic, milk coagulating, and fat-splitting properties.

286. *Real Estate Record and Builders' Guide* (*New York City*). 1919. Conveyances–Manhattan (July 16-21). 104(4):67. July 26.
• ***Summary:*** One page 67, column 1, 80% of the way down we read:

"173rd st, 553 W (8:2129-16). ss, 17 w Audubon av, 16.6x50, 4-sty bk tnt & str; Caroline F Takamine, 334 Riverside dr, to Alma B & Marguerite Bertsch. 503 W 172; mtg- $5,000 & AL: July l5; July l7 '19; A$4,000-7,000 (R S $3)."

Translation by Andrew Dolkart of Columbia University, New York. "553 West 173rd Street, (8:2129-16 means section 8, block 2129, lot 16) south side, [probably] 17 feet west of Audubon Avenue; lot size is 16.6 x 50 feet, 4 story brick tenement and store; Caroline F. Takamine, 334 Riverside Drive [her address] sold it to Alma B. and Marguerite Bertsch whose address is 503 West 172nd Street. Sorry but I cannot translate the details of the mortgage."

Interpretation: Caroline F. Takamine is selling a piece of property at 553 West 173rd St. that was owned by her husband, Jokichi Takamine, and used as his laboratory and office. He apparently no longer needs it.

287. Takamine, J.; Satow, S. 1919. [Vegetable proteins from cereals, pulses, etc.]. *Japanese Patent* 34,946. Sept. 12. (Chem. Abst. 14:2401). [Jap]*

288. *Republican Watchman* (*Monticello, New York*). 1919. Takamines in Japan. Nov. 7. p. 1.
• ***Summary:*** "Mrs. Jokichi Takamine has closed her country home at Merriewold Park, Sullivan County, and is occupying her house at 334 Riverside Drive, New York, where he daughter-in-law, Mrs. Ellen Takamine, will be with her for the winter. Mrs. Takamine's husband, Dr. Takamine, is in Japan on business, accompanied by their sons, Eben and Jokichi, Jr."

289. Takamine, J.; Satow, S. 1919. [Vegetable proteins from maize]. *Japanese Patent* 35,477. Dec. 11. (Chem. Abst. 14:2536). [Jap]*
• ***Summary:*** The maize is soaked in water containing sulfurous acid for a few days, then separated from the bran and sprouts, ground to a fine powder, filtered through bolting cloth, and separated from the starch. The product contains 40-50% proteins and corresponds to about 80% of the original mass of maize. It is dissolved in alkali hydroxide or carbonate. From this solution, purified proteins are precipitated by sulfuric acid, sulfurous acid, or phosphoric acid. The resulting product is suitable for use in foods, imitation celluloid, varnish, shellac, artificial, or artificial

rubber.

290. Thom, Charles. 1919. [The Aspergilli]. Paper presented before the American Bacteriological Society, Dec. 1919. 9 p. Handwritten. Unpublished manuscript.
• ***Summary:*** The paper begins: "The specific name *Aspergillus oryzae* is generally recognized in Japan as belonging to such molds of the genus *Aspergillus* as are used for their enzymatic activity in the preparation of sake, shoyu or soy sauce, etc." "The rice overgrown with mold and therefore fermented thru the agency of the mold activity is called a koji or more specifically sake-koji." "The Takamine patents have incorporated in them this specific name, *A. oryzae*. Because of such current usage we wish to state emphatically before this group of scientific workers that *A. oryzae* Ahlburg having narrow and easily delineated boundaries can not be used to identify the entire group of yellow-green Aspergilli.

"Our studies have proved to us that the species name, *Aspergillus oryzae* as used in Japan applies (1) to such yellow-green Aspergilli as come with the description *A. oryzae* Ahlburg, (2) to such green, shorter-stalked forms as we are sure justly come under the name of *A. flavus* Link in the sense of Brefeld, (3) to innumerable yellow-green forms morphologically between these two descriptions, (4) to brown Aspergilli as *A. tamari* Kita having spores similar to *A. niger,* and spore-bearing structures similar to the yellow-green forms and even (5) to a certain brown Aspergillus (*A. oryzae* var. fulvus) which does not at present seem to us as belonging to the group at all." Address: USDA.

291. U.S. Department of the Interior, Census Office. 1920. Charles P. Beach in the 1920 U.S. Census in Rosemont, Pima County, Arizona. Washington, DC. Jan. 2.
• ***Summary:*** Sheet 4. Household 11. Charles P. Beach is a boarder, boarding with Francis (age 26) and Anita (age 25) Mack (who own their own home, free, not mortgaged), and their young son, Richard (age 1 year, 2 months) in Rosemont, Pima County, Arizona.

He is age 30 [born 14 Sept. 1899 in Independence, Kansas], single, a miner by occupation, and the owner of a mining claim. He was born in Kansas. Father born in Connecticut. Mother born in Indiana.

292. Takamine, Jokichi, Jr.; Oshima, Kokichi. 1920. The properties of a specially prepared enzymic extract, polyzime, comparing its starch liquefying power with malt diastase. *J. of the American Chemical Society* 42(6):1261-65. June. [8 ref]
• ***Summary:*** "Polyzime," recently invented by Dr. J. Takamine, is an aqueous extract of diastatic enzymes, containing a large variety of enzymes, made from a special culture of *Aspergillus oryzae* on media consisting mainly of wheat bran. Its diastatic power does not decrease at temperatures below 40º. Below this temperature, its enzymic activity remains practically unchanged for more than 6 months. Polyzime is 3-5 times stronger in its amyloclastic power than ordinary malt extract, as tested by Wohlgemuth's method. Its optimum temperature for starch liquefaction is 50º for 30 minutes to 2 hours, and 40º for 24 hours. It shows a weaker saccharifying power than malt extract as tested by Lintner's method. Address: Clifton, New Jersey.

293. Two exterior views of the Takamine Laboratory in Clifton, New Jersey (Photograph). 1920. Undated. (See next 2 pages).
• ***Summary:*** The date and place of these two photos are unknown. In the 1st photo, the signs along the ridge / peak of the roof and on the elevated water tank both appear to read: "Takamine Laboratory Inc." The lab was not constructed until about 1920. Takamine's first company in Peoria, Illinois, in 1891 was "Takamine Ferment Co."

The 2nd photo is taken from the other side of the building. Look carefully at the sign along the ridge of the roof behind the "cupola" on the right front building. The words "Laboratory Inc." are visible. The entire sign probably says "Takamine Laboratory Inc."

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294. Caroline Hitch Takamine, wife of Jokichi Takamine (Photograph). 1920? Undated. (See p. 103).
• ***Summary:*** The date of this undated photo is hard to guess it could have been taken in the 1930s.

This photo is from the book "Where the Wings Grow," by Agnes De Mille (published by Doubleday, 1978).

295. Dr. Takamine and friends seated in front of Niagara Falls, New York (Photograph). 1920? Undated. (See p. 104).
• ***Summary:*** The date and place of this photo are unknown. However, this photo was taken in Dr. Takamine's later years. He is in the front line, 2nd from right. In the center of back line is Mr. Matasaku Shiobara, the founder of the company "Sankyo." The other people are unknown.

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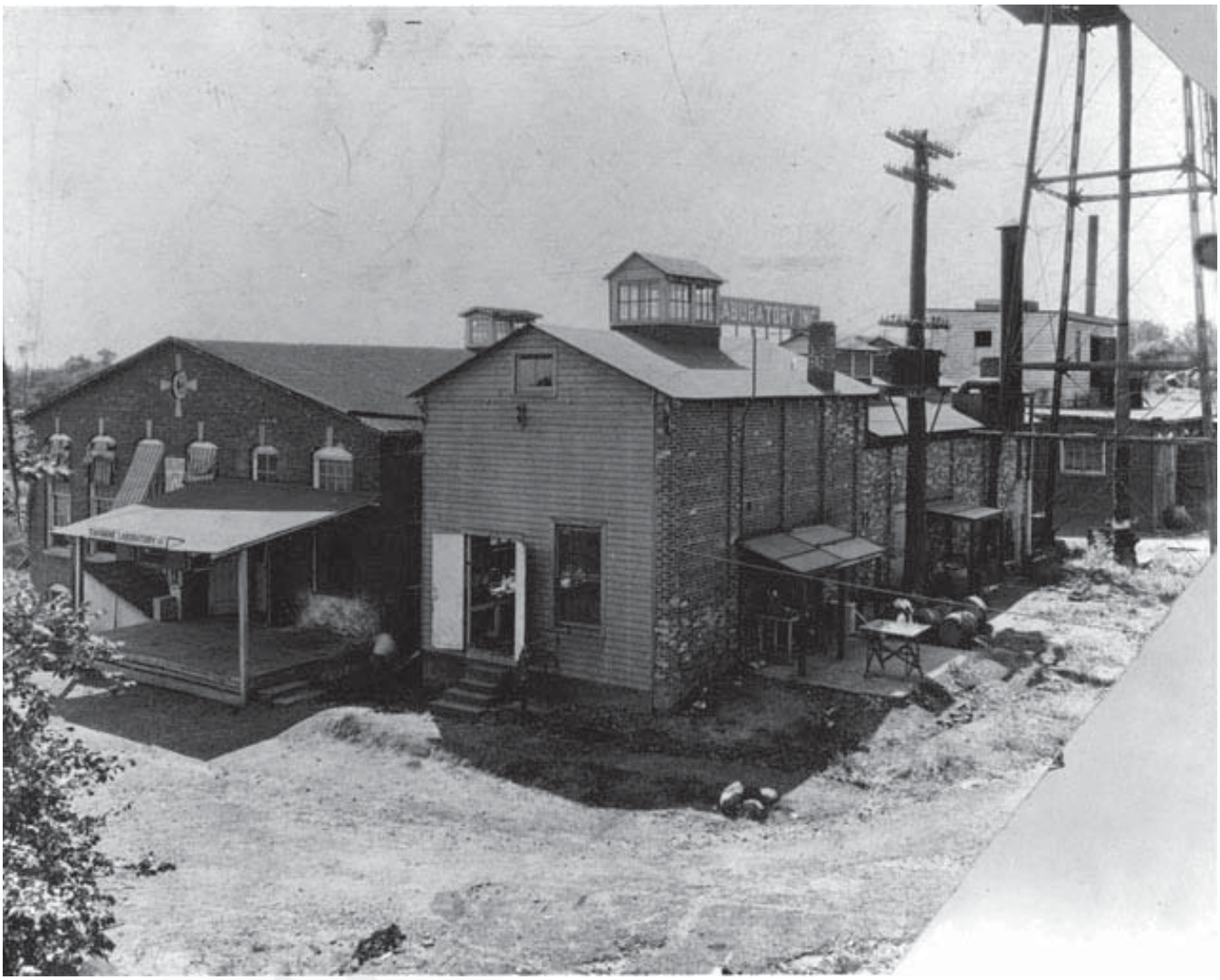
296. Dr. Takamine with two noted friends boating on Lake Michigan (Photograph). 1920? Undated.
• ***Summary:*** The date and place of this photo are unknown. From left to right: (1) Mr. Matasaku Shiobara, the founder of the company "Sankyo." (2) Mr. Shibasaburo Kitazato (1853-1931) a Japanese physician and bacteriologist, who is remembered as the co-discoverer of the infectious agent of bubonic plague in Hong Kong in 1894. He studied under Dr. Robert Koch in University of Berlin from 1885 to 1891; he



also had many other major accomplishments in the field of bacteriology. (3) Dr. Jokichi Takamine.

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297. Interior of the Takamine Laboratory built in Clifton, New Jersey (Photograph). 1920? Undated. (See next page).
• ***Summary:*** Sent by and reprinted with permission from *Kanazawa Furusato Ijinkan* (Great People of Kanazawa Memorial Museum) in Kanazawa, Japan.

298. Two views of Sho-Foo-Den in Merriewold, New York, the summer home of Jokichi Takamine and family (Photograph). 1920? Undated. (See p, 116).
• ***Summary:*** These photos are from the book "Where the Wings Grow," by Agnes De Mille (published by Doubleday, 1978).

299. Land patent: William H. Beach patents 120 acres (9 aliquots) of land in Coconino County, Arizona, in Township 23N, Range 6E. 1921. March 14. Accession #799341.
• ***Summary:*** William H. Beach appears not to be a close relative of Charles P. Beach; he is NOT the father of Charles nor an uncle of Charles.

Note: If William H. Beach were somehow related to Charles P., was his 120 acres near the Navajo Reservation included in the land swap of 1934 for 1,987.43 acres further south? Address: Tucson, Arizona.

300. Takamine, Jokichi. 1921. Last will and testament. Passaic County, New Jersey. 16 + 3 p. May 17. 23 cm.
• ***Summary:*** This will was written on 17 May 1921 while Dr. Takamine was "temporarily sojourning at Biltmore, North Carolina." It is typeset as a booklet with 16 numbered pages. In addition there is: (1) A title page; (2) A page from the surrogate's court, County of Passaic, New Jersey stating that this is a certified copy of the deceased's will. The certification is dated 18 March 1924; and (3) An end page showing that the will is recorded in county will book G-3, page 121+.

Joan Bennett of Tulane University obtained a copy of this will from Agnes DeMille; the marginal notes are probably in Agnes' hand.

Contents: Introduction (His wife, Caroline Takamine, is sole executor for all properties located in the USA; Caroline and his friend Matasaku Shiobara of Tokio are joint executors for matters related to Japan). United States properties: Life insurance (to Caroline), income derived from Parke, Davis & Co. of Detroit (Michigan)–adrenalin account (semi-annual royalty payments under his Adrenalin inventions, patent, and trademark. Gifts of $3,000 to $1,000 to 7 friends, monument for burial plot, and the remainder divided one third to Caroline and "one-sixth of such total each to my son Jokichi Takamine, Jr., his wife Hilda Takamine, my son Eben Takamine, and his wife Ethel Takamine, as long as said income continues"), dividends from Takamine Ferment Company stock, dividends from International Takamine Ferment Company stock, income from stock of Parke, Davis & Co., income from Hooker Electro Chemical Co. (25 Pine St., New York City), bonds of the Nippon Club of New York, other minor stocks, Takamine Laboratory Inc. stock, house at 334 Riverside Drive, New York City, Sho-Foo-Den property at Merriewold Park [3 miles northeast of the town of Forestburgh], Sullivan County, New York (incl. Japanese building and nearly 23 acres), farm house and farm of nearly 100 acres at Merriewold Park, Sullivan County, New York, about 20 acres of land along Florence Lake and a few acres back of Cohen's house at Merriewold Park, Sullivan County, New York.

The estate at Merriewold Park, Sho-Foo-Den, which consisted of twenty acres and an elaborate home of Japanese design, is to go to his wife, Caroline. Another tract of 110 acres goes to Mr. and Mrs. Eben Takamine, and still another of 20 acres on Forest Lake, Merriewold Park, to Mr. and Mrs. Jokichi Takamine, Jr.

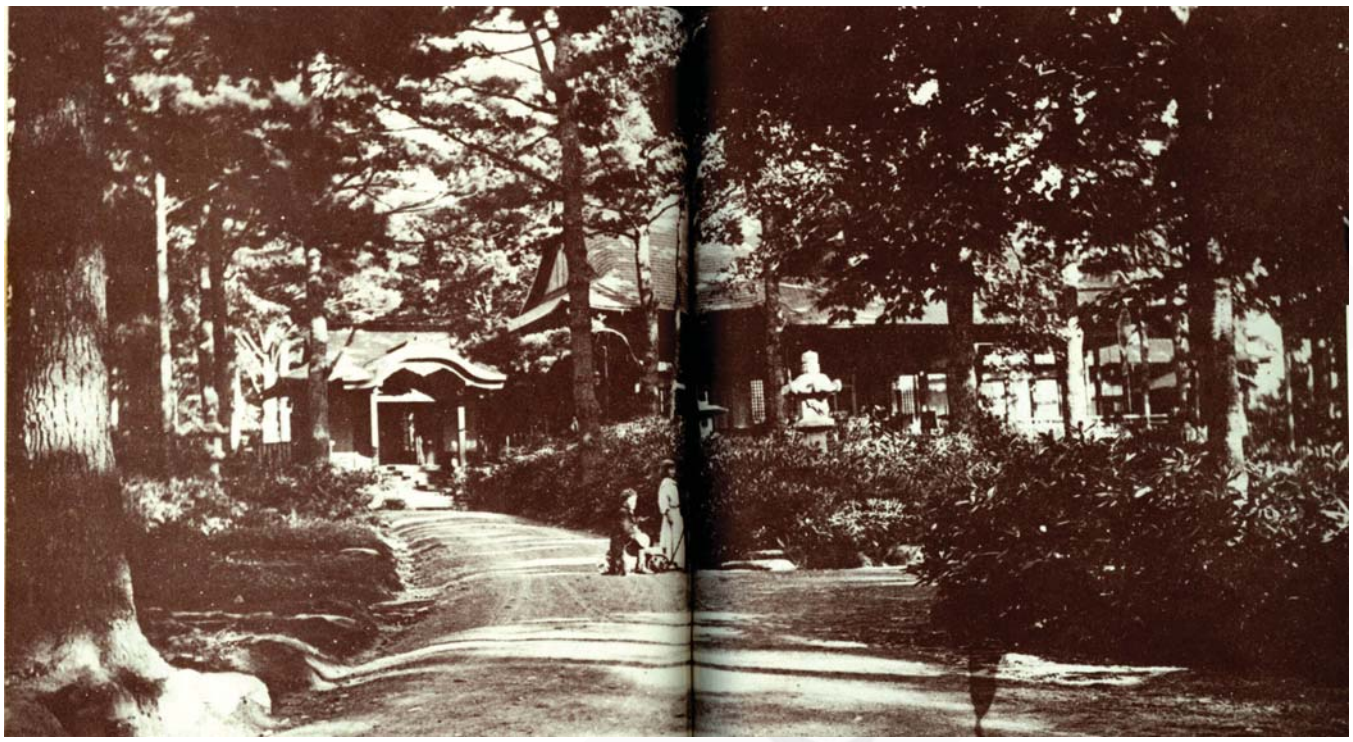
The house at 93 The Boulevard, Passaic, will go to the widow besides one-third of the residuary estate. She is also entitled to sell the home at 334 Riverside Drive, for a price she considers fair and use the proceeds to liquidate the indebtedness of the Takamine Industry Company of Japan to the Sumi Tomo [Sumitomo] Bank of Tokio.

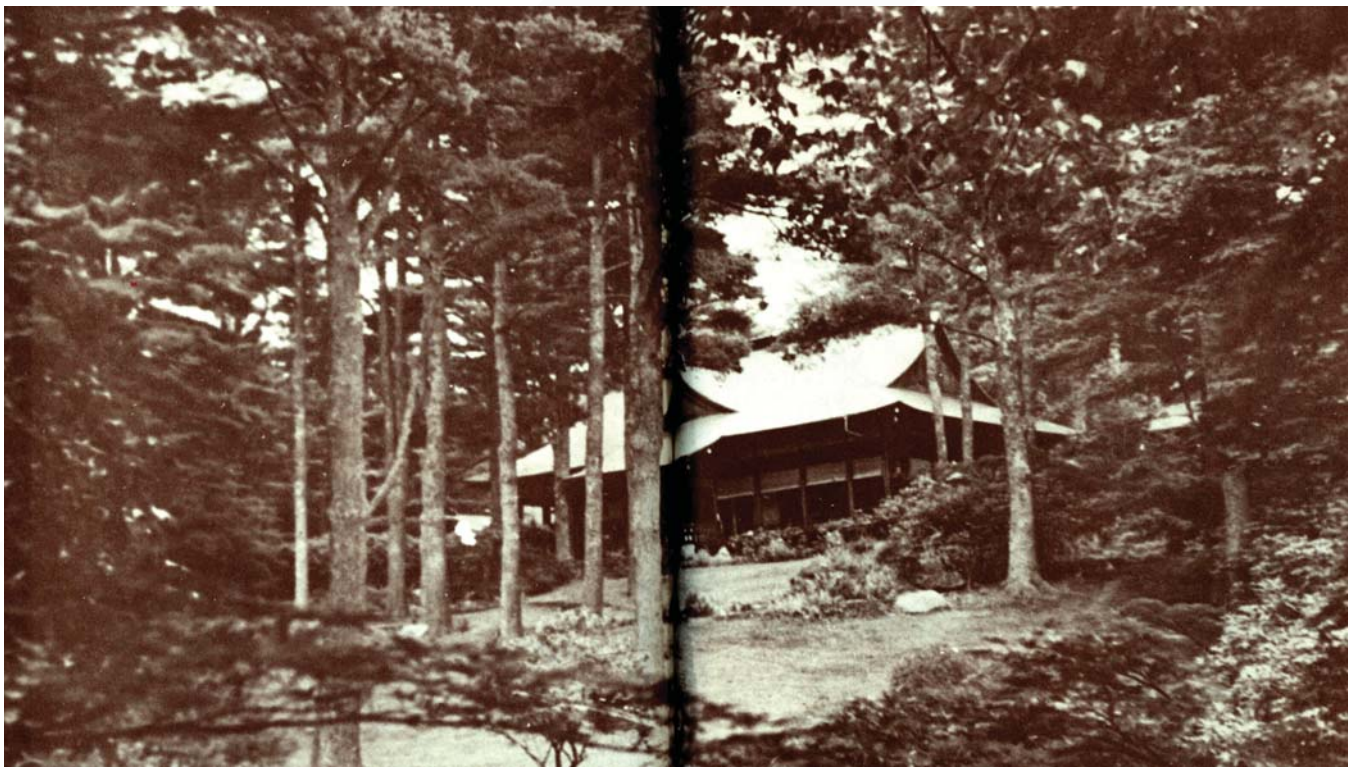
Japanese properties: Royalty income from Taka Diastase (gifts of 20,000 to 500 yen to 20 people; ¥10,000 to be donated every year for 5 years to the Physical and Chemical Research Institute of Tokio; ¥5,000 to be donated every year for 5 years to the Imperial Academy of Science as "Prize Fund"), income from adrenalin in Japan (and use of Adrenalin trade mark by Sankyo Co.), dividends from stock of Sankyo Company of Japan, general provisions. Witnesses: Edythe Cottrell of Biltmore, North Carolina; Jane A. Eckles of Black Mountain [North Carolina].

"I request that at my death my body, if possible, be offered to Dr. Malcolm Harris of Chicago, Illinois, for anatomical examination and scientific research, particularly with regard to my liver, upon which he and Dr. Heurotin [Henrotin] of Chicago, operated nearly 30 years ago." After that, he would like his body cremated and one half of the ashes buried in Woodlawn Cemetery, New York City, and the other half of his ashes to be sent to his sister, Jun Takahashi, or to Matasaku Shiobara of Tokio, Japan, to be buried in Tokio cemetery (p. 2).

"I have incurred an indebtedness on account of loss in the running and operations of Takamine Laboratory, Inc. at Clifton, New Jersey, and particularly in connection with the manufacture and sale of Arsaminol [a brand of arsphenamine]... (p. 7).

"I have incurred or assumed indebtedness to the





Sumitomo Bank of Tokio, Japan, in behalf of the Takamine Industrial Company of Japan" (p. 9).

"It is my wish and desire that any property I may have or own at the time of my death, at Kokutaiji, Japan, be given to Mr. Fuji. It is my wish and desire that a Takamine family monument to be designed by Mr. Katsuji Makino and the same erected in Aoyama Cemetery in Tokio..." (p. 15).

Dr. Takamine's insurance of $100,000 goes to the widow. His business affiliations included the Hooper Electro Chemical Company, the headquarters of which is at 25 Pine street, New York City, and interest in Parke Davis and Co., the drug concern, which prepared all his adrenalin. The latter cost him 25 cents a grain to prepare and he sold more than 60,000 grains annually to Japan alone at 80 cents a grain. Address: New York.

301. *New York Times.* 1921. W.R. Hearst buys valuable corner. June 24. 9.
• ***Summary:*** Near the bottom of column 1 of this article is a new section titled "Other private house purchases." It begins: "Dr. Jokichi Takamine, head of the Takamine Laboratory, Inc., is reported to have sold his residence at 334 Riverside Drive, between 105th and 106th Streets, valued at around $125,000. It is a six-story American basement house, on a lot 25 by 100 [feet], and has been owned and occupied by Dr. Takamine for several years [since 1909]. He spent considerable money in altering it, introducing many features from his native land."

302. Takamine, Jokichi; Takamine, Jokichi, Jr. 1921. Enzymic substance and process of making same. *U.S. Patent* 1,391,219. Sept. 20. 5 p. Application filed 23 Jan. 1918.
• ***Summary:*** Describes an enzymic preparation for treating fibers. See British Patent 152,792 (24 July 1919). Address: 1. New York City, NY; 2. Clifton, Passaic County, New Jersey.

303. Nov. 12–The Washington Naval Conference, also called also called the Washington Arms Conference or Washington Disarmament Conference, opens in Washington, DC (Important event). 1921.
• ***Summary:*** "This military conference, called by President Warren G. Harding, was held in Washington from 12 Nov. 1921 to 6 Feb. 1922. Conducted outside the auspices of the League of Nations, it was attended by nine nations, the United States, Japan, China, France, Britain, Italy, Belgium, Netherlands, and Portugal, having interests in the Pacific Ocean and East Asia. Soviet Russia was not invited to the conference. It was the first international conference held in the United States and the first disarmament conference in history" (Source: Wikipedia, at Washington Naval Conference, Aug. 1012).

This conference was of great importance to Dr. Jokichi Takamine, who had spent much of his life working for peace, understanding, and friendship between the United Sates and Japan. An article in the *New York Times* titled "Dr. Takamine," written two days after his death on 22 July 1922, states eloquently (p. 14): "In his own person and through the organizations which he founded or fostered Dr. Takamine has done perhaps more than any one else of his race in this country to bring the two peoples into better understanding. It will be especially remembered that his last public service, given at the peril of his health, was in support of purposes of the Disarmament Conference at Washington. His distinguished guest, Baron Shibusawa, had

as a young samurai guarded the person of our first Minister to Japan, Townsend Harris, and so had helped to initiate that relationship of amity between the two nations which Dr. Takamine, out of his love for the two lands, was to the very end zealously active in strengthening. He had discarded the two swords of the samurai for these two devotions."

A photo (see previous page) shows the New York reception for the Japanese delegates to the Washington Conference in 1921. This photo (with date) is from the booklet "Shofu-Den" by the Japanese Heritage Foundation (1994, p. 7).

304. Land deed: Ellen F. Gordon (of Reselle, New Jersey) sells her land at Merriewold (Sullivan County, New York) to Caroline Takamine (of Forestburgh, Sullivan County, New York). 1921. New York. 2 p. Dec. 14. In Book 216, p. 284-85.
• ***Summary:*** Ellen sells lots numbers 13 and 14 in Forestburgh as follows...

Note: It is not clear whether these lots are in Merriewold or not. The word "Merriewold" is not mentioned in this land deed. Address: Sullivan County, New York.

305. On board a ship on their way to Europe; from left to right: Jokichi, Jr., his wife Hilda, Ebenezer, and Jokichi with white hair (Photograph). 1921. (See next page).
• ***Summary:*** This photo (with date) is from the booklet "Shofu-Den" by the Japanese Heritage Foundation (1994, p. 13).

306. A view of Sho-Foo-Den in Merriewold, New York (Photograph). 1921? Undated. (See p. 112).
• ***Summary:*** Sent by and reprinted with permission from *Kanazawa Furusato Ijinkan* (Great People of Kanazawa Memorial Museum) in Kanazawa, Japan.

307. Oshima, Kokichi. 1922. Promising development of soya bean sauce: Studies on the protease of the *Aspergillus oryzae-flavus* group and its role in shoyu brewing. *American Food Journal* 17(1):30-31. Jan. [10 ref]
• ***Summary:*** "Editor's note.–The author of this article has been engaged for some time in experimental work in the laboratories of the Pathological Division of the Bureau of Animal Industry and the Microbiological Laboratory of the Bureau of Chemistry, U.S. Department of Agriculture. He is studying in Europe at the present."

The article begins: "Shoyu (soya bean sauce) is a most important seasoning in Japan and China, where it is widely used instead of vegetable or meat extract and salt. It is a fermented product made from soya beans, wheat and salt which are acted upon by *Aspergillus flavus* and related forms. The finished product contains about 20 per cent sodium chloride, 5 per cent glucose and 3 per cent protein cleavage products. Being highly palatable, nutritious and cheap, it will probably be used more and more extensively in many countries."

Note. This is the earliest English-language document seen (April 2012) that uses the term "soya bean sauce" to refer to soy sauce.

From "analysis of 'moromi' at different ages and from the fact that *Aspergillus flavus* and related forms which are used in 'shoyu-koji' preparation, produce a very strong proteolytic enzyme, it may be assumed that the protease from such *Aspergilli* is the most important one."

A table (p. 30) shows three different species of *Aspergillus* and their characteristics: *Aspergillus oryzae.* Amylase production: strong. Growth: quick. *Aspergillus effusus.* Amylase production: very weak. Growth: slow. *Aspergillus parasiticus.* Amylase production: very weak. Growth: quickest.

"Influence of cooking on glycinin digestibility [by protease enzymes]: In 'shoyu' brewing soya beans are generally cooked 2 to 3 hours in open kettles. Cooking in the autoclave [pressure cooker] at 15 pounds pressure for 1½ to 2 hours is coming into vogue."

"Summary: 1. Proteolytic enzymes prepared from *Aspergillus oryzaeflavus* group can digest native proteins such as beef muscle, egg white, glycinin, edestin and casein as well as paoepton [peptone?] with the production of amino acids... The glycinin is favored by the presence of sodium of sodium chloride because the salt keeps the protein in solution..."

Acknowledgment: "The author is greatly indebted... to Drs. William N. Berg, Margaret B. Church and Charles Thom.

"Many thanks are due to Dr. Jokichi Takamine, in whose laboratory many practical experiments were made on Taka-diastase." Address: Was at USDA Bureau of Chemistry Microbiological Lab. Now studying in Europe. By 23 Feb. 1923 he is in Sapporo, Japan.

308. Takamine, Jokichi, Jr. 1922. Process of making beverages. *U.S. Patent* 1,412,378. April 11. 2 p. Application filed 10 Dec. 1919.
• ***Summary:*** Describes a process for making digestive cordials which contain alcohol, plus an enzyme as a digestive agent. To keep the digestive properties of the enzyme from being impaired by the alcohol, a protective substance such as sugar is added to enzymic preparations before mixing with alcohol.

It is a common custom to serve a beverage called a cordial following meals. "It is also a common practice, particularly with individuals affected with indigestion, to take digestive compounds of various kinds... following meals as an aid to digestion. It is among the special purposes of my special invention to combine the after dinner cordial, for example, and a digesting agent in suitable proper quantities so that the after dinner cordial will contain a proper

medicinal dose of the digestive compound and I have found that an enzyme such, for example, as takadiastase, pepsin, pancreatin or the like, or suitable compounds thereof, will well answer the purpose." Address: Clifton, Passaic County, New Jersey.

309. Takamine, Jokichi; Takamine, Jokichi, Jr. 1922. Process of treating textile and other fabrics, thread, yarn, and the like. *U.S. Patent* 1,421,613. July 4. 4 p. Application filed 8 Oct. 1920.
• ***Summary:*** Describes how to remove starches and gums from textile materials. Textile materials such as yarns or threads are treated with enzymes produced by *Eurotium oryzae* or other material containing proteolytic and diastatic enzymes to dissolve starches and gums and render them capable of being removed by washing with water. Address: 1. New York City, NY; 2. Clifton, Passaic County, New Jersey.

310. *Washington Post.* 1922. Noted Japan chemist is ill: Dr. Jokichi Takamine in serious condition in New York. July 15. p. 11.
• ***Summary:*** "New York, July 14–Dr. Jokichi Takamine, one of Japan's foremost chemists, was reported critically ill today of a complicated kidney disease at the Lenox Hill hospital."

He is president of the Takamine Ferment Company in Chicago, Illinois.

311. *Times-Picayune* (*New Orleans, Louisiana*). 1922. Dr. Takamine no better. Noted husband of Orleans woman in critical condition. July 16. p. 41.
• ***Summary:*** "Special to the *Times-Picayune.* New York. July 15.–The condition of Dr. Jokichi Takamine, noted Japanese scientist, who has been critically ill at the Lenox Hill Hospital since June 3 [or 8] was unchanged today. Dr. Takamine is suffering from nephritis. Little hope is held out for his recovery. His wife was Miss Olivia Hatch [sic, is Miss Carrie Hitch] of New Orleans."

312. Associated Press. 1922. Noted Jap chemist dies in New York: Originated new chemicals to aid digestion; was decorated for work. *Los Angeles Times.* July 23. p. 14.
• ***Summary:*** "By A.P. night wire. New York, July 22.–Dr. Jokichi Takamine, prominent Japanese chemist, died in Lenox Hill Hospital shortly before noon today after an illness of several weeks. Dr. Takamine, producer of the diastatic enzyme 'Takadiastase' and originator of adrenalin, died of a complicated kidney disease from which he had suffered for several months."

"In 1915 he was decorated by the Emperor of Japan with the fourth Order of the Rising Sun. The Emperor had previously made him a member of the Royal Academy of Science. In New York he was head of the Nippon Club and a member of others, including Lotos, Chemists, Drug and Chemical, and New York Athletic."

313. *New York Times.* 1922. Died–Takamine. July 23. p. 21. Sunday.
• ***Summary:*** "On July 22, 1922, Dr. Jokichi Takamine, the beloved husband of Caroline Field Hitch Takamine and devoted father of Jokichi Takamine Jr. and of Eben T. Takamine. His remains will rest at his late home, 93 Boulevard, Passaic, N.J. [New Jersey] until noon of Monday, July 24, and then will be conveyed to the Nippon Club, 161 West 93d St., Manhattan, where they will lie in state until Tuesday morning, July 25, whence they will be conveyed to St. Patrick's Cathedral, Fifth Avenue at Fiftieth Street, where a solemn mass of requiem will be offered for the repose of his soul, at 10:30 A.M. Interment at Woodlawn Cemetery. Automobile cortege."

314. *New York Times.* 1922. Jokichi Takamine, noted chemist, dies: Japanese who discovered adrenalin and takadiastase had been ill two years. Founded the Nippon Club. He was widely known for his work for friendly relations between Japan and United States. July 23. p. 19. Sunday.
• ***Summary:*** An excellent obituary and biography. "Dr. Jokichi Takamine, the chemist, and perhaps the best-known Japanese in this country, died yesterday at the Lenox Hill Hospital, where he had been ill for several weeks of heart disease. His illness dated back two years, and he had almost regained his health when his activities in welcoming the delegates of the Japanese Business Men's Mission, Baron Shibusawa's party, and the Japanese delegates to the Disarmament Conference brought on a recurrence of his illness. He was forced to take to his bed on Dec. 16, 1921, and never regained his strength.

"With Dr. Takamine at the time of his death were his wife, his two sons, Eben T. and Jokichi, with their wives, and his sister, Mrs. J. Takehashi. A few intimate friends were also at the bedside.

"The body was taken to Dr. Takamine's home in Passaic [New Jersey] where it will remain until Monday afternoon. It will then be taken to the Nippon Club, in West Ninety-third Street, where a memorial service will be held at 6 o'clock Monday evening. On Tuesday the body will be taken to St. Patrick's Cathedral, where funeral services will be held at 10:30 o'clock. Burial will be in Woodlawn Cemetery [Bronx, New York].

"Born in Japan in 1854: Dr. Takamine was widely known in the United States and Japan for his work for better relations between the two countries and his achievements in chemistry. He was born Nov. 3, 1854, at Kanazawa City in Kaga Province, Japan, the first son of Sei-Ichi and Yuki [sic, Seiichi and Yukiko] Takamine and a samurai of the Kanazawa clan. His father was a physician to the Prince of Kaga. When 12 years old he went to Nagasaki to study

under the Portuguese Consul, and later went to Osaka to study medicine. He was one of the first graduates of the Imperial University of Japan at Tokyo, taking his degree in Engineering and Chemistry. He then went as a Government student to the University of Glasgow and the Andersonian University of Glasgow, where he spent three years.

"On his return to Japan Dr. Takamine was appointed Chemist of the Department of Agriculture and Commercial, where he did much to improve the brewing of sake and the making of indigo. The quick applicability of his inventions to commercial uses was always a market feature of his work. His appointment as Japanese Commissioner to the Cotton Centennial World's Fair at New Orleans in 1884 was the turning point of his life, for there he met Miss Caroline Hitch, whom he married, and resolved to spend the rest of his life in the United States.

"Has two greatest discoveries: He went to Tokyo in 1857 to erect the first superphosphate works in Japan, and his two sons, Jokichi and Eben, were born there. He returned to America in 1890, and began his research work which brought him recognition as a commercial chemist. His two greatest discoveries were adrenalin and takadiastase. He discovered adrenalin in 1900 through experiments with the glands of sheep. It is now manufactured from bovine glands, and is used by surgeons throughout the world to raise blood pressure, which is accomplished through the contraction of the small arteries. It has made possible bloodless surgery in minor operations, especially on the eye, ear and throat. He was honored for his discovery by surgeons all over the world.

"Dr. Takamine discovered takadiastase in 1894. It is obtained from a fungus growth, mainly on the rice plant, known as aspergillus oryzae, and is largely used in the fermentation of sake, or rice beer, in Japan. It is also used by physicians for starch digestion and is today a remedy known to all druggists.

"A company was formed in Chicago for the manufacture of this product and it soon became very profitable. In the meantime he introduced many useful industries into Japan, among which were soda, works, fertilizer works, dye, alkali and aluminum, and was also the founder of a large pharmaceutical corporation. He established a chemical and physical research laboratory at Tokyo and on his return here set up a laboratory of his own at Clifton. N.J. [New Jersey].

"Decorated by Japanese emperor: Dr. Takamine was made Doctor of Chemical Engineering in the University of Japan and Doctor of Pharmacology in 1906. He was decorated by the Japanese Emperor with the Fourth Order of the Rising Sun in 1915, having been appointed member of the Royal Academy of Science by the Emperor in 1913. He was President of Sankyo. &. Co. Ltd., Tokyo; Takamine Ferment Company, International Takamine Ferment Company, Takamine Laboratory, Inc., and Takamine, Incorporated.

"He founded the Nippon Club of New York, the Japan-America Society, the Chemical and Physical Research Society of Japan and was prominent among the founders of the Japan Society of New York and the Japanese Association of New York Athletic, Merriewold, Bankers and Nippon Clubs, the American Chemical Society, Royal Chemical Society of England, Institute of Chemical Engineers and the Franklin Institute.

"J.I.C. Clarke's tribute: A tribute to Dr. Takamine was paid yesterday by his friend J.I.C. Clarke, who had known him for many years, and said: 'Apart from his devotion to science, it was his dearest wish to promote abiding and enduring friendship between the land of his birth and that of his adoption. In the field of the chemistry of life he had created powerful corporations to develop and apply his valuable inventions and discoveries, always keeping before him his cherished ideal of a union between Japan and the United States based on a common economic interest and mutual esteem. In his pursuit of this ideal he incessantly worked with tireless zeal and grim determination, giving most unstintedly [sic, unstintingly], and was rightly spoken of as an uncrowned Ambassador of Good-Will between the two nations. An intense lover of Japan, its ancient art, its domestic virtues, its rich traditions, he became an equally ardent lover of the United States, its high ideals, its balanced freedom.'

"Dr. Takamine had a unique country home at Merriewold Park, Sullivan County, N.Y. [New York]. He purchased two of the Japanese buildings at the St. Louis Exposition, combined them under one roof and adapted them to American life, surrounding them with a wealth of Japanese designs and gardens. His friends were frequently entertained there."

Note: This is the earliest document seen (Aug. 2012) in which the word "Ambassador" is used to refer to Dr. Takamine, or in which he is referred to as an "uncrowned Ambassador" or an "Ambassador of Good-Will."

315. *Times-Picayune* (*New Orleans, Louisiana*). 1922. Famous Japanese chemist is dead: Dr. Jokichi Takamine, who married New Orleans girl, rose rapidly. July 23. p. 15. • ***Summary:*** "New York, July 22.–Dr. Jokichi Takamine, prominent Japanese chemist, died in Lenox Hill Hospital today after an illness of several weeks.

Dr. Takamine, producer of the diastatic enzyme 'takadiastase' and originator of adrenaline, died of a complicated kidney disease from which he had suffered for several months. He was thought on the road to recovery until June when his condition became so much worse that he was compelled to leave his country home at Merriewold, N.J. [sic, New York], with its extensive Japanese gardens and go to a hospital.

"Dr. Takamine was particularly well known for his discoveries in chemical research and he also was the head

of several organizations which manufactured and distributed chemical products." There follows a brief biography of Jokichi Takamine.

"In 1885 [sic, 10 Aug. 1887] he married Miss Olivia Hitch [sic, Miss Carrie Hitch] of New Orleans and returned to Japan where he organized and erected the first super-phosphate works at Tokio." In 1890 he returned to America. The rest of his brief biography follows.

Note: Most of this obituary is based on the much longer obituary in *The New York Times.*

316. *World* (*The*). 1922. Famous Japanese chemist dies here: Dr. Jokichi Takamine, who discovered Adrenalin and Takadiastase, expires at 67. Wife an American woman. Leader of countrymen and advocate of peace. July 23. Evening edition.
• ***Summary:*** The article begins: "Dr. Jokichi Takamine, eminent Japanese chemist and ardent advocate of friendship, economic and otherwise, between his native land and the United States, died yesterday morning in the Lenox Hill Hospital, after an illness that began in November 1920. He was sixty-seven years old." A photo (top of col. 2) shows Dr. Jokichi Takamine.

317. Dr. Takamine's memorial service at the Nippon Club in Manhattan, New York (Photograph). 1922. Undated. (See next page).
• ***Summary:*** Shows many floral displays. Sent by and reprinted with permission from *Kanazawa Furusato Ijinkan* (Great People of Kanazawa Memorial Museum) in Kanazawa, Japan.

318. *New York Times.* 1922. Dr. Takamine. July 24. p. 14. Monday.
• ***Summary:*** "The year of Dr. Takamine's birth in Japan was the very year in which Commodore Perry negotiated the treaty with Japan opening the country to foreign commerce and residence. This, the life of this world-famous chemist, the best known and most highly respected of all Japanese in America, spans the entire period of Japan's new relations with our country and with Europe. His contributions to pure science, and especially to the health of both Eastern and Western nations, are among the first notable fruits of that intercourse. While Japan has reason to be proud of the great service of this samurai of an ancient clan to the modern world, America may rightfully lay claim to a share of the credit for his achievement. The United States opened the doors of Japan, and then opened her own doors of opportunity to his genius.

"In his own person and through the organizations which he founded or fostered Dr. Takamine has done perhaps more than any one else of his race in this country to bring the two peoples into better understanding. It will be especially remembered that his last public service, given at the peril of his health, was in support of purposes of the Disarmament Conference at Washington. His distinguished guest, Baron Shibusawa, had as a young samurai guarded the person of our first Minister to Japan, Townsend Harris, and so had helped to initiate that relationship of amity between the two nations which Dr. Takamine, out of his love for the two lands, was to the very end zealously active in strengthening. He had discarded the two swords of the samurai for these two devotions."

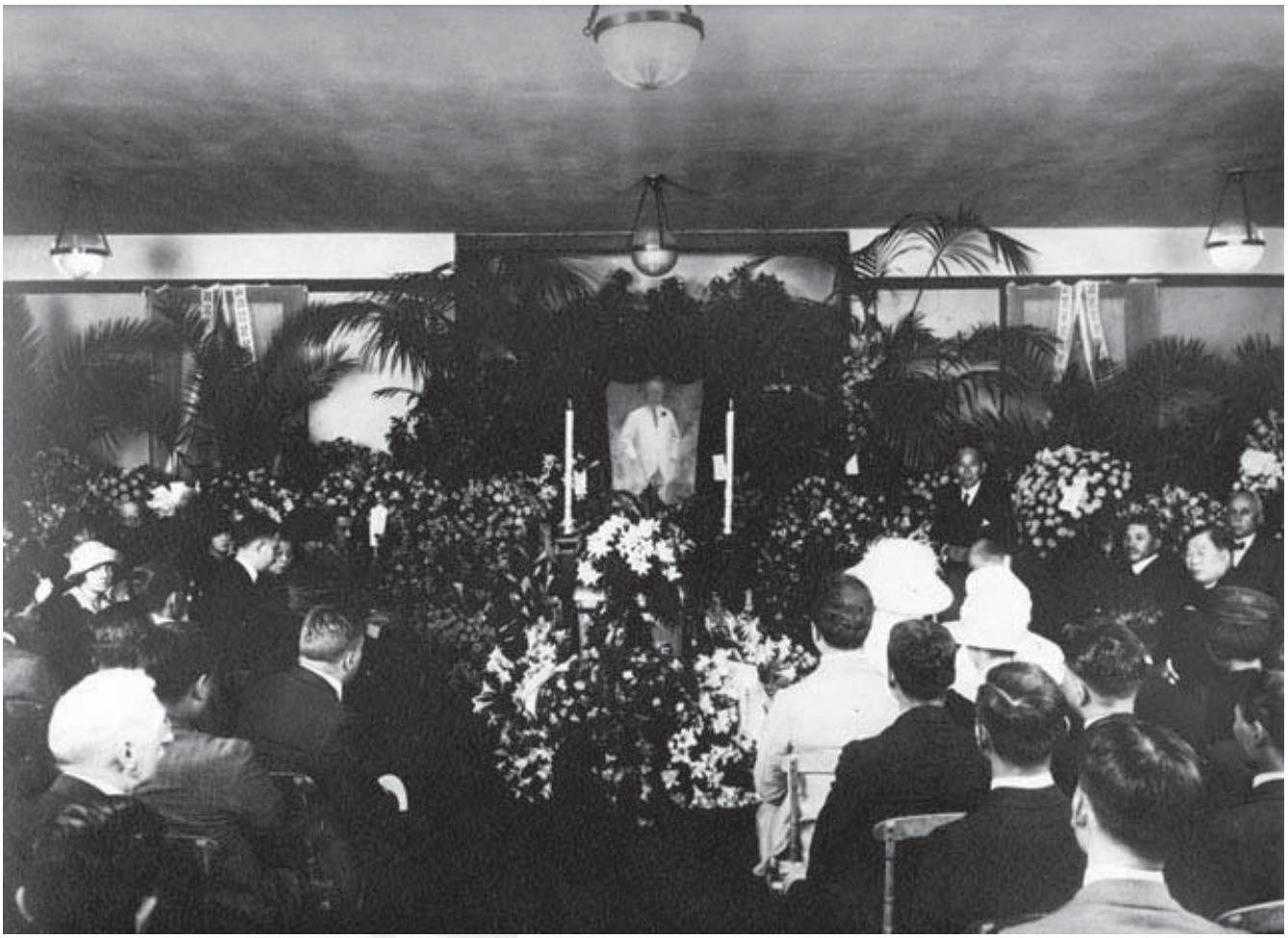
319. *New York Times.* 1922. Dr. Takamine eulogized. Japanese pay tributes at memorial services at Nippon Club. July 25. p. 11. Tuesday.
• ***Summary:*** "Surrounded by more than three hundred floral pieces from prominent Japanese and American friends, the body of Dr. Jokichi Takamine, noted chemist and perhaps the best-known Japanese in this country, lay in state last evening at the memorial services at the Nippon Club, 161 West Ninety-third Street, of which he was the founder and for 18 years President. Tributes were paid him by Consul General of Japan Kumasaki, S. Imamura, President of the Nippon Club, and other well-known Japanese.

"An American and a Japanese flag were crossed on his breast, symbolical of his efforts to cement the friendship between the two countries. At the head of the coffin, amid the flowers that reached to the ceiling and made the air heavy with their perfume, was a simple bunch of orchids, bearing the inscription: 'As a tiny expression of gratitude from a person who owes all her comfort in life to adrenalin, the use of which was discovered by Dr. Jokichi Takamine. May his soul rest in peace.'

"Several hundred Japanese and Americans were present at the services, and others continued to arrive through the evening. The body was taken this morning to St. Patrick's Cathedral, where the funeral services will be held at 10 o'clock. Judge Elbert H. Gary will be among the pallbearers."

320. *New York Times.* 1922. Dr. Takamine very ill. Distinguished Japanese chemist is in Lenox Hill Hospital. July 15. p. 6.
• ***Summary:*** "Dr. Jokichi Takamine, one of Japan's foremost chemists, is critically ill of a complicated kidney disease at the Lenox Hill Hospital. He has been in failing health for a long time, but apparently was on the road to recovery when a relapse set in last December. In June his condition necessitated removal to the hospital from his country home in Merriewold, New York, with its extensive Japanese gardens."

321. *Drug & Chemical Markets* (*New York*). 1922. Dr. Takamine dead. 11(4):210. July 26.
• ***Summary:*** A positive but unoriginal ½-page obituary.



322. *New York Times.* 1922. Takamine buried with Catholic rite: Noted Japanese chemist renounced Buddhism, religion of his birth, only 6 weeks ago. Services in St. Patrick's. Many prominent men at bier of scientist, who had also delved into philosophies of religions. July 26. p. 13. Wednesday.

• ***Summary:*** "Diplomats as well as chemists, merchants, writers and friends, joined yesterday in paying the last tribute of respect to Dr. Jokichi Takamine, the noted chemist and binder of ties of friendship between Japan and America, whose funeral took place from St. Patrick's Cathedral in the morning.

"While deep sorrow was visible upon the faces of those who knew him, there was a sense of gratification in the hearts of church dignitaries, because only six weeks ago Dr. Takamine renounced Buddhism, the religion of his birth, and embraced Catholicism. And the priest who baptized him and gave him the other sacraments of the church after his conversion was the celebrant of the solemn high mass of requiem which was sung yesterday.

"The story of Dr. Takamine's conversion to the Catholic faith was related by the Rev. Father William B. Martin, acting rector of the Cathedral and Master of Ceremonies at the funeral.

"'For many years,' said Father Martin, 'Dr. Takamine had been delving into the philosophies of different religions, finding time for his study despite his labors in the field of chemical research. He awoke one morning about six weeks ago and informed his wife that he needed spiritual support. He had wandered far into intellectual things and told her that the one thing missing in his life he felt could be supplied only in a belief in God.

"'Of all the religions he studied, Dr. Takamine said Catholicism supplied this need the best, because it was a religion of authority and revelation. His wife had been converted several years ago and she was very much pleased with his decision. She immediately called for the Rt. Rev. Thomas J. Kernan of the St. Nicholas' Church of Passaic, N.J. [New Jersey]. The priest was surprised at the knowledge Dr. Takamine possessed in the religion and he found it unnecessary to give him any further instruction before conversion, which is remarkable. The chemist soon received the sacraments of conversion.'"

Assisting Mgr. Kernan were the Rev. Patrick Daly, as deacon, and the Rev. Bernard McQuade, as sub-deacon. The Rev. Martin received the coffin into the cathedral. The honorary pall-bearers were Judge Elbert H. Gary, O.W. Smith, Dr. M.T. Whitaker, Y. Murat, S. Imamuri, J.I.C. Clark, Captain S.E. Darby, M.W. Williamson, Dr. T. Takami, E. Jimushi, Japanese Consul General K. Kumasaki, and S. Saburi, Japanese Chargé d'Affaires at Washington [DC].

"Ever since his death at the Lenox Hills Hospital [sic, Lenox Hill Hospital, in Manhattan, New York City] last Saturday floral tributes had been received in such large numbers that ten touring cars were required to carry them. There were upward of 300 floral pieces, many of them having sashes with Japanese inscriptions.

"Besides his personal friends, there were at the services men and women who knew the scientist only through the association of his name with adrenalin. Several were heard to remark that their life blood, oozing out of a cut made by a surgeon's knife, would never have stopped were it not for Dr. Takamine's discovery twenty-two years ago. There were many butlers present, who took the morning off to attend their compatriot's funeral.

"One of his closest friends at the services was Dr. Charles F. Chandler, who is 85 years old. Dr. Chandler was founder of Columbia's School of Mines and for many years head of the department of chemistry at the university. Others attending included Melville E. Stone of The Associated Press; Whidden Graham, writer; Dr. Louis Livingston Seaman, surgeon and writer; Dr. John H. Finley, first President of the Japan Society of New York and former State Commissioner of Education; Dr. Maximilian Toch, the chemist; J.B. Millet, writer; Herbert S. Houston, editor; Alexander Tison, Douglas Dunbar and Eugene S. Worden, representing the Japan Society. There were delegations present, also, from the many other clubs and societies with which he was affiliated.

His immediate family present were his wife, his two sons, Eben T. and Jokichi, with their wives, and his sister, Mrs. J. Takehashi [Jun Takehashi].

"The body was taken to a receiving vault at Woodlawn Cemetery."

323. Parker, George F. 1922. Dr. Jokichi Takamine (Letter to the editor). *New York Times.* July 29. p. 6.

• ***Summary:*** "To the Editor of The New York Times. July 24. Nothing could have been more appropriate or deserved than the tribute paid in your columns to the work and the memory of Dr. Jokichi Takamine. To few men, and, so far as I know to none of foreign birth or origin, has it fallen to do more for our countrymen and the world. Able, honest, persistent and, withal, so modest that he never laid any claim to merit, he went along about his conspicuous life-work in a way that made him an example to all men. If any one is ever tempted to raise a question about the contribution of the Japanese people to the world, he may well turn to this career for answer, not only in science and industry, but in those qualities that raise a human worker above the average of his fellows.

"You speak well and properly of his efforts in promoting good will between the people who gave him birth and those among whom he found his career. He never forgot that it was his duty to do what lay in his power to make one fairly understand the other. It was my good fortune to know him well, and I can fairly say that no man in the wide circle of my acquaintance went out of his way more

sedulously or unselfishly to insist that prejudice had no place in the large relations of races of different origin and that an understanding fellowship should never be lost to mind. He did his part to promote this result, always with a devotion that nothing could dampen or excel.

"Going in and out among us for many years, we may well be proud that we gave shelter and confidence to this unassuming gentleman, while those of us who were privileged to know him may appreciate his association as a privilege which we might well do something to earn. On behalf of these friends I thank you for your gracious recognition of these facts." Address: Winnisook Club, Oliverea, New York.

324. New York State–Department of Health of the City of New York–Bureau of Records. 1922. Certificate of death for Jokichi Takamine. New York City, NY. 1 p.
• ***Summary:*** Jokichi Takamine died on 22 July 1922 at Lenox Hill Hospital, Borough of Manhattan, New York City, New York. Color or race: "Yellow." He was married. His date of birth is not given. Age: 68. Occupation: Chemist, with Takamine Laboratories. He was born in Japan and has resided in the United States for 40 years. Father: Seiichi Takamine, born in Japan. Mother: Uhi? [his mother's given name was Yukiko], born in Japan. Former or actual? residence: 93 Boulevard, Passaic, New Jersey.

The attending hospital physician, W.W. Hall, M.D., stated that Dr. Takamine entered the hospital on June 7 and died at 11:30 a.m. on July 22. The cause of death was "chronic nephritis" [acute or chronic inflammation of the kidney caused by infection, degenerative process, or vascular disease]. Place of burial: Woodlawn Cemetery. Date of burial: July 25. Undertaker: Joseph A. McCallister. Address: 39 E 43 St.

Note: He was survived by his wife and two sons, Jokichi and Eben. Address: New York City, New York.

325. *Chicago Daily Times.* 1922. Doctor Harris declines body willed to him. Aug. 4. p. 9.
• ***Summary:*** Paterson, N.J. [New Jersey], Aug. 3–The late Dr. Jokichi Takamine. Japanese chemist, suggested in his will two means of disposing of his body, but neither will be carried out.

"First, he desired that his body be offered to Dr. Malcolm Harris of Chicago, for 'research and examination, particularly with regard to my liver, which was operated on thirty years ago.' Should Dr. Harris not want the body, the chemist requested that it be cremated, and some of the ashes be buried here and the rest in Japan.

"Dr. Harris has declined to accept the body, it was learned today from Jokichi Takamine, Jr., and it will not be cremated, because six weeks before his recent demise, Dr. Takamine was baptised into the Catholic church, which is opposed to cremation. The will was drawn up a year ago.

"The younger Takamine declined to discuss the matter further than to say that his father's remains have been buried in Woodlawn Cemetery."

326. *New York Times.* 1922. Dr. Takamine's will to be disregarded: Scientists see no value in dissection and Catholic Church bars cremation. Widow to order burial. Chemist becomes a convert to Catholicism after making will–bequests to science. Aug. 4.
• ***Summary:*** According to directions in his will, which was filed for probate yesterday in Paterson, New Jersey, the body of Dr. Jokichi Takamine, who died on July 22, is either to be dissected for the advancement of science or to be cremated and the ashes buried partly in this country and partly in Japan.

But there is a conflict between his directions and the tenets of the Roman Catholic Church, to which he became a convert six weeks before his death at age 68.

Dr. Malcolm L. Harris, Chicago surgeon, famous for his "nerve-blocking" theory is specified in the will as the person to whom the body is to be delivered "for anatomical examination and scientific research, particularly with regard to my liver, upon which he and Dr. Heurontin [Henrotin] of Chicago, operated nearly thirty years ago."

The will specifies that if Dr. Harris believes that nothing of scientific value can be learned, or if dissection is objectionable to Mrs. Takamine, the body is to be created; then half of the ashes are to be buried in Woodlawn Cemetery and the other half sent to Dr. Takamine's sister, Jun Takahashi, or to Matasaku Shiohara in Japan for interment there.

Since the will was written on 17 May 1921, nearly a year before Dr. Takamine's conversion to Catholicism, Mrs. Takamine thinks that the directions with reference to cremation would automatically be nullified by his becoming a Catholic, she said yesterday by telephone from her home at 93 Boulevard, Passaic, New Jersey. She believes the body should be buried in Woodlawn Cemetery, where it is now in a receiving vault pending the construction of a mausoleum.

It is understood that Dr. Harris has concluded that no great benefit to science would accrue from using the body for research.

The Rev. Dr. William B. Martin, acting rector of St. Patrick's Cathedral, who was in charge of the funeral ceremonies for Dr. Takamine's body at the Cathedral, explained that cremation was objectionable to the Church in that in involved the hastening of a natural process, and that natural laws are regarded by the Church as sacred.

In his will, Dr. Takamine bequeathed to his wife one-third of everything that he owned. To his son Jokichi Takamine and the latter's wife, he left each one-sixth of the entire estate. And to his other son, Eben Takamine, and the latter's wife, he also left one-sixth of the total estate after many bequests to persons who has been employed by Dr.

Takamine, and to relatives and friends in both Japan and the United States.

To the Institute of Tokio he bequeathed 50,000 yen for physical and chemical research work, and to the Imperial Academy of Science in Tokyo he left 25,000 yen.

327. S.E.E. 1922. Dr. Jokichi Takamine dead. *Indianapolis Medical Journal* (*Indiana*) 25(9):232. Sept.
• ***Summary:*** A positive ½-page obituary which concludes. "Dr. Takamine was consulting chemist for Parke, Davis & Company, Detroit, Michigan,..."

"After the Japanese cherry trees were planted at Grant's tomb, by permission, the few left were planted on the river front of Parke, Davis & Co., in Detroit. The history was given in this journal a few years ago. I had an opportunity to look at them two weeks ago, suggested by the death of Dr. Takamine. They seem to be slow in growth and only about half of them are thrifty and these are small."

328. Scott, William W. 1922. History of Passaic and its environs. Historical-biographical. Vol. III. New York and Chicago: Lewis Historical Publishing Company, Inc. See p. 370-72. Illust. Index.

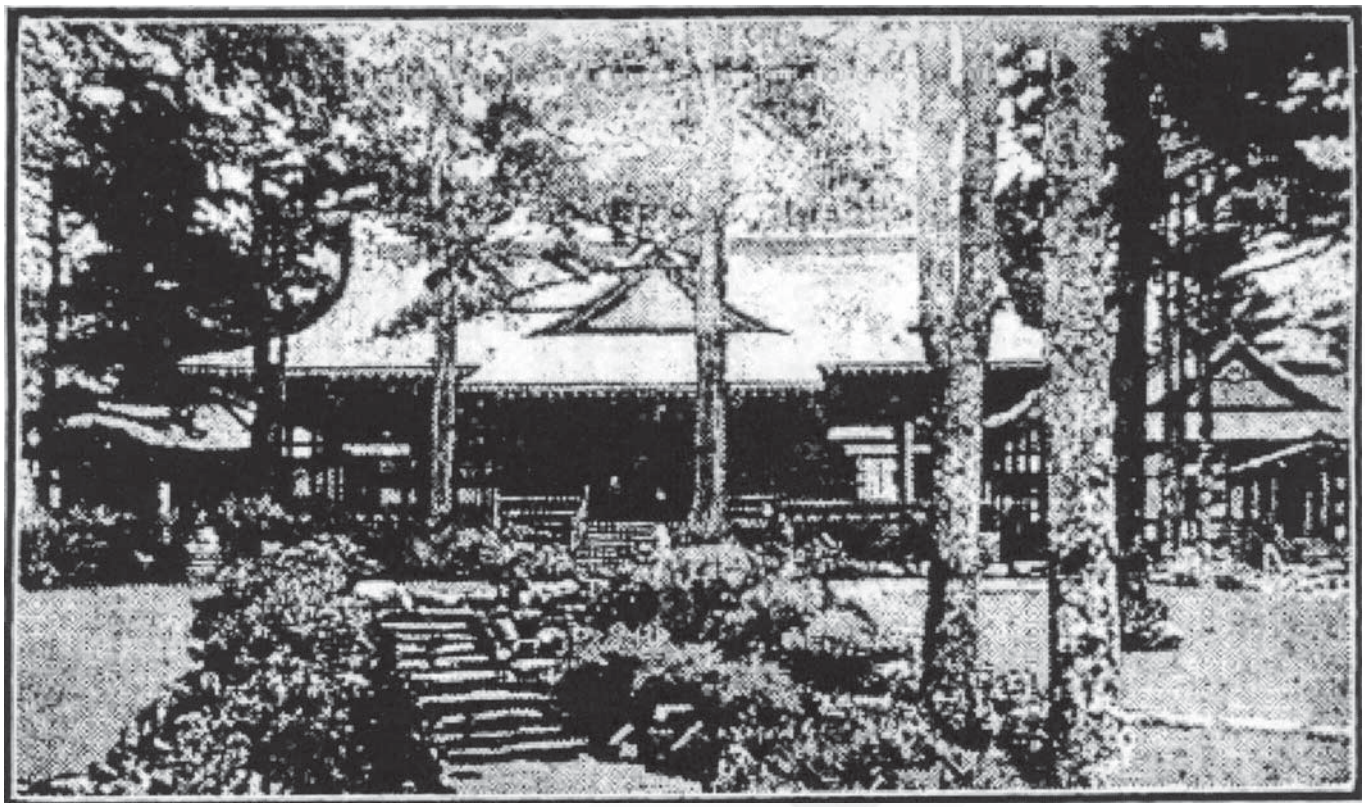
• ***Summary*:** Contains an excellent biography and (facing p. 371) a large formal portrait photo of Dr. Jokichi Takamine taken in 1913. He established the Takamine Laboratory and Chemical Manufacturing Plant in Clifton, New Jersey. Dr. Takamine was born in Takaoka, Japan, on 3 Nov. 1854, and died on 21 July 1922. "His parents were Dr. Seichi and Yuki [sic, Seiichi and Yukiko] Takamine. Soon after completing his preparatory educational training, Dr. Takamine entered upon a special course of study in the department of chemistry and engineering in one of the leading colleges in the city of Tokyo, and from there entered the Imperial University of Tokyo, from which institution he graduated in 1879. He next was sent by the Imperial Japanese Government as a student to the University of Glasgow, and the Andersonian University, in Scotland, where he remained for three years, 1879-81." He received the degree of Doctor of Chemical Engineering from the Imperial University of Japan, in 1899, and the degree of Doctor of Pharmacy in 1906. In 1881 Dr. Takamine entered the agricultural and commercial department of the Imperial Japanese Government in the city of Tokyo, the duties of which position he faithfully discharged up to 1884, after which he became the Imperial Representative of the Japanese Chamber of Commerce to the Cotton Centennial Exposition in New Orleans, 1884-85. Soon after entering actively upon his chosen line of work, Dr. Takamine organized and erected the first superphosphate manufacturing works in Tokyo in 1877 [sic, probably 1887].

"In 1890, desiring to apply his time and skill to further investigation and studies in his chosen line of work, he decided to emigrate to the United States. Soon after his arrival here he began to apply his methods and processes of conversion and fermentation to practical use, which efforts finally resulted in the production of diastatic enzyme ("Takadiastase") which is now largely used as a starch digestant. He next established a research laboratory in New York City where he originated a process for isolating the active principle of the suprarenal glands [a term first used in 1876, later more commonly called adrenal glands (a term first used in 1875)]. This product became known in scientific and medical fraternities as 'adrenalin.' In 1920 Dr. Takamine was the consulting chemist for Parke, Davis & Company in Detroit, Michigan. His studies and investigations in chemistry caused him to become well and favorably known in professional and scientific circles in every civilized country of the world.

"In addition to his many professional and technical responsibilities in New York City and the immediate vicinity, Dr. Takamine likewise became identified with other commercial enterprises in his line of endeavor. He was president of the Takamine Ferment Company of Chicago, Illinois, the Takamine International Ferment Company and the Takamine Ferment Company of New York. He was also a member of the firm Takamine & Darby, with offices at 220 Broadway, New York City. He was president of the firm Sankyo & Company, Limited, the largest manufacturers of chemicals and pharmaceuticals in Japan, with offices in the city of New York, London, and Tokyo, Japan, and was vice-president of the Asia Aluminum Company of New York and Tokyo." In 1913 the Emperor of Japan appointed him a member of the Royal Academy of Science. In 1915 Dr. Takamine was decorated by the Emperor of Japan with the 4th Order of the Rising Sun.

"Jokichi Takamine married, August 10, 1885, Caroline Hitch, of New Orleans, Louisiana. His home was at No. 334 Riverside Drive, New York City, and his office in the Equitable building, New York City."

Dr. Takamine had a son named Jokichi Takamine Jr., whose biography is given. Born in Tokio, Japan, on 28 Aug. 1888, he came to the USA when he was only 3 years old with his parents, who established their residence in New York City. "His education was obtained at Horace Mann, a private school in New York City." He prepared for college at Andover [Philipps Academy], the famous "prep" school in Andover, Massachusetts. He attended college at Yale



University, graduating in 1913 "with the degree of Ph.B." [Bachelor of Philosophy, a degree which usually involves considerable research]. "His scientific studies at Yale were obtained at one of its well-known departments, the Sheffield Scientific School. For further advanced studies in chemistry he next took a course of studies at the Pasteur Institute in Paris. In 1915 he returned to America and at once became connected with the Takamine Laboratory, Incorporated, New York City, which in November 1915 was removed to Clifton, New Jersey." Among the firm's products is their well-known "Polyzime." His residence is No. 93 Boulevard, Passaic. He was married on 4 June 1917 to Hilda Petrie of New York City.

329. Takamaine, Jokichi. 1922. Collected papers (Archival collection). *
• ***Summary:*** This archive of Takamine material is at the University of Wisconsin School of Pharmacy.

330. Estate of Jokichi Takamine. 1923. To close estate of late Doctor Jokichi Takamine (Display ad). *New York Times.* June 17. p. 5. Real estate section.
• ***Summary:*** "Cost over $250,000. For sale $70,000. Sho-Foo-Den, Merriewold Park, Sullivan County. Twenty acres in restricted preserve of fifteen hundred acres, which in itself is surrounded by large neighboring private parks. Suitable for residence or club; altitude fifteen hundred feet; tennis, water sports, fishing and hunting–deer, partridge, rabbits, snipe, &c. Forty acres adjoining residence could be used for golf. Buildings in finest Japanese architecture–main building designed after old Imperial Palace in Kyoto, Japan. Living and dining rooms, 48 feet long, 25 feet wide. Walls covered with Gold Leaf [gold that has been hammered into extremely thin sheets]; painted by famous Japanese artists; six large master bedrooms; two baths; four servants' rooms, bath. Fifteen acres of exquisite Japanese gardens and miniature lakes. Boathouse on large lake. Excellent roads, all improvements and conveniences. For particulars apply Estate of Jokichi Takamine, 120 Broadway, New York City. Telephone Rector 7885."

Above the ad text is a large photo of the entranceway to the main building taken from the base of some stairs.

Note: This ad also appeared in the *New York Times* on June 24 (p. 7) and July 22 (p. 5). Address: 120 Broadway, New York City.

331. Takamine, Jokichi; Takamine, Jokichi, Jr. 1923. Enzymic substance and process of making the same. *U.S. Patent* 1,460,736. July 3. 5 p. Application filed 30 July 1921. [1 ref]
• ***Summary:*** Seed spores of *Eurotium oryzae* or a similar fungus are propagated on sterilized wheat bran. The enzymic product is strongly diastatic, and is also proteolytic and possesses some milk-coagulating and fat-splitting properties. It is suitable for use in destarching cotton fabrics, degumming silk, and in bread-making. Address: 1. New York City, NY; 2. Clifton, Passaic County, New Jersey.

332. Wooyenaka, Keizo. Assignor to Jokichi Takamine, of New York, N.Y. 1923. Process for the recovery of the active principle of the suprarenal glands. *U.S. Patent* 1,460,832. July 3. 5 p. Application filed Dec. 27, 1920. [4 ref]
• ***Summary:*** Note: In June 1900 Keizo Uenaka first isolated adrenaline while working as chemist and assistant to Jokichi Takamine in New York. He is now living in Tokyo, Japan. Address: Tokyo, Japan.

333. Akamatsu, S. 1923. Ueber das Vorkommen von Glycerophosphatase in der "Takadiastase" [On the incidence of glycerophosphatase in Taka-diastase]. *Biochemische Zeitschrift* 142:184-. [Ger]*

334. Akamatsu, S. 1923. Ueber Lecithinspaltung durch "Takadiastase" [Hydrolysis of lecithin by Taka-diastase]. *Biochemische Zeitschrift* 142:186-. [Ger]*

335. Takahashi, Y. 1924. Ueber das Vorkommen von Inulase der Takadiastase [On the incidence of the enzyme inulase in Taka-diastase]. *Biochemische Zeitschrift* 144:199-202. Jan. 4. [8 ref. Ger]
Address: Institute for Experimental Therapy and Biochemistry, Berlin, Germany.

336. Land deed: Jokichi Takamine, Jr. and Hilda Takamine, his wife, sell their land at Merriewold to Charles Dill (Sullivan County, New York). 1924. New York. 2 p. Aug. 27. In Book 234, p. 246-47.
• ***Summary:*** The land being sold is "in Merriewold Park, Town of Forestburgh, County of Sullivan, and State of New York, being Lot No. 10 in Plot E. as shown on a map of Merriewold Park, filed in the Sullivan County Clerk's office and being one of the lots described in a deed from Caroline H. Takamine to Jokichi Takamine, Jr., and Hilda Takamine, his wife, by deed dated September 22, 1922 and recorded in the Sullivan County Clerk's Office September 21, 1922 in Liber [Book] 221 of Deeds at page 267." Address: Sullivan County, New York.

337. *Republican Watchman* (*Monticello, New York*). 1925. Mrs. Eben Takamine gets divorce: Claims husband threatened her with bodily harm. Takamine family has fine summer home near Monticello. May 22. p. 1.
• ***Summary:*** Reno, Nevada, May 19.–Mrs. Ethel Takamine has obtained a decree of divorce here today from Eben Takamine, New York machinery exporter and son of the famous Japanese chemist, Jokichi Takamine, originator of adrenaline and head of the Takamine Laboratories, whose wife was Caroline Hitch, of New Orleans.

"Concealing her identity during her residence, Mrs. Takamine's case excited no interest until her father-in-law's identity was disclosed.

"Takamine has an ungovernable temper, his wife told the court, frequently flying into a rage and threatening her with bodily injury. She testified that she frequently came home under the influence of liquor and under those conditions neglected her for long periods at a time.

"The Takamines are well known in Monticello, the family having erected a fine summer residence a few miles from here. The late Dr. Takamine erected the buildings in Japanese architectural designs and made the extensive grounds in keeping. The Japanese government presented the buildings for its exhibition at the Buffalo [sic, St. Louis] Exposition, to Dr. Takamine, and he had them removed to his place here and reconstructed. The place is one of the show places of Sullivan County."

338. Takamine, Jokichi, Jr. Assignor to Takamine Ferment Company (New York, NY; a corporation of West Virginia). 1925. Starch-free bran and method of making the same. *U.S. Patent* 1,543,458. June 23. 2 p. Application filed 14 Sept. 1922.
• ***Summary:*** Wheat bran is cooked until the starch cells are opened, mixed with diastatic enzyme to convert the starch into dextrin and sugars, and washed to remove these conversion products. The residual wheat bran is suitable for use as a laxative food ingredient. Address: Clifton, Passaic County, New Jersey.

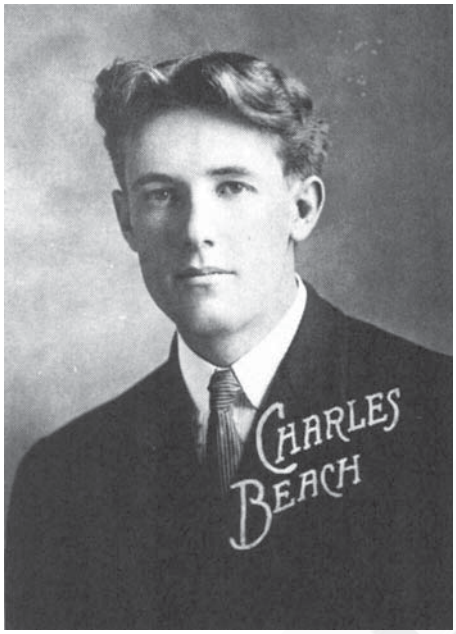
339. Takamine, Jokichi, Jr. Assignor to Takamine Ferment Company (New York, NY; a corporation of West Virginia). 1925. Enzymic beverage. *U.S. Patent* 1,561,955. Nov. 17. 1 p. Application filed 17 Nov. 1919.
• ***Summary:*** Beverages having diastatic and proteolytic properties are prepared by isolating a water-soluble enzymic composition derived from a fungus, such as *Aspergillus oryzae*, and mixing this enzymic material with dissolved cane sugar to produce a thick syrup suitable for dilution with water. Address: Clifton, Passaic County, New Jersey.

340. Maslow, Herman L.; Davison, Wilburt C. 1926. The effect of the hydrogen ion concentration upon the starch-liquefying activity of amylase of *Aspergillus oryzae. J. of Biological Chemistry* 68(1):83-93. April. [17 ref]
• ***Summary:*** The optimal reaction for the starch-liquefying activity of the amylase of *Aspergillus oryzae* (taka-diastase) was pH 3.0. The amylase was completely destroyed at pH 1.0 and 2.0 with unbuffered starch and at ph 2.0 and 3.0 with starch buffered with N/2 universal buffer. Address: Dep. of Pediatrics, the John Hopkins Univ. School of Medicine, Baltimore, Maryland.

341. Maslow, Herman L.; Davison, Wilburt C. 1926. The effect of the hydrogen ion concentration upon the dextrin-liquefying activity of dextrinase of *Aspergillus oryzae. J. of Biological Chemistry* 68(1):95-99. April. [3 ref]
• ***Summary:*** "Conclusions: 1. The viscosity of 15.0% dextrin

solution was but slightly affected by changes of reaction from pH 2.0 to pH 9.0. 2. The optimal reaction for the dextrin-liquefying activity of the dextrinase of *Aspergillus oryzae* (taka-diastase) was pH 4.0 when determined by the viscometric method at 34ºC. 3. The dextrinase was completely inhibited at pH 2.0." Address: Dep. of Pediatrics, the John Hopkins Univ. School of Medicine, Baltimore, Maryland.

342. Record of marriages: Marriage license. Charles P. Beach and Caroline Takamine. 1926. Arizona. 1 p. Aug. 16.



• ***Summary:*** "State of Arizona, Country of Pima... to join in marriage Charles P. Beach, age 39 years, and Caroline Takamine. age 46 years, and to certify the same according to law. Witness my hand and official seal this 14th day of August A.F. 1926..."

"Marriage certificate: I do hereby certify that Charles P. Beach and Caroline Takamine were joined in marriage by me at Tucson in the County of Pima on the 16 day of Aug. 1926. Witnesses: Arturo Carillo, Phoenix Brown [for the groom], P. [Rev. Peter] Timmermans, Catholic Pastor, Minister.

Note: They were married in St. Augustine's Cathedral. Tucson, Arizona. Certified copy obtained from the Pima County Clerk of Superior Court, Tucson, Arizona, for $26.00.

343. Shiobara, Matasaku. 1926. Takamine hakase [Dr. Takamine]. Tokyo: Ozorasha 244 p. Aug. 22. 23 cm. [Jap]*
• ***Summary:*** This is widely considered to be the best, most important biography of Dr. Takamine ever written in Japanese. Many of the subsequent biographies were based on it. Unfortunately, it contains no genealogical information about the family in which Jokichi Takamine was a child. The author lived 1877-1955.

The book was reprinted in 1998 (244 + 6 p.) but with a subtitle: *Takamine Hakase: Denki Takamine Jokichi* [Dr. Takamine: Biography of Jokichi Takamine]. Address: Japan.

344. Takamine, Jokichi; Takamine, Jokichi, Jr.; Fujita, Nobuchika. 1926. Manufacture of bread. *U.S. Patent* 1,599,930. Sept. 14. 2 p. Application filed 25 March 1922.
• ***Summary:*** Describes an enzymic composition for use in making bread. A stable composition is prepared from glucose syrup and an extract from a fungus such as *Aspergillus oryzae;* it has diastatic and proteolytic properties. Address: Passaic County, New Jersey.

345. Oshima, Kokichi; Itaya, Shinichi. 1926. Kôji-kin kôso-zai (Taka jiasutaaze) o mochiiru denpun shinteiryô-hô [A new method for determining the amount of starch using the koji enzyme (Takadiastase)]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 4(2):95-106. Sept. [13 ref. Jap]
Address: 1. Hokkaido Teikoku Daigaku, Suisan Senmon-bu, Kyoju; 2. Ken Hokkaido Teikoku Daigaku, Jokyoju, Japan.

346. Thom, Charles; Church, Margaret B. 1926. The Aspergilli. 1st ed. Baltimore, Maryland: Williams & Wilkins Co. ix + 272 p. See p. 64, 198-207. [250* ref]
• ***Summary:*** In this work, with its good bibliography, the authors "sought to bring together all of this taxonomic literature, as published before that date, and to present a critical opinion as to the proper relationship of the species described, whether retained in the genus or placed elsewhere. Some 350 names were thus accounted for, but the actual number of species accepted as known in culture or probably determinable from existing literature was given as 69 (p. 252). These were more or less arbitrarily considered in 11 groups."

Chapter 6 titled, "Enzymic and fermentative activities of Aspergilli and their industrial significance" (p. 58-75) includes sections on koji (incl. Takamine, Taka diastase), diastase, protease, soy fermentation (incl. soy sauce), and miso (with 7 references). Address: Microbiological Lab., Bureau of Chemistry, USDA.

347. Horvath, A.A.; Liu, Shin-Hao. 1927. The effect of soy sauce on blood sugar and phosphorus. *Japan Medical World* 7(4):105-08. April 15. [18 ref]
• ***Summary:*** "Introduction: Shoyu, or soy sauce, is a dark-brown, moderately thick liquid, very popular in China and Japan as relish or condiment to increase the flavor and palatability of the diet (Footnote: The now famous Lea and Perrins Worcestershire Sauce is a highly spiced soy sauce). In order [sic, odor] and taste it is not unlike a beef extract of good quality."

"Summary: 1. In rabbits, subcutaneous injections of Taka-Diastase gives no definite results for conclusions, but

seems to be capable of affecting the blood sugar in both directions. 2. In men the results of oral administration of soy sauce are varying and at present no definite conclusion concerning the effect of soy sauce on blood sugar and phosphorus can be drawn. But in some cases soy sauce seems to be capable of affecting the blood sugar and blood phosphatides." Address: Dep. of Medicine, Peking Union Medical College, Peking, China.

348. Takamine, Jokichi; Takamine, Jokichi, Jr.; Takamine, Caroline. Assignors to Takamine Ferment Company, of New York, N.Y. (A Corporation of West Virginia). 1928. Method of laundering. *U.S. Patent* 1,660,458. Feb. 22. 4 p. Application filed Dec. 17, 1921. [4 ref]

• ***Summary:*** Note: This patent was filed when Jokichi Takamine was still alive; he died on 22 July 1922. However it was issued after he died.

"This patent relates to an improved method of laundering.

"The object of the invention is to provide a method for use in laundries for digesting, that is, liquefying and converting into soluble condition, the starch contained in the articles being laundered, or which has previously been applied to the surface of such articles, to permit the easy and ready removal of such starch or the, release and removal of any soil or dirt deposit on the starchy surface." Address: 2. Passaic, New Jersey. Administratrix of Said Jokichi Takamine, deceased.

349. *New York Times.* 1928. Eben T. Takamine weds show girl: Son of noted Japanese chemist and Odette Jean married in Elkton, Md. A surprise to friends. Former Ziegfield Follies member and New York business man make plans hurriedly. July 27.

• ***Summary:*** Eben Takashi Takamine, Yale graduate in 1913 and son of the late Dr. Jokichi Takamine, famous Japanese chemist, was married to Miss Odette Jean of New York City on Wednesday [July 25] in Elkton, Maryland–it was learned yesterday. She was formerly a member of the Ziegfield Follies. Plans for their marriage were not made known in advance; it will come as a surprise to many of their friends.

The couple motored from New York City to Elkton, accompanied by Miss Betty Allen, the bride's sister, and Jokichi Takamine, a brother of the bridegroom.

The marriage took place in the manse of the First Presbyterian Church by the pastor, the Rev. Dr. Wagner. "This was the second marriage for each."

Yesterday the bride and groom were receiving friends at the Hotel Gladstone, 114 East 52nd St, where they plan to remain until they leave for Florida.

Mr. Takamine, age 37, who has been living at the Yale Club, said the marriage was not a runaway affair, even though it had been planned rather hurriedly. He spoke enthusiastically of his bride as an accomplished singer and pianist. The bride, age 26, said the marriage was the culmination of a 3-year romance. She said that four years ago she had appeared in George White's "Scandals" [a long-running string of Broadway revues that ran from 1919 to 1939, modeled after the Ziegfield Follies, and featuring underdressed chorus girls strutting to the "Scandal Walk"]. She is the daughter of William Jean of Birmingham, Alabama. Here first marriage ended in divorce.

"Mr. Takamine's first wife was Miss Ethel Johnson, daugther of the late Rev. and Mrs. William Johnson of Evanston, Illinois." They were married in Sept. 1915 in New York City. "On May 16, 1925, Mrs. Takamine obtained a divorce at Reno [Nevada] on the ground of extreme cruelty.

"After the divorce, Mr. Takamine, who is a manufacturer and exporter of machinery, with offices at 120 Broadway, went to Arizona for a while" [where he visited with Charles P. Beach].

There follows a description of the bridegroom's father, Mr. Jokichi Takamine, and his many major accomplishments. He was well known in the United States and Japan for his work to create better relations between the two countries. He also founded the Nippon Club of New York, the Japan-American Society, and the Chemical and Physical Research Society of Japan.

350. Land deed: Charles P. Beach buys 320 acres of land near Vail, Pima County, Arizona, from J.E. Stewart and his wife, Blanche, for $10 in gold coin. 1928. Arizona. 1 p. Dec. 8. In Deed Book 131, p. 170.

• ***Summary:*** Beach purchased the East half of Section 30 in Township 17 South, Range 16 East, G&SRB&M (Gila & Salt River Baseline & Meridian). This property was purchased subject to a mortgage which the Stewarts's had taken out January 24, 1922 with Southern Arizona Bank & Trust Company in the amount of $1,500. This mortgage as recorded in Mortgage Book 51, Page 449 was assumed by Charles P. Beach who agreed to pay it.

Note 1. The price of this land may well have been $10 in gold coin. For details on all of these Arizona land deeds, see the Aug. 2012 summary by Wayne Dawson who painstakingly located the deeds and drew the beautiful maps.

Note 2. It may be hard to find exactly where Charles (a ranch hand) was living when he and Caroline met in early 1926. We know they were married on 16 Aug. 1926. It is not clear why they waited more than 3 years to make their first land purchase.

351. Kawakami, K.K. [Kiyoshi Karl]. 1928. Jokichi Takamine: A record of his American achievements. New York, NY: William Edwin Rudge. x + 74 p. Foreword by John H. Finley. No index. 24 cm. [Eng]

• ***Summary:*** This is the earliest known English-language biography of Dr. Takamine. Contents: Foreword by John H. Finley, President of the College of the City of New York

("The story which is here told is one of the most romantic in modern life"). 1. The house of Takamine. 2. The dawn. 3. Youth. 4. England. 5. A new field. 6. New Orleans [Louisiana]. 7. The first venture. 8. Caroline Hitch. 9. A quandary. 10. A revolutionary process (for the production of diastase). 11. A Peoria episode. 12. Between life and death. 13. Taka-Diastase. 14. Glycerin. 15. Adrenalin. 16. Unknown admirers. 17. The triumph. 18. A man of affairs. 19. Other activities. 20. The Riverside mansion [334 Riverside Dr., Manhattan, New York City]. 21. Sho-Foo-Den. 22. And death is beautiful.

Birth: "For generations his forbears were physicians practicing in a city in the Province of Echigo [in north-central Japan on the shores of the Sea of Japan]. His father, Seiichi Takamine, moved to the castle city of Kanazawa in the Province of Kaga, and there continued to practice medicine. He had studied the Dutch language and through its medium acquired a knowledge of the European science of medicine and chemistry" (p. 1-2).

"On November 3, 1854, Seiichi Takamine and his wife Yukiko were blessed with a son" [Jokichi]. Jokichi was their first son (p. 3-4, 6). In March of that same year (1854) Commodore Matthew Perry, after forcing his way into Edo (now Tokyo), signed a treaty of amity and commerce (at Kanagawa, now known as Yokohama) between the Shogunate and the United States. "That memorable treaty opened with these ringing words:

"'There shall be a perfect, permanent and universal peace and a sincere and cordial amity between the United States of America on the one part and the empire of Japan on the other, and between their people respectively without the exception of persons or places.'"

"A new era had dawned upon Japan... And it was the glow of that great dawn which greeted the birth of the first son of Seiichi Takamine.

Youth: Farsighted Japanese leaders realized "that only by adopting the arts and sciences of the Occident could Japan cope with the new pressure thus brought to bear upon her. She had to meet Europe and America in her own arena.

"It was this recognition that persuaded the Lord of Kaga, of whom Seiichi Takamine was a retainer, to send a number of promising young men of his province to Nagasaki, the open port which had long been the only 'window' through which Japan could obtain fleeting glimpses of the strange people and stranger things of the West. Jokichi, the eldest son of the learned and aspiring Seiichi Takamine, was among the few chosen.

"A mere boy of twelve, Jokichi bade farewell to his parents and journeyed six hundred miles from Kanazawa, his native city, to the port of Nagasaki. In those days in Japan, the railway was unknown and the steamship, a bewildering monstrosity. Upon his arrival in Nagasaki Jokichi was placed in the home of the Portuguese Consul in the hope that he, thus removed from Japanese associations, might learn English the more quickly. When the Consul was found to be more or less versed in Japanese, Jokichi was taken to the home of another foreigner.

"When young Takamine was 18 years old [about 1872] he moved to the ancient city of Kyoto, long the seat of the Imperial Court, and there continued the study of English. Soon afterward he went to Osaka and entered a medical school. Before long, however, he found chemistry more fascinating than medicine, causing him to change his original intention of succeeding his father as a practicing physician.

"England: In 1872 Jokichi Takamine went to Tokyo, the new capital of New Japan, whither the Imperial Court and Government had moved from the classic city of Kyoto only four years before, there entered the College of Science and Engineering just established by the Government. Here Takamine spent six years devoting his energies to the study of chemistry and allied sciences. He was one of the twenty-three students who were selected to study at the Government's expense.

"When he graduated from the College in 1880 his ability and scholarship met with the recognition of the Government to such an extent that he, together with eleven of his fellow graduates, was ordered to go to England for further study. Shortly after his arrival in England he wrote home expressing his wonder and amazement at the sights and things which had greeted his eyes in that strange country. The letter read:

"'I have spent 18 days in London and have just come to Glasgow, the largest city in Scotland. Glasgow is about four hundred miles from London. It is not larger than Osaka in area, but as a population larger than that of Tokyo. This is because the houses are several stories high. It is a manufacturing city with thousands of chimney stacks piercing the clouds and murking the skies with black smoke. Naturally the air is very bad. All houses are of stone, and have three to seven floors... The tram cars run in all directions and are very convenient. London has an even more convenient conveyance, and that is the underground railway...'

"Takamine spent three years studying at both Glasgow University and at Andersonian University. During the summer vacations he visited factories, especially those manufacturing soda and artificial fertilizers, in Newcastle, Liverpool, Manchester and other industrial centers..."

"A new field: After three years of hard study in England Takamine returned to Tokyo in 1883, and was immediately given a position in the Department of Agriculture and Commerce. His work here was to study some of Japan's indigenous industries, such as the manufacture of paper, indigo, and saké (wine), with a view to improving them and finding out their future possibilities."

"New Orleans: Hardly had Takamine embarked upon the coveted work in the Department of Agriculture and Commerce when he was sent to the United States. In 1884, New Orleans held an international exposition and

invited Japan to participate in it. The Japanese Government accepted the invitation and appointed Takamine one of the commissioners."

The "exposition offered the young scientist a rare opportunity to observe the progress and achievements in industries and applied sciences of all countries of the world."

"Among the exhibits which attracted Takamine's particular attention was the phosphate rock from South Carolina." Wanting to learn more, Takamine went to Charlestown, South Carolina, and visited all the fields where phosphate rock was obtained, as well as the factories where it was turned into fertilizer.

This, in fact, proved to be "the beginning of Takamine's first industrial enterprise in Japan."

"Caroline Hitch [and marriage]: When Takamine was in New Orleans [in 1884] as a commissioner to the Exposition, romance entered his life." He found "in a New Orleans girl his future helpmate and life companion." "In New Orleans there was an old and respected family named Hitch. Colonel Eben Hitch was a veteran of the Civil War. His daughter, Caroline, young, winsome, active, was well known in the social circles of the southern city and was a popular figure at various functions given by the Exposition and by the foreign commissions. When Takamine returned home at the close of the Exposition, Caroline Hitch was not with him. Although fervently in love, Takamine took a cautious and wise course for her and his own sake." He was still a young man of thirty and he did not have a secure position or income. In 1887, his financial situation improved, Takamine went "to New Orleans to fulfill the engagement he had made with Caroline Hitch two years before. Having been married at the home of the bride, the couple journeyed to Japan–to her the first trip to the land of her dream" (p. 18-20).

Note 1. The birth of their two sons is not mentioned at the time that it happened in Japan. During the trip back to the USA we read: "His young wife, besides nursing two infants born in Japan, tended the sick husband" (p. 28). We finally learn their names at the end of the book (p. 73) as Dr. Takamine's survivors after his death. We are never given their dates of birth or marriage.

352. Kawakami, K.K. [Kiyoshi Karl]. 1928. A Peoria episode. Between life and death (Document part). In: K.K. Kawakami. 1928. Jokichi Takamine: A Record of his American Achievements. New York, NY: William Edwin Rudge. x + 74 p. See p. 28-32. Chap. XI and XII. Foreword by John H. Finley. 24 cm. [Eng]

• ***Summary:*** Chapter 11 begins by noting that 3 days after Takamine and his wife and two infants sailed from Yokohama, Japan, for America, he was taken ill with liver trouble. He feared for the worst and wrote a will. By the time his ship reached Seattle, Washington, his condition had materially improved. "A good rest in Seattle and in San Francisco [California] refreshed him, and when he arrived in Chicago he was able to proceed with the demonstration of his distilling process, substituting bran diastase for malt.

"The first demonstration having proved a success, Takamine was invited to Peoria, the home of the largest whiskey trust in America at the time, and there repeated the same experiment on a larger scale with equal success. A Mr. Greenhut, president of the trust, took immediate interest in the new method and agreed to retain Takamine's service.

"At first the public did not take Takamine's experiment seriously. Many a man shook his head in doubt, and said that no Japanese could accomplish such a wonder as was claimed by Takamine. But soon Takamine's enterprise passed the stage of experiment. Within three years he improved and expanded his plant to such an extent that he could easily dispose of corn, the raw material of whiskey, at the average rate of three thousand bushels a day. Then the people began to take notice. Particularly were the malt manufacturers apprehensive lest the new process should eventually destroy their own business. They let loose propaganda and agitation against Takamine and his method. They conspired to incite their own employees against him by telling them that the new process would rob them of the employment they had enjoyed at the malt factories. But Takamine was equal to the situation. He took the wind out of the sails of the malt manufacturers by giving work at his own plant to the laborers who had been employed at the malt factories.

"This of course did not end the anti-Takamine agitation, for his enemies were out to 'get' him. One night Takamine was awakened by riotous fire alarms, and he was amazed to find the distillery, for which he had been working, in conflagration."

Note: Kawakami does not give the date of the fire, but it was almost certainly 7 Oct. 1891. The name of the distillery is also not given, but it was almost certainly the Manhattan Distillery. The building at the Manhattan Distillery malt house was being prepared to house Takamine's process. No whiskey or other alcoholic beverage had yet been prepared using his process. For details see: *Peoria Transcript* (Illinois). 1891. Oct. 8. p. 8, col. 3. "A hard fight. Everything against the firemen at the Manhattan fire." Therefore we believe the above account is very misleading, and calls into question the accuracy of this entire chapter.

"Was the incendiarism the culmination of the malt manufacturers' agitation? No one, of course, could answer, but the suspicion, in view of what had been going on, was not without ground. In such misfortunes Takamine's innate courage, tenacity and resourcefulness always stood him in good stead. While the factory was still smouldering he asked the directors of the company to assemble for conference, and persuaded them to build a new distillery, so that he could continue the work he had undertaken.

"Although a new plant was built, Takamine's trouble was not to end. Indeed the supreme test was yet to come. One day, in 1894, those of the directors and shareholders of

the company who had been opposed to Greenhut's policy, suddenly called a stockholders' meeting and forced a resolution for the dissolution of the corporation.

"A death blow had been dealt to Takamine's enterprise in Peoria." Note: While Takamine's whisky experiments in Peoria did end in late 1894 or early 1895, it was for more complicated reasons than those expressed in this book.

Chapter 12 explains how this dissolution of the Peoria company brought about the greatest crisis in Takamine's life. His liver problems returned and soon he was constantly tortured with acute pain. Local physicians were agreed that only an operation could save him, but the 150-mile journey to Chicago (the nearest city where the surgery could be performed) might prove fatal. His wife, Caroline, decided to rush him [by train] to Chicago. "The very night they arrived in Chicago, Takamine was operated on by the famous surgeon Henrotin, and for the few days following his life quivered in the balance. But the patient, with the tender care of his devoted wife, fought valiantly, and miracle of miracles, he emerged victorious though the struggle was long and hard."

353. Kawakami, K.K. [Kiyoshi Karl]. 1928. Jokichi Takamine: A record of his American achievements (Continued–Document part II). New York, NY: William Edwin Rudge. x + 74 p. Foreword by John H. Finley. No index. 24 cm. [Eng]

• ***Summary:*** Continued. In the distillery industry, diastase (made from barley malt) "acts as a ferment, converting starch into dextrin and sugar... The sugar thus obtained is converted into alcohol by the use of yeast." In Takamine's process barley malt is eliminated. Sterilized wheat bran is inoculated with a special fungus; after 40 hours "the matter is ready for extraction of diastase. The process, if fully utilized, would revolutionize the distillery industry,..." (p. 25-26).

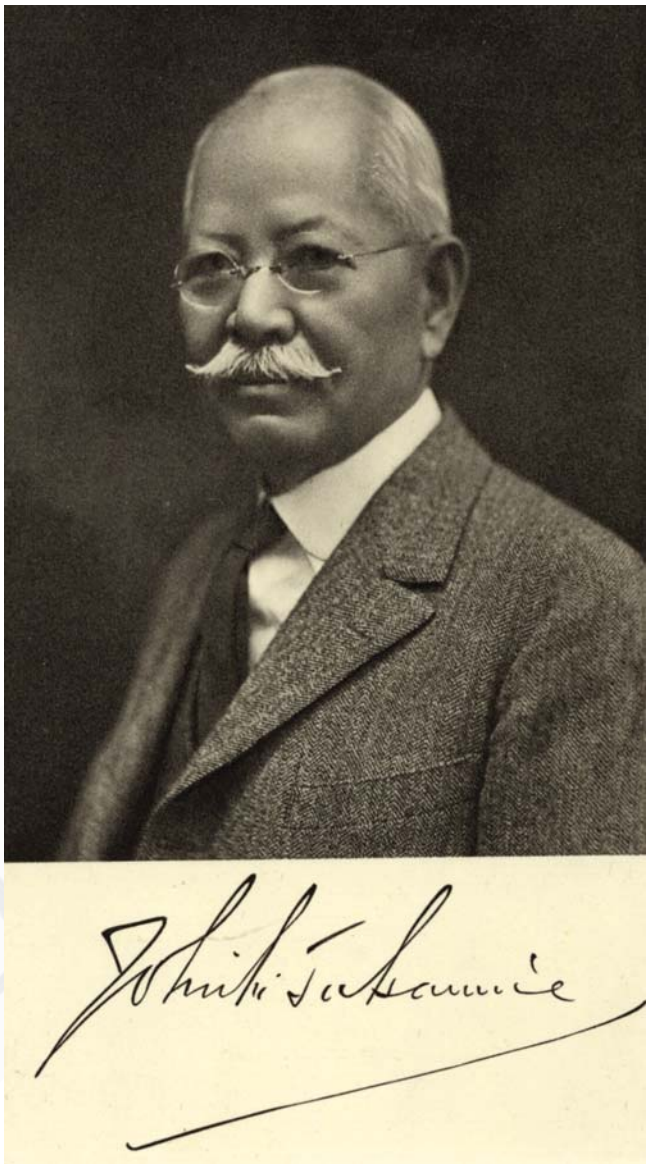
A separate record gives a detailed account of chapters 11 and 12.

"We have seen that Takamine used diastase of his own creation in obtaining alcohol from corn and other grains. He had established the Takamine Ferment Company in order to manufacture diastase for the distillery at Peoria" (p. 33).

"At first Taka-Diastase was made by the Takamine Ferment Company on a comparatively small scale. Later, when its efficacy became more widely known, Parke, Davis & Company of Detroit [Michigan] undertook, as it still does, to manufacture it and put it more extensively on the market" (p. 36).

Note 2. When and where (probably Chicago) was the Takamine Ferment Company established? Who established it–Jokichi Takamine or his mother-in-law? Was the diastase that it made ever sold in Peoria? When was Taka-Diastase first sold? When did Parke, Davis & Co. start to make and market Taka-Diastase?

Adrenalin: In 1897 J.J. Abel announced the discovery



of epinephrine and in 1898 Otto von Furth announced the discovery of supra-renin. In 1901 "Dr. Takamine formally announced the discovery of Adrenalin in a scientific paper read before a medical convention at Johns Hopkins University..." (p. 41-43).

Gene Tunney, the heavyweight boxing champion, wrote Dr. Takamine's son, Eben, on 22 March 1924: "Adrenalin Chloride is absolutely essential in every boxer's corner when engaged in combat. Many a time I have used it and many a time it has turned almost sure defeat into victory for me by stopping the flow of blood and enabling me to see and breathe freely" (p. 45).

"Even before the discovery of Adrenalin, Parke, Davis & Company, in appreciation of the success of Taka-Diastase, had enlisted his services as consulting chemist" (p. 47).

"When Takamine visited Tokyo in 1913 he impressed upon Baron (now Viscount) Shibusawa and other financial

and industrial leaders the necessity of organizing a national institute for scientific research on an adequate scale... It should, furthermore, extend financial assistance to promising but needy scientists." The Rikagaku Kenkyujo (Research Institute in Chemistry and Physics) was eventually established in Tokyo as a result of his efforts (p. 48-50).

"At the International Exposition held at St. Louis [Missouri] in 1904 the Japanese landscape gardens, one of the contributions of the Japanese Government, were a great attraction. Built in the gardens were two structures–one for a reception hall and the other for office purposes of the Japanese Commission. Both were of the classic style of the Heian period. All materials were finished in Japan and brought to St. Louis in parts ready to be put together. Even the massive stone lanterns and ornamental stones, essential parts of typical gardens, were shipped from Japan." Takamine visited the exposition of which he was a member of the jury. When the expo was over he approached the Japanese Commission with a view of removing the buildings and stones and some of the trees to Merriewold Park, one hundred miles from [northwest of] New York City, where he had purchased a villa site. The request was readily granted. The result was a unique country mansion" which Takamine named Sho-Foo-Den ("Pine-Maple-Hall") (p. 68-71).

Death: Jokichi Takamine died on 22 July 1922. The burial rites were held on July 25 at St. Patrick's Cathedral on Fifth Ave., New York City. The "remains were laid to rest in Woodlawn Cemetery." Takamine was sixty-eight years old when he died. The end came after a rather protracted illness, at the Lenox Hill Hospital in New York City. He is survived by his wife and two sons–Jokichi, the elder, who studied at the Pasteur Institute in Paris and has taken charge of the Takamine Laboratory at Clifton, New Jersey, and Eben Takahashi, who graduated from Yale and is managing the Takamine Corporation, the American affiliation of the Sankyo Pharmaceutical Company established in Tokyo by Takamine and Matasaku Shiobara and their associates" (p. 72-73).

Takamine died at age 68, after a protracted illness, of a complicated kidney disease at the Lenox Hill Hospital in New York City. He had had lifelong liver problems.

A nice portrait photo (frontispiece, facing the title page) shows Dr. Takamine, from a portrait by Seymour-Thomas.

A colophon at the rear of the book states that "1,000 copies were specially printed and bound for private distribution."

Note 3. Since this book was apparently commissioned by Dr. Takamine or his heirs several years after his death in 1922, it is often called a "vanity biography." Although it contains much valuable information, it is unclear whether it is completely accurate. It is also unclear whether or not the author ever met or interviewed Dr. Takamine (Kawakami probably met him but probably did not interview him for this book). for this book. Agnes de Mille (1978, p. 126) says: "It was written under the supervision and at the request of Caroline and it reads like a public relations tract."

Note 4. Kiyoshi "Karl" Kawakami (1873-1949) was a Japanese Christian journalist who was born in Yonezawa, educated in the law in Japan, and was for a short time involved in newspaper work in that country. In 1901 he came to the United States and studied at the universities of Iowa and Wisconsin. In 1905, engaged in journalism, he traveled extensively in China, Siberia, and Russia. He was a correspondent for leading newspapers in Tokyo and a frequent contributor to American magazines and newspapers. Kawakami wrote at least 11 English-language books from 1903 to 1938.

354. Quit-claim deed [land for Charles and Caroline Beach in Pima, Arizona]. 1929. Arizona. 2 p. Oct. 11.

• ***Summary:*** This indenture, made on 11 Oct. 1929, "between Guadalupe Lopez and Francisco Lopez, her husband, the parties of the first part, and Charles P. Beach, husband of Caroline Beach, the party of the second part.

"Witnesseth: That the said parties of the first part, for an in consideration of the sum of Ten ($10.00) Dollars, lawful money of the United States of America to them in hand paid by the said party of the second part, the receipt whereof is hereby confessed and acknowledged, have remised, released and quit-claimed, and by these presents do convey, remise, release and quit-claim unto the said part of the second part, and to his heir and assigns forever, all right, title, interest, claim and demand which the said parties of the first part has in and to the following real estate and property situated in the county of Pima and State of Arizona, to wit:

"Section Twenty-nine (29) Township 17 South, Range Sixteen East, G&SRB&M" [Gila & Salt River Baseline and Meridian–reference lines that set all surveys in southern Arizona]; improvement, farm and well equipment thereon;

"and any and all real property of whatever kind and wherever situated in which Guadalupe, one of the grantors, has any interest community or as heir or under any will of her deceased husband Francisco Estrada, including such as she might have acquired under deed from her said former husband dated April 19, 1927 and recorded in Book 115 Deeds of Real Estate at page 533, records of the Pima County Recorders Office."

Note 1. Wayne Dawson of Tucson later discovered that there were more quit-claim deeds than just this one. Here is his summary of various quit-claim deeds. 2012. Aug. 17. "The earliest land owned by Charles P. Beach and his wife Caroline was Section 29, Township 17 South, Range 16 East of the Gila and Salt River Base and Meridian. The land was originally given by Francisco Estrada to his wife, Guadalupe, for the love and affection he held for her on April 27, 1927. He specified that, if she survived him, the land was hers only as long as she remained his widow and did not remarry." She sold the land to Charles, but then she remarried [Mr.

Lopez and/or Fred Mayer], so he apparently had to give the land back, because she did not own the property any more and thus did not have the right to sell it! The "land transactions get complicated with Quit-claim deeds back and forth between Guadalupe (Estrada) Lopez, the Beaches and Francisco Estrada's children. Charles Beach bought the land, then had to give it back, and then finally bought part of it again. The end result of all these deeds described below [in Aug. 2012] is that the Beaches ended up owning the West Half of Section 29, Township 17 South, Range 16 East G&SRB&M by July 20, 1932..."

Note 2. This deed is in D BK 137 [Deed Book 137], p. 493-94, Pima County Recorder, Tucson, Arizona. It was found by Sharon Hunt of Tucson who was instructed to search for "Beach" in their grantee / grantor database. She found no other records but this one. In short: Charles and Caroline Beach acquired the land on which they would build El Rancho de Los Ocotillos after they have been married for 2-3 years. Prior to this, they apparently lived on the ranch where Charles lived when they met.

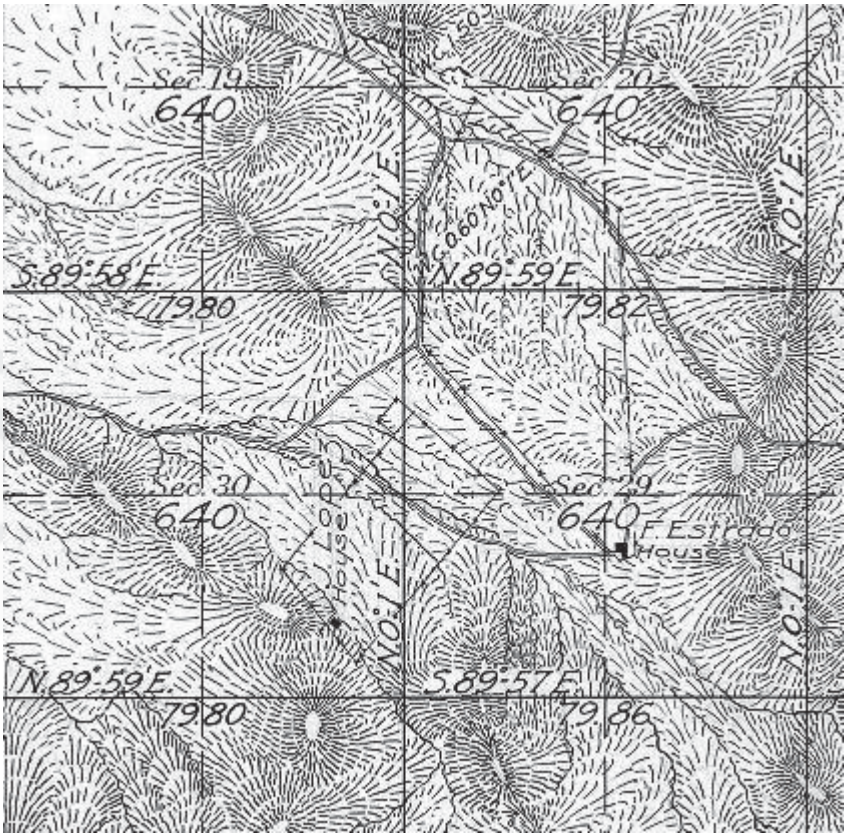
Note 3. A quitclaim deed is a legal instrument. "Unlike most other property deeds, a quitclaim deed contains no title covenant and thus, offers the grantee no warranty as to the status of the property title; the grantee is entitled only to whatever interest the grantor actually possesses at the time the transfer occurs. This means that the grantor does not guarantee that he actually owns the property at the time of the transfer, or if he does own it, that the title is free and clear" (Source, Wikipedia, at Quitclaim deed, 6 Aug. 2012).

Note 4. The Pima County Public Library has Tucson city directories for the years 1926-1935. Charles Beach is not listed in these directories for the years 1926, 1929, or 1935. Why? The librarian thinks he may have lived too far from Tucson (outside the city boundaries) to be within the geographical scope of the directories.

A 1914 Bureau of Land Management map of this area shows the house of J. Lopez in Section 30. This Lopez was probably the father of the Francisco Lopez (above) who executed the quit-claim deed. The rectangle around the Lopez house indicates a barbed wire fence. In Sec. 29 is the house of F. Estrada (see map below).

355. *New York Times.* 1930. Deaths–Takamine. Feb. 23.
• ***Summary:*** "Suddenly in New York City, Feb. 22, 1930. Jokichi, husband of Hilda Petrie Takamine, aged 41 years. Funeral services Tuesday, Feb. 25, at 10:30 A.M., at Christ Episcopal Church, Ridgewood, N.J. [New Jersey]. Interment Woodlawn Cemetery, New York."

356. *New York Times.* 1930. 12-foot fall kills Japanese chemist: Jokichi Takamine, Jr., son of discoverer of adrenalin, fatally hurt at the Roosevelt. Had been in night clubs. Feb. 23.
• ***Summary:*** Jokichi Takamine Jr., son of the well-known



Japanese chemist and president or director of various corporations, died early yesterday morning [Feb. 22] of a fractured skull. At about 5 o'clock he fell twelve feet from a window on the 14th floor of the Hotel Roosevelt to a ledge projecting from the floor below. He died at the Hospital for the Ruptured and Crippled, were it was said he was suffering from acute alcoholism when he was brought there.

According to detectives, Mr. Takamine, age 41, arrived in New York City Friday night after a business trip to Rochester, New York. Together with a night club hostess he visited various pleasure resorts before returning to the hotel, where they had registered earlier in the evening as man and wife. [Note: He was unmarried]. The woman with him gave her name first as Ellen Leenan, and then as Helen Fitts, age 22, of Somerville, New Jersey. Before meeting her it is said he had tried to telephone his wife [who had divorced him in May 1925] at their [sic, her] home at 265 Mountain Avenue, Ridgeway, New Jersey, but upon being told that she was spending the night in New York with friends, he left word with the butler that he would return home the next day.

Note: How could he return home if he was unmarried, and he and his wife had been divorced and living apart for almost 5 years?

Death held accidental: After questioning Miss Fitts, the police declared that they were convinced that the death had been an accident. She told detectives that she had been too intoxicated to remember what places they had visited during the previous evening.

Mrs. Takamine, who like Mr. Takamine's mother is an American [Caucasian], was at his bedside when he died; she learned of the accident when she telephoned home yesterday morning.

Mr. Takamine was born 28 Aug. 1888 in Tokio, Japan, where his father had gone to erect the first superphosphate works in Japan. He was brought to the United States when he was two years old, and attended Horace Mann, Andover and Yale. After graduating from Yale he studied chemistry in Germany and at the Pasteur Institute in Paris, after which he entered business with his father, whose work he carried forward until the latter's death in 1922.

"Officer of several concerns: He was a director of the Bankers Petroleum Company, vice president and director of the Clifton Piece Dye Works, president and director of the International Takamine Ferment Company, director of Takamine & Darby, vice president of the Takamine Ferment Company and president and director of Takamine Laboratory, Inc...

"He is survived by his widow, the former Hilda Petrie; his mother, Mrs. Charles Beach of Vail, Virginia [sic, Arizona]; a brother, Eben Takashi Takamine, whose education and interests are similar to his own; two children, Jokichi 3rd, age 5, and Caroline, age 7. He had planned to sail Wednesday for a vacation to Bermuda."

Note: On 22 May 1925 Hilda Takamine divorced her husband, Jokichi, Jr., in Reno, Nevada.

357. U.S. Department of the Interior, Census Office. 1930. Hilda Takamine (ex-wife of Jokichi Takamine, Jr.) and her children in the 1930 U.S. Census in Ridgewood, Bergen County, New Jersey. Washington, DC. April 8.
• ***Summary:*** District 207. Image 15. 265 Mountain Ave. Hilda Takamine, age 32, born in 1898, head of household, owns home valued $50,000 [about 5 houses in a row on census page at same value!], owns a radio, first married at age 19, in 1917. Widow. Born in New York. Father born in Scotland. Mother born in Norway.

Carolyn H. Takamine, age 6, born in 1924, daughter. Born in New Jersey. Father born in Japan. Mother born in New York.

Jokichi Takamine [III], age 5, born in 1925, son. Born in New Jersey. Father born in Japan. Mother born in New York.

Mable Johnston [sic], age 24, servant, age 24, single. Born in New Jersey. Father born in New Jersey. Mother born in New Jersey.

Charles Luidan, age 25, lodger, chauffeur, born in Germany. Father born in Germany. Mother born in Germany.

Bertha Luidan, age 23, servant, born in Germany. Father born in Germany. Mother born in Germany.

Bertha Luidan, age 3 years, 7 months, born in New Jersey. Father born in Germany. Mother born in Germany.

Note: Hilda was married to Jokichi Takamine, Jr. But she filed for (and was awarded) a divorce on 22 May 1925 in Reno, Nevada.

358. U.S. Department of the Interior, Census Office. 1930. Charles P. Beach and his wife (Caroline Takamine Beach) in the 1930 U.S. Census in Vail, Helvitia Election Precinct, Pima County, Arizona. Washington, DC. April 17.
• ***Summary:*** Household No. 3. Charles P. Beach. Head of Household. Owner of his home and land. The value of their home, $5,000, is crossed out. They do not own a radio set. The family does live on a farm. He is a white male. Age 41. Married. Age at first marriage: 37.

His birthplace: Kansas. Father's place of birth: Connecticut.

Mother's place of birth: Indiana.

Spouse's name: Caroline Beach. She is a white female. Age 21 [sic, 63]. Married. Age at first marriage: 21 [To Jokichi Takamine].

Birthplace: Massachusetts. Father's place of birth: Massachusetts. Mother's place of birth: Louisiana.

359. Takamine, Jokichi; Takamine, Jokichi, Jr.; Fujita, Nobuchika. Assignors to Takamine Ferment Company (New York, NY; a corporation of West Virginia). 1930. Vitamine product and process of obtaining the same. *U.S. Patent* 1,756,574. April 29. 5 p. Application filed 18 April 1924.
• ***Summary:*** The 1st inventor is: Jokichi Takamine, deceased.

The patent application was filed, after his death on 22 July 1922, by his wife and administratrix, Caroline Takamine, of New York, N.Y.

This invention related to obtaining water-soluble vitamines, in a chemically pure state, from the propagation of vegetable fungi.

"A further object is to combine protein containing materials such as cereals, grains, soya beans, and the like, or the husks, brans, germs, and other portions thereof..."

"1. The process of obtaining vitamines which consists in developing and propagating vegetable fungus of the genus Aspergillus upon a culture medium, then extracting the vitamine product and other water soluble products contained in the resulting mass."

Note: The term "soya beans" appears several more times in this patent. They are used as one ingredient in a "culture medium upon which the vegetable fungus is propagated..." Address: 1. Deceased, late of Passaic County, New Jersey; 2. Administratrix; 3. Clifton, New Jersey; 4. Tokyo, Japan.

360. Land deed: Caroline H. Beach (formerly Caroline Takamine Beach) of Vail, Arizona, sells her land and Sho-Fu-Den at Merriewold (Sullivan County, New York) to Moodyson Corporation, a Delaware Corporation. 1930. New York. 3 p. June 16. In Book 275, p. 129-31.
• ***Summary:*** Moodyson Corporation has its place of business and office at 65 Broadway New York City, New York. She sells: "All that tract or Parcel of land in the town of Forestburgh, Sullivan County, New York, known as the Takamine Homestead Property and being Lots One (1) to twenty-five (25) both inclusive and parts of" lots 25 and 27 in Plot G: and Lots 1 and 2 in Plot A, as shown on a map of Plots A., J. and G. of Merriewold Park, filed in the Sullivan County Clerk's office. "The premises intended to be conveyed are particularly shown on a map entitled Map of Lands belonging to Mrs. Caroline Takamine, Merriewold Park, Sullivan County, New York. made by Irving Righter, C.E., June 1908. The entire homestead property above described being bounded..." Address: Sullivan County, New York.

361. *New York Evening Post.* 1931. Oriental fete at Moody home. Aug. 21. p. 11. Special dispatch.
• ***Summary:*** "Merriewold, N.Y., Aug. 21.–The beautiful Japanese home, Sho Foo Den, of Mr. and Mrs. John Moody of New York will be thrown open to about 250 invited guests from the Merriewold Country Club and from near-by cities tomorrow evening at 9 o'clock, when Mrs. Moody will entertain with an Oriental fete, with guests in Oriental costumes."

For several years after the re-establishment of Sho Foo Den at Merriewold, "Japanese landscape gardeners and mural painters worked for the improvement of the grounds and the decoration of the interior of the palace. Today, Sho Foo Den presents a finished picture of medieval Japanese architecture set in a landscaped grounds shaded by large original pines and with pools, walks, shrines, bridges and Japanese cherry trees and dwarf pins and maples setting off the carefully planned vistas. More than 20,000 rhododendrons have been replanted to form an encircling hedge to the estate." A list of the performers and the invited guests is given.

362. *Brooklyn Daily Eagle* (*New York*). 1931. Oriental fete in Catskills. Aug. 23. p. 20B.
• ***Summary:*** "Merriewold, N.Y. Aug. 22–Close to 200 members of the Catskills resort colony and others were the guests of Mrs. John Moody of New York tonight at an Oriental Fete at her beautiful Japanese home, Sho Foo Den, on the estate of the Merriewold Country Club. All guests appeared in an Oriental costume.

"Miss Edith Piper of the American Opera Company and Mrs. William J. Clark, former light opera prima donna, who is well known in theatrical circles for her work in the Victor Herbert Operas, sang arias from Madam Butterfly."

363. Hashizume, Kei. 1931. Kyojin Takamine [The great man, Takamine]. Tokyo: Sankyo Co., Ltd. 85 p. Sept. 1. 23 cm. [Jap]*
Address: Kanazawa, Japan.

364. Harada, Taichi. 1931. Preparation of *Aspergillus oryzae* enzymes. *Industrial and Engineering Chemistry* 23(1):1424-27. Dec. [29 ref]
• ***Summary:*** *Aspergillus oryzae* enzymes are widely used in the food and textile industries in the Far East. They are used to make soy (Shoyu) sauce, miso, and saké. The source of the enzymes [koji] contains two important enzymes–diastase and protease. This paper describes "certain properties of *Aspergillus oryzae* enzymes which were obtained by Takamine's method" (described in this journal, 1914). Address: Dep. of Biochemistry, New York Post-Graduate Medical School, Columbia Univ., New York, N.Y.

365. Hitch, Daisy. comp. 1931. A Hitch orchard. 4 vols. Floral Park, New York.
• ***Summary:*** Note: This book was reprinted, with minor editing, in 1994 by Edna Hitch Bennett of Birmingham, Alabama, and Paul E. Hitch of Savannah, Georgia.

Mary Beatrice Field married Ebenezer Vose Hitch, son of Frederick Augustus Hitch (#109) and Caroline Amanda Soule, in about 1865 in Louisiana.

Frederick Augustus Hitch was born on 4 Jan. 1811 G.S. [Grave Stone] Record. He died on 6 Aug. 1871 G.S. Record. He was married on 12 Sept. 1833 to Caroline Amanda Soule; she was born on 30 Sept. 1812–G.S. Record and she died on 22 April 1888–G.S. Record.

"Frederick A. Hitch was a sailmaker. He lived in

Fairhaven, MA, on next street to his brother Hardy. He is buried in the same plot as his son Ebenezer (Eben) Voss Hitch in Fairhaven, MA. The compiler copied these dates of birth and death from the gravestones." The couple had 8 children, born between March 1836 and about 1857. The 3rd of these children (#216) was Ebenezer (Eben) Hitch.

Ebenezer Vose Hitch was born on 20 Sept. 1841 (G.S. Record) in Fairhaven, Bristol County, Massachusetts, and died on 1 Oct. 1914 in New York City. He was buried about 4 Oct. 1914 in Woodside Cemetery, Main & Morgan Streets, North Fairhaven, Bristol Co, Mass.

"I never met Cousin Eben's first wife but visited at his home after his second marriage. His second wife was a pleasant English girl who has now–1930–been living in England for several years. Cousin Eben, a very fine man, was blind several years before his death. He resided in many places, Fairhaven, New Orleans, Chicago, New York, England where he courted his second wife and possibly other places. Business caused him to move about. His Civil War service follows; -

"Was a private–3rd. Mass. Cavalry–Sept. 27, 1861 Capt. 2nd. Louisiana Cavalry–July 4, 1864. Reg. consolidated with 1st Louisiana Cavalry Sept. 7, 1864. Mustered out Dec. 18, 1865."

Ebenezer and his first wife, Mary Fields [sic, Field] (#432), had 5 children, the eldest being: Caroline Fields [sic, Field] Hitch, born 5 Aug. 1866.

Ebenezer and his 2nd wife, "Muriel–a young English girl, had 1 child, Violet Hitch, born 28 Nov. 1908.

Caroline Fields Hitch was born Aug. 5, 1866 at Falmouth, MA. Death–unknown. Married (#1): 10 Aug. 1887 to Jokichi Takamine at New Orleans, Louisiana. Jokichi was born on 9 Nov. 1854 at Kanazawa, Kaga, Japan. He died on 22 July 1922 at New York City. Married (#2) in 1926 to Charles Beach of Arkansas [sic, Arizona].

"Caroline Hitch was a beautiful girl residing in New Orleans at the time she married Dr. Takamine, the noted scientist. After her second marriage, she went to live on a ranch in the west.

"Dr. Takamine discovered adrenaline and takadiastase. He was also a financier and a patron of the arts especially the arts of his native land. His Japanese Gardens at Merriewold, NY, are famous. It was he who offered 2000 Japanese cherry trees as a gift to Mrs. Taft in the name of the city of Tokyo, to be placed in Potomac Park, Washington, D.C. Later he increased the number to 3000. These are one of the beauties of Washington. He was a Samurai of the Kanazawa Clan. He was the son of Sei-Ichi and Yuki Takamine.

Jokichi Takamine and Carolyn Hitch Takamine had one [sic, two] children: Jokichi Takamine (#669), born on 28 Aug. 1888 in Tokyo, Japan. He died on 22 Feb. 1930 in New York City. He married Helen Petrie of New York.

Letter (e-mail) from Mike Hitch, genealogist. 2012. June 14. "That 'book'–the Daisy Hitch Davies tome–was simply a mimeographed set of pages put together back in the late 1920s and early 1930s by the author who traveled around the country in search of kin. She did NOT source her material and relied completely on firsthand accounts of what she heard. This makes her work interesting but somewhat unreliable. I used it as a starting point for further research and confirmation of relationships from her time but not much else. I have attached the transcribed text version from 1994 that includes the Takamines–it is Volume 1 of 4 and I do not have all the volumes BUT, at least I have the one of which the Takamines are part–Volume 1!"

366. Maps of Beach Ranch in Pima County, Including Santa Cruz County, Arizona. 1932.

• ***Summary:*** The Beach Ranch, shown on the map with a green background, was located southwest of Vail (elevation 3,233 feet) in the foothills of the Santa Rita Mountains. (See next page).

Map courtesy of the Arizona Historical Society, Tucson, AZ. "Official Relief Map of Pima County including Santa Cruz County, Arizona" compiled by the Pima County Highway Department; drawn by C. F. Heney. Arizona Historical Society Call Number G4333. P4 1932. O3, Tucson Map Oversize.

The 2nd map, completed in 1932, is from the Bureau of Land Management, showing Township 17, Range 15, Gila & Salt River Baseline & Meridian. Look at Section 25 ("Sec. 25") is written just above the center of the section. You will see a double dotted line that enters Section 25 at the upper left corner and runs diagonally toward the lower right. That's the dirt road that led to the Beach Ranch, which is shown by two black dots at the end of the road (lower right end). In 1932, unfortunately, the maps did not show the names of ranch houses.

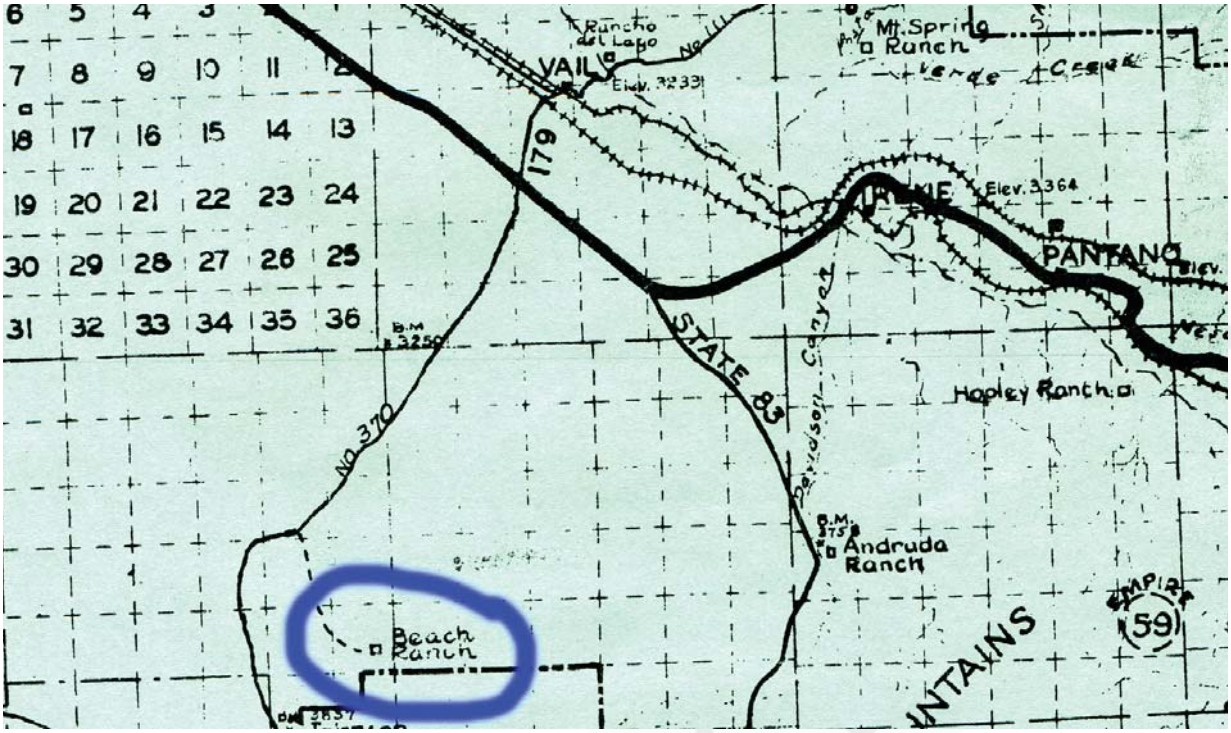
367. Associated Press. 1933. Vail man gets commission job: Charles P. Beach to be member of state game board. *Arizona Star.* May 9.

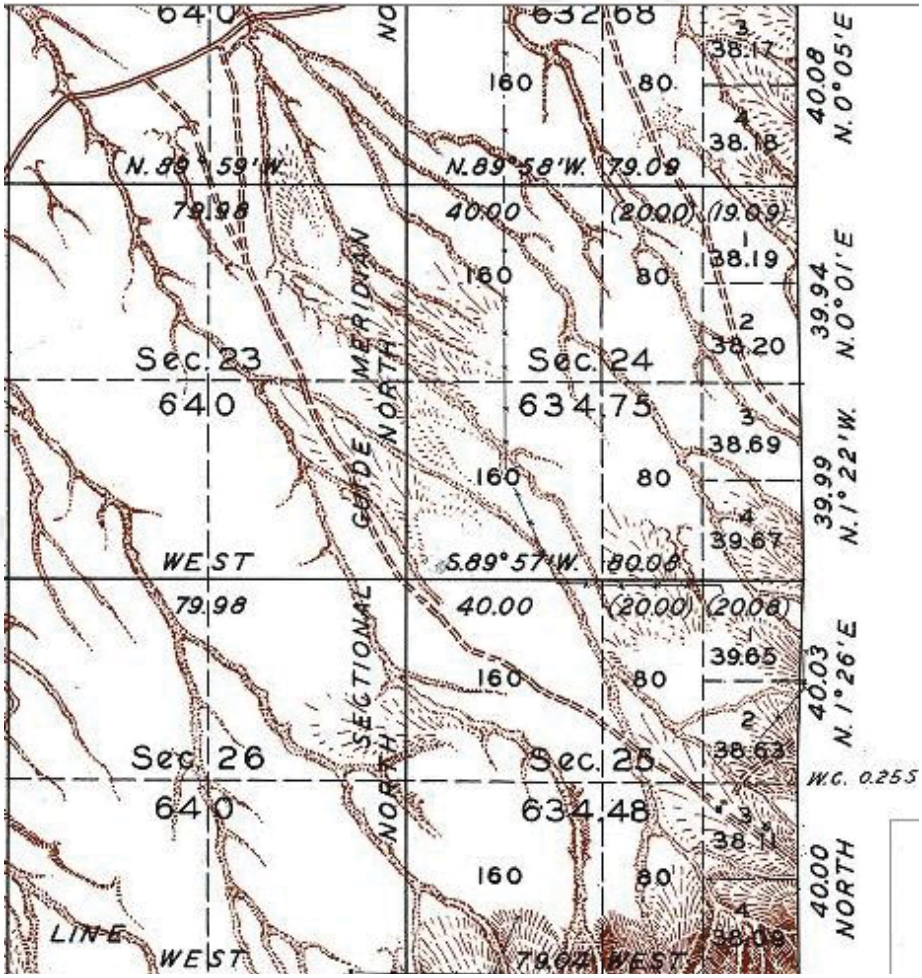
• ***Summary:*** "Phoenix, May 3–(AP)–Charles P. Beach of Vail was appointed Republican member of the state fish and game commission today by Governor Moeur."

"Beach known as field life authority: Charles P. Beach is a wealthy rancher living in Vail, 20 miles southeast of Tucson, and was described by Tucson acquaintances as being 'a thoroughly high class man, one who will fit into the commission and its work.' Beach, it is understood, is a college man and knows wild life conservation thoroughly, it being his interest for many years."

368. Land patent: Charles P. Beach patents 634.48 acres (6 aliquots) of land in Pima County, Arizona, in Section 25, Township 17S, Range 15E. 1934. Feb. 14. Accession #1068047.

• ***Summary:*** This is the first land *patent* issued to Charles





P. Beach, who had married Caroline Takamine on 16 Aug. 1926. The land is south of Vail, Pima Co., Arizona, in the Gila & Salt River Baseline & Meridian (G&SRB&M). Beach established his claim to this land in conformity to the requirements of the Homestead Act of 1862.

How did we find this land patent? Actually Wayne Dawson, a genealogical researcher in Tucson, Arizona, with 40 years genealogical research experience, found it. On 14 Aug. 2012 he explained to us how to do it. (1) Google: Bureau of Land Management.

(2) On their homepage (www.blm.gov), in the search box (upper left) type in: Land Patent [click Search].

(3) The 4th link down is "DOI: BLM: Online Land Records." Click that.

(4) That takes you to a page titled "Land records: The BLM currently has four different online systems for searching land records." Click No. 4 which is "General Land Office (GLO) Records Automation."

(5) Scroll down a bit and click (at the left) "Land Patents." Note: "Federal Land Patents offer researchers a source of information on the initial transfer of land titles from the Federal government to individuals." "A patent is the highest evidence of right title and interest in a piece of land."

(6) That brings up a page titled "Search Documents by Type." Under "Location" at "State" use the drop-down to choose "Arizona" and at "County" choose "Pima." Under "Names" type in: Last name: "Beach." First name: "Charles." Scroll down to bottom of screen and click "Search patents."

(7) Up comes 3 Patents (each with a different Accession number and date) for Charles P. Beach.

(8) Click on the Accession No. (column 2) and a whole new screen of detailed information comes up. Of special interest are the "Total acres" and the "Authority." Address: Tucson, Arizona.

369. Adolph, W.H.; Kao, Hsueh-chung. 1934. The biological availability of soybean carbohydrate. *J. of Nutrition* 7(4):395-406. April. [26 ref. Eng]

• ***Summary:*** Approximately 40% of the carbohydrate in soybean is utilizable by rats. The three soy materials investigated were ground yellow soybean (Peking variety), fat-free soybean (the meal "was defatted in a Soxhlet apparatus"), fat-free soybean curd (soybean cheese, which is essentially soybean protein–glycinin). The four methods used to estimate the biological availability of soybean carbohydrate give values ranging from 27 to 50 for the fraction of total carbohydrate used by the animal body. Experiments with phlorhizinized rates gave a utilization coefficient of 38%, which was "somewhat higher than the figure obtained by in vitro digestion with taka-diastase."

Note: This is the earliest English-language document seen (April 2004) that contains the word "defatted." Address: Dep. of Chemistry, Yenching Univ., Peiping, China.

370. Charles P. Beach makes his biggest land transaction to date. He swaps the family homestead land near the Navajo reservation to the north for 1,987.43 acres of equivalent value in Township 17S Range 15E south of Vail, Arizona. 1935. March 6. Accession 1074701.

• ***Summary:*** This land was obtained through a land patent, but it was not a simple patent; it involved a land swap. If you look at the "Authority" field on the BLM patent record for this land it says: "May 23, 1930: Exchange-PvtW Navajo Indian (46 Stat. 378)" which means his private land (which his family was probably homesteading) in Coconino County near the Western Navajo Reservation (name changed in April 1969 to "Navajo Nation") was swapped for new land in Pima County on the basis of the Statue known as 46 Statute 378 which established additional land for the Navajo Reservation.

The land he relinquished near Western Navajo Reservation: One of the more interesting patents, #1074701 was issued to Charles P. Beach by the United States government on March 6, 1935. This patent was recorded by Charles P. Beach in the Pima County Deed Book 180, Page 634, on March 22, 1935. The deed as recorded states the area of land involved was 2,000 acres. The patent records at the Bureau of Land Management state that there was 1,987.43 acres in the tracts awarded.

"The tracts awarded by the patent, all in Township 17 South, Range 15 East, were:

"2A. East half and the Northwest quarter of Section 13

"2B. Southeast quarter of the Northeast quarter, the South half of the Southwest quarter, and the Southeast quarter of Section 14

"2C. Northeast quarter of the Northwest quarter of Section 22

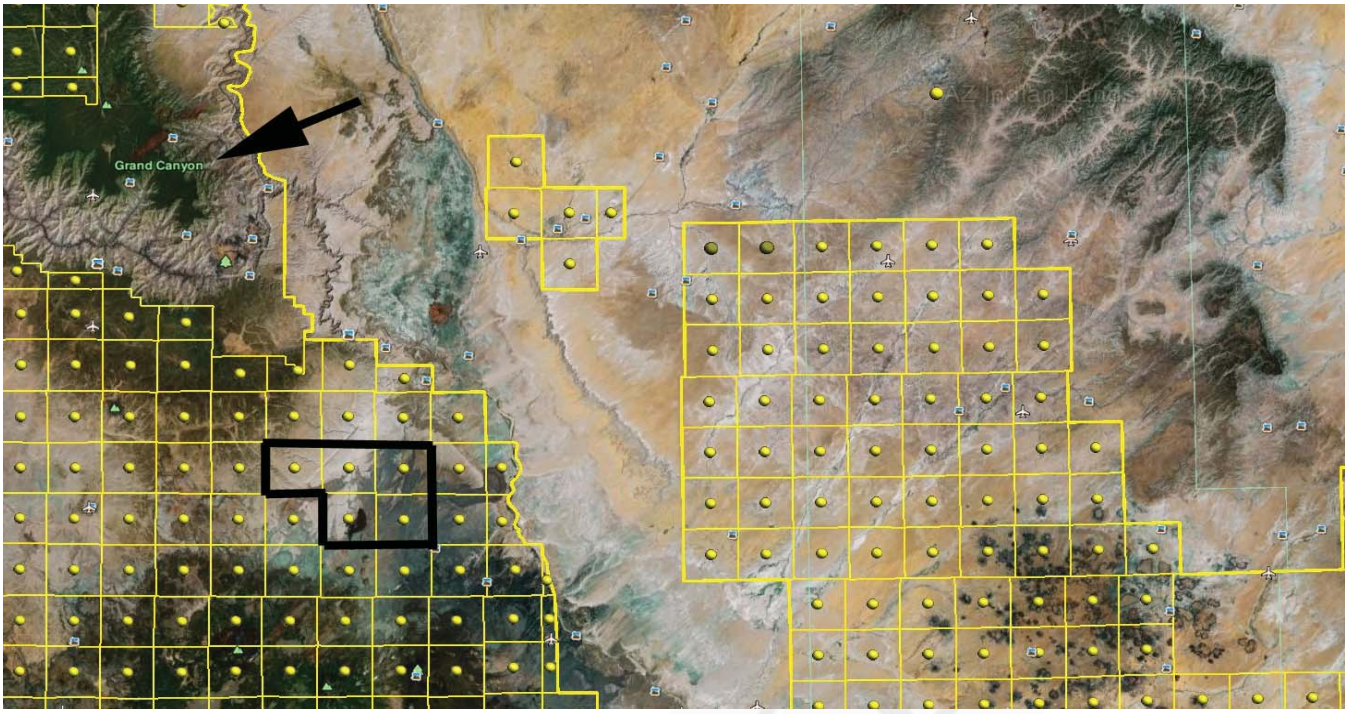
"2D. Section 23

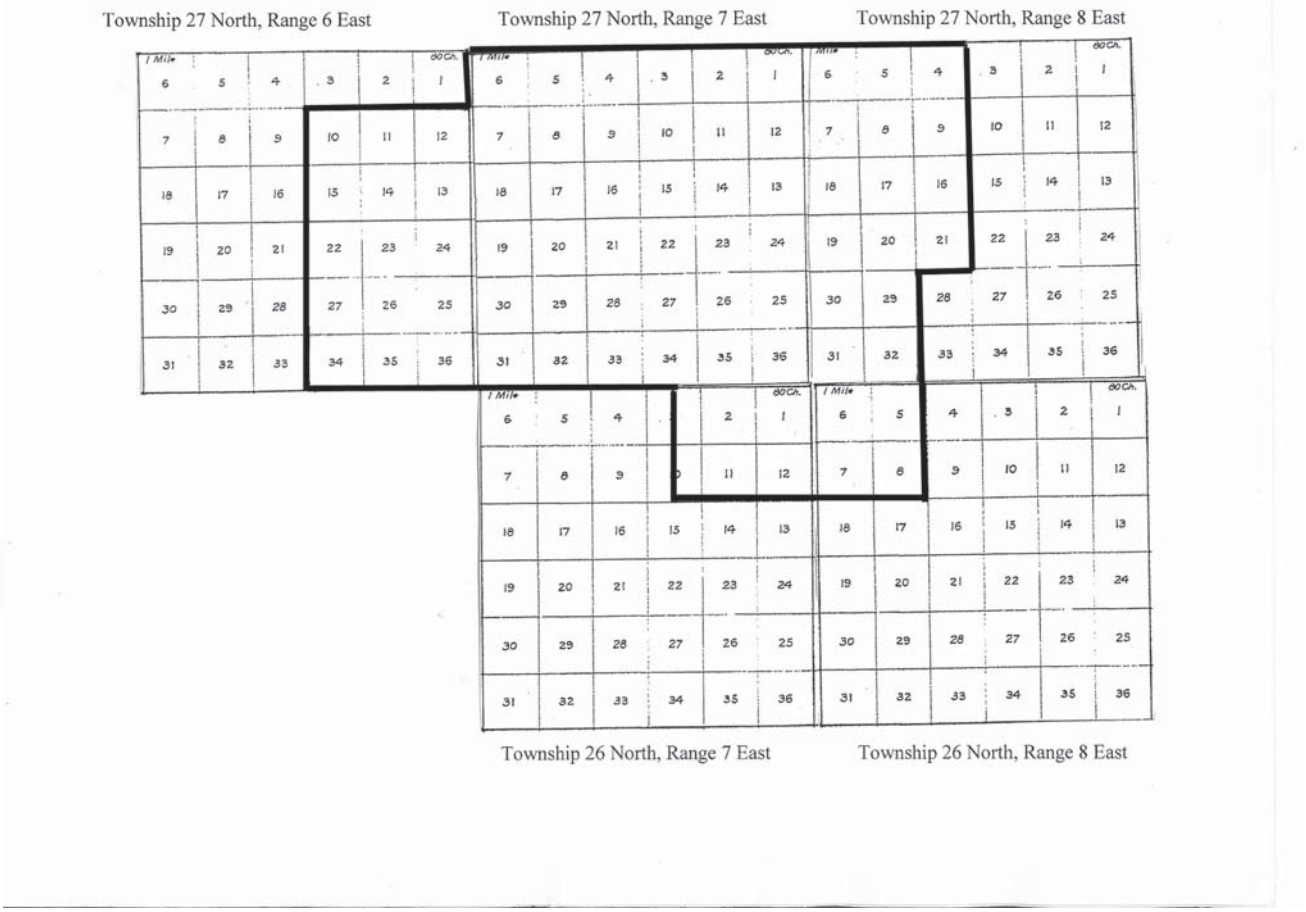
"2E. East half of Section 24

"2F. Northeast quarter and the East half of the Northwest quarter of Section 26

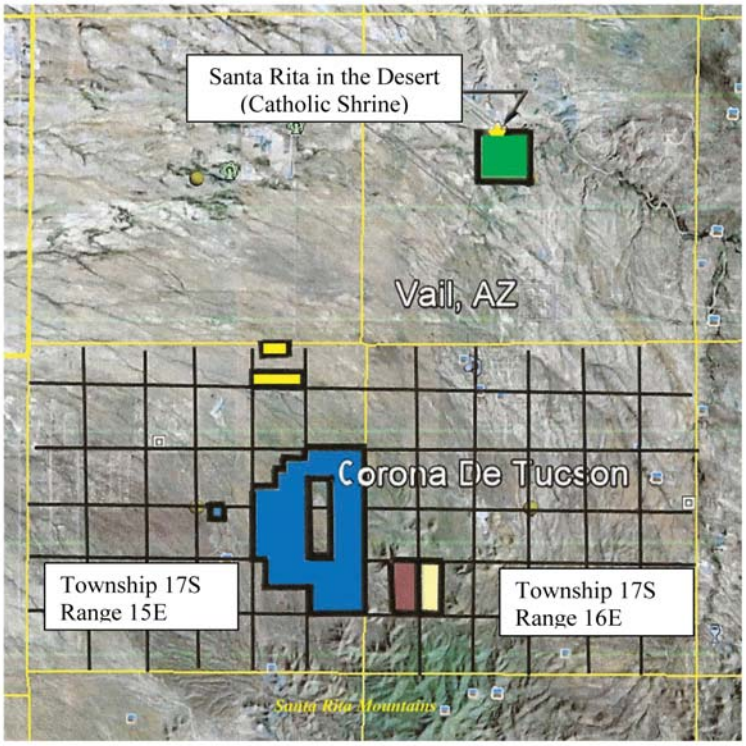
"The interesting part of this patent is that it was a land swap with the United States government. The deed states: "'... Charles P. Beach, being owner of certain lands situated and included within the limits of the addition to the Western Navajo Indian Reservation, Arizona, has, under the provisions of the Act approved May 23, 1930 (46 Stat. 387), as amended by the Act approved February 21, 1931 (46 Stat. 1204), reconveyed and relinquished the said lands to the United States and has under the provisions of said Acts, elected in lieu thereof the following described tracts of vacant public land' and then describing the tracts of land shown above.

Two maps created by Wayne Dawson show this land near the Navajo Reservation: (1) Made using Google Earth Shows the 75 sections included within the limits of the addition to the Western Navajo Reservation and their





Charles P. and Caroline Beach Lands in Pima County, Arizona



Earliest Purchase
December 9, 1928

Purchased from Estrada Heirs - July 30, 1932

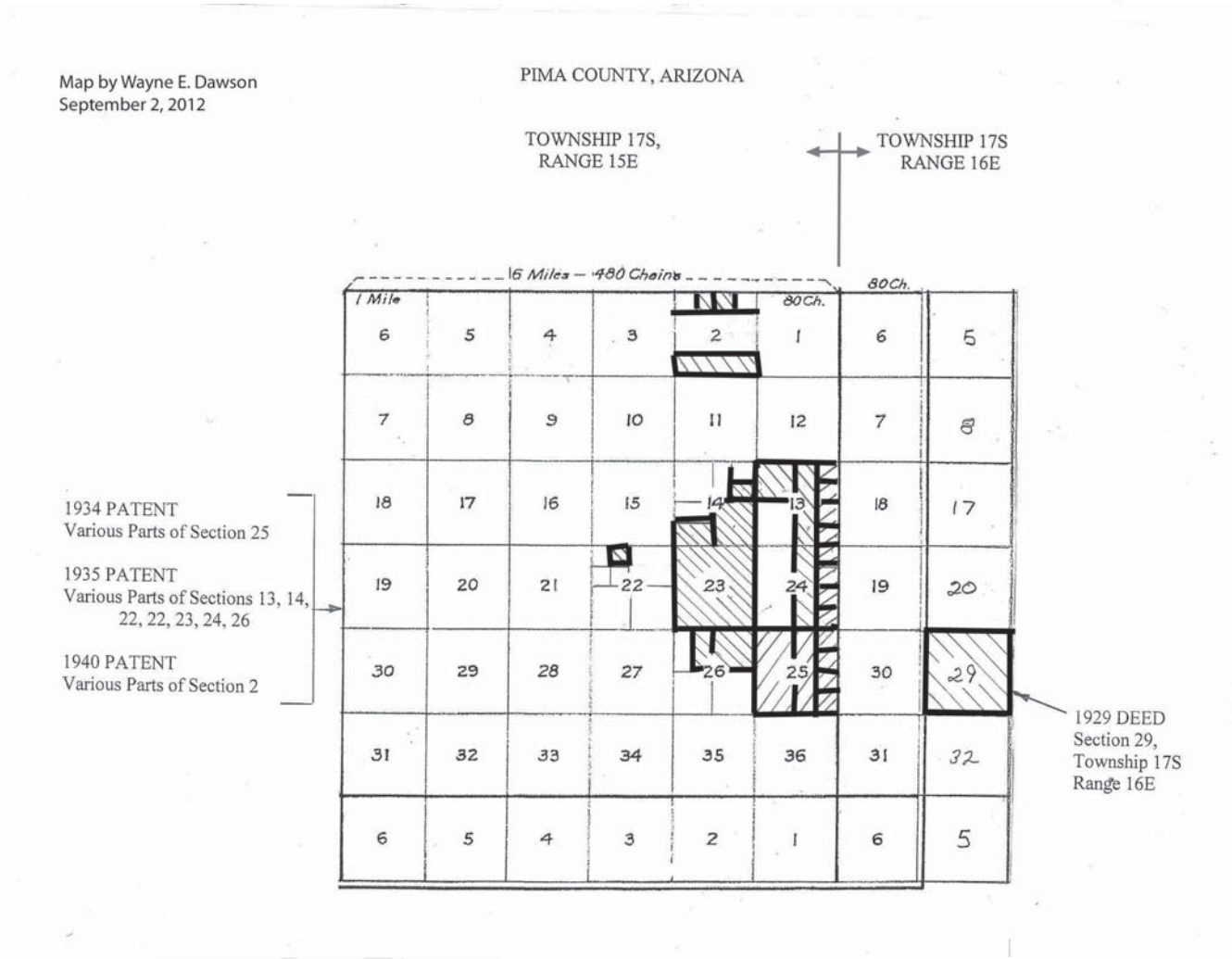
Patented - US Government
Patent 1068047
Dated: February 14, 1934

And

Patent 1074701
Dated: March 6, 1935

Patented - State of Arizona
Patent #1986
Dated: October 14, 1937

Patented - US Government
Patent #1106536
Dated: January 22, 1940



relationship to the Grand Canyon. (2) The exact 75 sections with their Township and Range. Address: Tucson, Arizona.

371. Consulich, Bernice. 1935. Santa Rita in Desert symbol of international friendship: Mrs. Charles Beach gives artistic desert mission to commemorate Takamine family of Japan. Bishop of Tucson to dedicate new Vail church. *Arizona Daily Star.* March 31. p. 8-9. Sunday.

• ***Summary:*** "Symbol of friendship between Japan and the United States is little Arizona mission of 'Santa Rita in the Desert' at Vail, which will be dedicated this afternoon (March 31, 1935) at 3 o'c1ock to the memory of the Takamine family of Japan. Rt. Rev. D.J. Gercke, bishop of the Tucson diocese, will officiate during the ceremonies today and Most Rev. Edmund Gibbons, D.D., Bishop of Albany, New York, will attend with several priests from Tucson.

"Nestled on the rolling desert under the Rincon mountains' shadows, this gem of a church 25 miles southeast of Tucson has been built and given to the Mexican people of Vail by Mrs. Charles Beach. It will be a permanent memorial to her late husband, Dr. Jokichi Takamine and his family.

"It was Dr. Takamine who made possible relief for thousands of sufferers when, in 1901, he isolated the active substance of adrenalin. Men of science the world over know and still praise the work of this great Japanese scientist who died in July 1922. His, and Mrs. Beach's son, Eben Takamine, carries on the late doctor's scientific work in laboratories at Clifton, New Jersey, and may possibly arrive by airplane in time for the dedication today.

"From many lands: Rita, who gives the church her name, is the saint of the impossible. Fitting is the name, for the mission represents the achievement of the seemingly impossible. Vestments from Japan, a crucifix especially carved at Oberammergau, the altar of Arizona stone, linens given by sisters in a convent in New York, statues from Italy, a baptismal font presented by the famous financial analyst and author, John Moody and the missal from Belgium. Those are but a few of the surmounting of impossibles, at the same time that they justify the statement that the church is a gem in which every facet represents perfection of planning and realization.

"Santa Rita in the Desert has been a plan in the mind of Mrs. Beach for more than three years, although its actual construction began only last October. It might almost be said the church grew around its lovely stained glass windows which she secured some years ago. But it was more than windows that gave impetus to her idea for a church at Vail.

"Donor is commended: Feeling the need for such a mission, since no church of any denomination is at Vail, Mrs. Beach set about realizing her dream for these young people whom she likes and admires. The Mexicans, who will form the major portion of the congregation, live at or near Vail, work on cattle ranches, in ranch homes or for the railroad which passes nearby the church. With nobility and modesty, quite unwilling that any special credit should be given her, Mrs. Beach has worked to perfect this church.

"'I wish to express my deep approval and appreciation for this gift and to commend Mrs. Beach highly for what she has so thoughtfully and generously done,' declared Bishop Gercke in discussing the dedication. 'She has been most kind to provide for the spiritual necessities of the people around her and I hope this gift may serve as an incentive and example to others whom God has blessed with this world's goods, that they too may return some of these in gifts of charity. I hope Santa Rita in the Desert may become a sermon in stone to others and make them realize that blessings are not given for themselves alone.'

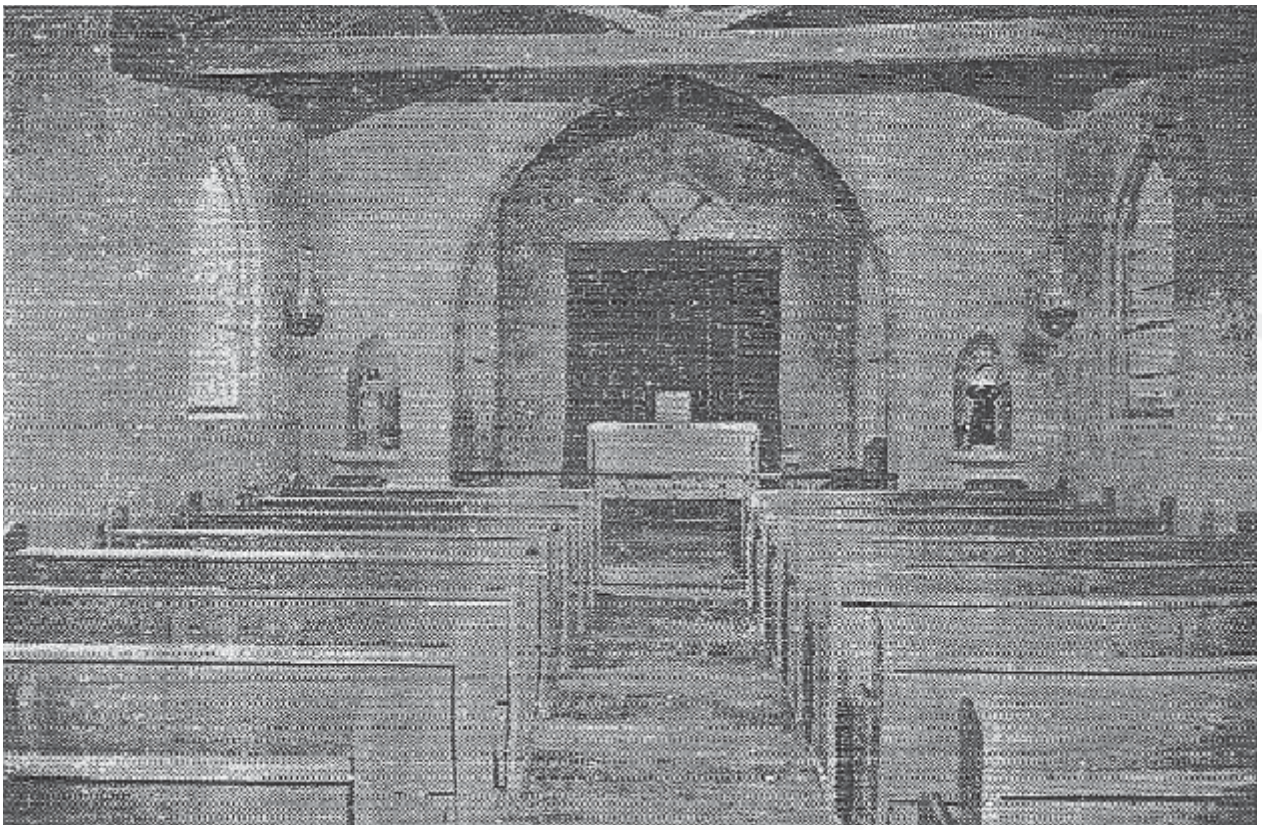
"The church itself is neither large nor pretentious. Simplicity and dignity mark its every aspect. It was built as a place of worship and not for show, though it has achieved both. H.D.R. Figge, the architect who is now in Belgium, planned the mission so it would carry some of the feeling of a rura1 Mexican church. Its central nave, which is 36 feet long, 27 wide and 19 feet high, has its sanctuary with its altar at the southern end and this flanked by the sacristy to the west and the priest's room to the east. The church will seat about 115 persons.

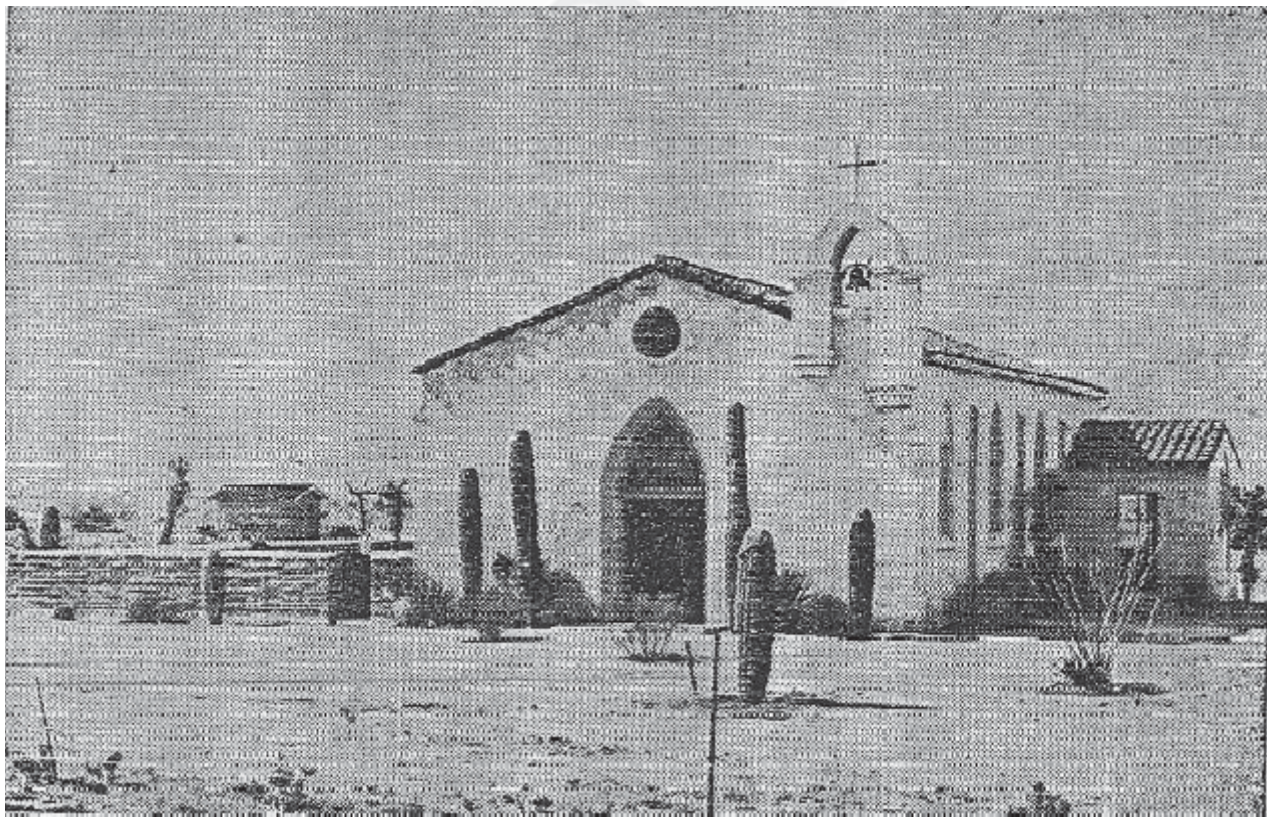
"Perfect setting: Santa Rita in the Desert has the perfect desert setting. Through the planning of Prof. A.A. Nichol of the University of Arizona and the careful execution of Mr. Beach, they have given the church a feeling of having grown up out of the desert, whereas actually the desert plants were brought to it. Yuccas, ocaillos [ocotillos], sahuaras [saguaros], desert broom, palo verde, bisnaga and Spanish daggers were transplanted with nature's respect for groupings and irregularities. Before the church entrance stand four giant saguaros, like slender sentinels or pillars adding to and extending the edifice itself. A stained glass window, with arch above it and base trim of native stone, has a setting of tall yuccas. The large patio for the resident priest has desert plants inside and others out the wall.

"In the patio is a well where rainwater from the church roof will be caught, for there are no wells in Vail and water comes in prosaically on railway cars. To make the well, which was given by Mrs. Rukin Jelks and is called 'Mary's Well,' have the final touch, an old bucket was obtained from faraway Vermont.

"The plain lines of the church, outside, set off the lateral stained glass windows along the nave, the great window behind the altar and the rose windows in the sacristy, priest's room and over the church door. Only native grey stone occasionally trims the stucco walls where windows break in or the small arched tower holds the sonorous bell which can be heard far across the desert. That bell Eben Takamine has had especially cast in bronze for this Arizona church in memory of his family.

"Statues are gifts: Entering the church, the long nave





with its peaked beamed ceiling leads the eye toward that sanctuary at the southern end. The lovely statue of Santa Rita herself, given by Mrs. Cleveland Putnam, and the one of the Madonna and child (both made in Italy) arrest the attention in their niches on either side of the sanctuary. But the eye moves on to that grey stone altar with its simple cross, its tabernacle of solid dressed stone, its hand-carved candlesticks and candelabra and to the baldachin and canopy of russet-red brocade. The great window behind tops the baldachin and canopy to let through a halo of light. The altar linens, some of which were sent by Mother Teresa and the Sisters of the convent of Our Lady of Lourdes in New York, the laces given by Miss Eloid Joye of New York and all the beautiful altar appointments in crystal and gold match that glow of diffused light."

"Oberammergau crucifix: But dominating the altar, as it should, is the crucified figure of Christ, suspended above the tabernacle. This was especially carved for the church at Oberammergau at the request of Miss Elizabeth King of Chicago, who presented it to Santa Rita in the Desert.

"Attention is given the wall coloring with its tones of sand and rose with a touch of almost mauve, which are echoed in the woodwork of the pews' woodwork. Then there are the suspended, wrought-iron lamps with a four-leaf, conventionalized design at the base of each; the holy-water fount of green tile, the confessional with its curtain blending into the walls and hides the bell cord. The baptismal fount, which is now being made in Italy of green marble, will stand at the left of the entrance. This gift will come from John Moody, New York financial analyst and author, whose recent book 'The Road Home' has been much acclaimed. The organ, which is ready for today's service, and the stations of the cross, which are being made in tile in California, are gifts from friends in Japan.

"So many and widely scattered are the contributors of gifts for this church that perhaps they should be gathered together for the purposes of this story. The altar, quarried in the Santa Rita mountains and dressed in Tucson, was given by Mrs. Eben Takamine and Mrs. Beach's two grandchildren. The bell was given by the donor's son; a chasuble or vestment in green and gold was made in Japan and sent to Arizona by the Taguchi family; the well, Mrs. Rukin Jelks; statue of Santa Rita, Mrs. Cleaveland Putnam; laces, Miss Eloid Joye of New York; linens from Convent of Our Lady of Lourdes; priere Dieu before the statues by the Mulcahy Lumber company; sanctuary lamp from W.L. Jones of Tucson; the missal stand came from Mr. & Mrs. Nishio of New York. The missal itself was printed in Belgium, the Latin in beautiful type on India paper and the whole bound in fine red Morocco leather.

"In the sacristy are vestments for all church services, black, green, red, purple and white; all the lovely linens, the chalice, censor, monstrance (which came from France), pure wax altar candles, cruets and votary.

"Special credit to each worker who has aided in achieving Santa Rita in the Desert is given by Mrs. Beach. D. Burr DuBois modified the architectural designs of Figge and originated the patterns for lights and the arrangement of altar and baldachin. John D. Steffes was the actual builder of the church; W.L. Jones of Tucson did the iron work; Walter Ross the painting; Andrew Grondona the altar drapes; the art glass and mill work by the Southwestern Sash and Door Company; furnishing of lumber by the Tucson Lumber company.

"This afternoon the services for dedication will begin at promptly 3 o'clock with Bishop Gercke officiating. He will be assisted by several priests. Among those who will go to Vail will be Rev. Leo Gattes, Rev. Arthur F. Gramer, Rev. Stanislaus Carolt. The dedication will be followed by baptism and the administration of the sacrament of confirmation.

"More than 200 persons from the Vail parish are expected to attend with many persons going down for the services from Tucson."

Photos by Irving Allen Fox show: (1) The interior of the chapel. "Artistic simplicity marks interior of chapel: Artistic in its simplicity, with each blended detail enhancing its quiet restfulness, the interior of Santa Rita of the Desert houses many treasures, gifts from all parts of the world to this little Arizona church." (2) The exterior as seen from the front. "Santa Rita of the Desert, haven of peace and rest: Its soft toned walls reflecting the desert sun, Santa Rita of the Desert swings wide its doors this afternoon when it will be dedicated, at Vail, to the service of the Catholic Mexican people of that little hamlet. It is the gift of Mrs. Charles Beach."

372. *Arizona Daily Star.* 1935. Vail church dedicated when city meets desert dwellers: Bishop Gercke presides in ceremonies which consecrate little chapel to service of people in range country near Tucson. April 1.
• ***Summary:*** "With more than 600 visitors present for the ceremonies, Santa Rita in the Desert, the newly completed mission church at Vail, assumed the role for which it was created yesterday afternoon when a number of little children were baptized within its walls and more received the sacrament of confirmation from the hands of Bishop Daniel J. Gercke of Tucson."

"Bishop Gercke delivered the dedicatory address to a crowd that filled every nook and cranny of the little church and overflowed onto the steps in front of the patio at the side.

"Then as a lowering afternoon sun cast sparkling rays through the many facets of the stained glass windows, the blessings of the prelate closed the services and the chapel of Santa Rita became the spiritual haven of the people of Vail country as had been planned by its donor, Mrs. Charles Beach. And, even more fitting, a memorial to a man who gave much to humanity, Dr. Jokichi Takamine."

373. *Arizona Catholic Herald.* 1935. Chapel at Vail blessed. Santa Rita in the Desert gem of architecture, has unique setting. April 5. p. 1, 5. Friday.
• ***Summary:*** "Tucson, April 4.–Before a mixed crowd of six hundred visitors Santa Rita of the Desert, a new mission church at Vail, twenty five miles southwest of Tucson, was dedicated last Sunday afternoon by Bishop Daniel J. Gercke, assisted by several priests. Most Rev. Edmund Gibbons, D.D., Bishop of Albany, New York, attended the ceremonies with a company of priests from Tucson. Among the fathers present were Rev. Leo Gattes, Rev. Arthur F. Gramer, Rev. Stanislaus Carolt, Rev. James P. Davis, Rev. J. Howard, Rev. J. Mulcahy and Rev. J. Gordon.

"Immediately following the impressive dedication ceremony the newly completed mission church assumed the role for which it was created when a large number of children were baptized within its walls and more received the sacrament of confirmation from the hands of Bishop Gercke.

"Long sheaves of wood placed upon saw horses served to accommodate the many people present with a fine barbecue cooked in western fashion over pits of fire. Those present included city folk and country folk, eastern folk and western folk. The transporting conveniences ranged from horse and saddle to wagon wheels to auto wheels of the finest up to the minute streamlined autos."

Also discusses: Gift of Mrs. Chas Beach in memory of her late husband Dr. Jokichi Takamine, and his family. Simplicity distinguishing mark. The interior. Labor of many.

A large photo (from the Arizona Daily Star) shows the front of the church.

374. *Japanese Times.* 1935. [In the Arizona desert, memorial church to Dr. Takamine: Plans drawn up by Mrs. Beach and other friends]. April 20. [Jap]
• ***Summary:*** Of all places, a small fountain of international friendship has sprung up in the desert of Arizona, infamous for its anti-Japanese sentiment. Perhaps the location is a bit on the ironic side, but all things considered, this development should be considered a good thing. The truth of the matter is that 25 miles southeast of Tucson, in the town of Vail, Mrs. Charles Beach has made a catholic church built for Mexican-American residents of the town.

Now Mrs. Beach is actually the widow of the late Dr. Jokichi Takamine, a well-known international scientist. Several years after the death of Dr. Takamine, Caroline Takamine, as she was then known, married the American Charles Beach. Now she lives with her new husband in Arizona, but because of the influence of Dr. Takamine, she has continued to work toward international, especially Japanese-American relations. This international outlook and her own dedication to the Catholic church were the motivation for erecting Vail's new church building.

Mrs. Beach says that all this came out of what began as a simple desire to make her small contribution toward world peace through her church. The new church building is to be named "Santa Rita in the Desert" as a sign of international friendship. In fact, the dedication of this little church was deemed so important that the dedication ceremony March 31, was led by Bishop Gercke of the Tucson diocese. Most Rev. Edmund Gibbons, bishop of Albany, came all the way from New York especially to attend the ceremony as well.

Tucson's *Arizona Daily Star* gave the following report on further contributions to the new church.

Mrs. Beach had the church built as a memorial to the late Dr. Takamine. Dr. Takamine became famous in 1901 as the discoverer of the drug adrenalin, which has since saved countless lives. Mrs. Beach began plans for the church three years ago, and groundbreaking finally took place last October.

The church was designed by architect Figge strictly according to Mrs. Beach's instructions, and although small, the building is beautiful in its simplicity. The church's bronze bell can be heard from far across the desert, and was specially cast as a memorial to Dr. Takamine from his son, Eben. The altar was paid for with a memorial contribution for the late doctor's daughter-in-law, Mrs. Takamine, and his grandchild by his late son, Joe. Prayer books were contributed by Mr. and Mrs. Kozo Nishio.

375. Ramsbottom, J. 1936. The uses of fungi. *British Association for the Advancement of Science, Annual Report.* Sept. 9-16. p. 189-218. See p. 206-08, 212. 106th year.
• ***Summary:*** This was an address to Section K (Botany) of the British Association for the Advancement of Science at Blackpool, Sept. 10, 1936. Discusses: Koumiss (effervescent drink), Egyptian Leben, Arrack, Japanese koji, shoyu, tamari, and miso, fermented tofu.

"There is a wide range of oriental foods produced by fermentation with *Aspergillus.* Chinese curd, To-fu, is made from soy-bean milk fermented with mould and ripened in brine. The curd is cut into squares which soon become covered with fungus. They are then placed in brine for further ripening. The curd is canned as white or red squares in a salty liquid."

In Japan, four large industries are built on the use of *Aspergillus oryzae.* Their approximate total yearly output is as follows: Saké (rice wine) 812,000 kiloliters, shoyu (soy sauce) 902,000 kiloliters, miso (soy cheese) 1,690,000 kilograms, and shocho (distilled alcoholic liquor) [sic, shochu or shôchû, cheap spirits] 39,700 kiloliters. The annual value of all the fermentation industries is approximately £40,000,000.

"Molds of the genus *Penicillium* play a large part in the ripening of the Camembert-Brie, and the Roquefort-Gorgonzola-Stilton series of cheeses. Milk is first coagulated with rennet or dried calf-stomach linings." Also: Mycorrhiza, Takadiastase, production of glycerin and yeasts in Germany during World War I. Address: O.B.E., President of the

Botany Section.

376. Wollner Distilling Company. 1936. Peoria, Illinois: WPA Project. 3 p. Unpublished manuscript. Numbered p. 14-16. Peoria Historical Society No. 1558 at Bradley University Library. [1 ref]
• ***Summary:*** The five Wollner brothers were born in the town of Szenitz, Hungary, where they learned the various processes of distilling alcoholic beverages. Samuel, Adolph, and Ignatius came to America and after various ventures bought a distillery in Louisville, Kentucky, which they operated until 1871 when they removed to Peoria, Illinois.

Their first move was to form a partnership and buy the Grove Distillery from Richard Grove. This plant was located at the foot of Apple Street in Peoria. According to an article in the *Peoria Transcript* of January 1888, this was the third largest distillery in the United States, and was equipped with the most modern machinery and appliances at that time. There were three of the largest coolers in the country, two alcohol still and one beer still.

In 1888 Adolph Wollner and J.B. Greenhut formed the Whiskey Trust. Adolph died in 1891.

"The Amolo [amylo] process used in distilling was conceived by a Japanese chemist named Takamine but did not prove successful. Twenty years later the Wollners worked out this process after ideas of their own. They patented the process and were the only ones who ever used it. A process for recovering vegetable glycerin and succinic acid was developed in the Wollner plant." Address: Peoria, Illinois.

377. George, Henry, III. 1937. Homage to Takamine. *Coronet.* Sept. p. 168-70.
• ***Summary:*** In Peoria, Illinois, he built his first laboratory in an old carriage house in back of his modest home; here he would often work late into the night. He "was a hard, self-imposed taskmaster, who scarcely knew the meaning of rest." Years later the prestigious journal *Lancet* wrote about the benefits that diabetic patients would receive from the use of Takadiastase.

In 1901 Takamine succeeded in isolating adrenaline. He had also isolated the first hormone, and his "name spread like wildfire over the civilized world... Hemorrhage no longer held its terror for the surgeon." Adrenalin could also be used in the treatment of heart failure, even from drowning or electrocution. And it even helped asthmatics.

The cherry trees he had sent to the United States to more closely bind the friendship between the two nations "were selected for their variance and time of flowering so that the capital might be bathed in blossoms for a longer period. Each variety had its own venerable history, and bespoke the admiration of a beauty-loving race. First the *Yoshino* blossomed upon the scene, followed by the *Shira-Yuki* which to the Japanese means snow-white. After the *Shira-Yuki* had dropped their petals, the *Ariake* opened its single large blossoms, white or faintly pink. This to the Japanese is the dawn. Then came the white flowers with pink tinges–named Returning Carriage or *Mikuruma-Gaeshi.* The imperial cherry or *Gyoiko* bloomed last with greenish yellow flowers, which before dropping turned to a clear pink."

"As long as men suffer, he will be thanked..." Address: Dr.

378. Land patent: Charles P. Beach receives (from the State of Arizona) 160 acres near the town of Vail, Pima County, Arizona; Northeast quarter of Section 16, Township 16 South, Range 16 East, G&SRB&M. 1937. Oct. 14. Patent #1986.
• ***Summary:*** This patent from the State of Arizona, #1986, was issued on October 14, 1937 to Charles P. Beach. It was a purchase from the state and full payment was received. The land is described as:

"A. Northeast quarter of Section 16, Township 16 South, Range 16 East, G&SRB&M.

"Charles P. Beach recorded the land in the Pima County records in Deed Book 202, Page 28-29, on November 2, 1937. The land was subject to rights of way, highways, Western Gas Co. and Mountain States Telephone and Telegraph Co., the Southern Pacific [Railroad] Co., and the United States canals and ditches. The Northwest corner of this land, in the city of Vail, Arizona, appears to be the land upon which Caroline Beach, Charles's wife, built the Roman Catholic Shrine of Santa Rita in the Desert."

However construction of the Shrine began in 1934 and it was finished and dedicated in 1935. Why did he not buy the land until 1937? Wayne Dawson, who found this patent, says that one of the requirements of a land patent is that you apply for a claim on a particular parcel of land, the government issues a warrant (which says you are now authorized to survey your claim), you do the survey and file it, and then you work that land for at least 5 years before it becomes yours (i.e., before you can patent it). Address: Tucson, Arizona.

379. Read, J.W.; Haas, L.W. 1938. Studies on the baking quality of flour as affected by certain enzyme actions. V. Further studies concerning potassium bromate and enzyme activity. *Cereal Chemistry* 15(1):59-68. Jan. [11 ref]
• ***Summary:*** This article gave the first indication of a protease inhibitor in plants, and the first indication that this inhibitor was or resembled a protein. In discussing the effects of an aqueous extract of soya bean flour on gelatin proteolysis, the authors state: "The soya bean contains a very potent fat peroxidizing enzyme which is water soluble. Some liquefaction tests were made with a 10% extract of soya bean flour to ascertain if such an extract contained any factor or factors which might affect the activity of several proteases... Trypsin appeared to be the most affected."

In the section title "Bromate and diastasis," Table 7

shows the "Saccharogenic activity as influenced by the bromate and persulfate of potassium." The dosage of potassium bromate ranged from 0.2 mg per 5 gm of wheat flour to 4.0 mg. Bromate was shown to increase diastasis.

"Summary:... Bromate and persulphate of potassium, when present in suitable amounts, promoted saccharogenic activity.

"An aqueous extract of soya bean contained some factor or factors which repressed the activity of trypsin, pepsin and the protease of Taka diastase, but did not inhibit the activity of papain and bromelin. Like trypsin and pepsin the proteinase of malt was also repressed."

Note 1. Haas did pioneering research in both trypsin inhibitors and lipoxygenases in soybeans. This is the earliest document seen (Jan. 2010) that discusses a protease inhibitor or a trypsin inhibitor in soya beans.

Note 2. This is the earliest document seen (Sept. 2007) that mentions potassium sorbate as a dough improver in connection with the addition of soya bean flour in baking. Address: The W.E. Long Company, Chicago, Illinois.

380. Tokuoka, Y. 1938. [On koji amylase. X. Effect of koji materials on production of alpha and beta amylases and maltase]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 14(7):829-38. July (Chem. Abst. 33:3497). [4 ref. Jap]
• ***Summary:*** Also discusses Taka-diastase.

381. Tokuoka, Y. 1938. Koji amiraaze ni tsuite. XI. [On koji amylase. XI. Effect of koji materials on production of amylases and maltase]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 14(7):839-42. July (Chem. Abst. 33:3497). [2 ref. Jap]
• ***Summary:*** Also discusses Taka-diastase.

382. Fairchild, David. 1938. Japanese cherry-blossom trees in Washington, DC, and J. Takamine (Document part). In: D. Fairchild. 1938. The World Was My Garden: Travels of a Plant Explorer. New York, NY: Charles Scribner's Sons. xiv + 494 p. See p. 410-15. Assisted by Elizabeth and Alfred Kay.
• ***Summary:*** "And now the moment has come to tell the story of the Japanese flowering cherry trees planted on the Speedway and around the Tidal Basin in Washington. I am often asked how they came there, for they have become a national institution..." In about 1905 Fairchild and his wife, Marian, grew Japanese cherry trees at their home "The Woods"; they were a gift from his friend H. Suzuki of the Yokohama Nursery Company. "When it became evident that the trees would do well, Marian and I wanted to do something towards making them better known in Washington [DC]. We therefore sent to Japan for more trees, mainly of the drooping type which seemed to be the most hardy..." In 1908 they were transplanted by schoolchildren on grounds of many local schools. Fairchild lectured about his idea of planting cherries along the new, unplanted Speedway. "Mrs. Taft, at the time the First Lady of the Land, was much interested in all that concerned the beauty of Washington, so Miss [Eliza Ruhamah] Scidmore [the great authority on Japan] took our suggestion to her, with the result that the Park Department was asked to buy any available trees and plant them along the Speedway. I think that it was the Ellwanger and Barry Nursery who supplied the first lot. Miss Scidmore consulted me regarding the importation of a large number from the Yokohama Nursery Company. She wanted bigger trees than Marian and I had imported, insisting that it was important to make a show as soon as possible, but I cautioned her not to order large trees, because of the difficulties in making them live as well as the extra expense involved.

"Some time later Major Cosby, Head of the Office of Public Buildings and Parks, wrote us that he had been notified by the Mayor of Tokyo that he was sending two thousand cherry trees as a gift to Mrs. Taft, to aid in her plans." The crates arrived on 7 Jan. 1910. This was the early days of the Quarantine service, and the trees "immediately came under the inspector's eyes, with the result that almost every sort of pest imaginable was discovered... Ghastly as it seems, all the trees were burned" in Washington, DC.

The Mayor of Tokyo generously sent another 2000 trees, with a letter of great humility; they arrived in March 1912 and, this time, passed inspection. The first tree was planted at the heart of the nation's capital "in the presence of Mrs. Taft, the Japanese Ambassador, Major Cosby and Miss Scidmore, but little was published in the papers about the affair. After several years, the cherry trees around the Speedway came into bloom. As a return gift, in 1915 and 1917 the U.S. sent several hundred pink flowering dogwood trees to Tokyo. In about 1918 the Americans sent photographs to Tokyo of the Japanese cherries flowering in Washington, DC. At the same time duplicate sets of photographs "were sent to Mrs. Taft and to Dr. Takamine of New York, who had been an enthusiastic collaborator in the project.

"I never dared to imagine the popular enthusiasm which these Washington trees have caused throughout the country. Through them there must have filtered into the consciousness of hundreds of thousands an appreciation of the nobility of a people who can love trees as do the Japanese."

Photos show: At Chevy Chase, Marian Fairchild wandering among cheery trees in blossom (p. 414A). Two thousand cherry trees, sent by the Mayor of Tokyo, being burned in Washington, DC. But the Mayor sent another shipment (p. 414A). Several huge single-flowered drooping cherry trees, which "are the longest lived and among the loveliest of these exquisite flowering trees."

Talk with Isabel Cunningham, author of a biography of Frank N. Meyer. 1998. Aug. 1. Some years ago Isabel visited the house where David and Marian Fairchild lived,

"The Woods," which is now near Connecticut Avenue, just outside of Washington, DC, in Maryland. The original house and grounds were being used as a nursery school. The day she visited, the children were out in the garden doing finger paintings, then listening to one of the teachers read a story. The cherry trees were in blossom and the blossoms were falling on the children. "I thought, how Fairchild would have loved that. It was such as picture. They had one tree they called the granddaddy tree, that had survived from Fairchild's original planting of the first Japanese cherry trees in Washington, DC. The children never tried to climb it; they were taught it was very, very old. It's a wonderful use of that property." Address: USDA.

383. *Peoria Star* (*Illinois*). 1939. The name Takamine mean anything to you? Feb. 10. "Stroller" column.
• ***Summary:*** Jokichi Takamine, "a mild-mannered Japanese chemist," came to Peoria in the 1890s to work for Wollner's famous distilling plant. Takamine is "one of the immortals enshrined in the Hall of Fame of modern medicine." His full story has not yet been told.

"Takamine was a brilliant Japanese chemist, sent as the representative of his government to the International Exposition at New Orleans [Louisiana] in 1884. He returned to his homeland with his head full of ideas about nitrate fertilizer needed by his people. But he was several years ahead of his time in the land of the Mikados, only just awakening to science and Western ways, and his ideas were looked upon with distrust by his slant-eyed brethren.

So he came back to Peoria, Illinois; and apart from his duties at the Wollner distillery, he built a laboratory in an old carriage house back of his modest home. Here he worked for long hours, entirely oblivious to time, pouring over his test tubes. A revealing insight was that he would stuff his coat over the communicating telephone, so that he could blandly assure his American wife that he had never heard her repeated calls for dinner.

"His first discovery was predicated on an enzyme brought from Japan, which through a secret process would liquefy six hundred times its volume of carbohydrate. This he called Takadiastase and gave it out for the starch sufferer and later diabetic patients. This won him widespread fame.

"But his next discovery dwarfed into insignificance all his previous efforts. He had seen patients lying on the operating table in a welter of blood; in keen and agonizing pain where anesthesia had ceased; and so from the adrenal glands of dead cattle he brought forth adrenalin, and adrenalin chloride, which, when injected directly into the heart, causes an impulse which literally brings back to life. And brings untold relief to asthmatic sufferers.

"Another thing which should have wrung forth lasting fame from present-day indifferent strollers, is the fact that those famous cherry trees in Washington [DC] were brought from his native land as his gift to America.

"So, Mr. and Mrs. Peoria, take heed when the name Takamine is mentioned; without any thought to present day condoned polite burglary [by the Japanese military in East Asia].

"It heralds the cognomen of one of our city's most famous sons!"

384. Land deed: Caroline Takamine Beach of Vail, Pima Co., Arizona, sells her land at Merriewold to Anna A. Moody of New York City (Sullivan County, New York). 1939. New York. 2 p. May 3. In Book 335, p. 235-36.
• ***Summary:*** The land being sold is: "All that tract, or parcel of land, situate in the Town of Forestburgh, County of Sullivan, and State of New York, in the First Division of the Minisink Patent, in Lots Nos. 13 and 14 and bounded as follows:,... A detailed description of the boundaries is given.

"Being the same premises conveyed to the party of the first part (Ellen F. Gordon) by Ida Thompson Erritts by deed dated the 4th day of February 1905, and recorded in the Sullivan County Clerks Office in Liber [Book] 141 of deeds at page 444.

"Being the same premises described in a deed from Ellen F. Gordon to Caroline Takamine by deed dated Dec. 14, 1921 and recorded Feb. 27, 1922 in the Sullivan County Clerk's Office in Liber 216 at page 284.

"Also conveying lots numbers 36, 37 and 38 in Plot G, and lots numbers 13, 14 and 15 in Plot C, as shown on a map of Merriewold Park filed in the office of the Clerk of Sullivan County on February 29, 1904 in Forestburgh map book #1 at pages 52 and 55.

"Together with all the appurtenances and all the estate and rights of the party of the first part,..."

Note: Anna A. Moody is the wife of John Moody, the financier, founder of Moody's Investors Service. The Moodys have been residents of Merriewold since at about 1912, when John Moody started building his house (Merriewold: The First Hundred Years, 1989, p. 50). Address: Sullivan County, New York.

385. Underkofler, L.A.; Fulmer, E.I.; Schoene, L. 1939. Saccharification of starchy grain mashes for the alcoholic fermentation industry: Use of mold amylase. *Industrial and Engineering Chemistry* 31(6):734-38. June. [11 ref]
• ***Summary:*** "Two strains of the mold *Aspergillus oryzae* have been found very satisfactory for producing amylase for use in saccharifying corn fermentation mashes... On the average the moldy bran produces approximately 12 per cent higher alcohol yields than does a good dried barley malt.

"Takamine patented the use of molds for the production of amylase preparations; one commercial product is marketed as 'Taka-diastase.' Use of mold preparations to replace malt in the fermentation industry was suggested by Takamine, and large-scale tests at the plant of Hiram Walker and Sons, Inc., in Canada in 1913 proved entirely successful,

yields of alcohol being better than with malt. However, a slight off-flavor or odor was produced in the alcohol, and since the flavor is of paramount importance in beverage alcohol, Takamine's preparation has not found favor in the alcohol industry. Now, however, with the increasing interest in power alcohol, it would seem that a procedure similar to Takamine's should hold much promise for production of industrial alcohol." Address: Iowa State College, Ames.

386. *Tucson Daily Citizen* (*Arizona*). 1940. Charles Beach ranch tour planned. Jan. 11.
• ***Summary:*** "C.B. Brown, Pima county agricultural agent, outlined plans for a range tour over the Charles Beach ranch and the Santa Rita range reserve on Jan. 22.

"Tom Rigden, University of Arizona livestock specialist, and Matt Cully, in charge of the reserve, will aid in directing the expedition.

"Results of the experimental work in range revegetation and control of burrow weed and mesquite will be shown."

387. Land patent: Charles P. Beach patents 205.83 acres (3 aliquots) of land in Pima County, Arizona, in Section 2, Township 17S, Range 15E. 1940. Jan. 22. Accession #1106536.
• ***Summary:*** This is the third land patent issued to Charles P. Beach, who had married Caroline Takamine in 1926. The land is south of Vail, Arizona, in the Gila & Salt River Baseline & Meridian.

The total land purchased (patented) on these three patents from 1934 to 1940 is 2,827.74 acres. All his parcels of land are in the direction of Vail from Tucson. Address: Tucson, Arizona.

388. List of United States citizens who are passengers on S.S. Munargo, sailing from Nassau, Bahamas, April 5, 1940, arriving at Port of New York, April 5. officials at port of arrival. 1940.
• ***Summary:*** No. 11. Full name of passenger: Carolyn Takamine. Age 16. Born: 20 May 1923, Passaic, New Jersey. Single. Address in USA: 265 Mountain Ave., Ridgewood, New Jersey.

No. 12. Name: Hilda Thomas. Age 42. Married. Born: 2 Nov. 1897, New York City. Address in USA: 265 Mountain Ave., Ridgewood, New Jersey.

No. 13. Ernest F. Thomas. Age: 5 years, 9 months. Male. Single. Born: 14 July 1934, Passaic, New Jersey. Address: With mother [Hilda], Line 12. 169 Haverhill Ave., Lawrence, Massachusetts.

Note: The Hilda was born Hilda Petrie; her 1st marriage was to Jokichi Takamine, Jr., whom she divorced on 22 May 1925.

389. U.S. Department of the Interior, Census Office. 1940. Charles P. Beach in the 1940 U.S. Census in Pima County, Arizona. Washington, DC. April 8.
• ***Summary:*** Charles P. Beach is the head of household and Carolyne [sic, Caroline] is his wife. Note: They are mis-indexed on Ancestry.com as Charles and Carolyne Beack [sic].

He is age 40 (born in Kansas) and she is age 65 (born in Massachusetts). They have ten servants (including children of servants, all born in Arizona except Margaret Halverson, who was born in Wisconsin) living on their property. They are: (1) Margaret Halverson, age 62. (2) Rupert Lopez, age 36. (3) Mari Lopez, wife of Rupert, age 32. (4) Albert Lopez, son, age 12. (5) Eddellia Lopez, son, age 10. (6) Mari Lopez, daughter, age 4. (7) C. Dravo, age 22. (8) Mary Dravo, his wife, age 20. (9) Norberto Dravo, infant son, age 1 month. (10) Julia Mungula, female servant, age 18.

390. Prescott, Samuel Cate; Dunn, Cecil Gordon. eds. 1940. Industrial microbiology. New York, NY: McGraw Hill Book Co. x + 541 p. Illust. Index. 23 cm. [53* ref]
• ***Summary:*** In Chapter 8, titled "Yeast: Its manufacture, vitamins, and uses," p. 155 states that soybeans, freed of bitter principles, sugar-beet juice, and various other substances have been proposed either to increase the yield of yeast or to act as the source of nutrient material (See Chrzaszcz and Janicki 1936).

Chapter 24 titled "The molds" (p. 339-57) discusses: Some important Aspergilli (members of the *Aspergillus flavus-oryzae,* especially strains of the *A. oryzae* series are of major industrial importance in the Orient [East Asia]). They are used to make sake, shoyu, miso, and *mizuame,* a sugar syrup made from rice (p. 350). Divisions of Penicillia (the genus Penicillium). The genus Rhizopus (used in the amylo process for converting starch to sugar by the use of selected molds–see p. 48-50). Mold enzymes. Apparatus for cultivating molds. References on molds (42).

Chapter 32 titled "Mold enzyme preparations: Uses and products" (p. 419-24), has the following contents: Introduction. Commercial amylase and its preparation. Koji and its preparation. Some mold products (in Japan): Soy sauce or shoyu, tamari, miso. The uses of mold enzymes (industrially): Amylases, invertase, proteases, and pectinase. The authors cite the industrial applications of members of the *Aspergillus flavus-oryzæ* group especially strains of *Aspergillus oryzæ*. Commercial amylase or diastase is marketed under a variety of trade names such as Taka-diastase, Kashiwagidiastase, Digestin, Polyzyme, Protozyme, and Oryzyme. These are generally mixtures of enzymes, however purified enzyme preparations (such as Taka-amylase) may be obtained.

Koji may also be used to make sake (rice wine) and shocho (distilled alcoholic liquor). "The use of *koji* in the United States was introduced by Takamine" (p. 420). Address: Cambridge, Massachusetts.

391. The story of Parke, Davis & Company. 1941. Detroit, Michigan: Parke, Davis & Co. [28] p. Illust. Map. 19 cm.
• ***Summary:*** A history of Parke, Davis & Co. on its 75th anniversary (1866-1941). "Seventy-five years of service to medicine and pharmacy."

On an unnumbered page we read: "The company is reorganized: With the passing of Parke and Davis a reorganization took place. Three prominent Detroit business leaders, David Whitney, Theodore D. Buhl, and Henry Stephens, took over Mr. Davis' interest in the concern. William M. Warren became general manager; Mr. Buhl succeeded Mr. Parke as president.

"What shall be said of this second important period in Parke-Davis history–the first 40 years of the present century? In a word, this was the period of the Company's greatest development, during which Parke, Davis & Company became the world's largest makers of pharmaceutical and biological products. This phenomenal growth has largely come from the discovery and introduction of many important medicinal products, the fruit of Parke-Davis research. Of these, only a few need be mentioned–Adrenalin, a powerful heart stimulant; Pituitrin, often necessary in childbirth; Ventriculin, specific in pernicious anemia; Antuitrin-S; Thio-Bismol; Haliver Oil; Taka-Diastase; Neo-Silvol; Pitocin; Pitressin; Eschatin.

Two pages later: "Parke-Davis has ever been a house of interesting personalities–prominent figures in the scientific world. Among them may be mentioned Dr. Charles T. McClintock, first director of the Research Laboratories; Dr. Jokichi Takamine, discoverer of Adrenalin and Taka-Diastase; Dr. J.M. Francis, Chief Chemist for many years; Dr. Wilbur L. Scoville, noted pharmaceutical authority; Dr. E.M. Houghton, pioneer in physiological standardization; and Dr. Oliver Kamm, the present Scientific Director of Research Laboratories, who has achieved more than a national reputation during recent years."

Six presidents: The first president was Hervey C. Parke. Address: Detroit, Michigan.

392. Kanazawa Kodomo Bunka-kai. 1942. Kyôudo no kagakusha monogatari [Story of my hometown scientists]. Kanazawa, Japan: Kanazawa Kodomo Bunka-kai. 30 p. Jan. 15. 19 cm. [Jap]*
• ***Summary:*** One chapter (30 pages long) is about Dr. Jokichi Takamine. "Kodomo Bunka-kai" means "Children's Cultural Society." Dr. Takamine spent much of his younger life in Kanazawa, Japan. Address: Kanazawa, Japan.

393. *Tucson Daily Citizen* (*Arizona*). 1942. GPA to discuss hunting rules at 8 p.m. meeting. March 27. p. 12.
• ***Summary:*** "Possible regulations for the 1942 hunting season will be discussed by members of the Tucson Game Protective association...

"Charles P. Beach, chairman of the state game commission, will be present at the meeting to answer the questions of the members and to report on the progress of the state game department."

394. Smith, Chas. B. 1943. Around the town [Takamine]. *Journal Transcript* (*Peoria, Illinois*). April 10.
• ***Summary:*** "Registered at the Hotel Pere Marquette last Tuesday and remaining until Wednesday afternoon were Ebon Takamini [sic, Eben Takamine] and Walter McIntyre of the Takamine Laboratory, Clifton, New Jersey. Mr. Takamine is the son of the Japanese scientist and chemist, Jokichi Takamine, who fifty years ago in the boom days of the old Whiskey Trust was a resident of Peoria in charge of a series of experiments on his methods of securing an increased yield of spirits per bushel of corn consumed at the Wollner Brothers, and, I believe, some of the other distilleries.

"Mrs. Takamine is recalled by some older Peorians as well as her distinguished husband. She was a beautiful and accomplished woman... She was prominent in social circles and the Peoria Woman's club. The home was on Jefferson Avenue near its junction with North Adams St. overlooking the river and Peoria lake. The large frame house was earlier the home of the old Peoria family of Lincoln.

"Mrs. Takamine is still living quietly in Arizona. She is far advanced in years and, I am told, is the same gracious lady as of yore. Her son, Ebon, has followed in the scientific footsteps of his father to whom the Takamine Laboratory in New Jersey is a monument. Being is this part of the country he stopped in Peoria, with his associate, Mr. McIntyre, to search out his old home. After leaving the North Jefferson Ave. home, the Takamine family lived for some years at the old National Hotel, Jefferson and Hamilton.

"The Takamine family removed from Peoria about 1910 [not true], going to Washington, DC. William Howard Taft was then president [he was president from 1909-1913]. His wife was a sister of William A. Heron, prominent Peoria banker, and by marriage was related to the Walker family of Isaac Walker Hardware Co. Mr. Takamine was an ardent disciple of horticulture and interested Mrs. Taft in Japanese cherry trees. The Mikado's government presented the first trees to Mrs. Taft and the United States through his influence. The first trees did not prosper, there being some trouble in their adaption [adaptation] to the climate, etc. This was overcome and other trees were sent and planted in Washington where there culture resulted in making 'Cherry Blossom Time' in Washington famous throughout the world."

395. Hao, Lu Cheng; Jump, John A. 1945. Microbial amylase preparations: Conversion agents for alcoholic fermentation. *Industrial and Engineering Chemistry* 37(6):521-25. June. [7 ref]
• ***Summary:*** Takamine (Ref. 6) first introduced mold bran, produced by growing *Aspergillus oryzae* on wheat bran,

to the modern distillery, but its used did not find favor on account of the slight off-flavor of the alcohol resulting from the use of mold." bran

A table lists 19 sources of microbial amylase, including Taka-Diastase, made by Parke, Davis & Co., and Alase, made by Takamine Lab. Address: Joseph E. Seagram & Sons, Inc., Louisville, Kentucky.

396. Robinson, Samuel. comp. 1945. Organizations and officials concerned with wildlife protection: 1945. *United States Dep. of the Interior, Fish and Wildlife Service, Circular* No. 9. 29 p. See p. 8

• ***Summary:*** The section titled "Organizations in states and territories" (p. 8) states:

"Arizona Game and Fish Commission, Phoenix.

"Chairman: W.S. Connor, Clarksdale.

"Member: Charles P. Beach, Vail.

"Member: R.K. Wickstrum, Phoenix..."

Note: The names of several other people and the titles of their publications are also given. Address: Administrative Assistant, Div. of Game Management, Fish and Wildlife Service.

397. Land deed: John Moody sells his land and Sho-Fu-Den at Merriewold (Sullivan County, New York) to Melvin Chester Osborn. 1946. New York. 3 p. Feb. 20. In Book 385, p. 281-83.

• ***Summary:*** John Moody resides at No. 277 Park Avenue, Manhattan, New York. Melvin Chester Osborn resides at Monticello, Sullivan County, New York (no street address). Moody sells:

"All that tract or parcel of land with the buildings or improvements thereon in the Town of Forestburgh, Sullivan County, New York, known as the Takamine Homestead Property and being Lots one (1) to twenty five (25), both inclusive, and parts of Lots twenty six (26) and twenty seven (27) in Plot G; and lots one (1) and two (2) in Plot A, as shown on a map of Plots A, C, and G of Merriewold Park, filed in the Sullivan County Clerk's Office. The premises intended to be conveyed are particularly on a map entitled Map of Lands belonging to Mrs. Caroline Takamine, Merriewold Park, Sullivan County, New York, made by Irving Righter, C.E. June 1908. The entire homestead property above described being bounded northerly by Merriewold Road, easterly by Lakeside Road and lands formerly of Read Gordon, westerly by the Monticello and Forestburgh Highway and southerly by the fire line,..." Plus many important legal details.

"Being the same premises described in a deed from Caroline H. Beach to Moodyson Corporation dated June 16, 1930 and recorded on the 9th day of September 1930 in the Sullivan County Clerk's office in Liber [Book] 275 of deeds at page 129, and the same premises described in a deed from Moodyson Corporation to the party of the first part [John Moody] dated September 18, 1939 and recorded on the 23rd day of September 1939 in the Sullivan County Clerk's office in Liber 335 of deeds at page 2."

Note: Osborn's full name, correctly spelled, is Melvin Chester Osborn. Born: 1916. Died: 1976. Buried at Rock Ridge Cemetery, Monticello, Sullivan County, New York. Source: "Find a Grave Memorial #23766984." Address: Sullivan County, New York.

398. *Republican Watchman* (*Monticello, New York*). 1946. Jap palace to be public: Melvin Osborn to open Takamine palace to public. May 24. p. 1.

• ***Summary:*** "At a dinner meeting of the Chamber of Commerce in the Monticello Inn Wednesday evening, it was revealed that Melvin Osborn has bought the Japanese estate of the late Dr. Jokichi Takamine at Merriewold Park and will open the property to the public at admission price in a few weeks. There are twenty acres of Japanese gardens with an artificial lake and other ponds surrounding the Japanese palace. The place will be opened for sightseers around the first of July. The house is richly furnished with Japanese furniture, Dr. Takamine, a chemist, brought the building and furnishings from the St. Louis exhibition in 1904 as a gift from the Japanese government.

"It was the consensus of opinion among the Chamber members that the property should be widely publicized in their annual booklet soon to go to press, as it is one of the beauty spots of the county."

399. *Republican Watchman* (*Monticello, New York*). 1946. Jap palace story to be on radio. June 14. p. 1.

• ***Summary:*** The story of Sho Foo Den, the Japanese palace located six miles south of central Monticello, in Merriewold Park, and Owned by Melvin C. Osborn of Monticello. is scheduled to be dramatized over the coast-to-coast Columbia Broadcasting System on the program "Time to Remember," Thursday, June 20th at 2:45 P.M. EDT.

"Sho Foo Den, a fantastic Japanese palace, a full-scale copy of a 520 year old palace in Kioto, will be open to the public starting July 1st." Mr. Osborn purchased it last February [i.e. Feb. 1946]. Sho Foo Den is located on 20 acres of beautifully landscaped grounds. "The estate is famous for its 50,000 Rhododendron plants. In the ponds which dot the grounds are many Oriental fish and water plants.

"Milton Bacon, narrator of 'Time to Remember,' veteran traveler and authority on Americana, on a recent visit to Sho Fu Den remarked that rarely has he seen anything to equal this sight."

400. Underkofler, L.A.; Severson, G.M.; Goering, K.J. 1946. Saccharification of grain mashes for alcoholic fermentation: Plant-scale use of mold amylase. *Industrial and Engineering Chemistry* 38(10):980-985. Oct. [10 ref]

• ***Summary:*** Nearly ten years ago, research was begun in

the biophysical laboratories at Iowa State University in an effort to find a satisfactory amylolytic material which could serve as an alternative to malt for saccharifying starch in the alcoholic fermentation of grains. In 1939, as a result of this work, Underkofler, Fulmer and Schoene suggested the use of mold bran prepared by growing selected strains of *Aspergillus oryzae* on moist, sterilized wheat bran. Many years earlier [starting in 1892] Jokichi Takamine (1914) made a similar suggestion, "but his suggestion has led to no large-scale developments in the alcohol industry."

"The purpose of this paper is to report the results of industrial-scale tests of mold bran in the alcohol plant of the Farm Crops Processing Corporation during the early months of 1945."

Photos show: (1) The plant of Mold Bran Company near Eagle Grove, Iowa. (2) Two men assisting the blowing of dried spore cultures into the cooker to inoculate cooked bran. (3) Cooked wheat bran in a vat-type cooker after being cooled and now ready for inoculation. (4) Inoculated bran being removed from the cooker. (5) A man wheeling the inoculated from the cooker and dumping it through a hole in the working floor into the tray room for incubation. (6) Two men spreading inoculated bran on incubation trays. (6) Freshly incubated mold bran flowing into drying bins. Address: Farms Crops Processing Corp., Omaha, Nebraska; 1. Present address, Iowa State College, Ames, Iowa; 3. Present address: Mold Bran Company, Eagle Grove, Iowa.

401. *Republican Watchman* (*Monticello, New York*). 1947. Rights to land in Merriewold Park now in dispute. July 25. p. 1.
• ***Summary:*** "A Merriewold membership meeting was held last Saturday afternoon to discuss property rights at Merriewold Park. Property there represents an investment said to approximate four million dollars and the development has long been a rather exclusive vacation resort.

"The problem is said to be a friendly determination of exact club rights of Sho Foo Den at present owned by Melvin Osborn. Osborn is represented by Weiss and Costa while the Merriewold Club has engaged Walton, Bannister and Stitt.

"It was pointed out at the meeting that papers executed in 1905 between the Takamine family and Merriewold Club Inc. gave to the Takamine family unrestricted rights to the club land and club facilities, in fact rights which were enjoyed by no other members. The legal problem is whether such special rights extended to an inducement to the Takamine family to bring Sho Foo Den there, pass to their successor Melvin C. Osborn and his successors or patrons. Mr. Brophy, President of the Merriewold Club, made it clear that no personal feeling toward Mr. Osborn was involved and that the action is merely a move to determine the legal status of the dedicated lands under present or any future ownership and also the legal use of the club facilities by whatever patrons there may be."

402. Esterow, Milton. 1947. Japanese palace: replica near Monticello now open to public. *New York Times.* Sept. 28. p. X17. Section: Drama, screen, music.
• ***Summary:*** Monticello, New York.–An enchanting Japanese palace nestled among pines and brilliant Japanese maples, six miles from here, is now open to the public for the first time in more than forty years. Only 75 miles from New York City, on Route 42 between Port Jervis and Monticello, Shofu-den ("Pine and Maple Palace") is a replica of the 1,200-year-old Kyoto Imperial Coronation Palace of Japan.

Note: It was once owned and occupied by Jokichi Takamine and his family.

403. *Peoria Star* (*Illinois*). 1948. Historical Society hears East tell of Whiskey Trust. Jan. 20. p. 17.
• ***Summary:*** Earnest E. East told the Peoria Historical Society on Monday evening the history of the "Whiskey Trust," headquartered in Peoria in the late 1800s, and one of the largest combines over organized in the United States. The Trust was organized in Peoria on 10 May 1887 as the Distillers and Cattle Feeders' Trust. Its president, Joseph B. Greenhut, was born in Austria, came to Chicago at age 9, learned to be a coppersmith, served in the Civil War, engaged in cattle feeding in Peoria for a while, went into the distilling business, organized the Whiskey Trust, and became an extremely wealthy tycoon. Adolph Wollner was also associated with the Whiskey Trust–which was accused of willfully destroying competing distilleries.

"The Whiskey Trust employed as a fermentologist expert a man who was to eventually rate a full-column obituary in the New York Times as the 'foremost Japanese in the nation' a Dr. Jokichi Takamine who was brought here by Greenhut to develop 'the Japanese process.'

"Although Takamine never perfected the process (John Dempsey who worked in Peoria distilleries at the time of the trust and was present Monday evening said the yield was even less), he went on to other experiments, sold several patents including adrenalin to the Park-Davis [sic, Parke-Davis] drug company on royalty basis, eventually built himself a five-story completely Japanese-furnished house in New York City, and bought two St. Louis World's Fair Japanese buildings to be erected at his 'summer home' outside New York City limits.

In 1895 Judge Jacob M. Bailey of the Illinois Supreme Court handed down a decision dissolving the Whiskey Trust for its illegal activities.

404. *Republican Watchman* (*Monticello, New York*). 1949. Injunction is sought to prevent operation of Shofu-Den as a resort hotel at Merriewold Park: Papers filed. March 11. p. 1.
• ***Summary:*** "A court action seeking temporary injunction to restrain Melvin C. Osborn from operating and maintaining

Sho Fu Den as a commercial project and asking damages from trespassing upon the dedicated lands of Merriewold Park has been instituted in county court and the papers have been filed in the office of the Sullivan County Clerk Emil Motl.

"According to the complaint which names the Merriewold Park Club and A.J. Milton Hamon and Myrtle Hamon as plaintiffs, Mr. Osborn has violated the rules of the club by operating Sho Fu Den as a Summer Hotel and has allowed his guests to trespass and enjoy of restricted park grounds.

"The plaintiffs allege that the defendant bases his claim upon an easement in and over the lands for gratuitous benefit of hotel guests and patrons, upon a grant made by Merriewold Park Club of certain rights and privileges granted to Caroline Takamine, original owner of Sho Fu Den, in a document dated April 20, 1905. They further contend that the grant was made to Mrs. Takamine alone and that no easement or state of any kind whatsoever accrued thereunder to the defendant as a subsequent grantee.

"Mr. Osborne claims that the rights granted Mrs. Takamine in conjunction with Sho Fu Den is his as successor in the title.

"Since the Osborns acquired the property from John Moody an investment banker in 1946 considerable sums have been spent in the improvement and remodeling of the grounds and buildings of the pine studded estate..."

"The Doctor lived there twenty years and continued to add to his palace collection of art.

"After his death it was sold to Mr. Moody who in turn sold it to Mr. Osborn who has just returned from service with the United States Navy in which he had seen action in the European War Theatre.

"Shofu-Den has become internationally known as a spot of beauty... It is currently described on the Esso road map as 'Twenty acres of oriental gardens which provides the settings for the replica of an ancient Japanese coronation palace.' Rare paintings, antique carvings and furniture greet the eye of the sightseer."

405. Yamashina, Shôsaku. 1952. Takamine hakase no gaibyô [Overview of Dr. Takamine]. In: Shôsaku Yamashina. 1952. Sankyo Chabanshi. Tokyo: Sankyo Co., Ltd. 175 p. See p. 90-119. May 1. 19 cm. [Jap]*
• ***Summary:*** Dr. Takamine was the founder of Sankyo. Address: Japan.

406. East, Earnest E. 1952. The Distillers' and Cattle Feeders' Trust. *Journal of the Illinois State Historical Society* 45(2):101-23. Summer. http://dig.lib.niu.edu/ISHS/ishs-1952summer/ishs-1952summer-101.pdf. [72 ref]
• ***Summary:*** On pages 111 to 115 of this excellent article is a long section about the work of Jokichi Takamine in connection with this trust. This is one of the best summaries of Takamine's work and troubles in Peoria.

A footnote on pages 111-112 mentions "Caroline Takamine Beach (widow of Jokichi, remarried to Charles Beach), of Vail, Arizona," who communicated with the author as late as Nov. 5, 1947. Note: Therefore we know that Caroline was alive and well in late 1947 in Vail, Arizona.

At the bottom of page 112 is a brief biography of Jokichi Takamine and on page 114 is a large portrait photo of him.

"The [Gibson / Dewar] incident provided a juicy morsel for critics of the combine which, despite the change of name, almost invariably was mentioned as the 'trust.' The *Peoria Journal,* edited and published by Jacob B. Barnes, frequently needled it:

"'The late fury over the whisky trust has almost subsided. The members now walk the streets like ordinary men and are no longer interested in the price of dynamite, the beauties of an antiseptic fluid or the possibilities of gin. Instead they are rejoicing that the new Japanese process of making whiskey will give them the market anyway (footnote #28, see below).

"'The Japanese process' was a formula developed by Dr. Jokichi Takamine (#29), a Japanese scientist who came to the United States in 1890 at the invitation of distilling interests. He was heralded as the discoverer of a revolutionary process for the manufacture of alcohol represented to be much cheaper and speedier than the barley malt method used by American producers.

"Takamine carried specimens of his ferment to Chicago where it was tested on an extensive scale in the Phoenix distillery. The *New York Times* in an editorial stated that the whisky trust had lost no time in offering liberal terms for its use. The *Times* was informed that the Takamine process would represent a gain to the trust of $2,000,000 a year, and that Takamine was to receive twenty per cent of the savings in the cost of production (30).

"President Greenhut placed Takamine under contract on February 18, 1891, to apply his process to experimental large-scale runs at Peoria. Takamine appears to have established residence at Peoria before April 4, 1891, for on this date the Takamine Ferment Company issued a license to the distilling corporation to use the new process. A second contract between Takamine's company and the trust was executed on July 18, 1894 (31).

"Takamine used wheat bran and similar materials to produce his converting agent which he called "koji." The name had been used in the Far East for many years to designate a pure culture of aspergillus oryzae propagated on a sterile media (32) It was ready for use in a much shorter time than barley malt.

"Takamine was in Peoria for nearly four years. Secrecy surrounded the experiments he conducted in the malt house of the Grove distillery which was built by Woolner Bros. Here he was often assisted by his wife, the former Caroline Hitch of New Orleans. Guards were placed at his equipment

to thwart 'spies' reported to be in the employ of independent distillers. Also, of the trust charged that President Greenhut used announcements of the varying success or failure of the Takamine experiments to influence the price of the corporation's stock.

"At Chicago Takamine and his backers had organized the Takamine Ferment Company which prepared to license users of its chemical processes. Shares had a book value of $1,000,000 which was increased to $10,000,000 at a Chicago meeting of directors on March 5, 1891 (#33).

"The Japanese scientist carried on other chemical experiments independently of his distilling operations. He established a laboratory in a cottage he called 'The White House,' next door to the Peoria house which he occupied with his wife and their two small sons, Jokichi and Eben, both of whom were born in Japan. Takamine brought from Japan a classmate, Shimidzu [Shimizu], a chemist, and two other men, Koiski and Yamada who were laboratory assistants of lesser skill (#34).

"Takamine's process was put into production in December, 1894 at the Manhattan distillery in Peoria, which was equipped with new machinery for that purpose. The scientist's triumph was short lived. Within two months the Distilling and Cattle Feeding Company was in the hands of receivers appointed by the United States Circuit Court in Chicago. The receivers changed the distillery back to the old process and at Takamine's request his contracts with the trust were cancelled without remuneration to him (#35) But through his discoveries in medical chemistry, Takamine went on to fame and fortune.

"Editor Barnes of the *Peoria Journal* evidently observed that the afterclap of the Gibson incident had not entirely 'subsided' for on March 13, 1891, he wrote:

"'The town is full of detectives. Two sets of Pinkerton men, the one for, the other against the Trust, prowl about the city, and all the drug stores are under surveillance. All the machine shops where infernal machines would be likely to be constructed are carefully guarded. A double line of pickets surround the Monarch Mills [Gibson's distillery]; fortifications are being thrown up around the Woolner establishment [where Takamine was conducting his experiments] whether to protect the men or conceal the special process by which the Japanese method of making 'saki' [sake] is to remain a close secret is not known.'"

Footnotes: #28. March 1, 1891.

#29. K.S. Kawakami. 1928. *Jokichi Takamine: A Record of His American Achievements.* New York, NY: William Edwin Rudge. x + 74 p. Plus: "Caroline Takamine Beach (widow of Jokichi, remarried to Charles Beach), Vail, Arizona, to the author, Sept. 19, Oct. 4 and 21, Nov. 5, 1947."

#30. *New York Times*, Sept. 28, 1891.

#31. *Olmstead v. The Distilling and Cattle Feeding Company,* no. 23640, U.S. Circuit Court, Northern Dist. of Illinois, Northern Div.; Caroline Takamine Beach to the author, Oct. 9, 1947.

#32. Kawakami 1928, p. 25; Eben T. Takamine to the author, Oct. 9, 1947.

#33. *Chicago Tribune*, March 6, 1891.

#34. Caroline Takamine Beach to the author, Oct. 9, 1947.

#35. *Olmstead v. The Company.*

407. Okazaki, Hiroshi. 1953. Properties of saccharogenic amylase of *Aspergillus oryzae. Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(5):296. May. [1 ref. Eng]

• ***Summary:*** The writer has previously reported on the process of purification and some modes of action of the saccharogenic amylase of *Asp. oryzae.* It has very different actions from that of barley alpha-amylase.

This letter, a complex technical analysis, shows that the enzyme was found not to have the properties of the so-called protein; rather it may be a polypeptide which has a molecular weight of 7,500 to 8,000. Address: Takamine Lab., Sankyo Co., Ltd., Shinagawa, Tokyo, Japan.

408. Hukinbara, Takashi; Muramatsu, Keiichiro. 1953. [The action of mold amylase on alcohol fermentations. I. The saccharogenic effect of Takadiastase and alcohol fermentation by the saccharifying agents of the differential enzymic ratios]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(7):398-402. July. [Jap; eng]

Address: The Scientific Research Inst. Ltd.

409. *New York Times.* 1953. Eben T. Takamine, 63, headed laboratory. Aug. 29.

• ***Summary:*** Eben T. Takamine, since 1930 president of the Takamine Laboratory in Clifton, New Jersey, and a son of the late Dr. Jokichi Takamine, died yesterday [Aug. 28] at the Passaic General Hospital [Passaic, Passaic Co., New Jersey]. He lived in Ridgewood, New Jersey. Almost 64 (he was born on Aug. 31 in Tokyo, Japan), he suffered a stroke on Monday.

Brought to the United States when he was 1 year old, Mr. Takamine was naturalized March 20 [1953] under terms of the McCarran Act [of 1952]. In 1913 he was graduated from Yale University. The Takamine Laboratory makes enzymes for industry and foods.

He was a member of the Yale Club of New York, the Bankers Club, and the Upper Montclair (New Jersey) Country Club.

"Mr. Takamine is survived by his widow, Mrs. Catherine McMahon, and his mother, Mrs. Charles P. Beach."

Note: The "McCarran Act" or "McCarran-Walter Act" was officially known as the Immigration and Nationality Act of 1952. It went into effect on 24 Dec. 1952.

410. Ikeda, Nobumasa. 1953. Ehon Takamine Jokichi [The Jokichi Takamine picture book]. Tokyo: Kodansha. 35 p. Oct. 5. 26 cm. [Jap]*
Address: Japan.

411. *Call* (*Paterson, New Jersey*). 1953. City in Japan honors late Dr. Takamine. Nov. 4.
• ***Summary:*** "The City of Kanazawa, Japan, is holding a four-day celebration this week to honor the late Dr. Jokichi Takamine, the discoverer of adrenaline and founder of the Clifton [New Jersey] laboratory which bears his name." Takamine was born in Kanazawa 100 years ago. Commemorative addresses will be presented by the Japanese minister of education, the U.S. ambassador to Japan, the president of Kanazawa College, and by Homer C. Fritsch, executive vice-president of Park [sic, Parke], Davis and Company, for which Dr. Takamine had been a consultant. Eben Takamine, Dr. Takamine's daughter-in-law, presented a large portrait of the scientist. "Eben T. Takamine achieved in Hackensack this year a feat his renowned father had never accomplished. He became a naturalized American citizen on March 21, under the provisions of the McCarran-Walter Immigration Act [1952], then died August 29 at the Passaic General Hospital of a heart attack."

Dr. Jokichi Takamine "died in New York City in 1922 after a lifetime of chemical research which included, in 1900, the isolation of adrenalin, a powerful heart stimulant, the discovery of TakaDiastase, a starch digesting ferment. Most of his important work was accomplished in this country, but immigration laws had prevented him from becoming a citizen.

"Fritsch, the Parke-Davis executive, called adrenalin 'one of the outstanding medical products of the age,' and he pointed out his firm had marketed more than three million pounds of TakaDiastase since 1895, the equivalent of one-billion doses." Fritsch, who traveled 7,000 miles to participate in the ceremonies, lauded Dr. Takamine for his "scientific discoveries, international trade contacts, and great humanitarian interests.

"It was also pointed out at Kanazawa that Dr. Takamine was the donor of the famed cherry trees which bloom [each spring] along the Mall in Washington, DC, and a similar group of trees in New York City."

412. Bett, W.R. 1954. Jôkichi Takamine (1854-1922): discoverer of adrenaline. *Chemist and Druggist* (*London*) 162:523. Nov. 20.
• ***Summary:*** Begins with a brief biography of Takamine up to about 1890. It states that "his father had studied medicine in the Netherlands." This biography ends: "The Takamine Ferment Company, however, proved a failure, and the production of takadiastase was taken over for medical use by Parke, Davis & Co., Detroit, Michigan, and New York.

Note: Did the royalties from the sale of Taka-Diastase by Parke, Davis go to the Takamine Ferment Co., or to the International Takamine Ferment Co., or directly to Dr. Takamine himself?

"Isolation of adrenaline: From 1890 onward Takamine was in close association with Messrs. Parke Davis. In 1898 he set himself the task of isolating the active principle of the suprarenal glands." There follows the story of his isolation of adrenaline, his announcement of his discovery (in Jan. 1901), and the introduction of adrenaline to the medical profession starting in 1901.

After his epoch-making discovery, prosperity and honors came to Takamine. He went out of his way to help young chemists, and "came to be recognised as Japan's unofficial ambassador to the United States..." Address: M.R.C.S., L.R.C.P., F.C.S., M.R.A.S.

413. *News* (*Paterson, New Jersey*). 1954. Mrs. Takamine wed Thanksgiving Day. Nov. 30.
• ***Summary:*** Note: Mrs. Takamine, whose maiden name was Catherine McMahon, was formerly married to Eben T. Takamine, the son of the famous scientist Jokichi Takamine. Eben died of a heart attack on 29 Aug. 1953 at the Passaic General Hospital in New Jersey.

Mrs. Takamine, president of Takamine Laboratories Inc., married Schuyler Van Renssalaer Gros, of Palo Alto, California on Thanksgiving Day [Nov. 25] of 1954. They were married in Baltimore, Maryland, and Mrs. Takamine was attended by her niece, Mrs. Jokichi Takamine, III, of New York City. The couple will reside at 537 Highland Ave., Ridgewood, upon their return.

Note: Ridgewood is a town in New Jersey, located about 10 miles northeast of Paterson.

414. Ikeda, Nobumasa. 1954. Jokichi Takamine [Jokichi Takamine]. Tokyo: Dainihon Yûbenkai Kôdansha. 262 p. Nov. Illust. (by Mamoru Sekiguchi). 20 cm. Series: Sakai Denki Zenshu, No. 6 [World Biographies–Complete Works, No. 6] [Jap]*
• ***Summary:*** This book is said to be for young (juvenile) readers. The author lived 1893-1980. Address: Japan.

415. Underkofler, Leland A. 1954. Fungal amylolytic enzymes. In: L.A. Underkofler and R.J. Hickey, eds. 1954. Industrial Fermentations, Vol. II. New York, NY: Chemical Publishing Co. vi + 578 p. See p. 97-121. Index. 22 cm. [53 ref]
• ***Summary:*** "Enzymes may be defined as biocatalysts which bring about specific biochemical reactions... Enzymes are of special importance in the fermentation industries, since all fermentation processes are the result of the enzymic activities of microorganisms" (p. 97).

"Takamine, in 1894, was probably the first to realize the technical possibilities of enzymes from molds and to

introduce such enzymes to industry." Several firms are presently making and marketing fungal amylases, proteases, and pectinases. The discussion in this chapter will be confined to "fungal carbohydrases which act on starch" (p. 98).

Tauber (1949) listed 23 enzymes that have been identified from the mold *Aspergillus oryzae.*

At first, Takamine used steamed rice as a substrate, as is widely done in East Asian countries. Next he tried other cereals, and finally wheat bran, which proved superior to other known procedures for producing fungal enzymes (p. 101).

"Takamine was the first to use the bran process and he secured some 19 patents on various aspects of the production and use of fungal enzymes. He particularly recommended (1914) and patented (1913) the use of a rotating horizontal drum. Details of the bran and drum process are given, along with its advantages and disadvantages" (p. 109). Address: Prof. of Chemistry, Iowa State College, Ames, Iowa.

415. *Tucson Daily Citizen* (Arizona). 1954. Mrs. Charles Takamine Beach dies after long illness. Nov. 27.
• ***Summary***: Mrs. Charles Takamine Beach, age 88, wife of Charles P. Beach of Vail, died yesterday [Nov. 26] after a long illness. Rosary services will be held tomorrow at 8:30 p.m. in the Reilly mortuary chapel.

"Funeral mass is scheduled at 9 a.m. Monday in the chapel of Santa Rita in the desert near Vail, which was built and furnished by Mrs. Beach and her husband. Monsignor A.F. Gramer, pastor of All Saints parish, will sing the mass with the Rt. Rev. Daniel J. Gercke, Bishop of Tucson, assisting.

"Following the services at Vail her body will be sent to New York for burial in the family mausoleum in Woodland [sic, Woodlawn] cemetery.

"Mrs. Beach was born in Falmouth, Massachusetts, the daughter of Mary and Ebenezer Hitch.

"She spent many years in New York and Japan with her first husband, Dr. Jokichi Takamine, who died in 1922.

"Dr. Takamine, a famous Japanese chemist, is well known for his gift of 3,000 cherry trees that bloom along the banks of the Potomac River in Washington, DC, each spring.

"When the first cherry trees were sent to Washington and planted on the Potomac they developed a blight disease and died. Dr. Takamine and his wife were in Japan. When they heard of the death of the trees they raised or had raised blight-free cherry trees and sent 3,000 of them to Washington. They were presented to Mrs. William Howard Taft and were planted along the banks of the Potomac." (Note: This story of Dr. Takamine and the cherry trees contains several errors).

"As a chemist, Dr. Takamine organized and erected the first superphosphate works at Tokyo and was head chemist for the imperial department of agriculture and commerce.

"When he came to America he became known for his work in originating a process for isolating adrenalin.

"After his death, Mrs. Beach married her present husband and went to Vail where she lived in the foothills at Rancho del Ocotillos [Rancho de los Ocotillos].

"The chapter at Vail which was built by Mr. and Mrs. Beach is a memorial to Dr. Takamine and his work. When it was finished in 1935 it was dedicated to the service of the Catholic people of the Vail area.

"The decorations of the chapel, the vestments, paintings and chapel bell as well as altar linens were sent as gifts from Europe and the Orient, from various parts of the United States and from the members of the Takamine family.

"Mrs. Beach is survived by her husband, two sisters, Mrs. Ellmore B. Bogan of Tucson and Mrs. Marie M. George of Wauwatosa, Wisconsin, a grandson, Dr. Jokichi Takamine of New York and a granddaughter, Mrs. T.W. Kramer of Tucson.

"In lieu of flowers the family has asked that all offerings be sent to the Arizona Children's Home."

416. *News* (*Paterson, New Jersey*). 1956. Takamine Labs to merge with Indiana firm [Miles Laboratories]. Feb. 3.
• ***Summary:*** The merger of Takamine Laboratories, Inc., with Miles Laboratories, Inc., of Elkhart, Indiana, has been approved by the stockholders and will be subject to approval by the Board of Directors. The merger is scheduled to become effective on 7 March 1956.

The Takamine Laboratories, which are located off Arlington Ave. in Clifton, New Jersey, is a pioneer commercial producer of industrial and pharmaceutical enzymes. The business was founded in 1898 by Dr. Jokichi Takamine, the discoverer of adrenaline and the first to enter commercial production of enzymes. The acquisition by Miles marks another step in the company's program of diversification. Miles, whose stock was recently offered to the public for the first time, is well known as a producer of drugs and chemicals. Miles is the pioneer maker of citric acid by deep tank fermentation.

"Takamine will become The Takamine Laboratory, Division of Miles Laboratories, Inc. The management of Miles anticipates no change in personnel or in sales or operation policies at Takamine, which will operate as a separate and independent unit of the parent company."

Note: The Clifton, New Jersey, city directory for 1956 contains the following entries under Takamine: (1) Takamine, Katherine McMahon, Mrs. president & treasurer Takamine Laboratory Inc., 193 Arlington Ave. Home at Ridgewood [about 10 miles northeast of Paterson]. (2) Takamine Laboratory Inc., Mrs. Katherine McMahon Takamine, president & treasurer. John J. Kenneally vice-president & comptroller. James W. Faucett vice-president. Ermen J. Colapietro asst. secretary. Arthur M. Wheeler asst. comptroller. 193 Arlington Ave.

417. *Tucson Daily Citizen* (*Arizona*). 1956. Pima County ranch sale announced. Feb. 21. p. 8.
• ***Summary:*** "Sale of the Mt. Fagan ranch near Vail was announced Tuesday.

"The ranch was sold by Charles P. Beach. well known Southern Arizona cattleman and a former member of the Arizona Game and Fish Commission. The Property was bought by Mrs. Star C. Simpson, wife of M.O. Simpson, Toronto industrialist.

"The sales price was not revealed. The property had been listed at $200,000. It includes 33,000 acres of deeded, forest and state lands."

418. Baens-Arcega, Luz; Marañon, Joaquin; Palo, Macario A. 1956. Proteolytic enzyme from a Philippine strain of *Aspergillus oryzae* (Ahlburg) Cohn. *Philippine J. of Science* 85(2):189-201. June. [7 ref. Eng]
• ***Summary:*** Strains of the mold *Aspergillus oryzæ* are used in Japan to make shoyu, miso, mizuame [rice syrup], and sake, and used in the manufacture of commercial enzymes such as Takadiastase, Polyzyme, Digestin, Oryzyme, and Kasiwagidiastase.

The authors isolated several protease-forming yellow-green molds. By repeatedly culturing the isolates in copra meal and rice bran media, one was found to produce protease of excellent digestive potency as evaluated by the Oshima and Church method. Optimum temperatures for protease production was 27ºC in copra meal and 22 to 27ºC in rice bran.

"The potency produced by the Philippine strain of *A. oryzæ* in copra meal is 3 times that of the most efficient *A. oryzæ* and 2 times that of the *Aspergillus effusus* type cultured in wheat bran by Oshima and Church." Address: Inst. of Science & Technol, Manila, Philippines.

419. Shuzui, K.; Sakamoto, M.; Tajima, O.; Kojima, Y. 1957. Gôsei seishu no kômi zôkyô ni kansuru kenkyû. IV. Seisei dasshi daizu to kôso-zai or riyô shita gôsei seishu ni tsuite [Studies for increasing the flavor and aroma artificial sake. IV. Artificial sake brewed by utilizing refined defatted soybean meal and taka-diastase]. *Kagaku Kenkyujo Hokoku* (*Reports of the Scientific Research Institute, Tokyo*) 33(6):353-58. [2 ref. Jap]

420. *Tucson Daily Citizen* (*Arizona*). 1958. Superior Court. June 5. p. 25.
• ***Summary:*** "Theodore W. Kramer vs. James C. DeVos / DeVoi [?] et ux. / at six, complaint on debt..."

Note: On 14 Jan. 1961 (p. 7) this newspaper says that this case was dismissed.

421. Underkofler, L.A.; Barton, R.R.; Rennert, S.S. 1958. Microbiological process report: Production of microbial enzymes and their applications. *Applied Microbiology* 6(3):212-21. [56 ref]
• ***Summary:*** "Dr. Jokichi Takamine (1894, 1914) was the first person to realize the technical possibility of cultivated enzymes and to introduce them to industry. He was mainly concerned with fungal enzymes, whereas Boidin and Effront (1917) in France pioneered in the production of bacterial enzymes about 20 years later. Technological progress in this field during the last decades has been so great that, for many uses, microbial cultivated enzymes have replaced the animal or plant enzymes." Address: Takamine Lab., Div. of Miles Laboratories, Inc., Clifton, New Jersey.

422. Tamiya, Hiroshi. 1958. The koji, an important source of enzymes in Japan. In: Proceedings of the International Symposium on Enzyme Chemistry; Tokyo and Kyoto. Tokyo: Maruzen Co. Ltd. 541 p. Held 15-23 Oct. 1957 in Tokyo and Kyoto, Japan. See p. 21-24. [17 ref]
• ***Summary:*** "Etymologically the word Koji is an abbreviation of Kabi-tachi meaning something like 'Bloom of Mold,' and, as a matter of fact, the essential part of Koji is the mold *Aspergillus oryzae*, which is grown on steamed rice or other cereals and sometimes on steamed pulses. In the brewing of the Japanese rice-wine saké, Koji has long been used as the 'malting' agent to convert rice starch into fermentable sugar."

It is "no exaggeration to say that the dietary life of Japan cannot exist without Koji or the mold *A. oryzae*. At present the foods and drinks processed with this agent are being consumed at the rate of about 1,000 million U.S. dollars each year, and the taxes taken from it run up to more than 500 million U.S. dollars each year, which is as much as 20 per cent of the total national budget of our country [Japan; Sakaguchi 1957].

"Historical documents show that Japan learned the use of Koji from China more than 1700 years ago... But the real understanding of the nature and the mode of action of Koji became possible only in the latter half of the 19th century when our country opened her door to Western civilization. It was with the initiation of scientific studies of Koji at this dawn of a new age that enzymology in Japan made its start.

"Soon after the Meiji Restoration in 1868, some governmental colleges were established for conducting higher education of western science and technology. As the teaching staff of these colleges a number of scientists were invited from Western countries. The mold *A. oryzae* was first isolated from Koji in 1878 by a teacher of natural history from Germany, Dr. Ahlburg*, and the fact that the mold has a strong diastatic activity was first made clear in 1881 by a teacher of applied chemistry from England, Dr. Atkinson **. (Footnote: *Ahlburg, H., and Matsubara, S., *Tokyo Iji-Shinshi* 24, 12 [1878].) (Footnote: **Atkinson, R. W., *Tokyo Imp. Univ., Sci. Dept.* 6,1 [1881]; *Proc. Roy. Soc.* (London) 32,299 [1881].)"

The first Japanese scientist to become deeply interested in Koji was Jokichi Takamine. He "eventually succeeded in increasing considerably the diastatic activity of the mold. Having heard that the malting process using mold activity had never been practiced in occidental countries, an ambitious idea occurred to him, the idea of introducing the method into those countries, and with this idea he went to America in 1890. The demonstration he made there was a successful one, but unfortunately his project could not be realized due to the strong opposition of the manufacturers of malt. Undeterred by this failure he soon started an entirely new project, again using Koji-mold, but this time preparing from it a drug having a strong digestive activity*. The procedure he adopted was to grow Koji-mold on [wheat] bran, and to extract the mixture with water, from which the enzymes were precipitated with alcohol. The drug was named Takadiastase after his name Jokichi Takamine, the name which gained world-wide fame not only from this brilliant invention, but also through his later discovery of the adrenal hormone, adrenaline. (Footnote: *Takamine, J., U.S. Patent, 525823, 525825 [1894].)

"As Takadiastase gradually found a larger market, this commercial preparation or its origin *A. oryzae* also became a popular material for the study of enzymes in biochemical laboratories. The more it was investigated, the more varieties of enzymes were found in it. Since the early twentieth century it thus became one of the most popular research objects used in the study of enzymology*. (Footnote: *Tamiya, H., and Morita, S., Bibliographie von *Aspergillus, Botan. Mag.* (Tokyo) 43, No. 506 [1929] to 44, No. 524 [1930].)" Address: The Inst. of Applied Microbiology, Univ. of Tokyo and Tokugawa Inst. for Biological Research, Tokyo, Japan.

423. Carson, Jack. 1959. Mt. Fagan ranch sold for $1.25 million: Development planned. *Tucson Daily Citizen* (*Arizona*). April 27. p. 1.

• ***Summary:*** "The 33,000-acre Mt. Fagan ranch [near Vail, formerly owned by Charles P. Beach] has been purchased for $1.25 million by Orland Fiandaca, who said today he plans an industrial development on 1,000 acres of the land.

"'I'm going to split the balance of the ranch up into small ranch homesites–ranchitas,' Fiandacas said.

"The purchaser is president of the Arizona Security & Investment Co. Seller is Mrs. Star C. Simpson, wife of Toronto, Canada, industrialist, M.O. Simpson."

"The ranch lies west of the Andrada Ranch which was recently purchased by Joseph Timan and associates as part of the Vail-Posta Quemada planned community."

Note: Posta Quemada means "burnt station."

424. Mahoney, Tom. 1959. The merchants of life: an account of the American pharmaceutical industry New York, NY: Harper & Brothers. x + 278 p. Index. 22 cm.

• ***Summary:*** An excellent history of this industry in the United States, including a detailed history of Parke, Davis & Co. and of adrenalin. Chapter 1, "Alchemy to antibiotics" chronicles the amazing rise of the pharmaceutical industry from the late 1800s until World War II; during the war penicillin, the first antibiotic, was commercialized.

In 1910 the first man-made compound that cured an infectious diseases was developed by Ehrlich in Germany; it was an arsenic compound that cured syphilis effectively. Until the 1930s, the accomplishments of the U.S. drug industry were few. Leadership of the industry passed to the United States from Europe during World War II.

Since World War II the United States has been the leader in field of pharmaceuticals. Before World War II, imports of drugs to the USA greatly exceeded exports. Yet in 1957 exports were $284 million against imports of only $11 million. Moreover, U.S. companies now manufacture in many overseas plants.

Life expectancy at birth has increased 50% since 1900 in most countries. Part of this increase is due to more abundant food, an understanding of microbiology, and improved sanitation and public health measures.

Chapter 5, "Parke, Davis & Company: Adrenalin, benadryl, chlormycetin" (p. 64-81) tells the history of that company which was founded on 26 Oct. 1866. Hervey Coke Parke was a businessman who became a partner of Dr. S.P. Duffield, a Detroit physician and pharmacist. The firm described itself as "Manufacturing chemists" and they made "Duffield's Concentrated Medicinal Fluid Extracts, which included aconite, belladona, ergot, and gentian. George S. Davis became the firm's first salesman in 1867. On 14 Jan. 1875 the firm was incorporated. In 1880 they began publishing *The Therapeutic Gazette.*

One of Davis' last contributions was enlisting for the firm the talents of Dr. Jokichi Takamine. The story of Takamine's early life is told (p. 73). Dr. Takamine had developed a starch-splitting enzyme which he named Taka-Diastase. After failing to interest the distilling industry in Chicago and Peoria, Illinois, in its use, in 1895 he "induced Parke-Davis to market it as a digestive product and became a consultant to the company while carrying on his own work in other fields.

Because of this association, he later delivered to Parke-Davis a more dramatic product–adrenalin. He obtained patents and a registered trademark, and "beginning in 1900 Parke-Davis marketed it under the trade name of Adrenalin.

"The H.K. Mulford Company, then an important rival, attacked the patents with the argument that the hormone existed in nature and that Takamine's work had been anticipated [by Dr. John Jacob Abel of Johns Hopkins; Dr. T.B. Aldrich of Parke-Davis, a former student of Dr. Abel, etc.]. After days of technical testimony, Federal Judge Learned Hand mopped his brow and said: 'I cannot stop without calling attention to the extraordinary condition

of the law which makes it possible for a man without a knowledge of even the rudiments of chemistry to pass upon such questions as these.' He ruled in favor of Takamine and ordered Mulford to cease infringing (p. 74).

"Adrenaline was the first hormone to be obtained in pure form and the first to have its chemical structure determined. Every doctor carries it in his bag. It has stimulated thousands of failing hearts and made famous the line: 'Quick, nurse, the Adrenalin!' Because of its power to restore apparently dead persons to life, Adrenalin perhaps is the greatest wonder drug of all."

"Dr. Takamine used much of the wealth from his royalties and the operations of the Takamine Laboratory (*) at Clifton, New Jersey, in efforts to better Japanese-American relations.

* Footnote: Founded in 1915. Dr. Selman Waksman, later Nobel Prize winner in Medicine, was employed there during World War I. Dr. Takamine died on 22 July 1922 at age 68 in New York City. In 1954 Kanazawa, Japan, where he was raised, hosted a four-day celebration of the centennial of his birth. His sons, Jokichi and Eben, later headed the Clifton enterprise and after the death of the latter it was purchased in 1956 by Miles Laboratories.

There follows the story of Dr. Takamine's role in giving cherry trees to Washington, DC. And: "He personally gave cherry trees to New York City for planting near Grant's Tomb and also in 1912 fifty cherry trees to Parke-Davis in Detroit 'in token of my appreciation of the kindness and good-will you have shown me during the past seventeen years.' In an accompanying letter, he said 'Banzai' [Cheers] to Parke-Davis and hoped that 'these trees take deep root and grow sturdily... symbolizing the traditions of good-will and admiration between the two countries, and may the blessings of peace and prosperous traffic flow back and forth in a deep, untroubled current between America and Japan'" (p. 75). Address: Author.

425. Prescott, Samuel Cate; Dunn, Cecil Gordon. ed. 1959. Industrial microbiology. 3rd ed. Revised by Cecil Gordon Dunn. New York, NY: McGraw-Hill Book Co., Inc. 942 p. Illust. Index. 23 cm.
• ***Summary:*** Chap. 41, titled "Mold enzyme preparations: Uses and products" (p. 666-83) discusses: Mold enzymes: Submerged culture method, continuous tray method for producing mold enzymes, rotating drum method for producing mold enzymes (described by Underkofler et al. 1947), glucose oxidase, uses of mold enzymes (proteases, fungal enzymes). Some mold products: Use in Japan and China, soy sauce (koji from *Aspergillus flavus-oryzae*, Chinese soy sauce, preparation of the "kojies," chemical soy sauce), soy sauce yeasts, tamari, miso, koji. The section on patents (p. 682) cites 15 patents by J. Takamine yet (amazingly) Takamine's name does not appear in the extensive index at the end of the book–though he is considered by some to be the father of industrial microbiology.

The amylo process and a modified amylo process are discussed on pages 864-66. The amylo process is used primarily for converting starch to sugar by the use of selected molds (*Mucor, Rhizopus*), some of which have the ability to produce small quantities of alcohol from sugar.

Soy is also discussed on the following pages: Soybean oil and meal are used in the production of vitamin B-12 by *Streptomyces olivaceus* (p. 485-86). In the production of pentonic acids, several drops of soybean oil were used as an antifoam agent (p. 508). In the production of sodium gluconate, small amounts of soybean oil could be used as an antifoam agent, though they decreased the sugar utilization to an impractical value. (p. 594). L-Glutamic acid can be produced in a number of ways. One is by the hydrolysis of wheat gluten, soybean cake, or other protein-rich food material (p. 713-16). The commercial process now being used in Japan employs sweet potatoes as the chief raw material in a one-stage fermentation process with a strain of *Micrococcus* (p. 712-13).

In the chapter on Saccharifying Agents, Takamine is discussed in the section on "Mold bran" (p. 844). "Takamine, in 1914, advocated the use of mold enzymes (from *A. oryzae*) in the distilling industry. Studies were carried out in distilleries in Canada using his mold-bran preparation (*Taka-koji*) in place of malt to saccharify grains. Although the yields of alcohol obtained through the use of mold bran were reported to be higher than those obtained through the use of malt, the process was not adopted."

A table (p. 857) lists 19 sources of microbial amylase, including Taka-Diastase, made by Parke, Davis & Co., and Alase, made by Takamine Lab. Also in this chapter, in the section on submerged culture of mold amylases, a table (p. 859) shows that soybean meal is used as a protein source in the production of dextrinizing enzyme by *Aspergillus niger* NRRL 337. Address: 1. Sc.D., Prof. of Industrial Biology (Emeritus), Former Head of the Dep. of Biology and Public Health and Dean of the School of Science, MIT; 2. Assoc. Prof. of Industrial Microbiology in the Dep. of Food Technology, MIT (Massachusetts).

426. Kamada, Hidemoto; Sakurai, Yoshito. 1961. Daizu seihin no chakushoku ni kansuru kenkyû. VI. [Browning reaction of soybean products. VI. Hydrolysis of soybean water-insoluble carbohydrate by Taka-diastase (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 15. p. 163. Feb. [1 ref. Jap]
• ***Summary:*** Reprinted from *Nosan Kako Gijutsu Kenkyu Kaishi* (*J. for the Utilization of Agricultural Products*) 7(3):111+ (1960). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

427. Takamine Jokichi Hakase Kenshu-kai [Dr. Takamine

Jokichi Memorial Foundation]. 1961. Takamine hakase no omokage [Vestiges of Dr. Takamine]. Kanazawa, Ishikawa-ken, Japan: Takamine Jokichi Hakase Kenshu-kai. 170 p. May 1. 19 cm. [Jap]*
Address: Japan.

428. *Tucson Daily Citizen* (*Arizona*). 1963. Tucsonian gets new state post. May 27. p. 14.
• ***Summary:*** "Theodore W. Kramer III of 6826 Topke Place [Tucson], has been appointed a supervising engineer for the state division of appraisals and assessment standards."

"A professional engineer and construction consultant, Kramer will travel throughout the state advising county assessors on technical methods of assessing buildings and property.

"The appointment was made by S.A. Spear. chief of the new division. Kramer will work in the Phoenix headquarters of the division about 20 per cent of the time and travel the rest. He will continue to make his home here.

"A former Hughes Aircraft Co. engineer, Kramer is a 1948 graduate of the University of Arizona.

"He will begin work with the state about the first of the month, Kramer said."

Note: Theodore Kramer was not a senior (the only class pictured) in 1947, 1948, or 1949 yearbooks (*The Desert*) of the University of Arizona.

429. Milburn, Betty. 1963. Straighten out your hair, says Richard of Helena Rubenstein: Bits of conversation. *Tucson Daily Citizen* (*Arizona*). July 23. p. 9.
• ***Summary:*** "Tucsonian Kay Reed is in charge of the Rubenstein Beauty Weeks which have been such a hit.

"Kay sends regards to... Carolyn and Ted Kramer,... and a number of other Tucsonians." Address: Citizen Woman's Editor.

430. Starett, Peter. 1964. Statewide revaluation effort is moving slowly: Completion at least two years away. *Tucson Daily Citizen* (*Arizona*). Feb. 14. p. 6.
• ***Summary:*** "Some of the smaller counties had only crude and outdated maps to work with.

"Ted Kramer of Tucson, a civil engineer, took on the job last summer of designing a mapping system for each of the counties. Using drafting and engineering students from the universities, he began the mapping systems in all 14 counties.

"However the mapping effort 'just took a lot longer than we ever figured,' Spear explains and the actual revaluation could hardly start without it."

431. Kotake, Yazo; Ono, Tadayoshi. 1964. Shokubutsu-sei chû no bitamin B-12 ni tsuite [Vitamin B-12 in vegetable foods]. *Shokuhin Eiseigaku Zasshi* (*J. of the Food Hygienic Society of Japan*) 5(1):39-43. Feb. [32 ref. Jap; eng]
• ***Summary:*** Small amounts of vitamin B-12 were found in such vegetables grown in the mud such as arrow head (*Sagittaria sagittifolia* L. var. *sinensis* Makino; Jap. *junsai*) and lotus root, and also in bamboo shoots grown in the soil. Briefly discusses the importance of vitamin B-12 in vegan and vegetarian diets. Soy is not mentioned.

Note 1. As of 1975 in Japan *junsai* has the scientific name *Brasemia purpurea* and is also called "water shield." This tiny, delicate wild plant, surrounded by a gelatinous slippery coating or "shield," grows on the surface of ponds. Considered a great delicacy, it is used in soups. Sold in small bottled.

Note 2. Takadiastase is used in this experiment. Address: Osaka Public Health Institute, 1, Morimachiminami, Higashinari-ku, Osaka, Japan.

432. Arima, K. 1964. Microbial enzyme production. In: M.P. Starr, ed. 1964. Global Impacts of Applied Microbiology. New York: Wiley. 572 p. See p. 277-94. Held 29 July to 3 Aug. 1963 at Stockholm, Sweden.
• ***Summary:*** Table 1 (p. 278-79) shows industrially produced enzymes and their applications. Among the 34 enzymes are diastase (from malt), Takadiastase (from *Aspergillus oryzae*), amylase (from *B. subtilis*, [the natto bacterium]), rennet (from calf stomach), papain (from papaya), Takamine Pectinase Clarase (made by Takamine Lab.), penicillinase (from *B. subtilis*, made by Takamine Lab.), glucose oxidase (from *Aspergillus niger*, made by Takamine Lab.), adenylic acid (in Takadiastase).

Page 280 discusses "Takadiastase–This enzyme is produced by *Aspergillus oryzae* and is sold as a digestive aid. It is the oldest enzymatic product in use, but is still sold throughout the world. It is manufactured by the conventional tray culture method."

Page 282 discusses microbial rennet: "Rennet is the enzyme which develops in the fourth stomach of young calves while they are milk-fed. Later, when they are switched to other feed, the enzyme disappears." In recent years a shortage of animal rennet for cheesemaking has developed, so many investigators have searched for substitutes among vegetable and microbial enzymes. Arima and Iwasaki began this line of research several years ago and succeeded in isolating soil microorganisms that produced rennet. Their microbial rennet enzyme has been tested for making cheese, both in the USA and in Japan, and has proven satisfactory with respect to coagulation activity, flavor, and texture of the cheese.

Pages 283-89 discuss commercial enzyme production. The two basic methods are liquid culture (surface, or submerged) and solid culture (five types of Koji methods: Conventional koji tray culture, mechanized koji tray culture, rotary drum culture (not very successful), koji tray culture with aeration of controlled temperature and humidity, and thick layer koji culture). Address: Dep. of Agricultural

Chemistry, Univ. of Tokyo, Bunkyo-Ku, Japan.

433. Ilany-Feigenbaum, Jacob. 1965. The proteolytic enzymes of Japanese koji and Taka-diastase. *J. of Food Science* 30(1):148-50. Jan/Feb. [10 ref]
• ***Summary:*** Israeli research on reduction of time for fermentation of Japanese miso or Israeli miso-type products. The proteolytic activity of enzymes extracted from koji made by Japanese or Israeli methods and of commercial samples of taka-diastase (from Parke, Davis & Co.) was found to be slower at pH 5.0 than at either neutral or alkaline pH. At pH 5.0 it takes longer to obtain comparable digestion of the substrate compared with pH 7.8. Miso is a mixture of cooked soybeans and rice koji. Address: Dep. of Biochemistry, Bar-Ilan Univ., Ramat-Gan, Israel.

434. Ebine, Hideo; Hamazaki, Sakio. 1965. 5'-ribonukureochido no miso e no tenka [Improvement of the flavor of miso by 5'-ribonucleotides]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 19. p. 147-50. March. [12 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

435. Namba, Haruyuki. 1965. [Studies on heat-denatured soybean protein. I. Digestion of protein in autoclaved soybean flour by Taka-diastase]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 12(6):226-29. [7 ref. Jap]
Address: Shimane Prefectural Industrial Research Lab. (Shimane-ken Kôgyô Shikenjô), Koshihara-chô, Matsue-shi.

436. Raper, Kenneth B.; Fennell, Dorothy I. 1965. The genus *Aspergillus.* Baltimore, Maryland: The Williams & Wilkins Co. 686 p. Illust. Index. 24 cm. [400+* ref]
• ***Summary:*** The authors discuss the koji molds in Chapter 18 titled "Aspergillus flavus group." Contents: Outstanding characters. General considerations (incl. *A. oryzae, A. oryzae* var. *effusus, A. flavus, A. tamarii,* and *A. flavo-furcatis*). Occurrence and significance: Introduction, enzymes (amylolytic, proteolytic, lipolytic). "Members of this group are widely distributed in nature. They are regularly isolated from soils, particularly those from tropical and subtropical areas, from forage and decaying vegetation, from stored seeds and grains, and from various types of food products. They contribute to decomposition processes... Except for *A. Niger* and allied species, they have been used more widely in industry than any other group of molds, particularly for the production of enzymes.

"Members of the *Aspergillus flavus* group produce diastatic and proteolytic enzymes abundantly. In large measure the alcoholic and soy food industries of the Far East are based upon these molds and their enzymes. In the soy industries, closely related molds, or even the same strains, are used as a source of proteolytic enzymes. In 1894 Takamine secured a series of U.S. patents covering the production of diastatic enzymes and the making of alcoholic liquors. Subsequent to this, other investigators, mostly Japanese, published a number of papers in this field. Oshima, in 1922 and 1928, reported on the production of protease by members of the *A. flavus-oryzae* group. Today, considerable quantities of diastatic enzymes, proteolytic enzymes, and mixed diastatic and proteolytic preparations are being manufactured from these molds for use in the food, textile, and tanning industries." Address: Dep. of Bateriology, Univ. of Wisconsin, Madison, Wisconsin.

437. Brown, Mary. 1966. It's a weekend to celebrate. *Tucson Daily Citizen* (*Arizona*). July 2. p. 47.
• ***Summary:*** Mr. and Mrs. Ray E. Salzman will celebrate their 50th wedding anniversary this weekend. Their home is in Skyline Foothills Estates–a 72 household neighborhood located in Pima County.

"The Salzmans bought the house which was built and designed by Ted Kramer several years ago."

"Double carved entry door to the home has insets of tile in rose and white especially designed by Mr. Kramer."

Note: His formal name is Ted. W. Kramer. Another article in this same newspaper (1 April 1967, p. 51) states that Ted W. Kramer won the "Design in Steel" award for best engineering of an automotive product during 1966-67. Address: Citizen Homes Editor.

438. Kasai, Tadasi; Kawamura, Shin'itiro. 1966. Soybean oligosaccharides: Isolation by gel filtration and identification by acetylation. *Kagawa Daigaku Nogakubu Gakujutsu Hokoku* (*Technical Bulletin of Faculty of Agriculture, Kagawa University*) 18(1):9-15. Oct. [9 ref. Eng; jap]
• ***Summary:*** The authors used dextran gel filtration for the isolation and purification of sucrose, raffinose, stachyose, and verbascose from soybeans. They found that Sephadex G-15, which may be applied to compounds with molecular weights below 1500, was superior to carbon column chromatography, especially for isolating and purifying stachyose. The Sephadex G-15 elutes first the highest molecular weights whereas the carbon column elutes the lowest molecular weight.

The sugars were extracted from both the defatted raw and autoclaved flakes. The melting points and specific rotations were determined on the sugars and their acetate derivatives, and are reported for sucrose, raffinose, and stachyose in tabular form.

Note: This is the earliest document seen (June 2006) that mentions "verbascose," a soybean oligosaccharide. Address: Japan.

439. Narasaki, Teiichi. 1966. Enzymatic hydrolysis of soybean polysaccharides. II. Intermediate products in the

hydrolysis of the hemicellulose B-1 of soybean cotyledons by Taka-diastase. *Kagawa Daigaku Nogakubu Gakujutsu Hokoku* (*Technical Bulletin of Faculty of Agriculture, Kagawa University*) 18(1):23-26. Oct. [1 ref. Eng; jap]
• ***Summary:*** The soybean polysaccharides were hydrolyzed with Taka-diastase. Examination of the intermediate hydrolysis products gave new information on the components and structures of hemicellulose B-1. Address: Lab. of Agricultural Products Technology, Kagawa Univ., Japan.

440. Narasaki, Teiichi. 1966. Enzymatic hydrolysis of soybean polysaccharides. I. Hydrolysis of the hemicellulose B-1 of soybean cotyledons by Taka-diastase. *Kagawa Daigaku Nogakubu Gakujutsu Hokoku* (*Technical Bulletin of Faculty of Agriculture, Kagawa University*) 18(1):16-22. Oct. [5 ref. Eng; jap]
• ***Summary:*** Taka-diastase liberated xylose, arabinose, galactose, galacturonic acid in the hydrolyzate and gave an unhydrolyzable polysaccharide residue rich in rhamnose, fucose, xylose, glucose, and galacturonic acid. Moreover, five intermediate hydrolysis products were formed in an early stage of the incubation and two of them remained unchanged in the hydrolyzate after 48 hours of incubation. Address: Lab. of Agricultural Products Technology, Kagawa Univ., Japan.

441. *Tucson Daily Citizen* (*Arizona*). 1967. Kramer-Blee nuptials. Jan. 31. p. 8.
• ***Summary:*** "St. Pius X Catholic Church in Flagstaff was the setting Wednesday [Jan. 26] for the wedding of Marilyn Elizabeth Blee and John Joseph Kramer.

"Mr. Kramer is the son of Mr. and Mrs. T.W. Kramer II [sic, Theodore W. Kramer III], 6826 E. Topke Place. Mr. and Mrs. Henry C. Blee of Flagstaff are parents of the bride.

Marilyn chose a white wool suit with lace-trimmed collar and cuffs for her wedding attire. Her maid of honor, Mrs. James Orr of Tucson, wore a brown and white brocade suit. Mr. Orr served as the best man.

"Guests were seated by the bride's brother, Jack.

"Marilyn Elizabeth, a graduate of the University of Arizona College of Nursing, has been a registered nurse at Flagstaff Community Hospital. Her bridegroom is a third year law student at UA where his affiliates include Phi Delta Chi legal fraternity and Delta Upsilon fraternity.

"The couple is on a skiing trip in Park City, Utah.

A portrait photo shows Mrs. John Kramer–Marilyn Blee in her wedding dress.

A copy of this article appeared in the 2 Feb. 1967 issue of the *Arizona Republic* (p. 65).

442. *Arizona Register.* 1967. East meets West at Vail mission church. June 9. p. 12.
• ***Summary:*** "Vail–Nestled on the rolling desert in the shadows of the Rincon Mountains, 25 miles southeast of Tucson, is a symbol of friendship between Japan and the United States.

"Santa Rita of the Desert located at '42nd and Broadway' in Vail is a mission church. It is steeped in tradition, yet is only 32 years old. It was dedicated March 31, 1935 to the memory of Dr. Jokichi Takamine by Bishop Daniel Gercke.

"It is a memorial to the man who isolated the active substance of adrenalin in 1901. It was given to the people of Vail by Mrs. Charles Bach, wife of the Japanese scientist until his death in 1922.

"The church is neither large nor pretentious. Designed as a place of worship and not as a place for show, it was actually built around its stained glass windows. Mrs. Beach purchased the windows from a dismantled Methodist church and had architect H.D.R. Figge plan for a feeling of a rural Mexican church. It seats approximately 115 persons.

"Rita, who gives the church her name, is the saint of the impossible."

"Rev. Albert Wilson, a Salvatorian Father [a congregation of Catholic priests], will serve as administrator for Santa Rita. Father Wilson, a retired Army chaplain, arrived in the diocese in mid-May."

"The rectory was refurbished recently by parishioners of Our Mother of Sorrows.

"Father Wilson feels that sight-seers on their way to Colossal Cave via Interstate Ten will discover this haven in the desert and enjoy its rustic beauty."

Note: The phrase "42nd and Broadway" refers to the Center of Midtown Manhattan and the busiest place in New York City; it is a major intersection at the southeast of Times Square.

443. *Tucson Daily Citizen* (*Arizona*). 1967. Charles P. Beach rites scheduled tomorrow. Nov. 27. p. 48.
• ***Summary:*** "Memorial services will be held at 2:30 p.m. tomorrow for Charles P. Beach, 78, a prominent rancher and miner who died Saturday [Nov. 25] at his home, 2153 E. Juanita St.

"Mr. Beach was born in Kansas [on 14 Sept. 1889]. His family moved to California when he was a boy. His father was attached to the U.S. Bureau of Indian Affairs.

"He graduated from Los Angeles High School and from the University of Arizona, where he lettered in football, baseball and basketball.

"After service in France during World War I, he returned to Arizona and started a homestead near Vail. He gradually bought more land until his cattle ranch, Casa de los Acatillos [Rancho de los Ocotillos], became one of the area's biggest. He sold the ranch in 1956.

"Mr. Beach and his wife in the 1950s [sic, in 1935] erected Santa Rita of the Desert at Vail as a commemorative mission to Mrs. Beach's first husband, Dr. Jokichi Takamine

of Japan. Dr. Takamine was one of the first developers of the valuable heart stimulant adrenalin. Mrs. Beach died in 1954.

"Mr. Beach was active in developing mining claims and at his death had many claims near the Duval Mines copper development.

"His memberships included the Arizona Game and Fish Commission [sic], 1933 to 1951. When he retired he was given a gold cup for outstanding service.

"Survivors are a brother, Jess Beach, Los Angeles; a sister, Mrs. Mary Stone, Los Angeles; a granddaughter, Mrs. Ted A. Kramer, Tucson; two great grandchildren [the Kramer's two children] and one great-great grandchild [a Kramer descendant].

"The services will be at Santa Rita of the Desert. The family asks that donations be made to the J.F. McKale Scholarship, UA" [University of Arizona].

Note: It remains to be proved that the father of Charles P. Beach was attached to the U.S. Bureau of Indian Affairs. We do not know when or where his father died, however in the 1900 U.S. census his mother (in southern California) said she was a widow with five living children.

444. *Tucson Daily Citizen* (*Arizona*). 1967. Funeral announcements: Beach, Charles P. Nov. 27. p. 48.
• ***Summary:*** "78, 2153 E. Juanita, died November 25. Survived by his brother, Jess Beach; his sister, Mrs. Mary Beach Stone, both of Los Angeles; a granddaughter, Mrs. Carolyn Kramer, Tucson; nephew, Thomas Stone, of California. Friends may call at the family residence 2153 E. Juanita on Monday from 2 to 5 p.m. Services will be held from the Shrine of Santa Rita in Vail, Ariz., at 2:30 p.m., Tuesday. Memorials to be made to the McKale Scholarship Fund at the University of Arizona.

"Pallbearers: Orville McPherson, Tom Colvin, James Wolsey, Jim Sutherland, Fred Fickett / Pickett, Walter Lovejoy, Rae Dunn, Jack Weadock, Jake Meyer, Carter Porter, Ted Knipe, Bine [?] Thorpe, Ed Goyette, Peter Huntoon.

"Arrangements by Arizona Mortuary, Stone and Third."

445. Ilany-Feigenbaum, J.; Laxer, S. 1967. Color development in Israeli miso type products and its possible use for quality control. *Food Technology* 21(11):113-14. Nov. [13 ref]
• ***Summary:*** Miso darkens in color as the fermentation time increases. "When stimulated with koji and miso-extracted enzymes or with taka-diastase, the time required to produce the dark brown color for the Israeli type miso products has been shortened from several months to a few weeks." This browning reaction is viewed as the result of interaction between the products of the activity of the proteolytic enzymes and amylases of koji and if its extracted enzymes or taka-diastase. It is suggested that the intensity of this color could be used in quality control of miso or miso type products. Address: Dep. of Biochemistry, Bar-Ilan Univ., Ramat-Gan, Israel.

446. *Tucson Daily Citizen* (*Arizona*). 1967. Hummels sell bottling firm; plan new venture. Dec. 7. p. 28.
• ***Summary:*** "... and currently is negotiating for a site to build the trailers. He expects to get under way early in January.

"During the past year or so, Hummel and engineer-designer Ted Kramer have supervised the construction of 11 trailers for the Tucson plant.

"The trailer won the 1966-67 Design in Steel Award of the American Iron and Steel Institute."

447. *Tucson Daily Citizen* (*Arizona*). 1968. 3 Tucsonians' estates valued at $891,554. July 11. p. 42.
• ***Summary:*** "A $487,548 estate, according to the inventories, was left by Charles P. Beach, prominent rancher and miner who resided at 2153 E. Juanita St. Beach, a former owner of the Casa de los Acatillos [sic, El Rancho de los Ocotillos] cattle ranch, died here last November at the age of 78. Most of his estate consists of stocks and bonds."

448. Fujimaki, Masao; Kato, H.; Arai, S.; Tamaki, E. 1968. Applying proteolytic enzymes on soybean. I. Proteolytic enzyme treatment of soybean protein and its effect on the flavor. *Food Technology* 22(7):77-81. July. [9 ref]
• ***Summary:*** It is demonstrated that enzymatic proteolysis is useful for removing trypsin inhibitors and undesirable flavors from soy protein concentrate under mild conditions. Spray-dried soy sodium proteinate (Promine-D from Central Soya Co.) was as the substrate; it contain 97% protein on a dry basis. Three well-known enzymes (papain, bromelin, and pepsin), and nine commercial proteolytic enzyme preparations of microbial origin (Molsin, Rapidase, Prozyme, Takadiastase-SS, Coronase, Thermoase, Pronase, Bioprase, and alkaline proteinase of *Bacillus subtilis*) were tested. Molsin gave the best results; optimum conditions are given (incl. pH 2.8, temperature 60ºC).

Undesirable flavors were mostly removed by treating the soy protein preparation with an appropriate proteolytic enzyme. Beany flavor generally decreased in the early stage of digestion/fermentation, however bitter flavor often increased with increasing digestion time. In some cases astringent flavor and oily or maltol-like flavor appeared, the latter being prominent after long digestion.

Takadiastase-SS was produced from *Aspergillus oryzae* by Sankyo Co. in Japan. Address: Dep. of Agricultural Chemistry, The Univ. of Tokyo.

449. Milburn, Betty. 1969. Tucson seen. *Tucson Daily Citizen* (*Arizona*). Nov. 22. p. 19.
• ***Summary:*** "Carolyn Kramer is home again after a visit with her mother, Hilda Thomas, in Sarasota, Florida."

Note: Hilda's maiden name was Hilda Petrie; she was the wife of Jo Takamine, Jr., until she filed for a divorce.

450. Hosokawa, Nobuo; Nanba, T.; Takeuchi, T.; Yoshida, T.; Yoshida, M.; Amano, T.; Yoshii, H. 1969. Miso shôyu jôzô ni okeru kôso-zai no riyô ni kansuru kenkyû. III. Kôso-zai ni yoru tanshoku-kei kara miso no shijô [Studies on the use of enzyme preparations in miso and soy sauce brewing. III. Trials on the application of some kind of mold protease preparation for light-colored salty miso]. *Aichi-ken Shokuhin Kogyo Shikenjo Nenpo* (*Annual Reports of the Food Research Institute, Aichi Prefecture*) 9:83-88. For the year 1968. [10 ref. Jap]
• ***Summary:*** Enzymes used included Takadiastase and papain. Address: Food Research Inst., Aichi prefecture, 2-1 Shinpukuji-cho, Nishi-ku, Nagoya-shi 451, Japan.

451. Milburn, Betty. 1970. Tucson seen. *Tucson Daily Citizen* (*Arizona*). May 12. p. 8.
• ***Summary:*** "John and Marilyn Kramer are parents of a brand new son, as yet unnamed, but born Saturday [May 9]. Grand-parents are Ted and Carolyn Kramer, who kept the new baby's brother Michael last weekend to their great delight."

452. Kuehlthau, Margaret. 1970. Church honors Japanese scientist: Shrine of Santa Rita in Desert. *Tucson Daily Citizen* (*Arizona*). Aug. 22. p. 4.
• ***Summary:*** "Twenty-five miles southeast of Tucson is a beautiful little country church, dedicated to the memory of a Japanese scientist who died in 1922.

"Called the Shrine of Santa Rita in the Desert, it is located at Vail on the road that leads to Colossal Cave."

Contains a nice biography of Dr. Jokichi Takamine, who died in 1922. "His widow married Charles P. Beach, a pioneer Arizona rancher and mining man. They lived near Vail at Casa de los Ocotillos, one of the largest cattle ranches in the area. Mrs. Beach died in 1954 at the age of 88. Mr. Beach died three years ago [1967] at the age of 78."

"It was Beach who planned the landscaping, designed to give the church a feeling of having grown up out of the desert. Today, the grounds of the church are cared for by Brother Camillus. The Rev. H.G. Messmer is the priest for the parish. Both are members of the Salvatorian Fathers."

"Mass is held daily, and a Catholic Ladies Society of St. Rita has been organized for the Catholic women in the community."

A photo shows the large stained glass window.

Note: Ocotillo is the name of a desert plant (*Fouquieria splendens*) of the southwestern United States and northern Mexico. Although it is not a true cactus, the plant has spines. "For much of the year, the plant appears to be an arrangement of large spiny dead sticks, although closer examination reveals that the stems are partly green. With rainfall the plant quickly becomes lush with small (2-4 cm) ovate leaves, which may remain for weeks or even months" (Source: Wikipedia at Ocotillo).

453. Milburn, Betty. 1970. Tucson seen. *Tucson Daily Citizen* (*Arizona*). Oct. 31. p. 16.
• ***Summary:*** Continued from page 15: "Two attractive New Yorkers, Doug and B.J. McLean, were in the Old Pueblo this week looking it over with the possible thought of moving this way. Carolyn and Ted Kramer gave a little cocktail party for them Tuesday evening."

454. *Tucson Daily Citizen* (*Arizona*). 1970. Judge Frey will get testimonial. Dec. 19. p. 19.
• ***Summary:*** "A testimonial dinner is being planned Jan. 16 at the Ramada Inn for U.S. Dist. Judge William C. Frey. The 8 p.m. dinner will be preceded by a cocktail hour.

"Committee members include Caroline Kramer [sic, Carolyn Kramer], Clarence Black,..."

455. Milburn, Betty. 1971. Unusual menus, decorations make for memorable parties. *Tucson Daily Citizen* (*Arizona*). June 5. p. 15.
• ***Summary:*** "Ted and Carolyn Kramer did a Japanese dinner for 14 or so.

"Their house is filled with gorgeous Japanese things, dishes, art works, rugs, furnishings. And Japanese foods are traditional and delicious there–Carolyn's grandfather was Japanese.

"The party began with green shrimp threaded on a skewer, and cooked on the coffee table in boiling stock, then dipped in your choice of sauces. There were also cheeses and smoked oysters and baby clams and mussels and other unidentifiable but delicious tidbits.

"Then, at table, Ted Kramer cooked sukiyaki at one end and Dr. Dick Dexter duplicated cookery at the other. Such beautiful food combinations as well as delicious. And there was hot sake and paper-thin seaweed and gorgeous mixed fruits to produce a memorable and certainly out-of-the ordinary dinner."

456. Miles Laboratories Inc., Marschall Div. 1971. The automatic enzyme (Ad). *Cereal Science Today* 16(8):237. Aug.
• ***Summary:*** "Our fungal protease relaxes dough. Makes it more machineable. Reduces a baker's mixing time by as much as 1/3. A unique enzyme, it shuts itself down when the job is done." This is just one of hundreds of enzymes and additives that Marschall manufactures for the food industry. For more information contact: "The Takamine enzyme people." Address: Elkhart, Indiana 46514. Phone: (219) 264-8716.

457. *Tucson Daily Citizen* (*Arizona*). 1971. Unexpected snow

sets jolly mood at annual party: Sue Giles about town. Dec. 10. p. 14.
• ***Summary:*** "The Assistance League's 12th annual party promises to be a real family event.

"Carolyn and Ted Kramer are gathering relatives and old family friends at their table. With them will be their daughter Cathy and her fiance, John Condiss.

"Also joining them will be his mother, Mrs. Constantine Condiss, the Kramer's son and daughter-in-law, Mr. and Mrs. John J. Kramer,..."

In this same issue (p. 18) a more formal article titled "Engagees" states: "Kramer-Condiss: Mr. and Mrs. T.W. Kramer III, 6826 E. Topke Place, announce the engagement of their daughter Kathryn Anne to John Constantine Condiss.

"The prospective bridegroom is the son of Mrs. Constantine John Condiss, 6102 E. Lee St., and the late Mr. Condiss.

"The bride-elect, a graduate of Sahuaro High School, attends the University of Arizona. Mr. Condiss, also a UA student, is a Tucson Police Department employee.

"An April 15 wedding is planned at St. Demetrios Greek Orthodox Church."

Note: This newspaper (17 July 1970, p. 17) states that John Condiss is a police officer and a good photo shows him eating spaghetti.

458. *Tucson Daily Citizen* (*Arizona*). 1972. Weddings. April 22. p. 20.
• ***Summary:*** "Condiss-Kramer: St. Demetrios Greek Orthodox Church was the setting April 15 for the wedding of Kathryn Anne Kramer and John C. Condiss." Condiss is a graduate of Amundson High School in Chicago, Illinois.

"Mr. and Mrs. Condiss are students at the University of Arizona and he is employed as a Tucson police officer.

"Mrs. John J. Kramer, sister-in-law of the bride, Stacey Hayes and Peter Fasseus served as honor attendants."

A portrait photo shows Mrs. John Condiss / Kathryn Kramer in her bridal gown.

According to articles in this newspaper: By 27 Sept. 1974 John Condiss is a detective. By 17 March 1976 he is co-owner of Gyro Taverna Restaurant (Greek food) in La Placita Village.

459. *Tucson Daily Citizen* (*Arizona*). 1972. Kramer prediction: Big Nixon win. Oct. 31. p. 2.
• ***Summary:*** "Richard Nixon will win–and by a gigantic margin. That's the opinion of Carolyn F. Kramer, Pima County Republican vice chairwoman in assessing the outcome of the 1972 presidential election.

"Mrs. Kramer has Nixon compiling a whopping 463 electoral votes of a possible 538..."

A portrait photo shows Mrs. Kramer, smiling.

460. Natsume, Soseki. 1972. I am a cat. 3 vols. Rutland, Vermont: C.E. Tuttle Co. 20 cm. *
• ***Summary:*** Translation by Aiko Ito and Graeme Wilson of the Japanese-language novel *Wagahai wa Neko de aru* by Natsume Soseki.

"Since he (the protagonist) had a weak stomach, his skin was a light yellow and showed symptoms of losing its elasticity. And yet he kept on eating, after which he would drink Taka-Diastase and crack open a book."

One of Japan's most famous novelists, Natsume Soseki lived 1867-1916.

461. Sakaguchi, Kinichiro. 1972. Development of industrial microbiology in Japan. In: Proceedings of the [Sixth] International Symposium on Conversion and Manufacture of Foodstuffs by Microorganisms. Tokyo: Saikon Publishing Co. viii + 297 p. See p. 7-10. Held 5-9 Dec. 1971 at Kyoto, Japan. [Eng]
• ***Summary:*** Japan has made many important contributions to the development of industrial microbiology, especially industrial mycology, because of the widespread use of koji molds (*Aspergillus oryzae*). Foods made from this one mold (including sake, miso, and soy sauce) accounted for about 1.5% of the Japanese gross national product, or ¥75,000 billion, in 1970.

Early documents show that molds were being used to make foods as early as 1,000 B.C. in China and as far back as the 6th century [A.D.] in Japan. In Japan, the use of lactic acid fermentation in the pure culture of yeast is already mentioned in "the diary of sake" [*Goshu no Nikki*] written in 1355, however the technology of adding koji starter [*tané koji* or "seed koji"] is even 400 years earlier [i.e., ca 955]. Moreover, an unmistakable description of low temperature pasteurization (*hiire*) appears in the *Tamon-in Diary* (1539-1596), "which was written about 300 years prior to Pasteur's famous invention."

When Japan began to introduce European scientific techniques during the Meiji period (Sept. 1868 to July 1912), the first subject of scientific research in Japan was the unique koji mold. One of the first major discoveries was the invention of Takadiastase [a diastatic enzyme] by Jokichi Takamine. This enzyme has a great influence on biological chemistry, enzyme chemistry, and various enzymes using microorganisms worldwide.

Soon the physiology of the koji mold and its fermentation products (especially organic acids) was studied by Japanese scientists. The determination of kojic acid by Yabuta was a major discovery. The *Rhyzopus* [*Rhizopus*] mold was also investigated; this led to the development of producing organic acids fumaric acid, citric acid, isocitric acid, itaconic acid, gluconic acid and others.

Two outstanding discoveries have recently been made in Japan: (1) The technology for making L-glutamic acid, lysine, and other amino acids; (2) The microbial technology for making flavor-enhancing nucleotides such as inosinic

acid and guanylitic acid.

Japanese scientists and industries soon realized that instead of using microorganisms, the enzymes isolated from them could be used (in whole or in part) with no reduction in yield or quality. In the case of *Aspergillus oryzae*, which produces various enzymes (amylase, lipase, protease, etc.) this idea has been applied to the manufacture of alcohol, sake, mirin, miso, and soy sauce.

The classification and taxonomy by Jun Hanzawa of microorganisms used in the manufacture of *natto* (fermented soybean) and other popular Japanese fermented foods was of major importance.

Recently, Japanese scientists including Murakami and Yokotsuka [of Kikkoman] have found that the koji mold does not produce aflatoxins.

The industrial application of molds to establish a method of mass culture involves various difficult problems. Many Japanese manufacturers of sake, miso, and soy sauce "are practicing the conventional solid culture by using what are called Koji rooms" but large manufacturers are gradually switching over to aerobic apparatus.

To use the living action of microorganisms or their enzymatic action to make foods on a large scale will be increasingly seen "as a form of bioengineering or biotechnology," and the life sciences will increasing be spoken of as "a science for the future. 'Seek whatever is desired in microorganisms first. They will never betray you,' is my slogan." Although it may seem a little exaggerated, "I should like to ask you to take it as my firm conviction."

As I stated above, "microorganisms are the most intimate friends of the food industry," yet they are at the same time its powerful enemies. Their malignant side is as powerful as their benevolent side.

I am very glad, even proud, to see first-class microbial specialists and food specialists exchanging technological knowledge and cooperating with one another, "here in Japan where fermented foods have so long been a tradition." Address: Prof. Emeritus, Univ. of Tokyo, Tokyo, Japan.

462. Roozen, J.P.; Pilnik, W. 1973. Ultrafiltration controlled enzymatic degradation of soy protein. *Process Biochemistry* 8(7):24-25. July. [17 ref]

• ***Summary:*** "Because of their taste, most hydrolysates formed by enzymatic degradation are not used in foodstuffs. Enzymatic depolymerisation in an ultrafiltration cell continuously separates peptides of desirable molecular weights from the reaction mixture. For application, the molecular weight has to be low enough to ensure solubility in acid fruit juice media, but not so low as to give a bitter taste."

Soy proteins of middle molecular weight are most suitable for introducing into fruit juices. These intermediate proteolytic products can be isolated by first digesting a soy protein solution with enzymes, then subjecting the mixture to ultrafiltration as the digestion proceeds.

Promine D, a commercial neutral isolated soybean protein in the sodium form, was purchased from Central Soya's plant in Chicago, Illinois. The following enzymes were studied: Pankreasproteinase A and Bakterienproteinase N (Röhm [Roehm] GmbH, Darmstadt, Germany), FAAN type A and Saure Protease SPR (Schweiz Ferment AG, Basel, Switzerland), HT Proteolytic 200 (Takamine, Miles Labs Inc.), and Rhozyme P-53 conc (Rohm & Haas, Philadelphia, Pennsylvania). The hydrolysis was carried out in a 142 mm Hi-Flux Ultrafiltration Cell (Millipore) placed in a thermostat. The ultrafiltration membrane was the DDS 800 membrane (De Dansk Sukkerfabrikker, Copenhagen, Denmark) with a nominal 100% rejection of molecules larger than 6,000 daltons. The pressure on the cell varied from 2 to 8 atmospheres.

The authors conclude that absence of beany flavor and bitterness is a very attractive property of these instant soluble hydrolysates. Therefore ultrafiltration appears to be a useful means of preparing high-grade food peptides. Address: Dep. of Food Science, Agricultural Univ., Wageningen, Netherlands.

463. Acton, William. 1974. Biennial convention: Tucsonian defeated for state GOP slot. *Tucson Daily Citizen* (*Arizona*). Oct. 1. p. 26.

• ***Summary:*** "Phoenix–Carolyn Kramer a long-time Tucson Republican worker has been defeated for a full two-year term as state Republican committee first vice chairman by a Cochise County man.

"The floor fight over that election at the biennial GOP convention provided one of the two spots of drama in an otherwise bland meeting here yesterday at Del Webb TowneHouse."

A portrait photo shows Carolyn Kramer, smiling.

464. Blain, J.A. 1975. Industrial enzyme production. In: J.E. Smith and D.R. Berry, eds. 1975. The Filamentous Fungi. Vol 1. Industrial Mycology. New York: Wiley & Sons. xi + 336 p. See p. 193-209. [67* ref]

• ***Summary:*** Contents: Introduction. Production of fungal enzymes. Major industrial uses of fungal enzymes. Future considerations.

"Processes such as brewing and breadmaking have for millennia involved the unrecognized use of enzymes... When in 1837 Berzelius wrote on the nature of catalysis he cited processes which we now know to be enzymic and crude precipitates of diastase from malt and pepsin from gastric juice had already been studied.

"While the use of yeast and malt formed much of the foundation for enzyme technology in the West, there were in Asia corresponding processes for the modification of food sources which hinged on certain enzymic conversions associated with fungal growth. These led to a major step

in the deliberate use of microbial enzymic material when Takamine towards the end of the 19th century used the amylase preparation 'Taka-diastase.' this was obtained from *Aspergillus oryzae* grown on wheat bran." Address: Dep. of Biochemistry, Strathclyde Univ., Glasgow, Scotland.

465. Lehninger, Albert L. 1975. Biochemistry: The molecular basis of cell structure and function. 2nd ed. New York, NY: Worth Publishers, Inc. xxiii + 1104 p. Illust. Index. 29 cm. [200+* ref]

• ***Summary:*** A classic textbook in this field. Appendix A (p. 1058-1063) is titled "A chronology of biochemistry." The earliest entry is: 1770-1774–Priestley discovered oxygen and showed it is consumed by animals and produced by plants.

Other entries: "1780-1789–Lavoisier demonstrated that animals require oxygen, recognized that respiration is oxidation, first measured oxygen consumption by a human subject, and recognized that alcoholic fermentation is fundamentally a chemical process.

"1783–Spallanzani deduced that protein digestion in the stomach is a chemical rather than a mechanical process.

"1804–Dalton enunciated the atomic theory...

"1806–Vauquelin and Robinet first isolated an amino acid, asparagine."

"1833–Payen and Persoz purified diastase (amylase) of wheat, showed it to be heat-labile, and postulated the central importance of enzymes in biology.

"1837–Berzelius postulated the catalytic nature of fermentation. He later identified lactic acid as a product of muscle activity.

"1838–Schleiden and Schwann enunciated the cell theory.

"1838–Mulder carried out the first systematic studies of proteins...

"1854-1864–Pasteur proved that fermentation is caused by microorganisms and demolished the spontaneous-generation hypothesis...

"1859–Darwin published *Origin of the Species*...

"1864–Hoppe-Seyler first crystallized a protein: hemoglobin.

"1866–Mendel published his experiments leading to the principles of segregation and independent assortment of genes.

"1869–Miescher discovered DNA.

"1872–Pfluger proved oxygen is consumed by the tissues of all animals rather than by the blood or lungs alone.

"1877–Kühne proposed the term enzyme and distinguished enzymes from bacteria...

"1890–Altmann described procedures for staining mitochondria, studied their distribution, and postulated them to have metabolic and genetic autonomy.

"1893–Ostwald proved enzymes are catalysts.

"1894–Emil Fischer demonstrated the specificity of enzymes and the lock-and-key relationship between enzyme and substrate."

"1897–Bertrand coined the term coenzyme.

"1897–Buchner discovered that alcoholic fermentation may occur in cell-free yeast extracts.

"1897-1906–Eijkman proved that beri-beri is a dietary-deficiency disease and that a water-soluble component of rice polishings can cure it.

"1901-1904–Takamine and Aldrich, and also Abel, first isolated a hormone, epinephrine [also known as adrenaline], and Stoltz achieved its synthesis.

"1902–Emil Fischer and Hofmeister demonstrated that proteins are polypeptides.

"1903–Neuberg first used the term biochemistry."

"1911–Funk isolated crystals with vitamin B activity and coined the name vitamin.

"1912–Neuberg proposed a chemical pathway for fermentation."

"1917–McCollum showed that xerophthalmia in rats is due to lack of vitamin A."

"1922–McCollum showed that lack of vitamin D causes rickets."

"1925-1930–Svedberg invented the ultracentrifuge for determination of sedimentation rates of proteins.

"1926–Sumner first crystallized an enzyme, urease, and proved it to be a protein.

"1926–Jansen and Donath isolated vitamin B-1 (thiamine) from rice polishings.

"1927–Muller, and also Stadler, demonstrated mutation of genes by x-rays.

"1928-1932–Szent-Györgyi, and later Waugh and King, isolated ascorbic acid (vitamin C).

"1930-1933–Northrop isolated crystalline pepsin and trypsin and proved their protein nature.

"1933–Krebs and Henseleit discovered the urea cycle."

"1935–Rose discovered theronine, the last essential amino acid to have been recognized.

"1935–Davson and Danielli postulated a model for the structure of cell membranes."

"1937–Krebs postulated the citric acid cycle."

"1940–Beadle and Tatum deduced the one gene-one enzyme relationship.

"1941-1944–Martin and Synge developed partition chromatography and applied it to amino acid analysis."

"1953–Watson and Crick postulated the double-helical model of DNA structure"

"1955–Benzer carried out fine-structure genetic mapping and concluded that a gene has many mutable sites."

"1958–Crick enunciated the central dogma of molecular genetics." Address: Johns Hopkins Univ. School of Medicine.

466. Miall, L.M. 1975. Historical development of the fungal fermentation industry. In: J.E. Smith and D.R. Berry, eds. 1975. The Filamentous Fungi. Vol 1. Industrial Mycology.

New York: Wiley & Sons. xi + 336 p. See p. 104-21. [84 ref]
• ***Summary:*** Contents: Introduction. Fungal fermentation on solid substrate: Cheese production, edible fungi, koji process, and gallic acid (used in tanning and printing). Fungal fermentation in liquid culture (A) Surface culture: Citric acid, gluconic and fumaric acids, penicillin (discovered by Fleming in 1928), microbial genetics; (B) Submerged liquid culture: Organic acid production, Northern Regional Research Laboratory at Peoria (Illinois), antibiotics, riboflavin, Beta-carotene, gibberellins, ergot alkaloids, microbial transformations.

Concerning the koji process (p. 105-06): This process, developed in Japan, is the basis for the manufacture of saké, which is believed to have been made in Japan since at least the eighth century. Koji produces amylases and other enzymes, and these saccharify the starch in rice in exactly the same way that malt does in brewing. The introduction of the koji process to the western world is due mainly to the work of Jokichi Takamine, which started in about 1891. His early work was unsuccessful, but later he developed a process for making fungal diastase that could be operated on a large scale (see Takamine 1914). This involved the growth of *Aspergillus oryzae* on wheat bran (rather than on the traditional rice), to make a preparation named Taka-koji. Later Takamine carried out the process using rotating drums, each of which had a capacity of 4,800 lb and rotated on a horizontal axis once a minute. "Large scale trials of the use of Taka-koji instead of malt in distilleries were carried out in the plant of Hiram Walker & Sons in Ontario [Canada], in 1913." The yield of alcohol was higher than when malt was used, but the resulting product had a slight off-flavor, which meant the process could not be used to make potable spirits.

If the Taka-koji is extracted with water and precipitated with alcohol, a much purer enzyme preparation is obtained. This was marketed for many years as a digestive aid under the name Takadiastase.

The transition from Takamine's koji process to the modern use of mold enzymes for saccharifying starch can be traced to a series of papers by Underkofler and colleagues at Iowa State College. In 1939 they were making highly active amylase preparations by growing *Aspergillus oryzae* on wheat bran in rotating drums and using this for saccharifying corn mashes prior to yeast fermentation for production of industrial-grade alcohol.

"Scientists in Rank Hovis McDougall have been working for several years to develop a process for growing fungi on cheap sources of starch, such as potatoes, cassava and yams, and thereby obtain protein for animal feeds. A pilot plant producing about 150 tons a year of a species of *Fusarium* has recently been built and large scale trials of the product will be carried out. One claimed advantage of using fungi rather than bacteria or yeasts is that the fibrous nature of the fungi will make it easier for them to be fabricated into pseudo meat products, for instance steaks. The further development of this project is one that mycologists, as well as food technologists and many others, will be following with great interest over the next few years" (p. 118). Address: Pfizer Ltd., Sandwich, Kent, England.

467. Mega, Tomohiro; Matsushima, Yoshio. 1976. Affinity chromatography of glycosidases: Preparation and properties of affinity column adsorbents. *J. of Biochemistry* (*Tokyo*) 79(1):185-94. Jan. [11 ref. Eng]
• ***Summary:*** Discusses Takadiastase and soybean glycosidases. Uses partially purified glycosidase mixtures from Takadiastase and soybeans. Address: Dep. of Chemistry, Osaka Univ. College of Science, Toyonaka, Osaka 560.

468. Miles, Wyndham D. ed. 1976. American chemists and chemical engineers. Washington, DC: American Chemical Society. x + 544 p. Index. 25 cm. [7 ref]
• ***Summary:*** On pages 468-69 is a fairly accurate, 1½-page biography of "Jokichi Takamine (1854-1922), by Joe Vikin. It (of course) emphasizes his chemical accomplishments. The list of sources is particularly interesting. It begins: "Takamine's life spanned two centuries, two cultures, and two countries."

In 1887 he was given leave from his official duties in Japan "to establish the Tokyo Artificial Fertilizer Co., a factory for the manufacture of superphosphates, the first of its kind in the Orient.

During this time he developed methods for extracting cobalt oxide from manganese ore, and found new uses for manganese chloride–a substance that had previously been discarded as useless. Takamine used the cobalt oxide as a coloring agent for porcelain and the manganese chloride as a deodorizer and fireproofing agent for wood. Address: PhD, Gaithersburg, Maryland.

469. Kondo, Hitoshi; Nakatani, H.; Hiromi, K. 1977. Studies on action pattern of amylase-catalized hydrolysis of amylose using TNS fluorescence as a probe. *Agricultural and Biological Chemistry* 41(4):631-34. April. [20 ref. Eng]
• ***Summary:*** This is a new method for following the hydrolytic reaction of amylose. Taka-amylase EC-3.2.1.1 is discussed. TNS stands for 2-p-toluidinylnaphthalene -6-sulfonate. Soy is mentioned only in a very minor way; Crystalline Beta-amylase from the soy bean was used in the experiment. Address: Lab. of Enzyme Chemistry, Dep. of Food Science and Technology, Faculty of Agriculture, Kyoto Univ., Sakyo-ku, Kyoto, Kyoto 606.

470. Iwao, Seiichi. 1978. Biographical dictionary of Japanese history. Tokyo: International Society for Educational Information. 655 p. Reprinted in 1982 by Kodansha International (655 p.). [Eng]*
• ***Summary:*** Takamine also completed the applied chemistry

course from the College of Public Works, Tokyo.

471. Beuchat, Larry R. 1978. Food and beverage mycology. Westport, Connecticut. AVI Publishing Co. x + 527 p. See p. 224-42. Illust. Index. 23 cm. [300+* ref]
• ***Summary:*** Chapter 9, "Traditional fermented food products" (p. 224-53), by Larry R. Beuchat, is cited separately.

In Chapter 13, "Metabolites of fungi used in food processing" (p. 368-96), by R.J. Bothast and K.L. Smiley, the section on enzymes (p. 378) begins: "Fungal enzymes have been used for hundreds of years, especially in the Orient. However, modern industrial enzyme technology probably started with Takamine (1894) [Note: In Sept. 1894 he was issued two U.S. Patents for "Process of making diastatic enzyme," Nos. 525,820 and 525,823] and his work with *Aspergillus oryzae.* Today many industrial enzymes are of fungal origin." These include α-amylase (from *Aspergillus oryzae* and *A. niger*), glucoamylase, pectic enzymes or pectinases, naringinase, invertase (sucrase), α-galactosidase, lactase (Beta-D-galactosidase), protease (from *Aspergillus oryzae*), rennet (called rennin, if pure; from *Mucor pusillus, Mucor miehei,* or *Endothia parasitica;* used in many types of cheeses), and glucose oxidase, cellulase, lipase, catalase.

There are also chapters on: 14. "Myctoxins," by N.D. Davis and U.L. Diener. 15. "Methods for detecting mycotoxins in foods and beverages," by L.B. Bullerman. 16. "Methods for detecting fungi in foods and beverages," by B. Jarvis. Address: Assoc. Prof., Dep. of Food Science, Agric. Exp. Station, Univ. of Georgia, Experiment, GA.

472. De Mille, Agnes. 1978. Where the wings grow: a memoir of childhood. Garden City, New York: Doubleday & Company, Inc. 286 p. Illust. No index. 22 cm.
• ***Summary:*** Agnes de Mille (lived 19 Sept. 1905 to 7 Oct. 1993) was an American dancer and choreographer. She was born in New York City into a well-connected family of theater professionals. Her father William C. deMille and her uncle Cecil B. DeMille (1881-1959) were both Hollywood directors. She was the granddaughter of economist Henry George {her mother's father} (Source: Wikipedia, at Agnes de Mille).

Agnes has written eight books before this one, most of them about dance, dancing, and choreography. Her last book, published in 1990, was memoirs and anecdotes about famous performing artists. This book suffers greatly from lack of an index.

This memoir is mostly about her early memories of summers at Merriewold, New York, and her lifelong memories, opinions, and even psychological analyses (some controversial and disputed) of the Takamine family because her aunt, Caroline Hitch, married Dr. Takamine and she knew the entire Takamine family throughout most of her life. The memoir has almost nothing to do with her career as a dancer and choreographer.

The book begins in about 1909-10 (her father bought a summer house in Merriewold in 1909), when she is age 4-5, with her detailed memories of a summer at their summer home with her family (her parents were deeply in love), baby sister Margaret, and servants at Merriewold, Sullivan County, in upstate New York. We are treated to the sensitive and perceptive child's view of a time long gone. Although the family was not wealthy, there were full-time servants who earned $10 a week (a cook {Ruth} and a nurse {Marie "Mamie" Harlowe}; Irish Catholics, no negroes at all). Father was the head of the household and what parents said was obeyed. Mother was the Absolute, and the way she did things was The Way. The dirt tennis court was rolled and painted. The ice cream was hand churned. Wild summer fruits were canned in Mason jars. Uncle John Moody, the financier (Moody's Investors Service) was a summer neighbor. Mamie was their nursemaid. Parents were remarkably self-sufficient, knew how to do a multitude of things, and had firm opinions about things such as cold baths, fresh air, health foods, bowel movements, a tablespoon of cod liver oil every day in winter and of castor oil once a week to please the family doctor. Garbage was disposed of in three pits: One for tin cans and bottles (not many), one for loose food, and a third for accumulations from the night house and crockery chamber pots decanted twice weekly by employee Fred Felter (summertime unmarried servant) with sprinklings of lye and ashes. Flies and flypaper were ever present. Indoor plumbing was limited to kitchen sinks with hand pumps. There were mysterious forests, lakes for swimming, clear springs and sylvan pools with the most delicious water she ever tasted. Father had cocktails, but no woman ever drank alcohol. Laura Graves, age 14, who liked to act older than she was by wearing lipstick, high heels and hair done up, danced with young Jo Takamine (p. 34). There were bedtime stories and goodnight kisses. Vivid memories of animals–deer, raccoons, porcupines, skunks, a procession of wildflowers and berries, summer insects. The awareness of death was close at hand.

"There were moments when I stopped being a member of a family, my parents' child, when I stopped having an identity or a calendar and simply became a part of the forest... I wondered then, as I have wondered since, how I could hold the reality of the moment, the wilderness of leaf and blossom existing beyond vision, beyond knowledge or personal experience..." (p. 46). And then came the frost and the summer was over.

The book also contains many excellent photos: Chapter 1: (1) Agnes as a young girl. (2) Her mother, Anna Angela George, before her marriage. (3) Her father, William Churchill de Mille, the year before his marriage. (4) Agnes, mother and Margaret. (5) The de Mille family house at Merriewold

Chapter 2: Merriewold, which lies in the southwest

corner of New York State near the Delaware River, which divides New York from Pennsylvania, had been discovered in 1892 by her grandfather, Henry George.

"At the time of his death in 1897, Henry George was probably the best-known American, excepting Theodore Roosevelt and Mark Twain. He was certainly the best-known serious American writer." His theory was popularly called the "Single Tax" (p. 50). He ran for Mayor of New York city to fight Tammany; he died four nights before the election.

The 2,000 acres of unattractive burnt land were on the market for only $1,000. The second growth had started and the land would soon be attractive. Henry George and a few friends bought the land and built houses. There George and his wife, Annie, "lived a primitive life of idyllic working conditions and tranquility" (p. 51).

Agnes' paternal grandfather, Henry de Mille married Beatrice Samuel (Jewish). De Mille genealogy and character sketches (p. 53-56). Sexual indiscretions. Early houses at Merriewold. In 1909 her father, now head of a family and author of two Broadway hits, bought a little house on the George family land at Merriewold. The house was built by Charles Klein, the playwright. They called all the adults Uncle or Aunt. Big tennis tournaments were played on their court.

Chapter 3 begins by introducing (at the Other End of the George family property) "the Palace, Sho-Foo-Den, and this was the sign that Merriewold mattered and that we mattered, because this Japanese house lay quite outside our homely amusements. It had international importance and it had beauty." A tragedy occurred in this house, and so Agnes never forgot anything about it (p. 93).

The children thought of the land as being divided into two parts: The "Other End" (where the Takamine family lived) and "Our End." "The mile walk between them was not to be attempted lightly, but only possibly for ice cream" (p. 67).

The lady at the Great House, Aunt Takamine, was more royal and better. "There was an aura sanctioned and blessed about her that no one ever questioned. She had the kind of presence that made everyone rise... and without knowing who she was, not only in Japan but everywhere she went. Her tact, her courtesy, became legendary. A welcome from Takamine-San, no matter what your age, was like a diplomatic recognition. She was the supreme example, the Queen" (p. 94).

Agnes was age 5 when she first met Aunt Takamine. On her sixth birthday she had lunch with Aunt Takamine in the great dining room, "at the gold table under the chandelier of a hundred golden chains." Water trickled over a stone beside the moss-covered Buddha. For Dr. Takamine ("Uncle Jokichi") she had only awe. When he arrived on the Ontario & Western train at the St. Joseph station, he was dressed impeccably in Western clothes. But 40 minutes he would be refreshed in white Japanese clothes, including tabi and geta, having a talk with Inamoto, the head gardener on their 25 acres, about the placement of a flower. With his white hair and scarlet fan, "we thought him the most stylish figure any of us had ever seen. He was not aloof, he was just different and superb." His handsome eldest son was named Jo–the Prince, the heir apparent.

Candles flickered in the stone lanterns in the garden. In August, the grounds twinkled with fireflies. No one could tell where the forest ended and the garden began, "so subtle was the marrying of the two." There were arched lacquer bridges, ancient stone lions, and a great wooden gong shaped like a fish. Once, during a rainstorm, Aunt Takamine invited little Agnes and her friends into the Great House and was very gracious and kind to them. "We Americans were untidy with quarrels and misunderstandings... But the Takamines,... were flawless, of unblemished excellence, with no signs of trouble" (p. 103).

Chapter 4 begins: "While the Takamines with their Great House were something like having a branch of the royal family in residence at Merriewold," there was some disrespect behind their backs. Danger of the Yellow Peril, gossip, "Japs"–"as Mr. [William Randolph] Hearst kept drumming into us." But Aunt Takamine never raised her voice or became upset. To one young ignoramus she quietly explained: "Young woman, obviously you come from some place that does not teach history. The Japanese achieved one of the great civilizations when your ancestors were living in wattle huts and dressing in wolfskins" (p. 106).

When the Takamine boys were at Merriewold, the atmosphere changed markedly. Jo would arrive in his white Stutz Bearcat, a professional racing car that terrified the locals. He was dazzling with his glossy mustache, black glossy hair, flawless amber skin, and wicked eyes. He went on rides in the Stutz at night with his brother Eben. "Eben was sweet and warm; Jo a little terrifying, with the possibility of being untrustworthy," said three local young ladies. "Jo was tender and elusive, small and sophisticated, the one the women feared. Eben was taller, bland in a kind of boyish way." In earlier days both boys used to ride their motorcycles on the muddy country roads, their only light a Japanese lantern held on a stick in their left hand or in their teeth. They sang bawdy Japanese songs and bragged of running over chickens. None of the older girls were allowed to go out with Jo or Eben, except Laura Graves, only 14, and she "went all out with Jo, all the time, and it was a fast thing to do" for he "was Japanese and out of bounds" (p. 106-07)

"Jo [a student at Yale] was a brilliant scholar, a really first-class mind, but due to his escapades, he didn't always achieve what he intended." So it was good news to his parents when it was learned that he had been accepted to the Kaiser Wilhelm Institute in Berlin. He later studied at the Pasteur Institute in Paris (p. 108). Continued.

473. De Mille, Agnes. 1978. Where the wings grow: a

memoir of childhood. Garden City, New York: Doubleday & Company, Inc. 286 p. Illust. No index. 22 cm.

• ***Summary:*** Continued. Aunt Takamine was a white women, a Caucasian, born Caroline Field Hitch. She was "Auntie Marie's sister and, like her a New Orleans Creole."

Note: How was Agnes de Mille related to Caroline Hitch Takamine? It is a tale of three interesting families. First on the Hitch side: Marie Morelle Septima Hitch was the younger sister of Caroline Hitch. Both were the daughters of Ebenezer Vose Hitch (born 20 Sept. 1841 in Fairhaven, Massachusetts) and Mary Beatrice Field (born in 1850 in New Orleans Parish, Louisiana), who were married in 1865 in Louisiana. They had at least nine children, of whom Caroline was the 2nd (born 5 Aug. 1866 in Falmouth, Massachusetts) and Marie was the 8th (born 22 Jan. 1879 in Orleans Parish {coterminous with the city of New Orleans}, Louisiana). Caroline married Jokichi Takamine on 10 Aug. 1887 in New Orleans, Louisiana. Marie married Henry George Jr. on 2 Dec. 1897.

Now on the George side of the family. Henry George Sr. (born 2 Sept. 1839 in Philadelphia, Pennsylvania) married Annie Corsina Fox (an 18-year old Australian girl who had been orphaned) in late 1861. They had four children. The 1st was Henry George Jr. (born 2 Nov. 1862 in Sacramento, California) and the 4th was Anna Angela George (born in 1879; she became the mother of Agnes de Mille). Henry George Jr. married Marie Morelle Hitch (see p. 90) on 2 Dec. 1897 in Chicago, Illinois. Henry George Jr. was well known in the USA. He was elected as a Democrat from New York to the U.S. House of Representatives for two terms; he served from 4 March 1911 to 3 March 1915. He was not a candidate for reelection in 1914.

Finally on the de Mille side: Henry Churchill DeMille (born in 1853) married Matilda Beatrice Samuel (born in 1853). They had three children: The 1st was William Churchill de Mille (a noted American screenwriter, film director, and playwright, who became the father of Agnes de Mille). The 2nd was Cecil B. deMille (1881-1959, who became a famous Hollywood film director and Academy Award-winning film producer). In 1903 William C. de Mille married Anna Angela George. daughter of the notable economist Henry George, Sr. Anna bore William two children: Agnes George de Mille (born 18 Sept. 1905 in New York City; she married Walter Prude, and became a choreographer and dancer) and Peggy DeMille (mentioned often in this book as Agnes' younger sister).

Agnes was not a blood relative of Marie Morelle Hitch, but rather a relative by marriage. Only blood relatives were invited to stay at Sho-Foo-Den.

"Although there are not reliable records, Caroline Hitch Takamine was probably the first American and the third Caucasian to marry a Japanese, the first to bear legitimate half-caste American-Japanese children. She went to Japan before Lafcadio Hearn and Pierre Loti" (p. 110). When Agnes first knew her, Carolyn was in her early forties. She was tall but not slender. She was quiet and always imperial.

There follow (p. 110-15) long, impressionistic character sketches of Carolina and Jokichi Takamine. We must question the accuracy of these since Agnes was so young at the time. In fact, in June 1922, when Jokichi Takamine died, Agnes was only age 16.

The origin of Sho-Foo Den is discussed (p. 117-120), the gift on cherry trees to Washington, DC (p. 121), the clubs and organizations Dr. Takamine founded (p. 122), Prince and Princess Kuni visit Sho-Foo-Den in 1907. This visit was "the culmination of the Takamine's social life, and was never surpassed." Yet it was a strain for Caroline, who was expected to play the role of accomplished royal hostess yet spoke little Japanese (p. 123-27).

Chapter 5 describes how Caroline Hitch's parents met during the Civil War, were married and raised a family. How Caroline's mother (Mary Beatrice) invited Dr. Takamine for dinner and Caroline said she would not eat with a "Jap"–although she ended up doing so in a dressing gown with unkempt hair. American views of Japan at the time. Caroline's mother, it is safe to infer, on all levels of sensibility, was quite taken with young Takamine–who was only four years younger than she. "She was a woman of intense feeling; the situation was intriguing and mysterious." During that year the two "had ample opportunity to get acquainted" (p. 144-45).

Jokichi Takamine's biography (p. 145-47). The proposal of marriage to Dr. Takamine. His return to Japan. The wedding and honeymoon (p. 152-53). Caroline's move to Japan (with it she lost her U.S. citizenship). Caroline's meeting with Jokichi's parents and her life in Japan. The birth of her two sons in Japan. Jokichi, Jr. was born on 28 Aug. 1888, and Ebenezer Takashi Takamine on 3 Aug. 1889 (p. 163). Mary Beatrice Hitch forms the Takamine Ferment Company to manufacture diastase, fully protected under American patent laws. She was the president of the company (p. 164-66). Jokichi, Taka-diastase, and the Whiskey Trust (p. 168). The discovery and isolation of Adrenalin by Wooyenaka (p. 171-73).

Chapter 6: Consequences of the isolation of Adrenalin. Conflicting interpretations. Jokichi indulges / spoils his sons but Caroline tries to discipline them. The sons feel discriminated against in America. Psychological study of the Takamine family. In this chapter are seven good Takamine photographs. (1) 1865–Ebenezer and Mary Hitch, the parents of Caroline Field Hitch. (2) 1884–Caroline Field Hitch at age 18. (3) 1885 ca.–Mary Beatrice Field Hitch in a white French house cap. (4) Marie Morelle Septima Hitch George, undated. (5) 1892–Jokichi Takamine (center) with his two young sons. (6) 1918?–(Left to right) Jokichi Takamine, Caroline (his wife), and Jokichi Takamine II (their eldest son). (7) Lady Caroline Hitch Takamine.

Chapter 7: Aug. 1914 England declares war on

Germany. Jo was in Leipzig and several Georges were in Europe. Agnes and her family move to Hollywood, California; after this summer they must leave Merriewold behind. Carline Takamine and spoiled boys (p. 218). Agnes returns for a summer to Merriewold. Caroline's musical competition at Merriewold (p. 233). Two photos of Sho-Foo-Den. Continued.

474. De Mille, Agnes. 1978. Where the wings grow: a memoir of childhood. Garden City, New York: Doubleday & Company, Inc. 286 p. Illust. No index. 22 cm.

• ***Summary:*** Continued. Chapter 9. Jo marries a svelte and seductively pretty Norwegian girl named Hilde. "Little Bea made friends with the Norwegian wife, 'the most honest person I ever met.' Beth let Bea spend lots of time at Jo's cottage by the lake in the years that followed. Bea was allowed one cocktail and Beth trusted Hilde to see there were no more. Everybody else had more. Everybody else was drunk the whole weekend." Caroline could impose no drinking rules in her own home, but not in her son's home and not even in her own when she was absent. That's how it was in the 1920s (p. 244).

Jo and Hilde have two children, Jokichi Takamine III and Caroline, who are both flaxen-haired and blue eyed–pure Scandinavian types. Eben marries Ethel, whom she met on a boat, when she was traveling with another man. But when she discovered his Dun and Bradstreet rating, she was his. Ethel was not well liked by Eben's family (p. 244-45).

Conflicts between Jokichi and Caroline. Jokichi offered his wife, Caroline a divorce. She was lonely–even though she was beautiful, powerful, and very rich. While her husband, Dr. Takamine, "was totally occupied and spending large stretches of the year in Japan, Caroline Takamine sought solace with young men. Eben introduced his friends, many of whom fell directly in love" (p. 248).

One of these friends "was a devout Catholic and they had long walks through the woods talking about mysticism and the afterlife and other reassuring matters... The inevitable happened. Caroline converted" [to Catholicism] (p. 249)

One night after a great testimonial banquet in his honor in New York City, Dr. Takamine was stricken with an old liver complaint. Rushed to Lenox Hill Hospital [on Manhattan's Upper East Side] he lay fighting for his life, with Caroline by his side. His nurse was a Roman Catholic and he asked her some questions. "A priest was sent for and Jokichi Takamine became a Roman Catholic to the gratitude and joy of his wife, to the distress of his friends. But he was beyond physical help. "He died soon after on July 22, 1922, at the age of sixty-eight." Caroline, "in a flooding of gratitude for the nurse's spiritual reinforcement, gave her a string of jade worth a thousand dollars" (p. 250). Caroline may not have mourned his passing. Ethel stood by just long enough to receive her inheritance then divorced Eben to marry a man with a yacht.

"Eben had gone to Arizona and was staying on a working ranch where he lived in basic simplicity with the owner, the head wrangler, one Charles Beach. He invited his mother to visit them, and she was bored, so she went.

"At the end of the visit Charles Beach simply took Caroline in his arms. This had never never happened to her before and she was swept off her feet. He was thirty years her junior" (p. 256).

They are married [16 Aug. 1926] and live at The Rancho de los Oscilitos [sic, Ocotillos] in the Arizona desert. Caroline builds a second Catholic church in the area–Santa Rita in the Desert; according to Agnes the local bishop explained that, in view of their extreme poverty, the people needed a hospital and school and not more stained glass. When Caroline insisted, the local bishop washed his hands of the matter, but the bishop of Chicago, Caroline's good friend, agreed to come west and dedicate the chapel in 1935 (p. 258; very inaccurate!). There has long been deep affection between Jo, Jr. and his cousin, Little Bea (p. 259).

The death of Jo Takamine, Jr. (p. 260-61; very different from detailed account in *New York Times*, 23 Feb. 1930. De Mille believes Jo, Jr. was killed by bootleggers and gangsters). Jo, Jr. is portrayed as the one who made life exciting and interesting. Merriewold was no longer enchanted. Now it had become female (p. 262).

Chapter 10. Agnes' parents are divorced. Why? Last years of Aunt Caroline Takamine's life (p. 271). Caroline sells Sho-Foo-Den to longtime friend and fellow Merriewold resident John Moody of Moody's Investors Service (p. 272). Caroline's thoughts on marital infidelity (p. 273-74).

On 20 March 1973 [sic, 1953], after passage of the McCarran-Walter Immigration Act, Ebenezer Takashi Takamine became a citizen of the United States–something that had eluded his father and brother. Five months later, on 28 Aug. 1953, 6 days after his 64th birthday, he dropped dead of a heart attack (p. 275).

John Moody sells Sho-Foo-Den to a real estate operator [Melvin C. Osborn (1915-1976)], who turned it into a motel. "More buildings were added, a plastic swimming pool and manifold arched red bridges. A good part of the trees were sold for timber. In the interest of sprightliness the six-hundred-year old wood carvings were painted over in cheerful colors. 'Desecration,' said the plain-spoken Jane George to the pleased, proud, and complacent landlord. Several of the smaller ancient garden figures have disappeared–likely stolen. The gardens are gone... The cornfield opposite the Georges' is gone, replaced by a golf course, the greens of which take all the water. No more dragon fountain, no more moss-padded sluiceways or spitting bronze frogs. The little lake is now a mud puddle" (p. 276).

The doctors kept Eben's death from his mother, Caroline, who was herself dying in Arizona–but she guessed.

Caroline's last illness was long, and her husband,

Charles Beach, attended her with unceasing and tender devotion. “She died in his arms. The Bishop of Tucson officiated at her funeral.” Her body was brought to New York by Charles to be buried next to Dr. Takamine, Jo, Jr., and Eben. Charles made no plans to be buried with her. Now they lie together. “Caroline was really Takamine-san to the end” (p. 275).

John Moody had cherished Sho-Foo-den, but he eventually sold it. The new owner transformed it into a motel. More buildings were added, a plastic swimming pool and arched red bridges. The ancient wood carvings were painted over in cheerful colors. The gardens are gone. It is but a ghost of its glorious past (p. 276).

475. Matsuura, Yoshiki; Kusunoki, M.; Date, W.; Harada, S.; Bando, S.; Tanaka, N.; Kakudo, M. 1979. Low resolution crystal structures of Taka-amylase A and its complexes with inhibitors. *J. of Biochemistry* (*Tokyo*) 86(6):1773-83. Dec. [23 ref. Eng]
• ***Summary:*** Taka-amylase A, an enzyme which was extracted from “Taka-Diastase Sankyo,” is an α-amylase from *Aspergillus oryzae*. Its molecular structure was studied by x-ray diffraction analysis. Two interesting and very complex balsa wood models on p. 1778 show the averaged electron density of the Taka-amylase A molecule. Address: Inst. of Protein Research, Osaka Univ., Suita, Japan 565.

476. Warren, Bacil B. 1980. Vail’s impossible shrine: It’s better known in far corners of the world than in Arizona. *Tucson Magazine* (*Arizona*). Jan. p. 79-80.
• ***Summary:*** “The village of Vail, a wide place in the railroad tracks, 25 miles southeast of Tucson, is the unlikely location of a memorial church apparently known in some distant parts of the world but almost totally overlooked by Arizonians.”

“The soberly-colored stained glass in this Catholic shrine has a protestant look about it, which is understandable when you know that it came from the historic First Methodist Church in Tucson when that early-day landmark was torn down.” Mrs. Charles P. Beach asked architect H.D.R. Figge to plan the church building around these windows. Mrs. Beach planned the landscaping, designed to integrate the building with its natural desert setting which includes cholla cactus, ocotillo, century plants, palo verde, mesquite trees, and stately sahuaros.

“The unpretentious church, seating 115,” was dedicated to the memory of Jokichi Takamine by the late Bishop Daniel Gercke on 31 March 1935.

“Father Vincent Putzer, parish priest at the Shrine of Santa Rita, estimates that well over a thousand people visit the shrine each year. Most, he says stop by while on their way to visit Colossal Cave, a few miles away, because they see the roadside sign identifying the church. But a few visitors have heard of the shrine previously and make a special visit while in the Tucson area.”

A biography of Jokichi Takamine followed; he “specialized in the commercial production of enzymes, substances normally produced by living organisms, that promote [catalyze] chemical changes without themselves being changed or used up in the process.

“Many patented products bearing the Takamine name are used today to tenderize meats, improve the texture of baked products, digest starch, improve the whipping properties of egg albumen, and dissolve gelatine coatings from silk screens without damaging the silk.”

Takamine Laboratory, Inc., of Clifton, New Jersey, was later sold to Miles Laboratories.

Mrs. Takamine married Mr. Beach, a pioneer Arizona rancher and mining man. They “lived near Vail at Casa de los Ocotillos, one of the largest cattle ranches in the area.” Mrs. Beach died in 1954 at age 88 and Beach died in 1967 at age 78.

A large photo shows the front exterior of the church, with its stained-glass windows and bell tower / belfry.

477. Miles Laboratories, Inc., Enzyme Products Div. 1980. Bob, Linda and Bill make end-product quality. Miles makes enzymes work (Ad). *Cereal Foods World* 25(4):169. April.
• ***Summary:*** “Years ago, Dr. Takamine pioneered the use of Miles enzymes for food technology. Drawing upon that genius, Miles scientists such as Linda Lasure have developed additional enzymes to bring about greater effectiveness and unique performance.” Address: P.O. Box 932, Elkhart, Indiana 46515.

478. Toda, Hiroko; Kondo, K.; Narita, K. 1980. N-terminal amino acid sequence of Taka-amylase A from Aspergillus oryzae. *Agricultural and Biological Chemistry* 44(8):1945-47. Aug. [24 ref. Eng]
• ***Summary:*** Taka-amylase A (TAA) is an α-amylase from *Aspergillus oryzae* made by Sankyo Co. Ltd. and sold under the trade name Takadiastase Sankyo. Address: Inst. of Protein Research, Osaka Univ., Suita, Japan 565.

479. Choukas-Bradley, Melanie. 1981. City of trees: The complete field guide to the trees of Washington, DC. Acropolis Books Inc. 283 p. Illust. (by Polly Alexander). 2nd ed. 1987 (Johns Hopkins Univ.). Third ed. 2008 (University of Virginia Press).. *
• ***Summary:*** Discusses the world-famous Japanese cherry trees encircling the Tidal Basin in Washington’s West Potomac Park. They were a gift to the American people from the city of Tokyo. “They are probably the world’s greatest living symbol of friendship between two nations” (p. 52).

In 1909 Takamine used his influence in Japan to have the Japanese government send 2,000 cherry trees to be planted on the banks of the Potomac River in the nation’s capital. However this first shipment of trees “proved to be infected with insect pests and plant diseases.” Therefore they

could not be accepted by the plant quarantine service of the U.S. Department of Agriculture; they were burned. But Dr. Takamine tried again, and the second time he succeeded.

480. Davenport, H.W. 1982. Historical articles: Epinephrine. *Physiologist* 25:76-82. [10 ref]*

481. Miles Laboratories, Inc. 1983? Biotech Products Division (Leaflet). Elkhart, Indiana. 1 p. Single sided. 28 cm. Undated.
• ***Summary:*** "Introduction & history: Miles Laboratories Inc. has been an innovative force in biotechnology since 1952 when it began producing citric acid using a revolutionary deep tank fermentation process." In 1963 Miles perfected a process for producing citric acid from starch. Miles now operates two plants in North America for producing citric acid: One in Elkhart, Indiana, and one in Dayton, Ohio. Production facilities are also located in Mexico, Brazil and Colombia through joint ventures with local partners.

"Enzymology: Miles entered the enzymology field in 1956 when it acquired the Takamine Laboratory in Clifton, New Jersey, and became heir to a rich tradition of innovation. Takamine Laboratory was established at the turn of the century by Dr. Jokichi Takamine, a native of Japan who immigrated to America in 1880 [sic, 1890].

"In 1901 Dr. Takamine isolated adrenaline and an enzyme of rice malt [sic, koji] which later became known as Taka-Diastase. He then went on to devise methods using diastase for digestion of starch in manufacturing processes. When he died in 1922, he had developed and patented more than 50 commercial enzymes.

"Since 1972, Miles has established enzyme manufacturing facilities in West Germany, Mexico, and Argentina, through joint ventures with local partners, and expanded in the United States. Miles put into production its second domestic enzyme plant in Elkhart, Indiana in 1983, becoming the only world producer with two production plants in the United States." Address: Elkhart, Indiana.

482. Land deed: Elinor W. Osborn (widow of Melvin Chester Osborn) of Monticello, New York, sells her land and Sho-Fu-Den (Sullivan County, New York) to Japanese Heritage Foundation for $600,000.00. 1984. New York. 13 p. Sept. 17. In Book 1147, p. 5-12, 73-76.
• ***Summary:*** Japanese Heritage, Inc. (later renamed Japanese Heritage Foundation, Inc.), is a New York Corporation with its principal place of business c/o O'Donnell & Phufas, Esqs., 14 East 4th Street, Suite 407, New York City, New York 10012. Page 12 is a real estate transfer tax of $2,400.00 paid 17 Sept. 1984.

Page 73 states that Japanese Heritage, Inc., a New York Corporation (1 Penn Plaza, Suite 100, New York NY 10019) transfers Shofu-Den to Japanese Heritage Foundation, Inc., a New York Corporation, at the same address. Address: Sullivan County, New York.

483. Japanese Patent Office. 1985. History of industrial property rights: Ten Japanese great inventors. Jokichi Takamine (Web printout). *http://www.jpo.go.jp/seido_e/rekishi_e/judaie.htm.* April 18. [Eng]
• ***Summary:*** Introduction: The system of industrial rights in Japan was founded on 18 April 1885, and is now celebrating 100 years of its existence. Up to the present 2.5 million patents and new utility models have been granted in Japan.

We "thought that the best way to celebrate this occasion of the one hundred year anniversary of our system of industrial property rights would be by selecting from inventors and authors of utility models those inventors whose contributions were particularly memorable and of historical significance."

Jokichi Takamine. Patent Number 4785. Adrenaline.

"Jokichi Takamine was born in the first year of the Ansei Era (1854) in Ecchukoku (presently in prefecture Toyama). In year 12 of the Meiji Era, he graduated from Engineering Faculty (presently the Engineering Faculty of the Tokyo University) in applied sciences, and the next year he went on a study stay to England. After he came back to Japan in year 16 of the Meiji Era, he was employed by the Ministry of Agriculture and Commerce. Because he was interested in the patent system, he stopped in Washington to examine the American system when he was dispatched to America. After that he was appointed by the Patent Office Commissioner Korekiyo Takahashi to the post of Vice Commissioner of the Patent Office in year 19 of the Meiji Era. In addition to that, he was also working at the Ministry of Agriculture and Commerce, where he was participating in a number of research projects relating to brewing processes, the manufacture of Japanese paper, and of other products. Although he retired from the Ministry of Agriculture and Commerce in year 21 of the Meiji Era, he passionately continued his research activities.

"In year 23 of the Meiji Era he successfully improved the brewing methods using original yeast and obtained the patent rights to his method. These brewing methods were then transplanted to America when American brewers also started using these methods. A method to manufacture diastase, which is a digestive agent, was invented in America, for which he obtained a great number of patents. At the same time, he also studied the effect of adrenaline, which is a hormone secreted by medulla, which was studied in many places in the world. Although the effect of this hormone was clear, it was necessary to isolate it in a pure form in order to make it possible to use this hormone for clinical purposes.

"After he was asked by an American company manufacturing pharmaceutical to isolate adrenaline, he successfully developed a method to manufacture pure adrenaline through separation of crystals with several

creative methods which he created by reducing atmospheric pressure without increasing the temperature of the solution while eliminating the solvent. He obtained the patent rights to the manufacturing method that he invented (patent number 4785, year 34 of the Meiji Era). "This method represented the first crystallization of a hormone, and it was valued very highly as it represented an important contribution to manufacturing of daily pharmaceutical products which are necessary for treatment. He received the Order of Merit of the Third Class Order in year 11 of the Showa Era. He died in year 11 of the Showa Era (1922)."

A link takes you to: Jokichi Takamine, Taka-Diastase, Adrenaline: "Taka-Diastase is a digestive enzyme discovered by Dr. Jokichi Takamine in 1894. The enzyme name comes from the term 'Diastase,' which means 'enzyme,' rendered in easier to pronounce German pronunciation, and 'Taka,' which means 'best' or 'excellent' in Greek and is also the first half or Dr. Takamine's name.

"Taka-Diastase is still used as an ingredient in medicines, and was in fact mentioned long ago in Soseki Natsume's novel 'I am a Cat.' 'Since he (the protagonist) had a weak stomach, his skin was a light yellow and showed symptoms of losing its elasticity. And yet he kept on eating, after which he would drink Taka-Diastase and crack open a book.'

"In 1900 Dr. Takamine succeeded in crystallizing and isolating adrenaline, the hormone secreted by the adrenal glands. Adrenaline is widely used in all medical fields as a hemostatic and cardiotonic agent.

Photos show: (1) A glass bottle of Taka-Diastase with both English letters and Japanese characters on the label. (2) Two cakes of Taka-Diastase with both English letters and Japanese characters on the label.

484. Bennett, Joan W. 1985. Taxonomy of fungi and biology of the aspergilli. In: Arnold D. Demain and Nadine A. Solomon, eds. 1985. Biology of Industrial Microorganisms. Menlo Park, California: Benjamin / Cummings Pub. Co., Advanced Book Program. xviii + 573 p. See p. 359-406. Chap. 12. 25 cm. [232* ref]

• ***Summary:*** This article is so clearly written that even a beginner can understand it.

Contents: Introduction. Some systematics for the nonmycologist: What is systematics? (classification, nomenclature, identification), what is a fungus? (general overview). The genus *Aspergillus:* Morphology, sexual stages (teleomorphs). Genetics: Introduction to *A. nidulans*, the parasexual cycle. Economic aspects: Secondary metabolites, *Aspergillus* metabolites used in food processing, Oriental food fermentations (soy sauce, sake, miso, koji). Conclusion.

Table 12.1 (p. 360) lists "Historical landmarks in mycology and biotechnology involving the genus *Aspergillus."* 1729–P.A. Micheli: Publication of *Nova plantarum genera*, name *Aspergillus* given to group of molds with characteristic spore head. 1827–J. Schilling: First continuous observation of the growth of a fungus from spore to spore, *A. glaucus*. 1854–A. deBary: First association of a perfect state (*Eurotium herbariorum*) and an imperfect state (*A. glaucus*). 1867–P. Van Tiegham: First to establish importance of Aspergilli in biochemical field with identification of *A. niger* in gallic acid fermentation. 1869–J. Raulin: First defined medium for a microorganism *A. niger.* 1894–J. Takamine: First patent for a commercial enzyme form fungus, "Takadiastase" from *A. flavus-oryzae.* 1917–J.N. Currie: Commercial citric acid production from *A. niger* demonstrated as feasible. 1952–J.A. Roper: Parasexual cycle discovered in *A. nidulans.* 1961–Sergeant et al.: Identification of *A. flavus* as mold association with Turkey-X disease; "mycotoxin revolution" begins. The name "aflatoxin" was given in 1962. 1983–Ballance et al.: Transformation system described in *A. nidulans*, the second transformation system elucidated for a mold. Table 12.3 (p. 378-79) is a "Glossary of morphological terms encountered in descriptions of the Aspergilli."

Table 12.6 (p. 392) lists "*Aspergillus*-derived metabolites used in food processing" (after Beuchat 1978, *Food & Beverage Mycology*, see p. 368-96). These fall into three broad categories: Acids, enzymes, and miscellaneous. Acids: Citric acid, from *A. niger,* is used in soft drinks, dairy products, jams, jellies, candies, frozen foods, fats and canned goods. Gluconic acid, from *A. niger,* is used in baking powder, bread mixes, desserts, bottle-washing formulations. Itaconic acid, from *A. itaconicus* or *A. terreus* is used in shortenings, or resin coatings in contact with food. Malic acid, from various *Aspergillus* species is used in beverages, jam, jellies, syrups, candy, and sour dough. Oxalic, from *A. niger,* is used in hydrolysis of starch to glucose. Tartaric acid, from *A. niger* or *A. griseus* is used in carbonated beverages, desserts, jellies.

Enzymes: α-amylase, from *A. oryzae* or *A. niger* is used in corn syrup, dextrose, baking, food dextrins, chocolate syrups. Glucoamylase, from *A. awamori* or *A. niger* is used in dextrose, dextrose syrup, baking. Glucose oxidase or catalase, from *A. niger* is used in powdered egg products, brewing, wines, mayonnaise. Lactase, from *A. niger* is used in dairy products. Naringinase, from *A. niger* is used in debittering grapefruit juice. Pectinase, from *A. niger* is used in clarifying fruit juice and wine. Protease, from *A. oryzae* is used in tenderizing meat, soy sauce, brewing, baking.

Miscellaneous: Mannitol, from *A. candidus* is used as a bulking agent, or humectant.

Illustrations show: (1) "Schematic representation of an *Aspergillus* conidial apparatus" showing metula (primary sterigmata), conidia, vesicule, phialide (secondary sterigmata), conidiophore, and foot cell (p. 377). Address: Prof., Dep. of Biology, Biology, Tulane Univ., New Orleans, Louisiana 70118.

485. Klein, Jerry. 1985. Peoria! Peoria, Illinois: Visual Communications, Inc. 276 p. See p. 89. Index. 29 cm.
• ***Summary:*** Dr. Jokichi Takamine was the discoverer of a new process for making alcohol that was said to be much less expensive and quicker than the barley malt method used by American distillers. He moved to Peoria, headquarters of the massive whiskey trust and home of its president, Joseph Greenhut. Greenhut hired Takamine on 18 Feb. 1891. He was assigned to apply his process to large scale runs of whiskey at Peoria. It was estimated that the Takamine process could save the whiskey trust two million dollars a year.

Takamine apparently lived in Peoria for almost 4 years. He conducted his experiments with wheat bran and similar materials in the malt house of the Grove Distillery, which had been built by Wollner Brothers. His work was conducted in secret. Many guards protected his laboratory to prevent spies from discovering his secrets.

His process was finally used in the Manhattan Distillery in Peoria [Note: Probably in late 1894]; it had been fitted with new equipment. Curiously the distillery went bankrupt within 2 months and the receivers changed it back to the old process. Takamine's contract with the whiskey trust was cancelled.

486. Frost, G.M. 1986. Commercial production of enzymes. *Developments in Food Proteins* 4:57-134. Chap. 3. (B.J.F. Hudson, ed. London and Englewood, New Jersey: Applied Science Publishers). [197* ref]
• ***Summary:*** The production of isolated enzymes on an industrial scale began less than 100 years ago. However the action of enzymes (fermentation) for changing and preserving foods has been exploited for thousands of years. Many traditional fermentations involve digestion by extracellular enzymes prior to fermentation by whole organisms. Enzymes are sold mainly to the food, beverage, and detergent industries. The present world market is valued at approximately £200 million. Most applications now involve hydrolytic enzymes, but future growth of other types seems probable. Most commercial enzymes are made by submerged cultivation of highly developed strains of microorganisms using specially optimized processes. Industrial enzymes, though rarely highly purified, are manufactured to exacting microbiological specifications. Enzymes for diagnostic and pharmaceutical use require more sophisticated purification methods.

The first artificial use of an enzyme was probably the addition of calf stomach extract to milk to cause coagulation when making cheese. In the West, the main use of fermentation is in making alcoholic beverages–wine, beer, etc. In East Asia, traditional fermentations are more concerned with improving the nutritional value, flavor, and texture of various foods–such as tempeh.

During the past century Asian and Western applications have been merged. For example, in 1894 Takamine in Japan used *Aspergillus oryzae,* the main organism in the soy sauce fermentation, to make Takadiastase, "an amylolytic enzyme which was first used for human consumption as a digestive aid." Takamine also established a business in the USA and new applications for his enzymes were found. His company still exists (though under a different name) and is still marketing essentially the same enzyme preparations.

Includes a long section on "Enzymes used in food." Address: John & E. Sturge Ltd., Selby, North Yorkshire, UK.

487. Klein, Jerry. 1987. Whisky Trust powered Peoria to prominence. *Journal Star* (*Peoria, Illinois*). May 10. p. C12.
• ***Summary:*** Peoria was long the whisky capital of the world–even though no whisky is made in Peoria today. Exactly 100 years ago today, on 10 May 1887, "the infamous whisky trust, one of the largest and most notorious combines in the industrial history of the United States," was organized in Peoria, Illinois, as the Distillers' and Cattle Feeders' Trust with Joseph B. Greenhut as its president and Adolph Woolner and John H. Francis of Peoria among its trustees.

Within 6 years, Peoria, with its 14 distilleries, was to become the center of the largest revenue district in the United States, with whisky taxes making up the bulk of the $23.13 million in taxes paid to the government.

The trust, of course, also controlled whisky prices.

The trust got interested in a new "Japanese process" for making whisky, discovered by Jokichi Takamine, that would supposedly make it easier and less expensive to produce alcohol than the standard barley malt method used in America.

"Greenhut hired Takamine in 1891 to apply his process to large-scale productions at Peoria. He was here for nearly four years and secrecy constantly surrounded his experiments at the Grove Distillery. His process was put into production in 1894 at the Manhattan distillery in Peoria. But the triumph was a brief one. Within two months the Distilling and Cattle Feeding Company was in the hands of receivers, who changed the distillery to its old process. Takamine, however, went on to some fortune and fame."

"Ultimately, the whisky trust collapsed because of trust-busting legislation enacted by the Illinois General Assembly in 1891 and the depression of 1893. The trust, for all practical purposes, ended in 1895. But the final act did not come until November 1920, when Illinois Attorney General Edward Brundage obtained a decree from the Circuit Court of Peoria dissolving the corporation."

"For almost 140 years, Peoria was the spirits capital of the world, and precisely a century ago the creation of the Distillers' and Cattle Feeders' Trust helped cement Peoria's title as Whisky City, U.S.A."

488. Beuchat, Larry R. 1987. Food and beverage mycology. 2nd ed. New York, NY: Van Nostrand Reinhold. xiii + 661 p.

Illust. Index. 23 cm. [20+ soy ref]
• ***Summary:*** Contents: Contributors. Foreword. Preface. Classification of food and beverage fungi, by E.S. Beneke and K.E. Stevenson. Relationships of water activity to fungal growth, by Janet E.L. Corry. Fruits and fruit products, by D.F. Splittstoesser. Vegetables and related products, by R.E. Brackett. Meats, poultry, and seafoods, by James M. Jay. Dairy products, by Elmer H. Marth. Field and storage fungi, by C.M. Christensen. Bakery products, by J.G. Ponte, Jr. and C.C. Tsen. Traditional fermented food products, by L.R. Beuchat. Alcoholic beverages, by G.G. Stewart. Edible mushrooms, by W.A. Hayes. Poisonous mushrooms, by Donald M. Simons. Fungi as a source of protein, by A.J. Sinskey and C.A. Batt. Fungal enzymes and primary metabolites used in food processing, by R. Bigelis and L.L. Lasure. Mycotoxins, by N.D. Davis and U.L. Diener. Methods for detecting mycotoxins in food and beverages, by L.B. Bullerman. Methods for detecting fungi in foods and beverages, by B. Jarvis and A.P. Williams. Appendix. Regulatory action levels for mold defects in foods.

Chapter 9, "Traditional fermented food products, has a section on koji and a long section on fermented soybean foods that discusses: Shoyu, miso, natto (incl. itohiki-natto, yukiwari-natto, and hama-natto / hamanatto; called tu su by the Chinese and tao-si by the Filipinos), sufu, meitauza, and témpé [tempeh]

Tables show: (9.1) Some fermented foods of fungal origin. For each food is given: Product name, geography, substrate, microorganisms, nature of product, and product use. Soy-related products include: Chee fan, Chinese yeast, Hamanatto, kecap, kinema, ketjap, meitauza, meju, miso (incl. chiang, jang, doenjang, tauco, tao chieo), natto, soybean milk, soy sauce (incl. chiang-yu, shoyu, toyo, kanjang, kecap, see-ieu), sufu (tahuri, tao-kaoan, tao-ju-yi), tao-si, taotjo, tauco and témpéh. Address: Dep. of Food Science, Agric. Exp. Station, Univ. of Georgia, Experiment, GA 30212.

489. Winterberger, Elsie. 1987. Forestburgh Sesquicentennial: 1837-1987. [Forestburgh, New York]: [Sesquicentennial Committee]. v + 112 p. Illust. 28 cm.
• ***Summary:*** On the cover: "Anniversary journal." Forestburgh is a town in Sullivan County, New York.

The section titled "Merriewold" (p. 38) states: "In 1872 Henry George became interested in and secured 1,000 acres that became Merriewold Park on Route 42 [on the east side going south]. A number of famous people involved in the entertainment world became affiliated with this club, among whom were Agnes DeMille, author, dancer and choreographer, niece of Cecil B. DeMille, Broadway producer and granddaughter of Henry George, well noted for his 'single tax' law. Mrs. Henry Guettel, daughter of Richard Rodgers of Rodgers and Hammerstein fame;... Mr. John Moody, the Wall Street genius, as well as Dr. J. Takamine, whose laboratory discovered adrenalin. Dr. Takamine even erected a Palace in the park, still standing in 1980, which was erected first in the 1904 World's Fair in St. Louis."

At the bottom of this page is a short section titled "Shofu-Den ('Pine and Maple Palace')." Dr. Takamine "moved it to its present setting. Dr. Takamine continued to enrich the garden with rare treasures including ancient Japanese stone statuary and garden lamps. Operated for a short time in the early forties [1940s] as a Japanese restaurant, and then used for private living quarters, it is today owned by a Japanese corporation" [Japanese Heritage Foundation].

Photos show: (1) Shofu-Den, exterior view of the main building. (2) The Shofu Room, interview of the main room.

A 2-page map of Forestburgh shows Route 42 (the main north-south route) but does not show Merriewold.

Note 1. Pages 52-112 of this book are ads which helped to pay for the cost of the book.

Note 2. Page iv states: "Without the efforts of Elsie Winterberger, our Town Historian from 1976 to the present, so much of our town's special history would have been lost and then forgotten.

"The historical events which are here summarized are a compendium of Elsie's colorful 'Forestburgh Lore' published in the *Sullivan County Democrat* from 1979 to 1986. We have attempted to retain the flavor and style of Elsie's pen... we give you a sampling of the history of Forestburgh as written by Elsie and edited by us."

On page 5 is a full-page photo of Elsie, seated on a stool by a fireplace with a fire burning. She is holding a large letter "H" as in "Keep the 'H' in Forestburgh." Address: Ex Officio, Sesquicentennial Committee.

490. Warren, J.V. 1988. Jokichi Takamine (1854-1922). *J. of Laboratory and Clinical Medicine* 112(6):793-94. Dec. [Jap]*

491. Bennett, J.W. 1988. Preface. In: Miles Inc. 1988. Takamine: Documents from the Dawn of Industrial Biotechnology. Elkhart, Indiana: Miles Inc. xix + 96 p. See p. viii-xv.
• ***Summary:*** Note: We have expanded and updated Dr. Joan W. Bennett's original Preface by merging into it part of a key document she wrote titled "In search of Dr. Jokichi Takamine and the origins of industrial mycology," published in Dec. 2002 in *Inoculum: Newsletter of the Mycological Society of America.* p. 6-9. Supplement to *Mycologia* Vol. 53(6). The quoted passages are from this 1988 Preface. The unquoted passages are from the Dec. 2002 newsletter.

"Preface: Dr. Jokichi Takamine was the founder of commercial enzymology and one of the major figures in the history of American biotechnology. During his lifetime he was the most famous Japanese in America, but in the decades since his death, many of his accomplishments have been

forgotten."

His 1906 application for a PhD degree "describes his two most important scientific accomplishments, the isolation of a potent starch-degrading enzyme from a mold, and the crystallization of adrenaline from adrenal glands."

Takamine was born on 3 Nov. 1854 in Takaoka, Japan, a small town at the base of the Noto Peninsula on the west coast of Japan. He was born "the same year that Commodore Matthew Perry signed a treaty opening Japan to the West."

When he was young, his family moved to Kanazawa, a nearby city famous for its walled castle, scenic gardens, and heavy winter snow. Jokichi grew up in "a cultured and enlightened family." His father, Seiichi, was a physician, spoke Dutch and was from a family of Samurai physicians. His mother, Yukiko, came from a family that owned and operated a sake (rice wine) factory. From an early age, Jokichi was a gifted student who showed an aptitude for languages and science, and he was encouraged by his father to pursue western scientific interests. He parents provided him with the best education they could devise. "Believing that the future of Japan lay in contact with the West, his parents sent him to Nagasaki, at the age of 12, so he could learn English in the home of a Dutch family" and study foreign science. At age 16 he entered the medical school in Osaka; at 18 he transferred to the College of Science and Engineering at the University of Tokyo, where he graduated in Chemistry. At age 24, he was one of twelve exceptional young men selected by the Japanese government to study technology in Scotland at Glasgow University and Anderson College. In Glasgow, he perfected his English, studied the industrial revolution, and specialized in the study of fertilizer manufacturing and the fertilizer industry. "In later life he was described as speaking English with little or no trace of a Japanese accent; rather he sounded Dutch, with an inclination to roll his *r's* in Scottish fashion.

"Takamine studied and traveled in Europe for four years, taking particular interest in the manufacture of fertilizers." In 1883, his formal education completed, he returned to Japan, where he worked in the newly formed Department of Agriculture and Commerce, charged with the goal of bringing western methods to improve traditional Japanese products such as paper, indigo, and sake. But his stay was brief. "He was soon dispatched to the United States as one of the Commissioners to the Cotton Exposition held in New Orleans, Louisiana, in 1884;" there Japan planned to showcase its unique culture and products. In New Orleans, Takamine rented a room in the home of Colonel Ebenezer Hitch, a retired Civil War officer (Union Army). He and his Creole wife lived in a large, three-story house in the French Quarter. Takamine fell in love with the family's eldest daughter, Caroline Field Hitch. The attraction was mutual. At the close of the Cotton Exposition, he proposed marriage. Although an interracial betrothal was unusual for this time, Caroline's parents gave their approval. It was to be a long engagement.

Takamine returned to Japan to secure enough money to support a wife. He soon became Chief of the Division of Chemistry in the Department of Agriculture and Commerce, then in 1886 Acting Chief of the newly formed Japanese Patent Bureau. However, only a year later, exhibiting the entrepreneurial spirit that was to characterize him throughout life, he resigned from his secure government post to establish the Tokyo Artificial Fertilizer Company, the first superphosphate works in that country. Then, with financial backing from several prominent Japanese investors, he left Japan for the third time, visiting several established fertilizer manufacturing facilities in Europe and the USA. He arrived back in New Orleans in the summer of 1887. He and Caroline were married on 10 Aug. 1887 in a French Quarter wedding. It was an unconventional match for the era but one that would eventually cement Takamine's ties to the USA.

On their honeymoon, the young couple visited fertilizer manufacturing plants in North Carolina and then to Washington, DC, where Takamine studied U.S. patent law. Finally they traveled West to California and then sailed to Japan. In his homeland, the young couple established housekeeping near the Tokyo Artificial Fertilizer Company. In short order, two sons were born: Jokichi Jr. (1888) and Eben (1889). Continued. Address: Elkhart, Indiana.

492. Bennett, J.W. 1988. Preface (continued–Document part II). In: Miles Inc. 1988. Takamine: Documents from the Dawn of Industrial Biotechnology. Elkhart, Indiana: Miles Inc. xix + 96 p. See p. viii-xv.

• ***Summary:*** Continued: "After a brief struggle to convince Japanese rice farmers of the value of phosphate fertilizers, the business became a financial success. Takamine built himself a private laboratory and–perhaps with prodding from his mother's family–conducted research on the diastatic (starch degrading) properties of the koji mold (*Aspergillus oryzae*) used in the early steps of sake manufacture. He applied for, and was awarded, one of the first Japanese patents ever granted on the process for making the diastatic enzyme.

"Takamine devoted his early life to following the principles of *Wakan-yosai*, the adaptation of Western concepts to fit and benefit Japan. He also had visions of the opposite: Japanese contributions to Western science, industry, and culture. His hopes for the discovery of rich natural resources in Japan were never met. Nevertheless his private research on the diastatic enzymes of fungi was an example of technological innovation of Japanese inspiration.

"Diastase is the old name for amylase. Both 'diastase' and 'amylase' are imprecise terms and encompass a group of different hydrolytic, starch-degrading enzymes. In the description of a 'Diastatic Substance Produced by a Fungus' that follows, Takamine was aware that his diastatic extract was a mixture. The starch-liquefying diastase he describes

was probably alpha-amylase and the starch saccharifying diastase was probably glucoamylase.

"The action of diastase is an essential step in the production of alcoholic beverages from grain (beer and whiskey). Yeasts can convert sugar into alcohol but they cannot convert starch into alcohol. Hence, prior to alcoholic fermentation, the starch in grains must be treated with starch-digesting enzymes. In the West, malt produced by germinating grains is the traditional source of amylolytic activity; in Japan, the enzyme is derived from the mold *Aspergillus oryzae* grown on rice. The mold-rice mixture called 'koji' is comparable to malt, but far more active. It takes at least six months to grow barley to maturity and then it takes six days to germinate and sprout barley for the malting process. Takamine's diastase could do this in two days. Takamine found that wheat bran, an inexpensive by-product in milling, was an even better substrate than rice for growing the mold. By all criteria, Takamine's diastatic enzyme could revolutionize the distillery industry."

Unfortunately, but not surprisingly, Caroline was not happy in Japan. At the time (late 1880s), there were few other western women in Japan. Her fair color and blue eyes made her conspicuous, and her childcare responsibilities left her little time for studying the Japanese language. To make matters worse, Jokichi's parents made it obvious that they did not approve of their unconventional daughter-in-law.

Takamine knew that the artificial fertilizer industry was too well established in the USA for him to compete effectively. But his research on the *Aspergillus* enzyme provided the basis for his next business enterprise, a venture that would enable him to move back to his wife's homeland.

Yeasts cannot metabolize starch. In order to make alcohol from grains, it is necessary first to change starch into sugar. In traditional western brewing and distillation, malt from germinating barley is used to obtain the diastatic enzyme. In traditional Japanese fermentation (as of sake), the enzyme comes from the koji mold.

Takamine had just obtained a Japanese patent on a process in which a seed koji (*Aspergillus oryzae* which had been grown on rice and allowed to sporulate) was cultured on steamed wheat bran, an inexpensive substrate with a large surface area. After several days of incubation, the resultant mash could be dried and stored. When diastatic enzyme was needed, it could be extracted sequentially with water and alcohol, yielding a starch-degrading extract that was far more potent than the malting enzyme from barley.

In 1890, Colonel Hitch invited Jokichi and Caroline to return to the USA, and to join him in the whiskey business. Jokichi and his father-in-law planned to speed up the manufacture of alcohol by starting a new business that would replace the malting step with the Japanese process. The Whiskey Trust supported the venture, and the Takamine family moved to Peoria, Illinois. "They established the Takamine Ferment Company in Peoria, Illinois, to manufacture diastase for a local distillery. One of the more unusual items currently held by the Miles Corporate Archives in Elkhart, Indiana, is a bottle of 'Banzai Whiskey' dating from this period."

Note: It is not clear where the Takamine family lived before they moved to Peoria, and whether the whole family resided in Peoria from 1891 to 1894. On six patent applications (British and U.S.) filed between 2 April 1891 and 23 Feb. 1894 Takamine gives his address as Chicago, Illinois; on the earliest two of these his gives a specific address as 25 & 26 Honore Buildings, Chicago, Illinois.

For a while, the endeavor seemed to go well. "Unfortunately, Takamine's innovation was not welcomed by all of the distillery industry. Malt manufacturers saw a threat to their business. They encouraged local xenophobia [fear and hatred of foreigners]. Although the historical records are not clear, the few facts that emerge do not tell a pretty story. There was labor agitation and ugly anti-Takamine propaganda. One night in 1894–the same year the enzyme product Taka-Diastase was patented in the U.S.–the distillery for which Takamine worked was burned to the ground. Arson was suspected. Although the directors of the company built a new plant, they dissolved Takamine's corporation. To make matters worse, Takamine was deathly ill with a liver ailment."

Note: This fire occurred in on 7 Oct. 1891, not in 1894; for details, see Peoria newspaper clippings and Note in Kawakami 1928.

The Takamine family moved back to Chicago and suffered a period of financial exigency, having to accept support from wealthy relatives in Japan, while Caroline sold arts and crafts to make ends meet. But their fortunes gradually improved. "With proverbial Japanese persistence and stoicism in the face of adversity, Takamine regained his health and continued to champion his fungal enzyme preparation. Alcohol manufacture was only one of the possible applications for diastase."

In Sept. 1894 Takamine was awarded the key patent on fungal diastase (U.S. Patent 525,823), which was the first patent on a microbial enzyme and the first biotechnology patent in U.S. history. He had the genius to recognize that it might have applications outside the manufacture of sake and whiskey. He named his enzyme preparation "Taka-Diastase," formulated it in tablet form, and marketed it as a treatment for indigestion [dyspepsia] and "acid stomach" believed to be caused by improper indigestion of starch due to a deficiency of ptyalin in the saliva. "Half or more of the carbohydrates consumed by people are in the form of starch."

In 1897, Parke, Davis & Company of Detroit, Michigan, took over the marketing and distribution of Taka-Diastase, beginning what was to become a lifelong relationship with Takamine. The digestive aid was an enormous success and became the "Alka Seltzer" of the 1890s. Continued. Address:

Elkhart, Indiana.

493. Bennett, J.W. 1988. Preface (continued–Document part III). In: Miles Inc. 1988. Takamine: Documents from the Dawn of Industrial Biotechnology. Elkhart, Indiana: Miles Inc. xix + 96 p. See p. viii-xv. [Eng; Jap]
• ***Summary:*** Continued: In 1897 the now prosperous Takamine family moved from Chicago to New York City, and Jokichi established yet another independent laboratory at East 103rd St. Using the money he was earning from Taka-Diastase, Takamine hired a young chemist from Japan, Keizo Wooyenaka (Uenaka), to help him with hormone research. With the backing of Parke, Davis, they began work on isolating the "active principle of the adrenal glands of sheep. In June 1900, Wooyenaka succeeded in crystallizing adrenaline.

"This hormone, also known as epinephrine," was the first 20th century "miracle drug." "It is the hormone responsible for the 'fight or flight' response. The subjective experience produced by the hormone is widely known–'Getting my adrenaline flowing' has become a colloquial expression.

"Physiologically, adrenaline acts by speeding heart rate and constricting blood vessels. It has found wide application in the relief of respiratory distress, for restoring cardiac rhythm after cardiac arrest, and for prolonging the action of certain anesthetics. Although Dr. J. [John Jacob] Abel of Johns Hopkins had succeeded in crystallizing the compound, almost simultaneously, Takamine had obtained the patent rights. A court battle ensued; Takamine won; Takamine's fame and fortune were sealed.

"Now Takamine's life became one of wealth, influence, and recognition. He founded three major companies: Sankyo Pharmaceutical Company of Tokyo, the International Takamine Ferment Company of New York, and the Takamine Laboratory of Clifton, New Jersey, and he held stock in many more, having a major influence on the direction of U.S. investments in Japan. Western products such as aluminum, asbestos, bakelite, and caustic soda were brought to Japan under Takamine's direction and frequently to Takamine's profit.

"Takamine became a philanthropist, a supporter of the arts, and a colorful figure in New York Society. Young scientists and artists were sponsored with his wealth. Teaching Americans about Japanese civilization and customs became a major preoccupation, and he founded several organizations to foster improved understanding and trade between the nations. Both his homes, one on Riverside Drive in New York City and Sho-o Foo Den at Merriewold, Sullivan County, New York, were showplaces, decorated in the Japanese manner and filled with Japanese art.

"One of his most enduring contributions was diplomatic. In 1911 he learned that the President's wife, Mrs. William Howard Taft, was interested in beautifying the Tidal Basin area around the Potomac River in Washington, D.C. Takamine was instrumental in arranging a gift of three thousand cherry trees from the Mayor of Tokyo to the City of Washington as a symbol of friendship and peace between the countries. The cherry trees have become a major tourist attraction, but few Americans know anything of their history

"Takamine was amply and repeatedly recognized by the country of his birth. He was honored with degrees by the Imperial Tokyo University in 1899, 1906, and 1912. He became a member of the Royal Academy of Science of Japan in 1915, and received the Fourth Order of the Rising Sun in 1915. Shortly before his death in 1922, he was awarded the Senior Degree of the Fourth Rank (*Sho Yon-i*) and the Third Merit (*Kun Santo*).

"This recital of Takamine's achievements and awards only gives a feeble idea of what he represented in life. He believed in the power of the scientific method for improving the effectiveness of technology. He was a brilliant businessman, always melding scientific progress with practical and economic feasibility. He succeeded in bringing Japan closer to the industrial and scientific community of the West.

"Takamine was less successful in bringing the West closer to Japan. Perhaps Western cultural arrogance obscured the ability of Americans to understand, much less value, the subtle strengths of Japanese culture. Later a World War fueled racist hatred and an irrational fear of 'The Yellow Peril.' Only the passage of time and recent economic and political realities have forced Americans to take another look.

"In the July 18, 1986, issue of *Science*, Editor Daniel Koshland wrote, 'We have seen the future, and it is Japan. A combination of awe, fear and respect has been earned by a country whose history is as amazing as its present achievement.'

"Dr. Jokichi Takamine was a unique part of that amazing history. He knew that each of his countries had something to offer the other. In that, as in many things, he was a man ahead of his times.

"Jokichi Takamine died on July 22, 1922, in New York City of the liver ailment that had plagued him throughout life. At his memorial service at the Nippon Club, he was surrounded by more than three hundred floral pieces from prominent Japanese and American friends. A Japanese and a United States flag were crossed at his breast, symbolic of his efforts to foster friendship between his two countries. He was remembered in the press as 'The Japanese Thomas Edison' and 'The Japanese Pasteur.'

"His funeral was held at St. Patrick's Cathedral, and he was interred at Woodlawn Cemetery, New York. In, later years, his wife and two sons were buried with him. If you go to Woodlawn Cemetery today you can peer in the door to his tomb and still see the Japanese and United States flags, standing upright in a Japanese urn, in front of a stained glass

window depicting Mt. Fuji.

"After Dr. Takamine's death, his sons Jokichi Jr. and Eben took over the management of Takamine Laboratory in Clifton, New Jersey. Originally founded to manufacture Taka-Diastase, the company grew to be a major producer of commercial enzymes for use in the food, pharmaceutical, textile, brewing and petroleum industries. Joe Jr. died prematurely in 1932; Eben successfully managed and expanded the business through the difficult Depression years.

"Eben had been born in Japan and was a Japanese citizen. He was a graduate of Yale University and the son of the great man who once worked for peace between the United States and Japan. During World War II, he was spared the indignities inflicted on most Japanese-Americans and continued as president of the Clifton plant. The company contributed to the war effort by producing penicillinase, an enzyme used to assay penicillin, the then new 'wonder drug.'

"Eben died childless in 1955. His widow Mrs. Catherine McMahon Takamine, took over management of the company and sought a worthy successor to continue the tradition of innovation and quality represented by the Takamine name. In 1956, Miles Inc. (through its division, Miles Chemical Company) purchased the Takamine Laboratory The acquisition helped make Miles one of the major contributors to the development of what has become the modern biotechnology industry

"It is fitting that Miles should now support the translation of some of Dr. Takamine's writings from the Japanese. By making his work more accessible to Americans, Miles enables him to assume his rightful place in the history of biotechnology. His research with the fungal diastase from Japanese koji can serve as a modern paradigm. It would please him that the lesson he worked so hard to implant has finally taken root: Japan has much to teach the West." Address: Elkhart, Indiana.

494. Miles Inc. 1988. Takamine: Documents from the dawn of industrial biotechnology. Elkhart, Indiana: Miles, Inc. xix + 96 p. No index. 24 cm. Preface by J.W. Bennett. [Eng; Jap]
• ***Summary:*** This is a superb little book, with an outstanding preface, plus key documents by Jokichi Takamine. On each left-hand page is the document in the original Japanese, and on the right-hand page is the English translation. The two facing pages each bear the same page number. Contents: Portrait (full body, illustration) of Dr. Takamine in tuxedo, with glasses, moustache, white gloves, and cane. Preface (the story of Dr. Takamine's life and work) by Joan W. Bennett of Tulane University.

Application for degree (p. 1, Sept. 1906, Tokyo; he has a PhD in engineering and is applying for the degree of Doctor of Pharmacology from the University of Tokyo).

Diastatic substances produced by fungus (p. 2-26; discusses koji, taka-koji, and Taka-Diastase). Note: This long, outstanding article was published in English in 1898 as "Diastatic substances from fungus growths" in *Journal of the Society of Chemical Industry* (London) 17(2):118-20. Feb. 28. Dr. Takamine presented this paper as part of the "New York Section" of the Society. "Meeting held at the College of Pharmacy on Friday, January 21st, 1898."

Adrenaline, the active principle of adrenal glands, and a method of its preparation (p. 27-48; about 1901. The trade name of the substance patented by Takamine is "Adrenalin"). Note: Unfortunately and the dates and sources of these Japanese-language documents are not given.

The Preface is cited separately. Address: Elkhart, Indiana.

495. Colson, David; De Mille, Agnes. 1989. Merriewold–The first hundred years (1889-1989). [Merriewold Club, Sullivan County, New York]. v + 73 p. Illust. No index. 26 cm.
• ***Summary:*** This book is extremely rare and hard to find.

So far as we can tell, it is in no public library in the United States–not even the local public library nearest Merriewold in Sullivan County, New York. It was written by David Colson "with the assistance of Agnes de Mille."

Contents: Happy birthday! Acknowledgements. Part I: The first hundred years. 1. Beginnings. 2. 1919-1939. 3. 1939-1989.

Part II: Inside the park–With a special tribute to Judy Clark. 4. How it works.

Part III: The houses and their people (a history of each house and the date it was built). 5. The years before World War I. 6. World War I until World War II. 7. World War II until the present.

In conclusion. In memory. A map of Merriewold, with the name and location of each homeowner, appears on p. 30.

The 2,000 acres of land that became Merriewold Park were purchased in the mid-1880s by Louis F. Post and William Croasdale after the land been charred by a huge forest fire. The third founder was Henry George, the noted economist and philosopher, and their good friend. By the time he died in 1897, Henry George "was one of the three best-known Americans (along with Mark Twain and Thomas Edison). He was a world renowned writer on economics and social theory. His book, *Progress and Poverty*, sold more copies world-wide in the 1880s than any book except the Bible."

On page 7 we read that most of the people who came to Merriewold for the summer from New York City had servants. "Sho-Foo-Den was erected in the years following 1906–and it was literally a palace, with living quarters in the rear for dozens of servants. It was the summer residence of Dr. Jokichi Takamine and his wife Caroline (Caroline was Mrs. Henry George Jr.'s older sister. More about the houses and who lived in them over the years will follow in Part III)."

After Dr. Takamine died in 1922, his widow, Caroline, continued to summer at Merriewold for several years, while her son, Joe, Jr., and his bride, Hilda, lived in another house. After Caroline Takamine was engaged to Charles Beach, an Arizona Rancher, and moved away, Joe, Jr. moved back to Sho-Fu-Den with his wife and two children. There was a lot of drinking and night dances at the house. After Joe, Jr., died in 1932, Ebenezer did not want the responsibility of the palace, so Caroline decided to sell it to John Moody, a longtime friend who was very wealthy and at the time lived in another home at Merriewold. Moody presented it to his wife (see also de Mille 1978, p. 272).

During the 1930s, the club decided to build its present golf course. The corn field opposite Sho-Foo-den was transformed into putting greens that needed a tremendous amount of water. "This lowered the water table–and destroyed the fountains, the tiny brooks that ran under bridges, the little lake. But Mr. Moody was obviously willing to tolerate this, since he paid most of the cost of putting in the golf course" (p. 47). The remaining sad history of Sho-Fu-Den is told in some detail. Melvin Osborn bought the palace from Moody and tried to run it as a hotel. As Agnes De Mille tells the story (p. 276): "More buildings were added, a plastic swimming pool and manifold arched red bridges. A good part of the trees were sold for timber. In the interest of sprightliness the six-hundred-year old wood carvings were painted over in cheerful colors. 'Desecration,' said the plain-spoken Jane George to the pleased, proud, and complacent landlord."

Osborn purchased a liquor license, advertised a public restaurant and cocktail lounge, and claimed the right to run a public inn. He was a Merriewold member, and he told his "guests" to feel free to use the club's facilities at the lake, golf course, tennis courts, etc. He even brought a speedboat to the lake and encouraged his "guests" to race around in it.

The club sued to stop him and won. The case was never tried; in 1951 a settlement was reached which basically required Sho-Foo-Den to be separated physically from the rest of Merriewold. Osborne was granted a limited right of access on the roads adjoining Sho-Foo-Den and the right to erect a small sign.

After this the property went down hill. Some stone lanterns and garden figures disappeared–probably from theft. After Osborn's death, his widow sold the property. Several years ago it was purchased by the Japanese Historical Society. A large amount of money has been spent to restore it. In 1987, for example, major structural repairs were made and a new copper roof was put on. The restoration is not finished and seems to have stopped–at least for now.

The Prude House (p. 41) was built in about 1906. William de Mille (a well-known Broadway playwright) bought the house in 1909. His wife was the former Anna George, daughter of Henry George. Their two daughters were Agnes and Margaret. In 1914, William De Mille and his family moved to Hollywood; so Agnes's childhood memories end that year. In 1927 William and Anna de Mille divorced. William gave the Merriewold house to Agnes. However, since Agnes was in Europe for most of the 1930s, Anna (Agnes' mother) lived there. In 1938 Agnes de Mille returned to the USA. In 1942 she became famous starting with *Rodeo*, then *Oklahoma!* (Rodgers & Hammerstein). She has won a huge number of high-level awards, most of which are listed here. During World War II she married Walter Prude, whose career was equally illustrious.

Letter (e-mail) from resident of Sullivan County (NY). This book exists but "the long time residents of Merriewold are extremely private about their little enclave, although many of the newcomers do not understand that inclination. That having been said, I have a copy of the book. Here is the information you requested: The book was published for Merriewold's 100th birthday in 1989 (Henry George's Merriewold Park Company completed the purchase of the original property from the estate of W.W. Gilman on August

3, 1889), but there is no indication who printed it. There are 73 pages in the book, including 4 pages of small ads and testimonials at the end.

"I do not know where to tell you to look for a copy to purchase, except to keep looking on eBay and possibly www.bookfinder.com. There is no ISBN number, so it will not likely be sold in traditional stores.

"Years ago Merriewold Park filed a lawsuit against Melvin Osborn when he owned the palace [Sho-Fu-Den] and had opened it as a Japanese restaurant. They did not want the public driving into the park to patronize the restaurant. The lawsuit was eventually settled, and Osborn had to construct a separate entrance into the palace from State Route 42 so that people would not drive into the park to access it. Nevertheless, I don't think the restaurant survived that long."

496. Adams, Bill. 1990. Penicillin developed in Peoria. *Journal Star* (*Peoria, Illinois*). July 2.
• ***Summary:*** Describes the development of penicillin at USDA Northern Regional Research Laboratory (NRRL). According to historical research conducted by Dr. Clifford Hesseltine, fermentation began in Peoria in 1844 with the first distillery which was started by Adam Cole. By 1864, a dozen distilleries were in operation in Peoria. In 1890 a Japanese scientist, Dr. Jokichi Takamine, founded the Takamine Ferment Co. in Peoria. It made diastase, a mixture of amylase produced by molds. It was in Peoria that fungal amylase was first introduced to the West. Up to this time only malt was used to produce alcohol. Takamine's process replaced malt with fungal amylase. But the new process was apparently opposed by malt manufacturers.

Groundbreaking for the NRRL took place on June 8, 1939. Its grand opening came the following year, on December 16, 1940. By the following summer a team of scientists at the NRRL were working on a major project to develop a practical method of making penicillin by fermentation. An Englishman, Alexander Fleming, had discovered penicillin in 1928 at St. Mary's Hospital in London, England. Then in 1930 USDA microbiologist Charles Thom identified the mold that produced penicillin, but nothing happened for several years. About 5 months before Pearl Harbor, on 9 July 1941, a telegram to NRRL director Orville E. May began the penicillin project. Dr. Andrew Moyer made several major discoveries about growing the mold. As a result of his work, Dr. Moyer was honored by being elected into the Inventor's Hall of Fame–a rare distinction.

497. Neidleman, Saul L. 1991. Enzymes in the food industry: A backward glance. *Food Technology* 45(1):88-91. Jan. [32 ref]
• ***Summary:*** The section titled "Some early enzyme patents" begins: "Table 1 lists a number of early enzyme-related patents in the food industry, beginning with that of Jokichi Takamine in 1894" (U.S. patent No. 525,823 concerning the enzyme amylase [diastase]).

"The multitude of patents that Takamine obtained on the application of fungal diastase for the preparation of alcoholic beverages had a major problem: the generation of off-flavors. The possible root of this difficulty was suggested by Harada (1931). Takamine's method for producing the diastatic enzyme involved a 70% ethanol precipitation step." Harada reported that this process did not yield a pure enzyme product, but a mixture of many enzymes, whose names he listed. "With such an enzyme cocktail as this, it is not surprising that Takamine's preparation did not infiltrate the brewing industry." Address: Senior Director of Project Acquisition and Planning, Biosource Genetics Corp., 3333 Vaca Valley Parkway, Vacaville, California 95688.

498. De Mille, Agnes. 1991. Takamine Jôkichi den: Shôfûden no kaisô [Biography of Jokichi Takamine: Recollections of Sho-Foo-Den. Translation of *Where the Wings Grow* by Aiko Yamashita]. Tokyo: Yushodo Shuppan. 303 p. Illust. No index. *
• ***Summary:*** For details see *Where the Wings Grow*, by Agnes de Mille–an American who knew Dr. Takamine when she was a young girl.

499. Hesseltine, C.W. 1991. Peoria, an international center of fermentation excellence. *Transactions of the Illinois State Academy of Science* 84(1-2):1-11. [11 ref]
• ***Summary:*** This paper was presented on 28 Sept. 1989 as the after-dinner address for the 50th Anniversary Celebration of the Peoria (Illinois) Branch of the American Chemical Society. Contents: First fermentations. Hiram Walker Co. (1816-1899; for many years they operated the world's largest bourbon whiskey plant in Peoria). Takamine. Northern Regional Research Center. Penicillin & Dr. Andrew Moyer. Penicillin–others (incl. Dr. Kenneth Raper). USDA's Agricultural Research Service (ARS) culture collection (which dates back to 1904). Polysaccharides. Mycotoxins. Fermented foods (especially soyfoods such as miso, shoyu, and tempeh). Fermentation in Peoria today (ADM uses the old Hiram Walker distillery to make fuel alcohol from corn). Honors and awards. References.

"Dr. Jokichi Takamine was the father of commercial enzymology and one of the pioneers of biotechnology. He was born in 1854 in Japan and received his Doctor of Pharmacology and Ph.D. in Engineering. He became very interested in Western concepts that would be useful to the Japanese but he also was interested in Japanese contributions to the West in science, industry and culture. In 1884 he married an American girl whose father helped him financially start the Takamine Ferment Company in Peoria in 1890. This company's business was to produce 'diastase,' a mixture of glucoamylase and α-amylase. This mixture of amylases was produced by the koji molds (*Aspergillus*

oryzae and *A. soyae*) and it was here in Peoria that fungal amylase was first introduced to the West. In the production of alcohol from grain it is necessary to break down the starch to sugar, which is then fermented to alcohol. Up to this time the starch conversion step of grain was brought about by the use of malt produced by the germination of grains.

"In the Takamine process the malt was replaced by fungal α-amylase and, therefore, was a process in direct competition with malt utilization. Apparently this new innovation was greeted with apprehension by the malt manufacturers. There was labor agitation and a propaganda campaign against Takamine. In 1894 the distillery where he worked was burned to the ground. Arson was suspected but never proven. The distillery which used fungal amylase was rebuilt, but the company dissolved the Takamine corporation and Takamine left Peoria in 1894. In 1894 Takamine obtained a U.S. patent on his enzyme diastase preparation called Taka-diastase.

"Later Takamine founded the Takamine Laboratories in the East [Clifton, New Jersey] and the Sankyo Pharmaceutical Company of Tokyo. He also isolated crystallized adrenaline at the same time that this was done by J. Abel at Johns Hopkins. Takamine obtained patents on adrenaline. He is also known for arranging for three thousand cherry trees for planting at the Tidal Basin in Washington. Recently a book on Dr. Takamine was prepared and printed by the Miles Company, which some years ago bought the Takamine Laboratories. The book contains his writings translated into English along side the original Japanese."

"The ARS Culture Collection is one of only two large culture collections in the USA, and its primary function is to find and maintain useful or potentially useful microbial and genetic taxonomic material. This collection dates back to 1904 when Charles Thom was hired by the USDA to investigate the mold cheeses. In making these studies, Thom secured several hundred strains of *Penicillium* and *Aspergillus* which became the nucleus of the ARS Culture Collection. At first Thom was at the Connecticut Agricultural Experiment Station, but in 1913 he moved to Washington, DC, taking his cultures with him. The oldest mold culture in the Collection is a strain of *Actinomucor elegans* isolated in 1892. Thom's collection had no formal recognition, and the story is told how Thom worked in the Laboratory on weekends to transfer his collection. In 1940 when the Fermentation Laboratory was established at NRRC, the Thom Collection was moved from Washington, DC, to Peoria and was formally recognized as one of the fermentation groups with Dr. K. Raper in charge. Dr. J. Wickerham joined the group to be curator of the Yeast Collection, and W.C. Haynes was selected to maintain a Bacterial Collection. Since then the number of curators has increased from 3 to 6. Some famous private collections were added in 1940, including the Harvard Collection which had strains isolated before 1900." Address: 5407 Isabell, Peoria, Illinois 61614.

500. Lahood, Gloria. 1992. Reference notes taken by Gloria Lahood in phone conversation with Dr. Jokichi Takamine, grandson of the internationally famous scientist, chemist, and inventor, Dr. Jokichi Takamine. Peoria, Illinois. 1 p. July 8. Unpublished manuscript.

• ***Summary:*** The young doctor, who lives in Los Angeles, California, is a doctor of internal medicine. He recently dedicated a bust of his grandfather [Dr. Jokichi Takamine] in a park in Japan. His office phone is 310-479-3709. His mother is Hilda Petrie and his father is Jokichi Takamine [Jr.]. All of his grandfather's papers were given to Joan Bennett, of Tulane University, who is writing a book about the famous doctor. His grandfather died of liver disease at Lenox Hill Hospital, New York [City], on 22 July 1922.

Note: As of Feb. 1995 there is a Lenox Hill Hospital in Manhattan, New York. Phone: 212-434-2000.

Location of document: Peoria Public Library, L. Sidney Eslinger Collection. Address: Peoria, Illinois.

501. Eslinger, L. Sidney. 1992. Scientist experiments on fermentation in Peoria: Whiskey era. *Observer* (*Peoria, Illinois*). Aug. 12. p. B-8.

• ***Summary:*** This article and biography of Jokichi Takamine was written for the Peoria Area Tricentennial 1691-1991. A black-and-white photo shows the large 3-story house at 2111 N. Jefferson where Dr. Takamine and his family lived in the early 1890s. Next to the house was a laboratory, where the doctor experimented with fermentation processes.

"Mrs. Takamine fit in well with the social leaders of Peoria. She joined the Peoria's Women's Club in 1892. In March 1893, Mrs. Takamine served on the education committee of this organization and gave a program on 'Life in Japan.'

"The original record book shows that she was a member until 1896 when she submitted her resignation."

After his liver operation in Chicago, Takamine decided to concentrate on the pharmaceutical aspect of diastase. His research eventually helped relieve stomach disorders due to starch consumption together with ptyalin deficiencies in the saliva.

502. Klein, Delores. 1993. We've come a long way, baby [About Jokichi Takamine]. *Observer* (*Peoria, Illinois*). March 24. p. A-6.

• ***Summary:*** Based on the autobiography of Agnes DeMille, *Where the Wings Grow,* this article describes how Dr. Takamine's mother-in-law, Mary Beatrice, played the leading role in helping him to establish America's first commercial enzyme manufacturing company in Peoria, Illinois. This American gentlewoman "put her life behind the young scientist becoming his business partner, his patron, his root in the New World." She sent him her savings and raised money from friends." It "was her idea to form a company for the manufacture of whatever Jokichi held patents for... a really daring and farsighted plan." She organized the company legally and soundly, sold stock to all the tradespeople she knew, and when driven to extremity, she sold her jewels. "One way or another Mary Beatrice formed the Takamine Ferment Company."

The young Takamine family, now with two tiny sons, moved to Peoria from Japan, to enter the brewing business. Living in an old carriage house, Takamine divided his time between whiskey research and experiments to find an elusive substance in the adrenal glands of sheep. Peoria's stockyards provided him with bloody basketsful, straight from the killing pens. He also worked to find a way that his enzyme could be used to cure dyspepsia. His wife, Caroline Hitch (Agnes DeMille's close relative), helped him interest the heads of Parke-Davis in investing in his research.

Now, as he neared the discovery of adrenaline, one of the breakthroughs of medical chemistry, according to DeMille, Takamine began to take control. Mary Beatrice "was ordered to step aside and resume the anonymity and powerlessness of womanhood." Assuring her that she would be paid back and looked after all her life, Jokichi said: "A company that was going to span Asia, Europe, and the United States could not be headed by a middle-aged woman... the matter was decided." DeMille wrote that Mary Beatrice's "heart broke right then." She died soon after. Ten days after her death, Takamine had secured the patent for adrenaline.

503. Iinuma, Nobuko. 1993. Chronological record of Dr. Jokichi Takamine. P.O. Box 577, Morris Plains, NJ 07905. 6 p. April. Unpublished manuscript.

• ***Summary:*** This very interesting and original chronology is laid out with 5 vertical columns: (1) Year. (2) Takamine's age. (3) Family & academic career. (4) Official activity. (5) Academic achievements. Much of this information is not in Kawakami's 1928 biography of Takamine. Here are some selected entries:

1854 (age 1)–Born on September 13, in lunar calendar (November 3, Gregorian calendar) in Takaoka, as the first son of Seiichi Takamine, father, and Yukiko, mother.

1855 (age 2)–With mother, moved to Kanazawa where father Seiichi resided.

1862 (age 9)–Entered Meirindo School of the Kaga Domain. Also started receiving calligraphy lessons from Shundai Nakamura.

1865 (age 12)–Sent by the Kaga Domain to Nagasaki for foreign study [to study English]. Lodged in Portuguese Consul Lorero's residence.

1866 (age 13)–Admitted to Missionary Fulbechy's English School in Nagasaki.

1868 (age 15)–In Kyoto, studied military science at Yukinosuke Ando's private school. Also, in Osaka, entered Ogata private school.

1869 (age 16)–In Osaka, changed school to Osaka Medical School. Also received analytical chemistry lessons under Prof. Litter of Osaka Chemistry School. Also learned English from Prof. Osborne at Nanao Language Institute, under the Kaga Domain scholarship.

1872 (age 19)–In autumn, moved to Tokyo and was selected as a government paid scholarship student to study at Kobu Technical School of Industrial Ministry.

1873 (age 20)–Entered the Kobu Technical School (which was later renamed Kobu Technical College, and again renamed Kobu Academy).

1877 (age 24)–Appointed as an editor of the monthly *Industrial Journal* and engaged in translation of articles from Western publications about industry and technology.

1879 (age 26)–Graduated first in his class from the Kobu Academy after 6 years of study there, under government scholarship, majoring in applied chemistry. His graduation thesis was titled "Studies on Petroleum."

1880 (age 27)–Ordered by the Industrial Ministry to go to study in Britain for 3 years. Admitted to Glasgow University [Scotland] and Anderson University, where he mastered industrial chemistry and applied electro-chemistry. He visited various chemical plants in Liverpool and Manchester [England], and studied actual manufacturing processes for soda products and chemical fertilizers...

1887 (age 34)–Married Miss Caroline Hitch in the USA. While holding a Japanese government post, visited and the USA to purchase plant equipment and facilities for the Tokyo Chemical Fertilizer Company.

1888 (age 35)–First son, Jokichi, was born. Established Takamine Pharmaceutical Laboratory to run Tokyo Chemical Fertilizer Company. Produced fireproof paint by regeneration of cobalt. Conducted research on brewing of saké (rice wine).

1890 (age 37)–Second son, Eben, was born. Jokichi developed liver disease on the way to the USA. He visited the USA on invitation from the Chicago Whiskey Trust. He was issued a patent on koji.

1891 (age 38)–First experiment at Chicago Phoenix Brewery was conducted successfully.

1892 (age 39)–Founded the Takamine Ferment Company in Chicago. At Peoria, Illinois, he experimented with Takamine method brewery, researched production process of raw malt and diastase, and secured a dozen or so patents.

1893 (age 40)–Liver disease re-occurred and he hovered between life and death. Henrotin was his physician. Success of Takamine malt [koji] production method raised antagonism from malt manufacturers, and as a result the Takamine malt plant was burned down.

1894 (age 41)–His mother Yukio passed away (April 29). Obtained qualifications for American Patent Attorney. Taka-Diastase won a patent. Succeeded in development of powerful digestive enzyme and named it "Taka-Diastase..."

1900 (age 47)–Father Seiichi passed away (Aug. 22)...

1906 (age 53)–Returned to Japan. Received doctorate in pharmacy...

1908 (age 55)–Returned to Japan...

1912 (age 59)–Completed construction of his principal residence, a 5-story Japanese renaissance-style palatial structure. It became an important place for the civilian level Japan-USA goodwill and diplomatic social exchanges. It was called No. 336 Mansion, [334] Riverside Drive. It received an award from the Imperial Academy. Thru his efforts 2,100 cherry trees were presented to New York City. They were planted at Cremont and Central Parks, which are now called "Sakura Parks."

1913 (age 60)–Returned to Japan. Elected as member of the Imperial Academy. Elected president of Sankyo Co. Ltd. Presented a statement on the views of Japan-USA goodwill promotion. Launched a movement for the foundation of a National Science Institute.

1915 (age 62)–Decorated with the Fourth Class Order of Merit with the Medal of Rising Sun.

1917 (age 64)–With the foundation of the Institute of Physical and Chemical Research, he is elected to the board of directors. He established the Takamine Chemical Laboratory in Clifton, New Jersey.

1919 (age 66)–Returned to Japan. On return to the USA, he suffered from heart disease and noticed that his health was ruined.

1920 (age 67)–As the heart disease grew worse, he took rest at Passaic, New Jersey.

1921 (age 68)–Despite ill health, he worked hard to assist and entertain in the USA the visiting trade mission of Viscount Shibusawa, and also the Japanese government delegation to the Washington Peace Conference [in DC].

1922 (age 69)–Died at Lenox Hill Hospital on July 22. On July 25 his funeral service was held at St. Patrick's Cathedral [New York City], and he was buried in Woodlawn Cemetery. Specially promoted to the Senior Grade of the Fourth Court Rank, and was decorated with the Third Class Order of the Sacred Treasure. On Sept. 26 his hair and picture were buried at Aoyama Cemetery in Tokyo. On Nov. 10 a grand scale memorial service was held in Japan with his visiting widow, Caroline, and second son, Eben, in attendance.

Location of document: Bradley University, Special Collections. Address: Morris Plains, New Jersey.

504. Henry, Bonnie. 1993. Cemetery, chapel in Vail provide community lore. *Arizona Daily Star.* Oct. 31.

• ***Summary:*** The Rev. Don Verhagen is pastor at the chapel. Twenty mounds or so are visible rising above the desert floor. A few old wooden crosses used to mark several of the anonymous graves. Fresh crosses have recently been put on each grave.

"Charles P. Beach, a pioneer rancher and mining man who owned one of Vail's largest cattle ranches and his wife, Caroline, financed the building of the chapel back in the mid-'30s." It was constructed in classic mission style.

"For years it served as a missionary church, with visiting priests from other parishes conducting Mass. That all changed in 1968, when the chapel was designated a parish church for the people of Vail and surrounding settlements.

"Over the years, the church, like all churches, has seen its share of weddings, baptisms, and funerals. In late November 1954 a funeral Mass was held at the little chapel for Caroline Takamine Beach. But she was buried not in her beloved church, but in the [Takamine] family mausoleum in New York."

Rev. Verhagen says a simple Mass twice each year at the nearby cemetery.

Photos show: (1) A lonely cross that marks an anonymous grave. (2) Rev. Don Verhagen, the pastor.

505. Inuma, Nobuko. 1993. Takamine Jôkichi to sono tsuma [Jokichi Takamine and his wife]. Tokyo: Shinjin Butsu Orai-sha. 210 p. Illust. No index. 19 cm. [Jap]

• ***Summary:*** An excellent Japanese-language biography of both Jokichi Takamine and his wife, Caroline Hitch. Filled with original information, photographs, and insights. Plus the best genealogy seen to date of the two central characters (p. 60-61).

Talk with Nobuko Inuma. 1995. Jan. 11. Her book was published in Nov. 1993. It focuses on the personal lives of Dr. Takamine and his American wife–not on his professional life. Japanese TV (Midori Kyuichi / Mizuno) came to America and spent about 10 days with her filming a video documentary on Takamine, which will be broadcast as a 1-hour program on 16 Jan. 1995 in Japan by Asahi TV. She has quite a few English-language documents about Dr.

Takamine's personal life. She also has tapes of a number of interviews. The best one of these was with Agnes de Mille, the famous American dancer and choreographer, done in New York shortly before she died. Nobuko was not able to get any good information about Dr. Takamine from his living descendants (he has grandchildren and great grandchildren in Arizona) because they are either unwilling to talk about him or they don't know much about him. This is apparently because his eldest child, Jo, died mysteriously in 1929 [sic, 1930]. Nobuko thinks it may have been either a suicide or a mafia-related killing. Agnes de Mille knew a great deal about this death and about Dr. and Mrs. Takamine, and she told the whole story to Nobuko.

Nobuko's books focus on Japanese men who came to America, marry an American woman, then become famous and make a major contribution. Her first book was about Dr. Noguchi, a pathologist who arrived in America in Dec. 1919, worked at the Rockefeller Institute, and made important discoveries concerning yellow fever. She is now researching and writing a book about Dr. Matsudaira, an engineer and the son of a samurai.

On pages 60-61 of this book is the best published genealogy of the Takamine family (the family in which Jokichi was a child) seen to date. Jokichi, born on 3 November 1854 was the eldest child and the eldest son. He was one of 12 children–5 boys and 7 girls. The other boys were: Taiji [?] born 1864. Eizaburô born 1865. Saburô born 1866. Kyôjirô born 1873 Dec. 7. The girls were: Setsuko born 1857; now resides in south of France, Mrs. Hyôkichi Minami. They have two children: (1) Toyoko Nagashima; (2) Sôgen [?] Nagashima. Sadoko born 1860. Junko born 1861, died 1953 (age 94). Married Tadahiro TAKEHASHI to become Mrs. Naofumi Takehashi. Lives in Chicago. Tokuko born 1868; married to become Mrs. Hisaharu Nô [?]. Tomiko born 1869. Seiko born 1870. Married to become Mrs. Kichiemon TAJIMA. They had a son, Kazuo Hasegawa. Itoko born 1871. The full names of both of Jokichi Takamine's parents, and of his four grandparents, are given.

Dr. Takamine's father, Seiichi Takamine, was born in 1827 in Takaoka, Japan. His father, Yukiko Tsuda, was born in 1834 in Takaoka, Japan. Dr. Takamine's paternal grandfather was Gendai Takamine, and his paternal grandmother was Tokiko Koan. Dr. Takamine's maternal grandfather was Kimiji Tsuda, and his paternal grandmother is unknown.

This book contains many interesting photographs, including portrait photos of Dr. Takamine and his wife, and of the author (inside front dust jacket): On the dust jacket cover are oval portrait photos of Dr. Takamine and Caroline Hitch Takamine, his wife. Inside: (1) Agnes de Mille telling her memories, p. 10. (2) Jane, Caroline, Marie, and Beatrice George, p. 13. (3) Agnes de Mille in her younger days. (Right, in London), p. 14. (4) Bust of Dr. Jokichi Takamine at his birth place (Toyama-ken, Takaoka-shi, Japan), p. 18.

(5) Old estate / house of Takamine family in Kanazawa city, Japan, p. 20. (6) Jokichi and his father Seiichi before he went to Nagasaki to study, p. 26. (7) Bronze Statue of Andrew Jackson in the square of French Quarter in New Orleans, p. 33. (8) Old house in New Orleans. (1880), p. 34. (9) The house where Lafcadio Hearn resided, p. 36.

(10) Workers / members of the Patent Bureau of Japan (*Senbai tokkyo-kyoku;* 2nd row 5th from left is Takahashi Tadakiyo (?), 3rd row 4th from left is Takamine Jôkichi), p. 41. (11) List of the names of members of the Patent Bureau of Japan (*Kanin-roku*) published in July, 1886, p. 42. (12) Esplanade Avenue [New Orleans] where Caroline grew up, p. 46. (13) Mr. & Mrs. Ebenezer Hitch right after the American Civil War, p. 47. (14) Jôkichi and Caroline's marriage certificate (marriage registration paper), p. 51.

(15) Caroline, p. 52. (16) Caroline's father Ebenezer (circa 1904) and her mother Marie (circa 1889), p. 57. (17) Takamine and Hitch family trees and genealogy (p. 60-61). (18) Eldest son Jôkichi, Jr., Jôkichi (left), and the second son Eben Takashi (right) with their father (1891), p. 63. (19) The birth certificate of Jokichi, Jr., p. 64.

(20) Caroline in Japanese kimono, p. 65. (21) Jokichi and Caroline with both sons in Fukagawa, Tokyo (1980), p. 67. (22) The Takamine's house in Peoria, Illinois, p. 73. (23) Grave of Tetsukichi Shimizu, p. 76. (24) Train track that ran near the backyard of Takamine home, p. 81.

(25) The remains of Woolner Distillery in Peoria, p. 84. (26) Paper on diastase, p. 92. (27) Paper on Adrenaline, p. 100. (28) Keizo Uenaka (Wooyenaka) at age 11 (second from right, 1887), p. 104. (29) Newly married Mr. & Mrs. Keizô Yaeno (1905), p. 105.

(30) New York Takamine Institute. There was a cherry tree on the left corner, p. 106. (31) Keizo Uenaka visiting Parke, Davis & Co. (1905), p. 108. (32) Keizo Uenaka's daily research journal. p. 110. (33) Keizo Uenaka's daily research journal, p. 111. (34) No caption is provided here. But the top of chart reads (left to right) in romaji (*Kyôshiryô–Jûbun Ittei kisan–shôsan no, kyôshihin 100 ni taishi shoyôryo*), p. 115.

(35) At Japan Club. Kaminaka 5th from right in back row, and Hideyo Noguchi far left in front row. (circa 1905), p. 119. (36) Document requesting the academic degree, p. 120. (37) Friendship party at home of Takamine. The person hiding his face with a fan is Jo and the guy sticking out his tongue is Eben, p. 126. (38) Cherry blossoms in New York (circa 1940), p. 127. (39) Overview of Japanese building at St. Louis Exposition (1904), p. 133.

(40) Fûshin-zu (illustration of the Wind God, by Katsuji Makino) at Takamine's villa (*bessô*) Sho-Foo-Den (*Shôfû-den*). The art was painted in the same method used in the main home at 334 Riverside Drive, p. 138. (41) Caroline (right) and her younger sister, Marie, kneeling at the Takamine's main home on Riverside Drive, New York City, p. 139. (42) Exterior of their main home on Riverside

Dr., p. 140. (43) Interior of the main house, p. 141. (44) Jo Takamine, age 24, p. 142.

(45) Sho Foo Den (one part), p. 149. (46) Framed writing (characters) at Sho Foo Den by Keisuke Ootori, p. 152. (47) Interior of Sho Foo Den, p. 153. (48) Unban (given) from people of Takaoka, p. 154. (49) On the boat during their trip to Europe (1912), p. 158.

(50) Reception of Washington Peace Conference (1912), p. 160. (51) A handwritten letter to Jun Takehashi, p. 161. (52) Takamine Family grave in Woodlawn Cemetery, Bronx, New York City, p. 166. (53) Dr. Takamine's last recuperation at Sho Foo Den (spring 1922), p. 167. (54) Jo, Jr. who died a mysterious death (at age 40), p. 171.

(55) Jo's children Jokichi Takamine III and Katharine [sic, Carolyn] Yuki Takamine, p. 176. (56) Sho Foo Den, p. 179. (57) Dr. Takamine in the hospital with Hilda (left) and Caroline. p. 184. (58) Caroline's second husband, Charles Beach, p. 189. (59) Caroline (age 59) in her horse riding clothes at her ranch in Vail, Arizona, p. 191.

(60) The Deer Park in Nara, Japan (1933). Left Caroline, Right Eben, Charles Beach 2nd from right, p. 192. (61) Santa Rita chapel which was donated by Caroline, p. 193. (62) Newspaper article telling of Eben's naturalization (1953), p. 198. (63) Eben Takamine's old home in Ridgewood, p. 199. (64) The place where Takamine's Institute once stood now belongs to Miles Co. (in Clifton, New Jersey), p. 200. Address: 7352 Cirrus Way, West Hills, California 91307. Phone: 818-887-2209.

506. Inuma, Nobuko. 1993. Takamine Jôkichi to sono tsuma [Jokichi Takamine and his wife (Continued–Document part II)]. Tokyo: Shinjin Butsu Orai-sha. 210 p. Illust. No index. 19 cm. [Jap]

• ***Summary:*** Continued. The descendants of Jokichi Takamine and Caroline Field Hitch. First generation, two boys: (1) Jokichi Takamine, Jr. Born 28 Aug. 1890 [sic, 28 Aug. 1888 in Tokyo, Japan]. Yale University graduate. Head of Takamine Research Institute, and President of various Takamine companies. Died Feb. 1930 [22 Feb. 1930] in accidental (dark and mysterious) death. He married Hilda I. Peter [Petrie], born 3 Nov. 1899. She later remarried to E. Thomas, and they had a son, E. Thomas II.

(2) Eben Takashi Takamine. Born 30 Sept. 1889 [sic, 31 Aug. 1889 in Tokyo]. Yale University graduate, Head of Takamine Research Institute, and President of various Takamine companies. Died suddenly on 27 Aug. 1953 [sic, 28 Aug. 1953 in Passaic, New Jersey]. Eben had many wives and no children. He married: (1) Ethel Johnson. (3) Catherine McMahon, who was born on 2 Sept. 1892. She attended the 100th anniversary [of Dr. Takamine's birthday in Kanazawa, in Japan].

Second generation: Jokichi Takamine. Jr. and Hilda Petrie had two children: (1) Hilda Katharine [sic, Carolyn] Yuki Takamine, born 20 May 1923. She married Theodore W. Kramer, who now [1993] lives in Arizona. They had one child, John Kramer (3rd generation). (2) Jokichi III, no birth year listed. Medical doctor in Los Angeles. In Shôwa 33 (1958) he attended Dr. Jôkichi Takamine's statue unveiling ceremony (*Jomakushiki*) in Kanazawa. In Shôwa 59 (1984, at age 60) September 17 he again visited Kanazawa [to attend the centennial of Dr. Takamine's birth].

Third generation: John Kramer (of Arizona) married Diana (no surname given). Diana (separately) had a child named Stuart A. Foster. Neither his birth date nor the name of his father is given. John Kramer and Diana had two children: (1) Robert J. Kramer. (2) James M. Kramer (Arizona). The birth dates and places of these two children are not given. Address: 7352 Cirrus Way, West Hills, California 91307. Phone: 818-887-2209.

507. Jokichi Takamine, chemist [brief chronology]. 1993? Peoria, Illinois. 1 p. Undated. Unpublished manuscript.

• ***Summary:*** "In 1890 he was in Chicago, employed by the Whisky Trust (Distillers' and Cattle Feeders' Trust) applying some of his research experiments with Sake to manufacture of whiskey. Results showed promise and in 1891 he was transferred to Peoria, the home office of the trust.

"Takamine's process substituted less expensive wheat bran for the normally used barley malt. Production work was carried out at the Manhattan and Woolner Brothers distilleries located along the south side riverfront.

"His Peoria home was in the 2100 block of N. Jefferson with the house next door being used as his private laboratory and the location of the Takamine Ferment Company. Both houses still stand and are located just north of the Peoria Mass Transit garages.

"In 1896 Takamine moved to New York. It had been discovered that Taka-Diastase" could also be used as a remedy for dyspepsia. It was later manufactured by Parke, Davis & Company of Detroit.

"In 1901 he announced his discovery of adrenalin, the first home to be isolated. Adrenalin, manufactured from" the adrenal glands of cattle, "was used by surgeons to stop surgical bleeding."

"In 1914 he formed the Takamine Laboratory, Inc. at Clifton, New Jersey which he operated until his death.

"Takamine died in New York City on July 22, 1922." Address: Peoria, Illinois.

508. Aso, Yoichiro. 1994. Reflected in Japan-U.S. relations. *Yomiuri Shinbun* (*American ed.*). March 25.

• ***Summary:*** "In the 1994 New Year's edition of The Yomiuri America, we featured an article on the life and achievements of the Japanese chemist Jokichi Takamine, also founder of The Nippon Club and the Japan Society, which received an overwhelming response from our readers in the U.S. and Japan. The January 11th issue of the daily Yomiuri Shimbun Satellite Edition, published by our parent company in Japan,

also introduced this feature article to its readers in Japan and overseas, stirring interest among various Japanese organizations and Japanese living in the U.S. This show of interest resulted in plans for the upcoming event, 'The Life of Jokichi Takamine: One Great Step for Japan-U.S. Relations,' which will be held at the Nippon Club Gallery from March 25th through April 8th, 1994.

"The Nippon Club, the sponsor of this event, will celebrate the 90th anniversary of its establishment next year. Many cultural exchanges and events still take place today at the Club, as it honors the late Dr. Takamine's goal to improve the lives of Japanese residents in the U.S. as well as Japan-U.S. relations. Recent news reports that trade-related friction still exists between our two countries. Therefore we find it crucial to shed light on the forgotten Takamine history in order to re-evaluate the Japan-U.S. relationship.

"The three generations of Takamines who have lived through a century of American history reflect the pre-war, war-time, and post-war Japan-U.S. relationship. We have compiled a special issue of our New Year's edition for this Nippon Club event. In order to inform the American public of the Takamine history as well as the tumultuous century of Japan-U.S. relations, we have included an English translation of this special compilation. The Takamine exhibition is also scheduled to be on display in Los Angeles after its New York showing." Address: President / Editor-in-Chief, Yomiuri America, Inc.

509. Miura, Ryoichi. 1994. Kyoto's Imperial Palace hidden in the woods of New York: Relocating the Japanese pavilion of the 1904 World's Fair. A time trip to the 1920s. *Yomiuri Shinbun* (*American ed.*). March 25.

• ***Summary:*** "His childhood of over 60 years ago reappeared before his very own eyes–Jokichi Takamine III rushed through the corridors and stopped in front of the main shrine to look upon the gently undulating Japanese garden. The large stone lantern, the little stream, the narrow trail leading to the lake, the boat house, the beautiful lake–it was all just as it was when he had lived there until the age of five. Now almost 70, Jokichi Takamine III, grandson of the famous Jokichi Takamine, gazed upon the landscape as if to follow a vision of himself as a child..." *Sho-Fu-Den* was beautifully lit to welcome him back.

Jokichi III is 5 feet 11 inches tall; with blond hair and blue eyes he looks unmistakably anglo-saxon. He was born on 6 Feb. 1924 (two years after his famous grandfather passed away) in Passaic County, New Jersey. He was the first son [but second child] of Dr. Takamine's first son.

"Of the 2,000 acres originally owned by Dr. Takamine, only 100 now remain as the land for *Sho-Fu-Den.* When the Japanese gave *Ho-O-Den* (the main Japanese pavilion at the 1904 World's Fair) to Dr. Takamine he invited a team of 30 carpenters from Merriewold to St. Louis to study the disassembly of the structure and then to ship it to Merriewold via railroad in order to reconstruct it."

"After moving *Ho-O-Den* to Merriewold and renaming it *Sho-Fu-Den,* a 25-acre Japanese garden was mapped out... The Takamine family spent winters at their home on Riverside Drive in Manhattan, but as soon as the snow melted and spring came they would all move to this home in the Merriewold woods.

Jokichi III was only 5 years old at the time so he can't remember much. But he clearly remembers his visits when he came as a teenager. "'I also remember being afraid of my grandmother who was a very strict person.' Saying this he stopped to look at the life-size portraits of his grandfather and grandmother in the hallway of the main entrance."

Jokichi Takamine was born on 3 Nov. 1854 as the first son of Seiichi Takamine, a doctor of the Kaga domain [Kaga-han] which ruled the present Toyama and Ishikawa prefectures. [Note: Kanazawa castle was the seat of the Kaga domain]. A biography of Dr. Takamine follows, continuing onto the next page, which also contains a detailed chronology of Dr. Takamine.

"Past hidden from Jokichi III: After his father's death, Jokichi III and his sister were brought up by their mother Hilda, but she soon remarried and left the children to live" elsewhere. "'My grandmother never told me about my grandmother either, nor how successful and famous he was. It was as if I had been totally denied of my roots. I actually learned about my grandfather's achievements through my colleagues and patients at medical school rather than from my own family.'"

510. Miura, Ryoichi. 1994. The mysterious death of Jokichi Jr. *Yomiuri Shinbun* (*American ed.*). March 25.

• ***Summary:*** Tells the whitewashed version of the story. When Dr. Takamine died in 1922 at age 68 at Lenox General Hospital in New York, his eldest son, Jokichi Jr., became his successor as executive director of the Takamine Laboratory. He was 34 years old. Two years later, his son Jokichi III was born.

When Jokichi III was age 6, his father Joe died at the young age of 42 by falling out of a window at the Roosevelt Hotel in Manhattan, New York City. [Note: The detailed story of this death is told in *The New York Times* on 23 Feb. 1930. The investigation concluded that it was an accident]. "Joe's mother Caroline, however, was convinced it was foul play until the day she died. These were times of prohibition and rumor had it that the Mafia was pressuring Joe for the patent rights to the Takamine distillery methods for whisky production.

"Even though he seemed to live in the fast lane and was perceived as having a carefree attitude, Joe never succumbed to the threats of the Mafia. Some believe this prodigal son refused the hands of evil to defend his family honor, even though it may have eventually cost him his life."

"After Jokichi Jr.'s death, ownership of the Takamine

laboratory went to his younger brother Ebenezer. The weight of this responsibility was especially had for Ebenezer who had just lost his beloved brother. His mother Caroline remarried and these sudden changes hit him hard since he was not used to dealing with anything other than comfort.

"To make matters worse, Ebenezer's wife Ethel began to show he true self after her father-in-law's death, and left Ebenezer with all the Takamine valuables she could carry including a mural she actually cut from the wall with a knife. till Ebenezer continued to have a lingering affection for Ethel."

After World War II Japanese Americans were finally allowed to apply for citizenship, and on 16 Feb. 1953 Ebenezer Takamine became a U.S. citizen. Unfortunately he was a citizen for only 6 months, since he died in August of that year–at age 63.

511. Miura, Ryoichi. 1994. The history of Jokichi Takamine. *Yomiuri Shinbun* (*American ed.*). March 25.
• ***Summary:*** "1854–Born November 3rd to Seiichi Takamine, doctor of the Kaga Domain, in Takaoka City of the Toyama Prefecture. Oldest of 6 brothers and 7 sisters.

"Early childhood–Studies at the Merindo School of the Kaga Domain.

"1865–The Domain selects Takamine to study English in Nagasaki. Later studies medicine in Kyoto and Osaka.

"1870–Studies applied chemistry under H. Ritte at Osaka.

"1872–Enters Kobu-Daigaku (today's Kyoto University).

"1879–Graduates from the first graduating class of Kobu University and becomes one of the first Japanese university graduates. Selected by the Ministry of Engineering as a full-scholarship student to study abroad in Great Britain.

"1883–Returns to Japan and joins the Ministry of Agriculture and Commerce. He oversees the improvement of *washi* (Japanese rice paper) production and sake (Japanese rice wine) production.

"1884–Visits the U.S. as a representative to the New Orleans World's Fair and Cotton Centennial. Intrigued by phosphatic fertilizer on display and brings back a sample of superphosphate of lime for his research in Japan. He meets Caroline Hitch.

"1885–Becomes temporary Chief of the Patent Office for one year.

"1887–Establishes an artificial fertilizer company with Eiichi Shibusawa and Kiyonari Yoshida; he becomes technical director of the company. He goes to the U.S. to marry Caroline Hitch.

"1888–Returns to Tokyo. Gives birth to first son, Jokichi, Jr.

"1890–Receives patent right for his distillation method. Invited by Whisky Trust of Chicago and moves family to U.S.

"1893–Takamine's Chicago factory mysteriously set on fire. Recurring liver ailment.

"1894–Produces Taka-Diastase. Receives patent right and sells powerful digestive drug through Parke, Davis, a pharmaceutical company.

"1896–Moves to New York.

"1899–Receives doctorate in chemical engineering. Taka-Diastase distributed in Japan.

"1900–On July 21st successfully isolates hormones in crystalline form from bovine adrenal glands. Names this 'Adrenaline.'

"1904–World's Fair held in St. Louis, Missouri. Receives Japanese main pavilion from the Japanese government and relocates it to New York.

"1905–Founded the Nippon Club in New York City.

"1906–Receives a doctorate in medicine.

"1907–Founded the Japan Society. Prince and princess Kuni of the Japanese Imperial family visit *Sho-Fu-Den* during their stay in the U.S.

"1913–Awarded the Imperial Academy Prize for his discovery of Adrenaline.

"1917–Founded a semi-public chemical laboratory in Japan.

"1922–Dies July 22nd at the age of 68."

512. *Yomiuri Shinbun* (*American ed.*). 1994. The lost 90 years of Sho-Fu-Den: After 43 years, Jokichi Takamine III finally returns home. March 25.
• ***Summary:*** Exactly 100 years ago, Dr. Jokichi Takamine succeeded in preparing the digestive enzyme, Taka-Diastase. Six years later, in 1900, he was also successful in isolating adrenaline, which greatly reduced the mortality rate of patients in surgical operations. These two great achievements, each worthy of a Nobel Prize, brought Dr. Takamine wealth and international acclaim. "During his lifetime he also left us with two cultural legacies of great importance which reflected his hopes for a lasting Japan-U.S. friendship, as well as his concern for those living in the U.S. These legacies are the establishment of The Nippon Club and Japan Society in New York City, and the preservation of the magnificent of the magnificent palace in New York, *Sho-Fu-Den.*

"In the midst of the Russo-Japanese War in 1904, Dr. Takamine suggested that Japan enter the World's Fair to be held in St. Louis, Missouri, in hopes of winning support from the U.S. and Great Britain. After the World's Fair, he was awarded Japan's main pavilion, *Ho-O-Den* and transferred it to Merriewold in Sullivan County, New York. There it was renamed *Sho-Fu-Den* by Ototi Keisuke, Privy Councilor of the Meiji Era." It "became the site of intellectual and cultural exchange between Japanese and American politicians and intellectuals. These glory days. however, have vanished during the past 90 years. After Dr. Takamine's death, the Takamine family was torn asunder."

"Although forgotten by the Japanese government as well as Japanese residing in the U.S., *Sho-Fu-Den* has been preserved and maintained by Americans until eight years ago [i.e., about 1986] when a casual incident brought it back into the hands of Japanese ownership. Furthermore, it is known that the grandson of Dr. Takamine, Jokichi Takamine III, was alive and well and working as a clinician in Los Angeles, California. Yomiuri America invited Dr. Takamine III to *Sho-Fu-Den*, where he had spent his early childhood years. Today, there is a movement to restore *Sho-Fu-Den* among businessmen, diplomats, and experts in other fields to make it a symbol of Japan-U.S. friendship in the 21st century. The rally around the 'last Dr. Takamine' is bringing back attention to the relative obscurity of 90 years in the Takamine family spanning 3 generations, as *Sho-Fu-Den* quietly awakens to a new era in the deep woods on the outskirts of New York."

A photo shows the 2-3 Japanese standing in front of *Sho-Fu-Den.*

513. *Yomiuri Shinbun* (*American ed.*). 1994. The Russo-Japanese War and the St. Louis World's Fair. March 25.
• ***Summary:*** Note: The St. Louis World's Fair, officially known as the Louisiana Purchase Exposition, was held in St. Louis, Missouri (from 30 April 1904 to 1 Dec. 1904) to celebrate the centennial of the 1803 Louisiana Purchase. Exhibits were staged by 62 foreign nations.

Due to the efforts of Jokichi Takamine, Japan also participated in this event. He explained to the Japanese government that such an event "provided the ideal chance to expand the recognition and influence of Japan as a nation. This was especially important since Japan had gone to war with Russia in early 1904" and needed to raise huge amounts of money from the U.S and Great Britain to help fund the war.

The beautiful Japanese pavilion has restaurants and theaters in a Japanese garden by a meandering pond. The main feature of the pavilion was "*Ho-O-Den*, a magnificent palace modeled after homes of the Japanese nobility," as well as a tea ceremony room and a five-story pagoda. "Stone lanterns illuminated the garden and structures in the evening to create a wonderful world of fantasy. During the day the promenade was filled with street performers and rickshaw [Jap. *jinrikisha*] carriers carrying well-dressed aristocrats in their carts." More than 300 "Japanese government officials, businessmen, and artists crossed the ocean to be part of this grand event."

When the spectacle was over, the Japanese government was asked if they wanted to keep *Ho-O-Den* in the U.S. or to take it back to Japan. "Dr Takamine, without hesitation, requested to relocate *Ho-O-Den* to another location in the U.S. to help strengthen the Japan-U.S. friendship. He was awarded the palace for bringing the government success at the World's Fair, and it became Takamine's second home. This is what stands today as *Sho-Fu-Den* in the woods of Sullivan County, New York."

A portrait photo above the article shows Dr. Takamine.

514. Okamura, Yuki. 1994. Shô-Fu-Den: Jokichi Takamine–Pioneer of cultural relations between the United States and Japan. New York, NY: Fashion Institute of Technology. 19 p. March.
• ***Summary:*** "This catalogue was printed in conjunction with the Exhibition held at the Nippon Club, New York City, March 25 to April 8, 1994... Shô-Fu-Den is owned and operated by The Japanese Heritage Foundation, 401 Fifth Ave., New York, NY 10016. Telephone (212) 213-0640, Fax (212) 213-0627.

Note: Only the odd-numbered pages (1, 3, 5, 7, etc.) are numbered.

"Preface: The purpose of this exhibition is to draw attention to the restoration of Shô-Fu-Den and the memory of its original owner, Dr. Jokichi Takamine. Shô-Fu-Den stands as a noble testament of centuries of friendship between East and West."

Sam (Yoshitaka) Ikeda is Chief Executive Officer, Japanese Heritage Foundation, Inc.

Page 3. "Shô-Fu-Den. In re-erecting the structures [from the St. Louis Fair], the architects joined three buildings with galleries. The central building, modeled on Shi-Shin-Den in the Imperial Palace in Kyoto, includes the living-hall, dining-hall, parlor, service wing and bedrooms. One adjacent building is in fact a separate house which is modeled on Sei-Rio-Den in Kyoto. The remaining building is a smaller structure for use as a reception hall...

"The walls and ceilings in the main rooms of the central building are covered with gold-leaf murals executed in oil by K. Makino, a well-known Japanese artist of the period. All the Japanese furnishings, lighting fixtures, bronzes, carvings, paintings and art objects in the buildings were selected for their beauty and antiquity by Dr. Takamine.

"At least ten acres of the estate are laid out in Japanese landscaped gardens. There are many different varieties of Japanese maples, as well as native plants and shrubs. Rhododendron are also used extensively. The beauty of the landscape is enhanced by a series of spring-fed lakes and pools. Throughout the gardens are many antique granite lanterns and other stone carvings–said to be the largest and best single collection in the country."

Page 5. There follows a long translation of an article which appeared in the January 1, 1994, edition of the *Yomiuri America.* The original article is by Ryoichi Miura; it was translated by Koichiro Shinohara. The photographs are by Satoru Ishikawa, All copyrights reserved. Yomiuri America, Inc.

Jokichi III was born on 6 Feb. 1924. He spent most of the first 5 years of his life in the palace at Merriewold. After the death of his father (Jokichi, Jr.) he and his [elder]

sister, Catherine-Yuki [Katherine Yuki] were brought by their mother, Hilda, but she soon remarried and left the children, to live in Florida. Jokichi III was now 6 years old with no parents and no family inheritance. So he moved to Arizona with his sister to spend his young adulthood with his grandmother, Caroline. She never told him about his grandfather, Jokichi, nor how successful and famous he was. While a junior in high school he decided to become a physician. When he completed his studies at NTU Medical School, he received no praise or support from his family. He never saw a penny of the Takamine inheritance. Address: Student in the Restoration Department, Fashion Institute of Technology, 227 West 27th St., New York, NY 10001-5992.

515. Certificate of marriage: Charles P. Beach and Caroline Takamine. 1994. Arizona. 1 p. Aug. 16.
• ***Summary:*** "St. Augustine's Cathedral. Tucson, Arizona 85701. This to certify that Charles P. Beach and Caroline Takamine were lawfully married on the 16th day of August 1926 according to the Rite of the Roman Catholic Church and in conformity with the laws of the State of Arizona. Rev. Peter Timmermans officiating, in the presence of witnesses Arturo Carrillo, Phoenix Braun as appears from the Marriage Register of this Church.

"Dated Nov. 7, 1994, Pastor Msgr. A.S. Carrillo."

Certificate courtesy of Vail Preservation Society, Vail, Arizona.

516. Morano, Jim. 1994. What ever happened to Jokichi Takamine? His company was purchased by Miles Laboratories (Interview). *SoyaScan Notes.* Nov. 12. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** A brief background: Takamine (pronounced tak-ah-MEE-nay), who was born in Japan on 3 Nov. 1854, was the first commercial manufacturer of purified enzymes in the USA. He introduced the koji process to America, where he arrived in 1890. In 1891, he made an arrangement with the Distilling and Cattle Feeding Co., of Peoria, Illinois, and carried out on a practical scale the application of the koji process using *Aspergillus oryzae* to the American Distillery. His experiments, which ran for a couple of months on a 2,000 bushel scale, were partially successful, "but unfortunately the process did not attain general recognition of its merit..." In 1894, while living in Chicago and Peoria, Illinois, he was issued four U.S. patents on his process. He started a company in America making diastatic enzymes under the name Taka-Diastase, mostly for use as a digestive aid. By 1913 he was living in New York City. In 1914 he wrote a history of his work to date In the *Journal of Industrial and Engineering Chemistry* (Oct. p. 824-28). Takamine also gained worldwide fame through his later discovery of the adrenal hormone, adrenaline (See Miall 1975; "Historical development of the fungal fermentation industry).

Miles Laboratories purchased Takamine's company in 1956. At one time Miles had a food industrial enzyme group and a pharmaceutical & analytical industrial enzyme group. One of Miles' enzymes, named Taka-Therm, is an alpha-amylase that is stable at very high temperatures. Many of their enzyme names start with "Taka-." This seems to show that extracts of *Aspergillus oryzae* are in the public domain. About 6-7 years ago Solvay Enzymes (now in Elkhart, Indiana) purchased the Miles Enzymes division of Miles Laboratories. Miles is now owned by Mobay and Bayer, two gigantic German companies. Jim recently visited Elkhart and talked with people at Solvay who know this history and Miles' connection to Takamine. Fortunately the "elders" of the Miles enzyme group who retired are still in the area and some of them stayed with Miles Labs. One old-timer worked with Mr. Takamine. Clarase is the brand name of an enzyme extract of *Aspergillus oryzae*. It was developed by Mr. Takamine, primarily as a digestive aid. Bob Kennedy used Clarase at Chico-San.

Jim has a PhD in food science from Rutgers University, as well as an MBA and a Master's degree in philosophy from Rutgers. His business, Innovative Sweeteners, manufactures organic malt extract, sweet sorghum syrup, and corn syrup from grits.

Afterword: For an excellent biography of Takamine, see Miles Inc. 1988. *Takamine: Documents from the dawn of industrial biotechnology.* Address: PhD, owner of Innovative Sweeteners, 1 Kingsbridge Road, Somerset, New Jersey 08873. Phone: 908-545-5544.

517. Hopkins, Elaine. 1994. Steps of Japanese legend traced: Crew comes to Peoria to film documentary about Japanese scientist. *Journal Star* (*Peoria, Illinois*). Nov. 17. p. A14.
• ***Summary:*** A nine-member Japanese film crew came to Peoria to film a documentary on Jokichi Takamine. The 1-hour film, narrated by Japanese film star Midori Mizuno, will be aired in Japan in January. It is based on a biography of Takamine written by Nobuko Inuma of California. A local historian, Ms. Sidney Eslinger, accompanied the group. She has researched Takamine's life in Peoria and provided information to Inuma.

Takamine built and lived in the house in Peoria that is now at 2111 N. Jefferson. It is now 104 years old.

In Chicago, Takamine went to work for the so-called Whiskey Trust, the Distillers and Cattle Feeders Trust.

In 1891 he moved to Peoria, the home office of the Trust. At the Manhattan and Wollner Brothers Distilleries (located along the south side riverfront), he developed a process for improving distillery production. He also worked from the Takamine Ferment Co., a laboratory next to his home. A special train was dispatched from Chicago to take Takamine to doctors in Chicago when he was ill. This trip may have saved his life.

The film crew's last stop was the Peoria Women's Club,

301 NE Madison, of which Takamine's wife, Caroline, was a founding member. The cornerstone of the building shows that it was laid in 1893.

In 1896 Takamine moved to New York. Address: Staff writer.

518. Dawson, Hilton G. 1994. Re: The life and work of Dr. Jokichi Takamine. Letter to William Shurtleff at Soyfoods Center, Nov. 22–in reply to inquiry. 2 p.

• ***Summary:*** Jokichi Takamine had PhD degrees in engineering and pharmacology from Japan. His first enzyme facility was built in Clifton, New Jersey, in about 1900. The first product was Takadiastase, made from koji fermented with *Aspergillus oryzae*. It was used initially for its amylase activity to produce fermentable substrates. It is still manufactured in Japan for use as a digestive aid. This plant was later the site of manufacture for numerous enzymes from koji, as well as deep tank fermentations.

Takamine Laboratories was purchased by Miles Laboratories, Inc. and became part of the Miles Chemicals Division in 1956. Many of the products marketed by Miles were sold as "Takamine brand" products. Also the "Taka" prefix was used for the following products: Takamyl (fungal alpha amylase), Takatherm (thermal stable alpha amylase), Taka Sweet (glucose isomerase), Take Bate (pancreatic enzymes for leather bating), Taka Screen (bacterial protease for gelatin hydrolysis), and Taka Muse (bacterial protease for dry cleaning).

The plant in Clifton, New Jersey, closed in 1988. Solvay purchased the enzyme business from Miles in June, 1990.

There are several people who may remember more on the subject. A full address and phone number is given for each: Bob Charles, (Elkhart, Indiana), Richard DeSenna (Kennesaw, Georgia), and Al Blaze (Elkhart, Indiana). Address: Solvay Enzymes, Inc., P.O. Box 4859, Elkhart, Indiana 46514-0859. Phone: (219) 523-3800.

519. Gill, Brendan. 1994. Imperial retreat: A replica of Kyoto's eleventh-century palace in upstate New York. *Architectural Digest.* Dec. p. 131-41, 204.

• ***Summary:*** "For devotees of architectural history, New York State amounts to a series of delectable treasure hunts, with prizes to be sought and won in a thousand obscure corners of the state's exceptionally varied terrain. The cultures living and dead that have flourished there over several centuries-Native American, Dutch, French, English and the like-have left behind innumerable souvenirs in the form of mounds of earth, stone walls, cellar holes and broken pottery, as well as substantial structures of a more recent time, some of which, though once well known, have slipped into anonymity with the breaking up of the families that built them or of the communities in which they were located. In architectural terms, these extant but 'lost' structures are the most valuable prizes of all, and it is remarkable how many of them appear to have escaped the notice of historians. This is especially true of big summer houses that were built on remote wooded sites in the Catskills and the Adirondacks by wealthy people seeking in the nineteenth and early twentieth centuries to avoid the heat and discomfort of densely populated lowland cities.

"Among the least known and most exotic of such properties is Sho-Fu-Den, once the country estate of an immensely rich Japanese scientist named Jokichi Takamine. Carved out of a pine forest a few miles from the Catskills resort town of Monticello, Sho-Fu-Den is a version, accurate in its proportions if somewhat reduced in scale, of two pavilions of the Imperial Palace complex in Kyoto, dating back to the eleventh century.

"Sho-Fu-Den was built as part of the Japanese exhibit at the World's Fair held in St. Louis in 1904. When the fair was over, the buildings were presented by the Japanese government to Dr. Takamine, in grateful recognition of his efforts to further friendly relations between Japan and the United States. Dr. Takamine had the buildings disassembled, shipped by train to the Catskills and erected on a large tract of land adjoining a private residential colony called Merriewold, founded by the economist Henry George. (Dr. Takamine and George had married sisters, Marie and Caroline Hitch, of a well-known New Orleans family.) Dr. Takamine gave his estate the name of Sho-Fu-Den, which means 'Palace of Pines and Maples.' It took a year or so to put the structures together and several more years to develop the twenty acres of Japanese gardens, complete with ponds, streams and teahouses, that surrounded the high-roofed, sumptuously furnished main building.

"Dr. Takamine was born in 1854, the year in which Commodore Perry signed the treaty that opened Japan to foreign trade. The eldest of thirteen children of a physician living in Takaoka, Dr. Takamine grew up to become a highly successful chemist who developed a means of producing adrenaline in commercial form, of speeding up the manufacture of whiskey and of making a variety of artificial fertilizers and digestive enzymes. He spent most of his professional life in New York City, where he occupied a splendid mansion-still standing-on Riverside Drive and was instrumental in the founding of the Japan Society and the Nippon Club. He died in 1922 and is interred in a handsome marble mausoleum in Woodlawn Cemetery.

"It was Dr. Takamine who gave the first plantation of Japanese cherry trees to Washington, D.C.; he also gave a couple of thousand cherry trees to New York City, whose scions continue to prosper there. His grandson and namesake, Jokichi Takamine III, now seventy, is a physician practicing in Los Angeles.

"After Dr. Takamine's death, Sho-Fu-Den passed into the hands of the Moody family, who were already members of the Merriewold colony. Many years later it was bought by Mr. and Mrs. Melvin C. Osborn, who at one time ran a

restaurant on the premises. After the death of Mr. Osborn, his widow found the buildings hard to maintain in proper order. And the gardens were being reclaimed by the forest out of which Japanese gardeners had created them almost eighty years earlier. Eager to see Sho-Fu-Den returned to Japanese ownership, Mrs. Osborn sold it in 1986 to Yoshitaka Ikeda, a New York City-based businessman, who set up a not-for-profit organization, the Japanese Heritage Foundation, in order to make possible a complete and accurate restoration of Sho-Fu-Den.

"That restoration is now under way. As is the case with so many large and costly undertakings of this kind, what architectural historians call an appropriate 'adaptive reuse' of the property must be found. Ikeda and the advisory board on the foundation have it in mind eventually to turn a portion of the property into a conference center, at which (in the words of Dr. Jokichi Takamine III, an honorary cochairman of the foundation) people of various disciplines from all over the world will be brought together to explore ways of improving life for future generations. To that end, preliminary designs for a center have been drawn up by Skidmore, Owings & Merrill; it will be built at a discreet distance from the palace and gardens, but they will be available to participants in seminars and other professional gatherings. 'Who could imagine a better place in which to meditate?' Ikeda asks, as he conducts a visitor through the grounds. 'Here one has stepped out of the hurlyburly of the everyday world and into the world of thought.'

"It is true that one feels an uncanny sense of being carried far back in time and place in the course of even a brief stay at Sho-Fu-Den. Telltale signs of the neglect of the many precious materials employed in its construction-rare woods, fabrics and stone sculptures-add a note of poignancy to the sheer unexpectedness of the presence of an ancient-seeming Japanese pavilion in a wilderness only a couple of hours by car from New York City. At the moment, streams that used to run through channels down to ornamental ponds are dry, and the ponds themselves have lost their definition; from the sedgy shore of the largest of them, the supports of a long-vanished teahouse can be discerned beneath the glassy surface of the water.

"The two large ceremonial rooms of the main building, along with many of their original furnishings, have survived in far better condition than the grounds. It is easy for us to imagine Dr. Takamine entertaining distinguished guests in them, and the American families that followed him evidently found no difficulty in adapting the traditional formality of Japanese design to the casual practices of a Catskills summer holiday.

"The fact is that for several generations now American architects have been incorporating Japanese motifs into their architecture, and especially into the architecture of summer places. With good reason, for the intimate relationship between interior and exterior in Japanese design-the ready access in one-story structures between house and garden by means of sliding panels, whether of wood or other materials-is a much-sought-after feature of contemporary American houses. And the imitation of Japanese design in this and other respects goes back at least as far as the Centennial Exposition held in Philadelphia in 1876, where the Japanese exhibits launched a national vogue for designs in the Japanese style. One thinks of such buildings as the Newport Casino by McKim, Mead & White, built in 1879, and of the great camps of the Adirondacks of a slightly later period, their timbered roofs decorated with Japanese parasols, their floors covered with tatami. The vogue was reinforced by Japanese exhibits at the Chicago World's Columbian Exposition of 1893 and, as we have seen, by the exhibits at the St. Louis World's Fair.

"Frank Lloyd Wright was designing a pretty cottage in the Japanese style on the outskirts of Chicago as early as 1900, and having visited the exhibits at St. Louis in 1904, he was inspired to pay the first of his many visits to Japan the following year. In truth, what Wright called his Prairie houses have far less to do with prairies than with Japanese temple and domestic architecture. For that reason, to stand on the lofty front porch of Sho-Fu-Den is to feel oneself in the presence not only of the sunny ghost of Dr. Takamine but also in that of Wright and the host of architects who shared his adventurous spirit-among them, Welles Bosworth, George Howe and William Wilson Wurster and were happy to borrow principles of design and construction from a culture seemingly so distant and so much at odds with their own."

520. Japanese Heritage Foundation, Inc. 1994. Shofu-Den. New York, New York: Japanese Heritage Foundation, Inc. 19 p. Illust. 20 x 28 cm. [Jap; Eng] (See p. 200).

• ***Summary:*** This artistic bilingual brochure is designed to find a source of funding for restoration or a buyer for this very beautiful and valuable Japanese palace. It is also a marvelous source of images of and information about Shofu-Den and Dr. Jokichi Takamine.

On the cover is written: "The Shofu-Den has stood for 90 years as a tangible symbol of cultural relationship between the United States and Japan. The current restoration project seeks to preserve and extend that tradition." An illustration (line drawing from a blueprint) shows a side view of one building.

On page 2 is a photo of Dr. Jokichi Takamine and his wife, Caroline Hitch Takamine.

Page 3: "Near the town of Monticello in Sullivan County, upstate New York, stands the historic structure known as Shofu-Den. Modeled after the main building in the old Imperial Palace in Kyoto, the Shofu-Den originally served as the main pavilion for Japan's exhibit in the 1904 St. Louis World's Fair. Afterward the Japanese government awarded the building to Dr. Takamine Jokichi... He had

the building moved to Sullivan County for the cause of American-Japanese friendship. By restoring and renovating the Shofu-Den we hope to realize the historic purpose of greater cultural understanding between the United States and Japan." A large photo shows a lily pond in the foreground and a part of Shofu-Den in the background. A small photo shows the exterior of the main building.

Page 3. "Dr. Takamine Jokichi who bridged the US and Japan in the late Meiji Era." Begins to tell the story of Dr. Takamine's life and work. A timeline, titled "The history of Takamine Jokichi and Shofu-Den" also begins. Along the top of the line are major world events, while below the line are events in the life of Dr. Takamine. This portion of the timeline covers the period from 1853 ("Top: Commodore Perry arrives at Uraga, Japan") to 1860 ("The uprising of Sakurada-mongai. A voyage to the U.S. by the Kanrin-maru. Bottom: Early childhood: Studies at the Merindo School of the Kaga Domain"). A photo shows: "View of the Japanese Pavilion and the Imperial Garden at the St. Louis World's Fair in Missouri. The main Pavilion, later [renamed] Shofu-Den in seen in the far back."

Page 5. The story of Dr. Takamine and his wife, Caroline continues, including the gift of cherry trees to Washington, DC. The timeline continues from 1861 to 1884. 1861–Top. "Abraham Lincoln sworn in as president. The Civil War broke out." Bottom: "The Kaga Domain selects Takamine to study English in Nagasaki. Later studies medicine in Kyoto and Osaka. 1884–Bottom: "Visits the U.S. as a representative to the New Orleans World's Fair and Cotton Centennial. Intrigued by phosphatic fertilizer on display and brings back a sample of superphosphate of lime for his research in Japan. Meets Caroline Hitch." Photos show: (1) Cherry trees in Riverside Park, New York City. (2) Cherry trees in bloom in Washington, DC, with the Washington Monument in the background.

Page 6. The story of his life continues with "The Shofu-Den and the St. Louis World's Fair. The timeline runs from 1885 to 1894. Photos show: (1) The first laboratory set up by Dr. Takamine in Manhattan at 109th Street. (2) A package of Taka-Diastase distributed in Japan.

Page 7. The story of Shofu-Den and the St. Louis World's Fair continues. The timeline runs from 1897 to 1910. A large photo shows the "New York Reception of Japanese delegates to the Washington Conference in 1921." Two long tables with many Japanese men, both seated and standing.

Page 8. The story of Shofu-Den continues after Dr. Takamine's death in 1922. It was owned by the Moody family, then the Osborne [sic, Osborn] family, then returned to Japanese ownership. The timeline runs from 1911 to 1939. A photo shows the "Interior of the factory in Clifton, New Jersey. Keizo Uenaka is at the center."

Page 9. Photos show: (1) A Japanese stone lantern, inscribed "Todaiji." (2) A spectacular lacquered table with carved gold carp fish legs used by Dr. Takamine at Shofu-Den. (3) An exterior view of one building at Shofu-Den. An illustration (map) shows an overhead view, partial plan drawing of Shofu-Den and Japanese garden, including Lakeside Road to the east, Merriewold Road to the north, and Monticello Turnpike [Highway 42] to the west. The property boundaries, a new road from the turnpike (double broken line) and a small lake are also shown.

Page 10. Photos show: (1) Dining room (small). (2) The view of Shofu room through the dining room. (3) Replicas of the coronation chairs at Kyoto Imperial Palace.

Page 11. A gorgeous, stunning full-page photo of the interior of the Shofu-Den main room named the Shofu room. With table, overhead chandelier, and elegant wall paintings.

Page 12. Begins the story of "The Shofu-Den and the Takamine family." A photo shows Jokichi Takamine with his two sons, Jokichi Jr. and Ebenezer, in 1891.

Page 13. Continues the story of page 12. Photos show: (1) A small portrait photo of newly-wed Jokichi Takamine in 1887 when he is age 33. (2) Jokichi Takamine, Jr., kneeling Japanese style, in traditional Japanese clothing, in 1912 at age 24 (small). (3) On board a ship in 1921 on their way to Europe (large photo); from left to right: Jokichi, Jr., his wife Hilda, Ebenezer, and Jokichi with white hair.

Page 14. Story continues as "Beyond time and space three generations of the Takamine family share in their contribution to society." Photos show: (1) Left to right (large): Katharine Yuki Takamine and her brother Jokichi III, as children [about age 5]. (2) Small: "Wife Caroline (right) and sister Marie at their Riverside home. Caroline's obi (kimono sash) is presently among the collection at Furusato Ijinkan, a museum in the city of Kanazawa."

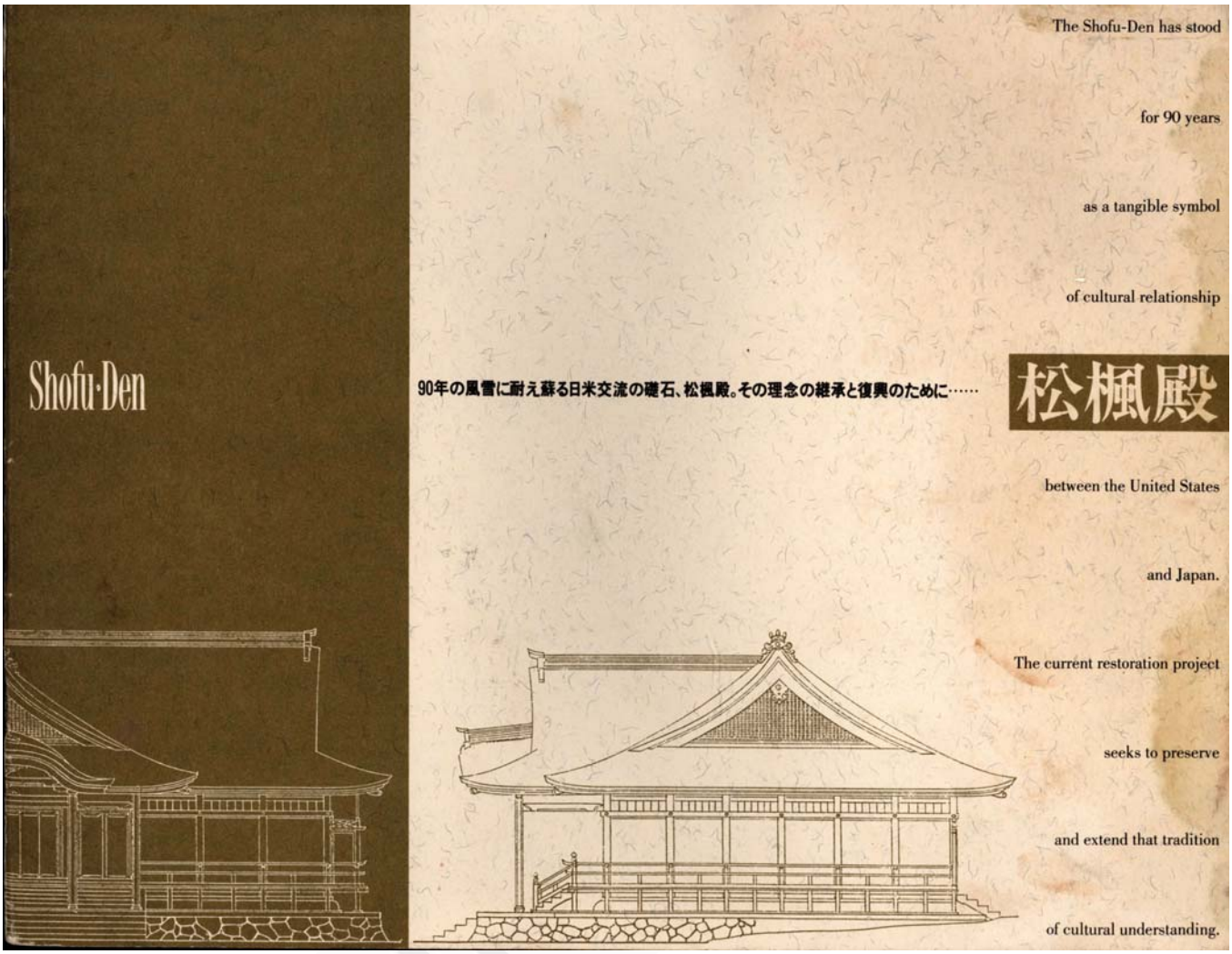
Page 15. "The future for the Shofu-Den: Once more a setting for history-making interactions." "It is for this reason that the Japanese Heritage Foundation has undertaken the Shofu-Den restoration project." A photo shows: "A painting of the completely renovated Shofu-Den and Japanse garden based on Shofu-Den materials. Artist: Wabe. It shows a pond with flowers blooming around it, and one of the Shofu-Den buildings in the background.

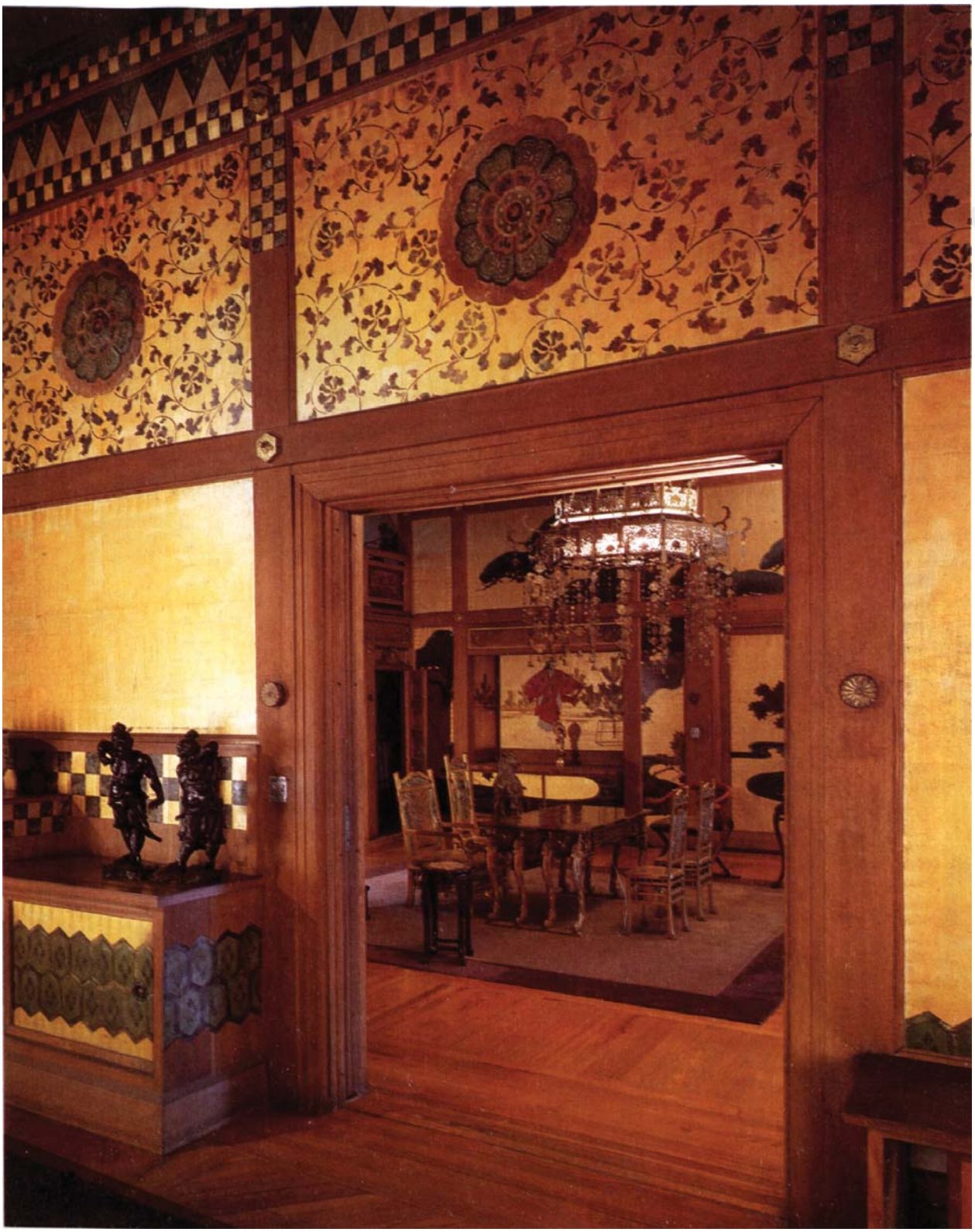
Page 16. "The Shofu-Den under restoration." "(A) The Shofu-Den: A new pavilion honoring Dr. Takamine Jokichi will be added to the existing main structure, and left and right wings... A book store and gift shop will also be built.

(B) Japanese garden: Restoration and renovation work will be performed on the classic Japanese-style garden and a new teahouse and summerhouse will be added along with a new outdoor floral garden.

(C) Forest land development" A new international exposition hall will be constructed... equipped with full multimedia capabilities... and full banquet facilities. In addition, new hotel and food service facilities will be constructed..."

(D) The Shofu-Den Endowment"... will be professionally managed to provide funding for scholarly and





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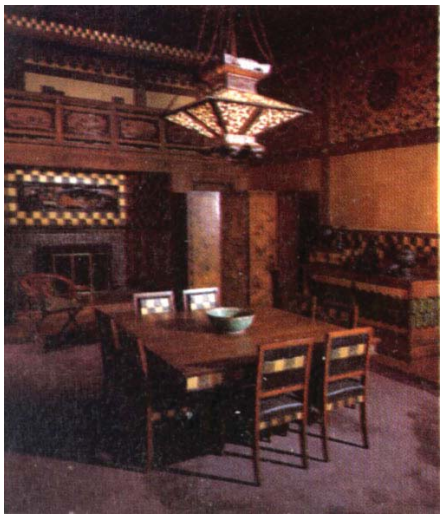
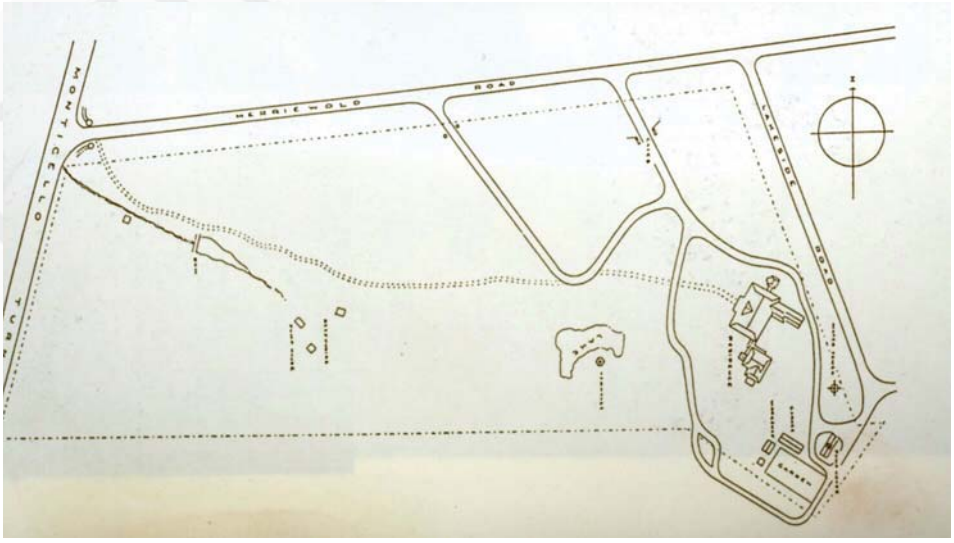
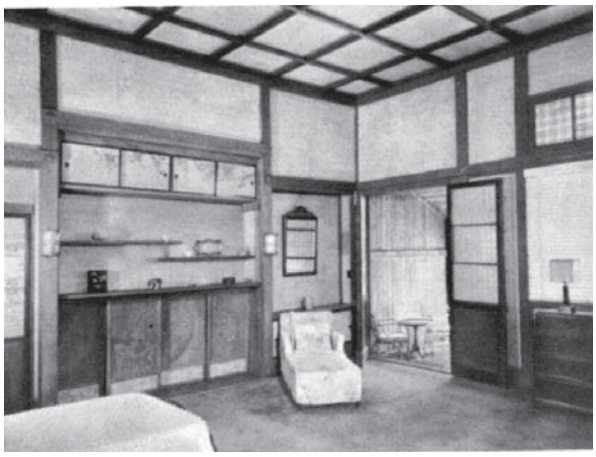
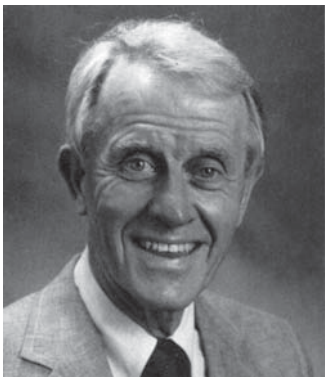






cultural activities and to support ongoing lectures and other educational activities. The Endowment will also provide support for the Friends of Shofu-Den organization and will underwrite publication of a Shofu-Den newsletter. Two small photos show: "Restoration work on the Shofu-den is proceeding apace under the sponsorship of the Japanese Heritage Foundation."



Page 17. "Message from our distinguished International Advisory Board." Contains a portrait photo and short message from each of the following: (1) Hon. Douglas MacArthur, II, Honorary Chairman, Former United States Ambassador to Japan. (2) Dr. Jokichi Takamine, III. Honorary Co-Chairman. Grandson of Dr. Jokichi Takamine. (3) Hon. Jose M. Chaves. Ambassador of the Ibero-American Nations. (4) Dr. Eric Marler, Consultant, National Information Infrastructures. (5) Dr. Hugh R. Crean, Chairman, Restoration Department, Fashion Institute of Technology, New York City.

Page 18. "To the friends of Japan," a message from Yoshitaka Ikeda, President, Japanese Heritage Foundation. A small photo shows: "Shofu-Den Sign. 'Shofu-Den' means 'Pine-Maple Palace' and was named after its surrounding woods. In 1906, Keisuke Otori, Privy Councilor of the Meiji Era, gave the Palace this name and hand-wrote it for Dr. Takamine. This Shofu-Den sign has been hanging on the main entrance of the place for almost a century."

Page 19. An architect's overhead view of the renovated and expanded "Shofu-den International Cultural Center: Schematic Master Plan. Prepared by Skidmore, Owings & Merrill, New York [a famous American architectural and engineering firm] and painted by Michael McCann.

Note: The original Shofu-Den is a small part of the total new cultural center. Will the new cultural center require the acquisition of more land? Address: 401 Fifth Avenue, 2nd Floor, New York, NY 10016. Phone: (212) 213-0840.

521. Photographs of Shofu-Den in its full glory. 1994.
• ***Summary:*** Photos show: (a) The view of the Shofu room through the dining room. Just to the left of the door are two bronze guardian figures (*Kongô Rikishi*). The artist and provenance are unknown. The figure with its mouth open is Ah and represents life. The other, with its mouth closed, is Un and represents death. (b) A gorgeous full-page color photo of the interior of the Shofu-Den main room named the Shofu room. With table, overhead chandelier, and elegant wall paintings. At the rear left and right of the table are two carved wooden Korean dogs (*Shi-Shi Komainu*), carved in about 1000 A.D. (c) The characters for *Shô Fu Den.* (d) Dining room. (e) Replicas of the coronation chairs at Kyoto Imperial Palace. These were made in Japan for Dr. Takamine in about 1909 by special permission of the Meiji Emperor and are the only copies in existence. They arrived at Sho-Fu-Den in 1909 while his Imperial Highness Prince Kunihito, the Emperor's cousin and representative at the Hudson-Fulton Memorial Celebration and his wife were being entertained there. They were at once unpacked and given the veritable imperial touch by being first used by the Prince and Princess. As of 1994 the chairs were in the Shofu room of Shofu-Den. (f) A map shows an overhead view, partial plan drawing of Shofu-Den and Japanese garden, including Lakeside Road to the east, Merriewold Road to the north, and Monticello Turnpike [Highway 42] to the west. The property boundaries, a new road from the turnpike (double broken line) and a small lake are also shown. (g) A spectacular lacquered table with carved gold carp fish legs used by Dr. Takamine at Shofu-Den. (h) A west wing bedroom. (i) The Shrine Room. (j) On 23 Aug. 1931 Sho Foo Den, now owned by Mr. and Mrs. John Moody of New York, was thrown open to about 200 invited guests from the Merriewold Country Club and from near-by cities. At this housewarming "fete" the guests wore Oriental costumes.

The first six of these undated photos (and one map) are from the booklet "Shofu-Den" by the Japanese Heritage Foundation (1994, p. 9-11). The last three (all black and white) are from the book *Merriewold: The First Hundred Years,* by David Colson with the assistance of Agnes de Mille (1989, p. 46-47).

522. Schneider, Sherri. 1995. The life and work of Jokichi Takamine (Interview). *SoyaScan Notes.* Jan. 6. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Their Special Collections Center has a file on Dr. Takamine and the Takamine Ferment Co. In 1891 Dr. Takamine moved to Peoria, which was the home office of the Whiskey Trust. He worked at the Manhattan and the Wollner Brothers' distilleries, located on the southside river front. Peoria had a huge distillery industry at that time–perhaps the largest in America. Takamine's home was in the 2100 block of North Jefferson. Sherri has no information on a 1894 distillery fire–even though she has several lists of fires in Peoria, including the Comptroller's report which lists all the fire department calls during 1894, and a report titled "Community Stricken by Stunning Disasters in its First Century," which lists all major fires in Peoria since 1870. She has heard several times that after the fire in Peoria, Dr. Takamine was so ill that a special train took him to Chicago.

In 1896 he moved to New York.

A Japanese television crew was recently in town doing a documentary on the life of Dr. Takamine. A Japanese-language book on Dr. Takamine by Nobuko Inuma (7352 Cirrus Way, West Hills, California 91307) was published in late 1993.

A novel titled *Where the Wings Grow* by Agnes de Mille (related to filmmaker Cecil B. deMille) contains information about the life of Dr. Takamine because her aunt married Takamine. A third book (in English) is titled *Takamine: A record of his American achievements* (1928) by K.K. Kawakami.

The Peoria Public Library (Phone: 309-672-8858) also has good information on Dr. Takamine. Address: Special Collections Center, Cullom-Davis Library, Bradley Univ. Library, Peoria, Illinois 61625. Phone: 309-677-2822.

523. Bennett, Joan W. 1995. The life and work of Dr. Jokichi Takamine, and his descendants (Interview). *SoyaScan Notes.* Jan. 11. Conducted by William Shurtleff of Soyfoods Center. • ***Summary:*** How did Joan get interested in Dr. Takamine? She has spent her professional life working on the genus *Aspergillus.* While writing a review article on that subject, she was compiling a table titled "Great moments in the history of *Aspergillus."* She discovered that the first patent relating to the genus *Aspergillus* was issued to J. Takamine [British Patent No. 17,374, Application filed 12 Oct. 1891. Accepted 12 Oct. 1892]. Two weeks later, while browsing in the stacks of the Tulane Medical School Library, she happened to notice on the shelf an entire book on J. Takamine (Kawakami's 1928 biography). Thinking that Takamine was just an obscure Japanese scientist, she was astonished to find that an entire book had been written about him. She read the book and began to take a great interest in the life and work of this pioneering Japanese scientist. This interest increased when she discovered that Takamine had also lived New Orleans, where Joan now lived and worked. She found Takamine's marriage certificate and visited his wife's parents' home in the French Quarter where Dr. Takamine was a boarder and where he courted the woman he married. She also has a copy of Dr. Takamine's will.

In 1988 Joan was planning to spend a good part of the summer writing a major article or book claiming that he was the father of American biotechnology. Isn't it ironical that a relatively unknown Japanese man should have founded what we Americans now consider one of our most successful industries–especially since the introduction of gene engineering. But that June she received a phone call saying that her father had had a heart attack. For the next six years she was unable to find any time to devote to her "scholarly hobby"–J. Takamine. In 1989 she was elected president of the American Society for Microbiology.

Joan has done a great deal of research on the life of Dr. Takamine. She has boxes of documents and unpublished research she has done and now she finally has the time available in her life so that she is thinking of starting to write. She went to Washington, DC, to check out Dr. Takamine's gift of the cherry trees. She could find no record of it, even though she talked with an expert on the subject. This may not be too important since the trees were supposed to be an anonymous gift from the city of Tokyo. She has interviewed Agnes de Mille [born in about 1909], one of her best sources. Agnes's book about her childhood, *Where the Wings Grow,* contains some interesting material about Takamine based on Agnes' recollections when she was very young. In the spring of 1994 she visited the exhibit on Ms. Inuma's book at the Japan Society in New York. When there, she was lucky to meet a person who is descended from the Japanese chemist who actually isolated adrenaline while working for Dr. Takamine in a basement in America. This chemist was not even mentioned on Dr. Takamine's patent, though Dr. Takamine did leave him a little money in his will. By modern standards, this scientist should have shared in the patent, but unfortunately Takamine took all the money and all the credit. This year is the 100th anniversary of Takamine's first American patent.

Concerning the 1894 fire in Peoria, she may have the date wrong, but she thinks the date came from his 1928 biography by K.K. Kawakami. This book was commissioned by his family, so it is a sort of vanity publication. She has had great difficulty in tracking down the story of Dr. Takamine's life and work in Peoria and then Chicago, Illinois. Miles Laboratories has good, active archives, including a box containing a bottle of "Banzai Whiskey." She has heard that the beer makers were so upset about the *Aspergillus* enzyme, which was cheaper than the malting enzyme, that they actually passed legislation or regulations that it can't be used in beer making.

At the time of fire in Peoria, it is hard for Joan to believe that Takamine had a personal train take him to Chicago, since he was impoverished at the time.

Concerning the mysterious death of Jo Takamine, Joan doubts that the death was from suicide or a Mafia-related murder. She has heard that Jo was a very heavy drinker and may possibly have been drunk when he died by falling out of window from a hotel. He may have been a playboy; he was probably quite wealthy. She has met with one of Jo's living descendants and spoken with him many times. He invited Joan to call his cousin Aggie (de Mille). Agnes was planning to write a story on Dr. Takamine's mother-in-law (his wife's mother), who she thought was a fascinating character. But its hard to separate fact from fiction because Ms. de Mille was a very young woman when all this was happening. Some of the things she said may also have been embellished because of her interest in drama and writing.

There are few living descendants of Dr. Takamine. His eldest son, Jo, had two children. Jo's son, named Jokichi Takamine III, has no children and he is a man in his 60s. He

is a psychiatrist who lives in the Los Angeles, California, area, but he knows nothing about his grandfather. Dr. Takamine's daughter may have children, but Joan has been unable to find them. Eben had no children. In the 1980s, Joan interviewed Eben's widow, who may no longer be living. Agnes de Mille believes that Dr. Takamine had a Japanese mistress, so he may have living descendants in Japan. Joan is in touch with a very nice retired man who worked for Dr. Takamine's Bakelite Company that made plastics in Japan, and who has gotten interested in Dr. Takamine's life.

Who was the world's first manufacturer of commercial enzymes? This is an interesting and difficult question. Dr. Takamine did not initially sell a single purified enzyme. Takadiastase, which was separated from koji with a solvent, was later found to contain more than 25 different enzymes. Thus it was a "concentrated enzyme preparation made from a ferment." European companies may have been the first to isolate enzymes commercially, since much of the early scientific research on enzymes was conducted in Europe. Joan enjoys studying history and after spending a year on sabbatical in the Netherlands she published a paper on Gist-Brocades (pronounced zhist bro-KAHD), a company which was a pioneer in this field. *Gist* is the Dutch word for "yeast" or "barm." They had a very forward-looking CEO in the late 1900s and around the time that Dr. Takamine was applying for patents in America, Gist hired a very bright Dutch microbiologist named Martinus Willem Beijerinck [1851-1931; also spelled Beyerinck]; he later left Gist and went to the Delft Institute of Technology, where he became head of the Delft School and did research on the enzymes in yeast. Note: He was also a pioneer in elucidating the action of nitrogen-fixing bacteria on the roots of legumes.

Major enzyme manufacturers today are Novo Nordisk in Denmark (probably the biggest in the world; they trace their origins back to a Danish scientist named Johanssen), Gist-Brocades in the Netherlands (probably number 2; they also make antibiotics), and Solvay in America. Address: Dep. of Molecular Biology, Tulane Univ., New Orleans, Louisiana. Phone: 504-865-5546.

524. Hesseltine, C.W. 1995. History of the commercial enzyme industry and Dr. Jokichi Takamine (Interview). *SoyaScan Notes.* Jan. 12. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Dr. Hesseltine is one of the world's leading microbiologists. He has had a long interest in the history of microbiology and especially of fungal enzymes (primarily of the genera *Aspergillus* and *Penicillium*). He would like to write a history of the commercialization of fungal enzymes in the United States and Europe. He has never seen a book on this subject or on the broader subject of the history of the commercial enzyme industry. The leading early companies were probably the Takamine Ferment Company in Peoria, Illinois (founded 1890) and Gist-Brocades and Novo Nordisk in Europe.

One interesting question is: Which company made and sold the first purified enzyme product, and which enzyme was it? Takamine's first product was 'diastase,' a mixture of glucoamylase and α-amylase; thus it was in Peoria that fungal amylase was first introduced to the West. Takamine's real contribution was that he applied fungal enzymes to new uses–his fungal amylase replaced malt.

Apparently this new innovation was greeted with apprehension by the malt manufacturers. The distillery where he worked was burned to the ground [on 8 Oct. 1891, early in the morning, shortly after midnight, at the Manhattan Distillery in Peoria]. Arson was suspected but never proven.

The fire was a huge one. The spent mash from making whiskey was being fed to cattle in large feedlots in downtown Peoria. The cattle were burned in the horrifying fire, and all night the residents could hear them crying out in pain as they were burned alive. Dr. Hesseltine's source of this information is *The History of Peoria, Illinois* (C. Ballance 1870. N.C. Nason Pub. 281 p.). Note: How could a book published in 1870 describe a fire in the 1890s?

Dr. Hesseltine is interested in the life and work of Dr. Takamine; he visited Dr. Takamine's ancestral family home in Kanazawa, Japan, while he was chairman of the UJNR (United States–Japan Cooperative Program on Natural Resources) Panel on Toxic Microorganisms. This panel was established to aid in the exchange of information between the two countries, and to conduct study tours. Address: 5407 Isabell, Peoria, Illinois 61614.

525. Schneider, Sherri. 1995. Re: More on the life and work of Jokichi Takamine in Peoria, Illinois. Letter to William Shurtleff at Soyfoods Center, Jan. 27. 2 p. Typed, with signature on letterhead.

• ***Summary:*** Concerning the Peoria fire connected with Dr. Takamine, according to the *City Clerk's Report,* there was a fire in the malt house of the Manhattan Distillery on 8 Oct. 1891. "I did not find any distillery fires listed in the 1894 *City Comptroller's Report.* In addition, the local distillery 'expert' I contacted provided some newspaper citations from the *Peoria Transcript* concerning Takamine's arrival and work in Peoria:"

1891 Feb. 26–A large room at Woolner (Grove Distillery) was set aside for Takamine.

1891 March 8 and March 19–Takamine is mentioned.

1891 Oct. 8–Malt house fire at Manhattan Distillery.

"Another source summarized the following newspaper articles concerning distilleries, however no record of any distillery fires:

1894 March 3–Work under way on new Wollner Distillery.

1894 Oct. 8–A number of repairs are being made to the Manhattan Distillery, and several new buildings added.

1894 Nov. 27–The Manhattan Distillery will reopen in

a few days. Address: Special Collections Center, Cullom-Davis Library, Bradley Univ. Library, Peoria, Illinois 61625. Phone: 309-677-2822.

526. Bennett, Joan W. 1996. More on the life and work of Dr. Jokichi Takamine (Interview). *SoyaScan Notes.* Feb. 25. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Agnes de Mille, who was a gossipy old woman, hinted that Takamine had a mistress and one or more illegitimate descendants in Japan. She implied that in later years his American wife was not sleeping with him.

Joan hopes to write an article on Takamine for a magazine such as *The Smithsonian,* and maybe also a scholarly article.

John Jacob Abel did most of the work on adrenaline. Miles Laboratories has a lot of information on the battle that ensued between Abel and Takamine.

Last year Joan and her new husband, David, drove to the address of the Takamine Labs in New Jersey. It was there until the 1980s, but not a trace of it remains today. New houses are being built on the site. Address: Dep. of Molecular Biology, Tulane Univ., New Orleans, Louisiana. Phone: 504-865-5546.

527. Pauly, Philip J. 1996. The beauty and menace of Japanese cherry trees: Conflicting visions of American ecological independence. *Isis–History of Science Journal* 87(1):51-73. March. *

528. Bernard, Larry. 1996. CU journal details D.C. cherry trees' early woes: Cherry trees as blooming in Washington, DC. *Cornell Chronicle* (*Ithaca, New York*). April 4.
• ***Summary:*** When the cherry trees first arrived in 1910 there was a major conflict. The U.S. government burned them, in a bizarre display that pitted federal USDA bureaucrats against each other. "President William Howard Taft approved the final order in an effort to prevent Japanese insect pests from infesting America's plants."

"Although new trees, certified by the Japanese government to be bug-free, the protectionists within the USDA had already won their war, argues Philip J. Pauly, professor of history at Rutgers University, in an article published in the Cornell journal *Isis*... (March 1996, p. 51-73)."

"Entomologists in the USDA wanted the trees destroyed, while botanists clamored to have them saved." "This was an important moment in the biotic history of North America, in which humans started to control and manage what the flora and fauna ought to look like in this country in the future." "One sees parallels in the early 20th century between attitudes toward 'plant immigrants' and 'human immigrants.'

Note: How about USDA's massive and ongoing seed and plant introduction program that was started in 1898 by David Fairchild?

529. Grigsby, Ann M. 1996. Whispered prayers in the Arizona desert: The history of the Shrine of Santa Rita. Vail, Arizona: Santa Rita in the Desert. 56 p. + [17] p. of plates. Illust. No index. 22 cm. Saddle stitched.
• ***Summary:*** This is the best history of Santa Rita in the Desert seen to date. After the Preface and each of the first three chapters are many black-and-white photos on unnumbered pages.

Contents: Preface. 1. The inspiration (Jokichi Takamine). 2. The dream (the idea and development of Santa Rita in the Desert). 3. The mission (a history of the church form its dedication on 31 March 1935 until it became a parish church in 1968. Includes a biography of each father). 4. The parish (which had a priest in residence; includes a biography of each father).

Chapter 1 is an excellent, concise biography, but with little or no new information, except for this: "He traveled to the United States two years later to procure more fertilizer and to marry Caroline on August 10, 1887. The next day the New Orleans *Daily Picayune* described the event as 'A Brilliant Wedding.'"

Concerning Sho-Fu-Den: After Dr. Takamine's death in 1922, Caroline sold the estate to John Moody, a longtime friend of the Takamines "who founded Moody's Investor's Service in New York. This family owned the property and buildings until the 1940s. In 1945 [sic, Feb. 1946] it was purchased by Melvin Osborn. In 1986, Yoshitaka Ikeda, Chief Executive Officer of the Japan Heritage Foundation purchased the estate with support from volunteers dedicated to the historical preservation of the site."

"The Shrine of Santa Rita in the Desert began service as a mission. From 1935 to 1968 Franciscan Priests officially assigned to San Xavier del Bac near Vail and later from the Our Mother of Sorrows parish in Tucson would come to Vail to celebrate Mass and administer the sacraments to the Catholics who lived in and near Vail" (p. 39).

Photos show: After the Preface: Portrait of Jokichi Takamine. Santa Rita under construction, 1934-35. Dedication ceremony, 31 March 1935 (5 photos). Church exterior, 1930s-1940s (3 photos). Church door.

After Chapter 1: Church's interior, 1930s-1940s. Dedication ceremony, 31 March 1935. Church's exterior, 1930s-1940s (2 photos). Church and rectory, 1962. The crucifixion group donated to Santa Rita by Father William Gockel in its original position behind the altar. The Gockel crucifixion group in the rear of the church where it hangs today.

After Chapter 2: Dedication ceremony, 31 March 1935. Church's interior, 1930s-1940s (2 photos). Father Constant Mandin, 1937-43. Well in courtyard. Gift shop. Altar. Father Donald Verhagen, SDS (Society of the Divine Savior), 1987-96. Father William Gockel, SDS, 1948-51, 1953-54, 1955-62, 1967–in playful pose.

After Chapter 3. Full-page portrait photos of: Father Albert Wilson, SDS, 1967-68 ("Fr. Wilson began the Salvatorian tradition at the Shrine which continues to today). Father Hermenegild Messmer, SDS, 1969-73. Father Daniel Carroll, SDS, 1973-74. Father Claude Klotz, 1983-87.

Note: The U.S. headquarters and cemetery of the Salvatorian order is in St. Nazianz, Wisconsin. The Salvatorian Priests & Brothers came to St. Nazianz in 1896, 15 years after the Society of the Divine Savior was founded by Father Francis Mary of the Cross Jordan in Italy. Address: Arizona.

530. Manabe, Shigeki. 1999. Dôdôtaru yume: Sekai ni Nipponjin mitomesaseta kagaku-sha, Takamine Jokichi no shogai [A magnificent dream: The life of Jokichi Takamine, one of the Japanese chemists who is recognized worldwide]. Tokyo: Kodansha. 369 p. Feb. 10. 20 cm. [Jap]*
• ***Summary:*** This book contains some exaggerations because the style is novelistic. The historical accuracy of what he says is sometimes questionable.

Concerning the special train that took Dr. Takamine from Peoria to Chicago, Illinois, for a liver operation: According to Mr. Yutaka Yamamoto, an expert on Takamine living in Japan, Caroline asked the station master to stop the train behind their house. However he would not agree to do that, but rather he suggested that she flag down the train by lighting a fire close to the tracks at the point she wanted the train to make an emergency stop. Mr. Yutaka says this book was his source for the statement. Address: Japan.

531. Bennett, M.R. 1999. One hundred years of adrenaline: the discovery of autoreceptors. *Clinical Autonomic Research* 1(4):36-43. Fall. [Jap]
• ***Summary:*** Not until 1946 did von Euler show that demythelated adrenaline (noradrenaline) rather than adrenaline is a sympathetic transmitter. The possibility that this sympathetic transmitter could also act on nerve terminals was not developed until 1971. Research on autoreceptors culminated in the identification of adrenergic receptors on nerve terminals different to those on muscle cells. This paper assesses the contributions that established the idea of the adrenergic autoreceptor, 100 years after the discovery of adrenaline. Address: Inst. for Biomedical Research and The Dep. of Physiology, Univ. of Sydney, Australia.

532. *Tucson Citizen* (*Arizona*). 1999. Funeral notices. July 9.
• ***Summary:*** "Kramer, John Joseph, 57, of Tucson, died at his home on Sunday, June 27, 1999. He is survived by his wife, Dianna Kramer, sons James Michael (Danika) Kramer of Ponte Vedra Beach, Florida, and Robert Kramer of Tucson, his father Ted W. (Dorothy) Kramer of Tucson, and one uncle Dr. Jokichi Takamine III, of Los Angeles, California. A memorial service will be held [for John Joseph Kramer] at 9 a.m. on Saturday, July 10, 1999 at the Shrine of Santa Rita in Vail.

Note: An article in the *Tucson Citizen* (18 Oct. 1994), titled "UA report is called an illegal 'blacklist," by Maria Elena C. Lopez, states that John Kramer was a former employee of the University of Arizona (UA). In Oct. 1993 he and three other former UA employees filed suit against the university for maintaining such a list of people who will not be rehired.

533. Aronson, Jeffrey K. 2000. "Where name and image meet"–the argument for "adrenaline." *British Medical Journal* 320(2733):506-09. Feb. 19. [33 ref]
• ***Summary:*** "Assuming that you don't want to call it dihydroxyphenylmethylaminoethanol, which name should you use–adrenaline or epinephrine? All the arguments and evidence suggest that you should prefer adrenaline."

Summary points:

"A European Commission directive requiring member states to use recommended international non-proprietary names for all drugs is soon to be implemented

"For most drug names there will be little or no change

"For around two dozen drugs the changes are more important; these will be dual labelled during the five year changeover period

"It is intended that adrenaline (British approved name) will be changed to epinephrine (recommended international non-proprietary name).

"The strong arguments for persuading the European Union to resist this particular change are based on usage, history, etymology, and, most importantly, risk of clinical errors. In short, the drug should be called 'adrenaline.'"

The section titled "The historical argument" states: "Then, in 1901, after visiting Abel, Jokichi Takamine prepared a pure extract of the active principle from the adrenal gland and patented it. Parke, Davis & Co. marketed his extract, and because they used the proprietary name Adrenalin, epinephrine became the generic name in America, on the incorrect assumption that Abel's extract was the same as Takamine's adrenaline. It was, in fact, an inactive benzoylated derivative." Address: Clinical reader, Dep. of Clinical Pharmacology, Univ. of Oxford, Radcliffe Infirmary, Oxford OX2 6HE, UK.

534. *SoyaScan Notes.* 2000. Theodore W. Kramer–Social Security Death Index (Overview). Nov. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** According to the Social Security Death Index for "Theodore W. Kramer." He was born on 7 Aug. 1916. He died on 2 Nov. 2000. Last city and state of residence: Tucson, Arizona.

535. Iinuma, Kazumasa; Kanno, Tomio. 2000. Takamine Jôkichi no shôgai: Adorenarin hakken no shinjitsu [The life and times of Dr. Takamine: The truth of his discovery of

adrenalin]. Tokyo: Asahi Shinbun-sha. 330 p. Dec. 15. 19 cm. [Jap]*
• ***Summary:*** The author investigated the details of this subject in depth. This book provides a unique and important look into the life of Dr. Takamine. The author says that the Takamine Ferment Company was established in about July 1891; he does not give the city or state. Address: Japan.

536. Bennett, Joan W. 2001. Aspergillus and koji: History, practice and molecular biology. *Society for Industrial Biology News* 51:65-71. March/April. [6 ref]
• ***Summary:*** Contents: Introduction. Shoyu, miso and sake. Dr. Jokichi Takamine and Industrial enzymology. Contains a brief biography of Takamine and a summary of his many contributions.

"Shoyu, miso, and sake are all *Aspergillus*-based koji fermentations. In these processes, the starch is turned into sugars by the amylolytic enzymes of the fungus."

"According to statistics from Kikkoman Corporation,... the population of Japan consumes about 317,000,000 gallons of soy sauce per year, which works out to about 10 liters [2.64 gallons] per person." Consumption of soy sauce is increasing in the United States, where Kikkoman now operates two manufacturing plants.

"The production of soy sauce takes about six months. The raw materials are soybeans, wheat, salt, and water. The contributing microorganisms are *Aspergillus oryzae* or *A. sojae,* lactobacilli [lactic acid bacteria], and yeasts. Wheat is roasted and crushed; soybeans are steamed; then an *Aspergillus* starter (*tane koji*) is added to the combined wheat and soybean mixture. The particular strains of *Aspergillus* play a critical role in determining the flavor of the final product. After three days of incubation, a brine solution is added to the resultant koji, forming a kind of wet mash called *moromi.* The moromi is fermented in tanks for approximately six months at which point it is filtered [and pressed], yielding raw soy sauce and a press cake. The sauce is refined and pasteurized; the press cake is diverted as livestock feed."

"Since the 16th century [1500s], sake brewing has incorporated a heating step that is similar to the process later introduced by Pasteur ('Pasteurization') [in 1862] to destroy harmful bacteria in wine."

"The modern enzyme industry has roots in the Japanese shoyu, miso and sake fermentations due to the foresight, scientific acumen and entrepreneurship of Dr. Jokichi Takamine (1854-1922). Although Dr. Takamine spent much of his adult life in the U.S., his role as a 'father of American biotechnology' is not well known in his adopted country. His story deserves a wider audience." A good one-page biography follows.

"On his honeymoon in Washington, DC, Takamine continued his study of US patent law, and then returned to Japan with his blond, blue-eyed wife. In rapid succession, two sons–Jokichi, Jr. and Eben–were born. However Caroline was not as adaptable as her husband. Caring for young children in a strange culture under the eyes of a disapproving mother-in-law only exacerbated her homesickness. In an attempt to make his wife happy, and with a strong belief that he could establish a successful business in the US, Takamine moved his young family back to America in 1890."

Figures show: (1) The Chinese character for koji (large and bold). (2) Scanning electron micrograph of *Aspergillus sojae* conidiospores (two different magnifications). (3) Dr. Katsuhiko Kitamoto standing next to a keg of sake. (4) Some attendees of the International Symposium on Molecular Biology of Filamentous Fungi, including Joan W. Bennett. Address: Prof., Dep. of Cell and Molecular Biology, Tulane Univ., New Orleans, Louisiana 70118.

537. Yamashima, Tetsumori. 2001. Nihon kagaku no senkusha Takamine Jokichi: Adorenarin hakken monogatari [The pioneer Japanese scientist Jokichi Takamine: The story of his discovery of adrenaline]. Tokyo: Iwanami Shoten. 180 p. June 20. [Jap]*
• ***Summary:*** This book explains Dr. Takamine's life in plain language, which can also be understood by children. Address: Japan.

538. Gray, Christopher. 2001. Streetscapes: 161 West 93rd Street. A building that recalls the days after Pearl Harbor. *New York Times.* Sept. 30.
• ***Summary:*** One of the traces of early Japanese architecture and culture in New York City is this elegant 1912 building, located between Columbus and Amsterdam Avenues, which was seized by the federal government during World War II. It is now (since 1968) a Seventh-Day Adventist Church named Templo Adventista, with a congregation of about 300. However few New Yorkers realize that it was originally the Nippon Club, built by Jokichi Takamine, who arranged the donation of several thousand cherry trees from Tokyo to Washington, DC.

Takamine was born in 1854 in Japan. He learned English in school at home and abroad, and studied science–especially chemistry. He achieved financial success by establishing his own company to make artificial fertilizer. In the 1890s he moved to New York, where he did research in applied chemistry. In 1901 he isolated the hormone adrenaline in his laboratory.

In 1905 he organized the Nippon Club, and in 1912 the Club had its own building constructed, designed by architect John Vrendenburgh Van Pelt, who made a facade of light gold brown brick. "Takamine, the president, had a town house at 334 Riverside Dr., between 105th and 106th streets."

The interior of the building was elegant, with many Japanese touches.

"A dinner in February 1940 was exclusively Japanese, as

250 gathered at the club to celebrate the 2,600th anniversary of the founding of the empire, with folk songs and sake, presided over by the Japanese consul general, Kaname Wakasugi, who led a low bow to the flag of the rising sun. The New York Times quoted him as saying that Japan was going to 'do our best in a humble way to make this world a better place.'"

But tensions between the United States and Japan were increasing. On 6 Dec. 1941 *The New York Times* reported that the Japan Institute, a Japanese cultural mission at 630 Fifth Avenue, was closing because of an American freeze on Japanese assets.

After the Japanese attack on Pearl Harbor, about 200 of the 2,500 Japanese nationals living in New York City and its suburbs were taken into custody. "At the Nippon Club, 12 Japanese members were escorted by police to their homes, and the club was closed. It was confiscated by the Office of the Alien Property Custodian, and in 1943 the office put the building up for sale. In early 1944 it was bought by the Elks for a clubhouse, complete with its furniture; the club said that the interior would be remodeled and that the Japanese artifacts would be sold to art collectors."

After the war, the Nippon Club was reestablished elsewhere; it is now located at 145 West 57th St., on the first seven floors of a 21-story tower.

The brick exterior has been covered with white paint. The deep cornice has weathered down to bare metal. Almost none of the Japanese décor has survived.

539. Bennett, Joan W. 2001. Adrenalin and the cherry trees: Jokichi Takamine, a pioneer of American biotechnology, isolated the hormone a century ago. *Modern Drug Discovery* (*MDD*) 4(12):47-48, 51. Dec. [2 ref]

• ***Summary:*** "The isolation of adrenalin (also: adrenaline)–the first hormone to be obtained in pure form and called 'the blood-pressure-raising principle of the suprarenal glands'–was first reported in 1901. The work was done in a small independent laboratory run by Jokichi Takamine, a Japanese chemist who spent most of his adult life in the United States. His success in isolating adrenalin was a surprise to the scientific community, especially because his competition included such better known figures as John Jacob Abel of Johns Hopkins University and Otto von Furth of Strassburg, Germany (now France).

"Jokichi Takamine was born on November 3, 1854, in a small town [Takaoka] on the west coast of Japan, shortly after Commodore Matthew Perry's black gunships arrived in Tokyo Bay [14 July 1853] and opened Japan to the West."

He married Caroline Field Hitch of New Orleans. "For their honeymoon, Takamine took his bride to South Carolina, where they visited fertilizer plants; to Washington, DC, where he studied U.S. patent law; and then west to California, where they embarked on the long sea voyage to Japan." Discusses Takamine's early life and work with koji, the diastatic enzyme, Taka-Diastase, and Parke, Davis & Company.

"With Parke, Davis as his patron, Takamine moved his family to New York [City] and established an independent laboratory on East 103rd Street around 1898. It was there that the famous work on adrenalin was conducted. Using his profits from Taka-diastase, Takamine hired a young chemist from Japan, Keizo Uenaka (sometimes transcribed Keizo Wooyenaka), to assist him. For the next two years, their main attentions were focused not on enzymes but on another class of biological compounds that were active in minute amounts, the 'internal secretions' associated with the glands.

"In 1895, George Oliver and Edward Schäfer had discovered that when the secretions of the adrenal glands were extracted and injected into an experimental animal, they could raise blood pressure. The purification of this principle became a matter of interest, and in 1897 John Jacob Abel and Albert C. Crawford thought they had succeeded when they purified a crystalline principle they named epinephrine. (It was later shown that they had isolated a benzoyl derivative rather than the pure hormone.)

"Takamine was encouraged by Parke, Davis to follow up on the epinephrine work, and sometime in 1900 he visited Abel's laboratory at Johns Hopkins University, where he was welcomed and shown full scientific courtesy. Then, working with Uenaka, Takamine followed Abel's methods for removing fat and protein, partitioning his concentrated extract with acidified water, and then precipitating the active principle with ammonia. It was Uenaka, working alone one night, who first obtained a crystalline product, but it was Takamine who filed a patent application on November 5, 1900, titled 'Glandular Extractive Product' on a blood-pressure raising principle he called adrenaline. Within a few months, Takamine presented two papers, one before the Society of Chemical Industry and another before the New York Medical Society. That same year (1901), he published two single-author papers in the scientific literature and applied for and was awarded the right to use the word Adrenalin as a trademark. Simultaneously, a colleague at Parke, Davis, Thomas Aldrich, published the correct chemical structure, and the company began marketing the product under the trade name Adrenalin.

"The discovery of adrenalin was a medical and popular sensation. Physicians carried it in their bags and it was said that Gene Tunney, the champion boxer, always kept some on hand when he went into the ring. The drug transformed surgery, where it was used to control hemorrhage... The emperor of Japan acknowledged Takamine's feat by conferring the Order of the Rising Sun, Fourth Class. He also sent 15 imperial cherry trees to Parke, Davis, where they were planted in front of the administrative offices.

"John Jacob Abel, who had not spent his honeymoon studying patent law, felt scooped and duped. Although he accepted the fact that Takamine had isolated a crystalline

product, he persisted in the belief that the product was not pure and that the chemical formula proposed by Aldrich and Takamine was not correct. Horace Davenport, Beaumont Professor of Physiology at the University of Michigan, later wrote, 'A faint air of scandal seemed to hang over adrenalin.' Gradually, the term 'adrenalin' fell out of the scientific literature and was replaced with 'epinephrine.' But adrenaline was the word adopted in ordinary language. People commonly talked about having 'an adrenaline rush' or 'getting their adrenalin up.'

"Although Abel was wrong about the chemical structure of epinephrine, his assertion that Takamine's adrenaline was impure was shown to be correct in a way that did not anticipate, or could not have been demonstrated, given the chemistry of the time. The contaminant was norepinephrine. The early 20th century product sold by Parke, Davis under the trade name Adrenalin was actually a mixture of epinephrine and norepinephrine.

"Although Takamine's patent was originally filed on November 5, 1900, the application was subsequently divided and refiled. Eventually, on June 2, 1903, five separate U.S. patents were granted to Takamine on adrenaline. He also obtained British and Japanese patents on the drug. Later, a rival company of Parke, Davis, H.K. Mulford, attacked the adrenaline patents with the argument that the hormone existed in nature and that Takamine's work had been anticipated by Abel and von Furth." Mulford took the case to court.

"Federal Judge Learned Hand listened to days of technical testimony and immersed himself in the chemical literature surrounding the rival claims. His cogent and chemically accurate summation contains one of the most famous lines in biotechnology patent history: 'I cannot stop without calling attention to the extraordinary condition of the law which makes it possible for a man without a knowledge of even the rudiments of chemistry to pass on such questions as these (Circuit Court, S.D. New York, April 28, 1911, *Federal Register* 189:115). Judge Hand ruled in favor of Takamine; Mulford was ordered to cease infringing."

There follows a short summary of how Takamine helped to bring cherry trees to Washington, DC. "When Takamine learned in 1909 that First Lady Helen Herron Taft was working to beautify the Tidal Basin around the Potomac River in Washington, DC, he funded a gift of 2,000 cherry trees from the mayor of Tokyo to the city of Washington." The real story is much more complex than the one presented here.

"Jokichi Takamine died on July 22, 1922, of a liver [sic, kidney] ailment that had plagued him most of his life. In his obituaries, he was called the Japanese Thomas Edison and the Japanese Pasteur. For his pioneering patents and entrepreneurial spirit, he could also be considered the forgotten father of American biotechnology."

A portrait photo (owned by the National Library of Medicine) shows Jokichi Takamine. Address: Dep. of Cell and Molecular Biology, Tulane Univ., New Orleans, Louisiana 70118.

540. Huang, Hsing-Tsung. 2002. Takamine Jokichi and the transmission of ancient Chinese enzyme technology to the West. In: Alan K.L. Chan, Gregory K. Clancey and Hui-Chieh Loy, eds. 2002. Historical Perspectives on East Asian Science, Technology and Medicine. Singapore: World Scientific Publishing Co. See p. 525-32.

• ***Summary:*** "When we talk of technology transfer in the last hundred years, we tend to think of the traffic as flowing entirely from West to East. Actually, even in the 20th century significant bits of Chinese or East Asian technology were also being transmitted to America and Europe. Of these the most influential and yet least appreciated is the use of microbial enzymes in food processing and related industries."

Most of the enzymes used today are derived from 3 genera of moulds, namely *Aspergillus, Rhizopus* and *Mucor.* In the early 1950s Dr. Huang gained a working knowledge of the enzyme industry in the U.S. when he worked as a research chemist at the Enzyme Research Department of Rohm and Haas Co. (Philadelphia, Pennsylvania).

Table 1 (p. 526) shows microbial enzymes used in food processing in 2002, and Table 2 (p. 527) shows those used in food processing in 1951. Takamine Laboratories (Clifton, New Jersey) made and marketed Takadiastase, a digestive aid. Wallerstein & Co. (New York) produced the enzyme papain for chillproofing of beer. Rohm & Haas pioneered the application of pancreatic enzymes for the bating of hides. All 3 companies were founded at about the turn of the 19th to 20th centuries.

Jokichi Takamine's innovation was based on koji (Chinese: *qu* [pronounced ch'ü]; the Japanese word is written with the ancient Chinese character), which has been used in Japan for centuries to make saké (and other alcoholic drinks), soy sauce, and miso (both soy condiments). "Modern microbiological studies show that the principal organisms in *qu* are grain molds of the genera *Aspergillus, Rhizopus,* and *Mucor.*

"The origin of *qu* is obscure. It was a known entity in the early Zhou (1000 B.C.), but it could have been in existence much earlier, perhaps even before the legendary Xia dynasty (2000 B.C.). According to the *Jiu Gao* (Wine Edict), c. 300 A.D., by Jiang Tong, *qu* was first obtained when steamed rice was inadvertently left in the open and became mouldy [endnote 3 gives the exact Chinese characters]. This view is supported by two pieces of evidence. First, rice was already cultivated extensively and pottery steamers were known around 6000 B.C. in the Hemudu culture near Hangzhou [W.-G. Hang-chou, or Hang-chow, capital of Zhejiang province in eastern China]. Second, this is precisely the way a rudimentary *qu* was prepared and used in making wine

in the 1950s by the aborigines in Taiwan. Thus the earliest *qu* probably had rice as the growth substrate. Rice is still the principal substrate in South China today. But during the Zhou [1045-256 B.C.], as barley and wheat (which were considered inferior grains) grew in importance as cultivated crops in North China, they were adopted as the preferred substrates for making *qu.* Endnote 4. For further details on the origin of *qu,* see H.T. Huang's book titled *Fermentations and Food Science* in the *Science and Civilization in China* series.

"The art of using *qu* or koji to make fermented drinks, i.e. *sake,* was brought to Japan from South China, probably towards the end of the Han dynasty (Shinoda Osamu 1967, p. 551-74). Their employment in the making of fermented soy condiments, such as *Jiang,* arrived later during the Tang (618-907 A.D.), accompanied by the famous agricultural treatise *Qimin Yaoshu* (Important Arts of the People's Welfare) of 544 A.D. But the Japanese soon developed their own versions of soy condiments such as miso which is quite unlike the fermented *jiang* (soy paste) of China." Modern microbiology has shown that the principal mould in koji is *Aspergillus oryzae.*

"The technology of *qu* was also transmitted, presumably by Chinese immigrants in more recent centuries, to Indonesia. It is called *raggi* [*ragi*] by the natives or *peh-khak* ('white qu') by the Chinese settlers. In the 1890s Dutch scientists determined that the fungi in *raggi* were species of *Mucor* and *Rhizopus.* They tried to exploit the amylolytic activity of these fungi for converting grains to alcohol commercially in Seclan [Seclin], France, and Antwerp, Belgium, but their attempts were unsuccessful."

These early ventures might have remained forgotten were it not for the work Jokichi Takamine in the USA. There follows a summary of Takamine's life to 1890. In his travels in the U.S. Takamine learned how the brewers and distillers there "used malt to hydrolyze grains into sugar so they could be fermented into alcohol. He realized that Japanese *koji* was much more active than malt for the hydrolysis of grains. He studied the production of 'diastase' (amylolytic [starch splitting] enzymes) by the *koji* mold *Aspergillus oryzae* when he returned to Japan. The results convinced him that replacing malt with *koji* enzymes would be a great improvement in the manufacture of whiskey." In 1890, with the help of his wife's parents, Takamine made the fateful decision to move his family to the USA and to start the Takamine Ferment Company in Peoria, Illinois, to produce diastase for a local distillery company. The initial results were very promising.

"However, Takamine's apparent success presented an unwelcome threat to the malt producers in Peoria. They incited local xenophobia [fear and hatred of strangers or foreigners or of anything that is strange or foreign]. One night in 1894 the distillery in which his experiments were being conducted was burned down." Note 1. There is no evidence that he ever sold any of his purified enzymes in Peoria. [Three years later] "He moved his family to Chicago, where he continued to promote his diastase preparation. Fortunately, by this time, he had obtained a patent (U.S. 525,820) on the use of his diastase as a cure for dyspepsia." Parke, Davis & Co. (Michigan) agreed to make and market the product under the brand name Takadiastase. In 1897 he moved his family and research laboratory to New York City. Address: Goodwin House, 4800 Fillmore Ave., Alexandria, Virginia 22311.

541. Land deed: Japanese Heritage Foundation, Inc. sells its land and Sho-Fu-Den (Sullivan County, New York) to Sho-Fu-Den LLC. 2002. New York. 11 p. May 14. In Book 2412, p. 319.

• ***Summary:*** Japanese Heritage Foundation, Inc., a New York Corporation, is located at 224 Madison Ave., New York City, New York 10016. Sho Fu Den, LLC (Osamu Ikeda, president), a Delaware limited liability corporation, is c/o Takihyo Inc., 45 West 45th St., New York, NY 10036.

Page 1 of this deed states: Mortgage / Deed amount: $996,000.00 Transfer tax: $3,984.00. Recording charge: $70.00. Address: Sullivan County, New York.

542. Bennett, Joan W. 2002. In search of Dr. Jokichi Takamine and the origins of industrial mycology. *Inoculum: Newsletter of the Mycological Society of America.* Dec. p. 6-9. Supplement to Mycologia, Vol. 53(6). http://msafungi.org/wp-content/uploads/Inoculum/53(6).pdf [2 ref]

• ***Summary:*** This excellent article has three parts: (1) Introduction. (2) Biographical sketch of Dr. Takamine. (3). A modern pilgrimage. Part (2) has been merged with the excellent Preface Dr. Bennett wrote in 1988 to a book titled *Takamine: Documents from the Dawn of Industrial Biotechnology*–in order to expand and update that 1988 publication.

Part (3) describes a trip Dr. Bennett was invited to make to Japan in Dec. 2001 to address the Kanto Branch of the Mycological Society of Japan about new developments in fungal genomics and to learn more about Dr. Takamine. She and Mr. Yutaka Yamamoto (of Shin Nihon Chemical Company) visited many places associated with his life including: Takaoka City, where he was born on 4 Nov. 1854. "Although his birth house no longer exists, in 1954 the City of Takaoka had commemorated the 100th anniversary of Takamine's birth by creating a park in his honor... Near the entrance of the park stood a pedestal stood an impressive bust of Dr. Takamine. The plaque on the pedestal listed the dates of Takamine's birth, graduations, honors, and death (in Japanese)."

The next day she visited the "Great People of Kanazawa Memorial Museum" which "has collected what is probably the largest assortment of Takamine-related artifacts in the world. These include... many old photographs and

magazine articles... and a detailed exhibit describing the preparation of Takadiastase... A second exhibit showed the way Takadiastase is extracted from an *Aspergillus*- bran koji using water, alcohol precipitation, and filtration." "Other museum holdings not on exhibit, but preserved in the archives, included Dr. Takamine's death mask... There were also several albums with newspaper clippings and family photographs that have never been published."

Mr. Yamamoto presented the curator of the museum with a "copy of a letter from Thomas Edison to Takamine, some original laboratory notebooks from the Takamine Ferment Company, and a recent video tape that Mr. Yamamoto made of Sho Fu Den, Takamine's splendid summer home in Merriewold, New York, as well as the house in New Orleans on Esplanade Avenue, where Takamine had transformed himself from lodger to son-in-law." "The city of Kanazawa has turned Dr. Takamine's childhood home into a museum." Thanks also "to Mr. Mamoru Arai (Sankyo Company) who has long supported my interest in Dr. Takamine."

Photos show: (1) Toru Okada, standing. (2) Joan Bennett. (3) Yutaka Yamamoto holding a letter written by Jokichi Takamine. Address: Dep. of Cell and Molecular Biology, Tulane Univ., New Orleans, Louisiana 70118.

543. Yamashima, Tetsumori. 2002. Research note on adrenaline by Keizo Uenaka in 1900. *Biomedical Research* 23:1-10. [10 ref]*
Address: Dep. of Neurosurgery, Div. of Neuroscience, Kanazawa Univ. Graduate School of Medical Science, Takara-machi 13-1, Kanazawa 920-8641, Japan.

544. Yamashima, Tetsumori. 2003. Jokichi Takamine (1854-1922), the samurai chemist, and his work on adrenalin. *J. of Medical Biography* 11(2):95-102. May. [10 ref]
• ***Summary:*** "This paper reviews Takamine's route to the discovery of adrenaline and presents historical documents and photographs collected in Kanazawa, Japan, where he grew up, and the United States, where he made his major discoveries."

Contents: Summary. Introduction. Early life. Visits to the West. Engagement and marriage. Industrial innovation. The Takamine Ferment Company in Peoria. Ill-health and a new venture. A laboratory in New York. Suprarenin, epinephrine and adrenalin. Later life. Takamine's death.

During his lifetime, Takamine "was the most famous Japanese person in the United States,..." He "accomplished two great things for humanity: isolation of a potent starch-degrading enzyme, Taka-Diastase, from a mould, and the crystallization of adrenaline (the first hormone to be isolated in the twentieth century) from the adrenal gland." In the United States, adrenalin is generally, and inappropriately, called epinephrine. "The year 2000 marked the centenary of the crystallization of adrenalin."

Takamine was born in 1854 in Takaoka on the west coast of Japan. "In March of that year, Commodore Matthew Perry signed a commercial treaty between the Shogunate and the United States, after forcing his way into Yedo (now Tokyo) Bay to the consternation of many at Yedo, the capital of the Shogun." This marked the beginning of a new era for Japan. At age 1, Takamine was brought by his mother, Yukiko, to the castle town of Kanazawa, a Province of Kaga. "Seiichi, his father, was a well known samurai and physician who had worked there. Through his mastery of the Dutch language, Seiichi Takamine acquired knowledge of European modern medicine and chemistry, and was one of the few medical doctors in Japan at the time who knew both Western and traditional Japanese medical practice." At age 12, Jokichi was sent by his parents to Nagasaki, the only place in Japan where fleeting glimpses of the West could be obtained. There he was taken into the home of the Portuguese ambassador to learn basic English. At age 18, Jokichi moved to Kyoto and continued to study English. Soon afterwards, he went to Osaka and entered medical school, where he found he was more interested in studying chemistry than in becoming a physician.

"In 1872 Jokichi Takamine went to Tokyo to study applied chemistry at the College of Science and Engineering (later the Imperial University of Tokyo). After he graduated in 1879, he was one of 11 students selected for further study at the new Imperial government's expense." He "was assigned, along with 10 other young men, to go to Britain for postgraduate study. He attended Anderson's College in Glasgow (now Strathclyde University), where he studied the manufacture of fertilizers. He developed an interest in the basic and applied science of fertilization of soils. In 1883 he returned to Japan, his formal education completed."

At the International Cotton Exposition in New Orleans [Louisiana], Takamine learned that superphosphate rocks were a product of South Carolina. He brought 10 tons of the rock and phosphate fertilizer back to Japan and established the first superphosphate company in Japan, the Tokyo Artificial Fertilizer Co. The company began to show a profit after its third year in business.

In New Orleans Takamine had also met his bride to be, Caroline Hitch; he was 30 and she 18. Her mother "had purchased a commodious but dilapidated mansion in the unfashionable French quarter and refurbished the living areas in readiness for housing visitors to the exposition," who included Takamine. The two fell in love and became engaged, with the consent of her parents. But Takamine "was not confident that he would be able to establish a comfortable home and financial security, so he returned home without her."

"In 1887 Takamine was sent to Europe again, to investigate the fertilizer industry further and to purchase fertilizer machinery. On his way back to Japan he visited new Orleans again," where he and Caroline were married on 10 Aug. 1887.

"In Japan, the newlyweds lived in a dirty, uncomfortable wooden house close to the fertilizer factory in Tokyo... During their three-year stay in Tokyo, Jokichi and Caroline had two sons–Jokichi Junior, who was born on 28 Aug. 1888, and Ebenezer Takamine, who was born on 31 Aug. 1889."

In his private laboratory, he began to investigate diastatic enzymes from koji. He found that koji [long used to make sake from rice] was much more active in the production of alcohol than malt, used in the USA to produce whiskey and beer after the grain had been allowed to germinate for six days. He obtained a U.S. patent that he thought could revolutionize the U.S. distillery industry.

After putting his fertilizer company on a sound financial basis, Takamine "received a telegram from his mother-in-law informing him that a large Chicago [Illinois] distillery was interested in applying his diastase to the manufacture of whiskey. She had already been instrumental in marketing his scientific discoveries to the American business community and in founding a new company to hold the patents." Deciding to embark on a new, but risky, venture in a foreign country, the Takamine family headed for the USA.

"Takamine established the Takamine Ferment Company in Peoria, close to Chicago." There follows the story of his work with diastase and a detailed analysis of the controversial discovery of adrenaline in the USA and the court battle that ensued. Key questions are raised and carefully examined: (1) Who first isolated adrenaline / epinephrine? (2) When? (3) Was the isolated substance pure or not? (4) What had Takamine learned from his visit to the laboratory of John Jacob Abel, Professor of Pharmacology at Johns Hopkins University in about the fall of 1900, and how important had this information been to Takamine's claim to priority?

Photos (many courtesy of the *Kanazawa Furusato Ijinkan* {Great People of Kanazawa Memorial Museum}) show: (1) Takamine's boyhood home in Kanazawa. (2) Takamine at age 12 with a samurai bodyguard. (3) Caroline Hitch as a young lady (perhaps age 18). (4) Cover of the "Memorandum on adrenalin, July-December 1900, by Mr. Keizo Uenaka." (5) Illustrations and text in (4) showing Uenaka isolated adrenalin crystals by vacuum vaporization and confirmed by the Vulpian reaction that these crystals were the active principle of the adrenal medulla. (6) Shoh-Fuu-Den [Sho-Fu-Den, Sho-Foo-Den] in Sullivan County, New York. (7) Dr. Takamine in 1913 in formal dress. (8) The Takamine mausoleum at Woodlawn Cemetery in New York. Address: Dep. of Neurosurgery, Div. of Neuroscience, Kanazawa Univ. Graduate School of Medical Science, Takara-machi 13-1, Kanazawa 920-8641, Japan.

545. Bowden, Mary Ellen; Crow, Amy Beth; Sullivan, Tracy. 2003. Pharmaceutical achievers: The human face of pharmaceutical research. Philadelphia, Pennsylvania: Chemical Heritage Press. xi + 220 p. Index. Illust. 28 cm. [160* ref]

• ***Summary:*** Shows the human side of pharmaceutical research. Contains interesting sections and excellent photos of: Harvey W. Wiley (p. 26-28). John Jacob Abel and Jokichi Takamine (p. 1, 47-51 adrenaline). Andrew Moyer of the NRRL (p. 86-87, penicillin). Percy Julian (p. 106-12, steroids, stigmasterol, cortisone, hydrocortisone).

Chapter 4, "Enzymes, hormones, and neurotransmitters" (p. 42-63) begins with a subtitle: "In the early twentieth century, scientists made great strides in understanding the roles of the body's own chemicals in regulating its functions and transmitting information among its parts. Among these chemical substances were enzymes, hormones, neurotransmitters, and histamines–all investigated successfully in the first three decades of the twentieth century."

Page 43, which contains an early history of enzymes, begins: "Enzymes are remarkable compounds that make possible the chemical reactions of life." In 1835 "Jöns Jakob Berzelius recognized that some substances in living bodies cause chemical reactions but do not themselves undergo change. He named these substances 'catalysts...' Such substances were also called 'ferments.'" "In 1876 Willy Kühne coined the word *enzyme...*" "In 1894, in the course of his work on sugars, Emil Fischer noted the specificity of enzymes, that each enzyme works only with a specific substrate." "Seminal work published in 1912 by Leonor Michaelis and Maud Leonora Lenten, a German man and a Canadian woman, cast light on the reasons why enzymes are so efficient."

The section on John Jacob Abel (1857-1938) and Jokichi Takamine (1854-1922) notes that the word "hormones" was coined in 1905. It begins with a good biography of Abel. "In 1897, using various separation techniques, Abel managed to obtain a crystalline product from sheep adrenal glands, which he named 'epinephrine,' that was remarkably effective in raising blood pressure. He had not, however, isolated the pure substance but probably a slightly impure derivative of it."

While Takamine and Wooyenaka did isolate the pure substance, Takamine attempted but failed to determine the correct chemical formula for adrenaline. The correct formula was actually determined by Thomas Aldrich, a chemist working at Parke, Davis & Co. in Detroit, a company with which Takamine had long had a business relationship. (p. 47-51 adrenaline). Address: Chemical Heritage Foundation, Philadelphia, Pennsylvania.

546. Bennett, Joan W.; Yamamoto, Yutaka. 2004. Dr. Jokichi Takamine: Japanese father of American biotechnology–the 150th anniversary of his birth. In: M.W. Watanabe, K.Y. Suzuki, and T. Seki, eds. 2004. Proceedings of the 10th International Congress for Cultural Collections. See p. 41-45. Held 10-15 Oct. 2004 at Tsukuba, Japan. [5 ref]

• ***Summary:*** This paper was presented as part of a session titled: "Innovative Roles of Biological Resource Centers." It is No. 2.5.

Contents: Abstract. Early years and marriage. The diastatic enzyme from *Aspergillus oryzae.* Adrenalin. Takamine's golden years. Epilogue.

Photos show: (1) Portrait photo (the best and most famous) of Dr. Jokichi Takamine (courtesy of The Great People of Kanazawa Memorial Museum, Kanazawa, Japan). (2) View through the woods of *Sho Fu Den* in Merriewold, New York.

Adrenalin (epinephrin) was the first modern wonder drug. "His mother, Yukiko, came from a family that owned a sake brewery." Sake is made using rice koji in which the mold *Aspergillus oryzae* is grown on steamed rice.

"While in New Orleans he rented a French Quarter apartment from a retired Union officer Colonel Ebenezer Hitch, and befriended a young journalist named Lafcadio Hearn, who later emigrated to Japan and achieved fame as a writer." More significantly, "he fell in love with the landlord's daughter, Caroline Field Hitch. Before returning to Japan at the end of the Cotton Exposition, Takamine proposed marriage to Caroline, promising to return as soon as he had established himself financially."

True to his word, he returned within two years. Jokichi was married to Caroline Hitch "in the heat of the New Orleans summer, on August 10, 1887. It was an unconventional match for the era, and one which would eventually cement Takamine's connection to the USA." "Because Caroline was unhappy living in Japan, Jokichi sought new business opportunities back in the U.S.A. He knew he could not compete in the well established American fertilizer industry. Therefore, in a stroke of genius, Takamine decided to reverse what was then the usual cultural flow of technology. Rather than adapting a western technology to a Japanese enterprise, Takamine adapted a Japanese technology to a western industry."

Throughout human history, brewers worldwide have "learned by trial and error how to use yeast to make alcohol. Alcoholic fermentations start with sugar. Since yeast does not possess any starch degrading enzymes, starchy materials such as corn, rice and wheat must be saccharified [broken down into sugars] before fermentation. Starch-degrading enzymes are variously called amylases or, in the older literature, diastases. In Western brewing, diastatic enzymes were traditionally derived from malt made from germinating barley. In Japan and some other Asian cultures, diastases were obtained from mold cultures grown on rice. These mold cultures are comparable to malt but more enzymatically active (Nout and Aidoo 2002). Believing that a diastatic enzyme derived from *Aspergillus oryzae* could revolutionize the American distillery industry, Takamine and his young family [of four] returned to the USA in 1890."

"In his will, he [Dr. Takamine] left most of his estate to Caroline, who commissioned a vanity biography for her late husband, sold off the Japanese style homes, and then married a much younger American man [Charles P. Beach, of Vail, Arizona] who eventually dissipated much of her fortune.

Jokichi, Jr. died under mysterious circumstances well before World War II [22 Feb. 1930 in New York City] and with his death the International Ferment Company of New York was dissolved. Eben continued running the Clifton company. After his death in 1953, Eben's widow sold it to Miles Laboratories of Elkhart, Indiana. In 1978 Miles was acquired by Bayer Corporation and several years later the antiquated facilities in Clifton were leveled and the land sold off for a suburban housing development. In 1989, Bayer sold the Miles enzyme business to Solvay, a Belgian company, which in turn sold the business to Genencor International in 1996. The old Miles facility in Elkhart, Indiana, which had housed some archival Takamine materials, was closed.

"Mr. Jay Shetty of Genencor International, working with Yutaka Yamamoto, arranged to have Takamine's papers and other artifacts from the Miles archives moved to 'The Great People of Kanazawa Memorial Museum' [*Kanazawa Furusato Ijinkan*] in Kanazawa, Japan. In addition, Arthur Sears of Valley Research, Inc., South Bend, Indiana, established a Takamine Memorial Room at his company headquarters."

"Thus, in addition to being a pioneer of enzymology, Takamine was a major figure in endocrinology, isolating epinephrine, and patenting and copyrighting it under the name Adrenalin. Unlike many scientists, he was brilliantly entrepreunurial: he knew how to turn his biochemical extracts into profitable products. Quite remarkably, he held two of the earliest patents in biotechnology: the first patent on a microbial enzyme and the first patent on a purified hormone.

"Jokichi Takamine understood the power of philanthropy. During his lifetime he did much to improve cultural and political relationships between Japan and the U.S.A. The cherry trees in Washington, DC are a lasting legacy of his foresight. On this 150th anniversary of his birth [in 1854], it is important to remember his contributions not only to early biotechnology but also to cultural understanding." Address: 1. Dep. of Cell and Molecular Biology, Tulane Univ., New Orleans, Louisiana 70118; 2. Shin Nihon Chemical Co., Ltd., Aichi 446-0063.

547. Yonema, Shiro. 2005. N.Y.'s Nippon Club turns 100: Scientific founders remembered. *Japan Times* (*Tokyo*). April 2.

• ***Summary:*** The centennial included an exhibition on the history of founder Jokichi Takamine (1854-1922), a renowned chemist and industrialist. The two other founders (in 1905) were pioneering businessmen Ryokichi Arai and Yasukata Murai. Takamine became the first president of the club, where famed bacteriologist Hideyo Noguchi, a fellow

at the Rockefeller Institute, was often seen playing *shogi* (Japanese chess).

The exhibition "gives visitors a glimpse of an America baffled by Japan's impending victory in the Russo-Japanese War. 'My dear little man, if you are the Yankees of the East, then I want to be called the Jap of the West,' said *Life* magazine's April 13, 1905, issue."

"The exhibition also featured memorabilia, including a letter to Takamine from the legendary inventor Thomas Edison, and bottles of takadiastase, which helped Takamine become the first president of Sankyo Co., one of Japan's largest pharmaceutical companies."

The exhibition also depicts Takamine the "philanthropist who, as friend of then Tokyo Mayor Yukio Okazi, sent cherry trees to Washington [DC] and New York in 1912." A large, excellent portrait photo in the online version of this article shows Jokichi Takamine.

548. Consulate General of Japan in New York. 2006. Sakura Park (Website printout–part). www.cgj.org/ 150th/html/ nyepiE2c.htm. 1 p. Printed Feb. 10.
• ***Summary:*** "As the name indicates, Sakura Park ("Cherry Blossom Park"), located in Manhattan's Upper West Side at 122nd Street and Riverside Drive, is a historic site, with close ties to Japan.

"In 1909 the Hudson Fulton Celebration was held to commemorate the 100th anniversary of Robert Fulton, the inventor of the steamboat, as well as the 300th anniversary of English explorer Henry Hudson's discovery of the Hudson River. At the time, various events were held throughout New York State to mark these anniversaries.

"As part of these celebrations, the Committee of Japanese Residents of New York arranged to donate 2,000 cherry trees to what was then known as Claremont Park."

But customs agents declared that the trees were infected with insects and could not be planted for fear of infecting American agriculture. President Taft was forced to order all the trees burned, creating quite a diplomatic quagmire. Questions have arisen as to whether or not the trees were truly infected, as the Japanese nursery had certified them before leaving Japanese shores.

"Finally in 1912, three years after originally scheduled, the trees arrived and were planted in the park. The park was renamed Sakura Park.

"Later, the City of New York purchased Sakura Park from John D. Rockefeller who owned the land. It was redesigned and opened to the public in 1934. This was made possible, in part, by contributions from the Rockefeller family." Address: New York City.

549. Deerland Enzymes. 2006. Dr. Jokichi Takamine: Japanese father of American biotechnology (Web article). http://www.deerland-enzymes.com/userfiles/image/deerland/ Dr_Jokichi_Takamine.gif. 5 p. Printed Feb. 10.
• ***Summary:*** An excellent biography written by Dr. Joan Bennett and Yutaka Yamamoto. At the top of page 1 is an outstanding portrait photo of Dr. Jokichi Takamine, dressed in a two-piece suit with white tie.

550. National Park Service (U.S.). 2006. History of the cherry trees in Washington, D.C. (Web article). http://www.nps.gov/cherry/cherry-blossom-history.htm. 11 p. Printed Feb. 11.
• ***Summary:*** An excellent chronology, with many photos, from 1885 to the present. Discusses (with portrait photos): Mrs. Eliza Ruhamah Scidmore, Dr. David Fairchild, First Lady Helen Herron Taft, Dr. Jokichi Takamine. Mr. Midzuno (Japanese consul in New York). President William Howard Taft. Yukio Ozaki (Mayor of Tokyo).

Here are some sample entries:

"The plantings of cherry trees originated in 1912 as a gift of friendship to the People of the United States from the People of Japan. In Japan, the flowering cherry tree, or "Sakura," is an exalted flowering plant. The beauty of the cherry blossom is a potent symbol equated with the evanescence of human life and epitomizes the transformations Japanese Culture has undergone throughout the ages.

"1885: Mrs. Eliza Ruhamah Scidmore, upon returning to Washington from her first visit to Japan, approached the U.S. Army Superintendent of the Office of Public Buildings and Grounds, Colonel Spencer Cosby, with the proposal that cherry trees be planted one day along the reclaimed Potomac waterfront. Her request fell on deaf ears. Over the next twenty-four years, Mrs. Scidmore approached every new superintendent, but her idea met with no success.

"1906: Dr. David Fairchild, plant explorer and U.S. Department of Agriculture official, imported seventy-five flowering cherry trees and twenty-five single-flowered weeping types from the Yokohama Nursery Company in Japan. He planted these on a hillside on his own property in Chevy Chase, Maryland, where he attempted to test their hardiness.

"1907: The Fairchilds, pleased with the success of the trees, began to promote Japanese flowering cherry trees as the ideal type of tree to plant along avenues in the Washington area. Friends of the Fairchilds also became interested and on September 26, arrangements were completed with the Chevy Chase Land Company to order three hundred Oriental cherry trees for the Chevy Chase area.

"1908: Dr. David Fairchild gave cherry saplings to children from each District of Columbia school to plant in their schoolyard for the observance of Arbor Day. In closing his Arbor Day lecture, Dr. Fairchild expressed an appeal that the 'Speedway' (no longer existing, but marked by portions of Independence and Maine Avenues, SW and East and West Basin Drives, SW, around the Tidal Basin) be transformed into a 'Field of Cherries.' In attendance was Eliza Scidmore,

to whom he referred later as a great authority on Japan.

"1909: Mrs. Scidmore decided to try to raise the money required to purchase the cherry trees and then donate them to the city. As a matter of course, Mrs. Scidmore sent a note outlining her plan to the new first lady, Helen Herron Taft. Mrs. Taft had lived in Japan and was familiar with the beauty of the flowering cherry trees. Two days later the first lady responded:

"The White House, Washington

"April 7, 1909

"Thank you very much for your suggestion about the cherry trees. I have taken the matter up and am promised the trees, but I thought perhaps it would be best to make an avenue of them, extending down to the turn in the road, as the other part is still too rough to do any planting. Of course, they could not reflect in the water, but the effect would be very lovely of the long avenue. Let me know what you think about this.

Sincerely yours, Helen H. Taft

"April 8: The day after Mrs. Taft's letter of April 7, Dr. Jokichi Takamine, the Japanese chemist who discovered adrenaline and takadiastase, was in Washington with Mr. Midzuno, Japanese consul in New York. When he was told that Washington was to have Japanese cherry trees planted along the Speedway, he asked whether Mrs. Taft would accept a donation of an additional two thousand trees to fill out the area. Mr. Midzuno thought it was a fine idea and suggested that the trees be given in the name of the City of Tokyo. First Lady Taft agreed to accept a donation of 2,000 cherry trees.

"1909 August 30: The Japanese Embassy informed the Department of State that the City of Tokyo intended to donate to the United States two thousand cherry trees to be planted along the Potomac River.

"1909 December 10: Two thousand cherry trees arrived in Seattle, Washington from Japan.

"1910: On January 6, the two thousand trees arrived in Washington, D.C.

"January 19: To everyone's dismay, an inspection team from the Department of Agriculture discovered that the trees were infested with insects and nematodes, and were diseased. To protect American growers, the department concluded that the trees must be destroyed.

January 28: President William Howard Taft granted his consent to burn the trees.

"Tokyo Mayor Yukio Ozaki and others suggested a second donation be made, and the Tokyo City Council authorized this plan. The number of trees had now increased to 3,020. The scions for these trees were taken in December 1910 from the famous collection along the bank of the Arakawa River in Adachi Ward, a suburb of Tokyo, and grafted onto specially selected understock produced in Itami City, Hyogo Prefecture.

"1912: February 14, 3,020 cherry trees from twelve varieties were shipped from Yokohama on board the S.S. Awa Maru, bound for Seattle. Upon arrival, they were transferred to insulated freight cars for the shipment to Washington. D.C.

"March 26: 3,020 cherry trees arrived in Washington, D.C." Most were of the variety "Somei-Yoshino."

551. Sankyo Co., Ltd. 2006. Key figures in Sankyo history: Jokichi Takamine (Web article). http://www.sankyo.co.jp/english/history/history05.html. 2 p. Printed Feb. 10.
• ***Summary:*** "On a passenger liner moored in Kobe harbor in February 1902, Jokichi Takamine, on a visit back to Japan from his home in New York, was anxiously awaiting his first meeting with the young Shiobara. Three years had passed since Takamine had turned over to this young man the Japanese sales rights to Taka-Diastase, the powerful digestive enzyme that he had discovered. This meeting held a special significance for Takamine, himself, and for the company that would become Sankyo." The story unfolds. "This was the beginning of a friendship between the two men that lasted for more than 20 years, and eventually led to Takamine being invited to become the first president of Sankyo and the start of its long history."

Photos show: (1) Portrait photo of Jokichi Takamine. (2) Photo of the book, in Japanese, *Takamine: The Legend.* (3) Shiobara with Takamine on a boat in Lake Michigan, 1904.

552. Innes, Stephanie. 2006. Vail congregants to worship in roomier surroundings. *Arizona Daily Star.* June 20.
• ***Summary:*** "Catholics in the exploding community of Vail southeast of Tucson are at long last getting a reprieve from overcrowding that has plagued their church for the past decade."

The original St. Rita's sanctuary, which continues to draw tourists from around the world, will continue to be used for weekday Masses. Tourists also are often drawn to the history of the shrine, which was dedicated in 1935 to Japanese chemist Jokichi Takamine–a Buddhist who converted to Catholicism–by his widow, Caroline Takamine Beach. Takamine Beach moved to Arizona from New York City to marry Vail rancher Charles P. Beach after her first husband died in 1922.

"The altar and tabernacle are made from stone from the nearby Santa Rita Mountains. The altar weighs 5 tons. Stations of the Cross made of Mexican tile in the church are from the original 1935 construction.

"The church was able to acquire extra land for its new building with more than $200,000 left in a trust by the Beach and Takamine families, for use only if St. Rita's was still attracting worshippers.

"Parameters set out by the families forbade any alterations to the chapel. But no one in 1935 could have predicted the surge in Vail's population. The church was originally built for what was then a large population of

migrant Mexicans who worked on ranches and for the Southern Pacific Railroad."

Note: Charles Beach was born in 1865.

553. *SoyaScan Notes.* 2007. Documents on the history of the Whisky Trust, formally known as the Distillers and Cattle Feeders' Trust. Jan. 20. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** According to the OCLC database, no book or PhD these has ever been written about the history of this trust. However several government documents are available:

(1) 1888 July 27. Whiskey. On this date a Congressional committee, U.S. House of Representatives, convened to question John M. Atherton, Thomas H. Sherley and Joseph B. Greenhut, all members of the trust. The questions encompassed all aspects of the distilling industry and the trust. The resulting document (94 pages, 23 cm) is OCLC 6133-0750.

(2) 1889 March 2. Trusts: Report. Investigation of whisky trust by the House Committee on Manufactures (188 + 35 p., 23 cm). OCLC 1803-6748.

(3) 1893 March. Whiskey trust investigation report. House Committee on the Judiciary. Report No. 2601 (98 p., 22 cm). OCLC 3414-8594.

Trusts were a major issue in the USA in the late 1800s. In 1890 the Sherman Antitrust Act was passed; this federal legislation prohibited "monopolies or attempts to monopolize" and "contracts, combinations, or conspiracies in restraint of trade" in interstate or foreign commerce. This act was supplemented by the Clayton Antitrust Act of 1914. Both acts are enforced by the Federal Trade Commission (FTC) and the Antitrust Division of the U.S. Attorney General's office.

554. Katsuo, Kinya. 2007. Jokichi wa yuku nami norikoete: Taka-Jiasutaaze o hakken shita kagaku-sha Takamine Jôkichi [Jokichi has overcome the advancing waves: The scientist who discovered Taka-Diastase]. Kanazawa: Hokoku Shinbun-sha. 40 p. May 10. Illust. by Shinya Kamide. 30 cm. Series: Furusato Ijin Ehon-kan Henshû-iin. [Jap]*

• ***Summary:*** This is largely a picture book. Address: Japan.

555. Hitch, Michael G. 2007. Adam Hitch (1658 to 1731) of Old Somerset in ye Province of Maryland: His descendants Denver, Colorado: Outskirts Press, Inc. xvii + 685 p. Illust. Index. 30 cm. [300+* ref]

• ***Summary:*** This is a genealogy of Adam Hitch (1658/59-1731) who came to Maryland in the 17th century, and his descendants through the present day. Each piece of genealogical information is well documented. Michael G. Hitch was born in Salisbury, Maryland in 1959.

The family of Caroline Field Hitch and Jokichi Takamine is given on page 455 (#1481).

The family of Caroline's parents, Ebenezer Vose Hitch and Mary Beatrice Field, are given on pages 325-27 (#738). Ebenezer was born on 20 Sept. 1841 in Fairhaven, Bristol Co., Massachusetts, They were married in about 1865 in Louisiana. He died on 1 Oct. 1914 in New York City, New York, and was buried on about 4 Oct. 1914 in Woodside Cemetery, Main & Morgan Streets, North Fairhaven, Bristol Co., Massachusetts, Mary was born in 1850 in Louisiana. She died on 12 Dec. 1897 in Chicago, Cook Co., Illinois. Ebenezer and Mary had about 13 children; seven are listed here and 5 of those grew up and were married. Photos show: (1) Mary Hitch circa 1885. (2) Ebenezer and Mary at the time of their marriage in about 1865. Both photos are from *Where the Wings Grow,* by Agnes de Mille (Doubleday 1978). Ebenezer was married (#2) to Elizabeth Muriel (?). She died about Sept. 1922. They had one child, Violet Hitch, born 28 Nov. 1908.

The family of Ebenezer Vose Hitch, Frederick Augustus Hitch and Carline Amanda Soule, is given on pages 209-10. Frederick was born on 4 Jan. 1811 in Fairhaven, Bristol Co., Massachusetts. He was christened in Feb. 1813 in Rochester, Plymouth Co., Massachusetts. He and Caroline were married on 12 Sept. 1833 in Bristol Co., Massachusetts. He died on 6 Aug. 1871 in Bristol Co., Massachusetts, and was buried about 9 Aug. 1871 in Woodside Cemetery, Main & Morgan Streets, North Fairhaven, Bristol Co., Massachusetts. Caroline was born on 30 Sept. 1812 in Westport, Bristol Co., Massachusetts. She died on 12 April 1888 in Bristol Co., Massachusetts. She was buried about 15 April 1888 in Woodside Cemetery. Frederick and Caroline had about 8 children, of which Ebenezer Vose Hitch was the 3rd child and 2nd son.

The family of Frederick Augustus Hitch, Hardy Elgate Hitch and Betsy Delano, is given on pages 106-07 (#134). Hardy was born on 12 June 1775 in Bristol Co., Massachusetts, and died on 30 Aug. 1858 in Bristol Co., Mass. He married Betsy Delano on 11 Dec. 1803 in New Bedford, Bristol Co., Mass. They had 9 children. Address: Salisbury, Maryland.

556. Hunt, Sharon E. 2007. Vail and Colossal Cave Mountain Park. Charleston, South Carolina: Arcadia Publishing. 127 p. Illust. Index. 23 cm. [9 ref]

• ***Summary:*** Vail became know as "The Town Between the Tracks" although it never incorporated. The first tracks were laid by the Southern Pacific Railroad in 1880 and the second by the El Paso and Southwestern Railroad in 1912 (p. 87).

Chapter 3, "Cows, cowboys, and cowgirls" notes (p. 69) that in the late 1900s and early 20th century, Vail was primarily a cattle ranching area. Ranches spread over the desert and cattle roamed the hills and valley. "Caroline and Charles Bach owned the Beach Ranch or El Rancho le los Ocotillos" (the word "ocotillo" refers to *Fouquieria splendens* Engelm., a desert plant of the southwestern United States and northern Mexico. Although it looks somewhat

like a cactus, it is not a true cactus). The Beachs, who were prominent members of the Vail community, owned property and buildings along the railroad tracks in the center of Vail.

A photo (p. 92) shows the center of Vail between the railroad taken in March 1935 on the day of the dedication of Vail's Catholic church, the Shrine of Santa Rita in the Desert. The buildings from left to right are the post office, the freight depot, the section foreman's house, and the Vail train junction. Many 1930 autos are parked.

A large map (p. 92, courtesy Bill Allen) bears this caption: "Vail resident Bill Allen drew this map of Vail in 1944." It shows (from top to bottom): The stockyard. The westbound tracks. Vail road to Colossal Cave. Wagner house. Adobe house. Post office. Church. Rectory. Guest house. Ore dump. Railroad workers quarters. Eastbound tracks. Mail bag stand. Vail school. etc.

Chapter 5, "The Shrine of Santa Rita in the Desert" (p. 103-106+) notes that this shrine was built in 1934-35 in Vail between the railroad tracks. "It was a gift from local rancher Caroline Beach and erected as a memorial to her first husband, Dr. Jokichi Takamine."

Her youngest son, Eben Takamine, came to Arizona in the mid-1920s "for health reasons and stayed with Charles P. Beach, a ranch hand in Vail. He introduced Caroline and Charlie, and they married in Tucson's St. Augustine Cathedral in 1926.

"Charles Pablo Beach was born in 1889 in Kansas and grew up in California. He attended the University of Arizona in Tucson from 1913 to 1916 and studied 'mining and cattle' in the agriculture department. He served in France during World War I and then returned to Arizona where he homesteaded near Vail" (p. 103).

Photos (p. 104, courtesy Calvin Baker) show: (1) The outside of the Shrine, with many autos parked, during the dedication ceremony held March 31, 1935. "Tucson's first American-born bishop, Daniel J. Gercke, officiated before 600 visitors on that day. A barbecue, with steers from the Beach Ranch cooked in the western fashion over fire pits, was open to all. People came from Tucson and the neighboring ranches to celebrate. (2) Another view of the shrine on the same day showing many other autos. The shrine is located next to the northern train tracks. The building on the left is the guesthouse for the shrine. The building on the right is the Vail Post Office. This image as taken from in front of the Vail School. The Santa Rita Mountains tower in the background.

Photos (p. 105) show: (1) Another view of the church on the day of its dedication. "Caroline Bach commissioned architect H.D.R. Figge to build the shrine to convey the feeling of a rural Mexican church. It was built around the lovely stained glass windows she rescued from Tucson's First United Methodist Church before it was demolished in 1931. The church was built in the classic Mission style with soft-toned walls reflecting the desert sun and giving the impression of rising out of the surrounding desert (Courtesy of Calvin Baker).

(2) The front of the shrine, which was built to be simple and dignified. It is constructed of white adobe with red-tile roof. The bell at the top right front of the building was a gift of Eben Takamine, Caroline and Jokichi's younger son; he had it specially cast in bronze for the church. A small arched tower atop the church holds the bell. The ringing of this bell brought together the far-ranging residents of Vail in its early days (Courtesy Roman Catholic Diocese of Tucson)."

Photos (p. 106, both courtesy of Calvin Baker) show: (1) Mary's Well, donated by local rancher Mary Haskell Jenks. Her well was an artificial one, built to collect rainwater from the church roof. (2) Children celebrate their first communion at the shrine in 1936. From 1935 to 1968 the shrine was a mission; priests from Tucson would come to Vail to celebrate Mass and administer sacraments to Catholics who lived in the area."

Talk with Sharon E. Hunt. 2012. July. The two sets of tracks in Vail about are 100 yards apart. Sharon learned that Eben stayed with Charles Beach from an excellent book which is no longer in print, titled "Whispered prayers in the Arizona desert: A history of the Shrine of Santa Rita," by Ann Grigsby. She will try to find her copy and send a scan or copy to Shurtleff. Address: Librarian and archivist at Colossal Cave Mountain Park.

557. Klein, R.M. 2008. The legacies of Dr. Jokichi Takamine. *MD Advisor* 1(4):36-43. Fall. [Jap]
Address: Dep. of Pediatrics, Div. of Allergy & Clinical Immunology, Columbia Univ. College of Physicians & Surgeons, New York, NY.

558. Lamb, J.J. 2010. The shrine that love built. *South East Side Connections* (*Vail, Arizona*). Feb. p. 12.
• ***Summary:*** "Carolyn was a young woman when the World Exposition was held in her hometown of New Orleans in 1884. Her family provided accommodations at their Esplanade Avenue residence for foreign delegates to the year-long event. Mr. Tamari and Jokichi Takamine, Japanese scientists spent their stay in the Hitch household. It was an exciting time of discovery as experts from around the world met to discuss and promote progress and good will between nations.

Carolyn and Jokichi fell in love and before he returned to Japan he had proposed. He pledged that when he was financially established he would return. Their love was unconventional for the time; they were wed in August 1887. Her beautiful white dress embroidered with chrysanthemums was designed, and made in Japan. The couple honeymooned in South Caroline and Washington D.C. taking time to work and study during their travels before sailing from San Francisco to Japan to make their home. They were very much in love, and two sons were soon born, but life was

difficult for Carolyn who never felt completely accepted in her adopted home.

"In 1890 the family returned to the U.S. where Jokichi's hard work paid off. One of his many patents was 'Adrenalin.' He became increasingly wealthy and famous, even receiving the Order of the Rising Sun from the emperor of Japan. In about 1909 Takamine encouraged the Japanese government to send a gift of 2000 cherry trees to Washington D.C. Then, in 1922 his health failed and he left Carolyn, his wife of nearly 35 years to mourn his passing.

"Their son Eben introduced her to Arizona and to Charles Beach, a ranch hand from Vail who would become the second love of her life in 1926. They married and built a ranch house calling it 'El Rancho de los Ocotillos.'

"Carolyn, a devout Catholic, was very active in the small Vail congregation that met at the school house. She felt very strongly that they needed a permanent place to worship. That need grew into action as she planned and built the beautiful Shrine of St. Rita in the Desert as a memorial to her first husband, Jokichi Takamine. The faith and loves that filled Carolyn's life live on in her gift to Vail, The Shrine of St. Rita in the Desert."

Note: A color photo shows the Shrine of St. Rita in the Desert. Address: Vail Preservation Society.

559. Sakura, sakura [Cherry trees, cherry trees]. 2010. Japan: Debuted in Japan on 10 April 2010. [Jap]*
• ***Summary:*** This Japanese-language film is a biography of Jokichi Takamine and his wife, Caroline Hitch. Directed by Tôru Ichikawa. Screenplay by Mieko Shimojima and Toshimichi Saeki. Jokichi Takamine played by Masaya Katô. Caroline Hitch Takamine, his wife, played by Naomi Grace. Matasaku Shiobara played by Shinnosuke Fujima.

560. Hokoku Shinbunsha Henshu Kyoku. 2011. Samurai kagakusha: Takamine hakase [Samurai chemist: Dr. Takamine]. Kanazawa: Hokoku Shinbunsha 312 p. 18 cm. *
• ***Summary:*** This is a compilation of columns that were published serially in a local newspaper.

561. Takamine [Jokichi Takamine]. 2011. Japan: 105 min. Debuted in Japan on 16 May 2011. [Jap]*
• ***Summary:*** This Japanese-language film is a biography of Jokichi Takamine and his wife, Caroline Hitch. Directed by Tôru Ichikawa. Screenplay by Shimojima and Toshimichi Saeki. Jokichi Takamine played by Hatsunori Hasegawa. Caroline Hitch Takamine, his wife, played by Naomi Grace. Jun Takehashi played by Sachiko Kokubu.

562. Bennett, Joan W. 2011. Jokichi Takamine: Japanese father of American biotechnology. Paper presented at International Union of Microbiological Societies, Sacred Heart School, Sapporo, Japan. Sept. *
• ***Summary:*** This paper was presented to girls at a Catholic high school near Sapporo, Japan. It was shorter than her professional paper, with more emphasis on young Carline. Address: Prof., Dep. of Plant Biology and Pathology, Office for Promotion of Women in Science, Engineering, and Mathematics, 59 Dudley Rd., Rutgers Univ., New Brunswick, New Jersey 08901-8520.

563. Bennett, Joan W. 2011. Jokichi Takamine and the birth of biotechnology. Paper presented at International Union of Microbiological Societies, Sacred Heart School, Sapporo,

Japan. Sept. *
• ***Summary:*** This paper was presented as part of a session titled: "Transformative moments in the history of microbiology: the contributions of Takamine and Kitasato" (with Jorg Hacker). Address: Prof., Dep. of Plant Biology and Pathology, Office for Promotion of Women in Science, Engineering, and Mathematics, 59 Dudley Rd., Rutgers Univ., New Brunswick, New Jersey 08901-8520.

564. Saito, S.; Kamiyama, J. 2011. [Adrenaline: isolated 111 years ago by an energetic Japanese scientist, Jokichi Takamine]. *Masui. The Japanese Journal of Anesthesiology* 60(11):1331-41. Nov. [Jap]
• ***Summary:*** Adrenaline is one of the most commonly used drugs in anesthesia, intensive care and pain medicine. Conflicts provoked after the invention suggest many fundamental issues regarding scientific invention and business. Address: Dep. of Anesthesiology, Gunma Univ. Graduate School of Medicine, Maebashi 371-8511.

565. Harkness, Jon M. 2011. Dicta on Adrenalin(e): Myriad problems with Learned Hand's product-of-nature pronouncements in *Parke-Davis v. Mulford. Journal of the Patent and Trademark Office Society* 93(4):363-99. [50 ref]
• ***Summary:*** Takamine obtained the first patent on "an isolated or purified natural substance." The paper explains the great reluctance the U,S. Patent Office had in issuing such a patent and their rationale for such reluctance. It also shows that it took seven rounds of applications before Takamine and his attorneys were able to overcome this reluctance. Examining their perseverance and various approaches can give us a new insight in into Dr. Takamine.

But of much broader significance is the legal principles that flowed from patent, and, even more, from *Parke-Davis v. Mulford* (1911). This 1911 case was a patent dispute over a therapeutic version of the hormone adrenaline. This article is based on a detailed historical examination of Parke-Davis and the patent application process that predated the litigation by roughly a decade.

Parke-Davis was a classic (and protracted) priority dispute; the litigants gave no discernible attention to whether isolated products of nature could be patented. Judge Learned Hand's now-famous Parke-Davis pronouncements on the patentability of isolated products of nature were under-informed dicta, which conflicted with existing patent law.

Hand's rulings from Parke-Davis essentially lay dormant until 1958, when it was relied upon by Fourth Circuit judges grappling with the patentability of vitamin B-12. By 1958, Hand had become a living legal legend, and his judicial colleagues did not recognize that, in April 1911, a 39-year-old district court judge–less than two years removed from law practice on Wall Street (handling one of his first patent cases)–had made an uninformed mistake in Parke-Davis. In the years since 1958, Hand's errant Parke-Davis pronouncements have ascended from obscurity to conventional wisdom.

This conventional wisdom is now making possible the patenting of human genes, plant genes, and a myriad of other natural products that have commercial value.

The author argues that we should "reverse the trajectory of historical inertia that began with a small–almost inadvertent–shove in the wrong direction, a century ago, from an inexperienced and under-informed district court judge" and prohibit the patenting of natural products and of substances isolated from natural products.

"The current controversy was sparked in May 2009 when a consortium of medical societies, researchers, physicians, and patients filed a lawsuit aimed to invalidate patents on two sections of human DNA that serve as markers for breast cancer." In fact, more than 2,500 patents have been issued with claims to "isolated DNA" during recent years. Address: J.D., Ph.D., Univ. of Minnesota.

566. Wikipedia, the free encyclopedia. 2012. Jokichi Takamine (Web article). http://en.wikipedia.org/wiki/Jokichi_Takamine. 4 p. Printed June 4.
• ***Summary:*** Jokichi Takamine (in Japanese: Takamine Jokichi, November 3, 1854–July 22, 1922) was a Japanese chemist.

"Early life and education: Takamine was born in Takaoka, Toyama Prefecture, in November 1854. His father was a doctor; his mother a member of a family of sake brewers. He spent his childhood in Kanazawa, capital of present-day Ishikawa Prefecture in central Honshu, and was educated in Osaka, Kyoto, and Tokyo, graduating from the Tokyo Imperial University in 1879. He did postgraduate work at University of Glasgow and Anderson College in Scotland. He returned to Japan in 1883 and joined the division of chemistry at the Department of Agriculture and Commerce.

"He learned English as a child from a Dutch family in Nagasaki and so always spoke English with a Dutch accent.

"Career–Japan: Takamine continued to work for the department of agriculture and commerce until 1887. He then founded the Tokyo Artificial Fertilizer Company, where he later isolated the enzyme takadiastase, an enzyme that catalyzes the breakdown of starch. Takamine developed his diastase from koji, a fungus used in the manufacture of soy sauce and miso. Its Latin name is *Aspergillus oryzae,* and it is a "designated national fungus" (*kokkin*) in Japan.

"In 1899, Takamine was awarded an honorary Doctorate in Engineering by what is now the University of Tokyo.

"United States: Takamine went as co-commissioner of the Cotton Exposition to New Orleans in 1884, where he met Lafcadio Hearn and Caroline Hitch, his future wife. He later emigrated to the United States and established his own research laboratory in New York City but licensed the exclusive production rights for Takadiastase to one of

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the largest US pharmaceutical companies, Parke, Davis & Co. This turned out to be a shrewd move–he became a millionaire in a relatively short time and by the early 20th century was estimated to be worth $30 million.

"In 1901 he isolated and purified the hormone adrenaline (the first effective bronchodilator for asthma) from animal glands, becoming the first to accomplish this for a glandular hormone.

"In 1905 he founded the Nippon Club, which was for many years located at 161 West 93rd Street in Manhattan.

"Many of the beautiful cherry blossom trees in the West Potomac Park surrounding the Tidal Basin in Washington, D.C. were donated by the mayor of Tokyo, Yukio Ozaki and Dr. Takamine in 1912.

"In 1904, the Emperor Meiji of Japan honored Takamine with an unusual gift. In the context of the St. Louis World Fair (Louisiana Purchase Exposition), the Japanese government had replicated a historical Japanese structure, the "Pine and Maple Palace" (*Shofu-den*), modelled after the Kyoto Imperial Coronation Palace of 1,300 years ago. This structure was gifted to Dr. Takamine in grateful recognition of his efforts to further friendly relations between Japan and the United States. He had the structure transported in sections from Missouri to his summer home in upstate New York, seventy-five miles north of New York City. In 1909, the structure served as a guest house for Prince Kuni Kuniyoshi and Princess Kuni of Japan, who were visiting the area. Although the property was sold in 1922, the reconstructed structure remained in its serene setting. In 2008, it still continues to be one of the undervalued tourist attractions of New York's Sullivan County.

"The Takamine home in Kanazawa can still be seen today. It was relocated to the grounds of Kanazawa Castle in 1964."

Photos show: (1) An excellent portrait of Jokichi Takamine. (2) The mausoleum (See page 223) of Jokichi Takamine in Woodlawn Cemetery, Bronx, New York City.

567. Bennett, Joan W. 2012. Update on the life and work of Dr. Jokichi Takamine (Interview). *SoyaScan Notes.* June 11. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Joan W. Bennett (born 1942) is a prominent mycologist, fungal geneticist and Associate Vice-President for Promotion of Women in Science, Engineering and Mathematics at Rutgers University. She is a member of the National Academy of Sciences (inducted in 2005, a few months before Hurricane Katrina) (Source: Wikipedia).

Joan has moved five times since Hurricane Katrina struck New Orleans and Tulane Univ. in late August 2005. In the ensuing flooding, many of her papers were under water. Fortunately her many boxes of papers relating to Dr. Jokichi Takamine were on the 2nd floor of the house and were untouched by the water. She ended up at Rutgers University with a double job. She has not had any time to do any writing about Dr. Takamine, so the whole project is completely on hold. She is not sure if she will ever be able to find time to write a book about Takamine; she hopes that she will live to be a very old woman so that she can find the time to write this book.

She has started new research (which is going incredibly well, and which was prompted by the flood after Hurricane Katrina and the molding that ensued) which will take precedence over Takamine in terms of publication. The subject is the odorous substances (volatile organic compounds) made by fungi.

Joan plans to give a lecture on Takamine this coming Sunday (June 17) at the 112th General Meeting of the American Society for Microbiology in San Francisco at the Marriott Marquis. Her lecture will be part of a session on rice; there will also be a lecture on saké and a saké tasting. Joan has long been active in the archives and history of science part of this society. For the very first time she has been invited to speak on Dr. Takamine–her hobby.

A steadily increasing number of people are interested in Jokichi Takamine (1854-1922). One person has written an excellent paper about Takamine's work on the adrenalin patent. There was a symposium last year on Dr. Takamine in Sapporo, Japan, at which Joan presented a paper–which has not been published; she worked very hard and spent much time on this lecture to make it as complete as possible. She even developed some timelines. Her upcoming talk in San Francisco will be an expanded version of this Sapporo talk with more about koji in it. A wealthy Japanese businessman (Mr. Taki) in New York has purchased Dr. Takamine's elegant summer home, *Sho-Foo-Den*, in Merriewold, New York; Mr. Taki and two co-workers have also established the Jokichi Takamine Research Foundation to make Dr. Takamine more famous in Japan and in the USA.

Miles Laboratory no longer exists, and their Takamine archive (which contains most of Dr. Takamine's papers) was rescued and moved to "The Great People of Kanazawa Memorial Museum," in Kanazawa, Japan, by Mr. Yutaka Yamamoto, a Japanese businessman who lives in Japan, is doing excellent research and writing on Dr. Takamine in Japanese. For years he was president of an enzyme company in Japan (Shin Nihon Chemical Company, Ltd. 19-10, Showa-cho, Anjyo, Aichi, 446-0063 Japan). In his retirement he is living in Anjyo [Anjô]. Aichi prefecture, studying Dr. Takamine, and working quite closely with Joan. He is, of course, fluent in Japanese, and he has even been learning old Japanese so that he can read some of the documents about Dr. Takamine. This year Mr. Yamamoto was instrumental in getting a documentary made about the cherry trees sent by Japan 100 years ago to Washington, DC. In addition, a motion picture / movie has been made in Japan (in Japanese) about Dr. Takamine.

At the Museum in Kanazawa, Dr. Takamine is one of five people with a special exhibit devoted to him. One

display gives a detailed description of the process for extracting the diastatic enzyme from *Aspergillus oryzae*. Also featured are evening clothes worn by Jokichi and Caroline, family photographs and information on adrenalin. Takamine's death mask is kept in storage along with original correspondence, diary and other materials from the Miles Archives. It's a real treasure trove and Joan had a wonderful day there.

Sankyo Company is the only part of Takamine's business empire that survives. It has grown into one of the largest pharmaceutical companies in Japan. At their research and development center in Shinagawa, Tokyo, a special room is maintained containing Takamine's desk and some other personal effects, as well as a handsome portrait in oils.

Joan's induction into the National Academy of Sciences has ratcheted up her lab life and her position as a woman in science. It's like there is a halo effect from it. But now she must spend more time in that area. Her passion for women in science may be even greater than her passion for Dr. Takamine. Address: Prof., Rutgers Univ., School of Environmental & Biological Sciences, Dep. of Plant Biology & Pathology, 59 Dudley Rd., New Brunswick, New Jersey 08901-8520.

568. Bennett, Joan W. 2012. Re: Hitch and Takamine genealogy. Letter (e-mail) to William Shurtleff at Soyinfo Center, June 13. 1 p.
• ***Summary:*** Joan had a sabbatical in 2005-06 and had planned to spend half of it writing about Dr. Takamine. When her home flooded in Hurricane Katrina and she and her husband had to move many times, the project never came to pass.

Joan begins: "To the best of my knowledge, Caroline [wife of Jokichi Takamine] outlived both of her sons. Jo [Jokichi], Jr. died under mysterious circumstances in New York during the 1930s [on 22 Feb. 1930], leaving behind a son, a daughter and a widow. Jo III is still alive, I think. He is a psychiatrist in California. No children. I never tracked down the granddaughter.

"Eben took over the Clifton company and died in New Jersey in the early 1950s. His widow ran the Clifton plant for a few years and then sold it to Miles Laboratories. They didn't have children.

[After her husband, Jokichi, died in 1922] "Caroline re-married a much younger man and moved out west. I think she died in 1954.

"I will talk about all of this in my lecture on Sunday [17 June 2012 in San Francisco].

Question: Joan has written: "Takamine rented a room in the home of Colonel Ebenezer Hitch, a retired Civil War officer" (Miles book) vs. "Takamine lived in a French Quarter apartment that he rented from a retired Union officer, Colonel Ebenezer Hitch" (2001, Adrenalin & cherry trees). Which is more accurate?

Joan's answer: "The house in the French Quarter is quite large. There is a side apartment in a separate building and then the main house is three stories. It has been divided into several units and then brought together into one house again over the years. I do not know exactly where in the building Takamine lived.

"With a Japanese scientist who lived in New Orleans, we have arranged an historic plaque to be placed on the side of the building Quarter. I will show a picture of the house in my lecture." Address: Prof., Rutgers Univ., School of Environmental & Biological Sciences, Dep. of Plant Biology & Pathology, 59 Dudley Rd., New Brunswick, New Jersey 08901-8520.

569. Hitch, Michael G. 2012. Re: Genealogy of Ebenezer Hitch and his daughter Caroline, who married Jokichi Takamine. Letter (e-mail) to William Shurtleff at Soyinfo Center, June 13. 1 p.
• ***Summary:*** "Eben Hitch's father had a brother named Ebenezer Delano Hitch so I can possibly assume that Eben / Ebenezer Hitch was named after what would be his uncle–though there are other Ebenezer Hitch's in that line as well.

"And, you are right [about the word Colonel], Eben V. Hitch was a *Captain* in the Massachusetts Infantry in the Civil War, not a Colonel. But, the designation 'Colonel' back in that day was often just a term of endearment or false title–like 'Buddy' or 'Pal' these days. Sometimes you hear or see in old literature someone referred to a 'governor' as well–just a slang term so to speak. The truth of the matter is, I have no definitive proof of a ranking higher than 1st Lieutenant but it seems he had made Captain by war's end. Ebenezer is definitely not Jewish in this case. Also, everything I have seen about Eben Hitch is his name as Vose or a V. as a middle initial. Not sure of the origin of that name, though!

"I have no other info. on Caroline Takamine, d/o [daughter of] Jokichi." Address: Salisbury, Maryland.

570. Wikipedia, the free encyclopedia. 2012. Nippon Club (New York) (Web article). http://en.wikipedia.org/wiki/Nippon_Club_(New_York). 2 p. Printed July 14.
• ***Summary:*** "The Nippon Club of New York City is a private social club in New York City founded in 1905 by Jokichi Takamine for Japanese Americans and Japanese nationals. [1]

"The only Japanese traditional gentlemen's club in the United States, the Nippon Club's dual purpose is to help enhance the unity of the Japanese community in New York and to help develop evolving relationships with the American people. Over the course of its first century, the Nippon Club has fostered ongoing business and cultural relationships through various events, workshops, cultural classes and athletic events. [2]

"History of the Nippon Club buildings: The Nippon Club initially occupied a townhouse at 334 Riverside Drive,

located between 105th and 106th Streets on the Upper West Side of Manhattan [from 1909 next door to the Takamine family residence at 334 Riverside Dr.]. In 1912, the club relocated to a new building which had been designed for the organization by architect John Vredenburgh Van Pelt. The Nippon Club remained at 161 West 93rd Street until December 1941. After the Japanese attack on Pearl Harbor, the building was seized by the U.S. federal government. [5] In 1944, the Federal Office of the Alien Property Custodian sold the building to another; the Manhattan chapter of the Elks for $75,000. [6]

"In 1956, the Nippon Club relocated to One Riverside Drive at 72nd Street near Riverside Park. [7]"

571. Bennett, Joan. 2012. Jokichi Takamine: *Aspergillus oryzae* from farm to pharma. PowerPoint presentation at the special session "The Culture of Rice: From Farm to Fermentation" at the American Society of Microbiology, 112th General Meeting. Held June 17, San Francisco, California.

• ***Summary:*** Gives a good biography of Jokichi Takamine with many interesting photos and a timeline–by his leading English-language biographer. Address: Prof., Rutgers Univ., School of Environmental & Biological Sciences, Dep. of Plant Biology & Pathology, 59 Dudley Rd., New Brunswick, New Jersey 08901-8520.

572. Lamb, J.J. 2012. Caroline Takamine Beach, Santa Rita in the Desert, and Vail, Colorado. *SoyaScan Notes.* June 22.

• ***Summary:*** The correct name of the chapel donated by Caroline Takamine Beach is either "Santa Rita in the Desert" or "Shrine of Santa Rita in the Desert." Also, the Santa Rita mountains are just to the south. She has just sent me a scan of several articles. She knows of a few others at the Catholic diocese. She is "writing the National Register nomination for the shrine." She is arguing that it is eligible on the basis of both its architecture and its association with Jokichi Takamine. It is another layer of protection and it qualifies the shrine for potential funding–as for maintenance. There was a trust that was set up by someone (J.J. thinks it was a niece named Caroline, whose last name she does not know) in the mid- to late-1990s but every time she tries to phone the trust officer, the phone is always busy. The trust was administered from a San Francisco address–which she has. J.J. also has this address: Joe Takamine, 119 Montana, Apt. 102, Las Angeles, CA 90049-5057. J.J. has been unable to find any papers related to the shrine left by Caroline Takamine Beach or her husband. That surprises her a lot. She has also been unable to find Caroline's will. Nor has she been able to find much information about the original architect whose name was Figge, who returned to Belgium before the shrine was built, and who may have been a personal friend of Caroline's. A local person, John Steffen, actually supervised the construction. Walter Ross completed the painting and W.L. Jones did the iron work. The landscaping was designed by D. Burr DuBois and Charles Beach to create the illusion that the Shrine grew up out of the desert. Caroline was very "hands-on" and was clearly very involved in the design and construction. She was a perfectionist who didn't leave anything to chance.

The lectern was built by Charles Beach and Father Henri Constant Mandin, a Catholic priest from France. This was the Father's last station; he arrived at Santa Rita in 1937 and died there in 1943. The very first parish he was sent to was in Clifton, Arizona. He helped to build the rectory (where the priest lives; separate from the shrine / chapel) at Santa Rita.

J.J. does a lot of oral histories as part of her preservation work; she tapes each one, and has transcribed most of them. "A group of us got together in 2007 and formed the non-profit Vail Preservation Society. As Vail moves toward incorporation, our Society wants to be sure that its heritage and history is not lost. We try to engage people of all ages in community projects. Our tagline is 'Creating community connections through local history.' It's always a race against time, to interview the oldtimers before they grow too old or pass away."

J.J. has no regular job; she is a freelancer who earns income writing proposals, articles, etc. Before Caroline met Charles Beach, Charles wasn't doing all that well financially. A homestead record shows that he had a homestead located on the Navajo reservation in northern Arizona. When everyone who wasn't a tribal member was excluded from tribal lands, he was able to do an exchange and he get another piece of land near at the base of Mt. Fagan near Vail. Charles was working for various ranchers in the area; her impression from people she has interviewed is that he was a ranch hand more than he was a rancher. After he met Caroline, they built a beautiful ranch house (which is still there) on the land he owned. J.J. is working on doing a site visit there. She wants to go to the house, take photographs, etc. and write a story about it for the local newspaper. They also owned land at the original Vail townsite. The land that the chapel / shrine was built on was owned by them. J.J. has spent a little time looking at land deeds and she plans to spend more time doing that. J.J. has no good photos of Caroline or Charles, except for one, a group photo (which is not of very good quality) taken at the Ocotillo Ranch; Caroline is in the photo but Charles may not be; it shows their cook and some of the other wranglers.

Vail is a town that has grown almost 400% since the year 2000. There are relatively few people that have been there for more than 20 years. People don't understand the richness of their heritage. J.J. works with community building and is now trying to save the old post office. She has written articles but would like to write a book. J.J. estimates that in 1926 there we no more than 25 to 35 people living at the Vail townsite–by which she means within 3 miles of that dot on the map. Today when people say "Vail" they associate

it with the boundaries of the Vail School District, a large extended area that contains 74,000 people in about 24 square miles.

Shurtleff is interested in knowing how Caroline's interest in Catholicism developed during her life and particularly after she moved to Arizona and got involved with designing and building a Catholic chapel in the desert. J.J. says that Caroline was responsible for holding mass meetings on Sunday for the local people–mostly Hispanics. Many of the Hispanics who came to Vail did so to escape the unrest of the Mexican revolution (1911-1917).

Father William Gockel was a priest at the shrine who lived in the rectory and had a close priestly relationship with Caroline and Charles. Before the chapel / shrine was built, the local population–which was mostly Catholic and Hispanic–was under the San Xavier parish. A traveling priest, on horseback, would come out and hold mass periodically at the Vail school; this was one of Caroline's projects. When Caroline decided to build the shrine, she did not go through the diocese. She did not want outside bureaucracy or interference involved; she did it herself, the effort and the funding.

The various fathers who lived in the rectory at the shrine each left behind their writings, which J.J. has read. Each was very happy that this population was going to be served, and that the shrine would be a wonderful addition to the diocese.

J.J. has never heard that Charles squandered Caroline's wealth after she died.

"The shrine was built around the beautiful stained-glass windows that Caroline purchased from a Methodist church that was being torn down in Tucson. The design of the whole shrine is based on beautiful, simple lines that I think is a reflection of her appreciation of Japanese architecture. I think she built the church for two reasons. First, because her Catholic faith was so strong, she wanted a place for these families to worship. Second, she wanted to do something to honor the memory of her husband. I think that Charles very strongly supported everything she did."

One big question is: Where are all of Caroline Takamine's documents and photos. She must have kept a large collection of personal papers and photos during her lifetime, and she would never have thrown them away. But where are they? Maybe one of her descendants has them. "I know that she left papers. I would love to find the blueprints for the shrine." They are not at the Tucson Historical Society, or at the University of Arizona College of Architecture Library, or in the Tucson Catholic dioceses archives. Address: Director, Vail Preservation Society, Vail Colorado.

573. Lamb, J.J. 2012. Re: Information about Charles P. Beach. Letter (e-mail) to William Shurtleff at Soyinfo Center, June 24. 1 p.

• ***Summary:*** "Charles Pablo Beach–born Sept. 14, 1889 in Kansas.

"Family moved to Colton, California in early 1900s. He graduated from Los Angeles High School in 1912.

"Attended University of Arizona 1913-1916 where he studied in the Dept. of Agriculture.

"Played baseball and was team captain. Participated in basketball and football. Shown on the 1913 and 1915 roster of the University of Arizona baseball team.

"Member of Sigma Pi Alpha fraternity.

"Cadet 1st Lt. in Company B of the student military squad.

"Served in World War I.

"The homestead: He originally had a homestead on the Navajo Reservation up north. When non-tribal members were excluded, homesteads were transferred to another section. His was at the base of Mt. Fagan.

"Married Caroline Takamine on Aug. 16, 1926 (he was 37 but recorded his age as 39, she was 60 but recorded her age as 46).

"They called their ranch 'El Rancho de los Ocotillos.'

"I'm pretty sure that they built the Rancho together (I am trying to find out if it was designed by Figge, the architect who did the initial design for the shrine). Charles was college educated, but poor by all accounts before his marriage.

"Charles had a house in Tucson when he died–not sure when he moved. I have an idea but I want to check it out.

"Republican member of Arizona Fish and Game Commission from 1933-1951.

"1963 he made a generous contribution to help fund a well at the church.

"He died on 25 Nov. 1967 at his home."

Note: The source of this information is not given. Address: Director, Vail Preservation Society, Vail Colorado.

574. Taki, Tomio. 2012. Working to preserve the legacy of Dr. Jokichi Takamine (Interview). *SoyaScan Notes.* June 26. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Mr. Taki, a Japanese businessman (based in New York), and two colleagues (Mr. Yamamoto, and Mr. Taguchi) established the Jokichi Takamine Research Center (a non-profit organization) in about 2008 in Tokyo, Japan, in a satellite building owned by Sankyo Pharmaceutical Co. and made available to them at a greatly reduced rate by Sankyo. Mr. Hasebe is director and manager of the Takamine Center in Tokyo; he goes to the office 3 days a week. They can't yet afford a full-time person, but they are trying to raise the money necessary to pay for one.

Mr. Yamamoto is an expert on Dr. Takamine and he has collected many of his letters and other documents; he still has 5-6 carton boxfuls of documents that he has not yet opened. The goal is to digitize these documents, which are mostly in English, and which were formerly in the Miles Laboratories Takamine archives. Some are in handwritten English that is very hard to read. Mr. Yamamoto also

donated many documents from his personal collection to the Great People of Kanazawa Memorial Museum (*Kanazawa Furusato Ijinkan*). Mr. Matsuda is the president of this museum in Kanazawa.

After Mr. Taki sold his companies, kept an office in New York City. He travels to Japan several times a year. He still does consulting but does not spend much of his time with the Jokichi Takamine work; he can't afford to do it now.

He purchased Sho-Foo-Den in upstate, New York. He has no long term plan for the place but when he saw it, he knew he had to buy it. Half of it was for sale and half was not. Mr. Sam Ikeda made arrangements for Mr. Taki to buy it, about ten years ago (2002). After Dr. Takamine died in 1922 and his wife left for Arizona, it was bought and sold many times by people who had no idea what it was. It was turned into a restaurant, a swimming pool was installed, etc. Mr. Taki has had it cleaned it up and repaired the foundation of the main building (which was almost rotten out), the roof, the floor (there was no tatami) and the ceiling, but there is much restoration work that needs to be done. There are so many beautiful paintings on the walls. The building was built Japanese style using joints instead of nails. The main building has been left pretty much as it was in 1922. Such work is very expensive. The building, which was in St. Louis in 1904, is over 100 years old. Mr. Taki has removed all royal symbols from the building and put it in a warehouse. Building sits on 100 acres of land, of which 20 are Japanese-style garden. The rest is wild forest.

Mr. Taki's biggest problem is that he has no long-term plan for the place. Over the years Merriewold has become more remote and now somewhat desolate. New Yorkers prefer to take their summer vacations on Long Island.

Mr. Taki now owns Sho-Foo-Den himself, but he wants to donate it to a foundation and raise money for that foundation. If he were to die unexpectedly, it would be put on the market and sold at auction. The foundation would own and maintain the space, and would pay off the loan he had to take from the bank when he bought the place. Address: Businessman, New York City.

575. Hasebe, Masaaki. 2012. Re: Genealogy of Jokichi Takamine. Letter (e-mail) to William Shurtleff at Soyinfo Center, June 27. 1 p.

• ***Summary:*** Dr. Takamine's father was Seiichi Takamine. He was born in 1827 in Takaoka, Japan. He married to Yukiko Tsuda in 1852 in Takaoka, Japan. He died on 21 August 1900 in Kanazawa, Japan.

Dr. Takamine's mother was Yukiko Tsuda. She was born in 1834 in Takaoka, Japan. She died in 1894 [about 6 years before her husband] in Kanazawa, Japan. Her family business was manufacturing saké. Address: Secretary-general of NPO Jokichi Takamine Research Foundation, Kyoyu-Bldg., 5th Floor, Akasaka, 3-12-5 Minatoku, Tokyo 107-0052, Japan. Phone: +81-3-6277-7711.

576. Bennett, Joan W. 2012. The many facets of Caroline and Jokichi Takamine, and their relationship (Interview). *SoyaScan Notes.* June 28. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** Joan met Jo Takamine III and she thinks he is still alive. The last she heard he was in Los Angeles.

Concerning the death of Jo, Jr. in 1930, when he was drunk and fell out of a hotel window: Joan thinks his mother and wife and friends tried to clean up the story and put a positive spin on it. Agnes de Mille (1978) tells a very different story than did *The New York Times* (23 Feb. 1930, the day after he died by accident of a fractured skull).

Question: Joan says of Jokichi: "In his obituaries, he was called the Japanese Thomas Edison and the Japanese Pasteur." Where did she find these statements? Ans: Early on, in the 1980s, Joan went to the New York Public Library, and sat with some microfiches. She is 99% certain that those sobriquets came from obituaries she read there.

Q: How does Joan know that her 2nd husband in Arizona squandered Caroline's fortune? Ans: "Squandered" may be hyperbolic or inflammatory language. "Inherited" would be a much better word. It comes from talking with Jo III long ago. Apparently his mother, he and his sister, were left without very much money after Caroline died. Whether this has to do with Caroline's 2nd husband or with Caroline's disapproving of his family, Joan definitely got the feeling that they had not been given as much money as they had expected. Joan also got some disapproving murmurs from Eben's widow and 3rd wife (Catherine McMahon; Eben died in Sept. 1953). Joan thinks Eben was her 2nd husband. Eben did not have any children. She was a sharp / bright woman. Joan met her only once in 1990; she lived near Stanford, in California, and she said that she would be leaving money to Stanford for "enzyme research." She was frail and not in good health but her mind was very clear. She inherited the company in Clifton, New Jersey, and managed the transition to it becoming part of Miles Laboratories. She also represented the Takamine family on the 100th anniversary of Dr. Takamine's birth (1954) at a celebration in Japan. On the boat coming back from Japan she met a rich diamond merchant and married him (her husband No. 3). She was on husband No. 4 when Joan met her. She told Joan that Jo, Jr.'s daughter (Caroline, whom Joan never could track down) would regularly call and ask her (Catherine McMahon) for money. There's something wrong there!

Joan has not seen Caroline's will; we should find that, since it is a public document and it would probably answer many questions–if she left a will. Since she outlived both of her children and predeceased her husband, she could leave her own fortune to whomever she wished. Yet Joan is pretty sure she did not leave money to her grandchildren. Joan got a copy of Dr. Takamine's will from Agnes de Mille.

Joan was initially attracted to the story of Dr. Takamine

and Caroline because it was a love story. They definitely fell in love at the beginning. Joan is not sure how long the mutual feeling of genuine love lasted, but they did stay together. A key point for Joan is that they didn't have more children, and that they had those two so close together.

Joan would not be surprised if Dr. Takamine had relationships with other women. There was so much hypocrisy during that era. It was so proper and so constrained. Read Edith Wharton (1862-1937), the Pulitzer-Prize winning American novelist.

Caroline must have had a large number of very interesting personal papers when she died. Joan does not know if she left them to any archives, or (if she did) where they ended up. She may have just left them all with Charlie Beach–and that's where the story seems to come to an end. There are a number of her letters in the archive in Kanazawa.

What happened to the Miles Laboratories archives? The originals went to the Kanazawa museum. Joan may have one copy in boxes (she has not gone through them) and the non-profit Jokichi Takamine Research Foundation (Mr. Yamamoto) in Tokyo has another copy. The Clifton company in New Jersey was sold to Miles Labs in Indiana. Miles had a good archivist. Joan wrote the Preface to the translation of Takamine's Japanese dissertation; it was the first thing Joan wrote for this archivist or for Miles. When Bayer bought Miles, the archives was closed. Dick DeSenna saved the archive (4-5 boxes) and sent it to Kanazawa.

Concerning the vanity biography of Dr. Takamine titled *Jokichi Takamine: A Record of His American achievements,* by K.K. Kawakami (1928), Joan thinks she either read or heard from Agnes de Mille that Caroline commissioned it as a memorial to her husband. "So the mythology is kept intact that way." Joan has found parts of the book she thinks are not historically accurate–but she does not recall any right now. But as we talk through this question of the book's origin, Joan is not sure. She agrees with the hypothesis that it may have been commissioned by both of them as his last big project during the last year of his life when he as largely in bed; he died in 1922. That scenario makes a lot of sense to Joan. It may have been that he told the story to Mr. Kawakami. Kawakami wrote that story and came back to them both with questions, they answered the questions and then read each draft to check for completeness and accuracy.

Why does Joan say that Dr. Takamine is the "Japanese father of American biotechnology"? A lot of it has to do with the definition of biotechnology. Her definition is much broader than simply "genetic engineering." For a good introductory book see *The Uses of Life,* by Robert Budd [and "History of biotechnology" on Wikipedia. The word "biotechnology" was coined in 1941]. Starting in the 1970s, the word came to be strongly associated with genetic engineering. But the word has been used far more broadly in common language to mean "applied microbiology" or "microbiology making money." These are the sense in which Joan used it.

Takamine patented the first microbial enzyme. Joan got interested in Dr. Takamine at about the time in about 1983-84 that interest in biotechnology was rapidly increasing; she was involved in several committees on biotechnology and she ran a biotechnology meeting for the American Society for Microbiology–more than once, she used to give lectures on it, etc. She initially found out that the first patented enzyme comes from her beloved fungus *Aspergillus,* then quickly found that Dr. Takamine applied for that patent. A key early event for her was going to Miles Laboratories to give a lecture.

Question: Does Joan believe Agnes de Mille's story that Caroline's mother in New Orleans started the Takamine Ferment Co. and then invited Jokichi and her daughter to come to the United States from Japan to make it work? Joan does not know. She suspects there was a great deal of correspondence between Caroline and her family. She thinks her family moved out of New Orleans because her father was always looking for a way to make money, a way to make a living. This story is not mentioned in Kawakami's 1928 vanity biography. Agnes de Mille also intimates that Caroline's mother was hot for handsome young Takamine. Joan only met Agnes once, in about 1986; Joan took a tape recorder but something happened and she does not have a tape of the session–only her memory. It was quite fascinating. Agnes went to the trouble to also invite Mr. Uenaka's daughter, who was very gracious and well spoken, had been born and educated in the United States, went back to Japan during World War II and almost starved to death. Agnes said at the time that she would love to write a biography of Caroline's mother–who she thought was fascinating.

Agnes knew Caroline Takamine, although quite a few people found Caroline quite off-putting. Agnes was born in 1905. So she would have been age 17 in 1922 when Dr. Takamine died, age 21 in 1926 when Caroline moved from the New York area to Arizona, but age 49 in 1954 when Caroline died. Agnes knew Jo, Jr.'s wife and probably saw Caroline when Caroline came east to visit.

Joan does not know why Caroline's son, Jo, Jr. (the playboy) went to Arizona, which drew Caroline to Arizona in the first place.

Joan knows almost nothing about the genealogy of the family in which Jokichi was a child, except that his father was interested in Western medicine. The Museum in Kanazawa would probably have that genealogical information. When Joan went there, none of the people at the Museum spoke English, so Mr. Yamamoto translated. Joan introduces Shurtleff to Mrs. Ai Caine, who is related to the Takamine family and who has a daughter who graduated from Harvard. Mrs. Caine may well be a descendant from one of Takamine's sisters or brothers. Address: Prof., Rutgers Univ., School of Environmental & Biological Sciences,

Dep. of Plant Biology & Pathology, 59 Dudley Rd., New Brunswick, New Jersey 08901-8520.

577. Bennett, Joan W. 2012. The many facets of Caroline and Jokichi Takamine, and their relationship (Interview) (Continued–Part II). *SoyaScan Notes*. June 28. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** Caroline Hitch was not born a Roman Catholic, but converted to Roman Catholicism not long before Jokichi did. Joan tracked down their marriage certificate in New Orleans and it shows they were married in a Protestant church (as Joan recalls, a Methodist church) in August 1887 in Orleans Parish, New Orleans. Joan thinks Caroline was a very devout Catholic by the time she moved to Vail, Arizona, in 1926, and even more devout when she conceived of dedicated the Catholic chapel in Vail in 1933-35.

A famous oil painting portrait of Dr. Takamine appears in the front of the Miles Laboratories book about Dr. Takamine. But Joan has no idea when, or by whom, it was painted. She is not certain where it is now, but there is definitely a portrait of him in the Sankyo memorial room in Tokyo (Sankyo Co. Ltd. was acquired in 2005 by Daiichi to form Daiichi Sankyo Co., Ltd.), where his desk and a bust are also found. Joan has been to that room twice. The room is kept like a sacred place–the founder's room. When Joan was first there in about 1989 she found it very moving.

Joan presented two separate papers in Sapporo, Japan, in Sept. 2011, at an international conference. Joan helped organize one session and invited Mr. Yamamoto and Mr. Taki to speak. The first PowerPoint presentation was presented at the conference; the second was presented at a Sacred Heart catholic girls school on the outskirts of Sapporo. The grandparents of the head nun, who was Japanese, had been friends of Takamine. Joan was given a copy of a photo of the grandparents' wedding showing Jokichi and Caroline in the background. Joan spoke in English and a local man translated for the girls and teachers. The paper was shorter with more emphasis on his childhood than the one presented at the symposium. It was quite sweet. After the talk, there were about 45 minutes of questions. The girls were all in their uniforms.

Joan would be willing to comment on the chronology at the beginning of the book on Takamine that Shurtleff plans to write.

Joan used to teach genetics. She is now in the Dep. of Plant Biology and Pathology, but most of her work nowadays is administrative, in the Office for Promotion of Women in Science, Engineering, and Mathematics.

Joan knows of no evidence supporting the intimation by Agnes de Mille that Dr. Takamine had a Japanese mistress or any illegitimate children. Joan also asked a Japanese man who was in position to know, and he said he knew nothing about it. Address: Prof., Rutgers Univ., School of Environmental & Biological Sciences, Dep. of Plant Biology & Pathology, 59 Dudley Rd., New Brunswick, New Jersey 08901-8520.

578. Pima County Recorder's Office. 2012. Re: The will (last will and testament) of Mrs. Caroline Takamine Beach is not the state of Arizona public records. Letter to William Shurtleff at Soyinfo Center, June 28. 1 p.

• ***Summary:*** In search of this will, William Shurtleff first called this office and asked for instructions on how to order a search in Arizona, and if found, a copy of the will itself. He explained that Caroline Beach died on 26 Nov. 1954 in or near Vail, Arizona.

He was told to send a letter with as much relevant information as possible (including place of burial, mother's maiden name and year of birth, father's name and year of birth) plus a check "not to exceed $70" in case the will was found.

A thorough search of all state and county records found that no such will was on file. A lady from the office kindly phoned Mr. Shurtleff and explained (1) all the different places that had been searched, and (2) that the filing of a will was not required in Arizona. She concluded that there was no hope of finding this will among public records in Arizona.

However, the will might be in the possession of relatives or descendants. Address: P.O. Box 3145, Tucson, Arizona 85702-3145.

579. Masuyama, Hitoshi. 2012. Re: Genealogy: Jokichi Takamine's parents and grandparents Letter (e-mail) to William Shurtleff at Soyinfo Center, July 11. 1 p.

• ***Summary:*** Concerning the parents and grandparents of Jokichi Takamine:

His father: Seiichi Takamine.

Born 18 June 1827 in Takaoka, Kaga-han, Etchû province.

Died on 21 Aug. 1900 in Kanazawa.

His mother: Yukiko Tsuda.

Born 25 March 1835 in Kanazawa, Kaga-han.

Died on 29 April 1894 in Kanazawa, Ishikawa prefecture.

They married on 2 Nov. 1852 in Takaoka.

His paternal grandfather: Gendai Takamine.

Born on 11 July 1794 in Kanazawa.

Died on 25 March 1865 in Takaoka.

His paternal grandmother: Tokiko Takamine [her maiden name].

Born 27 March 1808.

Died on 6 August 1879 in Takaoka.

They married on 23 Feb. 1825.

His maternal grandfather: Kisanji Tsuda.

Died in 1871 in Takaoka.

His maternal grandmother: Yoshiko Tsuda

Died in 1884 in Takaoka.

The source of this information is an old "family registry"

scroll (*makimono*) in the archives of the Kanazawa Furusato Ijinkan (Great People of Kanazawa Memorial Museum). Address: Kanazawa Furusato Ijinkan–Great People of Kanazawa Memorial Museum, 6-18-4 Shimohonda-machi, Kanazawa, Ishikawa 920-099.

580. Masuyama, Hitoshi. 2012. Re: Letters by and to Jokichi Takamine and his wife in the archives of the Kanazawa Furusato Ijinkan (Great People of Kanazawa Memorial Museum). Letter (e-mail) to William Shurtleff at Soyinfo Center, July 18. 1 p.

• ***Summary:*** First, to answer your first question: Takamine and his family left Chicago and moved to New York in about December 1897. The biography by Kazumasa Iinuma (published in 2000) says that.

"There are 263 English-language letters relating to Dr. Takamine in our museum. And 223 of the 263 letters show us the date clearly.

"The earliest letter was written on 12 Oct. 1893. It's from Parke, Davis & Co. to Takamine Ferment Laboratory. This is also the earliest letter written on a letterhead.

"The most recent letter that was sent while Takamine was alive was written on 26 May 1922. It is from 'Nicholas Samuelson' to Takamine.

"The date of the earliest letter written from New York is 15 Jan. 1899. I couldn't read who wrote it because of the handwriting.

"Of the 263 letters, there are 58 letters about contracts for Taka-Diastase. They were written from 12 Oct. 1893 to 8 March 1897.

"I don't have any letters about Adrenaline, and there are many letters later than 1912 comparatively.

"The most recent letter after Takamine's death was written on 3 Aug. 1955 from "Stage Coach Inn".

"There are 22 letters that were sent to Dr. Takamine's wife, Caroline, after his death."

Note: We deeply regret that we were unable to examine these letters and use them to add depth to our understanding of Dr. Takamine and to this book. We hope some future writer will go through them carefully. See the book *Galileo's Daughter.* Address: Kanazawa Furusato Ijinkan–Great People of Kanazawa Memorial Museum, 6-18-4 Shimohonda-machi, Kanazawa, Ishikawa 920-099.

581. Burns, Patricia Donnaly. 2012. How do you get to Sho-Foo-Den / Sho-Fu-Den? What is it like there now? (Interview). *SoyaScan Notes.* July 25. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Patricia's museum has no photographs of Sho-Foo-Den; they all went with the Takamine family. The beautiful Japanese gardens are largely overgrown. Very few people in Sullivan County even know that Sho-Foo-Den exists!

Sullivan County is a rural county and 1 hour and 45 minutes by car northwest of New York City. The private railroad that used to run to Merriewold closed down decades ago. Sho-Foo-Den is in the town of Forestburgh, New York–population 819 as of the 2012 U.S. census. Merriewold is now called "Merriewold Park–A hamlet northeast of Forestburgh village. Forestburgh is a very quiet part of the county.

If you drive down Route 42 (a 2-line paved road), going south (towards New York City) from the town of Monticello, after about 4-5 miles you will see two stone pillars on your left. You could turn in at those stone pillars (if you found them; just before Merriewold) you will find yourself on a very small paved road, about 1½ cars wide. Sho-Foo-Den would lie off to your right about ¼ to ½ mile in from the pillars. Very few people ever go through those stone pillars. About 5 years ago caretakers were living on the premises, living in one of the small houses on the outside. At one point, in about 2000-2002, it was owned by Japanese who planned to turn it into a conference center and worked to bring attention back to it. They restored the dining room and started working on restoring the entire complex to its original state. Patricia thinks it failed because Japan had overextended itself financially in the USA in the late 1980s and 1990s. This was a low-priority investment a small country estate in a rural community.

The people who used to go to Merriewold for summer vacations now go to South Hampden on the north shore of Long Island. At one point in the 1950s Sullivan County had quite a few big hotels; they are now all closed. "But Sullivan County is making a comeback, and many people own a large 2nd home here, where they take their summer vacation. We have now have Bethel Woods Center for the Arts, in Bethel, Sullivan County, New York–located at the site of the famous 1969 Woodstock festival on Max Yasgur's Dairy Farm. It is a beautiful place and done very well. It has brought us a new group of people coming through this area. This is attracting concerts and concert-goers, from classical and traditional to rock and roll. The opening concert each summer is generally the New York Philharmonic Symphony Orchestra. Also Boston Pops, etc. Very similar to Tanglewood in Massachusetts." Address: Sullivan County Historical Society and Museum, 265 Main St., Hurleyville, New York 12747. Phone: 845-434-8044.

582. Ikeda, Sam. 2012. Re: Jokichi Takamine's land at Merriewold. Letter (e-mail) to William Shurtleff at Soyinfo Center, July 25–in reply to questions. 1 p.

• ***Summary:*** In 1904 Dr. Takamine purchased more than 100 acres in Merriewold, New York, before he was given Sho-Foo-Den. He seems to have purchased the land at several times.

Note: Dr. Takamine made his first purchase of land in Merriewold on 14 Aug. 1902.

At the time the wooden building buildings were

reconstructed, seven buildings were relocated from the St. Louis World's Fair to the current site in New York and there are 3 buildings in the Sho-fu-den site. He has no photographs of the buildings being reconstructed.

Update. Talk with Osamu "Sam" Ikeda. 2012. Aug. 20. He and Mr. Tomio Taki are now equal owners of Shofu-Den, LLC, which was purchased Shofu-Den from the Japan Heritage Foundation in May 2002. They bought it because the Japan Heritage Foundation wanted to sell it and needed the money.

583. Yee, Thomas. 2012. Re: "Takamine family" (Not Subdivided Geographically) approved... Letter (e-mail) to William Shurtleff at Soyinfo Center, July 30. 1 p.
• ***Summary:*** in the "Library of Congress Subject Headings Monthly List 07 (July 16, 2012)."

Note: The application for this new subject heading was submitted to Tom Yee by William Shurtleff for consideration in early June 2012. The editorial board at the Library of Congress meets weekly to consider new applications but issues a new list only once a month. These subject headings are used to catalog new books.

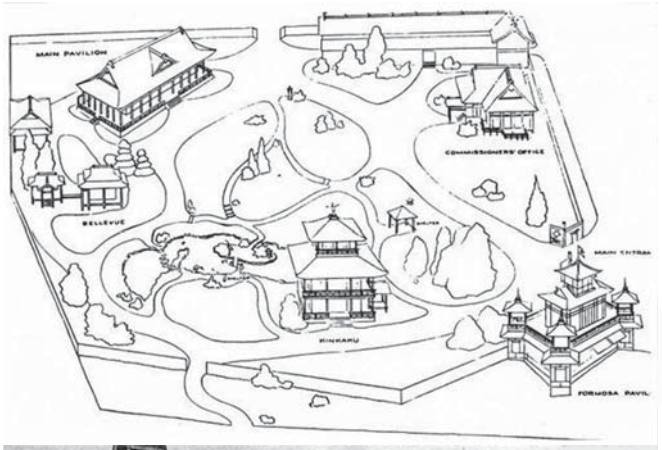
584. Salinas, Andrew. 2012. Re: Looking for early articles that mention Jokichi Takamine in the Daily Picayune (New Orleans). Letter (e-mail) to William Shurtleff at Soyinfo Center, July 31–in reply to questions. 1 p.
• ***Summary:*** He has been able to find 20-30 articles, "up to a reflective article from 1953 or so looking back on his life in New Orleans.

"Nothing, however, predates the wedding [10 Aug. 1887], so I don't see anything for the Cotton Centennial / World's Fair of 1884." Address: Reference Archivist, Amistad Research Center, Tilton Hall, Tulane Univ., 6823 St. Charles Ave., New Orleans, Louisiana 70118.

585. Shofu-Den–Imperial retreat (Website printout). 2012. http://shofuden.com. 6 p. Printed 25 July 2012.
• ***Summary:*** Contents: Home. Restoration plan. History: "Merriewold: The first hundred years," by David Colson with the assistance of Agnes de Mille. Imperial retreat: "A replica of Kyoto's eleventh-century palace in upstate New York," by Brendan Gill. Photograph by Feliciano. Japanese influence. Shofuden, LLC. (See next page).

"Restoration: Sho Fu Den & Garden. Inn, spa, and dining. New facilities in the joint property: Modern Japanese inn and villa (with *Ryokan* type service) 88 units. Dining (Japanese restaurants in the garden) for guests. Cultural Japanese spa (*onsen*)." Address: Shofuden, LLC.

586. Shofu-Den–Imperial retreat: The Imperial Japanese Garden at the Louisiana Purchase Exposition (Website Printout–Part). 2012. http://shofuden.com. 3 p. Printed 25 July 2012.



• ***Summary:*** "The California Midwinter Exposition at San Francisco, which could not compare for size or importance with its immediate predecessor, the World's Columbian Exposition at Chicago, was followed by several fairs of similar character. In 1898 the Centennial Exhibition was held at Nashville, Tennessee, and featured a full-scale copy of the Parthenon as a permanent monument. Also in 1898 Omaha, Nebraska, presented the Trans-Mississippi and International Exposition. In 1901 Buffalo, New York, sponsored a return of festivities to the Great Lakes region in its Pan-American Exposition, the first fair at which color figured in the lighting. The buildings were distributed along the Court of Fountains, an avenue of water displays terminating at the

tall, light-bulb studded Electric Tower, and on its right was the stadium, balancing the midway on the left. Here, in the entertainment area, was a thatched-roof Japanese tea house where native girls in kimono served tea, and in the garden stood a tile-roofed house with a bazaar on the lower floor for selling inexpensive souvenirs. The Pan American Exposition was the largest of the fairs staged during the decade following the Columbian Exposition, but the Buffalo show occupied less than half the acreage of the Chicago exhibition and was concerned only incidentally with the world outside the Americas.

"The next anniversary of a national historical event of sufficient moment to warrant an international celebration was the centennial of the Louisiana Purchase of 1803. Acquisition of the Louisiana Territory from France, made during the administration of Thomas Jefferson, added 825,000 square miles to the United States, almost doubling the size of the existing country and equaling about one-third of its final magnitude. All or parts of fifteen states west of the Mississippi River were carved out of the $15,000,000 investment. Saint Louis was appointed host to the one-hundredth anniversary exhibition, and 1240-acre Forest Park was provided for a fair site. This was close to twice the size of the area occupied by the World's Columbian Exposition and over five times that of the Philadelphia Centennial. The designers of the Louisiana Purchase Exposition chose a more Baroque version of the classic style than that of the Chicago fair for the exhibition halls. The main buildings, or 'palaces,' were disposed around a gigantic fan-shaped labyrinth of lagoons radiating from Grand Basin, with fountains spouting to a height of seventy-five feet. The background was a great hemicycle of cascades, and on the summit of the hill stood domed Festival Hall, with the Fine Arts Building behind. The vast layout was circumnavigated by public conveyances in the form of boat, train and motor car. The state buildings were grouped in the southeast corner of the park, and most of the foreign displays were in the western section. The Philippine Islands were allotted one of the largest tracts, but it was far from the middle of things, beyond Arrowhead Lake near the west boundary of the grounds. The native village here was made up of thatched-roof huts. More civilized forms of eastern buildings were the Shanghai Restaurant (on The Pike), the Palace of Pu Lun, a Siamese wat, the 'Temple of the Tooth' from Ceylon, a reproduction of the Tomb of I'timad-ud-Daula at Agra, India, and the Mosque of Omar in Jerusalem, a compound located close to the geometric center of Forest Park. Adjoining this on the west was the Morocco Village, north of which was the Japanese group.

"The official exhibit from Nippon was called the Imperial Japanese Garden. Its site provided a slight incline toward the southeast corner. The Japanese at first proposed constructing a replica of Nagoya Castle and incidental tea houses, but the outbreak of war with Russia curbed such an ambitious undertaking. Instead the Imperial Japanese Garden was landscaped with meandering paths among picturesque planting and highlighted with several frame buildings. It attracted its share of public attention.

"A small body of water wound through the center of the garden. Stepping stones crossed the west end, and an island was in the middle, reached by an arched bridge from one shore and by a plank bridge from the other. A tall bronze crane and a squat stone lantern shared the island. The building nearest the water was a facsimile of the Kinkaku, the three-storied Golden Pavilion near Kyoto, built for the Shogun Yoshimitsu upon his abdication in 1395. It was a square building encircled by open galleries, which were supported by slender posts, and sheltered by dipping hipped roofs with deep eaves. The first story represented the type of architecture known in Japan as shinden-zukuri, in which the whole interior was without permanent partitions and could be divided into rooms by sliding screens. The floor was laid with tatami. This was the living space. The middle story was in a mixed style, with decorated ceiling, used by Yoshimitsu for musical and literary parties and other entertainments. The superstructure was set back; its single room was finished in the restrained Zen manner, for an oratory, and entirely surfaced with gold leaf, which gave the building its title. On the apex of the roof perched a bronze phoenix bird with outstretched wings. The Saint Louis version apparently was faithfully copied in all details. The original at Kyoto burned in 1950 but has been rebuilt.

"A panoramic view of the Imperial Japanese Garden was to be had from the top of Observation Wheel situated near its northwest corner. The angle of Machinery Hall enframed the garden on the left, and the domed Festival Hall rose beyond the southeast corner, with the representation of Jerusalem in between. In the foreground was the main entrance to the Japanese area. The Formosa Pavilion was on the slope just north of the gateway (Formosa had been ceded to Japan at the close of the Chinese-Japanese War in 1895), and the building was rectangular with small flankers at the corners. An upper deck expanded into square summerhouses set on the diagonal over the flankers, and in the center was a small hall with a lookout on the roof. Among the trees beyond the Formosa Pavilion could be seen the roof of the Kinkaku. The small structure up the hill to the right was known as the Bellevue. It was composed of many different kinds of woods, no two pieces from the same species of tree, and had been exhibited the previous year by the Forestry Bureau at the Osaka Exposition in Japan.

"The Main Pavilion in the Imperial Japanese Garden stood on the highest point in the enclosure, facing the principal entrance opposite. The building was an abridgement of the Reception Hall or Shishinden (Purple Dragon Hall) of the Imperial Palace at Heian-kyo, Kyoto, dating from the end of the eighth century. The Shishinden looked out on a vast flat sanded court used only on ceremonial occasions, the starkness of which was relieved

by an orange and a cherry tree planted in square tubs. Two rows of round posts supported timberframed walls of plaster forming hisashi-no-ma (galleries under the eaves) around the throne room proper. The Saint Louis modification had a porch around three sides of a single interior with a small platform centered on the side across from the entrance. The single gable in front, breaking the long plane of the irimoya roof, was not on the Kyoto Reception Hall.

"The building next in importance was the Commissioners' Office, located halfway between the west and south gates of the garden. It was a compact, L-shaped frame house, with batten siding below windowsill level and half-timber and stucco above. There were carved ornaments in the gables and at the ends of the ridge boards. An unexpected feature adopted from the West was the glass casement windows. The building contained two passages and five rooms. Alongside the Commissioners' Office, to the south, was the long, barn-like bazaar, of no particular architectural interest. It had entrances on the north side and east end inside the Japanese compound, whereas its principal door in the west end opened on The Trail.

"Japan was allotted exhibition space in the Agriculture, Forestry, Transportation, Varied Industries, Electricity and Machinery, Educational, Manufactures, Mines and Metallurgy, Liberal Arts, and Fine Arts buildings. There was also an unofficial group of Japanese buildings in the amusement area, near the north entrance to the midway, called The Pike. Here were two gateways. One was an ornate specimen modeled on the Yomei-mon of the seventeenth-century Toshogu Shrine at Nikko. It was an abominable reproduction, with an abbreviated mezzanine, of a gaudy archetype. It appeared in the guide books labeled 'The Temple of Nekko.' The other was a well proportioned and beautifully detailed two-storied gateway to a Buddhist temple three hundred years old. It stood by a canal providing boat rides. An outside staircase was added for ascent to the balcony level where, presumably, the visitor was rewarded by some kind of an exhibition.' The Pike group also included a bazaar and a Japanese theater. At the San Francisco fair only acrobatics had been offered in the theater, but at Saint Louis audiences were treated to a classic of the Japanese stage. It was the Kabuki version of Tsuchigumo. The guidebooks called it 'The Spider Play,' and the chants of the actors were translated into English. At the climax of the play the four elaborately costumed heroes–Raiko, Taisho, Kintoki and Tsuna–come upon Tsuchigumo's mound in the forest and close in to slay the monstrous spider, who throws out strands in all directions. Undoubtedly most Americans who witnessed it remember the scene in terms of a New Year's celebration with string confetti.

"The Louisiana Purchase Exposition of 1903-04 was by far the largest and most spectacular of American world's fairs held up to that time. Although in a state of unrest and under economic strain due to war with Russia, Japan submitted its most varied display, consisting of a gardened space containing six or seven pavilions, exhibits in ten of the great galleries, and an unofficial set of buildings on the midway. One of the pavilions in the Imperial Japanese garden represented the eleven-hundred-year-old Reception Hall of the palace at Kyoto, and another reproduced the Golden Pavilion, also in the Kyoto vicinity, dating from the end of the fourteenth century. The Golden Pavilion typifies an important milestone in the evolution of architecture in the flexibility of its first story; and it is significant that a facsimile was shown at the first important American fair of the twentieth century. The building opened up in close communion with its hill-and-water garden setting. On The Pike fairgoers could attend a live Japanese theatrical entertainment and purchase refreshments and Japanese souvenirs if they felt so inclined." Address: Shofuden, LLC.

587. Daiichi Sankyo Co., Ltd. 2012. The story of Jokichi Takamine: Japan's goodwill ambassador (Color motion picture). Tokyo, Japan: Daiichi Sankyo Co., Ltd. 47 minutes. http://www.daiichisankyo.com/takamine/index.html

• ***Summary:*** This excellent online motion picture, which commemorates the 100th anniversary of the planting of cherry trees in Washington, D.C., has four parts: Part 1 (13 minutes 40 seconds) starts by showing cherry trees that grow in the tidal basin in Washington, DC. A memorial plaque mounted on a large stone among the cherry trees states: "The first cherry trees presented to the City of Washington as a gesture of friendship and good will by the city of Tokyo were planted on this site March 27, 1912. National Capital Sesquicentennial Commission. 1950." Every spring a large National Cherry Blossom Festival is held to promote exchange between people from Japan, the United States, and all countries. The Centennial National Cherry Blossom Festival will be held this year (2012). Daiichi-Sankyo is the top sponsor of this year's host committee. Takashi Shoda, chairman of Daiichi-Sankyo, gave an address at the opening ceremony. Taka-Diastase and Adrenaline Chloride are both indispensible, 100 years after their discovery, in clinical practices worldwide. The developer of these two substances is Jokichi Takamine, the first president of Sankyo Company Ltd., which later became Daiichi-Sankyo. He played a major part in the gift of the cherry trees to Washington, DC.

Jokichi Takamine was born in 1854 in Takaoka City, Kaga (in an area now known as Toyama Prefecture), in the small island nation of Japan. Today there is a bronze bust of Dr. Takamine in Takaoka. That same year, long isolated, Japan opened itself to the world after the 2nd arrival of Commodore Perry at Uraga in Japan. J. Takamine arrived in Kanazawa City the next year, and there he spent most of his childhood.

His father, Seiichi Takamine (his photo is shown), was a skilled physician who held the rank equivalent to samurai. He had mastered chemistry (*seimi*), the most advanced

academic subject at that time. Seiichi was also a chemist at Soyukan, a research institute developing gunpowder. Soyukan gathered together excellent researchers from across Kaga.

At age 8, Jokichi Takamine started attending the Meirindo School, a school for the Kaga Clan in Kaga. He aspired to become a respectable doctor and take over his father's practice. Shoichi Matsuda, director of the Great People of Kanazawa Memorial Museum, in Kanazawa, explains the importance of this school. At Age 10, Jokichi went to Nagasaki to study. This was the main city in Japan where, for the past 200 years, Western culture had touched Japan. Modern Japan began in Nagasaki. Jokichi, still a young boy [a photo shows him at about age 10], learned English directly from foreigners and developed his international worldview. At age 14 Jokichi began studying language, medicine, and chemistry in Kanazawa, Kyoto and Osaka. At around this time he decided to become a chemist rather than a physician like his father, so that he could save more lives.

At age 19 he began to major in applied chemistry at the Imperial College of Engineering (today's Faculty of Engineering, Tokyo University; a photo {see below} shows the early buildings) on a government scholarship; he graduated with the first class from the College in 1879 at age 25. At the graduation ceremony, Henry Dyer, first head of the college [a photo shows principal Dyer], gave some parting words of advice. "Never forget that you live not only for yourself but also for society."

At that time, young people like Jokichi were filled with a sense of mission. Shoichi Masuda explains that Japan's national goal was to become a civilized country. The young people at that time must have known that, without extraordinary growth almost akin to walking on stilts, the country would never be able to catch up. They always felt pressure and I believe they thought they were responsible for the people. That's why, I guess, they never thought they were studying for themselves alone.

At age 26, with Henry Dyer's advice in mind, Jokichi sailed for Glasgow, Scotland (Henry Dyer's home town) again on a government scholarship. At that time, Glasgow was a world-class industrial city. When Jokichi arrived in Glasgow, he was shocked by what he saw. Although he had known about Western civilization from books and conversations with foreigners, seeing it directly brought home to him how far behind Japan really was. He expressed his shock in a letter which still survives in the Kanazawa Museum. The roads and bridges are made mostly of iron. Gas lamps, mailboxes, even toilets are all made of iron. Iron, iron iron! Everything is made of iron. He made it his personal mission to close this large gap between western nations and Japan. For three years he studied hard in Great Britain, visiting various factories when he could find the time. Returning to Japan, he took a job with the Ministry of Agriculture and Commerce [a photo shows the building]; he worked hard to modernize industries unique to Japan–sake, Japanese paper, and indigo dyeing.

Part 2 (10:59) is about his first trips to the United States and his marriage to Caroline Hitch. In 1884, at age 30, he crossed the sea again, this time to the United States on a business trip to New Orleans. He was sent as a co-commissioner to the World Cotton Exposition. Dr. Joan Bennett explains that the Japanese pavilion was very

popular, with its beautiful art and silks. They were very interested–but Japanese culture seemed so strange and unusual to Americans. Though he met many people, one person became special to him–Caroline Hitch, age 18 and his landlord's daughter. Photos of her and of him are shown. The two had nothing in common–not age, not culture–and yet they were attracted to each other and fell in love. Dr. Joan Bennett explains that Jokichi was apparently extremely charming and she thinks they were very much in love. She got interested in Takamine because she thought it was such a wonderful love story. There can be no doubt that this fateful encounter changed the direction of his life from "For Japan" to "For Japan and the U.S." At the end of the exposition, before returning to Japan, Jokichi proposed marriage to Caroline and gave her an engagement ring. Two years later he returned to the U.S. and in 1887 they were married at a church in New Orleans.

After their honeymoon in the U.S. they returned to Japan. But (as Dr. Bennett explains) she could speak almost no Japanese; the food was strange, the buildings were strange–everything was strange. The foreign culture was overwhelming. Also, she had two children in Japan, just a year apart. With no mother or sisters to help her, she must have been very lonely. Yet she tried hard to fit in, and to make her husband successful. He had visited a fertilizer manufacturing plant in the United Kingdom. Now he embarked on the manufacture and popularization of chemical fertilizers. He left the Ministry of Agriculture and Commerce and, with the help of acquaintances, established the Tokyo Artificial Fertilizer Co. Then he began to study koji, which is used to make sake, soy sauce, and miso. He thought koji could also be used for making whisky–at lower cost and in less time. No one but Jokichi could have come up with this idea!

Yutaka Yamamoto, Director General of the non-profit Jokichi Takamine Research Foundation, explains that he was planning to insert a surgical knife of reform into the traditional fermentation industry of Japan and to launch a pioneering business. "Caroline's mother, Mary, a strong supporter of Jokichi's idea, sold the plan to a major manufacturer in the U.S." In 1890, as the research looked more and more promising, Jokichi decided to emigrate to the U.S. But on the ship to California, he suffered a terrible pain in his abdomen. It turned out to be a serious liver ailment. The pain was so great that he even wrote his will on the ship. Fortunately, he arrived safely. After resting and successful trials, he concluded a contract with a major whisky manufacturer. But those made malt and were at risk to lose their jobs if he succeeded, opposed his efforts. His factory was burned to the ground, just as it was about to start production. He was overwhelmed with sadness. He wrote: Everything I had worked for was gone overnight and I cried and cried. His liver condition worsened. Yutaka Yamamoto explains: Caroline made a fire by the side of a rail track and stopped a train; he underwent emergency surgery at a hospital in Chicago. They sold many possessions, Caroline got a side job, and they borrowed money from relatives. It was a difficult time for them. His illness returned and she nursed him. He later said that much of his success was due to his wife. Above all, explains Dr. Bennett, she believed in him. He gradually recovered. That was when he realized the importance of medicine. After almost giving up, he returned to the laboratory. Continued.

588. Daiichi Sankyo, Ltd. 2012. The story of Jokichi Takamine: Japan's goodwill ambassador (Color motion picture) (Continued). Tokyo, Japan: Daiichi Sankyo, Ltd. 47 minutes. http://www.daiichisankyo.com/takamine/index.html
• ***Summary:*** Continued. Part 3: Working for society (9:35) is about his discoveries of Taka-Diastase and Adrenaline. "In his search for a new way of making whisky, Jokichi had discovered that koji had enzymes with strong digestive

capabilities."

A photo (see previous page) shows his laboratory at that time and the actual microscope he used. "Among these versatile microorganisms [the koji mold], he found some with stronger digestive capabilities. He used these to create a digestive aid. 'Finally I know how I can help people.'"

"Jokichi named the digestive aid Taka-Diastase." "This breakthrough was hailed as cutting-edge research. It later earned him the title of 'The father of biotechnology.' Jokichi and Caroline invited the head of Parke, Davis, a major pharmaceutical company, to dinner and succeeded in winning a contract for managing and selling Takadiastase.

A photo shows the first purchase order for Taka-Diastase, on Parke, Davis & Co. (Purchasing Department) letterhead. The date is Jan. 9th, 1897. The order is addressed to Takamine Ferment Co., 6641 Woodlawn Ave., Chicago, Illinois.

"In 1895 when Taka-Diastase was sold in the West and the rest of the world, Jokichi approached a pharmaceutical company with a proposition: 'I want the Japanese to sell the product in Japan."

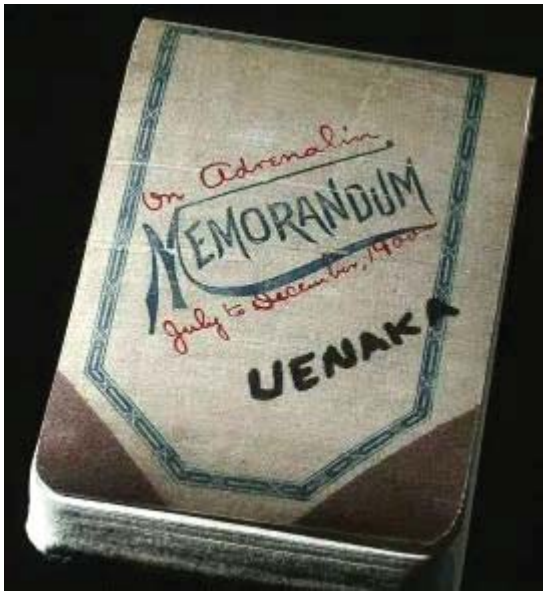
As well as being an outstanding chemist, he was also learning to be an outstanding entrepreneur. In those days, most Japanese would not have thought of patenting the results of their research; but applied for many patents, worldwide. "He always thought about Japan with his Western business mindset. He entrusted the sales of Takadiastase to Matasaku Shiobara, who name was given to Jokichi by an acquaintance while staying in the U.S." Jokichi put his trust "in this young man who was just 20 years old. Shiobara launched a small store, Sankyo Shoten, with two friends, and successfully met Jokichi's expectations by actively promoting the product." A color photo shows 3 signboards, written in katakana characters, for advertising Taka-Diastase.

Natsume Soseki mentioned Taka-Diastase in his famous novel, *I am a Cat*, as follows: "He has a weak stomach and his skin is of a pale, yellowish color, inelastic and lacking in vitality. Nevertheless he is an enormous gormandiser. After eating, he takes some taka-diastase for his stomach."

Photos show (1) The cover of the novel. (2) The front label of a bottle of Adrenalin Chloride (in color). Soon Taka-Diastase was sold worldwide.

Jokichi is also closely associated with adrenaline. It was attracting attention (for its hemostatic action and vasopressor action) in the fields of emergency medical care and surgery. "But on one had yet succeeded in isolating the substance in its pure form. In 1900 Jokichi became 46 years old. He was living in New York and focusing intensely on his research. This field of adrenalin was a totally new field for him and his experiments kept failing. He hired an outstanding assistant named Keizo Uenaka.

A photo shows Uenaka seated in a chair in the laboratory with his right elbow on a desk. He had graduated from the Pharmaceutical Department of the Faculty of Medicine, at Tokyo University. "With the help of his outstanding assistant, Jokichi finally found a way of extracting adrenaline from bovine organs. Uenaka wrote down in detail how the research was carried out."

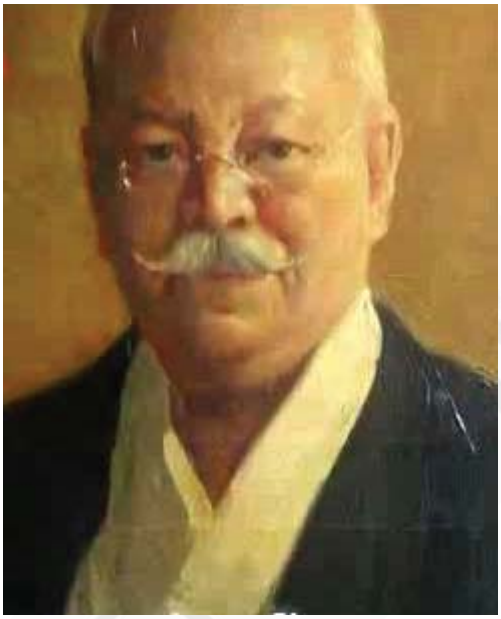


A photo shows Uenaka's laboratory notebook titled "On Adrenalin: Memorandum. July to December, 1900. Uenaka." "But then success came at an unexpected moment." Dr. Joan Bennett explains: "One night Dr. Uenaka was very tired and he didn't clean up his laboratory glassware; he went home. When he came back the next day, crystals of adrenaline were on the glassware that he had not cleaned up. Narrator: Nov. 7, 1900, he wrote in his lab notebook. "The extracted crystals have been named adrenaline." The success startled the world and earned Jokichi high praise. "Without adrenaline there is no medicine." And: "A great innovation comparable to the telephone." Soon adrenaline was distributed to clinical practices worldwide. Matasaku Shiobara also delivered adrenaline to clinical practices in Japan. A photo shows an advertisement for Adrenalin Chloride in Japanese. In 1913 Sankyo Shoten was reorganized into a limited company, Sankyo Shoten, Ltd. Jokichi became its first president.

The company started making Taka-Diastase and Adrenalin in Japan. A photo shows an early bottle and box of Adrenalin Chloride. He always hoped and worked for a bright and prosperous future for Japan, but his homeland was moving in a direction he did not like. In 1904 the Russo-Japanese war broke out.

Part 4. Is about his part in the gift of Cherry Trees to the United States and his later life. In 1904, for the first time, Takamine has some spare cash; he thought about what he could do for his homeland. He bought space in American newspapers to tell Americans about the wonderful new developments in science and technology in Japan. He sometimes hosted parties to promote friendship between Japan and the U.S. He devoted himself to private diplomacy to such an extent that he was calls a "goodwill ambassador."

One day he heard that Eliza Scidmore, a woman whom he had known for a long time, was planning to plant cherry trees in Washington, DC. She could not forget the beautiful



photos of cherry blossoms that she had taken in Japan. She even consulted with an acquaintance, Helen Taft, the wife of President Taft. But nobody would listen to her.

However in Jokichi, who had experienced the beauty of cherry blossoms and also wanted to plant cherry trees in the U.S., Scidmore's proposal (which she had been setting forth for more than 25 years) had found another ardent proponent. The best way to foster friendship between Japan and the U.S. he thought, was to have Americans experience cherry blossoms, which symbolize the Japanese mind. With three people working toward the same vision, things started to move forward. Photos show: Helen Taft, Eliza Scidmore, Jokichi Takamine, and Yukio Ozaka (Mayor of Tokyo). Jokichi suggested to Yukio Ozaki that Tokyo send a gift of 2,000 cherry trees to Washington, DC, to promote friendship between Japan and the U.S. In Jan. 1910 (when Jokichi was age 56), the 2,000 cherry trees arrived in the American capital. Quarantine officers in the U.S., however, turned pale when they saw them. Almost all of the trees were infested by pests that did not exist in the U.S. So unfortunately, the cherry trees, along with the dreams of many people, went up in smoke as all the trees were burned. Former Ambassador John Malott explains that the Japanese, wisely, understood– thus averting a diplomatic incident. So those with the dream refused to give up; they tried again. The second shipment of 3,000 cherry trees arrived in the U.S. in March 1912. The American agricultural officials said they had never seen a cleaner shipment arrive in the United States. The next day, the first trees were planted, marking the start of a 100-year history. The names of Jokichi or Scidmore were never written down in any official record or documentation. A botanist, however left the following note in the *International Geographic Newsletter* (Oct. 1920): "... a Japanese gentleman, who has spent a large part of his life in America

should have made it possible for the mayor of his native city to give to the country of his adoption thousands of the trees which represent the spirit of his people."

Until the day in 1922, when Jokichi died at age 68, he was active in promoting private diplomacy. A photo shows his death mask. His record of passionate actions earned him the title of "goodwill ambassador." The news of his death was highly publicized in American newspapers. Over 1,000 people paid their respects at the funeral in New York City and a memorial service in Japan. The cherry trees in Washington, DC, have continued to bloom beautifully every year since Jokichi's death.

589. Hunt, Sharon E. 2012. Re: Photographs of Santa Rita in the Desert (Vail, Arizona). Letter (e-mail) to William Shurtleff at Soyinfo Center, Aug. 5. 1 p.

• ***Summary:*** This weekend, Sharon took these color photos of the shrine: St. Rita in the Desert Parish, 13260 E. Colossal Cave Road, Vail, Arizona 85641-0400. Office phone: 762-9688. Fax: 762-5967.

She writes: "It's very dark in there–the only light source are the small stained glass windows. Part of the charm, actually, is the subdued atmosphere. There are *always* people in the Shrine worshiping (they have a schedule for that), so there are people in the photo... I also took a few photos of the outside showing the stained glass and of the beautiful garden outside. The plaque indicating it was a gift from the Takamine family is to the right of the front door as you enter it."

Photos (see next 3 pages) show: (1) The altar and stained glass windows as seen from the nave. (2) Statue of Santa Rita–the Saint of the Impossible–in the garden outside the church. (3) "A Memorial to the Takamine Family, 1935." (4) A stained glass window in the side of the church. Address: Tucson, Arizona.

590. Dawson, Wayne. 2012. Re: Searching for information on Charles P. Beach or the Beach Ranch at the Arizona Historical Society, Tucson, Arizona. Letter (e-mail) to William Shurtleff at Soyinfo Center, Aug. 15. 2 p. [6 ref]

• ***Summary:*** "1. There is no question that Township 16S, Range 16E contains the Santa Rita in the Desert. Google Earth would place it in the Southeast quarter of the Northwest quarter of Section 16 rather than the Northeast quarter–but this is subject to small errors. The Assessor's ID is correct as is the acreage of the property per the Assessor's records.

"2. I have no idea why the Beachs patented Section 2 or Township 17S, Range 15E. Interestingly, Google Earth shows two "settlements" or clusters of buildings around Lots 2 & 3 and in the South Half of that Township. The rest of the section seems vacant, even today. "4. My findings at the Historical Society were nil other than the proper reference for the map that showed the Beach ranch (the one on green paper). I talked with the Head Librarian. No permission to use the map is required nor is there a fee. They much prefer and very much appreciate a citation something along the line as follows:... (see 1932 map).

"I did confirm that this is the map which you have the copy of. I would use it as well as any recent maps because they tie together so closely and this map is the only place I've been able to find the Beach Ranch named.

"5. There is no book on ranches in Pima County. I checked the following files to see if they contained anything of interest about the ranch:

"Subject: Ranches-Pima County-1 of 4 (Photo file).

"Subject: Ranches-Pima County-2 of 4 (Photo file).

"Subject: Ranches-Pima County-3 of 4 (Photo file).

"Subject: Ranches-Pima County-4 of 4 (Photo file).

"(Above contain some cool photos of the area but nothing in the immediate area. Lots of photos of the Hilton ranch (location ?), several guest ranches, etc.).

"I checked about 20 or 30 maps in the drawers that were filed around the one cited above in hopes they might also have the Beach ranch shown. They did not.

"Vail Papers, 1875-1935: I checked the inventory of these boxes and couldn't find anything that looked of interest. I didn't think you wanted me to spend 4 or 5 hours reading something that probably wouldn't end up being of interest.

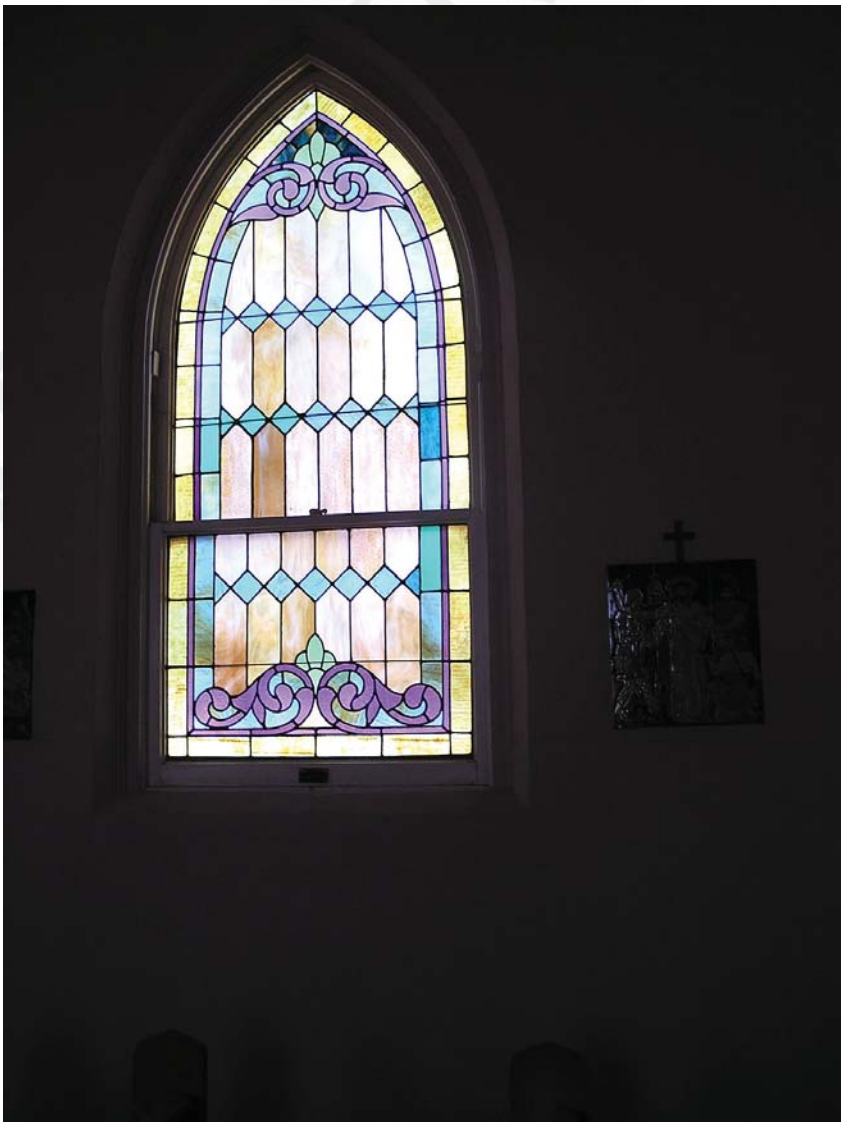
"Helvetia Photographs, 1905-1910: Although the time frame of these photos is earlier than the Beaches time in the area, I looked anyway since Helvetia is just a ways south of the Beach main property. Nothing that I thought would be worth the time showed up. They are cool photos of early Arizona mining.

"Family Surname Notebooks: There are a series of notebooks at the Historical Society that cover newspaper articles about many different families, many of whom were not the high flying people that sometimes get covered. There were several pages about Charlie, his wife and the shrine. I assume these are what you were sent by the person who did your research. Typically the copies would be on green paper. That material there sounded like what you were describing.

"Call me after about 4:30 if you want to talk further. I should have asked earlier–what is your book about? Charlie? His wife? the ranch?

"How interested are you in any mining claims Charlie might have had? If you want to know, I have a friend who is a nationally known Mineral Law Lawyer who has offered to show me how to find the listing of names of men and their claims. Most of the maps of claims show them by claim name, not by owner of the claim. We know he had the one and I would be surprised if he didn't have a *bunch* of others since the area is riddled with mining deposits, mines, etc.

"I looked at a 1919 map and an 1893 map, knowing that the Beach ranch wouldn't be there. The Andrade (some different spellings) ranch and the Hopley ranch date back to



before then. I would bet that some of the Mexican families had been there before the Gadsden Purchase in 1854. Many Mexican land grants preceded that day by many years." Address: Tucson, Arizona.

591. Lamb, J.J. 2012. Re: Location of Santa Rita in the Desert. Letter (e-mail) to William Shurtleff at Soyinfo Center, Aug. 15. 1 p.
• ***Summary:*** "Township 16S Range 16E Section 16, Quarter Section NE1/4

"13.24 Pima County Assessor's ID No. 305-13-053A.

"Acreage of property 13.24.

"UTM (Universal Transverse Mercator [coordinate system]).

"12N 527235ME 354598.

"Zone Easting Northing.

"I would be very interested in the land information around the Shrine and original town site. I have asked the folks at the Shrine to try and locate the original deed. It is not at the Diocese. It may be at Real Property-they will look there as well as at the Shrine in case it is in a folder or box.

"I still have to get back down to the County Recorders to do more work looking at deeds." Address: Director, Vail Preservation Society, Vail Colorado.

592. Dawson, Wayne. 2012. Re: Land in Arizona owned by Charles P. Beach and his wife, Caroline. Letter (e-mail) to William Shurtleff at Soyinfo Center, Aug. 17. 3 p. [6 ref]
• ***Summary:*** "The following is a summary of the deeds researched by Wayne E. Dawson on August 16, 2012, in the office of the Pima County, Arizona Recorder. Records searched were:

"Grantee Index: February 1926–April 1929 May 1929–December 1937

"Grantor Index: A-Z February 1926–April 1929, A-H May 1929–December 1937, A-H January 1938–December 1946

Executive summary: The earliest land owned by Charles P. Beach and his wife Caroline was Section 29, Township 17 South, Range 16 East of the Gila and Salt River Base and Meridian. The land was originally given by Francisco Estrada to his wife, Guadalupe, for the love and affection he held for her on April 27, 1927. He specified that, if she survived him, the land was hers only as long as she was his widow and did not remarry. However, she did remarry and the land transactions get complicated with Quit-claim deeds back and forth between Guadalupe (Estrada) Lopez, the Beaches and Francisco Estrada's children. The end result of all these deeds described below is that the Beaches ended up owning the West Half of Section 29, Township 17 South, Range 16 East G&SRB&M by July 20, 1932 as well as the East half of the adjoining Section 30 which they had purchased on December 8, 1928.

"In 1934, Charles P. Beach began patenting land from the United States government. On 14 February 1934, Charles received his first patent for 634.48 acres in the Township 17 South, Range 15 East, the adjacent Township on the west to their property they purchased from the Estradas.

"Apparently Charles had owned property in Northern Arizona in an area which became the Western Navajo Indian Reservation. He swapped this land with the United States government and obtained a patent for almost 2,000 acres, again in Township 17 South, Range 15 East.

"Charles received a third patent, shown in the records of the Bureau of Land Management, patent # 1106536, on January 22, 1940. Because this tract search did not cover that time period, it is unknown if Charles records this tract or not.

"With all these transactions, Charles P. Beach and his wife Caroline owned approximately 1,827 acres in Township 17 South, Range 15 East, another approximately 320 acres in Township 17 S, Range 16 East, and then approximately 160 acres in Section 16, Township 16 South, Range 16 East. It is probably on this last tract that Caroline Beach built the Shrine to Santa Rita in the Desert.

"Analysis of deeds involving property owned by Charles Pablo Beach and his wife, Caroline.

"1. Deed of Gift: On April 19, 1927, Francisco Estrada granted to Guadalupe Estrada, presumably his wife, for 'consideration of the love and affection which the party of the first part [Francisco] has and bears unto the party of the second part [Guadalupe], as also for the better maintenance, support, protection and livelihood of the said party of the second part [Guadalupe]' granted her a great deal of property with the condition 'that the said party of the second part [Guadalupe] remain the widow of the party of the first part [Francisco]" all his rights to the following property:'

"1A. Section 29 in Township 17 South of Range 16 East, Gila and Salt River Base and Meridian.

"1B. West half of the Southeast quarter and south half of the Southwest quarter of Section 12, Township 18 South, Range 16E, G&SRB&M

"1C. South half of the Southwest quarter of Section 1, and the north half of the northwest quarter of Section 12, Township 18 South, Range 16 East, G&SRB&M

"This deed was to remain in force during the rest of the life of Francisco and as long as Guadalupe remained his widow. Should she remarry, her interest will terminate.

"This deed was recorded in Deed Book 115, Page 533.

"2. Bargain and Sale Deed: On December 8, 1928, J. E. Stewart and Blanche, his wife, sold to Charles P. Beach for $10 gold coin:

"2A. The East half of Section 30 in Township 17 South, Range 16 East, G&SRB&M. This property was purchased subject to a mortgage which the Stewarts's had taken out January 24, 1922 with Southern Arizona Bank & Trust Company in the amount of $1,500. This mortgage as recorded in Mortgage Book 51, Page 449 was assumed by Charles P. Beach who agreed to pay it.

"This deed was recorded in Deed Book 131, Page 170.

"3. Quit Claim Deed: On October 11, 1929, Guadalupe Lopez and her husband, Francisco Lopez, sold to Charles P. Beach, husband of Caroline Beach, for $10 lawful money of the United States the following property:

"3A. Section 29, Township 17 South, Range 16 East, G&SRB&M.

"Guadalupe, one of the grantors, sold her interest 'community or as heir or under any will of her deceased husband, Francisco Estrada, including such as she may have acquired under deed from her said former husband dated April 19, 1927 as recorded in Book 533, Page 115.'

"This deed was recorded in Book 137, Page 193. It was probably a Quit-Claim deed because Guadalupe quit-claimed her rights to the property. Interestingly, under the terms of the deed whereby Francisco Estrada granted her this land, she really didn't own this property anymore since she had remarried.

"4. Quit-Claim Deed: Then on November 10, 1929, Charles P. Beach and his wife Caroline, husband and wife, quit-claimed:

"4A. Section 29, Township 17 South, Range 16 East, G&SRB&M

"This deed is recorded in Book 141, Page 43-44. The Beaches quit-claimed all their interest in this land that they had obtained October 11, 1929, Book 137, Page 493 to the Francisco Estrada, Elena Estrada, Bernardino Estrada, Laria [Maria?] Estrada, minors and Anita Estrada Mayer [wife of Fred Mayer]. Fred Mayer acknowledged that the property was the sole and separate estate.

"5. Quit-Claim Deed: Further, on April 19, 1932, Anita Estrada Mayer and her husband, Fred Mayer, for $10 lawful money 'and other good and valuable considerations,' released and quit-claimed all THEIR rights to the following property:

"5A. West Half of Section 29, Township 17 South, Range 16 East

"6. Guardian's Deed: On July 20, 1932, Fred Mayer (presumably Anita Estrada Mayer's husband), guardian of the estates of the minor children, Francisco Estrada, Elena Estrada, Bernardino Estrada and Maria Estrada, under court ordered sale, sold the following property to Charles P. Beach, husband of Caroline Beach for $1,600.

"6A. West Half of Section 29, Township 17 South, Range 16 East G&SRB&M

"After all these transactions, the Beaches ended up owning the West Half of Section 29, Township 17 South, Range 16 East, Gila and Salt River Base and Meridian by July 20, 1932." Continued. Address: Tucson, Arizona.

593. Dawson, Wayne. 2012. Re: Land in Arizona owned by Charles P. Beach and his wife, Caroline (Continues, Part II). Letter (e-mail) to William Shurtleff at Soyinfo Center, Aug. 17. 3 p. [6 ref]

• ***Summary:*** Continued: "Other Beach Lands:

"1. On 14 February 1934, the United States of America granted a patent, #1068047, to Charles P. Beach for:

"1A. West Half, the West half of the East half, and Lots 1, 2, 3, and 4 of Section 25 of Township 17 South of Range 15 East of the Gila and Salt River Meridian, Arizona, containing 634.48 acres. Mineral and coal rights were reserved for the United States government.

"Interestingly, this patent, recorded in Pima County Deed Book 175, Page 348, states: 'To secure Homesteads to Actual Settlers on Public Domain,' and the acts supplemental thereto, the claim of Charles P. Beach has been established and duly consummated.'

"This statement implies that Charles had homesteaded the land and hence, a Homestead Application may be on file in the United States Archives. These are not accessible on the Internet. 'There were few requirements to qualify under the Homestead Act. A homesteader had to be the head of the household or at least twenty-one years old. He had to live on the land, build a home, make improvements and farm for five years. There was a filing fee of eighteen dollars.' (Source: Wikipedia, Homestead Act).

"2. One of the more interesting patents, #1074701 was issued to Charles P. Beach by the United States government on March 6, 1935. This patent was recorded by Charles P. Beach in the Pima County Deed Book 180, Page 634, on March 22, 1935. The deed as recorded states the area of land involved was 2,000 acres. The patent records at the Bureau of Land Management state that there was 1,987.43 acres in the tracts awarded.

"The tracts awarded by the patent, all in Township 17 South, Range 15 East, were:

"2A. East half and the Northwest quarter of Section 13

"2B. Southeast quarter of the Northeast quarter, the South half of the Southwest quarter, and the Southeast quarter of Section 14

"2C. Northeast quarter of the Northwest quarter of Section 22

"2D. Section 23

"2E. East half of Section 24

"2F. Northeast quarter and the East half of the Northwest quarter of Section 26

"The interesting part of this patent is that it was a land swap with the United States government. The deed states: "'... Charles P. Beach, being owner of certain lands situated and included within the limits of the addition to the Western Navajo Indian Reservation, Arizona, has, under the provisions of the Act approved May 23, 1930 (46 Stat. 387), as amended by the Act approved February 21, 1931 (46 Stat. 1204), reconveyed and relinquished the said lands to the United States and has under the provisions of said Acts, elected in lieu thereof the following described tracts of vacant public land' and then describing the tracts of land shown above.

Note: J.J. Lambe, Director of Vail Preservation Society, Vail, says of this Navajo land: "The homestead: He originally had a homestead on the Navajo Reservation up north. When non-tribal members were excluded, homesteads were transferred to another section. His was at the base of Mt. Fagan." Wayne Dawson says of this Navajo land: "Just for the record, I did check the patents for all of Arizona and Charles didn't get the land by patent. Too bad–that would have been easy."

"In the records of the Bureau of Land Management (BLM) online, the listing of property in this patent differs somewhat from the list given in this deed.

"In the BLM records, the land in Section 13 was the Northwest quarter and the West half of the East half as well as Lots 1, 2, 3, and 4 of Section 13. This would indicate that there was more land granted to Charles than his deed portrays.

"Additionally, the BLM records define the grant in Section 24 as the West half of the East half and Lots 1, 2, 3, and 4. This equates to the East half of Section 24 but is more correctly stated in the online version. Lots 1, 2, 3 and 4 comprise the East half of the East half of Section 24.

"3. The remaining deed found in this tract search was a patent from the State of Arizona, #1986, issued on October 14, 1937 to Charles P. Beach. It was a purchase from the state and full payment was received. The land is described as:

"A. Northeast quarter of Section 16, Township 16 South, Range 16 East, G&SRB&M

"Charles P. Beach recorded the land in the Pima County records in Deed Book 202, Page 28-29, on November 2, 1937. The land was subject to rights of way, highways, Western Gas Co. and Mountain States Telephone and Telegraph Co., the Southern Pacific [Railroad] Co., and the United States canals and ditches. The Northwest corner of this land, in the city of Vail, Arizona, appears to be the land upon which Caroline Beach, Charles's wife, built the Roman Catholic Shrine of Santa Rita in the Desert."

Question: Why is there a "hole in the middle of the blue doughnut" of the largest landholdings of Charles and Caroline Beach? Wayne was never able to answer this question. He notes: "The only thing I can think of is that there's a mining claim there that Charles couldn't get. I am now learning how to research mining claims. Another theory is that he did not own the "hole" and did not need to since no one could get access to it. In those days it was free range; there were very few fences. So if he were sneaky or shrewd, he could use the land in the hole as ranchland without actually owning it."

Why is the population of the area around Vail and Corona del Tucson growing so fast? The elevation is higher than that of Tucson (3,400 feet vs. 2,600 feet) so it is cooler; it is also drier. Address: Tucson, Arizona.

594. Buckstad-Russo, Tara. 2012. Re: Sending link to www.fultonhistory.com, a website with two centuries of digitized historical newspapers from New York state. Letter (e-mail) to William Shurtleff at Soyinfo Center, Aug. 17. 1 p.
• ***Summary:*** In this database (which presently contains 19.63 million "old New York State historical newspaper pages") are hundreds of free, digitized articles about Jokichi and Caroline Takamine, their children, and Sho-Fu-Den / Sho-Foo-Den–especially in the old newspaper Republican Watchman (Monticello, New York).

Note: Using this link we found many old articles that appear in this book. Address: Bookkeeper, Town of Forestburgh, Sullivan County, New York.

595. Dawson, Wayne; Shurtleff, William. 2012. Additional thoughts and questions about land in Arizona owned by Charles P. Beach and his wife, Caroline. *SoyaScan Notes.* Aug. 20. Conducted by William Shurtleff of Soyinfo Center.
• ***Summary:*** In 1926 Charles Beach and Caroline Takamine met and were married. At that time he may have been living at his family homestead in Arizona on or near the Navajo Reservation southeast of the Grand Canyon. It seems fair to assume (as we will see shortly) that this homestead was about 3 sections or 1,920 acres in size.

However (according to J.J. Lamb, director of Vail Preservation Society and an expert on the history of Santa Rita in the Desert) Charles' father was attached to the Bureau of Indian Affairs and lived on that homestead near the Navajo Reservation. J.J. believes that Charles did not live on the that homestead, but was a ranch hand on some land closer to the Santa Rita Mountains. She has never been able to determine where Charles Beach was living when he first met Eben Takamine and, soon afterwards, Caroline Takamine–who was introduced to him by Eben.

His obituary says that he graduated from the University of Arizona. "After service in France during World War I, he returned to Arizona and started a homestead near Vail. He gradually bought more land until his cattle ranch" was one of the largest in the area.

According to the 1920 U.S. Census, Charles P. Beach was living as a boarder in Rosemont, Pima County, Arizona. with Francis and Anita Mack. He was single, age 30, a miner by occupation, and the owner of a mining claim.

Charles and Caroline purchased their first land on 8 Dec. 1928; it was in Pima County in the East half of Section 30 in Township 17 South, Range 16 East (G&SRB&M = Gila & Salt River Baseline & Meridian).

Then in March 1935 they swapped their family homestead land near the Navajo Indian reservation for 1,987.43 acres of land of equivalent value (or size) in Pima County further south.

The number 1,987 is an interesting number. It is about 3 sections of land, and Wayne assumes that Beach probably owned whole sections. Each section contains 640 acres, so

3 x 640 = 1,920 acres. Wayne would guess that the Beachs owned about 3 (but we do not yet know which 3) of the 75 sections in Township 27 that are on the map he sent located to the southeast of the Grand Canyon.

Moreover the "Authority" field of their March 1935 land swap record, on the Bureau of Land Management had a link to the law which actually laid out the 75 sections.

We know Charles finished his junior year at the University of Arizona, majoring in agriculture. But we do not know if he graduated. His picture is not in the yearbook for his senior year. He may have left college to fight in World War I. When he returned from the war, he could have either decided to pursue his career in agriculture or ranching by starting to homestead land, or he could have graduated from the university and then started his homestead. The homestead would have enabled him to get land without needing hardly any money; that is what the homestead act is for.

The color map of the Navajo Reservation that Wayne sent Bill (from the Wikipedia page on Navajo Nation–History) probably raises more questions than it answers. That map does not match what the Navajo Reservation looks like today. There is only one Navajo Nation (don't say "reservation") today (many images of it are on the Web). It completely surrounds the Hopi Reservation, which seems strange since the Navajo were warriors and the Hopi were farmers. It is located mostly in Arizona, southeast of the Grand Canyon, but with the northern part in Utah and the eastern part in New Mexico. It is beautiful but rather barren country.

Charles and his wife lived in pretty desolate country at that time–way out in the boondocks. They must have been very much in love to make it work in a place like that. She was much older than he. They also had very interesting projects that they worked on together–such as Santa Rita in the Desert–starting in about 1934.

Note: After his wife died in 1954, Charles sold his ranch in 1956. Address: Tucson, Arizona.

596. *SoyaScan Notes.* 2012. Genealogy of Charles Pablo Beach (Overview) Aug. 27. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** His paternal great-grandparents were: Heman Beach (son of Abner and Beulah {Abernethy} Beach). Born 25 Jan. 1775 in Litchfield, Connecticut. Died 1840; married 1st 27 Oct. 1794, to Clarissa Kilbourn, daughter of Appleton Kilbourn of Litchfield, born 1776, died in Litchfield 20 Sept. 1818. He married a second time. By his 1st wife he had five children, of whom the 5th was Heman Beach (born 23 June 1813, the grandfather of Charles P. Beach). Their first four children were Marcia, Milo, James, and Clarissa.

His paternal grandparents were Heman Beach, Jr. Born 23 June 1813 in Litchfield, Connecticut. Died 25 March 1881 in Litchfield, Connecticut. Married 1st: Eliza Thomas on 16 Jan. 1837. She was born in 1815 in Cornwall, Connecticut. Died 10 Dec. 1849 in Litchfield, Connecticut. He was a farmer, and married two more times after the death of his first wife.

Heman and his 1st wife had 6 children:

1. Algamon G. Beach, born 23 Oct. 1837.
2. Thomas W. Beach, born 19 Aug. 1839.
3. Eugene I. Beach, born 28 1842.
4. Charles Timothy Beach, born 22 Sept. 1844 (father of Charles P. Beach).
5. Heman W. Beach, born 24 Nov. 1846.
6. Eliza J. Beach, born 9 July 1849.

Charles T. Beach married Elizabeth "Lizzie" A. Bridgman on 5 Dec. 1876 at Radical City, Montgomery Co., Kansas (he was age 30 and she 22; marriage record). She was born in Feb. 1855 in Indiana, the daughter of Michael and Mary Bridgman (both born in Indiana; he in 1821, she in 1826). Charles and Lizzie met because they were next door neighbors (by 1875) in Sycamore Township, Montgomery County, Kansas. Charles and Lizzie Beach had five children, of whom Charles P. Beach was the youngest. They were:

1. Wesley H. Beach, born in Aug. 1878 in Kansas.
2. Everett B. Beach, born in 1880 in Kansas.
3. Jesse M. Beach, born in Dec. 1881 in Kansas.
4 Mary Beach, born in Sept. 1887 in Kansas.
5. Charles P. Beach, born 14 Sept. 1889 in Independence, Kansas.

In 1900 Lizzie was the head of household, a widow married for 17 years, living in Colton, San Bernardino County, southern California.

In 1910 the family lived at 604 Belmont Ave., Los Angeles, California.

In 1915 Charles P. was a junior at the University of Arizona, majoring in agriculture, and an outstanding varsity athlete.

On 12 Sept. 1917 Charles P. Beach enlisted in the U.S. Army at age 27. He saw action in France during World War I.

In 1920 Charles P. Beach was a boarder, single, in Rosemont, Pima County, California. He described himself as a miner who had a mining claim.

Questions: Why did Charles attend the University of Arizona? When and where did his father die?

597. *SoyaScan Notes.* 2012. Descendants of Jokichi Takamine (Overview) Aug. 28. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** First generation: Jokichi Takamine and his wife, Caroline, had two sons. The first son, Jokichi ("Jo") Takamine, Jr. married Hilda Petrie and they had a daughter and a son. The second son, Ebenezer ("Eben") Takamine married at least three times but had no children.

Second generation: Jokichi Takamine. Jr. and Hilda Petrie had two children: (1) Carolyn Yuki Takamine, born 20 May 1923. She married Theodore W. Kramer III, who was

born on 7 Aug. 1916 and died on 2 Nov. 2000 in Tucson, Arizona. They had at least two children, John Joseph Kramer and Kathryn Anne Kramer. (3rd generation). (2) Jokichi III, no birth year listed. Medical doctor in Los Angeles. In 1958 he attended Dr. Jôkichi Takamine's statue unveiling ceremony (*Jomakushiki*) in Kanazawa. In 1984, at age 60, (on September 17) he again visited Kanazawa [to attend the centennial of Dr. Takamine's birth]. As of 2012 Aug. 29 he is still alive, about age 87, and living in Santa Monica, California.

Third generation: (1) John Joseph Kramer (born about 1942, died 27 June 1999 in Tucson, Arizona) married (1) Marilyn Elizabeth Bee on 26 Jan. 1967 in Flagstaff, Arizona. They had two children: Michael Kramer and a 2nd boy whose name we do not know.

(2) Dianna (no surname given). Dianna (separately, probably her first marriage) had a child named Stuart A. Foster. Neither his birth date nor the name of his father is given. John Joseph Kramer and Dianna had two children: (1) Robert J. Kramer. (2) James M. Kramer (Arizona). The birth dates and places of these two children are not known.

Their first child was named Michael Kramer (born before 1970 in Tucson). Their second child was a boy–name unknown.

(2) Kathryn Anne Kramer married John C. Condiss on 15 April 1972 in Tucson (at St. Demetrios Greek Orthodox Church).

Note: We have been unable to contact any of these descendants.

598. *SoyaScan Notes.* 2012. Catherine McMahon in Darren Maytham Family Tree (Overview) Aug. 27. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** Catherine McMahon is part of a submitted family tree on Ancestry.com. It states: She is the daughter of William Joseph McMahon (1868-1921) and Mary Elizabeth Griffiths.

Catherine was born on 2 Dec. 1899 in Liverpool, Lancashire (Lancs), England.

Her first marriage in 1925 was to an unknown person. Her 2nd marriage was to John H. Leather in 1925; she was age 26. Her 3rd marriage was to Eben T. Takamine on 2 Oct. 1943 in Boltimore [sic, Baltimore], Maryland.

She died on 13 Oct. 1994 in Menlo Park, California, at age 94. Burial: 19 Oct. 1994 (probably in the Takamine family mausoleum), Woodlawn Cemetery, Bronx, New York.

599. Malott, John R. 2012. Mrs. Taft plants a tree: How the cherry blossoms came to Washington. Washington, DC: The Japan Society of Washington, DC. 42 p. http://myloc.gov/_assets/Exhibitions/cherry-blossoms/Assets/taft.pdf [1 ref]

• ***Summary:*** A beautiful and accurate story, filled with colorful photos and illustrations. Part I. 1. The advocates: So who was involved? 2. City beautiful. 3. The connection to Japan

Part II. 4. How it all came together. 5. Enter the advocates, again. 6. The shipments.

Part III. 7. What happened afterward.

Part IV. 8. The meaning of the trees.

A message from the author: Ambassador John R. Malott.

"The original idea to give thousands of cherry trees to Washington actually came from Dr. Takamine. And so, according to most sources, did the funding to pay for them... But, as a private businessman, scientist and goodwill ambassador, Dr. Takamine didn't think he should be 'out front' on this, so he and Japan's Consul General in New York agreed that the gift should be made through official channels, with the trees given to the City of Washington by the City of Tokyo–from one capital city to another. Mayor Ozaki agreed and the rest, as they say, is history."

Publication of Mrs. Taft Plants a Tree was made possible through support from Daiichi Sankyo Company. Address: President and CEO of the Japan-America Society of Washington, DC.

600. Spots: Jokichi Takamine. 2012.

• ***Summary:*** (1) A portrait photo of Dr. Takamine in his later years.

(2) Dr. Takamine in 1913 in an ornate vest.

(3) The Takamine family mausoleum in Woodlawn Cemetery, the Bronx, New York City, New York.

(4) A portrait photo of Dr. Takamine in his later years.

(5) A color land map of the lands owned by Charles and Caroline in and around Vail, Arizona.

601. *SoyaScan Questions.* 2012. Questions about the life and work of Jokichi Takamine. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** Which company, worldwide, and also in the United States, made and sold the first purified enzyme product? Which enzyme or mixture of purified enzymes was it? What year was it first sold commercially? Was it produced by a microorganism? If so, which one (genus and species) and on what substrate? What was its application?

When and where (what city and address) was the Takamine Ferment Co. founded? It was probably founded in 1890 in Peoria, Illinois, then moved to Chicago after 1894.

What was the first purified enzyme made and sold by Jokichi Takamine? Which enzyme or mixture of purified enzymes was it? What year was it first sold commercially? Was it produced by a microorganism? If so, which one (genus and species) and on what substrate? What was its application?

Did the Takamine Ferment Co. ever make and sell Taka-Diastase as a retail product before Parke, Davis & Co. If yes, where was the product made and when was it first sold commercially?

Which company made the product initially–The

Takamine Ferment Co. or Parke, Davis & Co.? Where was that company located at the time? Did Takamine license the manufacturing, marketing, and distribution rights for Taka-Diastase to Parke-Davis, or only the latter two rights?

What was the main reason the Takamine family left Japan and sailed for California? Did they get a letter from Caroline's mother saying she had talked to the Whisky Trust?

After arriving in Seattle then San Francisco, California, from Japan, did the Takamine family go directly to Chicago? Were both of Caroline's parents already living there? When did they arrive and why? Did Caroline's parents ever reside in Peoria or did they continue to live in Chicago? Did the whole Takamine family reside in Peoria from 1891 to 1894. Note that on six patent applications (British and U.S.) filed between 2 April 1891 and 23 Feb. 1894, Takamine gives his address as Chicago, Illinois; on the earliest two of these his gives a specific address as 25 & 26 Honore Buildings, Chicago, Illinois. From 1891 when the Manhattan distillery in Peoria, Illinois, burned down, until 1894 when his work in Peoria ended, did Takamine and his family continue to reside in Peoria? Did they have two residences, in Chicago and Peoria?

Did Takamine license the manufacturing, marketing, and distribution rights for Taka-Diastase to Parke-Davis, or only the latter two rights? Taka-Diastase was probably made initially on a very small scale, then scaled up as the demand for it increased.

Did the royalties from the sale of Taka-Diastase by Parke, Davis & Co. go to the Takamine Ferment Co., or to the International Takamine Ferment Co., or directly to Dr. Takamine himself?

When did Parke, Davis & Co. stop making Taka-Diastase and turn the production over to Dr. Takamine.

When did Takamine Laboratories first start production in Clifton, New Jersey. Was the company located at 193 Arlington?

Concerning Takamine's work using fungal enzymes to make whiskey in Peoria, Illinois (See Kawakami 1928, p. 28-30): What documentary evidence is there that: (1) Takamine owned a plant for making whiskey from corn in Peoria? (2) It could process 3,000 bushels per day of corn? (3) He hired workers who had lost their employment at malt factories because of his enzyme process? (4) The fire mentioned in Peoria newspapers was on 8 Oct. 1891. Did he stay in Peoria until 1894, after the burned plant had been rebuilt? Did he leave Peoria, not because of the fire, but because of an incident concerning Mr. Greenhut? If Takamine did own his own plant, he must have provided it with enzymes, which would have been the first purified enzymes used commercially in the USA.

Kawakami (1928, p. 33) states: "We have seen that Takamine used diastase of his own creation in obtaining alcohol from corn and other grains. He had established the Takamine Ferment Company in order to manufacture diastase for the distillery at Peoria" (p. 33).

Concerning Dr. Takamine's purchase of land at Merriewold, New York. How much land did he purchase in total and how many acres did he acquire with each purchase?

When did Jokichi Takamine III and his elder sister, Kathryn, move to Arizona to live with their grandmother, Caroline Takamine. Where did they live in Arizona? With Caroline and Charles P. Beach? Where did they go to high school and college? How long did they stay in Arizona? Why did Caroline not tell them about their famous grandfather, Jokichi Takamine?

Did Caroline Takamine Beach write a last will and testament? Does anyone know where it is?

When and where did the Beachs first use the name "Rancho de los Ocotillos" for their ranch?

To do list:

(1) Try to contact a living Takamine descendant for help in making a family tree of living Takamine descendants. Ask if any of these descendants has letters by Jokichi or Caroline, or Caroline's will.

(2) Try to have copies made of all existing letters written by Jokichi or Caroline Takamine. Start at the *Kanazawa Furusato Ijinkan* (See p. 231).

(3) Try to have a good English-language translation made of the 1926 book-length biography of Jokichi Takamine titled *Takamine Hakase* [Dr. Takamine], by Matasaku Shiobara.

(3) Try to get records for Charles P. Beach's homesteads near the Navajo Reservation and at Santa Rita in the Desert.

An asterisk (*) at the end of the record means that SOYFOODS CENTER does not own that document.
A plus after eng (eng+) means that SOYFOODS CENTER has done a partial or complete translation into English of that document.
An asterisk in a listing of number of references [23* ref] means that most of these references are not about soybeans or soyfoods.

SUBJECT/GEOGRAPHICAL INDEX BY RECORD NUMBERS