

**LI YU-YING (LI SHIZENG) -
HISTORY OF HIS WORK WITH SOYFOODS
AND SOYBEANS IN FRANCE,
AND HIS POLITICAL CAREER IN CHINA AND TAIWAN
(1881-1973):**

**EXTENSIVELY ANNOTATED
BIBLIOGRAPHY AND SOURCEBOOK**

Compiled

by

William Shurtleff & Akiko Aoyagi



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DEDICATION AND ACKNOWLEDGMENTS

This book is dedicated to **Li Yu-ying** - a soy pioneer in France, Europe, and the Western World.

Part of the enjoyment of writing a book lies in meeting people from around the world who share a common interest, and in learning from them what is often the knowledge or skills acquired during a lifetime of devoted research or practice. We wish to give deepest thanks...

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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

Chronology of Li Yu-ying (Courtesy name: Li Shizeng)

Li is generally known to the world as Li Shizeng (his “courtesy name”), whereas he used his original name, Li Yu-ying, on all of his soy-related documents (books, articles, patents, etc.).

Li Yu-ying (pinyin: Li Yuying) was one of the most remarkable and creative figures in the early history of soyfoods in France and in Europe. In 1912 he wrote one of the most important books to date about soybeans and soyfoods in Europe. He was the first person from East Asia to think about soyfoods like a Westerner, to grasp the great potential for soyfoods in the West, to start a soy dairy in Europe, to design modern equipment for making soymilk and tofu, to develop, make and market a full line of original Western-style soyfoods in Europe, to popularize commercial tofu and soymilk, and to play a key international role in the transmission of soyfoods from East to West.

Li’s work with soy (especially tofu and soymilk) and his work with politics always went together and were deeply connected.

He later became an important person in Chinese history – one of the “four elder statesmen of the Kuomintang.”

1881 May 29 – Li Yü-ying is born into a prominent family in Beijing, China, although his native place was Kaoyang, Chihli (Hebei). His father, Li Hongzao (Li Hung-tsao), was a dignitary at the Imperial Court of the Qing / Manchu dynasty. He held high offices in the Qing government such as Grand Councillor and tutor to Tsai-ch’ien, the T’ung-chi emperor. Li’s mother, who was his father’s second wife, was Mrs. Yang Shao-Ji.

Li is the youngest of five brothers (two of whom died at an early age). He had either 3 or 4 sisters, three of whom died at an early age.

Li later wrote (in *Le Soya* in 1911) that his father had been “nourished from the first year with soymilk. He is now 37 years old and has always been in excellent health.” Yet his father died in 1897!

Li is exposed to reformist ideas at an early age. In China he studies in an environment open to Western / Occidental ideas and culture.

1897 – Li’s father dies in China. The Qing government awards Li and his elder brother the high rank of lung-chang.

1897 – Li (age 17) marries Yao Tongyi (Yao T’ung-yi, who was Li’s older cousin). They have two children. Li Zongwei (Li Tsung-wei), a son, was born in 1899 in China and died in 1976. Li Yamei (Li Ya-mei; called “Micheline”), a daughter, was born in 1910 in Paris, France. Li’s son married Ji Xiengzhan and his daughter married Zhu Guangyi. From this marriage, Li had two grandsons (Li Dayang and Li Eryang) and one granddaughter (Li Ailian) (Boorman & Howard 1967, p. 321; Yang 1980).

1899 ca. – Li’s coming-of-age capping ceremony. His parents give him the “courtesy name” Li Shizeng, which is used mostly in his political and public life, and is the name by which he is known to the world.

1901 – Li meets Zhang Renjie (Chang Jen-chieh), with whom he establishes a life-long friendship. The two young men have many common interests, the strongest of which is the desire to travel abroad.

1902 – When Sun Baoqi (Sun Pao-ch’i) is appointed minister to France, they join his staff as attachés. Over 20 government and private students travel in the group. In June, on his way to France, Li stops for a while in Shanghai, where he meets Wu Zhihui (Wu Chih-hui) and Cai Yuanpei (Ts’ai Yuan-p’ei), who were also later to become his lifelong friends.

1903 – Li arrives with the group in Paris. He is age 22. This group soon becomes widely known among Chinese, and later among Chinese historians, as “The Paris group.”

1903-06 – Li abandons his intention of becoming a Mandarin in order to undertake studies in agronomy at the Chesnoy School of Practical Agriculture (*Ecole pratique d’agriculture de Chesnoy*) at Montargis, about 60 miles southwest of Paris.

1905 – Li presents his first paper on soy (in French) at the Second International Dairy Congress in Paris; it is later published in the proceedings. He emphasizes that the introduction of soybean milk to Western countries would be highly beneficial to public health and to the budget of the poor.”

1905 – Wu Zhihui arrives in Paris in late 1905 and joins with Li and with Zhang Renjie in founding the World Society (*Shi Jie She*; W.-G. *Shih-chieh-she*), a cultural and revolutionary publishing house with an affiliated printing establishment.

In early 1907 Zhang, who was from a wealthy Chinese family and was running a successful import-export company between Paris and China, financed the establishment of an important Chinese-language weekly magazine titled *New Century* (*Xin Shi Ji*; W.-G. *Hsin shih-chi*), which began publication on 22 June 1907 and issued 121 numbers before ceasing publication on 21 May 1910 because of heavy financial losses. Li and Wu, both of whom had become ardent anarchists, wrote most of the articles for the magazine. “For three years this journal was to champion the causes of anarchism and revolution, reaching Chinese students and intellectuals in all parts of the world” (Scalapino & Yu 1961. Boorman & Howard 1967).

1906-10 – Li leaves Montargis for Paris where he enrolls in biochemistry, chemistry and biology at the Sorbonne and works as an intern in the laboratory of Gabriel Bertrand at the Pasteur Institute. Under Bertrand, he conducts research on soybeans.

1907 – Li and Xia Jianzhong (Hsia Chien-chung) establish the Far Eastern Biological Society (also called Biological Society of the Far East; *Société biologique de l'Extrême-Orient*). Made up of physicians, scholars (men of letters), and businesspeople, this society would seem to have as its principal goal to make known and have used in Europe the pharmaceutical and agricultural products of the Far East [East Asia]. Li has by now done considerable research on the soybean at the Pasteur Institute.

1907 – Li, still a Chinese citizen, joins the *Tongmenghui* (Chinese Revolutionary Alliance), a clandestine resistance movement, founded by Sun Yat Sen, that aims at giving China back to the Chinese people, establishing a republic, and redistributing the land equitably.

1907 – During this time, Li develops his political philosophy as an anarchist, drawing inspiration from the thought of Kropotkin, Proudhon, and Elisée Reclus (1830-1905), with whose nephew Li was personally acquainted.

In 1907 the first nucleus of anarchists appears in Paris. Its most important members are Li Yuying, Wu Zhihui, and later Zhang Ji (Chang Chi). Although Laozi / Lao Tzu, the ancient Chinese sage, was also an anarchist, the Paris group tended to dismiss or even actively oppose any association of anarchism with traditional culture.

1908 – Li becomes a vegetarian – and apparently remains one for the rest of his life. He also decides to establish a

company to manufacture soybean products (Boorman & Howard 1967, p. 319).

1908 – According to several sources, Li publishes his first book, *The Soybean (Le Soja)* (Huang Shirong 1908; Yang 1980). Note: We have never seen this book or seen it cataloged. The earliest book we have seen by Li about soy was published in 1910 in Chinese.

1908 or 1909 – After 6 years in France, Li returns to China to raise funds for his tofu company (\$400,000 of startup capital). Six months later he returned to France with five workers and (apparently) a large supply of Chinese soybeans and coagulant. In France he and his engineers design modern equipment to transform soybeans into soymilk and then tofu. Li establishes the world's first soy dairy, named the Tofu Manufacturing Co. (*Usine de la Caséo-Sojaïne*), located in a large brick building at 46-48 Rue Denis Papin, Les Vallées, Colombes (near Asnières) (changed to La Garenne-Colombes as of 2011), a few miles northwest of Paris. He has two main reasons for establishing this plant: (1) He believes that soya could help China to meet its dietary needs and he wants to develop a model processing plant; (2) He wants to be able to provide work for about 30 worker-students that he brings from China to whom he provides additional intellectual training by setting up evening classes. The young Chinese workers use their wages to pursue their studies in France. They are escorted to France by Qi Rushan (Ch'i Ju-shan), whose elder brother, Qi Zhushan (Ch'i Chu-shan) managed the factory. Within a year, a second round of workers arrived from China to work at the tofu factory.

1909 – Li welcomes his friend, Sun Yat Sen, on a visit to Paris, to his Tofu Manufacturing Co., located just outside of Paris. Sun wrote: “My friend Li Shizeng has conducted research on soybeans and advocates eating soybean foods instead of meat.”

1910 Dec. – Li applies for the world's first soymilk patents (British Patents No. 30,275 and 30,351). The first patent is titled “Vegetable milk and its derivatives” and the second concerns fermented soymilk. He is issued both patents in Feb. 1912. The first patent is packed with original ideas, including various French-style cheeses and the world's first industrial soy protein isolate, called Sojalithe, after its counterpart, Galalith, made from milk protein. Li notes that Sojalithe could be used as an ivory substitute.

Also, on Dec. 27, he applied for two French patents, No. 424,124 concerning soy flour and its derivatives, and No. 424,125 concerning food products and condiments made from the soybean. He was issued both patents on 5 May 1911.

1910- Li's first major book, *Ta Tou: Le Soja* (The Soybean) is published in Paris by the Far Eastern Biological Society (*Société biologique de l'Extrême-Orient*; 66 pages). It is written entirely in Chinese.

1910 – While on a trip to China, Li attends the Nanking Exposition, where he sees 400 soybean varieties on display from various provinces. He may have been looking for new varieties to use for making tofu in his factory, or for cultivation in France (Li 1911. Jan. 12, p. 50). Also in 1910 a third round of workers arrives from China to work at the tofu factory. The total number of workers is now more than 30. When the workers are not working, they are studying Chinese and French; they are not allowed to drink, smoke, or gamble.

1911 May 15 – Li serves his vegetarian ham (*jambon végétal*), soy cheese (*fromage de Soya*), soy preserves (*confitures de Soya*, such as *crème de marron*), soy bread (*pain de Soya*), etc. at the annual lunch of France's national Society for Acclimatization (*Société d'Acclimatation*) in keeping with its tradition of introducing new foods from little-known plants (Bois 1927, p. 126).

1911 April – Li applies for three more French patents, and one U.S. patent, related to soy.

1911 Sept. – From Sept. 1911 to April 1912 Li collaborates with Mr. L. Grandvoinnet (a French agricultural engineer who works with Li at his tofu plant), to write a series of eight articles titled "The Soybean" (*Le Soja*), published in consecutive issues of the periodical *L'Agriculture Pratique des Pays Chauds* (*Bulletin du Jardin Colonial*). This series is both an expansion and a reworking of the ideas presented in Li's Chinese-language book of 1910, for these articles are now intended to be read by Frenchmen rather than Chinese.

1911 Oct. – Li returns to China during the *Xinhai* Revolution (or Revolution of 1911). The revolution began with the Wuchang Uprising of 10 Oct. 1911 and ended with the abdication of Emperor Puyi on 12 Feb. 1912. The overthrow of the Qing / Manchu dynasty and its last emperor marks the end of thousands of years of powerful imperial rule; theoretically this would usher in a new era in which political power rested with the people. However, in reality, China became a fragmented nation dominated by warlords.

1912 – The pioneering series of eight articles by Li and Grandvoinnet is published as *Soya – Its Cultivation, Dietary, Therapeutic, Agricultural and Industrial Uses* (Paris: A Challamel, 150 p.). Their magnum opus, it is one of the earliest, most important, influential, creative, interesting, and carefully researched books ever written

about soybeans and soyfoods. Its bibliography on soy is larger than any published prior to that time. Only *Die Sojabohne*, by Haberlandt (1878) and *Le Soya*, by Paillieux (1880) can rival it in influence – but not in scope concerning soyfoods.

1912 April – Li Yuying, Wu Zhihui, and Cai Yuanpei establish in Beijing the Society for Frugal Study in France (*liufa jianxuehui*; W.-G. *Liu-fa chien-hsueh hui*), with the intent of preparing young Chinese for low-cost studies (China \$600 a year) in France. It is also known as the Society for Rational French Education (*la Société Rationnelle des Etudiants Chinois en France*). A preparatory school is established in Beijing to teach French for 6 months to aspiring students.

In Jan. 1913 the first group of 30 students reaches France. Li arranges for them to be admitted to the College of Montargis, south of Paris. In all, this thrift-study program enables more than 100 students to study in France (Boorman & Howard 1968, p. 320).

1913 Sept. – After the so-called second revolution in China collapses, most Kuomintang leaders are forced to flee China. Li, together with Wang Ching-wei and Tseng Chung-ming, take their families to France. Wang lived with Li in Montargis and lectured to the thrift-study students.

1915 June 5 – Telegram from Li (in France) to Wu Zhihui: Sales of tofu are getting better. During the first 5 years, tofu sales averaged 500 pieces (cakes) per month, but they have been increasing ever since. Sales of tofu have averaged 10,000 pieces a month this year, and sometimes they are more than 17,000 pieces a month (Li 1980, p. 306).

1916 – When Cai Yuanpei becomes chancellor of Peking University, he invites Li Shizeng to join its faculty as professor of biology. Li's tofu factory is forced by wartime conditions to suspend operations (Boorman & Howard 1967, p. 320).

1917 – Li returns to China.

1919 May 4 – The May Fourth Movement starts in China. It grew out of dissatisfaction with the Treaty of Versailles settlement (which awarded Shandong province to Japan). An anti-imperialist, and cultural movement, it marked the upsurge of Chinese nationalism and a re-evaluation of Chinese cultural institutions, such as Confucianism. Li was an active participant, especially as a theorist.

1920 – Li sponsors the establishment of the Sino-French University near Beijing (and serves as chairman of the board), and the *Institut Franco-Chinois de Lyon* in France; it was housed in a fortress in Lyon which had been donated

by the French government. The Chinese government in Canton gave financial support. Wu Zhihui accompanied the first group of students from China to Lyon and became president of the Institut (Boorman & Howard 1967, p. 320).

1924 Jan. – At the First National Congress of the Kuomintang, held at Canton (today's Guangzhou), Li and Wu Zhihui are elected to the Party's Central Advisory Committee (Boorman & Howard, p. 320).

1924 Oct. – After warlord Feng Yuxiang occupied Beijing and took control of the Peking government, he decided to expel Puyi (China's last emperor) from the Forbidden City. Li Shizeng was appointed the civilian representative to the eviction, which took place on Nov. 5. Li was then appointed chairman of the committee in charge of the inventory and custody of the palace treasures (Boorman & Howard, p. 320).

1925 – The Beijing Palace Museum is established in the Forbidden City (*gugong*), with Li as chairman of the board and I Peiji (Yi P'ei-chi) as curator.

1925 – Li makes great efforts to secure the return to China of the French portion of the Boxer Indemnity Fund – which is to be used only for cultural and educational activities. After long negotiations, a Sino-French agreement is signed in 1925. All of this money is funneled through Li; it ensures him a position of power at least through World War II; he probably used a very small portion of it to finance his personal projects. This, plus money from his wealthy family, were probably his main sources of income for the rest of his life.

1925 – In France, Li is created a *Commandeur de la Légion d'Honneur* in recognition of his efforts on behalf of Sino-French cooperation (Boorman & Howard, p. 320-21).

1925 March 12 – Sun Yat Sen dies unexpectedly in Peking. This is a setback for the Kuomintang and for the Republic of China.

1927 – During the Kuomintang split into left and right factions, Li Shizeng, Wu Zhihui, Cai Yuanpei, and Zhang Renjie (all longtime friends since their days in Paris), staunchly support the conservative faction of Chiang Kai-shek. They are among the members of the Central Supervisory Committee who meet in Shanghai in April and adopt a resolution demanding the expulsion of all Communists from the Kuomintang. They also support the government established by Chiang Kai-shek at Nanking on April 18 in opposition to the Wuhan regime. In later years these four become known as the “four elder statesmen of the Kuomintang” (Boorman & Howard 1967, p. 321, 319).

1927 – Li is now connected with the Kai Cheng Bean Product Company in Peking. Li's former Tofu Manufacturing Company (*L'usine de la Caséo-Sojaïne*), is now *Société Française pour l'exploitation du soja et de ses dérivés*, located at 48 Rue Denis-Papin, Les Vallées-Colombes (Horvath 1927, p. 19, 36-37).

1928 – Li is a sponsor of the Academia Sinica.

1929 – Li is a sponsor of the National Peiping Research Academy.

1929 Oct. – Chiang Kai-shek's new government at Nanking promulgates regulations for the palace museum and confirms Li as chairman of the museum's board of directors. He holds this office until Nov. 1932.

1932 – Li goes to Geneva, Switzerland, to organize the Chinese delegation to the International Committee on Intellectual Cooperation sponsored by the League of Nations. While at Geneva he establishes the Sino-International Library. After returning to China, Li commutes regularly between Shanghai, where he lives, and Nanking, where he participates in government and party affairs (Boorman & Howard 1967, p. 321).

1937 July – The Sino-Japanese war begins. Li, who is in Europe traveling between Paris and Geneva, returns to China.

1941 – Li's first wife, Yao Tongyi dies in Paris. They had been married for 43 years.

1941 – Li leaves war-torn China and travels to New York, where he maintains residence until mid-1945, when he returned to China. But he made several trips to Chungking and Kunming during World War II (Boorman & Howard 1967, p. 321).

1943 – Li meets Mrs. Ru Su (“Mrs. Vegetarian”), who lives in New York and is Jewish. She becomes his “partner” but they never married. They were involved from 1943 to 1947, but Li lived in the USA only from 1943 to 1945. In 1947 Li telegraphed Mrs. Ru Su that he had decided to marry a Chinese lady.

1945-mid – Li returns to China. He and Yang Jialo (Yang Chia-lo) work together to compile an encyclopedia, the first volume of which is published in 1946.

1946 Feb. 14 – Li marries for the second time to Lin Sushan (Lin Su-shan) in Shanghai. She had been married before and divorced. He sends a telegram from Shanghai to

many of his friends.

1947 March 16 – Li (Rector of the National Peiping Research Academy) attends Europe's First Soya Congress in Paris, France (at the City University). Attended by the greatest soy researchers and advocates in France, it has been organized by the French Bureau of Soya (*Bureau Français du Soya*), the Laboratory of Soya Experiments (*Laboratoire d'Essais du Soya*), and the France-China Association (*l'Association France-Chin*).

1948 Sept. – Li travels to Beijing to celebrate the 19th anniversary of the National Peiping Research Academy.

1949 late – When the Chinese Communists begin to threaten Beijing, Li flees China and moves to Geneva. At about the same time, Chiang Kai-shek and the Kuomintang flee China and move their seat of government to Taiwan.

1949-1950 – Li and his wife live in Geneva, Switzerland, where he remains until 1950, when Switzerland recognizes the People's Republic of China. He then moved to Montevideo, Uruguay, taking the Sino-International Library Collection with him.

1950-1954 – Li and his wife live in Montevideo, Uruguay. His wife dies there in 1954.

1954 – Li starts to maintain a second home in Taiwan. From here he serves as national policy advisor to Chiang Kai-shek and a member of the Central Appraisal Committee, which superseded the Central Supervisory Committee.

1957 – Li marries for the third time to Tian Baotian (T'ien Pao-t'ien) in Taipei, Taiwan. He was age 76-77 and she was 42 (and lovely) (Yang 1980).

1973 Sept. 3 – Li dies in Taiwan (probably in or near Taipei) at age 92 years, 3 months and 5 days. His large funeral ceremony is attended by many of Taiwan's highest dignitaries, politicians, and members of the Kuomintang. He is buried in Taiwan.

Conventions used above:

Spelling: The names of Chinese people and places are spelled using the pinyin system of romanization. On the first mention, the spelling using Wade-Giles system of romanization is given in parentheses. The name should be pronounced the same regardless of spelling. Example of a person – Li Hongzao (Li Hung-tsao).

Order of Chinese personal names: The family name is always written first, followed by the given name – the name

given about a month after birth. Example: Li Hongzao.

Dates: All dates are based on the Western (Gregorian) calendar.

In documents cited in the following bibliography: We follow the conventions used in each document – including which name to use (courtesy name vs. original name) when discussing a person. For example, many English-language books and articles before the 1980s use only the Wade-Giles system of romanization, but almost all write personal names with the family name first.

ABOUT THIS BOOK

This is the most comprehensive book ever published about the work of Li Yu-ying with soy. It has been compiled, one record at a time over a period of 35 years, in an attempt to document the history of soy in this region. It is also the single most current and useful source of information on this subject.



This is one of more than 50 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:

- 24 different document types, both published and unpublished.
- 175 published documents - extensively annotated bibliography. Every known publication on the subject in every language.
- 9 original Soyinfo Center interviews and overviews never before published.
- 10 unpublished archival documents
- 14 commercial soy products.

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.

For commercial soy products (CSP), each record includes (if possible) the product name, date of introduction, manufacturer's name, address and phone number, and (in many cases) ingredients, weight, packaging and price, storage requirements, nutritional composition, and a description of the label. Sources of additional information on each product (such as advertisements, articles, patents, etc.) are also given.

A complete subject/geographical index is also included.



Li Shih-tseng 李石曾

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

HOW TO MAKE THE BEST USE OF THIS DIGITAL BOOK

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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 China or Rockefeller Foundation. 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, A.A. Horvath, Englebert Kaempfer, Mildred Lager, William 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 or more of 14 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).

Commercial Soy Products (CSP): See p. 12.

SoyaScan Notes: This is a term we have created exclusively for use with this database. A SoyaScan Notes Interview contains all the important material in short interviews conducted and transcribed by William Shurtleff. This material has not been published in any other source. Longer interviews are designated as such, and listed as unpublished manuscripts. A transcript of each can be ordered from Soyinfo Center Library. A SoyaScan Notes Summary is a summary by William Shurtleff of existing information on one subject.

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LI YU-YING (LI SHIZENG): HISTORY OF WORK WITH SOY

1. Li, Yu-ying. 1905. Le lait végétal fabriqué en Chine [The vegetable milk made in China]. In: 2nd Congrès International de Laiterie: Compte-Rendu des Séances (2nd International Dairy Congress: Proceedings): Paris: Comité Français-Fédération International de Laiterie. 548 p. See p. 387-89. Held 16-19 Oct. 1905 at Paris, France. [Fre]

• **Summary:** The president of this international milk congress introduces Li Yu-ying as attaché at the Chinese Legation, and official delegate to the congress. Li begins by expressing his happiness at being able to speak to the congress and getting to know the many scholars and very competent people from many countries.

“In China, not much animal milk is consumed. It is replaced by another product: *vegetable milk (le lait végétal)*. This latter product could not be used here and, therefore, is of little interest to you. I will speak to you about it only as a curiosity, first to explain the special method employed in my country for the production of vegetable milk and vegetable cheese, and finally to increase interest in these products because of their hygiene and economy.

“Everyone knows that animal milk is an excellent substance with numerous advantages. One may ask, therefore, why so little of it is consumed by the people of China. The reason is because it is relatively expensive and because cows cannot be raised in all parts of China. Dairying is practiced only in the north and the west of China. In the other provinces dairying is difficult because of the climate and the nature of the soil; so vegetable milk is consumed there.

“The latter is made with the seeds of *Soja hispida* or ‘oil peas of China.’ This is an annual legume which has been imported to England, Spain, Belgium, and France. Presently it is widely cultivated in America as forage.

“Mr. Lechartier, director of the agronomic station at Rennes, has experimented with this plant in France; he obtained yields of up to 25,000 to 30,000 kg of green forage per hectare. This plant is therefore already known here.”

“As forage, the *soja hispida* is as rich in protein as clover (*trèfle*), horse beans or dried kidney beans (*les féveroles*), etc.; but it is richer in fats than the other legumes. The seeds are richer in nitrogenous materials [protein] than other plants of the same family. Analyses show that they contain 30% protein, oil, and little starch.

“The seeds of this plant can also be used to make a cheese (tofu [tofu]) which is a major source of nourishment for the peoples of China and Japan. It is consumed, in effect, every day and at every meal, as a main dish.

“The production of these two products [milk and cheese] is very simple. First the seeds are cooked, then they

are pressed strongly to obtain a sort of puree, which is coagulated by a mineral salt that plays the role of rennet. The fresh cheese, which is made daily, must be sold and consumed the same day. It can be used in recipes like vegetables or meats. However it can also be preserved, either hot, or by putting it in a salt solution: in this way one obtains various cheeses which are used as desserts, as following:

“(1). Salted and smoked cheese (*Le fromage salé et fumé*), which in both flavor and form bears some resemblance to gruyere cheese. It can be stored for a rather long time; (2) Salted cheese (*Le fromage salé*), white in color, whose taste somewhat resembles that of goat cheese; (3) Fermented cheese (*Le fromage fermenté*). Its color is white, yellow, or gray, and its flavor is very strong, like that of Roquefort.

“The processes which give rise to Chinese milk and cheese also give residues [okara] which are not lost. They are employed either as fertilizer, or as feed for farm animals. Thus nothing is wasted from soybeans. Moreover, the factories where this plant is processed are very numerous, and the products made by them are the most moderately priced. A square or cake of vegetable cheese (*carré de fromage végétal*) (11 by 10 by 2½ cm), consumed daily by one person, costs about one centime, or about one-fiftieth the price of an animal cheese of average price.

“It is of interest, finally, to compare the products of the animal dairy with those of the vegetable dairy, not only in terms of their similarity in appearance, but also in terms of their chemical composition. It is well known that animal milk contains a large proportion of casein; the same is true of vegetable milk, which contains legumine that has the same chemical formula as casein.

“Furthermore, during processing, the peas (*le pois*, i.e. soybeans) undergo a complete chemical and mechanical transformation which concentrates the nutritive parts and eliminates the others; it is this which explains the richness of the vegetable milk and cheese in nutritive principles.

“After all these considerations, you can realize the interest present in this industry in China.

“It can also be interesting in places where raising livestock is impossible. It is evident that this would be more difficult than in the countries which produce animal milk in large quantities. I am well aware that animal milk has a real superiority over vegetable milk, but doesn’t it also have its disadvantages: Fraud, on the one hand, and its contagious diseases on the other? Moreover, milk merchants have various categories of milk at different prices; it is clear that the most expensive is the best, and vice versa. But the

consumer knows full well that some milk is not of good quality, yet he is obliged to take it in order to earn money. Thus it is the fate of the poor to be condemned to drink milk of inferior quality, and often fraudulent. However, vegetable milk does not support fraud and cannot transmit contagious diseases. It is the same for everyone; the poor consume the same product as the rich.

“Let the culture of soybeans expand therefore in Europe. One might try to make vegetable milk which will be destined, not for those who have the means to buy good milk, but rather for those who can only afford low-price milk; thus, fraud becomes useless, and this will be a benefit for public hygiene and for the purse of poor people.”

Note 1. This is the earliest document seen (May 2011) concerning Li Yu-ying. It is also the earliest publication seen by him on the subject of soya.

Note 2. These proceedings contain a list of attendees and of excursions. Address: Attaché at the Chinese Legation, and official delegate.

2. Marre, Francis. 1907. Le lait végétal en Chine [Vegetable milk in China]. *Nature (La) (Paris)* 35(1776 Supplement):13. June 8. [Fre]

• **Summary:** The use of milk as food in China is very limited. The immense empire, which is governed by the Son of Heaven, is not suited for raising livestock, except in its northern and western regions, which occupy only a small part of its total area. Moreover, the climate and nature of the soil do not permit the culture of forage crops. These purely geographical reasons are enough to explain why vegetable milk is consumed abundantly in the majority of Chinese provinces.

This milk, whose name seems strange and a bit paradoxical, is made from the seeds of *Soja hispida*, also called the oil pea of China (*haricot oléagineux de Chine*), an annual plant of the legume family. To obtain it, the seeds are first [ground with water], boiled and then pressed, making a sort of puree which, when dissolved in water, makes a very nourishing vegetable milk. When treated with a mineral salt, which acts much like rennet in milk, it coagulates and may be made into a kind of cheese (*to-fou*) [tofu] which plays an important part in nourishing the Chinese and Japanese people. It is one of their basic daily foods and can be made into a great variety of culinary preparations. It is generally consumed fresh, the day it is made. But it may be cooked, and preserved by salting or smoking. In commerce, three principal varieties of vegetable cheese (*fromage végétal*) [tofu] are found. One, which is fermented [fermented tofu], is white, yellow or gray, and has a piquant flavor like that of Roquefort. The second is white and salty, resembling goat cheese / goat's milk cheese. The third is smoked and quite like Gruyère (*gruyère*).

In the process of making vegetable milk and tofu, they recover with care the various by-products [okara, whey] and use them with ingenuity to nourish their animals and as fertilizer for their fields; in this way nothing is lost. Even the stems of the plant and the pods that envelop the seeds are used as forage. Thanks to the fact that every part of the plant can be used, and thanks also to the low cost of manpower in China, soy cheese (*fromage de soja*) can be sold for such a low price that enough to serve a man for a day (110 square cm of surface by 2.5 cm thick) costs less than a centime [one-fifth of a U.S. cent], or 50 to 60 times less than an equal quantity of animal cheese.

As for the food value of soymilk, it is approximately equal to that of cow's milk; it contains significant quantities of legumine, whose chemical composition is very close to that of casein.

Mr. Li Yu-Ying, an attaché at the Chinese legation in Paris, made soymilk (*lait de soja*) the subject of an important presentation at the last dairy congress, and forecast the introduction of soya (*soja*) into French culture.

Note: This is the earliest French-language document seen (Oct. 2003) that uses the term *lait de soja* to refer to soymilk. As of Oct. 2003 *lait de soja* is the modern French word for soymilk.

3. Bertrand, Gabriel; Rivkind, L. 1907. Recherches sur la répartition de la vicianine et de sa diastase dans les graines Légumineuses [Research on the distribution of vicianine, and of its diastase in the seeds of legumes]. *Bulletin des Sciences Pharmacologiques (Paris)* 14(2):161-64. [2 ref. Fre]

• **Summary:** The authors conducted 3 series of experiments. In the soybean (*Soja hispida* Mönnch) they found a new cyanogenic crystalline glycoside (*glucoside cyanhydrique*) named vicianin / vicianine, and an enzyme capable of effecting its hydrolysis. On p. 163-64 is a list of 45 species of legumes (about 40 genera, including the soybean, *Soja*) for which the reaction is negative, meaning that they do not contain diastase.

Conclusion: “In summary, among the species examined belonging to the forty genera of the legume family, most contained a diastase (*émulsine*) capable of hydrolyzing vicianine. A species containing the glycoside is found only in the genus *Vicia*. The distribution of two substances in this unique genus is, again, very regular because one can even cite a case, that of *Vicia narbonesis*, where there is neither diastase nor vicianine.”

Note: From about 1906 to 1910, Li Yu-ying worked at Bertrand's laboratory at the Pasteur Institute.

4. Huang Shirong. 1908. Weituiju suibi [Random notes from the “plain flavor” studio]. China. Passage on soy reprinted in C.N. Li 1958 #349, p. 248-49. [Chi]

• **Summary:** Wade-Giles reference: *Wei T'ui Ch'ü Sui Pi*, by Huang Shih-Jung. Qing dynasty. A revised edition of this book, edited by Huang's son, appeared in 1916 during the Republican period. This is a summary by Mr. Huang (in China) of a publication by Li Yu-ying—who was in France at the time.

The section titled “Soybeans efficacy and use” (*gongyong*) states: Mr. Li Yu-Ying recommends that China establish an association / society for soybeans and soybean technology for Chinese manufacturing. Li wrote two articles: One, to promote the establishment of a society for soybeans, and the second to promote manufacture of soybean products in China using modern technology. It is most important to invent new methods of production and manufacture, which would have a great effect on the industry. These two, which contained 5,000 words, were published in a Chinese newspaper [probably in China] the 2nd month on the 6th, 7th, 8th, 9th, 10th, 11th, and 12th days. Note: The name of the newspaper is not given. Mr. Huang summarizes the content as follows:

The nutrients of the soybean benefit health, economics, and commercial production; it is worthy of future development. Its wider propagation will improve the fertility of the soil because the roots contain nodules which fix nitrogen to enrich the soil. Soybeans are a rich source of dairy products (milk content) and oil, so they are very nutritious. They can be used to make good substitutes for meat. They are rich in phosphorus and potassium, so they are healthful and strengthen the brain. Since they are lacking in starch, they are good for diabetic diets. Because they are a rich source of dairy products (milk content) and oil, they would be a good material for industrial exploitation. And its very inexpensive; it sells for only about one-fifth as much as legumes from other countries. When you compare the milk / protein content with that of meat, milk, or eggs, or with other legumes and cereal grains, it is at least 2-10 times higher.

The soybean is rich in phosphorus, which is equal to the efficacy of Western medical phosphorus. Other products: Whole soybeans (*douren*). Soybean noodles (*doumian*; wheat pasta enriched with soy); it is a substitute for wheat gluten (*mianjin*). Soybean oil (*douyou*). Soybean cake—defatted (*doubing*). Okara or residue from making soymilk (*douzha*; [mostly fed to animals]). Soymilk (*doujiang*). Spray-dried soymilk (*doujiangfen*). Canned soymilk (*quandoujiang*). Soured soymilk (*suandoujiang*; by lactic acid fermentation). Soybean extract (*doujing*). Tofu (*doufu*). Pressed tofu—sliced (*doufugan yupian*). Fermented tofu (*faxiao doufu*). Whey—from making tofu (*yujiang*). Soy sauce (*jiangyou*). Sweet wheat-flour jiang (*tiandoujiang*). Soy sprouts (*douyacai*). Soybean coffee (*douren jiafei*). (Translated by H.T. Huang, PhD, April 2003).

5. Hitier, H. 1910. Société Nationale d'Agriculture de France: Le soja [National Society of Agriculture of France: Soya]. *Journal d'Agriculture Pratique* 74(1):24-25. Jan. 6. [Fre]

• **Summary:** “Mr. Sagnier, on behalf of Mr. Liyuying [Li Yu-ying], delegate of the government of China in Europe, gave a very interesting presentation on the soybean (*le soja*), and its alimentary, therapeutic, agricultural, and industrial utilization. (This journal will soon publish an article on the soybean.)

After his presentation, Mr. Sagnier showed the members of the Society various products that can be extracted from soybeans: flour, bread for diabetics, cake, seasoning sauce, confections, raw milk, fresh cheeses, etc.

Mr. Schribaux recalled that the soybean, which is widely grown in East Asia, is also cultivated in Europe, but the varieties introduced up to this time have been very sensitive to the cold. In the USA the crop has expanded rapidly.

Mr. Lindet remarked that the soybean contains 16-17% oil, a rather low percentage. Mr. Ch. Girard has cultivated soya at Joinville as a forage plant, but the forage obtained is mediocre, in part because the plant is covered with hairs.

The prince of Arenberg noted that prior to 1908 not one kilogram of soybeans passed through the Suez Canal, yet in 1908 35 million kilograms passed through. This gives a good idea of the commercial development of this plant. Address: France.

6. *Los Angeles Times*. 1910. Our consuls say. Jan. 16. p. II20.

• **Summary:** “For public reference the Bureau of Manufactures [Department of Commerce and Labor], Washington, D.C., has a report on the soya bean (coming greatly into vogue in Europe for Chinese process of manufacturing soy and soyacake), and two specimens of the plant.”

Note: The meaning of the last half of this sentence (starting with “for Chinese process”) is unclear. In Europe, the soya bean is now crushed to make soya bean oil and cake (or meal). An addition, Li Yu-ying in Paris is using soya beans to make many innovative types of soyfood products, including soy [sauce].

7. *Bulletin de l'Association Amicale Franco-Chinoise*. 1910. Le soja [Soya]. 2:62-64. Jan. [Fre]

• **Summary:** This periodical was established to promote understanding and friendship among the people of France and China. “The name *Soja* or *Soya* comes from the name that the Japanese give to the sauce made from soybeans. In Chinese it is called *tsiang-yeou* (Cc = Chinese characters given [soy sauce]) and it is made from *houang-teou* (Cc [yellow soybeans]). This sauce, which is used in the well-known *Worcester sauce*, is widely used in China and Japan.

Some Chinese residing in Paris [incl. Li Yu-ying] recently took the initiative to introduce into France this sauce, as well as several other products derived from these same “yellow peas” (*pois jaunes*).

They have just built a factory near Paris in a town named Les Vallées (rue Denis-Papin), on the train line going to Saint-Germain-en-Laye. There, perfected machines / equipment and the resources of western science allows them to obtain from the raw materials a much better yield than could be obtained using the rudimentary Chinese process. These things made it possible, at the same time, to develop many new soy products suited to European tastes.

A retail store named the Golden Jar in Paris (La Jarre d’Or, 4, rue du Renard) received the right to sell these products from *Caséo-Sojaïne*. And an exposition [of the soy products] was organized at the Grand Palace, at the time of the opening, last Nov. 20, of the Food Fair / Expo (*Salon de l’Alimentation*). There various products were offered.

A summary of the contents of an interesting brochure from that exposition is reprinted. Contents of the brochure: Introduction to the soybean. Products based on soymilk (*Le lait de soja*, *Le lait végétal*): Liquid, powdered, or fermented soymilk, soy cheese (*Le fromage de soja*, *Le fromage végétal* [tofu]) (fresh, hard, and fermented). Soy sauce. Soy oil. Sweet soya preserves (*Confiture de Soja*; this soy cream {*crème de soja*} resembles chestnut cream {*crème de marron*}). Soybeans used as a vegetable (dehulled dry soybeans, and soy sprouts). Other soy products (including soy flour, bread for diabetics, whole-meal bread, and soybean cakes—used as feed for animals).

Note 1. It is unclear whether the Chinese-run factory, *Caséo-Sojaïne*, has started to make and sell commercial soy products, or whether they are just about to. They may have started on Nov. 20 of the previous year, however there is no description of soyfood products now being sold in Paris.

Note 2. This is the earliest document seen (Aug. 2001) that contains the term *Caséo-Sojaïne*, which appears to be the name of a business, not of a product. This term would soon be used to also refer to “tofu.” Li Yu-ying’s name is not mentioned.

Note 3. This is the earliest document seen (Sept. 2002) that mentions soy cream (*crème de soja*).

Note 4. This is the earliest document seen (Sept. 2002) that mentions powdered soymilk (*Le Lait de Soja, en poudre*).

Note 5. This is the earliest document seen (Sept. 2002) that mentions fermented soymilk (*Le Lait de Soja Fermenté*).

8. Collin, Eug. 1910. La graine, la poudre et le tourteau de Soja [The seed, powder/flour, and cake of the soy bean]. *Annales des Falsifications* 3(15):19-24. Jan. (Chem. Abst. 4:1065). [3 ref. Fre]

• **Summary:** Describes food products made from soy and their history in France. Contents: Introduction. Exterior characteristics of the seeds. Microscopic characteristics. Characteristics of the cake (*tourteau*). Characteristics of the flour (*poudre*). Chemical composition (Mr. Brioux, director of the agricultural station of the Seine-Inférieure, conducted an analysis of soybean cake).

“Up until a few years ago, use of the soybean in France was limited to the preparation of a flour and bread destined for the feeding diabetics and consumptives (phthiques; those suffering from tuberculosis)... But now, taking advantage of the current wave of interest that is as intense as it was slow to arise, a Chinese company, supplied with powerful capital, is not hesitating to set up business in France, with the goal of popularizing the use of all the products based on soya, and to help us appreciate the excellence of their food qualities. To this end, it has built a factory at Colombes, organized with all the most modern improvements, where are these products are prepared by a crew of Chinese workers, who are well familiar with all the secrets and details of their preparation. Of these various products, there are two which particularly interest us; they are soy flour and cake (*la farine et le tourteau de Soja*). Several specimens of these products having already been sent to the Central Laboratory of the Ministry of Agriculture by experts who do not have indication of their nature or origin, we have believed it useful to describe their essential characteristics in the *Annales des Falsifications*.”

Illustrations (line drawings) show: A transverse section of the cellular layers of the soy bean (p. 21). Microscopic views of eleven anatomical elements of soybean cake such as albumen, debris of cotyledons, palisade cells viewed from their external surface, etc. (p. 22). The chemical composition of soybean cake (*tortea de Soja*) as analyzed by Mr. Brioux, at Seine-Inférieure, is: Moisture: 11.30%. Nitrogenous materials 42.88%. Fatty materials: 5.84%. Carbohydrates 29.93%. Crude cellulose 4.36%. Ash 5.23%.

Note: This is the earliest French-language document seen (Sept. 2003) with the term *tourteau de Soja* in the title, used to refer to soybean cake. Address: Expert-chimiste au Laboratoire Central de la Repression des Fraudes.

9. Itie, G. 1910. Le soja: Sa culture, son avenir [Soya: Its cultivation, its future]. *Agriculture Pratique des Pays Chauds (Bulletin du Jardin Colonial)* 10(82):37-49. Jan. See also: 10(83):137-44. Feb.; 10(84):231-46. March; 10(85):305-07. April; 10(93):485-93. Dec.; 11(94):55-61. 28 cm. [34 ref. Fre]

• **Summary:** A superb series of articles reviewing research and current developments with soybeans, and especially with soybean production / culture, worldwide. The extensive bibliography cites many early and rare works for the first time. Interestingly, the series started one year before Li Yu-ying wrote his equally excellent series in the same

journal. The author introduced lots of U.S. soybean research to France, citing many U.S. Agricultural Experiment Station publications and early work with growing soybeans in the tropics.

Contents: Introduction. The soybean (*Glycine hispida* Maxim.). Vernacular names: In China, Tonkin, Cambodia (*Sân dêk*), India, Burma, Nepal, Ceylon (*Bhatwan*), Indo-Malaysia (*Katyang-kadeleh*), England, USA, Germany, Holland, France, Italy. Scientific names and synonyms. Description of the plant. Varieties, general, and in China, India, Hawaii, Japan, USA, Europe (varieties from Hungary, Podolia, Etampes-France, Italy). Origin. History. Climate and geographical area.

Concerning the early history in France: "In France it is very certain that in 1739 missionary fathers sent the soybean to the Jardin des Plantes, along with other plants from China. There exists, in any case, in the Museum, a sachet having contained seeds from the harvest of 1779, and the soybean has been cultivated here in an almost uninterrupted fashion since 1834.

"In France, large scale production of soybeans began in 1821 at Champ-Rond, near Etampes, where large yields were obtained. But above all, starting in 1855, the Society for Acclimatization made great efforts to introduce it. They distributed seeds and conducted tests in various regions, but the methods of culture were not progressive (advanced), and the soybean did not take the place in France that was hoped for."

A table (p. 490) shows the name, yield (in hectograms/hectare; 1 hectogram = 100 gm), and source (a U.S. agricultural experiment station) for the following soybean varieties: Medium Black (12.1, Massachusetts Hatch), Very Dwarf Brown (8.4, Indiana), Early Brown (10.54 to 13.58, Indiana), Early Green (7.80 to 14.00, Delaware & Virginia), Medium Green (12.10 to 36.30, Massachusetts Hatch & Illinois), Hollybrook (8.7 to 10.0, Indiana), Guelph (5.70 to 7, Indiana), Ito San (11.4 to 28.70, Indiana & Wisconsin), Japanese Pea (13.20, Virginia), Mammoth Yellow (7.5 to 18.20, Mississippi), Michigan Green (19.10 to 34.80, Wisconsin), Green Samarow (11.00+, Kansas), Tokyo (7+, Kansas), Early White (15.90 to 33.00, Massachusetts & Illinois), Dwarf Early Yellow (11.00+, Kansas), Early Yellow (13.10 to 22.00, Ontario, Canada), Medium Early Yellow (8.70 to 33.00, Indiana), Yellow (11.00+, Kansas), No. 9407 (43.5, Wisconsin), No. 19.186 (28.0, Delaware).

Other tables show: (1) The chemical composition of the stem, leaves, and pods (p. 138-39, 243). (2) Yields with different fertilizing methods (p. 139). (3) Number of pods and seeds in different varieties of soybeans (p. 236). (4) Spacing at different experiment stations for 3 years that gave the best yield (p. 239). (5) Number of plants and seeds, and yield for 3 different brown or yellow varieties of soybeans from China and Manchuria (p. 491). An illustration (p. 40, line drawing by A. Berteau) shows a

cultivated soybean plant and its different parts, including leaves, pods, and flowers. The leaves of the wild soybean, *Glycine angustifolia* (Miq.), are also shown.

Note: The *Jardin Colonial* (Colonial Garden) is located in Paris, France. Address: Ingenieur d'Agriculture coloniale.

10. Product Name: [Soy Cream {Resembles Chestnut Cream} (Fresh, or Powdered)].

Foreign Name: Crème de Soja.

Manufacturer's Name: Usine de la Caseo-Sojaïne.

Manufacturer's Address: Vallées, Colombes (near Asnieres, Seine), northwest of Paris, France.

Date of Introduction: 1910. January.

New Product–Documentation: *Bulletin de l'Association Amicale Franco-Chinoise*. 1910 "Le soja [Soya]". 2:62-64. Jan. See p. 64. A company named Caséo-Sojaïne has published a brochure showing products that it makes, including sweet soya preserves (*Confiture de Soja*; this soy cream {crème de soja} resembles chestnut cream {crème de marron}).

Beltzer, Francis J.-G. 1911. "Études sur la caséine végétale du 'soja' et ses applications [Studies on the vegetable casein of soybeans and its applications]". *Revue Scientifique* 49(23):716-20. June 10. See p. 720.

Conclusion: "A Chinese factory has already been established on the outskirts of Paris (at Vallées near Colombes) to make food products based on soya (*produits alimentaires à base de Soja*). This factory now produces various food products, including sweet soya preserves (*confiture de Soja*).

Scientific American Supplement. 1911. "Extended utilization of soya bean products: Milk, cheese, and a variety of other products from a vegetable seed." Aug. 19. p. 115. "A Chinese factory has been established [by Li Yu-ying] not far from Paris for the purpose of manufacturing alimentary products from Soya, and it has already put on the market... preserves,..."

Li, Yu-ying; Grandvoinnet, L. 1912. "Le soja [The soybean]". *Agriculture Pratique des Pays Chauds* (Bulletin du Jardin Colonial) 12(109):302-08. April. See p. 304. Under "Soy preserves (*Confiture de soja*)" we read that this product resembles "Crème de Marron" (sweetened chestnut paste/butter). A table (p. 304) compares the composition of the soy and the chestnut cremes. Note: *Crème de marron* is made by pureeing cooked chestnuts and sugar to make a very sweet spread for bread.

11. Product Name: [Soy Sprouts].

Foreign Name: Germes de soja.

Manufacturer's Name: Usine de la Caseo-Sojaïne.

Manufacturer's Address: Vallées, Colombes (near Asnieres, Seine), northwest of Paris, France.

Date of Introduction: 1910. January.

Ingredients: Water, soybeans.

New Product–Documentation: *Bulletin de l'Association Amicale Franco-Chinoise*. 1910 “*Le soja* [Soya]”. 2:62-64. Jan. See p. 64. A company named *Caséo-Sojaïne* has published a brochure showing products that it makes, including soybean sprouts (*les germes de soja*). These are obtained in a hot-house (*une serre*) and can be consumed like vegetables or like a salad.

Li, Yu-ying; Grandvoinnet, L. 1912. “*Le soja* [The soybean]”. *Agriculture Pratique des Pays Chauds* (Bulletin du Jardin Colonial) 12(107):120-32. Feb. See p. 129-30. Describes how soy sprouts are made. “They have a particularly agreeable taste. Another seed that can be used for sprouting is green; it gives longer sprouts. A salad made from soy sprouts has the great advantage of being very clean, since it has had contact with nothing but water, whereas most salads are grown in continual contact with soil and manure.” A table (p. 130) gives the composition of both soy sprouts and the green seed [mung bean] sprouts. The soy sprouts contain 14.73% protein (4.3 times as much as the mung sprouts) and 3.41% minerals (7.1 times as much as the mung sprouts). “In China, a bouillon is prepared with soy sprouts, which replaces meat bouillon to good advantage. The good taste probably comes from the soluble diastatic principles produced by the germination. The sprouts and the bouillon can be consumed separately.” An illustration (fig. 24, p. 130), titled “Soy sprouts” shows three stages of germination.

Beille, L. 1916. “*Le Soja* [Soya]”. *Gazette Hebdomadaire des Sciences Medicales de Bordeaux* 37(9):67-70. May 7. See p. 67. “A factory, established on the outskirts of Paris, at Vallées (Seine), was able to supply French consumers with flour, cheeses [tofu], sauces, and many other soy-based preparations used in China and Japan... it is necessary to recognize that the chemical composition of the soybean is of real interest. The Parisian clientele promptly abandoned the sauces, cheeses, and milk made from soya, but they appreciated the sprouts, which are still selling well as vegetables in the markets of Paris and its suburbs.”

12. Sagnier, Henry. 1910. *Le soja et ses produits* [The soybean and its products]. *Journal d'Agriculture Pratique* 74(1):307-10. March 10. [4 ref. Fre]

• **Summary:** The soybean was a curiosity in Europe until 2-3 years ago, when large amounts started to be imported. The prince A. d'Arenberg, president of the Suez Canal Society, told the National Society of Agriculture, that prior to 1908 no soybeans had passed through the Suez Canal, yet in that year 35,000 tons passed through it. It seems that the new commerce has been stimulated by the expansion of the crop in Manchuria and Korea, under Japanese influence. Most of the imports have gone to England and northern Europe. In England, the oil is used to make soaps and the cakes are fed to livestock.

Recently it was announced that the Chinese government, preoccupied with the expansion of exports, would have manifested the intention to prohibit these exports in view of preventing a shortage of soybeans in the interior of the country.

“The Chinese are now greatly expanding their efforts to make known in Europe the advantages to be gained from soya and from the products that can be extracted from its seeds. I recently had the occasion to present to the National Agricultural Society of France a study written by Mr. Liyuying [Li Yu-ying], delegate of the government of China for several missions. It was titled *Le soja, utilisation alimentaire, thérapeutique, agricoles et industrielle*. This study was accompanied by samples of yellow and black soybean seeds, and by the principal products which can be extracted from this plant: flour, bread for diabetics, cake (*gâteau*), seasoning sauce (*sauce condimentaire*), confections (*confitures*), raw milk (*lait cru*), cooked and sweetened milk (*lait cuit et sucré*), cake for livestock feed, (*tourteau pour l'alimentation du bétail*), fresh cheese (*fromage frais* [tofu]), and smoked cheese (*fromage fumé* [smoked tofu]).

“These products originated from processing imported soybeans. They have been prepared at a test factory (a photo, p. 309, shows the interior) set up just outside of Paris, at Vallées, near Asnières. Li Yu-ying's study gives complete details on these products” which are made from imported soybeans. This factory, named *Caséo-Sojaïne*, “has been established by the agents of a civil society constituted in China under the name of *Société biologique de l'Extrême-Orient* (Far Eastern Biological Society). Made up of physicians, scholars (men of letters), and businesspeople, this society would seem to have as its principal goal/object to make known and have used in Europe the pharmaceutical and agricultural products of the Far East [East Asia].”

Note: This is the earliest document seen (May 2011) that mentions the Far Eastern Biological Society (*Société biologique de l'Extrême-Orient*)

The author concludes by discussing soymilk (*lait de soja ou lait végétal*), soybean cakes (*les tourteaux d'huilerie*), and a brief history of the soybean in France.

Illustrations (p. 308) show: Mature soy bean plant with pods. Close-up of soy bean pods and seeds. Soy milk and soy flour viewed under a microscope (p. 309).

13. Demolon, A. 1910. A propos du ‘*Soja hispida*’ [About the soybean, *Soja hispida*]. *Journal d'Agriculture Pratique* 74(1):375-76. March 24. [Fre]

• **Summary:** “The article by Mr. H. Sagnier which appeared recently in this journal on the subject of *Soja hispida* (No. 10, 10 March 1910) stimulates us to publish some reflections on this timely question in which we took an

interest while Li Yu-ying was working at our laboratory at the Chesnoy School of Practical Agriculture” [in France].

Demolon presents the soybean as a rather uninteresting plant, though one that could be of purely scientific interest. He makes 12 points—which Li later tries to refute in the Jan. 12, 1911 issue of this journal: 1. The carbohydrates in soybeans are represented by cellulose. 2. When one submits soy flour to an appropriate water treatment, the oil in the flour forms an emulsion and one obtains a whitish liquid. The name “vegetable milk” (*lait végétal*) which is applied to this substance has always seemed scientifically very inexact. 3. It is well known that vegetable albumins have a coefficient of assimilation very inferior to albumins of animal origin. The physical properties of so-called soy casein (*la soi-disant caséine du soja*) are not at all the same as those of milk casein, which has considerable importance from an alimentary/nutritional viewpoint.

Note: This is the earliest French-language document seen (Oct. 2008) that uses the term “soy casein” (or “soya casein”) to refer to soybean protein.

4. What should we think of a milk in which lactose is totally absent and cannot be replaced except by indigestible cellulose. 5. Where are the lecithins and the soluble ferments, in short all those things which give milk the character of a biological liquid? 6. This vegetable milk has to its disadvantage a very characteristic taste, which reveals its origin. 7. Those of us who raise livestock are reassured by that fact that vegetable milk cannot compete in terms of results. 8. From the industrial viewpoint, and above all from that of an oil mill, we must note that the oil content of soybeans (16-18%) is inferior to that of most oleaginous plants (rapeseed or colza 35-40%, linseed 20-25%, and peanuts 45-46%). 9. Concerning the preparation of bread for diabetics, it is not clear what advantages soy bread has over gluten bread. The oil content and the strong flavor of soya cannot help but make the product inferior. 10. As Mr. Schribaux has noted, an agronomic trial conducted last year at the Chesnoy School of Agriculture gave an insignificant harvest. And even if varieties suited to these regions could be found, they would have to be superior to our good traditional legumes. 11. Nevertheless, the imported cake can find an advantageous place in livestock feeding. 12. It is however true that the soybean plant represents one of the curiosities of vegetable physiology and in this regard its study will be of great interest.

Note: This is the earliest French-language document seen (Nov. 2003) that uses the term *caséine du soja* to refer to “soy protein.” Address: Director of the agronomic station of Aisne, France.

14. Blin, Henri. 1910. Le soja ou fève de Mandchourie. Production et utilisations [The soybean or bean of Manchuria. Production and utilization]. *Nature (La) (Paris)* 38(1, Supplement):141-42. April 2. [Fre]

• **Summary:** Since 1908 people in France have been very preoccupied with the large imports of soybean seeds which are grown in Manchuria and shipped from Dalny and Vladivostok. Soya beans are known in commerce as *Haricot de Chine* and *Pois oléagineux du Japon*. In England, soybeans have been used as a source of oil which is healthful, very nutritious, and of great value—especially for use by soap manufacturers. In Germany, this bean is used for the preparation of an artificial distillery yeast; it contains an important amount of fermentable materials and of an enzyme (*ferment*) similar to the diastase of malt which transforms fermentable starches and sugars. The investigations of Dr. Calmette of the Pasteur Institute at Lille, have made it possible to extract from soybeans diastatic enzymes (*des diastases*) which have unique effects. [Note: Dr. Calmette was one of the inventors of the “amylo process,” which began operation in France in 1891. He also first named *Aspergillus rouxii*.]

Recently Li Yu-ying, a delegate of the government of China in Europe, made a very interesting presentation to the French Society of Agriculture, concerning the food, therapeutic, agricultural, and industrial uses of the soybean: Flour, bread for diabetics, cakes, a seasoning sauce, confections, raw milk, fresh cheeses, etc.

Also discusses: Soybean cakes, cultivation of soybeans in Europe and the USA, soy coffee made by roasting soybeans in the south of France (*le Midi*), and the use of soya in diabetic diets. The author concludes by stating that the soybean has great potential in France, and varieties well adapted to this climate should be cultivated.

15. Brenier, H. 1910. La question du soja [The soya question]. *Bulletin Economique de l'Indochine (Hanoi)* 13(83):105-28. March/April. Series 2. [22 ref. Fre]

• **Summary:** This is an in-depth look at the relevance of the soybean to France, both now and in the future. It is prompted by the rapid growth of soybean imports to Europe from Manchuria. The author has a good knowledge of the literature on soybeans and a familiarity with the crop in the field in French Indochina and China.

Contents: 1. Soybean cultivation: Species and varieties, major soybean producing countries (China, Japan, Korea, Indochina), other countries (Java and the Dutch East Indies, France, USA. The Imperial Institute of London is conducting trials in the Cape of Good Hope and Natal [South Africa], in British West Africa, and in Gambia), methods of cultivation and yield. 2. Commerce: Exports of soybeans and soybean cake (beancake, *tourteaux de soja*) from China and especially Manchuria (Newchwang, Dairen/Dalny, Antung, Ta tung kow, Suifenhö [Suifenhö] / Sui-fen-ho), importing countries in 1908 in descending order of amount imported (Russian ports on the Pacific [Vladivostok, for re-export to Europe], Great Britain, France, Holland, Italy, Belgium, Germany), prices. 3.

Soybean utilization: Chemical composition, use as a forage plant and for improving the soil, use in human foods (tofu, shoyu, Worcestershire sauce, tuong [Annamite soy sauce], miso, natto, soymilk), the soybean as an oilseed (yield of oil from various oilseeds), soybean cakes. Conclusions.

Page 109 discusses soybeans in Indochina, according to information received from M. Crevost, Curator of the Agricultural and Commercial Museum of Hanoi, and from the article by Bui-quang-Chiêu (Dec. 1905). The names of the soybean are different in the various parts of Indochina. In Cochinchina (especially in the provinces of Chaudoc and Baria), in Annam (sporadically), and in Tonkin it is called *dau-nanh* or *dau-tuong* (*Tuong* is a sauce made with soybeans, described later under "Uses"). In Cambodia (*Cambodge*) it is called *sandek sieng*. The variety most widely cultivated in Indochina seems to be one with a yellowish-white color, more oblong than round, a little flattened (*soja platycarpa* of Harz [1880, 1885] (?)), different therefore from the fine (*belle*) varieties of Manchuria and Japan that are well rounded and pure yellow.

A table (p. 112) shows soy bean grain exports (in 1,000 metric tons) from different Manchurian ports for the years 1905-1908. The author notes that Indochina could be exporting soybeans to France. One factor that stimulated the large exports of soybeans from Manchuria in 1908 (besides an excellent harvest in 1907) was a program to suppress the cultivation of opium by expansion of soybean acreage (p. 113). The author uses the scientific *Phaseolus radiatus* to refer to the *petit haricot vert* (probably mung bean). He observed soybeans planted in mixed culture in Szechuan.

Page 116 notes that the rise of soybeans in Manchuria is due in part to the power of the Japanese commercial house Mitsui Bussan Kaisha and the large English oil mills, which joined to develop an industry that had not previously existed. At the end of 1906, which had a dominant commercial role in Southern Manchuria, sent one or two trial shipments of soybeans to England. Mitsui was followed mainly by the British trading houses (Samuel & Samuel, Jardine, Matheson), then by the Germans (Otto Reimers, Arnhold Karberg), and the Russians. Continued suppression of opium growing led to further expansion of soybean cultivation.

A table (p. 117) gives the price of soybeans (per picul of 300 catties = 180 kg), soybean cake (per 10 cakes of 53 catties each or 318 kg for the 10), and soybean oil (per picul of 100 catties = 60 kg) in Newchwang [Newchwang] taels and in French francs in the average year from 1882-1891, and in the year 1897. Prices were up in 1897.

Page 124 states: "A factory was recently founded near Paris (at Saint Germain en Laye), with Chinese capital, for the preparation of a series of products derived from soya: milk, "*caséo-sojaïne*," cheese [tofu], sauce, and sweet soya preserves (*confiture (?) de soja*)." A footnote states: "I owe this curious piece of information to the amicability of the

secretary of *Ecole française d'Extrême-Orient*, Mr. Ch. Maybon, who pointed it out in the January 1910 issue of the *Bulletin de l'Association amicale franco-chinoise*.

A table (p. 125) shows that the soybean gives the lowest yield of oil of all major oilseeds: copra (from coconut) yields 67-70% oil, sesame seeds 50-56%, poppy seed (*pavot*) 43-50%, castor oil plant 42-50%, rapeseed (*colza*) 42-45%, linseed 43%, peanuts 35-47%, cottonseed 21-26%, soybeans from Manchuria 16-18%.

Note: This is the earliest document seen (March 2000) that describes *caséo-sojaïne* as a product. Yet this may well be a mistake since its source of information is given as *Bulletin de l'Association Amicale Franco-Chinoise* (Jan. 1910)—which uses the term to refer to a business name. Address: Inspecteur-Conseil des Services Agricoles et Commerciaux de l'Indochine.

16. Lemarié, Charles. 1910. Les sojas du Japon [The soybeans of Japan]. *Bulletin Economique de l'Indochine (Hanoi)* 13(85):493-98. July/Aug. [4 ref. Fre]

• **Summary:** "As a contribution to the study of the question of soybeans, so clearly revealed by the Inspector-Consul Mr. Brenier in a recent edition of this Bulletin, he judged it useful to ask me for the notes hereafter collected as much over the course of my lectures as upon the occasion of my voyage to Japan in 1903.

"I borrow much from Rein (*The industries of Japan*) and from Messrs. Paillieux and Bois (*Le Potager d'un Curieux* or *The Kitchen-garden of a Curious One*) who summarized all that we know about soybeans (*soja*) in Europe up until recently" (p. 493).

Describes and gives the names of more than twenty cultivated varieties, using the classification system of Rein and the Japanese based on seed coat color.

"I have already said that it [the soybean] needs heat and frequent watering. These considerations explain, in part, the failures encountered up to now in the attempts to introduce this crop into Europe. I fear the same obstacles for Mr. Li-yu-Ying, of Chinese nationality, formerly a student at the school of practical agriculture at Chesnoy, near Montargis (Loiret).

Note: Loiret is a department of France just south of Paris. Montargis is a commune in the Loiret department; the ancient town is located about 110 km (68 mi) south of Paris.

According to a lecture he gave last year to his former classmates, Li set himself the task of taking up these trials on the outskirts of Paris: or was it on the manure fields / sewage farms (*champs d'épandage*) of Gennevilliers or Achères.

"But even if the cultivation of soybeans in France is not profitable, nevertheless the popularization of the diverse products that come from them is no less useful; Indochina, if the need be, could provide for new industrial ventures. With Mr. Albert Demolon, a scientifically educated

agriculturist (*ingénieur-agronome*), then professor at Chesnoy, and today director of the Agricultural Station of Aisne [northeast of Paris] and of the Laboratory of Bacteriology at Laon, Mr. Li-yu-Ying again took up his previous studies related to these various products. In particular, he compared soymilk, which he calls *Caséosojaïne*, with animal milk, and he believed [it] possible, employing the highly developed procedures of handling and fermentation used [in France] with cow's milk, to obtain forms of tofu (*Téou-fou*) acceptable for our Western palates. That is to say: first, before any fermentation, a liquid [form of tofu] lends itself to the same uses as milk, especially useful for artificial feeding of livestock; then, after coagulation: 1. a hard cheese, corresponding to cheese of the firm sort (*fromage à pâte ferme*), cooked egg, or cooked meat in richness of protein; 2. a soft cheese, corresponding to fresh cheese (*fromage frais*) and able to be consumed as a legume; 3. a fermented cheese, after sterilization then inoculation with microorganisms of certain special cheeses, corresponding to these diverse fermented animal cheeses" (p. 497-98).

Also discusses: Azuki (p. 497). Address: Directeur des Services agricoles et commerciaux du Tonkin.

17. *Tropical Agriculturist, Supplement (Ceylon)*. 1910. East Asiatic Co. and the soya bean industry. Soya cake factory erected at Copenhagen. 35(4):368. Oct. 15. Also titled Supplement to the Tropical Agriculturist and Magazine of the Ceylon Agricultural Society. [1 ref]

• **Summary:** A factory "has been erected there with capital provided by the East Asiatic Company at a cost of about 1,000,000 kr. (£55,500). It is estimated that as at present arranged 100 tons of soya beans can be pressed in 24 hours, and that, if necessary, the output could be increased. The factory appears to be well equipped and fitted with the latest improvements. The East Asiatic Company's own vessels are likely to largely contribute to the activity of the factory by bringing the beans from the East for pressing, though a quantity of soya beans has already been shipped from the United Kingdom [to Copenhagen]. It is anticipated that by establishing this, and in the course of time other oil cake factories, Denmark may be able to obtain a more effectual control over the price of butter than has been the case hitherto, and avoid the enormous fluctuations of price which of late have been so much in evidence."

"A French agency states that Mr. Li Yu Jin [sic, Li Yu-ying], who established the first soya bean industry in Paris, has returned from China after consulting Chinese capital of F. 1,500,000 for developing this enterprise in Europe. The soya will be worked at Paris, Brussels, London, and Berlin, and will be consumed in the form of milk, sauce, soup, vegetable, jam, cheese, flour, and bread.—L. & C. [London and China] *Express*, Aug. 19."

Note 1. It is not clear whether soybeans have arrived yet in Denmark for processing by this new oil mill. Note 2. This is the earliest English-language document seen (March 2000) with the term "Soya cake" in the title.

18. Li, Yu-ying. 1910. Farine de soja et ses dérivés [Soy flour and its derivatives]. *French Patent* 424,124. 2 p. Application filed 27 Dec. 1910. Granted 5 May 1911. [Fre]
• **Summary:** Flour is prepared from the soya bean, either by grinding selected material containing relatively little fat, or by pressing out the oil from the beans and grinding the pressed cake. The flour thus obtained (mixed with other flour if desired) is used in the preparation of articles of food, such as pastes (pastas of the macaroni type), soup, bread, biscuits, etc., bread made from soya flour being recommended in cases of diabetes. Address: Seine, France.

19. Li, Yu-ying. 1910. Produits alimentaires et condimentaires à base de graine de soja [Food products and condiments made from the soybean]. *French Patent* 424,125. 2 p. Application filed 27 Dec. 1910. Issued 5 May 1911. [Fre]

• **Summary:** "This invention has for its object the manufacture of products based on cooked soybeans (*graines de soja cuites* (*pois chinois* = Chinese peas)), which can be divided into two large categories: 1. Products fermented with salt, including soy sauce (*la sauce de soja*) and soybean paste (*la pâté de soja*). 2. Non-fermented, sweetened products, including sweet soya preserves (*la confiture de soja*) and soy powder (*la poudre de soja*), which can be utilized in pastry (*la pâtisserie*) and confectionery (*la confiserie*).

The process for making each type is described in general terms. To the fermented sauces "can also be added spices such as pepper, cloves, ginger, nutmeg, pimento / allspice, etc. Or sugar can be used in place of the spices. The soy sauce or paste obtained, as has just been said, can be concentrated or dried by heat or evaporation.

"For the non-fermented, sweetened products, including soy confectionery and soy powder, one proceeds as follows: For the confectionery, the soybean seeds are dehulled, cooked, and crushed. Then this pulp is mixed with about one-third part sugar. Or, one can add dry fruits, chestnuts, almonds, hazelnuts, cocoa*, etc. The product can be dried to obtain a soy-based powder, which can be employed in various ways in pastry and confectionery. This powder is different from flour, not only because it comes from cooked soybeans, but also because it contains none of the cellulose in the soybean hulls."

Note: This is the earliest document seen stating that soy can be used with cocoa. *Webster's Dictionary* defines cocoa (pronounced CO-co, a modification of the Spanish term cacao), a term first used in 1577, as "1: Cacao. 2a: Powdered ground roasted cacao beans from which a portion

of the fat has been removed.” *Webster’s Dictionary* defines cacao (pronounced kuh-KAO, derived from the Spanish from Nahuatl *cacahuatl* cacao beans, and first used in 1555) as the dried partly fermented fatty seeds of the cacao (a South American tree, *Theobroma cacao*), used in making cocoa, chocolate, and cocoa butter—also called cacao bean, or cocoa bean. Address: Resident in France (Seine).

20. Li, Yu-ying. 1910. Vegetable milk and its derivatives. *British Patent* 30,275. 5 p. Date of application, 30 Dec. 1910. Accepted 29 Feb. 1912.

• **Summary:** Li gives his occupation as “Engineer.” “This invention consists in the manufacture of a vegetable milk and its derivatives by means of soja grains (Chinese peas), the milk thus produced having the appearance, the colour and the taste of ordinary milk, its chemical composition greatly resembling the same. It has moreover the same nutritive and alimentary properties.” The grains are cleaned, decorticated, soaked and ground with water in a mill of the kind specified in British Patent Application 11,903 of 1911. The mechanized mill is composed of a fixed lower millstone above which the upper millstone is mounted on a vertical shaft.

“The clear milky liquid produced by grinding the grain previously mixed with water in combination with the supply of water in the millstone enters a channel then passes into a shoot (*t*) which conveys it to a tank (*u*) from which it is drawn off by a pump (*v*) which forces it under pressure into the filtering press (*x*). On leaving the filter, it falls, after passing through a sieve (*y*) into a vat (*z*). From this vat it is conveyed through a pipe (*a*) to the boiler or digester (*b*).” It is cooked with steam in a water-jacketed vessel, then pasteurized or sterilized. “It is then bottled and is ready for consumption. The soja milk may be utilised in the two following cases. 1st. As a substitute for ordinary milk. It may be consumed as sterilised at temperatures of 110° to 120°C. 2nd. As a raw material for use in different manufactures (cheeses, casein, and the like). It must then be heated from 60° to about 120°C.

“It may also be concentrated, dried, or fermented. “The milk obtained may be humanised or animalised,” i.e., its composition may be brought to resemble that of human or animal milk. It is coagulated for making cheese by magnesium salts, organic salts, rennet, lactic ferments, or “sojaobacille,” a ferment obtained by cultivation in a mixture of the above-described liquid and sodium chloride the fermented paste obtained by putting into salt water soy beans that have been cooked with water and allowed, alone or mixed with cereal flour, to stand in the air.

“For obtaining fermented cheese such as roquefort [Roquefort], parmesan [Parmesan], romatour, camambert [Camembert], and gruyere, suitable ferments are employed.”

“For the fermented milk, the special ferment termed ‘sojaobacille’ is employed or other ferments used for obtaining fermented milks—kephir [kefir], yoghurt [yogurt], koumiss, and the like, and which are the *saccharomyces cerevisæ*, *dispora caucasica*, *maya bulgare*, and the like, and the said milk is modified by the addition of sugar levulose, and the like and particularly of lactose.”

In making casein, the oil may be expressed from the beans before the preparation of the milk. The casein, obtained by coagulating the milk, may be used as food, paste, etc., or may be mixed with borax, oxide of zinc, magnesia, gelatin, etc., to obtain a hard industrial (non-food) substance termed “sojalithe” [resembling ivory, horn, or shell]. The filter press residues may be dried and ground to form a food for human beings, or may be used as food for cattle, or as manure. The liquid expressed in making cheese [soy whey] may also be used for feeding animals.

An illustration (see next page) shows a longitudinal view of all the equipment used in the invention; each important part is marked with a letter.

Note 1. This is the earliest document seen (June 2011) that mentions soy yogurt or fermented soy yogurt.

Note 2. This is the earliest document seen (June 2011) that mentions the word “sojalithe” or that discusses a specific non-food industrial use for soy protein; “sojalithe” is probably derived from “Galalith” (a registered trademark; see F.G.J. Beltzer, June 1911). Galalith, or Erinoid in the United Kingdom, a synthetic plastic material manufactured by the interaction of casein and formaldehyde, was introduced in 1900 at the Paris Universal Exhibition in France. In France, Galalith was distributed by the Compagnie Française de Galalithe located near Paris in Levallois-Perret. It was first used to make buttons, resulting in a revolution in the button industry. In 1913 some 30 million liters (8 million U.S. gallons) were used to make Galalith in Germany alone. Ever the entrepreneur, Li apparently saw “sojalithe” as a potential substitute for expensive ivory.

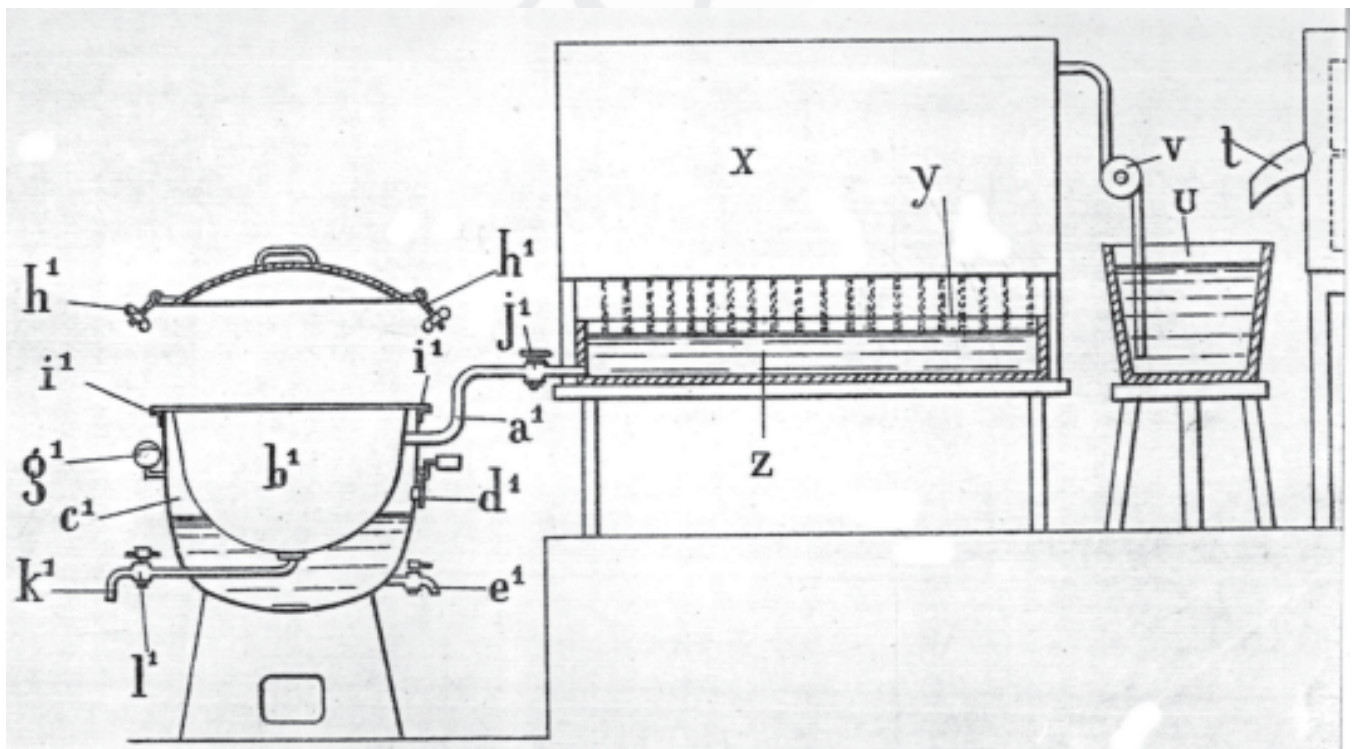
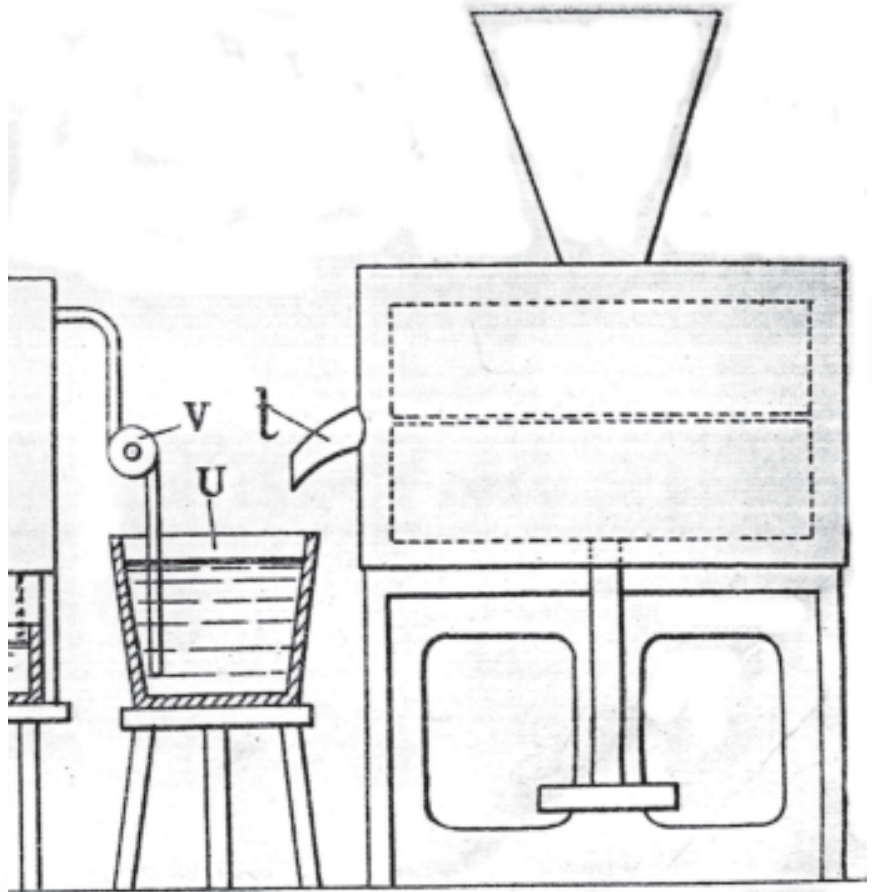
Note 3. This is the earliest document seen (June 2011) that mentions a fermented soy cheese or a Western-style soy cheese (Roquefort, Parmesan, Camembert, or Gruyere types), which it calls “fermented cheese.”

Note 4. Levulose, now more commonly called fructose, is a sugar.

Note 5. This is the earliest English-language document seen (Oct. 2003) that contains the term “soja milk.”

Note 6. This is the earliest document seen (Feb. 2011) that mentions the bottling of soymilk or the sale of soymilk in bottles. Address: 46 rue Denis Papin, aux Vallées (Seine), France.

21. Li, Yu-ying. 1910. Sauce consisting chiefly of soja grains. *British Patent* 30,351. 2 p. Date of application, 31 Dec. 1910. Accepted 29 Feb. 1912.



• **Summary:** Sauces. Cooked soy beans, to which flour may be added, are fermented with ferments such as “sojaobacille” (*vide* 30,275, 1910, *supra*), and the fermented mass is placed in saltwater. When matured, it is pounded to a paste or is diluted with saltwater and filtered. Alternatively, “soy milk,” obtained as described in 30,275, 1910, is fermented with sojaobacille, sodium chloride being added, and filtered. Spices or sugar may be added, and the products may be concentrated or dried.

Note: This is the world’s earliest patent seen for soymilk.

22. Li, Yu-ying. 1910. Soja flour and its derivatives. *British Patent* 30,350. 2 p. Date of application, 31 Dec. 1910. Accepted 1 Jan. 1912.

• **Summary:** “This invention has for its object the manufacture of soja (Chinese pea) flour for use in the preparation of a special kind of bread, alimentary pastes, rusks, cakes, soups, etc. Soja grains contain a considerable proportion of fatty matter which considerably impedes the operation of grinding.”

Flour is prepared from soy beans containing little fat, or from which most of the oil has been removed, by pressing the whole beans, the cakes produced being ground. Soja flour is employed: (1) with ordinary flour, green-pea or rice flour, and an extract of soy to form an alimentary paste, the starch being extracted and the flour gelatinized with hot water; (2) with cabbage, turnips, carrots, sorrel, potatoes, green peas, broad or kidney beans, tomatoes, etc., or jelly or gravy of cray-fish, for preparing soups; (3) to make a “highly palatable kind of bread... which may be recommended to persons suffering from diabetes. In order to make this bread a yeast is prepared from a culture of ordinary yeast germs in a soja base, the presence of the soja being favourable to the germination of special kinds of ferment and particularly of sojabacilli, although any other kind of ferment, barm, etc. may be used.

“It may also be made with other kinds of flour, made from wheat, oats, barley, rice, maize, etc., thus ensuring the production of bread containing a large quantity of nitrogen, and substances containing hydrocarbons and mineral matters;” (4) with eggs, butter, etc., for making cakes or rusks.

Note: This is the earliest English-language document seen (May 2005) that contains the word “hydrocarbons” (or “hydrocarbon”). Address: Engineer, 46, rue Denis Papin, aux Vallées (Seine), France.

23. Li, Yu-ying. 1910. Ta tou: Le soja [The soybean]. Paris: Société Biologique de l’Extrême Orient. 66 p. Illust. 28 cm. [Chi]

• **Summary:** This remarkable work, written entirely in Chinese, was the first of Li’s major works on soybeans and soyfoods. Published in Paris, it was written in Chinese and

meant to be read by young people in China interested in coming to Paris to study or in helping Li with research on Chinese soybean varieties. An expanded and revised version was published into French the next year (1911).

Contents: Soybeans: 1. Introduction. 2. Names and varieties (colors, sizes, and shapes) of soybeans. 3. Where soybeans are produced and their history. 4. The place of soybeans in the hierarchy of plants (taxonomy). 5. Nutritional composition of soybeans. 6. Characteristics of soybeans (physiological, morphological, etc.). 7. Food uses of soybeans (incl. tables comparing the price of tofu with various meats, and the various sicknesses associated with eating different types of meat). 8. Equipment used in making soyfood products (a photo shows the equipment in Li’s modern soymilk and tofu plant near Paris; p. 37), and compares soymilk with cow’s milk. A large soybean utilization diagram in Chinese (p. 44) shows all the products that can be made from soybeans using the wet process (from soymilk) or the dry process (from flour). Note: This is the earliest document seen (July 2002) that contains a diagram of this type.

9. Value of soybeans in agriculture (incl. fertilizer use). 10. Conclusion. Appendixes: (1) About the *Société biologique de l’Extrême Orient* (Far-East Biological Society). (2) Membership form for the Far-East Biological Society (Paris): Date, name, A.K.A., Address, Occupation or subject of study, Place of birth. Please enclose 2 yuan membership fee (p. A6). (3) Bibliography of publications on soybeans by the Society of the Far East (p. A7-8). (4) Special announcement concerning soybean research (p. A9).

Illustrations (line drawings) show: (1) Comparison of shapes and colors of 7 different colors of soybeans (p. 5). (2) Five views of soybean pods with beans, incl. outside of pod, inside of both halves when open, with beans in one half, the two cotyledons of a single soybean (p. 11). (3) Soybean plant with pods (p. 12). Photos show: (1) The cellular components and layers of soybeans and hyacinth beans (p. 22, 23). (2) The interior and equipment in Li’s soymilk and tofu plant on the outskirts of Paris (p. 37). (3) Microscopic views of soymilk (*doujiang*) and a liquid resembling soymilk made from soy flour (p. 38).

Tables show: (1) Size range (length, width, and thickness; maximum, average, and minimum) of 7 colors of soybeans: yellow bean, green skin bean, green bean, dark bean {“black” or “crow” bean}, black bean, red bean, spotted bean (p. 4). (2) Composition of four parts of a soybean plant: Comparison, water, protein, oil, carbohydrates, ash (p. 18). (3) Comparison of oil and protein content of 5 colors of soybeans (red, black, green, white, yellow) from various countries and regions: China, Japan, Southeast Asia, Russia, Hungary, and France (p. 19). (4) Composition of soybeans, hyacinth beans, and wheat (p. 21). (6) Comparison of the price of tofu with that of various meats (p. 29). (7) Ash content of soybeans, hyacinth beans,

大豆
LE SOJA

著 瀛 煜 李

par

LI YU YING

印 編 次 初

1^{re} Edition

行 刊 會 究 研 學 物 生 東 遠 黎 巴
Société biologique de l'Extrême Orient, Paris

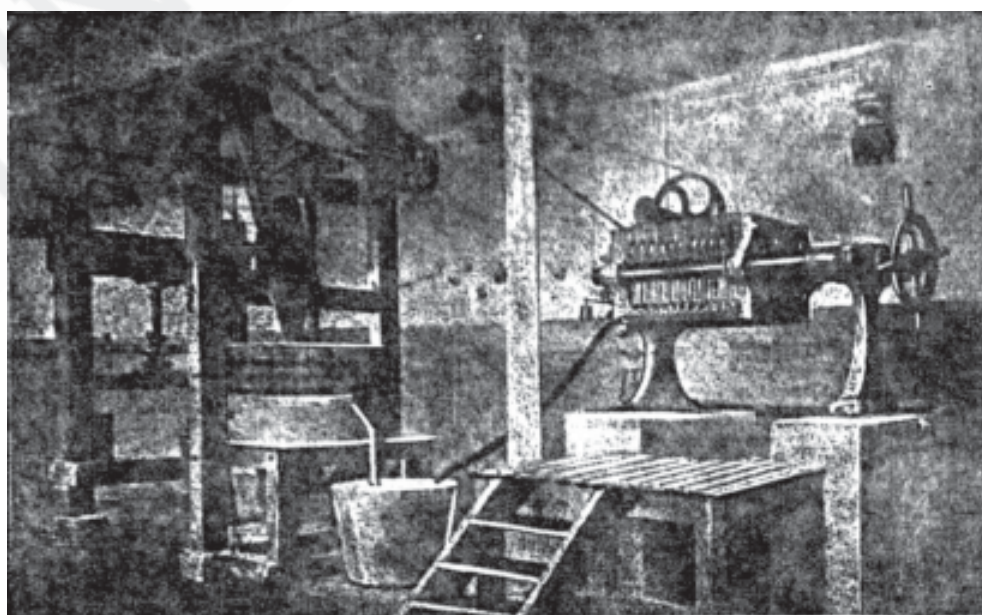
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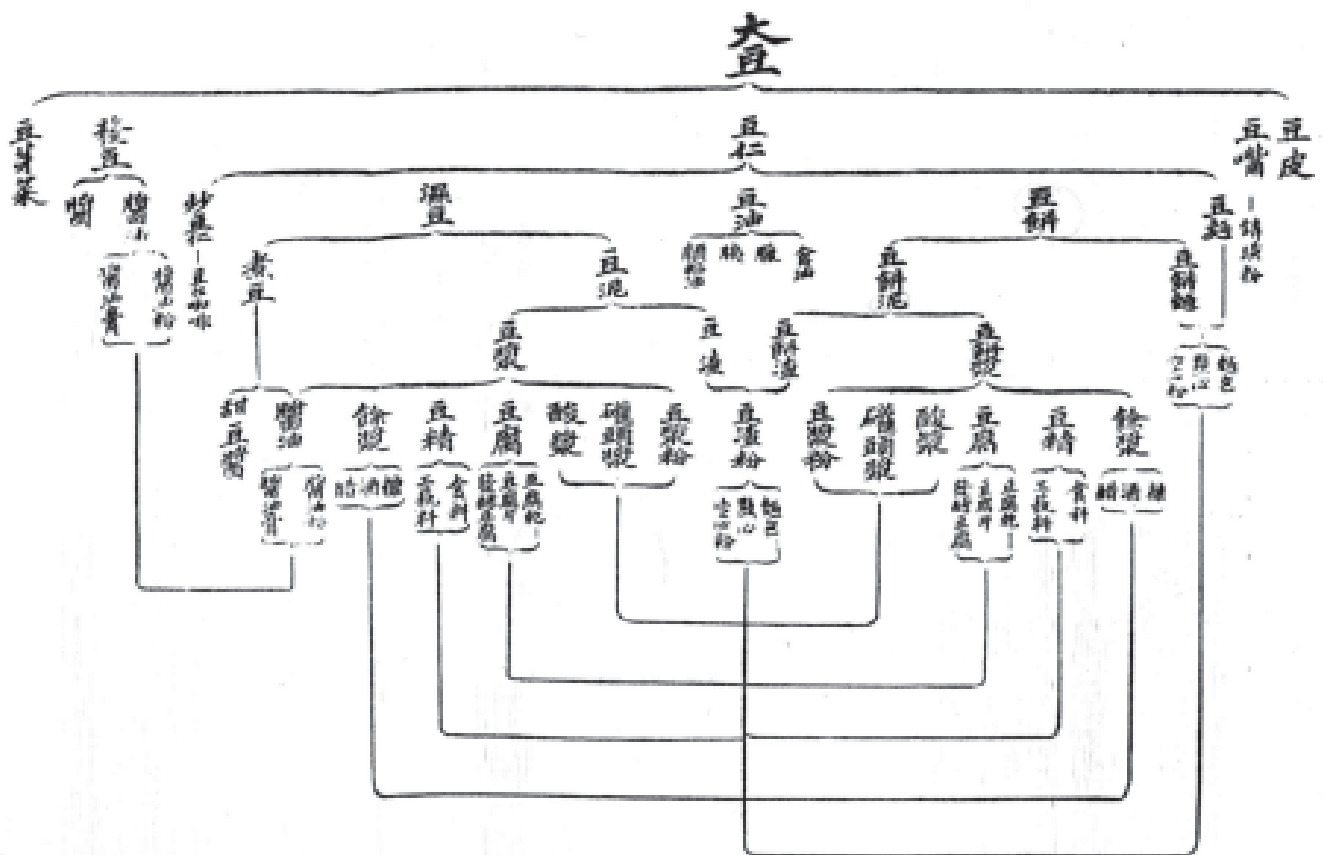
1910

各種大豆形色比較圖

 (揚州) 豆黃小	 (隸直) 豆黃大	 (天奉) 好人十本日	黃豆
 (隸直) 豆黑白	 (天順) 豆青大	 (天奉) 豆青大本日	皮青豆
 (天順) 豆青	 (天順) 豆青	 (州端) 豆青大	青豆
 全	 全	 (天順) 豆黑大	烏豆
 (門厦) 豆烏油	 (丘任) 豆黑	 (天奉) 豆黑本日	黑豆
 (寧永) 豆棕	 (隸直) 豆茶	 (隸直) 豆紅大	赤豆
 全	 全	 (隸直) 豆眼貓	斑豆

第三圖 (全棵大豆)





duck, uncooked rice, cabbage, egg, beef, chicken, lamb, pork, carp, wheat flour (p. 31). (8) Carbohydrate content of uncooked rice, wheat flour, hyacinth bean, soybean (p. 32). (9) Weight of products containing 100 gm of protein: Soybeans, tofu (somewhat firm), hyacinth bean, uncooked rice, bread, cooked rice, vegetables (p. 32).

Publications listed in the Bibliography (p. A7-8): *Ta tou—The soybean* (this book; published 1909). *Bean curd—20 centuries of great craftsmanship around the world* (1908). *Soycrafting—China's manufacturing specialty* (1908). *The Paris Bean Curd Company* (1908, illustrated). *An outline of the agricultural societies of France* (1908). Note: the above publications concern industrial matters.

A description of herbs (Chinese medicinal plants etc.) (1909). *TB [Tuberculosis] and its cure* (1909). Note: the above publications concern medicinal herb and health matters.

The benefits of soyfoods (1909). *Smoking and its relationship to health, economics and industry* (1909). Note: the above publications concern industrial and health matters.

Special announcement concerning soybean research (p. A9): “Gentlemen—Many of us in this society are researching the benefits of the soybean. It may be considered as China's greatest resource. We have already published a number of specialized reports. These have been made available to you. In view of the fact that there are so many varieties of soybean in China and that the regions of cultivation are so extensive, we must rely upon you, our colleagues, in all parts of the country to go into the field and collect data for us. Only then will we be able to complete our research into every variety of Chinese soybean. If we should receive your kind consent, we beg you to be so good as to send the soybean varieties to the Peking postal address of this Society (address is given). We are interested only in soybeans (see pages 1-6 of this book) and need one or two catties (0.5-1.0 kg) of each. Once our research into the benefits and properties of these beans is complete, we will submit a further report to this Society, in order to repay your goodwill. If you would please advise us of the cost of the beans and the postal charges, we will make the appropriate refunds. We will also send you a copy of this book as a modest token of our gratitude. Enclosed please find an explanatory document. Please take the trouble to complete this and send it together with the beans.

“The Paris/Far-East Biological Research Society”

On page A-10 is a form to be used when submitting the Chinese soybean varieties.

24. Portrait of Li Yu-ying (Photograph). 1910?

• **Summary:** This tiny 1¼ by 1.75 inch undated black-and-white photo shows Li Yu-ying at about age 30 with a high forehead and wearing a moustache and Chinese-style dress. He is a very handsome and intelligent-looking man. It was



first seen on the website www.thesoyfanclub.com at the head of a biography of Li Yu-ying written by William Shurtleff. Further investigation revealed that Paul King had located it on the website of the National Palace Museum (NPM) in Taiwan, of which Li had been one of the founding members.

25. Li, Yu-ying. 1911. A propos du Soja hispida [About Soja hispida, soybeans]. *Journal d'Agriculture Pratique* 75(1):48-50. Jan. 12. [4 ref. Fre]

• **Summary:** This is a the author's point-by-point reply to 12 points of a critical article in this journal on March 24 by M. Demolon, Li's former professor. Note: Li studied the soybean at Demolon's laboratory at the school of practical agriculture at Chesnoy. Li discusses: Carbohydrates and starch in soybeans, soy flour, the quality of vegetable proteins vs. animal proteins, the absence of lactose in soymilk, the lecithin in soybeans (*fèves de soja*), soymilk, soy bread for diabetics and their superiority to gluten breads.

“The soybean will grow in almost all climates, from Manchuria to the south of China. This year [1910], at the Exposition of Nanking, we found nearly 400 soybean varieties exhibited by different provinces. In Europe and America, successful trials have already been conducted. In France the Society for Acclimatization has already studied the soybean for many years. Mr. Paillieux has written a very

well documented book on this subject which concludes in favor of the adoption of soybean cultivation in Europe. The fact that there was an isolated unsuccessful trial at the School of Agriculture at Chesnoy does not seem sufficient to demonstrate that soybean culture cannot succeed in France."

"Mr. Demolon represents the soybean to us as being of interest merely from the viewpoint of pure science." Li concludes by re-stating his belief (stated two years earlier in this journal, on 2 July 1908): "The question up to this point has nothing to do with industry and commerce; it is purely scientific, but pure science always precedes applications. And there is nothing to say that tofu or soy cheese (*le to-fou* {*fromage de soja*}) won't one day become a prized food for Europeans."

Note: This is the earliest document seen (Oct. 2004) that mentions the Exposition of Nanking, where 400 soybean varieties were exhibited by different provinces. Address: Paris.

26. *Lancet*.1911. Notes from China (From our own correspondent): The soya bean. i(4560):202. Jan. 21. Summarized in *J. of the New Zealand Department of Agriculture*, 15 Feb. 1913, p. 149.

• **Summary:** "Within the past three years the outstanding merits of this pulse have come prominently to the front, and its export from Manchuria, where most of it is raised, has lately assumed very large dimensions. For the past 2000 years it has been used in North China for making bean curd, a thick nutritious jelly eaten daily by all classes of the people. A widely used vegetable oil is also expressed from it, the refuse left over serving for cattle food and manure for sugar plantations."

"It is a cheap product, each bean when sown multiplying itself, on an average, 450 times. On account of the great nutritive value of the Soy Bean, it is well worth medical attention, more particularly for diabetic cases, because of its low proportion of starch. For making biscuits, soup powder, infant and other foods, it will be widely used in future when its dietetic value becomes better known." The composition is then given, and it is shown to be rich in albumin [protein, 40%], fats (20%), sugar 8-11%, and minerals 4-6%. "The most abundant salt is sodium phosphate. Advocates of the fleshless diet have to contend with large amounts of indigestible cellulose which occurs in vegetarianism. This cellulose is present in 4 to 11 per cent. of the soya bean, but is easily eliminated from the other products. Bean curd is entirely free from it" as is "a most excellent vegetable milk which resembles animal milk in that it coagulates." The author then gives some comparative nutritional figures, based on "the work of a French-trained Chinese chemist, Mr. Li Yu Ying."

27. *Christian Science Monitor*.1911. Paris and the soy bean. Jan. 24. p. 16.

• **Summary:** "Western palates may not be easily reconciled to the culinary art of the eastern nations. Oriental cooking has not so far inspired the celebrated chefs of the world centers. For famous recipes, the epicures would hardly look to China. As many bills of fare still make their appeal in the French language, so the kitchens of France retain reputations earned long ago... But Paris, no doubt, is as proud of Alexis Soyer's 'Culinary Relaxations,' which the famous cook wrote in 1845, as of some other literary achievements of the period, more popular today, perhaps, but scarcely as interesting to the epicure."

"What, then, shall be said of Li Yu Ying, home address Peking, who has established himself in Paris and believes he has something of value in the cooking line for even the surfeited Parisians. This, assuredly, is blazing a new trail where it must have required considerable courage to venture. China teaching France how to cook! Here, to say the least, is a gastronomical novelty."

"Son of a former minister of state at Peking, Yi Ying [sic], after studying scientific agriculture in France returned to his native land two years ago. Apparently impressed with what the French had taught him, he nevertheless considered it possible to produce something different from anything they had to show. For this purpose progressive China assisted Li Ying [sic, Li or Li Yu-Ying] in forming a company with a capital of \$400,000. The factory built at Les Vallées, near Paris, is the result."

"This Chinese invasion of French territory, however, need not cause alarm to Parisian restaurateurs. Li Ying and his associates, for the present at least, propose to devote their efforts to concentration of foodstuffs. The French Agricultural Institute at Chesnoy, where Li obtained his training, has done vegetarianism more than one service, and it appears as if China is now the debtor through that which the institute taught one of her sons."

In the food area, Li is "proceeding along original lines. For instance, since all the machinery came from China, it is an interesting commentary on oriental progress that the far east is so advanced in mechanics that it can supply the equipment for a factory located in the center of European industrial activity. All the raw materials from which the foods are prepared are also imported from the eastern empire. Further than this, one of the most plebian staples in China, the soy bean, is the leading agricultural product from which Li Ying is manufacturing his delicacies."

"Tabloid foodstuffs may not revolutionize ordinary cooking methods, but if the soy bean is capable of tasty preparation, then it is evident from the magnitude of this Chinese enterprise there is a lesson wrapped in the incident. The Occident is no stranger to the value of the soy bean as basis for a piquant sauce. Here, now, is the Orient teaching many novel values for the same insignificant product."

“The western world has hardly had a chance to say what it thinks of this Chinese product. But if the Parisian institution is a success, there is no reason why other countries should not prove responsive to the idea. The civilization of the west owes many things to Asia. And the utilization of the bean is everywhere easy since there is practically no deterioration, no matter how far it is shipped.”

28. *Matieres Grasses (Les) (Paris)*.1911. La fève de soja [The soybean]. 4(33):2094-95. Jan. 25. [Fre]

• **Summary:** A summary of recent world news related to soybeans. Two German researchers have applied for a patent on the manufacture of artificial rubber from soy oil. In China a sort of vegetable milk is made from soybeans according to a report by Li Yu-Ying made at the Dairy Congress held in Paris in 1908.

“In 1906 and 1907 the price of various oils grew rapidly. At the same time the consumption of vegetable oils grew rapidly. Therefore people in Europe began to ask if there was not a good way to use soy oil, which had been used for a long time in China and Japan for food and illumination. Then in 1908 imports of soybeans to Europe began. In 1909 at least 400,000 tons were imported to England... There is at least one factory in France which uses soy oil in the production of cakes (*tourteaux*).

“One can see that soybean commerce is very active; this 2-year infant would seem to have a bright future.”

29. *Journal (Le)*.1911. Une usine chinoise fonctionnee dans la banlieue parisienne [A Chinese factory is operating on the outskirts of Paris]. Jan. 9. [Fre]*

30. Le Goff, Jean. 1911. Le soja dans l'alimentation des diabétiques [Soybeans in diabetic diets]. *Gazette des Hopitaux* 84(27):399-402. March 7. [8 ref. Fre]

• **Summary:** The author, a woman who has written more than 15 articles on diabetes mellitus (*diabète sucré*), reviews the literature on that subject as it relates to soybeans. Diet plays an important role in the treatment of diabetes mellitus. Takeuchi, in Tokyo, Japan, was the first to point out the presence of a very active urease in soybeans. Soyfoods are now available in France for there is a factory, located not far from Paris, that makes them under the direction of Chinese [Li Yu-ying]. Armand Gautier, in *L'Alimentation et les Régimes* recommended adding 12-15 gm of sodium bicarbonate per kg of soybeans that one is going to cook. The author feels that “except for shoyu, all soyfoods have a peculiar flavor and I believe that one will meet with many difficulties in trying to make them acceptable to the European palate.”

She gives five recipes for the use of soybeans in diabetic diets: 1. Roasted: “The soybean can be eaten roasted or grilled like our chestnuts (*grillé comme nos*

châtaignes). It is sufficient to run them through a chestnut-or coffee roaster. If the soybeans are imported, they must be soaked previously in lukewarm or soft water.” 2. Whole soybeans with butter. 3. Soybeans sauteed with vegetables. 4. Cooked soybean puree. and 5. Bread or cake with soybeans (boiled until soft with sodium bicarbonate).

She encourages the French to grow their own soybeans for use in diabetic diets. In 1911 the most widely grown varieties were le Soja d'Etampes and le Soja de Podolie [Podolia]. “In conclusion, the introduction of the soybean to our country for use as food is justified by the important role its oils can play in the feeding of diabetics. I would add that the leaves of this plant, which are equally nutritious, can constitute a precious resource for agriculture, and that its culture, after being practiced for a number of years, can improve the soil considerably. Under these conditions, I would consider that serious and ongoing trials should be undertaken, and I call this subject to the attention of those in public power who are interested in the question, and would be able to render an important service to the numerous diabetics and to agriculture.”

Photos show: (1) A small soy bean plant in the ground. (2) A field of soy bean plants growing in the suburbs west of Paris.

Note: This is the earliest French-language document seen that refers to soynuts, which may be made by roasting soybeans like chestnuts. Address: Laureat de la Faculté de Médecine de Paris.

31. Demolon, A. 1911. Lait végétal? [Vegetable milk?]. *Journal d'Agriculture Pratique* 21:140-41. March 24. [Fre]

• **Summary:** The milk of the soybean contains constituents which correspond to those of cow's milk: casein, fats, sugars, and minerals. However, plant milk will never be the same as artificial mother's milk made by mixing one volume of cow's milk with one-half volume of lactose solution. Nonetheless soymilk is an economical and highly nutritious food. Since its introduction into the United States, production of soybeans has expanded significantly. Address: Directeur de la Station agronomique de l'Aisne.

32. Li, Yu-ying. 1911. Charcuterie de soja [Cold cuts and meatlike products from soya]. *French Patent* 428,718. 2 p. Application filed 20 April 1911. Granted 6 Sept. 1911. [Fre]

• **Summary:** “This invention concerns the products of the pork-butcher's shop (*charcuterie*) such as fresh sausages (*saucisses*), pâtés, etc. to which are added a soy-based product (*un produit à base de soja*) (*pois chinois*). The preparation of these products of the pork-butcher's shop involves the use of tofu (obtained by the coagulation of soymilk) *fromage de soja* (*obtenu par la coagulation du lait de soja*) to replace ordinary meats in part or in totality, tofu being a sort of vegetable meat (*le fromage de soja constituant une sorte de viande végétale*).

The author then discusses how to cook tofu and use it in to make fresh sausages (*les saucisses*), large dry sausages or salami, (*saucissons*), pâtés, etc. Aromatics (*aromates*) which can be used for seasoning are soy sauce, salt, pepper, and the oil and juice of onions.

Likewise, tofu can be mixed with ordinary meat to obtain charcuterie products. Note:

Note: This is the earliest document seen (Aug. 2002) in the Western world concerning soy-based meat alternatives or a soy-based meatless sausage, or soy-based pork alternatives. Address: Resident of France (Seine).

33. Li, Yu-ying. 1911. Chocolat de soja [Soy chocolate]. *French Patent* 428,719. 2 p. Application filed 20 April 1911. Accepted 6 Sept. 1911. [Fre]

• **Summary:** The object of this invention is the manufacture of chocolate based on soya (*la fabrication de chocolat à base de soja (pois chinois)*) either in the form of a liquid or a solid. Soya beans are roasted either alone or in the presence of cacao beans, and then ground to a powder, or roasted soya beans are moistened and exposed to the vapors arising from cacao beans while the latter are being roasted. Decorticated soya beans may also be mixed with cacao butter, then roasted, and ground to a powder. Address: Resident of France (Seine-et-Oise).

34. Bontoux, Emile. 1911. Le Soja et ses dérivés [The soybean and its products]. *Matieres Grasses (Les) (Paris)* 4(36):2195-99. April 25; 4(37):2239-43. May 25; 4(39):2326-29. July 25; 4(40):2364-66. Aug. 25; 4(41):2405-07. Sept. 25. [48 ref. Fre]

• **Summary:** Contents. Introduction. The plant: origin and history, species and varieties, culture, and production: USA, Japan, Manchuria, France, England, China, Korea, Indochina (it is cultivated for the needs of the population in Cochin China {especially in the provinces of Chaudoc and Baria}, Annam, Tonkin, Cambodia), Formosa, Java, India, Africa. The soybean—a food plant: The plant, the seed, large table showing many analyses from many countries of the chemical composition of many soybean seed varieties.

Introduction to food products made from soybeans in East Asia. Shoyu [soy sauce] (and koji). Miso. Natto (from Japan). Le Tao-yu (a Chinese condiment also widely used in Japan. It is a thick, clear liquid made from black-seeded soybeans) Tao-tjiung (doujiang, from China). Tuong (from Annam). Tofu. Li Yu-ying. Table showing composition of powdered soymilk, fresh tofu, and soy flour.

The soybean—an oilseed plant. The soybean as an oilseed in the Far East. Table showing exports of soybean cake and oil from various Manchurian and Chinese ports in 1908 and 1909. The soybean as an oilseed in Europe and the United States. Table showing imports of soybeans to various British ports in 1909 and 1910 (the leading port by far is Hull, followed in 1909 by Liverpool, London, Bristol

Channel, Scotland, and Other ports {Rochester, etc.}). Table showing exports of soy oil from Great Britain in 1910: To Germany, Austria, Australia, USA, Belgium, Denmark, Egypt, France, Holland, Italy, the Indies (*Indes*), Norway, Russia, Sweden, other, total (115,372 barrels, each weighing 175 kg). Discussion of soy oil and cake in most of the above countries.

Trade in soybean seeds: Mitsui Bussan, Manchuria, England, China, Japan. Soybean cake.

Soy oil: Physical and chemical properties. Applications and uses as food and in industry: Margarine, for illumination, soaps, as a drying oil, paints and varnishes, linoleum, artificial rubber. An extensive bibliography is at the end of the last article in the series.

Note: This is the earliest document seen (May 2010) concerning the cultivation of soybeans in Cambodia. This document contains the earliest date seen for the cultivation of soybeans in Cambodia (April 1911). Earlier documents imply that soybeans were being cultivated in Cambodia by 1900, and it is highly likely that they were being cultivated for at least a century before that time. Address: Ingénieur-chimiste E.C.I.L., France.

35. *Times of India (The) (Bombay)*. 1911. Grilled shark and tortoise. June 7. p. 8.

• **Summary:** “An unusual menu was placed before a distinguished company at the annual luncheon of the French National Acclimation Society, an organisation whose object is to acclimatise foreign products in France, at the Gare de Lyon in mail week.

“One of the hors-d’oeuvre was ‘foie gras’ of tortoise while the roasts included grilled shark and Madagascar goat. A variety of dishes of Soya beans from a factory run entirely by Chinamen near Paris was also served. The luncheon was attended by the Minister of the Colonies, the Bulgarian Minister, the Governor of Dahomey, and several ladies. The guests, however, did not seem to have enjoyed the exotic dishes.”

36. Beltzer, Francis J.-G. 1911. Études sur la caséine végétale du “soja” et ses applications [Studies on the vegetable casein of soybeans and its applications]. *Revue Scientifique* 49(23):716-20. June 10. [4 ref. Fre]

• **Summary:** The author did his research in Cochin China [today’s Vietnam], then a French colony. This is a very original and important article.

Contents: Introduction. Vegetable milk [soymilk]. Vegetable cheese [tofu and fermented tofu]. Industrial vegetable casein (*La caséine végétale industrielle*; i.e. soy protein). Production of vegetable casein: Cleaning and washing the soybean seeds, extraction of the oil (which can be used in soap), extraction of the casein. Industrial [non-food] applications of vegetable casein: Paint, paper coating, Galalith, etc. Conclusion.

The preparation of vegetable milk and vegetable cheese are widely practiced today in Cochinchina and in Annam [today's North Vietnam], as recently discussed by Mr. Henri Labbé in *Revue Scientifique* (11 Feb. 1911).

Soy milk (*lait végétal*). After describing the process for preparing soy milk, the author notes: This soy milk serves for the feeding of infants and for general nutrition (*Le lait sert à l'allaitement des enfants et à l'alimentation générale*); it can also be used for the production of a vegetable cheese (*fromage végétal*).

Tofu (*fromage végétale*): When vegetable milk is treated with a mineral salt or an acid, playing a role analogous to that of rennet, it produces curds through coagulation, resembling those of ordinary casein. By draining and washing, one obtains a sort of white cheese (*fromage blanc*) which plays a major role in the nutrition of the peoples of the Far East. In Indochina the milk is coagulated by the addition of a very small quantity of a powder called Tchach-Kao or plaster [calcium sulfate], which comes from a selenite pulverised by the action of fire.

Tofu is generally eaten fresh, the same day it is made, but it can also be preserved by salting or smoking. In Annam, three main varieties of tofu are found: 1. Fermented tofu, gray or yellow in color, with a flavor resembling Roquefort cheese; 2. White or salted tofu resembling goat's cheese; 3. Baked or smoked tofu, resembling Gruyère cheese. At the market in Saigon, Chinese sell regular tofu to the natives for one-tenth the price of Gruyère cheese.

Industrial vegetable casein: Defatted soybean meal from oil presses is ground between millstones with cold water to give a slurry that is filtered to obtain soy milk. The soy milk is heated to boiling, then calcium sulfate is added to precipitate the protein, which is collected (just like tofu curds) on filter cloths. The presscake is mixed with forage and molasses, then fed to livestock. The curds are then dissolved in diluted soda lye (sodium hydroxide), filtered, precipitated with acetic acid. The finely divided precipitate is filtered out, washed on the filter, left to evaporate in the open air, then dried to a yellowish powder at a low temperature. The casein thus obtained is white, and, from an industrial viewpoint, very pure. It is insoluble in water, but soluble in dilute caustic alkalis and in ammonia. It exhibits almost precisely the same properties as the casein obtained from ordinary milk. It is found on experiment to be susceptible of the same industrial applications as animal casein, and may come to largely supersede this because of lower cost. 100 gm of soybeans yields about 25 gm of this "vegetable protein," which has both food and industrial uses.

Note 1. This is the earliest document seen (June 2011) concerning isolated soy protein. The author says that his "vegetable protein" has both food and industrial uses.

Note 2. This is the earliest French-language document seen (Aug. 2003) that uses the term *caséine végétale* du

"soja" or *caséine végétale industrielle* to refer to isolated soy protein.

Industrial applications of vegetable casein: "Like animal casein, industrial vegetable casein, free of fat or buttermilk, can be used in a host of applications. It can be used in making paints, and for the preparation of moisture-resistant products. Note 3. This is the earliest document seen (Oct. 2001) that mentions the use of soy protein in paints.

"It may be used also for the sizing (coating used to fill the pores) of paper, which consumes such large quantities of ordinary casein. Being soluble in ammonia and caustic solutions it is capable of forming a smooth and solid size.

Note 4. This is the earliest document seen (Oct. 2001) concerning the use of soy protein as a sizing for paper.

"Other uses are in certain manufacturing processes in the preparation of silks and artificial textiles, as well as of rubber, leathers, plastic materials, films, photographic emulsions, etc. Note 5. This is the earliest document seen (Sept. 2001) concerning the use of soy protein to make silks, artificial textiles, or other industrial (non-food) fibers. Note 6. This is also the earliest document seen (Dec. 2001) concerning the use of soy protein as a raw material for making plastics.

Large amounts of animal casein are at present employed in the manufacture of 'Galalith,' from which are made numerous objects which imitate articles made from ivory, tortoise-shell, bone, horn, etc. The Soya casein, when free from fats, is equally well adapted for these purposes.

"Formol acts upon this casein in the same way as on ordinary casein, rendering it insoluble. Hence it may be used for the water-proofing of fabrics, straw hats, etc., as well as for the preparation of sizes and dressings... A solution of vegetable casein and borax can be successfully utilized in the process of calico printing."

"It will be seen from the foregoing résumé, that the fabrication of vegetable casein for industrial purposes has immense possibilities, only exceeded in importance by the alimentary value of its food products for man and for beast.

Note 7. Webster's *Third New International Dictionary* (1963) defines Galalith (a registered trademark)—as "used for a hornlike plastic [also resembling ivory or bone] made from casein [milk protein] and formaldehyde and used especially in making small molded objects (as buttons, beads, or combs)." This is the earliest document seen (Nov. 2003) that mentions Galalith in connection with soy protein. Galalith, "a new horn-like product from cow's milk," was sold commercially by Nov. 1905 and the process was protected by patents "in all civilized countries" (*Monthly Consular and Trade Reports*, USA. 1905. No. 302. Nov. p. 243.)

Conclusion: "A Chinese factory has already been established on the outskirts of Paris (at Vallées near Colombes) to make food products based on soya (*produits alimentaires à base de Soja*). This factory now produces

tofu (*Caséo-Sojaïne*) and the following food products: Soy flour, soy bread, soy sauce, sweet soya preserves (*confiture de Soja*), soymilk (*lait de soja*), fermented soymilk (*lait de Soja fermenté*), tofu (*fromage de Soja*), etc.

Note 8. We wonder: Was Beltzer influence more by Li Yu-ying, or was Li influenced more by Beltzer? Both did independent and original research, however by Dec. 1910, some 6-7 months before this article was published, Li had applied for two French patents and three British patents which describe how to make various soy products in detail—including many of those products described by Beltzer. Therefore, we believe that Li influenced Beltzer more than Beltzer influenced Li.

“The Indochinese prepare, in addition, a fermented liquor, a concentrated milk, an alimentary flour, and a casein which forms the essential food of the people... Many Europeans are preoccupied with extracting part of the nutritive principles that exist so abundantly in the seeds, for the feeding of armies at war and of colonial troops... Hopefully the question of food uses of soy will be taken up at the same time as the manufacture of industrial casein, and that this will permit the utilization of the immense resources that our Indochinese colonies offer as raw materials.”

Note 9. Later in 1911 this article was summarized in *Scientific American Supplement* and printed as a special booklet.

Note 10. This is the earliest document seen (May 2000) that uses the term *la Caséo-Sojaïne* to refer to a food—clearly to tofu. Li Yu-ying coined this term, apparently after considerable thought and research. However the author also uses the term *fromage végétale* to refer to tofu—perhaps more generically. Martine Liguori, a native French speaker who is interested in tofu, noted in an interview (May 2000): “This term for tofu doesn’t sound foreign. Rather it sounds somewhat scientific, learned, and upper-class, as from the techno-elite. If you don’t know what it means, that’s because you are not well enough educated. In France, people will adopt something that is upper class, but they resist foreign things—even foreign words. This whole idea originated in France when Napoleon created the *Grandes Ecoles* (French graduate schools) to develop an intellectual elite to replace the royal elite.”

Note 11. This is the earliest document seen (April 2001) that mentions dried tofu. Address: Ingénieur-chimiste.

37. Product Name: [Soy Sauce or Shoyu].

Foreign Name: Sauce de Soja ou Schoyou.

Manufacturer’s Name: Usine de la Caseo-Sojaïne.

Manufacturer’s Address: Vallées, Colombes (near Asnieres, Seine), northwest of Paris, France.

Date of Introduction: 1911. June.

New Product–Documentation: Beltzer, Francis J.-G. 1911. “*Études sur la caséine végétale du “soja” et ses applications* [Studies on the vegetable casein of soybeans

and its applications”]. *Revue Scientifique* 49(23):716-20. June 10. See p. 720. Conclusion: “A Chinese factory has already been established on the outskirts of Paris (at Vallées near Colombes) to make food products based on soya (*produits alimentaires à base de Soja*).” This factory now produces various food products, including soy sauce (*sauce de Soja*).

Scientific American Supplement. 1911. “Extended utilization of soya bean products: Milk, cheese, and a variety of other products from a vegetable seed.” Aug. 19. p. 115. “A Chinese factory has been established [by Li Yu-ying] not far from Paris for the purpose of manufacturing alimentary products from Soya, and it has already put on the market... Soya sauce,...”

Li, Yu-ying; Grandvoinnet, L. 1912. “*Le soja* [The soybean”]. *Agriculture Pratique des Pays Chauds* (Bulletin du Jardin Colonial) 12(108):213-23. March. See p. 216-22. The section titled “Sauces” begins: “1. *Schoyou* (*Soyou*, *Schoyu*). *Shoyou* (*Phek-sze-You* in Chinese) is a liquid, soy-based condiment...” Details are given on the preparation, raw materials used and their proportions, formation of molds and koji, fermentation, perfection of the fermentation process in an aseptic environment using soymilk or soy bouillon inoculated with pure cultures, properties of shoyu, chemical composition of shoyu.

38. Product Name: [Soya Milk].

Foreign Name: Lait de Soja.

Manufacturer’s Name: Usine de la Caseo-Sojaïne.

Manufacturer’s Address: Vallées, Colombes (near Asnieres, Seine), northwest of Paris, France.

Date of Introduction: 1911. June.

New Product–Documentation: Beltzer, Francis J.-G. 1911. “*Études sur la caséine végétale du “soja” et ses applications* [Studies on the vegetable casein of soybeans and its applications”]. *Revue Scientifique* 49(23):716-20. June 10. See p. 720. Conclusion: “A Chinese factory has already been established on the outskirts of Paris (at Vallées near Colombes) to make food products based on soya (*produits alimentaires à base de Soja*).” This factory now produces various food products, including soymilk (*lait de soja*).

Scientific American Supplement. 1911. “Extended utilization of soya bean products: Milk, cheese, and a variety of other products from a vegetable seed.” Aug. 19. p. 115. “A Chinese factory has been established [by Li Yu-ying] not far from Paris for the purpose of manufacturing alimentary products from Soya, and it has already put on the market... Soya milk,...”

Li and Grandvoinnet. 1912. *Le soja*. p. 92-93. A photo shows the equipment used to make soymilk (*lait de soja*) and Li’s factory (*l’Usine de la Caséo-Sojaïne*) on the outskirts of Paris.

Fuerstenberg, Maurice. 1917. *Die Soja, eine Kulturpflanze der Zukunft und ihre Verwertungsmoeglichkeiten* [The soybean, a cultivated plant of the future, and possibilities for its utilization]. Berlin: Paul Parey. 40 p. See p. 5-6. The first manufacture of soyfoods in Europe took place in France, at Vallées near Asnieres, where they made flour, bread, cakes, cheese [tofu], and soymilk (*Mehl, Brot, Kuchen und Käse, vegetabilischer Milch*)—though only in small quantities and, above all, for diabetics.

39. Product Name: [Tofu or Soy Cheese].

Foreign Name: Caséo-Sojaïne (Fromage de Soja).

Manufacturer's Name: Usine de la Caseo-Sojaïne.

Manufacturer's Address: Vallées, Colombes (near Asnieres, Seine), northwest of Paris, France.

Date of Introduction: 1911. June.

New Product–Documentation: Beltzer, Francis J.-G. 1911. “*Études sur la caséine végétale du “soja” et ses applications* [Studies on the vegetable casein of soybeans and its applications]. *Revue Scientifique* 49(23):716-20. June 10. See p. 720. Conclusion: “A Chinese factory has already been established on the outskirts of Paris (at Vallées near Colombes) to make food products based on soya (*produits alimentaires à base de Soja*).” This factory now produces tofu (*Caséo-Sojaïne*) and various food products, including soy cheese (*fromage de Soja*).

Scientific American Supplement. 1911. “Extended utilization of soya bean products: Milk, cheese, and a variety of other products from a vegetable seed.” Aug. 19. p. 115. “A Chinese factory has been established [by Li Yu-ying] not far from Paris for the purpose of manufacturing alimentary products from Soya, and it has already put on the market... Soya cheese,...” The plant made fresh firm tofu, curded with salt or rennet.

Li, Yu-ying; Grandvoinnet, L. 1911. “*Le soja* [The soybean]. *Agriculture Pratique des Pays Chauds* (Bulletin du Jardin Colonial) 11(105):459-74. Dec. See p. 471. A chart (p. 471) titled “Soy based food products” (*Produits alimentaires à base de soja*) includes: I. Soymilk and its derivatives. These include tofu (soy cheese) (*Caséo-Sojaïne; fromage de Soja*). A photo (p. 473) shows soymilk being made inside his factory, using modern machines. More detailed information on Li’s tofu is given in the Jan. 1912 issue of this magazine (p. 32-38, especially p. 34-35), including: Method of production, coagulants used, perfected modern production methods at Li’s factory, tofu yields, preservation and storage, composition of tofu, digestibility of tofu, culinary preparations based on tofu. The introduction (p. 32) states: “Soy cheese (the Teou fou of the Chinese, To fu of the Japanese, Dau Phu of the Annamites) was first developed by the Chinese philosopher Whai Nain Tze before the Christian era.”

Fuerstenberg, Maurice. 1917. *Die Soja, eine Kulturpflanze der Zukunft und ihre Verwertungsmoeglichkeiten* [The soybean, a cultivated plant of the future, and possibilities for its utilization]. Berlin: Paul Parey. 40 p. See p. 5-6. The first manufacture of soyfoods in Europe took place in France, at Vallées near Asnieres, where they made flour, bread, cakes, cheese [tofu], and soymilk (*Mehl, Brot, Kuchen und Käse, vegetabilischer Milch*)—though only in small quantities and, above all, for diabetics.

40. Product Name: [Lactic Fermented Soya Milk (Perhaps Soy Yogurt)].

Foreign Name: Lait de Soja Fermenté.

Manufacturer's Name: Usine de la Caseo-Sojaïne.

Manufacturer's Address: Vallées, Colombes (near Asnieres, Seine), northwest of Paris, France.

Date of Introduction: 1911. June.

New Product–Documentation: Note: We know that a fermented soymilk product was sold by this company and we know that its founder and owner, Li Yu-ying, wrote about soy yogurt, but we do not know what the consistency (liquid milk vs. solid or semisolid yogurt) fermented soymilk product sold actually was.

Li, Yu-ying. 1910. “Vegetable milk and its derivatives.” *British Patent* 30,275. 5 p. Date of application, 30 Dec. 1910. Accepted 29 Feb. 1912. See p. 2. “For the fermented milk, the special ferment termed ‘sojaobacille’ is employed or other ferments used for obtaining fermented milks—kefir [kefir], yoghourt [yogurt], koumiss, and the like, and which are the *saccharomyces cerevisæ*, *dispora caucasica*, *maya bulgare*, and the like, and the said milk is modified by the addition of sugar levulose, and the like and particularly of lactose.”

Beltzer, Francis J.-G. 1911. “*Études sur la caséine végétale du “soja” et ses applications* [Studies on the vegetable casein of soybeans and its applications]. *Revue Scientifique* 49(23):716-20. June 10. See p. 720. Conclusion: “A Chinese factory has already been established on the outskirts of Paris (at Vallées near Colombes) to make food products based on soya (*produits alimentaires à base de Soja*).” This factory now produces various food products, including fermented soymilk (*lait de Soja fermenté*).

Scientific American Supplement. 1911. “Extended utilization of soya bean products: Milk, cheese, and a variety of other products from a vegetable seed.” Aug. 19. p. 115. “A Chinese factory has been established [by Li Yu-ying] not far from Paris for the purpose of manufacturing alimentary products from Soya, and it has already put on the market... fermented milk, etc.”

Li, Yu-ying; Grandvoinnet, L. 1912. “*Le soja* [The soybean]. *Agriculture Pratique des Pays Chauds* (Bulletin du Jardin Colonial) 12(106):28-38. Jan. See p. 30. The

section titled “Action of ferments [enzymes] and diastases [diastatic enzymes] on soymilk (*Action des ferments et des diastases sur le lait de soja*)” notes that the lactic ferments (kefir, yogurt, etc.) act in the same way on vegetable milk and on animal milks.

Li and Grandvoinnet. 1912. *Le soja*. p. 99. “Fermented soymilk (*Lait de soja fermenté*). Fermented milks (Kéfir, yoghourt, etc.) are used more and more therapeutically. One can replace them economically with soymilk inoculated with the same fermentation organisms. In addition to its low price, soymilk has the advantage of never being contaminated at its source. One can compensate for the lack of carbohydrates in vegetable milks by the addition of lactose (or levulose for diabetics).

Li, Yu-ying. 1913. “Method of manufacturing products from soja.” *U.S. Patent* 1,064,841. June 17. 3 p. Application filed 10 Oct. 1911. “The fermented milk is obtained by using ferments such as the ferments employed in producing fermented milks—kephir [kefir], yoghourt [yogurt], koumiss [koumiss], etc. These are the *Saccharomyces cerevisiae*, *Dispora caucasica*, *Maya bulgare*, etc., and the manufacture is effected by modifying the said milk through the addition of sugar (glucose, levulose, etc.), and more particularly lactose.”

41. Barrau, Fernand de. 1911. La situation agricole dans l’Aveyron: La fève soja; Lait et fromage de soja [The agricultural situation in the department of Aveyron. Soybeans, soymilk, tofu]. *Journal d’Agriculture Pratique* 75(2):21-22. July 6. [Fre]

• **Summary:** The Roquefort cheese industry in the region of Roquefort is experiencing hard times and the author fears that soy cheese (*le fromage de Soja*) may offer additional competition. “Many provinces of China, especially Manchuria, and all the countries of East Asia, cultivate on a vast scale the bean called *Soja* or *Soya* from which one can extract at will an excellent bread, oil, milk, butter, or cheese. Already, quite near Asnières (Seine), there exists a factory named *Caséo-Sojaïne*, supplied by soybeans imported from these distant countries. In this factory attempts have been made to make a special bread for diabetics using the flour of this bean. (Soybean seeds are very low in starch, which is the enemy of diabetics, and very rich in oils and protein.) The factory also produces confections, raw milk, cooked and sweetened milk, oil, various cheeses, not to mention the various cakes used to feed livestock.

“In the region of Roquefort, certain people are starting to ask themselves if they won’t soon have to fight against another products besides the cheese made in Corsica, or in the Pyrenees region, or in the plains of the Crau (near Avignon in Bouches-du-Rhone province). This product which they see as a competitor in the near future is soy cheese.”

“With special reference to soy cheeses, it is stated in the *Revue Scientifique* of last June 11, that the Orientals obtain three varieties of it: (1) A fermented variety, gray or yellow in color, reminiscent of Roquefort; (2) A white, salted variety resembling goat’s cheese; (3) A broiled or smoked variety (*cuite ou fumée*) resembling Gruyère.”

Since the Orientals themselves make a cheese from soya milk that reminds us of Roquefort, doesn’t this tell us that tomorrow the factory at Asnières, with the same milk, won’t also imitate Roquefort cheese very well? And how do we know that one day an industrialist won’t come right here to Roquefort to establish a factory, similar to that at Asnières, to convert to cheese the milk drawn from soybeans (*fèves de Soja*)? “Thus speak those who are always trembling for our old and glorious Roquefort cheese. They would like to limit clearly the territory and the rights of soja, and have Parliament decide that one can never make from it a cheese resembling ours, and above all that such a soy cheese can never be imported into the commune of Roquefort. But is that possible? No. What is possible is to let it be known, by the local tribunals (courts of law), what has already been pronounced 100 times, that Roquefort cheese is made from the milk of sheep, and that a cheese made from vegetable milk cannot be sold under the name of ‘Roquefort cheese.’”

“After all this time, we don’t really see that soya cheese could jeopardize our Roquefort. And if ever there are measures to take against soya, ordinary local tribunals will doubtless suffice, without national legislators getting involved.” Address: France.

42. Beltzer, Francis J.-G. 1911. Le lait végétal, la caséine végétale et les produits industriels retirés des graines de “soja” [Vegetable milk, vegetable casein, and industrial products extracted from soybeans]. *Revue de Chimie Industrielle et le Moniteur Scientifique*, Quesneville 22(259):209-15. July; 22(260):241-51. Aug. (Chem. Abst. 5:3597). Also published in Paris by Librairie Bernard Tignol (1911). *Bibliothèque des Actualités Industrielles*, No. 144. [13 ref. Fre]

• **Summary:** Contents: Introduction: Chemical composition of the soybean and of soy oil. Fermented soyfoods and koji: Li Yu-ying and his soyfoods plant established near Paris (at Vallées, near Colombes), the products it makes (tofu or soy casein {*Caséo-Sojaïne*}, soy flour, bread, sauce, confections, milk, fermented milk, tofu, etc.), soyfoods made in French Indochina. Soymilk (*lait végétal*). Tofu (*fromage végétal* or *to-fou*): fresh tofu, fermented tofu (*La variété fermentée*, which is gray or yellow and has a piquant taste resembling that of Roquefort cheese), white and salted tofu (which resembles a goat’s cheese), smoked tofu (which resembles a gruyère cheese)...

Industrial production of vegetable casein from soybeans (cleaning the seeds, extraction of the oil), cost of a plant to

make vegetable casein, industrial applications of vegetable casein: in paints, glues, paper coatings, plastics resembling Galalith, conclusion.

An illustration (schematic drawing; p. 248) shows two views (a cross-sectional side view and an overhead floor plan) of a factory for producing vegetable casein, with a capacity to process 10 tons of soybeans per day.

Note: This is the earliest document seen (Sept. 2001) concerning the use of soy protein in glues or adhesives. Address: Ingénieur-chimiste, Expert, Professeur de Chimie Industrielle, France.

43. *Scientific American Supplement*. 1911. Extended utilization of soya bean products: Milk, cheese, and a variety of other products from a vegetable seed. 72(1859):115. Aug. 19. Summary of Beltzer 1911, in *Revue Scientifique*. [Eng]

• **Summary:** “A Chinese factory has been established [by Li Yu-ying] not far from Paris for the purpose of manufacturing alimentary products from Soya, and it has already put on the market Soya flour, Soya bread, Soya sauce, Soya Milk, Soya cheese, preserves, fermented milk, etc.”

The well-known chemical engineer, F.J.G. Beltzer, “who has made a careful study of the whole subject, publishes in the *Revue Scientifique* a report of whose most important features we present an abstract.”

“For purely industrial applications it is necessary, as we have said, that the vegetable casein be entirely free from fatty matters.

“In the industrial treatment of Soya, therefore, the process is somewhat different. The 3 objects sought are: the pure oil, the casein entirely free from oil, and the residuary cake.

“The oil is extracted by pressing, and 2 grades are obtained. The first or purest is sold for edible purposes, while the second is useful for soap-making and other manufactures where oils and fats are employed...

“The pure casein is prepared from the pulp which remains after the extraction of the oil. The milky liquid obtained by triturating the pulp with cold water, is filtered and treated with powdered gypsum. About 1 kilo of gypsum per 1,000 liters of the liquid is used. The mixture is brought to a boil and the resulting coagulate is drained and washed in cloth filters. The casein thus obtained is dissolved in a quantity of very dilute soda solution, so weak that the reaction is either neutral or very slightly alkaline. The solution is filtered and then precipitated by acetic acid. The finely divided precipitate obtained is filtered out, washed on the filter and finally dried at a low temperature.

“The casein thus obtained is white, and, from an industrial point of view, very pure. It is insoluble in water, but soluble in dilute caustic alkalies and in ammonia. It exhibits almost precisely the same properties as the casein

obtained from ordinary milk. It is found on experiment to be susceptible of the same industrial applications as animal casein, and may come to largely supersede this because of lower cost.

“Among the various uses to which it may be applied we may mention its employment in painting, and for the preparation of products having a resistance to moisture.

“It may be used also for the sizing of paper, which consumes such large quantities of ordinary casein. Being soluble in ammonia and caustic solutions it is capable of forming a smooth and solid size.

“Other uses are in certain manufacturing processes in the preparation of silks and artificial textiles, as well as of rubber, leathers, plastic materials, films, photographic emulsions, etc. Large amounts of animal casein are at present employed in the manufacture of ‘Galalith,’ from which are made numerous objects which imitate articles made from ivory, tortoise-shell, bone, horn, etc. The Soya casein, when free from fats, is equally well adapted for these purposes...

“It will be seen from the foregoing résumé, that the fabrication of vegetable casein for industrial purposes has immense possibilities, only exceeded in importance by the alimentary value of its food products for man and for beast.

“The residuary cake left after the extraction of both oil and casein still retains sufficient nutritive qualities to be useful as an addition to the feed of animals.”

Note 1. This is the earliest English-language document seen (March 2007) that uses the term “soya cheese” to refer to either (or both) regular tofu or fermented tofu. By 1905 Li presented a paper (in French) describing how he had tofu to make “Fermented cheese (*Le fromage fermenté*). Its color is white, yellow, or gray, and its flavor is very strong, like that of Roquefort.” In Dec. 1910 he applied for British Patent 30,275, titled “Vegetable milk and its derivatives.” It was accepted / issued on 29 Feb. 1912. It stated: “For obtaining fermented cheese such as roquefort [Roquefort], parmesan [Parmesan], romatour, camambert [Camembert], and gruyere, suitable ferments are employed.”

This is also the earliest English-language document seen (March 2007) concerning the etymology of soy cheese.

Note 2. This is the earliest document seen (Oct. 2008) that uses the term “Soya casein” to refer to an isolated soy protein product; it is used for industrial purposes.

Note 3. This is the earliest English-language document seen (Dec. 2004) that uses the term “silks” (or “silk”) to refer to spun soy protein fiber used like a textile fiber.

44. Product Name: [Soya Flour (Low Fat)].

Foreign Name: Farine de Soja.

Manufacturer’s Name: Usine de la Caseo-Sojaïne.

Manufacturer’s Address: Vallées, Colombes (near Asnieres, Seine), northwest of Paris, France.

Date of Introduction: 1911. August.

New Product–Documentation: Li, Yu-ying. 1910. “Soja flour and its derivatives.” *British Patent* No. 30,350. 30,350. 2 p. Date of application, 31 Dec. 1910. Accepted 1 Jan. 1912. “This invention has for its object the manufacture of soja (Chinese pea) flour for use in the preparation of a special kind of bread, alimentary pastes, rusks, cakes, soups, etc.” Flour is prepared from soy beans containing little fat, or from which most of the oil has been removed, by pressing the whole beans, the cakes produced being ground.

Beltzer, Francis J.-G. 1911. “*Études sur la caséine végétale du “soja” et ses applications* [Studies on the vegetable casein of soybeans and its applications]. *Revue Scientifique* 49(23):716-20. June 10. See p. 720. Conclusion: “A Chinese factory has already been established on the outskirts of Paris (at Vallées near Colombes) to make food products based on soya (*produits alimentaires à base de Soja*).” This factory now produces various food products, including soy flour (*Farine de Soja*).

Scientific American Supplement. 1911. “Extended utilization of soya bean products: Milk, cheese, and a variety of other products from a vegetable seed.” Aug. 19. p. 115. “A Chinese factory has been established [by Li Yu-ying] not far from Paris for the purpose of manufacturing alimentary products from Soya, and it has already put on the market... Soya flour,...”

Fuerstenberg, Maurice. 1917. *Die Soja, eine Kulturpflanze der Zukunft und ihre Verwertungsmöglichkeiten* [The soybean, a cultivated plant of the future, and possibilities for its utilization]. Berlin: Paul Parey. 40 p. See p. 5-6. The first manufacture of soyfoods in Europe took place in France, at Vallées near Asnieres, where they made flour, bread, cakes, cheese [tofu], and soymilk (*Mehl, Brot, Kuchen und Käse, vegetabilischer Milch*)—though only in small quantities and, above all, for diabetics.

45. Product Name: [Pressed Tofu Sheets (Salted, or Unsalted)].

Foreign Name: Caséo-Sojaïne (Durs); En feuilles minces (Salés, Non salés); En morceaux demi-secs salés.

Manufacturer’s Name: Usine de la Caseo-Sojaïne.

Manufacturer’s Address: Vallées, Colombes (near Asnieres, Seine), northwest of Paris, France.

Date of Introduction: 1911. August.

New Product–Documentation: Li, Yu-ying; Grandvoinnet, L. 1912. Le soja [The soybean]. *Agriculture Pratique des Pays Chauds* (Bulletin du Jardin Colonial) 12(106):28-38. Jan. In Li’s factory tofu can be made into either non-fermented or fermented cheeses. The non-fermented cheeses {*Fromages non fermentés*} are of two types: Fresh and hard/firm. The fresh are white in color and the consistency of hard-boiled eggs. The hard / firm are of two types: In diced sheets {salted or unsalted}, and in salted, semi-dry pieces / morsels.

Li and Grandvoinnet. 1912. Le soja. p. 101.

46. Product Name: [Smoked Tofu].

Foreign Name: Fromage de soja fumé.

Manufacturer’s Name: Usine de la Caseo-Sojaïne.

Manufacturer’s Address: Vallées, Colombes (near Asnieres, Seine), northwest of Paris, France.

Date of Introduction: 1911. August.

New Product–Documentation: Li, Yu-ying; Grandvoinnet, L. 1912. Le soja [The soybean]. *Agriculture Pratique des Pays Chauds* (Bulletin du Jardin Colonial) 12(106):28-38. Jan. See p. 35, 37 (*Fromage fumé*). The smoked tofu is very firm and has a long shelf life, especially when it is sold wrapped in tin foil.

Note: This is the earliest known commercial smoked tofu made or sold in Europe or in the Western world.

47. Li, Yu-ying. 1911. Procédés et dispositifs pour la transformation intégrale du soja [Processes and apparatus for the complete transformation of soybeans]. *French Patent* 433,986. Application filed 6 Sept. 1911. Granted 20 Jan. 1912. [Fre]

• **Summary:** The beans, freed from stones and decorticated, are passed into a pipe from which they are withdrawn, through a number of branch-pipes, to be converted into flour (by dry grinding and bolting) suitable for bread-making, etc. They are also converted into oil and press-cake, or into “milk” (by wet grinding and pressing) and press-cake [okara], or into sauce, or after roasting into “coffee” or “chocolate.” The “milk” may be concentrated or reduced to powder, or converted into “cheese,” or into sauce, or it may be used for the preparation of casein (*sojalithe*, for various industrial uses). The cake obtained on expressing the “milk” may also be used for the preparation of casein, and the cake obtained on expressing the oil from the bean serves for the preparation of “milk” or meal.

Soybeans can be used in seven different food industries: (1) Milling. (2) Dairy and cheese. (3) Baking, pastry, and pâtes. (4) Confectionery. (5) Chocolate. (6) Charcuterie—Pork butcher deli business. (7) Preserves and canned foods.

They can also be used for industrial (non-food) uses in: (1) The casein industry (*Caséinerie*, incl. sojalithe for various industrial uses). (2) The oil industry (*Huilerie*, incl. soap, paint, candles {*bougies*}, and artificial rubber).

Note: This is the earliest document seen (Dec. 2005) that mentions the use of soy oil to make candles (one of two documents). However no description or details are given as to how the candles are actually made. Were they made from hydrogenated soybean oil? Address: Resident in France (Seine).

48. H.L. 1911. Le Haricot soja ou Fève de Mandchourie: Cultures exotiques [The soybean or Manchurian bean:

Exotic crops]. *A Travers le Monde* 17(36):288. Sept. 9. Bound in the back of *Le Tour du Monde*. [Fre]

• **Summary:** Contents: Introduction. Its utilization by the Japanese: Fertilizer, oil, and oil cakes. Its utilization by the Annamites [Vietnamese]: Milk and cheese. How will soybeans be used: The first exports to Europe. Some figures on the present trade in soybeans. The Germans are becoming masters of the European soybean market. Soya in France: It is utilized by foreigners.

Concerning the Germans: "Until the spring of 1909, the Japanese were the masters of the soybean market. Some German companies have in turn entered into competition in places of production, and there followed a rather significant rise [in production]. There resulted as a counter-measure some soybean cultural trials in terrains that seemed favorable to them in China. The result of these trials is not yet known.

"Be that as it may, the Germans hasten to assume first rank among the importers of soybeans in Europe.

"In effect, it follows from a report published by *The Chemical Trade Journal* (10 June 1911) that the port of Stettin recently received from Vladivostok a shipment of 4,823 tonnes (metric tons) of soybeans; the manufacturers of Stettin have established a society with capitalization of 1,875,000 francs for the utilization of this product.

"Its importation into Germany duty-free will favor its use for several reasons: first, soybean oil, a substitute for linseed oil, can be sold at a price that is one-third lower; secondly, it can be used in soap-making; thirdly, the cakes remaining after the extraction of oil can be used to feed livestock in the same way as cottonseed cakes. Finally, after the appropriate extraction of oil, the pulp, reduced to a flour and mixed with cereal flour, yields an edible bread or biscuit.

"The nascent industry in Germany of cottonseed oil, flour, and oil cakes, whose primary material is cottonseed imported from America, will have before long to struggle against the formidable competition of soybean products."

Concerning soya in France. "Soya (*soja*) is hardly known in France except by a few products that are found in certain food stores and that are bought sometimes, but without realizing their origin. (Footnote: Notably many flour products whose fortifying qualities are incontestable.)

"For, there would be every advantage to introduce this industry into our country where the mechanical and chemical resources would permit an improvement of yields. The example, moreover, is already given, not by French industries, but by the Chinese, who have established a factory at Vallées, Colombes, near Paris, where a Chinese workforce, exclusively employed, make all types of soy-based food products.

"Our industries would draw great profit from entering this path and not allowing themselves to be surpassed by German chemistry any longer."

49. Li, Yu-ying; Grandvoinnet, L. 1911. Le soja [The soybean]. *Agriculture Pratique des Pays Chauds (Bulletin du Jardin Colonial)* 11(102):177-96. Sept. See also: 11(103):270-94. Oct.; 11(104):360-75. Nov.; 11(105):459-74. Dec.; 12(106):28-38. Jan.; 12(107):120-32. Feb.; 12(108):213-23. March; 12(109):302-08. April. 28 cm. [33 ref. Fre]

• **Summary:** This series of articles, published in book form in 1912, is one of the earliest, most important, influential, creative, interesting, and carefully researched documents ever written about soybeans and soyfoods. Contents: Introduction. Origin and history of the soybean. Soybean culture. 1. Species and varieties of soybeans (botanical characteristics, species {vernacular names in Asia}, varieties {from China, Japan, India, Indochina, Hawaii, United States, and Europe}). 2. Needs of the soybean: Climatic (temperature, humidity), geographical area and varieties grown (in Asia [Manchuria, Japan, Formosa, Korea, Indochina], America, Guyane ("En Guyane, le soja mûrit" [ripens or matures]. Note: This probably refers to French Guiana [*Guyane française*], where Sagot and Raoul reported in 1893 that soybeans had been grown successfully), Europe [France, Italy, Russia], Southeast Asia (*Océanie* / Oceania) [Philippines, Java, Borneo], and Africa [Algeria, Tunisia, South Africa]), agrological needs of the soybean (physical, chemical).

"Oceania.—The soybean has been cultivated for a very long time in the Philippines, Java, and Borneo" (p. 194).

Illustrations (line drawings) show: Soybean plant with roots (p. 182). Soybean pods and beans (p. 183). A table (p. 191) and a graph (p. 192) show trade of soybeans, soybean cake, and the total of the two from five Manchurian ports (Newchwang, Antung, Ta-tung-ho, Dairen, and Suifenho [Suifenhe]) from 1905 to 1909; all have increased dramatically. Also contains 12 other tables from other sources. Note that this influential series of articles, like its predecessor by Itie in the same journal, were in large part prompted by the huge rise in imports of soybeans to Europe, starting in 1908. The contents of these articles is almost identical to that of the book by the same name, published in 1912, which see. Address: 1. Conseiller de 1ere classe au Ministère de l'Agriculture de la Chine; 2. Ingénieur agricole (G.).

50. Li, Yu-ying; Grandvoinnet, L. 1911. Le soja [The soybean]. *Agriculture Pratique des Pays Chauds (Bulletin du Jardin Colonial)* 11(103):270-94. Oct. [43 ref. Fre]

• **Summary:** Contents (continued): The needs of the soybean (continued): Fertilizer (influence of fertilizer, organic fertilizer, minerals, nitrate of soda {*nitrate de soude*}, potassium chloride {*chlorure de potassium*}, phosphate fertilizers), preparation of the soil, the place of the soybean in rotations. 3. Sowing soybeans: Study of the

seeds (weight of seeds, germinative faculty, selection of seeds), time of planting, spacing of the plants, depth of sowing, quantity of seeds to use per hectare, method of sowing. 4. The soybean during its vegetative stage: Germination, transplanting, types of maintenance, irrigation, flowering and fructification, enemies of the soybean (*Ennemis du soja*; insects [especially the larva of the spring beetle, *Agriotes segetis*], the caterpillar of *la Vanessa Cardue (Belle dame)*, rabbits or hares, field mice and hamsters).

5. Soybean harvest: Time of harvest (for forage, for seed), practical methods of harvest (for forage, for seed), threshing (and storage of the seed), yields (of forage, seed, reports from various countries and U.S. states, harvesting losses, yield of nutritive elements). 6. Fixation of atmospheric nitrogen by the soybean and improvement of the soil. 7. The soybean in mixed cultures and intercropping: With corn, cowpeas, rice, sorghum, sugar cane, or millet. Contains various charts and tables from other sources.

Concerning germination: The emergence of soybeans is retarded in soils that are hard, dry, or poorly cultivated. You must then seek to have, in appropriate fashion, a sufficient loosening of the layer that covers the seeds.

Emerging from the soil generally takes place in a week under ordinary circumstances. The plant develops slowly at first then grows quickly.

The growth of the soybean plant is rapid and allows two harvests per year in some climates (such as North Carolina, Tunisia, and certain provinces in China). Address: 1. Conseiller de 1^{ere} classe au Ministère de l'Agriculture de la Chine; 2. Ingénieur agricole (G.).

51. Barrett, O.W. 1911. Rice ally crops. *Philippine Agricultural Review* 4(11):592-98. Nov. See p. 594-96. [1 ref]

• **Summary:** The section titled "Soybeans" (p. 594-96) begins: "Probably every tourist who has visited any of the cities of Japan or China has noticed in the markets these peculiar blocks of a grayish white, jelly-like substance and wondered whether they were really good to eat, but comparatively few have ever tried there the three or four varieties of vegetable 'cheese' prepared from the soybean*."

*Footnote: A 3/4 page footnote, extracted from USDA Farmers' Bulletin No. 58 by Langworthy, discusses five preparations commonly made in Japan from the soybean: natto, tofu or bean cheese (eaten in the fresh state or frozen), miso, yuba, and shoyu.

"Experts in threpsology, the new science of nutrition, seem to be in accord on the fact that in dietary matters two kinds of food are at least four times as good as one... Recently the European food experts have realized the high nutritious value of the soybean and a factory has been

established near Paris [by Li Yu-ying] for the manufacture of various food products from this wonderful seed."

"Now is the time for the Philippine Agriculturist to take up soybean culture in earnest, and to develop it in the same way, even if not to the same degree, as our neighbors across the way have been doing for centuries. The fact that there are practically no seeds of this valuable crop at the present in the Philippines is a sad commentary on the progressiveness of the Philippine farmer; but it is never too late to learn" (p. 596). Address: Chief of the Div. of Experiment Stations, Philippines.

52. Li, Yu-ying; Grandvoinnet, L. 1911. Le soja [The soybean]. *Agriculture Pratique des Pays Chauds (Bulletin du Jardin Colonial)* 11(104):360-75. Nov. [20 ref. Fre]

• **Summary:** Contents (continued): 1. Composition of the soybean plant: Phosphoric acid, sulfuric acid, lime, magnesium, potassium. 2. Study of the seeds: morphology/structure/anatomy, chemical composition (nitrogen, *caséine du soja* {*Légumine*}, albumin du soja {soy protein}, sugars {*Matières sucrées*}, starch, dextrine, diastase, lipids, ash).

1. The soybean in feeding animals: As green forage or hay. Tables (p. 361-75, from other sources) show composition of the soybean plant and of individual parts of the soybean plant.

Note: This is the earliest French-language document seen (Nov. 2003) that uses the term *albumin du soja* or *caséine de soja* to refer to "soy protein." Address: 1. Conseiller de 1^{ere} classe au Ministère de l'Agriculture de la Chine; 2. Ingénieur agricole (G.).

53. Li, Yu-ying; Grandvoinnet, L. 1911. Le soja [The soybean]. *Agriculture Pratique des Pays Chauds (Bulletin du Jardin Colonial)* 11(105):459-74. Dec. [18 ref. Fre]

• **Summary:** Contents (continued): 2. The soybean in human nutrition. The soybean in general nutrition: From the viewpoints of physiology, economy, and gastronomy. The role of soybeans in special diets/regimens: Vegetarianism and vitalism, remineralization, anti-diabetic, others, lactose-free.

Foods made from soybeans (*Produits alimentaires à base de soja*): 1. Soymilk and its derivatives: Soymilk (developed by the Chinese philosopher Whai Nain Tze {Liu An of Huai Nan} well before the Christian era, method of production, Chinese method, modern method used at Li's factory *l'Usine de la Caséo-Sojaïne* at Vallées (Seine)), cleaning the seeds, steps in soymilk preparation (grinding and filtration), the nature of soymilk (physical properties). A graphic illustration (p. 465) shows a comparison of nutritional elements between soybeans, tofu, and beef. A chart in outline form (p. 471) titled "Soy based food products" (*Produits alimentaires a base de soja*) shows the numerous and varied food products that can be derived from the soybean: I. Soymilk and its derivatives: Normal

soymilk, concentrated soymilk, powdered soymilk, fermented soymilk (*lait fermenté*), soy cheese (*Caséo-Sojaïne*; *Fromage de soja* [tofu]), soy casein. II. Soy flour and its derivatives: Soy flour, soy bread for diabetics, whole-grain bread (*Pain complet*), cakes, biscuits (*Biscottes*). III. Soy oil and its by-products (cake). IV. The soybean used as a vegetable. V. Condiment products based on fermented soybeans. VI. Confectionery products: Soy confection, soy powder. VII. Soy coffee. Soy-based ferments: Kiu-tsee, lactic ferments based on soymilk. (*Ferments lactiques à base de lait de soja*).

Photos show: Inside view of Li's factory as the equipment is producing soymilk (p. 473). Microscopic view of soymilk, and of soy flour dissolved in water (p. 474). Also contains various tables, charts, and graphs from other sources.

Note: This is the earliest document seen (March 2000) written by Li Yu-ying which contains the term *Caséo-Sojaïne*. On p. 471 he states clearly that he uses it as a synonym for soy cheese (*Fromage de soja*) [tofu], which is made from soy milk—perhaps to avoid disputes over the word *fromage* with manufacturers of dairy cheese. On p. 472-73 he states that *Usine de la Caséo-Sojaïne* is the name of his modern factory at Vallées (Seine) which makes a variety of soy products. Address: 1. Conseiller de 1ere classe au Ministère de l'Agriculture de la Chine; 2. Ingénieur agricole (G.).

54. Product Name: [Soya Bread (for Diabetics)].

Foreign Name: Pain de Soja (pour Diabétiques).

Manufacturer's Name: Usine de la Caseo-Sojaïne.

Manufacturer's Address: Vallées, Colombes (near Asnieres, Seine), northwest of Paris, France.

Date of Introduction: 1911. December.

New Product–Documentation: Li, Yu-ying. 1910.

“*Farine de soja et ses dérivés* [Soy flour and its derivatives]”. *French Patent* 424,124. 2 p. Application filed 27 Dec. 1910. Granted 5 May 1911. “The [low-fat] flour thus obtained (mixed with other flour if desired) is used in the preparation of articles of food, such as... bread, biscuits, etc., bread made from soya flour being recommended in cases of diabetes.”

Li, Yu-ying; Grandvoinnet, L. 1911. “*Le soja* [The soybean]”. *Agriculture Pratique des Pays Chauds* (Bulletin du Jardin Colonial) 11(105):459-74. Dec. See p. 471. A chart (p. 471) titled “Soy based food products” (*Produits alimentaires à base de soja*) includes: II. Soy flour and its derivatives: Soy flour, soy bread for diabetics, whole-grain bread (*Pain complet*), cakes, biscuits (*Biscottes*). Soy biscuits are mentioned again in the Feb. 1912 issue of this article (p. 124).

Fuerstenberg, Maurice. 1917. *Die Soja, eine Kulturpflanze der Zukunft und ihre Verwertungsmoeglichkeiten* [The soybean, a cultivated plant

of the future, and possibilities for its utilization]. Berlin: Paul Parey. 40 p. See p. 5-6. The first manufacture of soyfoods in Europe took place in France, at Vallées near Asnieres, where they made flour, bread, cakes, cheese [tofu], and soymilk (*Mehl, Brot, Kuchen und Käse, vegetabilischer Milch*)—though only in small quantities and, above all, for diabetics.

55. Li, Yu-ying; Grandvoinnet, L. 1912. *Le soja* [The soybean]. *Agriculture Pratique des Pays Chauds* (Bulletin du Jardin Colonial) 12(106):28-38. Jan. [16 ref. Fre]

• **Summary:** Contents (continued): Soymilk (continued): Chemical properties, composition (comparison with 8 animal milks—in bar chart form showing protein, lipids, carbohydrates, and ash), action of ferments [enzymes] and diastases [diastatic enzymes] on soymilk (*Action des ferments et des diastases sur le lait de soja*) (1. The lactic ferments {kefir, yogurt, etc.} act in the same way on vegetable milk and on animal milks. 2. The ferments of certain European cheeses make analogous vegetable cheeses {*fromage végétal d'une façon analogue*}. 3. Rennet coagulates soymilk, but the optimum temperature is a little higher than for cow's milk. 4. The ferments that we have extracted from shoyu [Japanese soy sauce] coagulate animal milks in the same way as vegetable milk).

Uses of soymilk (p. 30): They are the same as those of the animal milks. We will note, mostly, its use in China as a substitute for mother's milk. (Footnote 1. One of our parents was nourished, from the first phase of life, with soymilk. He/she is now 37 years old and has always been in excellent health).

Residues of the [soy] dairy (*residus de laiterie*; okara).

Condensed soymilk (*lait de soja concentré*). Powdered soymilk (*lait de soja en poudre*). Fermented soymilk (Kefir, yogurt, etc. are increasingly used therapeutically. One can compensate for the lack of carbohydrates in vegetable milk by the addition of lactose {or levulose for diabetics}). Tofu—which Li calls *Caséo-Sojaïne* (*fromage de soja*)—meaning “tofu or soy cheese”: Method of production, coagulants used, perfected modern production methods at Li's factory (In this factory, tofu can be made into either non-fermented or fermented cheeses. The non-fermented cheeses {*Fromages non fermentés*} are of two types: Fresh and hard/firm. The fresh are white in color and the consistency of hard-boiled eggs. The hard/firm are of two types: In diced sheets {salted or unsalted}, and in salted, semi-dry pieces/morsels. The fermented cheeses {*Fromages fermentés*} may be of the Gruyere, Roquefort, or Camembert types), tofu yields, preservation and storage, composition of tofu (compared with 4 meats on a moisture-free basic, in bar chart form showing protein, lipids, carbohydrates, and ash), digestibility of tofu, culinary preparations based on tofu (tofu omelette with egg, smoked tofu with shoyu, tofu pâté, soy sausage—made like regular sausage except that meat and

fat are replaced by fresh, hard tofu plus butter or cocoa butter). Soy casein (*Caséine de soja*; for food or industrial uses). Contains various tables and charts from other sources.

Residues of the [soy] dairy (*residus de laiterie*; okara, p. 30-31): After filtering the [soy] milk, a slightly firm, aqueous oilcake remains in the filter cloth that is still very rich in nutrients (*substances alimentaires*). According to Dr. Bloch, it does not contain any trace of starch (our tests agree with this conclusion). Consisting of torn cells emptied of the largest part of their content, it would have the following percentage composition (see Bloch 1907):

Protein 0.248, water 88.75, ash 0.36, fat .04, other 10.85.

"The oilcake (*tortéau*) obtained at the factory of 'Soy-Casein' (*Caséo-Sojaïne*) and analyzed at the municipal laboratory of Paris yielded:

Water 80.04, protein 33, fat 8.44, carbohydrates 22.63, mineral salts 4.24.

"This oilcake was very easily dried to 10% water. The milk can only be filtered after boiling, thus according to Prinsen [Geerligs]:

Proteins 29.38, oil 12.81, ash 4.66, carbohydrates that are convertible to sugar 26.80, fiber 11.10, cellulose 10.2.

"The oilcake can be diluted in water. The liquid thus obtained is used in grinding to make the second extraction of [soy] milk."

Soy casein (p. 38): The casein or legumine of soymilk can be prepared by precipitation, purifying it by several dissolutions and precipitations, and finally drying it. One obtains a yellowish powder resembling animal casein obtained by the same processes.

It is generally admitted that vegetable albumins have a coefficient of assimilation greatly inferior to those of animal albumins. But confirmation of this is far from being definitive. The experiments of Messrs. H. [Henri] Labbé and Marchoisne have showed, in effect, that vegetable albumin is as well assimilated as animal albumin.

Legumine is different from animal casein, but the differences are of the same order as those which exist between the various animal caseins. The differences existing between the caseins of the various animal milks have been noted by many chemists.

The casein extracted from soymilk can be used in the same applications as casein from cow's milk. These are of two types: food and industrial. For food uses, one can point out the manufacture of powders, of lacteal flours (*farines lactées*, perhaps wheat flour enriched with soy casein), of whole-grain bread, etc.

Note 1. This is the earliest document seen (April 2001), worldwide, that mentions a Western-style soy cheese (Gruyere, Roquefort, or Camembert types), or a tofu sausage. This is also the earliest French-language document seen that mentions soy cheese, which it calls *fromage de soja*.

Note 2.

Note: This is the earliest document seen (Jan. 2003) concerning the use of tofu in a second generation product.

Note 3. This is the earliest document seen, worldwide, that mentions powdered soymilk or dried soymilk.

Note 4. This is the earliest document seen, worldwide, that mentions soy kefir. Address: 1. Conseiller de 1ere classe au Ministère de l'Agriculture de la Chine; 2. Ingénieur agricole (G.).

56. Li, Yu-ying; Grandvoinnet, L. 1912. Le soja [The soybean]. *Agriculture Pratique des Pays Chauds (Bulletin du Jardin Colonial)* 12(107):120-32. Feb. [12 ref. Fre]

• **Summary:** Contents (continued): 2. Soy flour and its derivatives: Soy flour (preparation, chemical composition), soy bread (*pain de soja*), wholemeal bread (*pain complet*), other products based on soy flour (as biscuits and cakes for diabetic diets). 3. Soy oil and by-products of the oil mill: Soy oil (physical and chemical properties, usage, price), residue of the oil mill: the cake (price, uses). 4. Use of the soybean as a legume: Whole soybeans (composition, digestibility), soy sprouts (*germes de soja*), green vegetable soybeans (*le soja frais*). 5. Fermented soy condiments—Solid condiments from Japan: Tokyo natto (*Le Tokio-Natto*, whole fermented soybeans, without salt) and Ping-Ming natto. (*Le Ping-ming-Natto*; soy nuggets with salt, ginger, orange rind, etc. A similar product is made in China and called *tao-tche*).

Note 1. This is the earliest French-language document seen (Feb. 2004) that uses the term *Tokio-Natto* to refer to natto.

Note 2. Footnote 2 under Soy bread (p. 122) states: "M. Dujardin-Beaumetz, *L'Alimentation et les Régimes*;" Soy bread constitutes a major step forward in the feeding of diabetics; it has a long shelf life and a relatively agreeable flavor.

Note 3. The book referred to here is probably: Dujardin-Beaumetz, Georges Octave. 1889. "L'hygiène alimentaire: Aliments, alimentation, régime alimentaire dans les maladies. Deuxième édition revue, corrigée et augmentée" [Food hygiene: Foods, feeding, special diets for illnesses. 2nd ed., revised, corrected, and expanded]. Paris: Octave Doin. viii + 239 p. Series: Conférences de Thérapeutique de l'Hôpital Cochin, 1885-1886. Illust. Address: 1. Conseiller de 1ere classe au Ministère de l'Agriculture de la Chine; 2. Ingénieur agricole (G.).

57. **Product Name:** [Fermented Tofu Cheese (Gruyere, Roquefort, or Camembert types)].

Foreign Name: Fromages fermentés (Gruyere, Roquefort, or Camembert).

Manufacturer's Name: Usine de la Caseo-Sojaïne.

Manufacturer's Address: Vallées, Colombes (near Asnieres, Seine), northwest of Paris, France.

Date of Introduction: 1912. February.

New Product–Documentation: Li, Yu-ying. 1910. “Vegetable milk and its derivatives.” *British Patent* 30,275. 5 p. Date of application, 30 Dec. 1910. Accepted 29 Feb. 1912. See p. 2. “For obtaining fermented cheese such as roquefort [Roquefort], parmesan [Parmesan], romatour, camambert [Camembert] and gruyere, suitable ferments are employed.”

Li Yu-ying and L. Grandvoinnet. 1912. “Le soja [The soybean].” *Agriculture Pratique des Pays Chauds* 12(106):28-38. Jan. See p. 34. Tofu can be made into either non-fermented or fermented cheeses. The fermented cheeses may be of the Gruyère, Roquefort, or Camembert types.

Li and Grandvoinnet. 1912. Le soja. p. 101.

Li Yu-ying. 1913. U.S. Patent 1,064,841. June 17. Application filed Oct. 10, 1911. “Method of manufacturing products from soja.” “The object of this invention is to provide a simple, efficient and economical method of producing a product from soja beans, and from which product it is possible to obtain by adding certain substances a product resembling human or animal milk, and also to obtain fresh or fermented cheese...” “The coagulated milk is molded and pressed, and cheese of different forms and consistency obtained according to the degree of coagulation or pressure. The cheeses may be eaten fresh or they may be dried. They are salted or not according to the nature of the manufacture... In producing fermented cheese: Roquefort, Permesan, Romatour, Camembert, Gruyère, etc., ferments suitable for the manufacture of those products are employed...”

58. *A Travers le Monde*. 1912. Le lait de soja, sa fabrication et ses propriétés: Cultures exotiques [Soy milk, its production and its properties: Exotic crops]. 18(10):80. March 9. Bound in the back of *Le Tour du Monde*. [Fre] • **Summary:** The periodical *Bulletin de l’Agriculture Pratique des Pays Chauds* contains interesting information about the milk of this vegetable. The process for making soy milk (*lait de soja* or *lait végétale de soja*) is described briefly, both the “very rudimentary” process used in China and the modern process [resembling that used by Li Yu-ying at his factory outside Paris—See the 9 Sept. 1911 issue of this periodical].

“Soy milk has properties resembling those of animal milk. It rises upon boiling... The boiling does not become regular until after the milk has been withdrawn from the first several times; it forms a solid film on the surface. The milk has an odor of malt.” Address: Paris.

59. Li, Yu-ying; Grandvoinnet, L. 1912. Le soja [The soybean]. *Agriculture Pratique des Pays Chauds (Bulletin du Jardin Colonial)* 12(108):213-23. March. [7 ref. Fre] • **Summary:** Contents (continued): Products and condiments based on fermented soybeans. 5. Condiments in paste form (*Condiments pâteux*): Miso (preparation, different varieties

including white miso, Yeddo miso, Sandai [Sendai] miso or red miso, composition of miso {a table based on studies by Kellner and König}), Tao-Tjiung (Tou-chiang, doujiang) or Chinese-style miso (preparation, properties, composition {a table based on analyses by Prinsen-Geerligs}). Sauces: Shoyu (Schoyou, soyou, schoyu, or Phek-sze-You in Chinese; preparation, raw materials used and their proportions, formation of molds and koji, fermentation, perfection of the fermentation process in an aseptic environment using soymilk or soy bouillon inoculated with pure cultures), properties of shoyu, chemical composition of shoyu (tables show: (1) Composition based on analyses by Kellner, Stift, Belohoubeck, Tahara & Kitao. (2) Composition and forms of nitrogen according to Suzuki, Azo [sic, Aso], and Mitarai (3 tables)), aroma of shoyu (2 tables based on analyses by Tahara and Kitao; Belohoubeck found two types of microbes in shoyu; the *Saccharomyces* and the bacteria). *Chiang-yu* (*Tsiang-yeou*; Chinese soy sauce), Ketjap (soy sauce from Java). Address: 1. Conseiller de 1^{ere} classe au Ministère de l’Agriculture de la Chine; 2. Ingénieur agricole (G.).

60. Li, Yu-ying; Grandvoinnet, L. 1912. Le soja [The soybean]. *Agriculture Pratique des Pays Chauds (Bulletin du Jardin Colonial)* 12(109):302-08. April. [2 ref. Fre] • **Summary:** Contents (continued): Products and condiments based on fermented soybeans (continued): Tuong (an Annamese condiment that can replace nuoc mam or fish sauce; preparation with rice or corn/maize as described by Bui), Tao-yu (a condiment widely used in China and Japan, as described by Prinsen Geerligs; preparation, properties, chemical composition).

6. Confectionery products (*Produits de confiserie*): Sweet soya preserves made from whole soybeans (*Confiture de soja*, such as soy-based *crème de marron*, a chestnut cream), soya powder (two types are made at Li’s plant: one by drying soy pâté and one from roasted soybeans), soy chocolate. At Li’s tofu factory (*l’usine de la Caséo Sojaïne*) near Paris, soy chocolate (*Chocolat de soja*) is prepared using roasted soybeans, sugar, and cocoa butter [a pale-yellow, pure edible vegetable fat extracted from the cocoa bean]. From these one is able to obtain almost the same composition, appearance, and flavor as chocolate. But this product has the advantage of containing considerably less toxic theobromine.

7. Soya used as coffee (*Le soja employé comme café*). For a very long time, soybean seeds, dried and roasted, have been used in certain parts of Europe (Switzerland) to replace coffee. By an infusion of these roasted seeds, a liquid is obtained which resembles coffee in color and flavor. Moreover, under a different name [Cole’s Domestic Coffee Berry, 1892], soybeans have been launched in the United States for this usage. This very special use of the soybean will be of interest to those who are forbidden to

drink coffee, for they will now be able to enjoy it in a different way. A table shows the composition of Swiss soya coffee according to Kornauth.

8. Ferments or starter cultures for fermentation: Kiu-tsee (a special ferment from Canton described by M. Daby de Thiersant), lactic ferments (fermented soymilks).

Industrial uses of soybeans: Uses of the oil to make soap, wax candles (*bougie*), paint, or artificial rubber. Uses of the protein (*caséine de soja*) to give products resembling those made from milk proteins: sojalithe or soy stone resembling lactite, insulators for electrical apparatus, soy glues, etc. Illustrations (line drawings, p. 305) show cellular elements of different soya confections. Address: 1. Conseiller de 1ere classe au Ministère de l'Agriculture de la Chine; 2. Ingénieur agricole (G.).

61. **Product Name:** [Roasted Soy Flour].

Manufacturer's Name: Usine de la Caseo-Sojaine.

Manufacturer's Address: Vallées, Colombes (near Asnieres, Seine), northwest of Paris, France.

Date of Introduction: 1912. April.

New Product–Documentation: Li, Yu-ying; Grandvoinnet, L. 1912. “*Le soja* [The soybean]”. *Agriculture Pratique des Pays Chauds* (Bulletin du Jardin Colonial) 12(109):302-08. April. See p. 305. Chapter VI, titled “Confectionery products” (*Produits de confiserie*) states that two types of soya powder are made at Li's plant: one by drying soy pâté and one from roasted soybeans.

62. **Product Name:** [Soy Chocolate].

Foreign Name: Chocolat de Soja.

Manufacturer's Name: Usine de la Caseo-Sojaine.

Manufacturer's Address: Vallées, Colombes (near Asnieres, Seine), northwest of Paris, France.

Date of Introduction: 1912. April.

New Product–Documentation: Li, Yu-ying. 1911. “*Chocolat de soja* [Soy chocolate]”. *French Patent* 428,719. 2 p. Application filed 20 April 1911. Accepted 6 Sept. 1911.

Li, Yu-ying; Grandvoinnet, L. 1912. “*Le soja* [The soybean]”. *Agriculture Pratique des Pays Chauds* (Bulletin du Jardin Colonial) 12(109):302-08. April. See p. 306. Chapter VI, titled “Confectionery products” (*Produits de confiserie*) states that at Li's factory a soy chocolate is made from [roasted] soybeans, sugar, and cocoa butter. “One is able to obtain the same composition, the same appearance, and the same taste as chocolate. But this product has the advantage of containing appreciably less toxic theobromine.”

Note: This is the earliest commercial soy product seen that is an alternative to chocolate or cocoa.

63. **Product Name:** [Soy Coffee].

Foreign Name: Le Soja comme Cafe.

Manufacturer's Name: Usine de la Caseo-Sojaine.

Manufacturer's Address: Vallées, Colombes (near Asnieres, Seine), northwest of Paris, France.

Date of Introduction: 1912. April.

New Product–Documentation: Li, Yu-ying. 1911. Procédés et dispositifs pour la transformation intégrale du soja [Processes and apparatus for the complete transformation of soybeans]. French Patent 433,986. Application filed 6 Sept. 1911. Granted 20 Jan. 1912. The [soy] beans, freed from stones and decorticated,... can be converted... after roasting into “coffee” or “chocolate.”

Li, Yu-ying; Grandvoinnet, L. 1911. Le soja [The soybean]. *Agriculture Pratique des Pays Chauds* (Bulletin du Jardin Colonial) 11(105):459-74. Dec. A chart in outline form (p. 471) titled “Soy based food products” (*Produits alimentaires a base de soja*) shows the numerous and varied food products that can be derived from the soybean.

In this same series of articles in this periodical, 12(109):302-08. April (1912). See p. 306. VII. Soya used as coffee (*Le soja employé comme café*). For a very long time, soybean seeds, dried and roasted, have been used in certain parts of Europe (Switzerland) to replace coffee. By an infusion of these roasted seeds, a liquid is obtained which resembles coffee in color and flavor. Moreover, under a different name [Cole's Domestic Coffee Berry, 1892], soybeans have been launched in the United States for this usage. This very special use of the soybean will be of interest to those who are forbidden to drink coffee, for they will now be able to enjoy it in a different way. A table shows the composition of Swiss soya coffee according to Kornauth.

64. *Washington Post*. 1912. A new kind of cow. June 30. p. M1.

• **Summary:** From The Vegetarian: “Notwithstanding vegetarians are being scoffed at and dubbed ‘cranks,’ more and more are coming into the field, and the cause is advancing at a rapid rate.

“This is not so much due to the effort of vegetarians as it is the result of sociological conditions.” The human population is increasing so “that the raising of cattle for culinary purposes [meat or dairy products] is each year becoming more of a problem. Each year science gives us some new food element to replace the barbarian piece of roast flesh.

“The latest announcement reveals that milk, butter and cheese can be made out of beans. This milk-producing bean is a special variety, however—the Soja bean, a native of China. A Chinese chemist [Li Yu-ying] has a factory in France working out the problem of milk from beans. He has succeeded in making from this Soja bean milk, a fine quality of butter [made of whole soybeans that have been cooked, pureed, and seasoned], and a highly delectable cheese [tofu].”

65. Li, Yu-ying; Grandvoinnet, L. 1912. *Le soja: Sa culture. Ses usages alimentaires, thérapeutiques, agricoles et industriels* [The soybean: Its culture. Its food, therapeutic, agricultural, and industrial uses]. Paris: Augustin Challamel (Rue Jacob 17). 150 p. Illust. Index. 25 cm. Translated into French and expanded from the Chinese edition, published by la Société Biologique d'Extrême-Orient (1910). [151 ref. Fre]

• **Summary:** One of the earliest, most important, influential, creative, interesting, and carefully researched books ever written about soybeans and soyfoods. Its bibliography on soy was larger than any published prior to that time. It was first published as a series of eight articles in *Agriculture Pratique des Pays Chauds (Bulletin du Jardin Colonial)* from September 1911 to April 1912. Before being published as a book, it was revised slightly by adding a table of contents at the back, dividing the material into 5 parts with 19 chapters, and adding several photos (p. 16-17), a world map showing the distribution of soybean cultivation (p. 21), and an interesting 2-page table (p. 66-67).

Contents: The soybean: Origin and history. Part I: Soybean culture. 1. Species and varieties of soybeans: Botanical characteristics, species, varieties (Chinese, Japanese, Indian, Indochinese, Hawaiian, USA, European). 2. Needs of the soybean: Climatic, geographical area of the soybean by region worldwide, agrological/soil needs, fertilizers, soil preparation, the place of the soybean in crop rotations. 3. Soybean seeds: Study of seeds (by weight, by germination rate, selection of seeds), time of planting, plant spacing, depth of seeding, rate of seeding per hectare, method of seeding (broadcasting, in rows, in mounds). 4. The soybean during its vegetative stage: Germination, transplanting, types of care (e.g., second dressings), irrigation, flowering and fruiting, enemies of the soybean (e.g., insects). 5. Harvest of soybeans: Time for harvest (forage or grain), methods of harvesting (forage or grain; mechanical mower), threshing (use of machine), yields of soybeans (forage and grain in various countries, ratio of seeds harvested to straw is about 1 to 2, yield of nutrients). 6. Fixation of atmospheric nitrogen by soybeans, and improvement of the soil. 7. The soybean in mixed cultures and alternate rows: With corn, cowpeas, rice, sweet sorghum, or millet.

Part II: Chemical composition of the soybean. 1. Composition of the plant: Minerals in the leaves and total plant. 2. Study of the seed: Composition, chemical composition, microscopic comparisons, table of analyses by 28 previous researchers, albumins, sugars, starch, dextrin or dextrine, diastase, lipids, ash/minerals.

Part III: The soybean as human food and animal feed. 1. The soybean as feed for animals: Green forage and hay. 2. The soybean in human feeding: From the viewpoints of physiology, economy, and gastronomy. The role of soya in

special diets: Vegetarianism, remineralization, diabetic, and lactose intolerant.

Part IV: Food products based on soya. 1. Soymilk and its derivatives: Soymilk (Methods of manufacture, Chinese and modern at l'Usine de la Caséo-Sojaïne, nature and properties [physical and chemical] and composition of the milk, action of ferments and diastases (enzymes) on the milk, uses of the milk, the residue from the soy dairy [okara], condensed soymilk, powdered soymilk, fermented soymilk (kefir, yogurt, etc.)), tofu (called Caséo-Sojaïne, or fromage de soya; methods of production, coagulants, yield of tofu, storing tofu, composition and comparison with various meats, digestibility, culinary preparations made from tofu (smoked tofu, tofu pâté, tofu sausages)), Soy casein (food and industrial uses). 2. Soy flour and its derivatives: Soy flour, soy bread, wholemeal bread, other products based on soy flour (as biscuits and cakes for diabetic diets). 3. Soy oil and its by-products: Soy oil, physical and chemical properties, usage, residue of the oil mill: the cake, price, uses. 4. Use of the soybean as a legume: Whole soybeans (composition and digestibility), soy sprouts (*germes de soja*), green vegetable soybeans (*le soja frais*). 5. Fermented soy condiments: Solid condiments from Japan: Tokyo natto (*Le Tokio-Natto*) and Ping-Ming natto or tao-tche (*Le Ping-ming-Natto*; soy nuggets with salt, ginger, orange rind, etc. A similar product is made in China and called tao-tche). Paste condiments: Miso (four types and composition), tao-tjung (Chinese miso). Sauces: Shoyu (its production, varieties, properties, composition), chiang-yu (*tsiang-yeou*), ketjap [kechap, from Java], tuong (from Annam, with rice or corn), tao-yu (widely used in China and Japan, described by Prinsen Geerligts). 6. Confectionery products: Comparison with chestnuts, roasted soy flour to replace chocolate. 7. Soy coffee (with analysis by Kornauth). 8. Special fermented products: Kiu-tsee (a special commercial ferment from Canton described by Thiersant), fermented soymilks.

Part V: Industrial uses of soybeans. Oil based: soap, wax candles (*bougie*), and paint oils. Protein based: sojalithe or soy stone which corresponds to lactite, insulators for electrical apparatus, glue, etc. Conclusion. Addendum (*Complément*) to Part III, Chapter 1: Soybean straw and stems. Composition of various seeds, including soybeans. Soy flour. The cakes from oil mills. Soymilk and the cake from soy dairies (*tourteau de laiterie*, okara).

A very interesting table (p. 66-67, which does not appear in the original 8 articles) shows earlier nutritional analyses of the composition of soybeans by Steuf (from Hungary, Mongolia and China), Schroeder, Caplan, Pellet (from China, Hungary, Etampes), Muntz, Nikitin (black soybeans from Russia, 2 samples), Lipski [Lipskii] (yellow, from Russia), Giljaranski (yellow from Russia, China and Japan; black from China and Japan; green), König (*Hispida platycarpa* black, Tumida yellow, brown and black), Prinsen



HARICOT

Coupe transversale faite au-dessus du hile.

Le contenu partiel des matières albuminoïdes dans les cellules est coloré par le réactif de Millon.



SOJA

Coupe transversale faite au-dessus du hile.

L'abondance des matières albuminoïdes contenues dans les cellules est montré par la coloration intense du réactif de Millon.



HARICOT

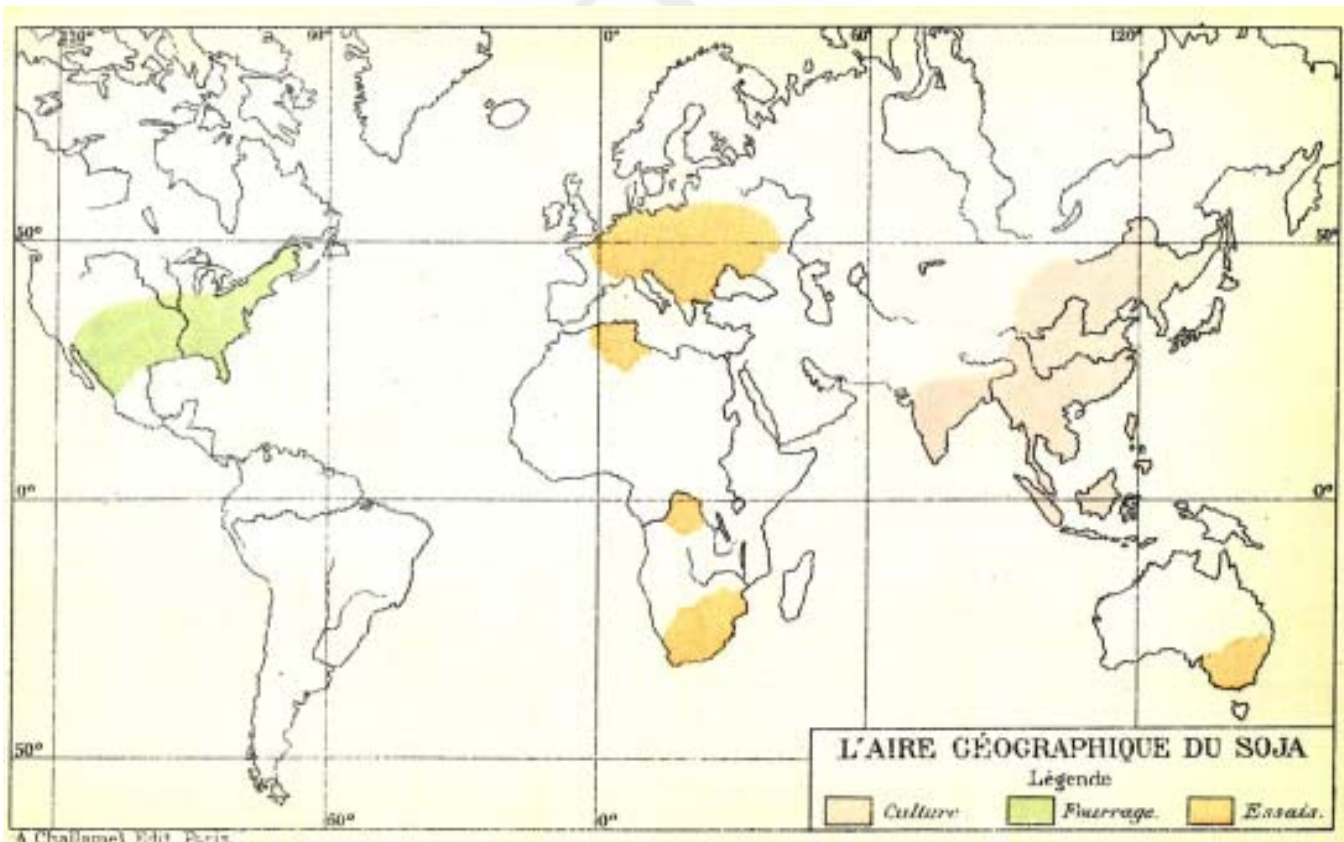
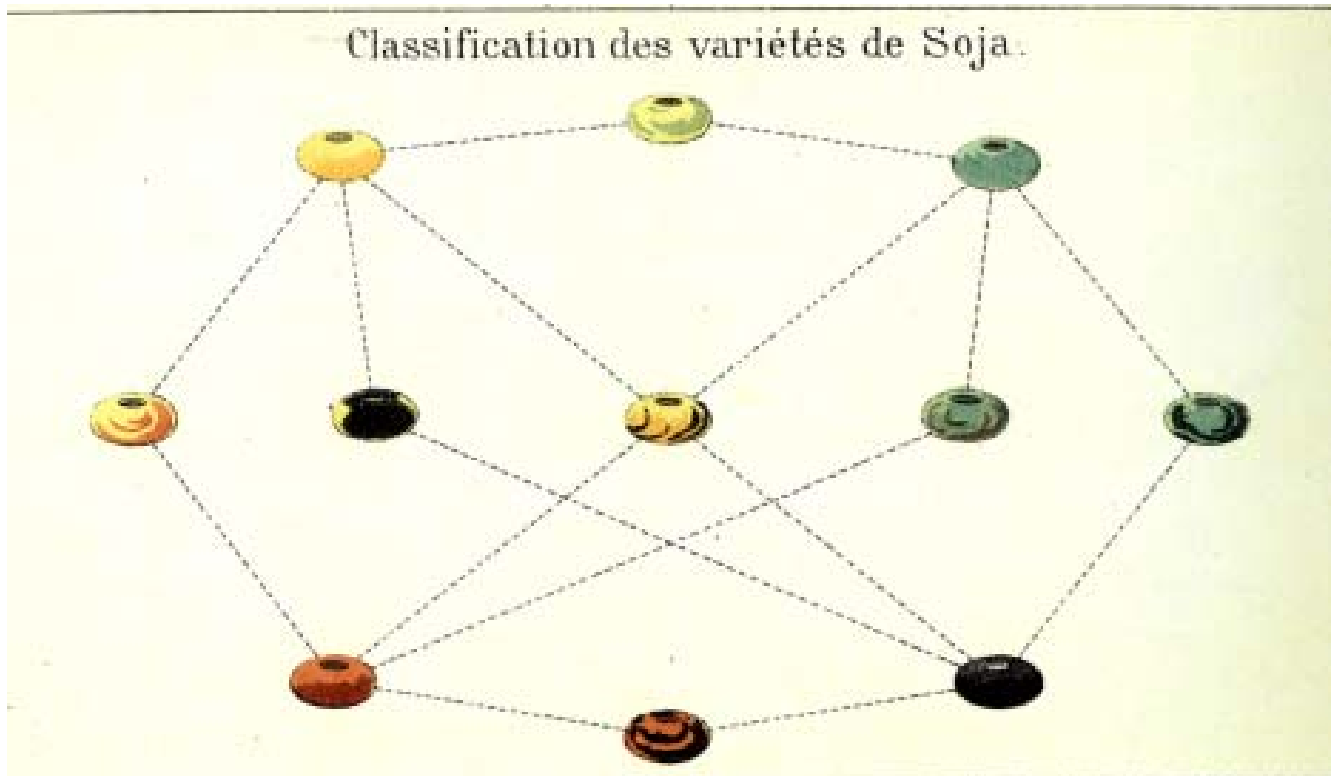
Coupe transversale faite au-dessus du hile.

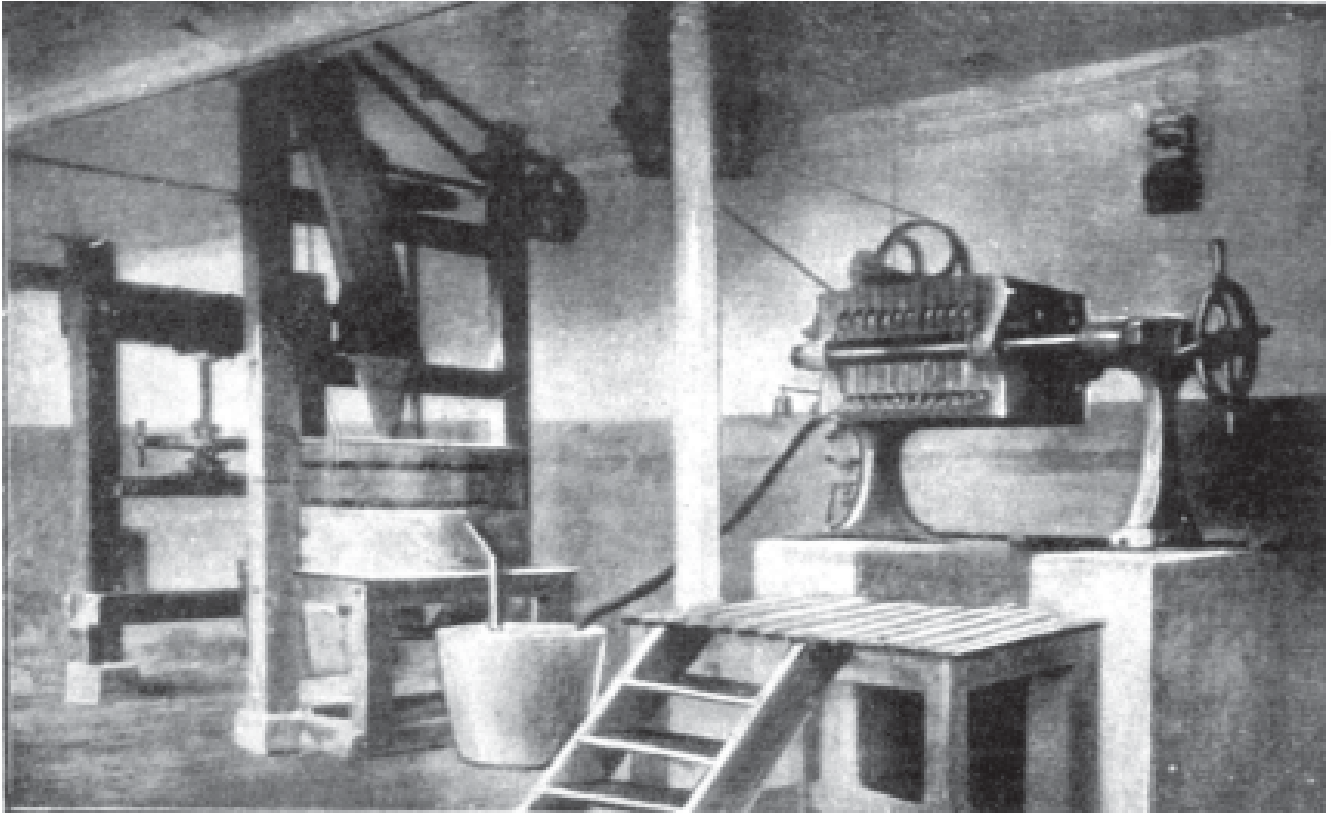


SOJA

Coupe transversale faite au-dessus du hile.







SOYINFO

(white from Java and China), Goessmann, Kellner, USDA, Chemiker Zeitung (white from Java and China, 29 Jan. 1896), Scuff (misomame; miso soybeans), Zulkovski (yellow from China, reddish brown from Mongolia), Institut Agr. de Vienne (Austria; yellow from Vienna, reddish brown from Tirol), Ecole Imp. et Roy d'Ag. Hong (yellow from Mongolia and China, reddish brown from China), Chez M. Olivier Lecq (from Moravia), Lechartier (Etampes and black), Joulie (yellow), Stingl and Morawski, Bloch (yellow, green, and black), Balland, Cavendish Evelyn Liardet (yellow, brown, green, black, and white), Jardin Colonial (Laos, Tonkin, China), Aufray (Tonkin, Yun-nan), Homes Laboratory (black from China, or white). Photos and illustrations are the same as those referenced in individual sections of the book, except for the following: A field of soybeans (p. 16). A soybean plant growing in Europe (p. 17). Color illustrations appear facing pages 12, 22, and 64. Address: Li is from Societe Biologique d'Extreme-Orient (Chine). Grandvoinnet is from Ingenieur Agricole (G.).

66. Beltzer, Francis J.-G. 1912. Industries du lactose et de la caséine végétale du soja [Industries producing lactose and soy vegetable casein]. Paris: Librairie Bernard Tignol. 144 p. Undated. (Bibliothèque des Actualités Industrielles, No. 144). [17 ref. Fre]

• **Summary:** Contents: Preface. Part 1: The lactose industry (p. 9-95; 4 chapters). Part II: Vegetable milk, vegetable casein, and products from soybean seeds. Introduction. 1. Vegetable milk (*Le lait végétal*; soymilk), microscopic examination of vegetable milk. 2. Vegetable cheese (*Le fromage végétal*; tofu). 3. Industrial uses of vegetable casein, proximate analysis of soybean seeds, quantity and dosage determination, the price of soybeans, price of recovery of vegetable casein, industrial production of vegetable casein, cleaning the soybeans, extraction of soy oil, extraction of soy casein. 4. Plan and installation of a factory for processing (10 tons/day of) whole soybeans [to make industrial vegetable casein], estimate and specifications for special materials, general materials, the buildings, price of recovery of vegetable casein, industrial uses of vegetable casein. Illustrations (line drawings) show: (1) Microscopic view of soymilk globules. (2) Microscopic view of soya bean tegument (exterior). (3) Schematic drawings (cross section and overview) of a factory for making vegetable casein.

The Preface notes that in Indo-China, vegetable milk and vegetable cheese made from the soybean form the base of the people's nutrition. Cow's milk is largely unknown, and the people raise and nourish their children largely with soymilk. Tofu serves equally for the current nourishment of the poor (p. 6).

The Introduction (p. 101-07) notes that soy protein is a globulin, called *glycinine* or vegetable casein (*caséine végétale*). Osborne & Clapp submitted this substance to acid

hydrolysis and found its composition, which is very rich in glutamic acid (p. 102). Soy flour (*farine de Soja*) contains little starch but a large amount of nitrogenous materials, similar to gluten; it is widely used in making bread for diabetics. It can also be used as the basis of foods that are rich in protein and very nutritious, as for colonial or European troops (p. 103).

Soy sauce (*Soja fermenté*) is made in Japan from a mixture of soy and wheat (*koji*). The number of brewers (*brasseurs*) of soy sauce exceeds 12,000 in the entire Japanese Empire, furnishing more than 2,500,000 hectoliters of this condiment (p. 103).

A Chinese factory has been founded on the outskirts of Paris (at Vallées, near Colombes) for the production soy-based food products (*produits alimentaires à base de soja*). This factory currently makes *Caséo-sojaïne* [tofu] and the following food products: Soy flour (*Farine de soja*), soy bread (*Pain de soja*), soy sauce (*Sauce de soja*), soymilk (*Lait de soja*), fermented soymilk (*Lait de soja fermenté*), soy cheese [tofu] (*Fromage de soja*), soy confections (*Confitures de soja*), etc. The Journal, in its issue of 9 Jan. 1911, under the title “*Une usine chinoise fonctionnant dans la banlieue parisienne* [A Chinese factory is operating on the outskirts of Paris]” gives some details (p. 106).

In our colonies in Indo-China, the indigenous people have long prepared soymilk, tofu, and several other foods. Soymilk is used like regular milk for feeding babies. Soy cheese, when cooked, is analogous to gruyere cheese; fresh soy cheese resembles our goat cheese. Many Europeans are now preoccupied with making the best of the abundant nutritive principles found in the soybean. One can eat green vegetable soybeans (*Les fruits verts*) like green peas (*pois verts*). In Annam and Japan a sauce is also made from soybeans; its use has spread from East Asia just like that of tofu (*fromage végétal*) (p. 107).

The introduction into Europe and France of soyfoods (*aliments retirés du Soja*), especially soymilk and tofu, will enable us to combat periods of scarcity of animal milk and periods when the prices of certain foods are high. Will the substitution of vegetable casein for milk casein enable us to likewise conserve milk for food use instead of delivering it to industry? (p. 107).

Chapter one, “Soymilk” (p. 108-13), discusses the work of the Japanese chemist T. Katayama (1906) with soymilk and notes that it can be homogenized and condensed. Illustrations show a microscopic view of the globules of soymilk and of okara. The absence of starch in soybeans is a very positive characteristic.

Chapter two, “Tofu” (p. 114-18), notes that in Cochinchina, calcium sulfate is called *Tchack-kao*, and there are three main varieties of tofu: (1) The fermented variety, which is gray or yellow in color, has a piquant taste and resembles Roquefort cheese. (2) The white salted variety resembles goat's cheese. (3) The baked (*cuite*) or smoked

variety resembles gruyere cheese and keeps as well as the salted variety.

Chapter three, “Industrial uses of vegetable casein” (p. 119-32), observes that the oil in soybeans must first be removed by pressing or extraction. A table (p. 120) gives the chemical composition of soybeans from Laos and Cochin China, Tonkin, and China and Manchuria. They contain 17.64 to 18.28% oil. In Indochina a food which Beltzer calls *La caséine végétale en lames* (“vegetable casein in sheets” = yuba) has a rather high oil content—about 25-28%. There follows a section (p. 126-32) which contains details on industrial production of soy casein. Chapter four, “Design and installation of a factory for processing soybeans into industrial vegetable casein,” describes each piece of equipment and its cost, itemizes the costs of general and special materials plus, buildings and working capital. Also includes a detailed schematic diagram (p. 136-37) with three production lines, and both top and side views. Finally, it lists expenses, income, and profit (p. 139). The last section, applications of industrial vegetable casein, includes paints, paper coatings, silk and artificial textiles, Galalith, and waterproofing of textiles and straw hats. The book contains no bibliography, few footnotes, and no mention of the work of Li Yu-ying—from whom the author appears to have borrowed much.

Note: Although this book is undated, all major sources (except a Seattle Public Library bibliography) give its date as 1912. Address: Ingenieur-Chemiste-Expert, Professeur de Chimie Industrielle.

67. Neumann, Hermann. 1912. Die Sojabohne, ihre Bedeutung fuer den gesunden und kranken Menschen und ihre Verwertungsform [The soybean, its significance for people in good and poor health, and the forms in which it is used]. *Zeitschrift fuer Physikalische und Diaetetische Therapie (Leipzig)* 16:129-51. [26 ref. Ger]

• **Summary:** “In my own medical practice, since 1908, I have served soybeans in various forms (as soup, vegetables, or bread) to many dozens of people, of all ages and degrees of ill health. In almost every case they have praised them and been helped by them.” The author reported splendid results in treating diabetics with soybean bread and a patented preparation named “Soyap.” Tables show the composition of various beans, including the soybean.

A Chinese establishment, Caséo-Sojaïne [founded by Li Yu-ying] near Paris, has undertaken to make soyfoods suited to French tastes (p. 149). Address: M.D., Potsdam.

68. Two photographs of Li Yu-ying. 1912? Undated.

• **Summary:** The first is an undated portrait photo of Li.

The second is a photo with Li and his students at the base of the Roman aqueduct, probably in Paris, France.



Both photos are owned by the Bibliotheque Municipale de Lyons, France. They are in the collection of L'Institute Franco-Chinoise de Lyon (1921-1946).

69. Bertrand, Gabriel; Rosenblatt, Mr.; Rosenblatt, Mme. 1913. Recherches sur l'hydrolyse comparée du saccharose par divers acides en présence de la sucrase de kôji [Research on the comparative hydrolysis of saccharose by various acids in the presence of the sucrase of koji]. *Annales de l'Institut Pasteur* 27(5):366-72. May. [10 ref. Fre]

• **Summary:** Discusses *Aspergillus niger* and *A. oryzae*. Conclusion: It is the great difference in the concentration of hydrogen ions (pH) that determines the maximum activity of the three kinds of sucraes.

A portrait photo shows Gabriel Bertrand.

Note: In 1906-1910 Li Yu-ying left Montargis for Paris where he enrolled in courses in chemistry and biology at the Sorbonne and worked as an intern in the laboratory of Gabriel Bertrand at the Pasteur Institute.



70. Houyet, A. 1913. La fève de soja [The soybean]. *Bulletin de la Societe Belge d'Etudes Coloniales* 20(5):367-90. May. [Fre]

• **Summary:** “The notes which follow have as their object the study of a commercial plant of East Asia which produces soybeans; it is interesting from the local point of view as a food plant and more specifically from the world viewpoint as an industrial plant.

“It appears useful to us to precede them with a geographic survey of the place of production of the plant, as well as some data on the population living there. After having studied the plant itself and the conditions of its agriculture, we will examine its uses, its commerce, and the possibilities for its development.”

This is largely a discussion of soybean production and trade in Manchuria. But pages 378-80 contain a brief discussion of the many ways of using soybeans including in soy sauce, margarine, soap, as meal for livestock feed, as flour for fortifying biscuits, as soymilk, and (in Germany) as artificial rubber. “A Chinese manufacturer [Li Yu-ying] has established a factory near Paris that makes food products from the soybean” (*produits alimentaires à base de fève de soja*).

Concerning margarine: “Refined [soybean] oil can be used for the manufacture of margarine and as a salad oil” (*L’huile raffinée peut être employée à la fabrication de la margarine et comme huile de salade*). Note: This is the earliest French-language document seen that uses the term *margarine* to refer to margarine.

71. Li, Yu-ying. 1913. Method of manufacturing products from soja. *U.S. Patent* 1,064,841. June 17. 3 p. Application filed 10 Oct. 1911.

• **Summary:** Li describes himself as “a subject of the Emperor of China, residing at Vallées, in France.” “The object of this invention is to provide a simple, efficient and economical method of producing a product from soja beans, and from which product it is possible to obtain by adding certain substances a product resembling human or animal milk, and also to obtain fresh or fermented cheese, milk in the form of powder and concentrated milk, fermented milk, sauces, preserves, etc. The manufacture of this milk comprises a series of operations viz., the cleaning and decorticating of the beans, which are effected in the ordinary manner, the grinding of the said grain previously mixed with a certain quantity of water, the passing of the crude product through a filtering press, from which the liquid, which is of a milky color, runs off to cool through a filter and passes thence into a boiler heated with a water bath, where it is pasteurized or sterilized, and from which it is removed, ready to be delivered for consumption as milk, or for use in the manufacture of the products mentioned above.

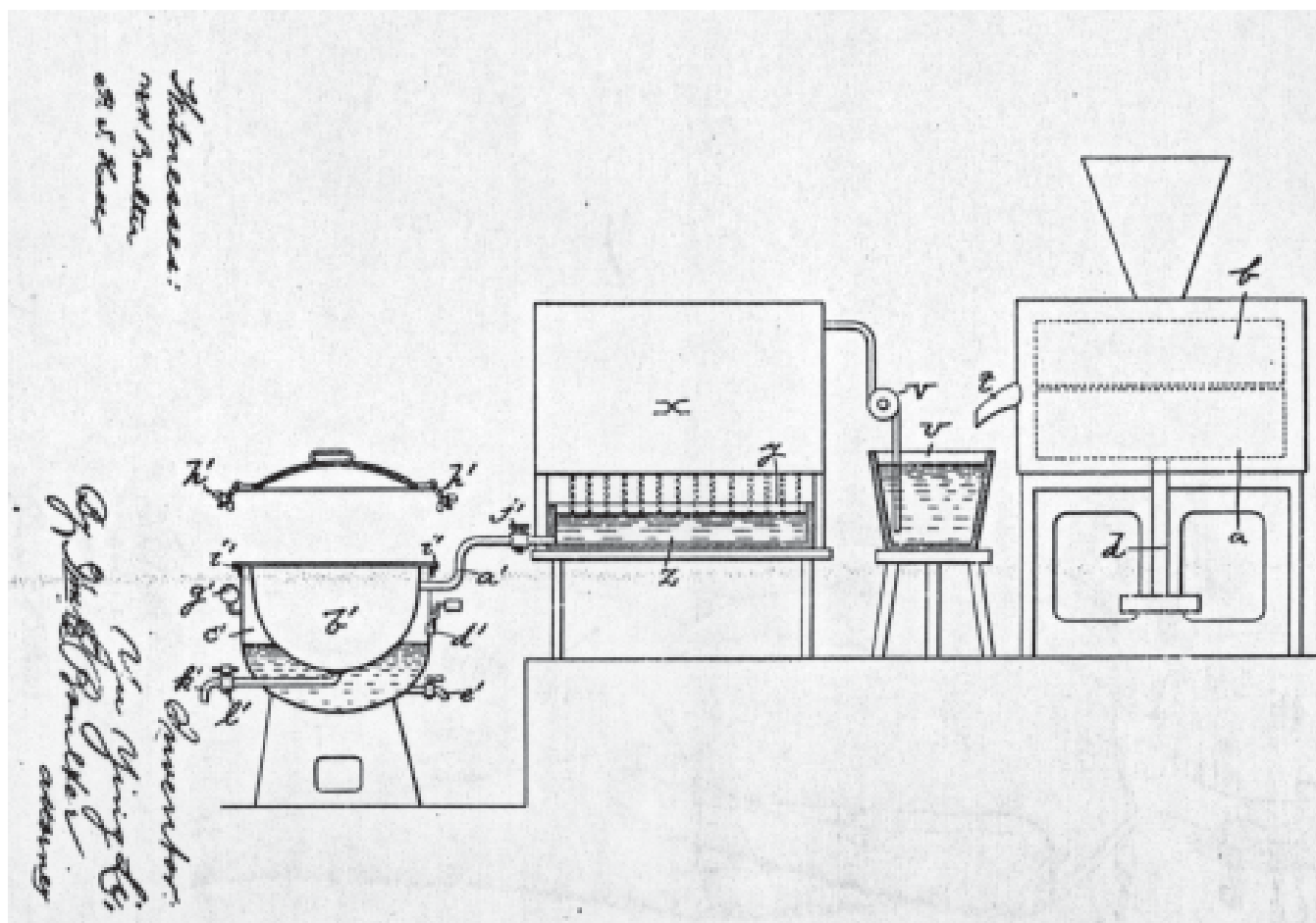
“The apparatus necessary for this manufacture is illustrated in the accompanying drawings by a longitudinal sectional elevation.” Li’s signature, written “Yu Ying Li,” is just below the mechanical drawing. A detailed description of the ingenious equipment and process follows. The ground paste is mixed with water; a pump “forces it under pressure into the filtering press...” The slurry is cooked in a “boiler or digester” which is actually a steam-jacketed kettle; there “it is heated to a variable temperature for the purpose of pasteurization or sterilization.”

Concerning the okara: “When the operation is finished, the grain [okara] is removed from the filter-press and now forms cakes which can be utilized for feeding human beings (they are in that case dried and reduced to powder). They may also be used for feeding cattle, and, even if these cakes are greatly exhausted, they form a very good nitrated manure, after undergoing certain treatment; drying and dressing.”

“The soja milk contains more casein and less lactose and butter than human or animal milk, but by reducing its quantity of casein by adding certain matters a product is obtained resembling human and animal milk. With this milk fresh or fermented cheese can be made as desired.

“In making fresh cheese [tofu], the milk is curdled or coagulated by means of magnesia salts, organic acids and ferments, rennet or lactic ferments.

“The coagulated milk is molded and pressed, and cheese of different forms and consistency obtained according to the degree of coagulation or pressure. The cheeses may be eaten fresh or they may be dried. They are salted or not according to the nature of the manufacture...



"In producing fermented cheese: Roquefort, Permesan, Romatour, Camembert, Gruyère, etc., ferments suitable for the manufacture of those products are employed...

"The fermented milk is obtained by using ferments such as the ferments employed in producing fermented milks—kefir [kefir], yoghurt [yogurt], koumis [koumiss], etc. These are the *Saccharomyces cerevisiae*, *Dispora caucasica*, *Maya bulgare*, etc., and the manufacture is effected by modifying the said milk through the addition of sugar (glucose, levulose, etc.), and more particularly lactose.

"The casein derived from Soja is manufactured either from the milk itself obtained as indicated or with the cakes remaining after the extraction of the oil or fatty matter of the soja beans...

"In order to prepare it the soja milk is coagulated. The coagulation having been effected, the product is dried, asepticated or not, ground or not, and may be employed as an alimentary or as an industrial product. This latter product may be employed for all purposes; paste, bedding paper, manufacture of the objects, etc. the same as animal casein. To the casein thus obtained chemical products such as borax, oxid of zinc [zinc oxide], magnesia, gelatin, etc., may be added in different proportions in order to obtain

solid casein. It is also possible to produce sauce with soja milk the fermentation of which is effected by means of special ferments such as sojaobacille and the acetomyces. This sauce is more or less salted with chlorid of sodium [sodium chloride] and an addition may be made of spices; pepper, clove, nutmeg, piment*, etc. The sauce having been made may be concentrated or dried by heating. Soja preserves may also be obtained with soja milk slightly thickened with sugar. In this case, the soja grains are cooked before being ground and may be mixed with or added to dry fruits, chestnuts, almonds, hazelnuts, cocoa, etc."

Note 1. This is the world's 2nd earliest patent seen (June 2011) concerning a fermented cheese made from soja, and also the earliest U.S. soymilk patent.

Note 2. Webster's *Third New International Dictionary* (1963) defines piment as "wine flavored with spice and honey." It defines pimento as a synonym for allspice. Address: Vallées, France.

72. Grimme, Clemens. 1914. Die Sojabohne und ihre Verarbeitung zu Nahrungs- und Genussmitteln [The soybean and its processing for food and stimulants]. *Konserven-Zeitung* 15(1):1-3, 10-11. Jan. 2. [1 ref. Ger]

• **Summary:** The author discusses the many food uses of soybeans and how they are made and use, drawing heavily on *Le Soja* by Li & Grandvoinnet (1912). He notes that there is a steadily rising interest in soyfoods in almost all branches of the German food industry [perhaps in anticipation of World War I].

Foods made from natural [unfermented] soybeans include: Soymilk (*Sojamilch*), tofu (*Sojakäse*), frozen tofu (*Kori-Tofu*), soy flour (*Sojamehl*), soy bread (*Sojabrot*), soya confections (*Sojakonfekt*), soy chocolate (*Sojaschokolade*), soy coffee (*Sojakaffee*), and green vegetable soybeans (*Soja als Gemüse*). Foods and seasonings made from fermented soybeans include: (1) Solid seasonings: Natto, and tao-tche (Chinese natto [sic, soy nuggets]); (2) Seasonings in paste form: Miso (4 types), and Tao-tjiung (Doujiang, Chinese miso); (3) Liquid seasonings: Shoyu (Schoyou), Tsiang-Yeou (Chinese soy sauce), Ketjap (Javanese soy sauce), Tuong (Annamite soy sauce, made with rice or corn), Tao-Yu (soy sauce made with black soybeans in China and Japan).

Note 1. This is the earliest German-language document seen (June 2009) that mentions green vegetable soybeans, which it calls *Soja als Gemüse*.

Note 2. This is the earliest German-language document seen (Oct. 2003) that uses the term *Sojamilch* to refer to soymilk. As of Jan. 2009 *Sojamilch* is the modern German word for soymilk.

Note 3. This is the earliest German-language document seen (Jan. 2009) that uses the word *Sojaschokolade* to refer to soy chocolate. The German word for “chocolate” is *Schokolade*. Address: Dr.

73. *Asie Francaise (L')*. 1914. Le soja: Une légumineuse alimentaire Chinoise [The soybean. A Chinese food legume]. 14(158):196-98. May. [Fre]

• **Summary:** Begins with a good introduction to the soybean (*haricot soja*), including its early history in France and statistics of current trade between Europe and Manchuria. A footnote (p. 196) states that the statistics are from the Chinese maritime customs. The shipments to Europe for first reported in 1908 by the official statistics. The Suez Canal Company (*La Société du canal de Suez*) made it known that for some years when not a single kg of soybeans passed through the canal, but 35,000 passed through it in 1908.

At the Nanking Exposition [Nanjing] of 1910 in China, some 400 varieties of soybeans were on display.

Continues with a long discussion of the work and writings of Li Yu-ying (p. 197-98). “It was soymilk that Li first introduced to French vegetarians (*végétariens français*). In 1908 he established a laboratory in Paris for the study of tofu (*la caséo-sojaïne*). Then he set up a factory at Vallées, on the outskirts of Paris, where he employed about 30 specialist Chinese workers. The machinery was

constructed in France based on designs by Li and his collaborators.

“The creation of this Chinese factory, smack in the middle of France, was not lacking in originality. But it seems that its output could be as wide and varied as its founders had dreamed. In a shop which sells exotic products, we were told that the Parisian clientele scorned (looked down on) the soy preserves / jams (*confitures*), cheeses, condiments, eggs, and other unique soy products, but they remained faithful to flour, rusks / zwieback (*biscottes*, twice baked bread without added sugar), and the housewives appreciate the soy sprouts that are found today in all the markets of Paris and its outskirts.”

74. Fruwirth, C. 1915. Die Sojabohne [Soybeans]. *Fuehlings Landwirtschaftliche Zeitung* 64(3/4):65-96. Feb. 1 and 15. [65 ref. Ger]

• **Summary:** Contents: Introduction (work in East Asia and Europe from 1905-10). History. Botanical aspects. Varieties. Breeding. Needs of the plant (incl. “heat units, *Wärmesumme*). Utilization (incl. in German *Tofu*, *Miso*, *Chiang*, *Schoyu* or *Sojatunke* (shoyu, p. 83), *Natto*, *vegetabilische Milch* (soymilk), soy sprouts). Measures and precautions in cultivating soybeans (incl. yields). The soybean as a crop in central Europe. Conclusion.

Note: On p. 83 the term “Sojas” is used to refer to soybeans, and “Sojatunke” to refer to soy sauce.

In 1905 the Japanese made the first attempt to import soybeans from Manchuria to Europe, but it failed because they did not arrive in good condition. The repetition of the attempt in 1908, however, gave good results. Then imports of soybeans grew, followed by imports of soybean cake (*Sojabohnenkuchen*). Major importers today are England, France, Germany, Denmark, Italy, Belgium, Netherlands, Sweden. The high import duty hinders imports to Austria-Hungary.

Toward the end of the 1800s in Russia, Owinsky took early-ripening soybean varieties from China and Japan and requested the expansion of soybean cultivation. In 1899 in Kiev, Owinsky wrote the name of the soybean as *Soja hispida praecox* (p. 67). Owinsky in Derajne [Derazhne?] grew Podolie soybeans (p. 77). Sempolowsky in Derebin, Russian Poland, also grew soybeans. European Russia gets soybeans overland (probably from Manchuria). Russia was one of the first countries to take an interest in growing soybeans after 1908. Russia now grows large amounts of soybeans in Podolia. In Germany, Prof. Kallo in Wiesbaden was a pioneer who recommended soybeans as an inexpensive food for the people. North America first started to import lots of soybeans as a source of oil because of a bad cottonseed harvest.

“Since the start of my teaching activities, I have had an interest in the soybean plant and have carried on my own investigations.” In 1900 the author received 7 soybean

varieties from L.V. Jurdiewicz from Deraznia in Podolia; these had been imported by Owinsky. In 1901 at Hohenheim he began to study the time needed for soybeans to mature; He found it ranged from 141 to 163 days. He continued this research at Hohenheim from 1901 to 1903, getting soybean seed yields of up to 1,560 kg/ha. From 1910 to 1914 he continued at Waldhof-Amstetten, with 5 varieties. The maturity range there was 112-166 days and the yields were up to 1,500 kg/ha (about 23 bushels/acre), but the yields of many varieties were low, about 300 to 500 kg/ha (4.5 to 7.5 bu/acre). Yields of soybean straw, however, were up to 3,600 kg/ha. Fruwirth uses three terms to refer to soybeans: (1) Die Sojabohne; (2) Die Soja; and (3) Sojas, as "Zuechtung von Sojas" or "Sojas, meist gemahlte." There are now a proposal to establish a joint stock company for growing soybeans in central Europe (probably in Germany), using big money. But it may not succeed because soybean yields in Germany and Austria are low. Seedsmen who sell soybeans commercially in 1915 include: Haage and Schmidt (Erfurt, Germany), Vilmorin Andrieux (Paris, France), Dammann & Co. (St. Giovanni at Tedaccio, near Naples, Italy), and Wood and Son (Richmond, Virginia, USA). The main soybean varieties sold by each of these companies are described in detail (p. 73-74).

Utilization (p. 82): Since soybeans are rich in protein and fat, they can be used as a good meat substitute. In Europe the use of soybeans for food is still very small. "In Europe, the first foods from soybeans were made in France, at Vallées near Asnieres: Flour, bread, and cakes for diabetics, and cheese. In Germany not long ago the Soyama-Works at Frankfurt am Main likewise began the production of such foods. Similar foods were also made in Romania. Soybeans sprouted in the dark yield a bitter-tasting salad. Production of vegetable milk started in France at 'Caséo Sojaïne' at Vallées (Seine); and is now being studied by the Synthetic Milk Syndicate in England. Using the process developed by Fritz Goessel, this Syndicate made 100 liters of soymilk from 10 kg of ground soybeans at a factory at Liverpool." "It is in no way certain that soybeans will ever be widely used in human foods."

A fairly large amount of soybeans are ground for use as fodder. The main use is for oil extraction. Yet Haberlandt considered that since the soybean contained only about 18% fat (range: 13-22%), its use as a source of oil would not be economical. The main use of soy oil is in soaps, for which it is highly prized. It is also used in making paints as a partial substitute for linseed oil. The best quality may be used as food. In England soy oil is used for margarine production.

Conclusion: The soybean originated in central Asia and is now widely cultivated in China, Japan, Manchuria, and India. Its seeds are rich in protein and, unlike most other legumes, also rich in fat. The plant is used in its homeland mostly as a source of human foods and seasonings, made by

fermentation; the oil is used mostly for industrial non-food purposes. In recent years soybean production has expanded significantly in the southern part of the United States. There it is used mainly as green fodder, hay, silage, and soil building. The main expansion of soybean cultivation in Europe has been in Italy, southern France, Hungary, and southern Russia. Good early varieties give yields of 1,100 to 1,300 kg/ha. A large expansion of soybean production in central Europe is possible only in southern Austria and Hungary, and maybe in a few other places where it is warm. But late-maturing soybeans may be grown for forage and silage in the cooler parts of Germany and Austria. Address: Prof., Dr., Wien (Vienna).

75. Schieber, W. 1915. Die Sojabohne und deren volkswirtschaftliche Bedeutung als Nahrungsmittel [The soybean and its economic significance as a food]. *Oesterreichische Chemiker-Zeitung (Vienna)* 18(10):85-86. May 15. Excerpts from a lecture to the Austrian Chemical Society, 24 April 1915. [1 ref. Ger]

• **Summary:** Includes a summary of information from Li Yu-ying (1912) about foods and food adjuncts made from the soybean: Soymilk, tofu (*Sojakäse*), soy flour (*Sojamehl*), soya bread (*Sojabrot*), soya confections (*Sojakonfekt*), soy chocolate (*Sojaschokolade*), soy coffee (*Sojaskaffee*).

Japanese foods from fermented soybeans: Natto (*Feste Würzen*), miso (*Pasten*), soy sauce (*Saucen*). Plus original nutritional analyses. Address: Austria.

76. Robert, J.C. 1915. Preliminary report on the economic value of the soybean. Jackson, MS: Mississippi Agricultural College, Tucker Printing House. 15 p. July 1.

• **Summary:** Contents: Introduction (incl. brief soy bean history). Composition of soybeans. Feeding value. Relation to soil fertility (nitrogen fixation, vegetable matter or humus). Yield of soybeans (shelled seed and hay). Uses of soybeans (milk, paints, etc.). Soybeans a valuable crop for the Southern farmer.

"The refined oil is used as a substitute for olive oil. Soybean milk and soybean cheese [tofu] are extensively used as an article of diet in the Orient. The cheese is made as follows:... magnesium chloride being added to precipitate the solution, which is hung in fine mesh cloth—and cottage cheese is obtained.

"In 1912 there was established [by Li Yu-ying] at Les Vales [sic, Vallées], France, a large factory for the production of a variety of soybean food. Among these varieties were milk, cheese, casein, oils, bread, biscuits, flour, jellies, cakes, and sauces" (p. 12-13).

"Varnishes made from soybean oil are extensively used, though when subjected to exposure they seem not to wear quite as well as those made from linseed oil. For internal painting purposes, however, these varnishes are equal in every respect to those made from linseed oil. Soybean oils

are used extensively in the manufacture of linoleums and table cloths, and for the manufacture of printing ink, and of enamel paints" (p. 14).

"Soybeans a valuable crop for the Southern farmer: As an article of human food, soybeans may become an important factor with us. We have used soybean meal made from our crop of 1913 and 1914 and had for breakfast excellent cakes. These cakes were made from wheat flour and soybean meal, and wheat flour and corn meal. Various proportions were used, sour milk and soda being added. Cakes made from equal parts of wheat flour and soybean meal were very palatable.

"Soybeans seem to be one of the most promising crops before the Southern farmer. Every particle of the plant has economic value, and a great number of commercial products are produced from the seed. It seems that the machinery of our cotton seed oil mills is suited to the manufacture of soybean meal and oil. The soybean straw is a good stock food... Therefore, soybeans offer a golden opportunity to the grain and cotton farmers, the live stock producers and the soil builders" (p. 14).

Photos show: (1) Numerous sacks of soybeans and oil cake in the Orient awaiting shipment (front cover). (2) People cleaning and resacking soybeans for shipment (front cover). (3) Five different varieties of soybeans, including Virginia (p. 2). (4) Soybean root tubercles, natural size (p. 7). (5) Several osier bins used for storing soybeans (p. 13). (6) Southern Manchurian railway cars, with sacks of soybeans (p. 13). (7) Seven varieties of soy pods and beans: Guelph, Ito San, Buckshot, Austin, Hollybrook, Haberlandt, Mammoth (p. 15).

Tables show: (1) Percentage composition of different soybean varieties (most have values for two years, 1913 and 1914): Wilson, Arlington, Jet, Brown, Tokyo, 19981-A, Mammoth, Small Yellow, Amherst, Ito San, Holly Brook [Hollybrook], Peking, Acme, Virginia, Black, Brachet [Barchet], Dwarf Green, Cloud. For each is given moisture, ash, fat, protein, nitrogen free extract, fiber. (2) Plant food elements in farm crops (N, P, and K, including soybeans as grain, hay, or straw). (3) Yield of soybeans (in lb shelled seed and lb of hay per acre): In 1911 in Mississippi: Hollybrook, Black Soybeans, Brown Soybeans, Small Yellow, Mammoth Yellow. The highest yields were from Small Yellow—2,600 lb seed and 5,500 lb hay. In 1912: Brown Soybean, Black Soybean, Hollybrook, Dwarf Green, Small Yellow, Mammoth Yellow, Haberlandt. Again the highest yields were from Small Yellow—2,680 lb seed and 5,200 lb hay. (4) Farm account with the soil in proposed three-year crop rotation (NPK balance incl. soybeans for hay, grain, or straw). (5) Proposed three-year rotation system for long-pine section of Mississippi (1915-1917).

Note 1. This is the earliest document seen (Jan. 2004) that mentions the soybean variety Virginia.

Note 2. This is the earliest published English-language document seen (Sept. 2006) that contains the term "Soybean oil."

Note 3. This is the earliest English-language document seen (Oct. 2003) that contains the term "Soybean milk."

Note 3. This is also the earliest English-language document seen (Feb. 2004) that uses the term "soybean cheese" to refer to tofu. Address: Director of the Station, School of Agriculture, and Prof. of Agronomy, Agricultural College, Mississippi.

77. T.C. 1915. Soya: The golden bean that Germany wants. *Daily Mail (London)*. Dec. 13. p. 4.

• **Summary:** "If Germany is being allowed to import soya beans she is getting food for her men, her cattle, and her guns. No country more than Germany appreciates the value of this wonderful golden bean whose introduction to Europe from China forms the greatest trade romance of the present century. Less than eight years Europe knew practically nothing of the soya bean or its remarkable nutritious qualities and the uses to which it could be put."

Discusses the early history and rise of the soya bean trade in Europe. "The soya bean survived the 'boom.' It justified most of the flattering things said about it. Its fame spread far and wide. Many tons were exported to Hull, where a factory and oil presses were established and a very important export trade to the continent was built up. Our agricultural colleges experimented with the bean products as food for cattle and pigs; Sweden set her experts at work and discovered that bean cake was a highly satisfactory food for milch cows; Denmark followed and built a large factory at Copenhagen to deal with the export from Vladivostok; the South African Government Trades Commissioner, convinced of the great future of the soya bean industry, urged the competition of South African farmers with the bean growers of Manchuria. In Paris a factory was built by a Chinese firm" [Li Yu-ying].

"In 1912 Germany rescinded the import duty and installed soya bean plant [plants?] in her oil mills, importing the beans through Vladivostok, often in British bottoms chartered for the purpose." In 1912 the Trades Commissioner for the Government of South Africa gave a list of 14 different soya bean products, plus an additional 14 products that can be made from soya bean oil, from salad oil and margarine, to dynamite and soap.

Note: This is the earliest document seen (July 2007) in which the soybean is called the "golden bean." This is also the earliest document seen (July 2007) in which a fanciful term or name is used to refer to the soybean. Address: England.

78. Associated Press (AP). 1916. Nutrition—Find soja bean valuable food. Blockade against Germany shows its merits. Chinese have used it extensively for the last 2000 years and

it possesses more universal usefulness than almost any other common article of diet. *Los Angeles Times*. Jan. 13. p. 13.

• **Summary:** London, Dec. 15.—Discussion of the food blockade against Germany has served to bring attention to the merits of the soja bean, to which is given up more than twenty-five per cent. of the cultivated area in Manchuria. Although the soja is well known and highly regarded in Germany and the Scandinavian countries and is now second on the list of China's exports, it has hitherto achieved small general reputation in the English-speaking countries, and even the latest dictionaries dismiss it with the brief description: An Asiatic leguminous herb, *Glycine Soja*, the seeds of which are used to prepare sauce called soy."

The "first important shipment to Europe was made in 1908 by a British firm. The Germans almost immediately began to experiment with it and five years later were using the major part of an importation estimated at over \$200,000,000 a year.

"The secret of the soja bean is its universal usefulness. A British government report gives the following list of soja products: 'Vegetable food (like marrowfat peas); soups; meat substitutes; chocolate substitute; macaroni preparation; flour; artificial milk; cheese [tofu]; coffee substitute; artificial horn; biscuit and food for diabetic patients; sauce; meal for cattle; oils, oil cake for fodder; fertilizer; beancake.'

"The same report points out that the oil from the bean is used in the manufacture of the following articles: 'dynamite and high explosives, soaps, linoleum, rubber substitute, margarine, paints, varnishes, toilet powder waterproof cloth, paper umbrellas and lanterns, salad oil, lubricants, lamp oil, preservative for sardines, substitute for lard.'"

"There are three principal varieties of the bean—yellow or huangtong [huangdou], green or chingtong [qingdou], and black or wutong [wudou]. The yellow contains more nutritive ingredients than the others, and this is the variety almost exclusively used for export. The quantity of oil extracted from the beans runs as high as 10 per cent. of the total weight.

"Sweden uses large quantities of the bean cake as food for milch cows; Denmark has a large pressing factory at Copenhagen; France has a factory built in Paris by a Chinese firm [Li Yu-ying]; and South Africa has recently begun to grow the bean in competition with the Manchurian Farmers. Germany in 1912 rescinded her former import duty and installed reduction plants for the far-eastern vegetable products in all her oil mills, importing the beans directly from Vladivostok by the shipload."

79. Beille, L. 1916. Le Soja [Soya]. *Gazette Hebdomadaire des Sciences Medicales de Bordeaux* 37(9):67-70. May 7; 37(10):73-76. May 21. [4 ref. Fre]

• **Summary:** "The question of the soybean (*haricot Soya* or *Soja*) reappears in our scientific and medical journals from

time to time; the importance that this grain has acquired in the diet of the essentially vegetarian peoples of the Far East, and its richness in oil, albuminous materials, and minerals, have long called it to the attention of hygienists. Some authors have wanted to portray the soybean as an ideal food, a little jewel with a nutritive power comparable to that of eggs and meat; others have extolled the milk-like emulsion, obtained by grinding soybeans with water, as an advantageous substitute for cow's milk. A factory, established on the outskirts of Paris, at Vallées (Seine), was able to supply French consumers with flour, cheeses [tofu], sauces, and many other soy-based preparations used in China and Japan.

"Leaving aside the inevitable exaggerations that accompany a product which is new to us, but which already has an established reputation elsewhere, it is necessary to recognize that the chemical composition of the soybean is of real interest. The Parisian clientele promptly abandoned the sauces, cheeses, and milk made from soya, but they appreciated the sprouts, which are still selling well as vegetables in the markets of Paris and its suburbs; soy-based flour and biscuits are very well adapted for use in diabetic diets."

The author then gives an overview of the soybeans from a medical viewpoint, including a brief history and review of worldwide production and nutritional studies. "In 1779 this plant was introduced to France and cultivated in Paris at the Jardin du Roi. Since that period, despite the laudable efforts of the National Society for Acclimatization, the cultivation of the soybean has not gone beyond botanical gardens and some experimental fields. Nor has it had any more success in England or Italy. However in North America it is cultivated in all the southern parts of the United States, but as a forage plant."

Through the merchant and importer Mr. A. Denis of Bordeaux, the author obtained two varieties of soybeans, one from Manchuria and one from Japan. He conducted a nutritional and microscopic analysis of these.

The author concludes that the soybean has great potential as both a food and an industrial uses, where the precipitated protein for example, can be used in place of milk casein to make Galalith, artificial ivory, glue, and paper coating.

Part II of this article discusses more about the general nutritional value of soybeans. He then discusses soy flour (*farine de soja*; he has a sample produced by the factory at Vallées), soy milk (*lait de soja*), tofu (*fromage de soja*), shoyu and various soy-based sauces (such as *Tao-Tjung* of China, or *Touong* of Indo China).

"In summary the soybean is of great interest from the industrial point of view. The place that it occupies in the oil mills of Europe is already important... Its oil, for food or industrial uses, and its by-product, soy casein, are likely to receive a host of diverse applications. On the other hand,

the future of the soybean as a food substance in Europe would seem to be more modest: its disagreeable taste removes it from daily consumption and enables it to be used only as an ingredient in mixtures.”

“If, in Europe, with a few reservations, we can include soya in the diet of healthy people, then there will be even stronger reasons to give it to sick people. At first glance soya, which is rich in fats and protein, with little or no carbohydrates, appears to be a food of choice for diabetics. And we must recognize that it has attained the greatest success among these sick people. But, here again, it would be appropriate to give soya in the form of rusks/zwieback (*biscottes*), or mixed with vegetables or fruits; if it is not tolerated by sick people in these forms, then we should not hesitate to stop using it.” Note: In Europe, rusks are widely given to sick people, like chicken soup in the USA. Both are considered to be good medicinal foods that are easy to digest. Address: Professeur à la Faculté de médecine et de pharmacie de Bordeaux.

80. Johnson, Nelson Trusler. 1916. Manufacture of bean milk at Changsha. *Commerce Reports [USA] (Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce)* 19(183):468-69. Aug. 5.

• **Summary:** “A firm composed of Chinese from the Province of Chekiang has recently opened a small factory at Changsha for the manufacture of milk from beans. This milk has long been known to the Chinese under the name of *to fu chiang* [soy milk] or bean-curd sauce. This is not to be confused with the product known as *chiang yu*, a fermented sauce made from beans which is well known as the soy of the Japanese and as one of the constituents of the famous sauces of Europe [such as Worcestershire sauce].

“Bean milk is made from small yellow beans, the same variety from which the Chinese bean curd [tofu] and *chiang yu* or soy [sauce] are made. The process appears to be a very simple one. The beans are soaked and then crushed between two stones. The crushed mass is allowed to run off into a tub and is then strained through cheesecloth and diluted with water and boiled. After boiling, it is again strained and the white milk run off into bottles and sold to the factory’s customers.” Note 1. The milk is first filtered when cold, before it is heated or boiled.

“An analysis of the bean-curd milk [soy milk] shows that it has a specific gravity of 1.020 and a fat content of 3.125 [percent], contrasted with a specific gravity of 1.029 and a fat content of 3.9 [percent] for good average cow’s milk in America.

“No complicated machinery: The factory is a very small one. The proprietors informed me that they did all their work at night, in order to have fresh milk for delivery the following morning. They begin their work at about 10 o’clock. The milk is ready and bottled by daylight, when it

is sent out by coolie to the various customers.” Note 2. See photo in Piper & Morse 1923, p. 231.

“The room where the milk is made shows that no complicated machinery is necessary in the manufacture of the milk. At one end of the room are found two of the small stone mills in which the beans were ground. Large numbers of bottles were arranged on a rack near the wall, clean and ready to receive the morning’s supply of milk. At the opposite end of the room there were three wooden [sic, metal] vats built into a concrete foundation, which proved to be a furnace. The prepared product is poured into these vats and boiled, the furnace being supplied with fuel from a hole in the outside wall. On either side were two earthenware jars into which the boiled product is poured and through which it is allowed to run through stop cocks into the bottles.

“The manufacturers of this milk seem to be endeavoring to conduct their factory along hygienic lines. They invited inspection of their factory and expressed a desire to carry out the suggestions made by the inspecting physician. These suggestions related principally to the sterilization of the bottles before allowing the milk to run into them. The whole room was very clean.

“Possible opening for milk bottle manufacturers: The manufacture and sale of this milk appears to be a new enterprise in Changsha, although I am informed by the natives of Shanghai and its neighborhood that it is an old and well-known product in that part of the country. To the eye the product looks exactly like unskimmed cow’s milk. It has an odor of raw beans and is said to be not unpleasant to the taste. I am informed that a member of the family of Li Hung Chang is now engaged in manufacturing the various products of beans in Paris, his factory turning out, among other things, this bean milk.

“The product is very cheap compared with cow’s milk. The factory undertakes to supply one pint each morning for approximately 50 cents gold a month. If this industry proves a success, manufacturers of milk bottles and patent milk-bottle tops should find a market for their wares here at Changsha, if they could be brought in cheaply... The milk bottle manufacturer will, of course, have to compete with the enormous numbers of empty bottles discarded by families who use aerated waters and wines. These bottles are sold by the servants, and are purchased for use in just such factories.”

Note 3. This is the earliest document seen (Dec. 2006) describing the selling of soymilk in bottles in China. Changsha is in southeastern China, far to the southwest of Shanghai. Note 4. Consul Johnson seems to be a careful and well informed observer and reporter. Address: Consulate, Changsha, China.

81. Ou Lu jiaoyu yundong [The movement for education in Europe]. 1916. Tours, France: Zhonghua Yin Zi Ju



廠工腐豆黎巴

[Impremerie chinoise]. 123 p. [Chi]

• **Summary:** This book contains many photographs on unnumbered pages, including a rare photo (between pages 48 and 49) of the outside of the brick tofu factory named *La Caséo-Sojaïne*, established by Li Yuying at Garenne-Colombe near Paris.

Another photo (between pages 70 and 71) shows Chinese students taking evening courses at *La Caséo-Sojaïne*,

Note: This book was written entirely in Chinese; it contains no French text. The title translated into French would be: *Le mouvement d'éducation en Europe*.

This publishing company, which has become famous as the first Chinese publishing company in France, was founded in 1905 (6 years before the Chinese Republic) by Wu Zhihui, Li Shizeng, Zhang Jingjiang, and Chu Minyi. Their earliest publication at the archives at Lyon is the magazine *Shijie*. The publishing company was founded in Paris, but moved to Tours during World War I for security reasons; that is why this book was published in Tours.

82. Balland, M. 1917. Le soja dans l'alimentation française [Soy beans in the French dietary]. *Comptes Rendus des Seances de l'Academie des Sciences (Paris)* 164(7):300-02. Feb. 12. (Chem. Abst. 11:1700). [3 ref. Fre]

• **Summary:** "Descriptions and analyses are given of some soy-bean products used in France. Among those used in the army are canned raw soy beans, canned soy-bean soup, whole beans, soy-bean flour, and war bread and biscuit made with soy-bean and wheat flours." Address: France.

83. Li, Yu-ying. 1917. Procédés et dispositifs pour la transformation intégrale du soya [Processes and technology for the transformation of whole soybeans]. *Chemisch Weekblad* 14(15):348-51. April 14. Included within a longer paper in this journal by de Waal, p. 344-56. [Fre; dut]

• **Summary:** This lecture, delivered in French on 11 Nov. 1911, includes a description of and an interesting, complex diagram showing the basic processes by which the many food and industrial uses of the soybean are created. "In the soybean industry, it is not only the whole seed / bean which constitutes the usable raw material, but also its derivatives such as soy flour, milk, etc., and even the by-products

fabrication of milk are pressed and ground and can be used to make casein.

“Soybeans are pressed to obtain oil which can itself serve as a base to make candles, soaps, paint, artificial rubber, etc. Oilcakes remaining as by-products can be ground to make milk or pulverized to obtain flour.

“Cooked soybeans are also used to make condiments, fermented [soy] sauce, liquid sauce, solid [sauce], [sauce] concentrated into a paste or in dry powder. Cooked soybeans are also used to make pasty preserves (*confitures pâteuses*) or in powder.

“Cooked and grilled soybeans again serve to make [soy] coffee and chocolate.” Address: Seine, France.

84. Waal, A.J.C. de. 1917. Over soja-producten [On soy products]. *Chemisch Weekblad* 14(15):344-56. April 14. (Chem. Abst. 11:2001). [22 ref. Dut]

• **Summary:** Describes the work done by men in different countries on various soybean preparations and includes a paper by Li Yu Ying (cited separately) titled “Procédés et Dispositifs pour la Transformation Intégrale du Soja,” including food and industrial uses of soybeans. A complex, full-page French-language diagram (p. 350) shows the basic processes by which the many food and industrial products that can be derived from the soy bean, and summarizes patents related to many of these. By milling and baking: soya meal (*soja-meel*) and soy bread (*soja brood*). Soya milk (*soja-melk*) and Western-style cheeses. Coffee and chocolate substitutes: Soy coffee (*soja-koffie*) and soy chocolate (*soja-chocolade*). Pork-butcher products, incl. soy sausages (*soja-worst*) in which one can use soy cheese (*soja-kaas*). Soy protein (*soja-eiwit*). Worcestershire sauce (*Worcestershire-saus*). Li is a resident of Seine France. This paper was presented on 11 Nov. 1911, and published on 20 Jan. 1912.

Note 1. This is the earliest Dutch-language document seen (March 2001) that used the term *soja-koffie* to refer to soy coffee.

Note 2. This is the earliest Dutch-language document seen (Oct. 2003) that uses the term *soja-melk* to refer to soymilk. Address: s’ Gravenhage (The Hague), Netherlands.

85. Chan, Shiu Wong. 1917. The Chinese cook book. New York, NY: Frederick A. Stokes Company. 201 p. 20 x 13 cm.

• **Summary:** Subtitle: “Containing more than one hundred recipes for everyday food prepared in the wholesome Chinese way, and many recipes of unique dishes peculiar to the Chinese—including Chinese Pastry, “Stove Pastries,” and Chinese Candies.” Contains 151 recipes.

Page 15: “Chinese white cheese (CC = Chinese characters). Foo yue [fermented tofu]. (a) Cut bean cake [tofu], made of Chinese white beans, into half-inch squares ¼ inch thick. (b) Put into a jar provided with an airtight

cover, the size of the jar depending upon the amount to be made. (c) Fill the jar ¼ full of Fun Wine. (d) Salt to taste. (e) Cover air tight and put away for not less than two weeks.

Page 16: “Chinese red cheese (CC). Noum yue [red fermented tofu]. For this the bean cake is made of Chinese red beans [azuki?]: (a) Wrap up the cakes in a piece of cloth in any desired size. Put pressure on top for 5 days. (b) Take off the weight. Then the cloth. Scrape off the mold on top. (c) Place in a jar. Fill the jar ¼ full with Fun Wine, and add plenty of salt. (d) Cover air tight, and set away for not less than 2 weeks; the longer, the better, provided the jar is kept air-tight.”

Page 147: “Bean cake. Do fu. This is a most delicious dish for its price. Many people in Paris can tell you how delicious it is, for there is a factory in Paris that makes millions of dollars each year by manufacturing this cake. The process of making bean cake is really so complicated that it would require a separate volume to describe it. Put white beans in water for a few hours. Then grind in a water stone grinder. Cook for 5 hours with calcium powder. Let it filter through a cloth and run into a cup or bowl. When cool it becomes solid. Tie this in a piece of cloth and boil. This is called bean cake” [Note: the above process, which does not even call for soybeans, will not make tofu!].

86. Crevost, Charles; Lemarié, Charles. 1917. Catalogue des produits de l’Indochine. 5 vols [Catalog of the products of Indochina. 5 vols.]. Hanoi: Imprimerie d’Extrême-Orient. 29 cm. Formerly published in Bulletin Economique de l’Indochine, Vols. 25 and 26. [Fre]

• **Summary:** Volume 1 (published in 1917; 175 p.), titled *Produits Alimentaires et Plantes Fourragères (Nutritious Products and Forage Plants)*, describes plants grown in Indochina and the nutritive value of each. Pages 106-09 describe “Soja–Glycine Soja,” the soybean. Local names are given in Annam and Tonkin, Cambodia, China, and Japan. “The plant is widely cultivated in Indochina for its seeds, which are consumed in various forms. Soybean seeds in Indochina are typically yellowish white... It is well known that the Japanese use the soybean to prepare a sauce named *shoyu* (*teou yeou* in China), as well as a *fromage de pâte* or vegetable cheese named *fu* [tofu], or *teou fou* in Chinese. The Annamites also prepare an analogous sauce named *tuong* and a *fromage de pâte* named *dau phu* and *dau phu-ao*. Cambodia and the Indochinese province of Châudôc produce significant quantities of soybeans, of which a part is sent down to Saigon to be consumed or exported. There are good varieties on the high plateaus of Tonkin, especially in the province of Lang-son, whence large amounts can be obtained for export.

“The dead leaves are ordinarily burned. However some indigenous people partially burn the stems of the soybean plants, stripped of their leaves, to obtain a very fine charcoal dust or ash, which they mix with the resinous balm



of *Canarium commune*, to use in making joss sticks. These are slender incense sticks burned as offerings in the pagodas and at the altars of their ancestors in their family homes.” [Note: A joss house is a Chinese temple or shrine.] A large, excellent, and very detailed illustration (p. 108) shows a soybean plant, with leaves, pods, seeds, and flowers. Nutritional analyses of soybeans from Laos, Tonkin, and Manchuria are given (from other sources).

Volume 3, titled *Matières Grasses Végétales (Fats and Vegetable Matter)*, includes analyses of Indochinese plants and their fat and oil contents. The contents of Vol. 3. was first published in the *Bulletin Économique de l'Indochine* 1922-1924. Pages 75-78 discuss “Soja—Soja Max (Lin.) Piper,” the soybean. “Mr. Li Yu-ying, a member of the Biological Society of the Far East, has greatly contributed, following several attempts made for more than a century by naturalists and those who acclimatize plants, to popularize in France this plant of many uses. He introduced cultivation of the plant in the area around Paris and, in Paris itself, in 1908 he established a laboratory for the study of the soybean, since completed by a soyfoods factory (*l'usine de la caséo-sojaïne*), where all the products derived from this plant are manufactured: Soymilk (regular, concentrated, powdered, or fermented), tofu (*fromage de soja*), soya patés (*pâtes de soja*), soya casein (*caséine de soja*), soy flour and bread, etc.” The rest of the article is concerned mostly with characteristics, uses, and trade of soybean oil.

Crevoist was born in 1858. Note: The meaning of soya casein is not clear. Address: 1. Inspecteur des Services agricoles et commerciaux; Conservateur du Musée [Maurice Long] agricole et commercial de Hanoi; 2. Ingénieur-Agronome, Directeur des Services agricoles et commerciaux du Tonkin, Lauréat de la Société nationale d'acclimatation.

87. Fuerstenberg, Maurice. 1917. *Die Soja, eine Kulturpflanze der Zukunft und ihre Verwertungsmöglichkeiten* [The soybean, a cultivated plant of the future, and possibilities for its utilization]. Berlin: Paul Parey. 40 p. [59 ref. Ger]

• **Summary:** Dedicated to the Prof. Friedrich Haberlandt, who introduced the soybean to Central Europe. Contents: Foreword. Introduction: The soybean. Ways of using the soybean in its homeland (East Asia, especially Japan and China). Shoyu or soy-sauce. Miso (vegetable cheese). Natto. Tofu of the Japanese or Tao-hu of the Chinese (bean cheese). The soybean as an oilseed. Soybean meal (and flour). Soy as a coffee substitute or extender. Soybean milk. Soy meat substitutes. Soybeans as a chocolate substitute. Soy rubber substitute. The utilization of the soybean in agriculture: As cow fodder. Summary. Bibliography.

Photos show: (1) A field of soybeans (p. 6). (2) A soybean plant with the leaves removed to show the pods (p. 12). (3) Soy beans and pods (p. 13).



Contains numerous tables, mostly from other sources: pages 11, 16-17, 19, 25, 27, 30, 35-37. Contains one of the best early European bibliographies on the soybean.

The author wrote this book during World War I. In his first book, published one year earlier in 1916 and titled “The Introduction of Soya, a Revolution in the Food of the People,” he discussed what he believed to be the great agricultural and nutritional value of the soybean. He uses two terms, *Die Soja* and *Die Sojabohnen* to refer to soybeans.

Chapter 1 (p. 5-7): In 1908 England started to import large quantities of soybeans; in 1909 these increased to 400,000 tonnes and in 1910 to 800,000 tons. Also in Germany, in the years just before World War I, imports of soybeans climbed in an unexpected way, reaching 43,500 tonnes in 1910, 90,600 tonnes in 1911 and 125,200 tonnes

in 1912. Note: These units are given in dz. One dz (*doppelzentner*) = 100 kg.

The first manufacture of soyfoods in Europe took place in France, at Vallées near Asnieres, where they made flour, bread, cakes, cheese [tofu], and soymilk (*Mehl, Brot, Kuchen und Käse, vegetabilischer Milch*)—though only in small quantities and, above all, for diabetics. In England, soy flour has been used for a long time in the preparation of cakes (p. 5-6).

However it was in Germany that the utilization of soybeans for food took place on a large scale; this began shortly before the war. The supply of foods to Germany was almost completely cut off during the war, so general attention soon turned to the new foods prepared from soybeans and people quickly became aware of their great nutritional value. Thus, in the middle of the war, a soybean industry was built in Germany. Unfortunately this youngest twig of the food industry was left crippled due to lack of raw materials. However one can predict that this industry has a bright future because of the great encouragement given to these products in so short a time. For example, in October 1914 the *Agumawerke* (Aguma Works) located in Harburg (near Hamburg) on the Elbe, first began mass production of a soy flour according to its own process. During the next few years it made many thousands of tonnes of this meal, until the production had to be stopped for lack of raw materials (p. 6).

Equally gigantic sales of soy products were made by the *Soyamawerke* (Soyama Works) in Frankfurt am Main; this company made only soy food products. In addition to a meal (flour), it also produced a meat substitute (*Fleischersatz*), and, largely from soybeans, fresh and dried milk (*Frisch- und Trockenmilch*) as well as a fresh and dried cream preparation (*ein Frisch- und Trockenrahm-Präparat*). Likewise, this firm had to cease production of most of its soy products because of difficulties in soybean procurement, and concentrate only on the production of meat substitutes (*Fleischersatz*). These articles likewise entered all classes of the population splendidly as is seen from the large demand for them. Within 3-4 weeks this firm had orders for more than 1½ million pound cans, of which unfortunately it was able to satisfy only a small part. In addition to these two well-known firms, there are in Germany still a number others that are occupied with the production of foods from the soybean.

In Austria [the Austro-Hungarian empire], there exists a unique firm, the food factory Santosa in Prague [in the Czech Republic as of Sept. 2002], which is still processing soybeans. They introduced soy coffee into commerce. I understand that in Austria a large-scale soy processing venture is now being planned.

Certainly the soy processing industry finds itself in a beginning state and, like all young industries, in need of improvement. Remember the sugar-beet industry was also

once young but it made improvements and went on to great success, as will be expected of this new twig on the food industry. In any case, the beginning of utilization of the soybean as food for the people has been made, and in the foreseeable future the soybean may, as in China and Japan, become an indispensable part of our people's food.

It is different with the introduction of the soybean as a cultivated plant in Central Europe. Forty years ago Friedrich Haberlandt showed (and after him countless others have shown) that the soybean grows well in Central Europe. Although additional new tests verify this, there are still those who object to soybean culture. One objection is the long time required by the soybean to come to maturity; the answer is the development of new varieties. Another is the relatively low yield compared with other beans; the answer lies in the use of inoculation. The author then discusses nutrient yield per acre and per unit of money, showing both to be high for soybeans.

Pages 10-11: It is well known that legumes possess the ability to transform and fix free nitrogen from the air. In 1886 Prof. Hellriegel discovered that this capability is due to certain bacteria that live in the soil and move through the root hairs into the root, where they cause nodule formation. The nitrogen-fixing bacteria living in the nodules nourish the plant. The author then talks about inoculation using either soil from a previous planting or "Nitragin," a pure culture of root bacteria, which is well known and has recently been improved. Dr. Kuehn of Berlin-Grünwald showed that soil inoculated with Nitragin gave a 3- to 4-fold increase in yield, plus an increase in protein in the roots and leaves. He then discusses improved cultural practices. Winkler says that transplanting improves yields. Continued. Address: Frohnleiten, Steiermark [Austria].

88. Fuerstenberg, Maurice. 1917. *Die Soja, eine Kulturpflanze der Zukunft und ihre Verwertungsmöglichkeiten* [The soybean, a cultivated plant of the future, and possibilities for its utilization. Part II (Document part)]. Berlin: Paul Parey. 40 p. 28 cm. [59 ref. Ger]

• **Summary:** Continued on p. 14. Ways of using the soybean in its homeland (East Asia, especially Japan and China): Note: In this section, starting on p. 15, the author repeatedly uses the word *Sojaspeisen* meaning "soyfoods." The soybean probably originated in India. The Chinese and Japanese used it to fortify their rice-based, protein-poor diet. The practice came before the theory. The author says (incorrectly, p. 15) that all the basic soyfoods are fermented. He then gives a long description of koji and how it is made.

Shoyu or soy sauce (*Shoju oder Soja-Sauce*) (p. 15-17): In Japan, 540-720 million liters are manufactured each year so each Japanese uses 60-100 ml/year. The fermentation time is 8 months to 5 years. The best soy sauce is fermented for 3 to 5 years. He explains how, as soy sauce is fermented,

the protein is broken down into amino acids such as leucine, tyrosine, and members of the “Xanthin” group.

Miso (vegetable cheese, p. 17-18): Miso is widely used in soups. More than half of the yearly Japanese soybean harvest is used for making miso. This is 30 million kg per year. Types of miso include *shiro miso* and Sendai miso. Winkler, in his small work titled “The Soybean of Manchuria,” mentions two other types of miso: Aka or red miso and nuka miso. Kellner investigated five types of miso; a table shows their composition. Loew reports that this vegetable cheese (miso) is consumed either raw or in soups. Kellner, Nagasaka and Kurashima report that, based on their investigations, the amount of amino-nitrogen increases 3-fold and the quantity of carbohydrates is significantly diminished through lactic acid and alcoholic fermentation. The carbonic acid created thereby rises significantly during fermentation (Loew).

Natto (p. 18): Discusses the findings of Yabe.

Japanese tofu or Chinese Tao-hu (p. 18-20): This is the so-called “bean cheese” (*Bohnenkäse*). A table (p. 19, from König) shows the nutritional value of fresh tofu (84.8% moisture) and frozen tofu (17.0% moisture). E. Senft studied frozen tofu, a Japanese military preserved food (*Militärkonserve*) that is not canned; he found it had a beige color and a unique, slightly sour aroma which was at times reminiscent of dextrin. It has a uniform texture throughout, with many tiny pores. Winkler refers to five other types of soy cheese. Concerning the military preserved foods, they were highly regarded during the Russo-Japanese War and (according to Senft) played a key role in the war. (Footnote: The descriptions of the various preparations made from soya make E. Senft’s treatises (1906 and 1907) valuable; in them he published his investigations of a number of Japanese vegetable foods and military preserved foods or conserves). The well-known food manufacturer Maggi in Kempttal, Switzerland, has tried for many years to introduce a commercial miso-like product, but was not successful.

The soybean as an oil plant (p. 20-26): Winkler, in his brochure, discusses the uses of soybeans in Manchuria. After 1908, soybeans were sold in Europe at incredibly low prices which resulted in the expansion of imports and production. Then tariffs were levied on soybeans. There were some major problems in the Austrian oil industry.

Soybean flour (*Sojabohnenmehl*; p. 26-28): In recent years, various processes have been patented. One manufacturer is Soyamawerke in Frankfurt am Main, which makes *Soyama Kraftmehl*. Yellow soybeans are mechanically cleaned, washed, dried, and dehulled according to the process of Dr. Fritz Goessel. Agumawerke in Harburg also makes soy flour.

The soybean as a coffee substitute and extender (p. 28-31): Coffee is known to be detrimental to good health and void of nutrients. Rye, for example, has been used since the 17th century as a coffee substitute. Barley also plays a

major role, especially as malt. A table (p. 30) shows the nutritional composition of ten coffee substitutes, including chicory, figs, lupin, and carob. Soy coffee tastes remarkably similar to real coffee. In Istria (*Istrien*), in the Austrian alps, in Switzerland as well as in Alsace (*Elsass*), the soybean has been used since its introduction as a coffee substitute. Haberlandt reported in his work that a teacher from Capo d’Istria told him that the soybean was used as a coffee substitute in Istria, and a friend told him that there was no difference between the flavor of the two. The Thunschen is used to make good soy coffee. The soybeans are mechanically cleaned, put into a trommel, agitated with water at 65-70°C, brushed and thereby freed of a large number of impurities which can leave a burned smell. The aroma of soy coffee can be improved by impregnation with an extract of largely decaffeinated coffee. It has roughly twice the nutrients of regular coffee and no harmful constituents.

Soybean milk (*Sojabohnen-Milch*, p. 32-33): The most popular vegetable milk is Dr. Lahmann’s Vegetable Milk (*Lahmannsche Vegetabile Milch*), an emulsion made from almonds and nuts. In Japan, they make milk from soybeans; he describes the process, inaccurately, based on information from Winkler. This milk is also used to make cheese [tofu]. Also in Europe there have been successful attempts to make a soymilk adapted to European tastes, as in France by the Caseo-Sojaine at Vallées near Asnieres, and in England by the Synthetic Milk Syndicate. Using the process of Dr. Fritz Goessel, the latter company has a factory in Liverpool; it makes 100 liters of soymilk from: 10 kg ground soybeans plus 5 gm sodium phosphate, 2.4 kg lactose, 2 kg sesame oil, 6 gm common salt, and 60 gm sodium carbonate. Also the Soyamawerke in Frankfurt makes a soybean milk, named Soyama, as mentioned above (fresh and dried milk and cream). Recently Prof. Melhuish developed a new method using soybean, peanuts, and added coconut milk fat.

Soy meat substitutes (*Soja-Fleischersatz*; p. 33): Soyamawerke makes a product named *Soyama-Fleisch-Ersatz*.

Soybean as a chocolate substitute (p. 34): Haberlandt reports such a product.

Soya rubber substitute (p. 34): Goessel and Sauer have developed a rubber substitute made from soybean oil.

The utilization of soya in agriculture (p. 34-38): Use as fodder for cows. In 1880 Blascowicz [Blaskovics], Assistant at the Royal Hungarian Academy in Hungarian Altenburg, conducted fodder tests, whose results are given in various tables.

Conclusions (p. 38).

Note: This is the earliest document seen that uses the word *Ersatz* or the word *Fleischersatz*. They mean “artificial or inferior substitute” and “meat substitute” respectively. Though often associated with World War I, the word “ersatz” (which means simply “substitute” in German)

was actually adopted into English as early as 1875, in reference to the German army's "Ersatz reserve," or second-string force, made up of men unqualified for the regular army and drawn upon only as needed to replace missing soldiers. Hence the meaning "inferior substitute." Address: Frohnleiten, Steiermark [Austria].

89. Lyman, Benjamin Smith. 1917. Vegetarian diet and dishes. Philadelphia, Pennsylvania: Ferris & Leach. 416 p. See p. 155-58. Index. Portrait. 21 cm. [3 ref]

• **Summary:** Discusses the physiological, economical, and ethical advantages of a vegetarian diet, with recipes and principles of preparation. The author, who wrote mostly about geology, lived 1835-1920.

A large table titled "Composition of foods" (p. 44-47) gives the percentage of protein, fat, carbohydrates, and ash (on a dry basis) for many foods, including natto, fresh tofu, soy bean-dried, Swiss miso, soy [shoyu] No. 1 and 2, and white miso (all figures from Abel 1900), plus peanuts-dried.

In the chapter titled "Foods of vegetable origin" (p. 141-267), the section on "Pulse" (p. 152-78) contains a subsection titled "Soy bean" (p. 155-58), which begins: "The soy bean of China and Japan is perhaps the most important food plant there, next to rice. The bean is eaten to a small extent boiled like other beans; but is generally elaborated into a variety of products remarkably rich in protein and fat and therefore going well with rice so deficient in those constituents." The following soy-related subjects are discussed, based largely on the writings of others: Soy sauce (Abel), natto (Abel), miso (R. Takahashi), tofu (Abel), *aburage*, *koritofu*, substitutes for milk and cheese, and nutritional comparison with eggs, milk and cheese (Abel, Atwater).

The section titled "Substitutes for milk and cheese" states: "The Chinese in Paris [probably Li Yu-ying] have been urging the culture of the soy bean. The seeds, when boiled, mashed, and pressed, yield both milk and cheese; if thinned with water, a very good substitute for animal milk; and if coagulated with mineral salt, a cheese that is usually eaten fresh, though it may be preserved by salting or smoking, after being cooked. Three varieties of the cheese are common in the oriental markets; a fermented kind, white, yellow, or gray in color, with a piquant taste, like roquefort; a salty and white kind, like goats' milk cheese; and a third kind, smoky and resembling Gruyère. The soy cheese costs about a fiftieth as much as animal cheese; and in nutritive value, like the vegetable milk, compares very favorably with the ordinary products of the cow. ('Phila. Ledger,' Sept. 27, 1906)."

Note 1. No such article in the *Philadelphia Ledger* or the *Public Ledger* (Philadelphia), of this date, can be found.

Note 2. This is the earliest U.S. document seen (Dec. 2008) that mentions smoked tofu.

The section on peanuts (p. 158-62) includes roasted peanuts, peanut butter, peanut taffy, and "Terralac or peanut-milk (here first published)." Details on how to make peanut-milk at home are given, followed by many recipes for its use—each preceded by the word "Terralac." Thus: Terralac custards, Terralac punch. Terralac cream, salad dressing, sauce, cream sauce, creams, blanc-mange [blancmange], cream pie, Bavarian cheese, Terralac in soup, "Ice-Terralac, or peanut ice-cream," peanut soup, salted peanuts.

There are also sections on the cowpea (p. 163+), almonds (p. 263-65; incl. salted almonds, marchpane, macaroons, nougat or almond cake, almond milk, orgeat syrup, burnt almonds, replacing almonds), vegetable-gelatine (p. 384-87, incl. carrageen or carrageen [carrageenan], Irish moss, and kanten), sesame oil or gingelly oil (p. 388), peanut oil or groundnut oil (p. 388), almond oil (p. 389), and sago and sago recipes (p. 390-91, incl. three sago puddings).

Note: *Merriam-Webster's Collegiate Dictionary* (1998) defines orgeat (a word first used in 1754) as "a sweet almond-flavored nonalcoholic syrup used as a cocktail ingredient or food flavoring."

90. Johnson, Nelson Trusler. 1918. Process used by Chinese in making bean curd. *Commerce Reports [USA] (Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce)* 21(58):926-28. March 11.

• **Summary:** This report begins: "Probably the first article of diet that attracts the attention of the foreigner coming to China is the bean curd which is served to him at the Chinese restaurant or hotel, or in the Chinese family in many ways. Bean curd is only one of a number of products derived from soya beans. Among these are bean meal, a kind of spaghetti, bean cheese, bean sauce (known as shoyu to the Japanese, *chiang yu* to the Chinese, and soy in commerce), bean milk, and bean oil. All of these products are used by the Chinese as foods. The shoyu is used as a foundation for a certain well-known brand of sauce." Note: Probably Lea & Perrin's Worcestershire Sauce.

The next section, titled "Product called an ideal food," is largely a summary of a 1917 article by John E.S. Han titled *The Yale-in-China Student* (Changsha, China) 1(2):8-14. Nov. Contents: Introduction. Product called an ideal food. Uniform quantities of beans used. Specific gravity near that of milk. Method of coagulating emulsion. Suggested improvements in process.

On the last point, Mr. Johnson notes that the changes Mr. Han recommends "are largely the same as those proposed by Li Yu-ying." Address: Consul, Changsha [China].

91. *Bulletin Bi-Mensuel, Office de Gouvernement Général de l'Algérie*. 1918. La culture et l'utilisation du soja [The cultivation and utilization of the soybean]. 24(4):54. April 1-15. [3 ref. Fre]

• **Summary:** This article appears in the section on "Agriculture" (p. 51-55). We reproduce the following note published by "Algerian Information" (*Informations algériennes*) on a question that presents a reality and an interest of the first order for Algeria:

"We can hope to see taken up, from this year forth, the cultivation of soybeans (*graine de soja*) even more as a letter received from Palestro gives us full confidence; the movement was already begun two years ago."

Having found a letter on this subject in the July issue of the *Bulletin of the Society of Agriculture* from Mr. Aimé Zurcher, of Zaatra near Courbet, we wrote him and he responds to us:

"I have, in fact, cultivated soybeans for 7 years from the point of view of industry. For, as you know, this precious bean furnishes several food products: milk, cheese [tofu] that is equal to meat, confections, oils, coffee, etc. I ate all these foods that I ordered from Paris where a company [founded by Li Yu-ying] makes them. And it was with the goal of selling my products to this company that I cultivated soybeans. I had distributed many grains and beans.

"The war having cut off my relations with this company, a certain quantity of soybeans remained. At the end of 3 years, they no longer germinated. I abandoned cultivation.

"I occupied myself with yellow soybeans with round seeds. I have had very high yields, even in nonirrigated, plowed soil and in slightly humid soil with ordinary labor.

"The lively, robust plant adapts to almost all terrain and completes its entire development in 3-4 months; it attains a height of 1-1.4 meters. It requires the same care as the ordinary haricot bean and more especially the dwarf haricot (*haricot nain*). It is then in March, even at the end of March and April that it should be sown (2 seeds/hole; but too much humidity can damage it).

"Nothing is lost of this precious plant. After threshing, the leaves and stems are very esteemed by livestock."

"... We also remark that for a liter of milk, that has nothing in common in taste with cow's milk but which is just as nourishing, 100-200 g [of soybeans] is used [to make the milk]; little matter, it's an insignificant expense. In any case the remains [okara] that the mincer (*hâche-viande*) (business M.F.G. Co., Philadelphia [Pennsylvania]) leaves must be used to obtain the result. We believe that we should give the recipe furnished by an ingenious experiment:

"[To] the okara (*drêche*, which originally meant dregs) that produced the milk [sic, that is a by-product of producing soymilk] is added half its weight in sugar and

enough water to dissolve this sugar; it is then cooked to have confections that you can flavor.

"These confections, instead of being consumed as is, can be mixed with an egg, 4-5 bitter peeled almonds, [or] 2 spoonfuls of flour and divided into small cakes, macaroons, that are cooked in the oven again on a lightly buttered pan. These cakes are delicious, a true luxury product rivaling the best *petits fours* (a small cake cut from pound or sponge cake and frosted) of pastry-makers."

Two more articles on soy are cited, both published in *Nature*, in 1907 and 1910.

Note: Spine title on bound volumes: "Bulletin de L'Office du Gouvernement General." Address: Govt. of Algeria.

92. Trabut, Louis. 1918. Le Soja: Soja Max (L.) Soja hispida Savi [The soybean]. *Algerie, Service Botanique, Informations Agricoles. Bulletin* No. 55. 16 p. April. [7 ref. Fre]

• **Summary:** One cannot say that the soybean has been introduced to the Western world only relatively recently; it has been cultivated at the Jardin des Plantes since 1779. There the soybean has always produced seeds, which have been distributed to botanical gardens and amateurs interested in plants. It would be unjust to say that for 138 years no one has been involved in the utilization of soya in Europe. In fact, there have been a number of fervent popularizers and propagators of the plant. A history of this work is given, including the Vienna Exposition of 1873, the work of Prof. Haberlandt in Austria disseminating and testing soybeans and his remarkable book on the soybean published in 1878, the work of the Society for Acclimatization in France from 1855 (they made the vegetable cheese, tofu [To-fou]), and exports from Manchuria to Europe.

Since 1898, Manchuria, which can no longer cultivate the opium poppy, has greatly expanded its cultivation of soybeans and has looked for outlets in European markets. In 1909 Manchuria exported 410,000 tonnes of soya, a figure which rose to 650,000 tonnes in 1912.

At that time, according to Mr. Brenier, Director General of the Chamber of Commerce at Marseilles, the industry of Marseilles, confronted with a influx of new oilseeds, tried to obtain soya but ran into customs problems. It wasn't clear whether soya should be classified as a legume (because it is a bean) or as an oilseed (*graine oléagineuse*). While the matter was being debated, all the available beans had been purchased by Hull, England, and Hamburg, Germany (*Académie d'Agriculture de France*, 1917, p. 189).

"As the Director of the Chamber of Commerce of Marseilles informs us, in England, Germany, and the Netherlands, the industrial use of the soybean has been growing in importance for several years. In Germany there even existed an important manufacture of soymilk.

“A Chinese factory [run by Li Yu-ying] was installed a few years ago near Paris to enable the soybean to realize its full potential and to introduce various commercial food products made from this seed. In 1912 Messrs. Li Yu-ying and Grandvoinnet published a work on the soybean, recommending its cultivation in France.

“In 1917 Mr. Balland notified the Academy of Sciences of the utilization of soya in war bread, biscuits, etc. All these products, said the knowledgeable chemist, can contribute to a good diet because of their rich nutrient content.

“The Swiss, who consume many coffee substitutes, roast the soybean seeds to make a coffee.

In Algeria, starting in 1894, soybean agronomic trials were started at the botanical station of Rouïba. The results were communicated to the other French colonies in 1898 [by Louis Trabut] in Bulletin No. 16 of the Botanical Service.” The results of these and subsequent trials in 1896 and 1897 in Algeria are summarized.

In 1896 a soybean with a green seed coat yielded 2,980 kg/ha of soybeans.

Pages 7-11 include discussions of the nutritional value of soybeans, their use in diabetic diets, the fact that soybeans are rarely consumed as such but are almost always processed into more sophisticated foods (including fermented foods). Following these trials, that were focused on a very important collection (80 soybeans in number) received [in France] from a missionary in China through the intermediary of Mr. H. de Vilmorin, the seeds were distributed and the results of their cultivation were generally good. There follows a letter from a person in Bou-Medfa [Bou Medfaa, Algeria]. Also discusses the availability, benefits, and method of producing soybean milk which the Chinese prefer to animal milks, and which is free of bacteria that can cause tuberculosis. In Algeria, soybean yields range from 12 to 30 quintals per hectare. Note: 1 quintal = 100 kg. The Arabs consume soybeans boiled in salted water. In England a Soya Flour is sold which contains 75% wheat flour and 25% soy flour. This flour is used commercially to make a soy bread. A Soja Biscuit is made in the Netherlands.

Pages 12-14 list 26 soybean varieties in order of their earliness. Synonyms and characteristics are also given: *Soja très hatif à grain noir* (Extra Early Black; Vilmorin or Ogema [Ogemaw] of Michigan. Matures in 80-90 days). *Brun précoce* (Early Brown from Indiana). Vireo (Tokyo). Chernie (Khabarovsk, Siberia; black seed). Auburn (American selection). Merko (Mekoechotka of Siberia; brown seed). Elton (Khabarovsk, Siberia; yellow seed). Chestnut (American selection 1907; brown seeds). *Jaune d'Etampes* (Yellow Etampes, or Ito San in America; One of the earliest varieties introduced to Europe and America). *Vert de Samarow* (Green Samarow, or Guelph in America; green seeds, matures in 120 days). Butterball (or *Jaune*

géant {Yellow Giant} from Dammann, from Tokyo; yellow seeds. Matures in 110 days). *Soja noir de Podolie* (Black Podolia, or Buckshot in America; black seeds). Wilson Black (Manchuria). Meyer. Austin. Haberlandt. *Huang-Tou* (Yellow Bean, from Ningouta {Ninguta, see Ning'an}). Bhetmas (from India; seed chocolate and yellow). Medium Yellow. Shingto (From Tieling {T'ieh-ling or Tiehling, Liaoning prov.}, Manchuria). Swan (from Canton). *Soja tigré* (Striped, spotted, or speckled soybean from Peking; seeds are grilled and eaten like peanuts). Brooks (Manchuria and China). *Maculata gigantea* (Large spotted, sold under this name by Dammann; probably the same as the American variety Meyer). Mammoth (American selection). Riceland (From China).

The importance of inoculation with bacteria is emphasized. Soybeans can be cultivated with cowpeas for forage. An illustration (line drawing) on the cover shows the soy bean plant, with a close-up of the pods.

Note: This is the earliest document seen (Oct. 2004) that mentions the soybean variety Wilson Black. Address: Director of the Botanical Service for the Government of Algeria.

93. Crevost, Charles. 1918. Plantes oléifères de l'Indochine [Oil-bearing plants of Indochina]. In: Congrès d'Agriculture Coloniale, Gouvernement Générale de l'Indochine. Hanoi-Haiphong: Impr. d'Extrême-Orient. 57 p. Series: Hanoi No. 6. See p. 26-27. [100* ref. Fre]

• **Summary:** Following an overview, the various oil-bearing plants are described in detail, organized by family. The section on Soja (p. 26-27) states: Indigenous names in Cochin China, Annam and Tonkin: Dau nanh, Dau tuong. Cambodia: Sandek sieng. China: Teou [dou]. Japan: Daizu mame. The plant is widely cultivated in Indochina for its seeds which, although not consumed directly as food, are used nevertheless to make various other foods: cheeses (dau phu and dau oc [tofu]), and a condiment sauce [soy sauce] (tuong).

In Indochina there is only one variety of soybean, which has oblong yellowish-white seeds, slightly flattened, more or less large according to its place of origin, whereas in China and Japan soybeans come in various colors and colorations.

The best seed in the colony come from Cambodia and the province of Lang-son in Tonkin.

It is well known that soy protein (*graine de soja à base de caséo-sojaïne*) serves as the basis for numerous food preparations; but the seeds are now most widely used in the manufacture of an oil, used for illumination [in lamps] or food; it tends to replace cotton oil in the soap industry, whereas soybean cakes (*les tourteaux de soja*) are considered excellent for use as a fertilizer or for fattening cattle.

A table shows nutritional analyses of soybeans from three locations, conducted at the colonial garden of Nogent-sur-Marne: Laos, Tonkin, and Manchuria. For each the moisture, protein, oil, carbohydrate, and mineral content are given.

Also discusses: Peanuts (p. 25-26, with illustration facing p. 25, and 9 references), sesame (p. 29-30, with illustration facing p. 29), perilla (p. 30).

Note the interesting phrase *graine de soja à base de caséo-sojaïne*, based on the work of Li Yu-ying near Paris, France. Address: Inspecteur des Services agricoles et commerciaux; Conservateur du Musée [Maurice Long] agricole et commercial de Hanoi.

94. Palen, L.S. 1919. The romance of the soya bean. *Asia and the Americas* 19(1):68-74. July. Illust.

• **Summary:** The author, who begins by acknowledging his indebtedness to Dr. Yamei Kin, Dr. John Harvey Kellogg, and Mr. W.J. Morse for much of the material in this article, gives an overview of the soya bean worldwide. The article contains excellent photos (many by Adachi): (1) Stacks of soya bean cake in open storage on Dairen wharves, South Manchuria. (2) Horses plowing soybean fields in North Manchuria. (3) Modern machinery [a huge steam-powered tractor] used in bean cultivation in remote parts of Manchuria where foreign interests are involved. A Western man and woman ride horses nearby. Caption: "To the Manchurian farmer, with his laborious methods of hand cutting and hand winnowing, the introduction of modern Western farming methods would spell many-fold prosperity." Note: This is the earliest document seen (Feb. 2003) that shows a photo of a tractor in connection with soybeans. (4) Stacks of soybeans piled high in sacks in Manchuria as far as the eye can see. (5) Soybeans stored in huge cylindrical, 20-foot-high osier bins, each covered with a conical top.

Soy oil is purified and flavored with an admixture of olive oil for use as a salad oil. It also forms the basis of some of our butter and lard substitutes. "What Mr. Li Yu-ying accomplished in Paris in the establishment of a Laboratory of Research and of a factory for the production of all the products derived from the soya has been the forerunner of activity on the part of certain independent Chinese companies in America and of government and private investigations."

"In general the use of whole soya beans has not been attended with much success because of the ever present flavor of the oil content and because, with the ordinary method of cooking, they remain hard and unpalatable; but it has been found that cooking at a temperature somewhat above the boiling point, say from 220 to 230 degrees, breaks up the cellulose structure and develops a richness of flavor that is not obtainable with the lower temperature."

"By far the most extensive use of the soya is in the products manufactured from it. And it is here that Dr. Yamei Kin, the talented Chinese physician, is making her chief studies under the direction of the Pure Foods Division of the Department of Agriculture, with the purpose of spreading a knowledge of the soya among Americans. For convenience of consideration the products studied may be divided into sauces, curds, cheeses and milk.

"Of the sauces the liquid form is already familiar, although unrecognized, perhaps, by a large percentage of Occidentals through the work of early English traders in bringing back the base of the now famous Lea and Perrins Worcestershire Sauce. This original Chinese *shi-yu* was highly spiced and became a well recognized adjunct to many an English meal. Following the example of Lea and Perrins, others have put out sauces with the same base without, however, attaining the same success, because the makers did not understand that there are many kinds of soya sauce. While they are all made by the same ferments and in the same general way, they differ very greatly in quality according to the locality and to the manufacturer, just as wine, though made from the identical kind of grape and by the same process of fermentation, may be a very different article from different hands. It takes several months to make this liquid form of sauce, while the best kind requires a year or more to attain the finest flavor and mellowness. The hot condiment added by Lea and Perrins is not favored by the Chinese, since according to their taste it detracts from a wide use of the soya sauce."

Tofu (spelled to-fu) is discussed in detail. "There are records to show that it has been used since at least nine hundred years B.C. *To-fu* making is a staple industry in every little community. Usually it is done at night so that the fresh curd will be ready for the morning demand in the market, or for peddling around the streets. It provides, for the fraction of a cent, the indispensable equivalent of meat and affords very often the explanation of how the Chinese laborer does so much work on what is purely vegetable diet, popularly supposed not to contain much protein. *To-fu* is made in many different forms and the bean stalls occupy quite as large and prominent places in the city market as the fish and meat stalls...

"Cheeses are also made from the growth of cheese-making moulds on *tofu*. The Chinese resident in America regularly import a certain highly flavored red bean cheese for their own use...

"Perhaps the greatest contribution of the soya to the life of the Occident will be in its form of milk. Back in the golden era of peace there had been established in London a soya bean milk factory which was prepared to place its product regularly on the market, and there were said to be plans consummated for the erection of two others at Manchester and Liverpool; but of what the development has been we have no definite information. In Shanghai, Peking

and Dalny Chinese companies are supplying hospitals and individuals with an 8 or 10 ounce bottle of concentrated milk per day at a cost of \$1.00 Mex per month.

"In its competition with the cow the legume has in its favor the following facts: Soya milk can be produced with less contamination; it is tuberculosis-free; its caseins break down much more readily than the caseins of cows' milk and do not form curds in the stomach in the same degree...

"By those who advocate and urge a vegetarian diet, a very strong bill can be drawn in favor of this oriental substitute. In these days when war has thrown new light on many of our life problems, it will be easier to secure acceptance for their contention that the world must for both economic and physiological reasons adopt the biological diet. It has been calculated that, roughly speaking, it takes 100 pounds of foodstuffs to produce 3 pounds of beef and that a given acreage of land can support five times the population if the necessary protein can be derived directly from vegetable sources rather than going through the roundabout way of an animal form, imposing upon the body the burdens incident to taking in the toxines [toxins] resultant from the catabolism of the cells of the animal, and from possible putrefaction. In China the Buddhist priests and people who enter the various temperance societies all depend on varieties of *to-fu*."

95. Rouest, Leon. 1919. Étude sur le soja [Studies on the soybean]. *Genie Rural (Le)* 11(99-100):23-26. (New Series Nos. 39-40). Continued: See Rouest 1920. [Fre]

• **Summary:** Gives a brief overview of the history of soya in Europe and France, including Li Yu-ying, Dr. Bloch, the Soyanna [sic, Soyama] Werke near Bockenheim, Messrs. Paillieux, Sagot, Raoul, and Jumelle, and the various soyfoods from China and Japan that they describe (Miso, shoyu {*Shoyua*}, tofu {*Tofou*}, dried frozen tofu {*Kouri Tofou*}, yuba {*Uba*}), and the potential threat of soya to the French cheese industry. "Finally in 1910-11 numerous soy products were presented at the expositions in Brussels [Belgium], Turin [France], and Dresden [Germany]."

Describes work on the *Ferme Expérimentale de Néoculture du Sud-Est*, at Villardonnel, Aude. Mr. Semichon, Director of the wine station at Aude, sent this experimental farm some soybean seeds which he received from the USDA accompanied by a bulletin written by William Morse (probably "The soy bean: Its culture and uses," 1918). Rouest translates the Bulletin into French. The most important varieties mentioned are: Mammoth, Hollybrook, Ito San, Guelph, Haberlandt, Medium Yellow, Wilson, Peking, Tokio, Manchu, Black Eyebrow, Barchet.

Rouest was born in 1872. Illustrations (line drawings, both non-original) show: Soja hispida plant, with close-up of a cluster of pods. Soja Hato soybean plant. Address: Director, *Ferme Expérimentale de Néoculture du Sud-Est*, at Villardonnel (Aude), France.

96. Rouest, Leon. 1920. Étude sur le soja [Studies on the soybean]. *Genie Rural (Le)* 12(103):20-26. Jan. (New Series No. 43). [Fre]

• **Summary:** Continuation of an article in issue No. 99-100 of this magazine. Describes work with soybeans on the *Ferme Expérimentale de Néoculture du Sud-Est*, at Villardonnel, Aude. States that Li Yu-ying was Counsellor of the First Class of the Ministry of Agriculture of China. Rouest was born in 1872. An illustration shows a close-up of the pods and beans of the soybean plant. Photos show: Pods and beans of different varieties of soybeans. Address: Villardonnel (Aude), France.

97. *Matieres Grasses (Les) (Paris)*. 1920. A propos des graines de Soja [Concerning soybean seeds]. 12(148):5614-15. Aug. 15. [16 ref. Fre]

• **Summary:** A two-page summary of information on soybeans from 16 sources, most of them in French. Soybeans are widely used in Manchuria and Japan. Soybean seeds from Cambodia and lower Laos are superior to those from Manchuria. A table gives the composition of three soybeans from Laos, Tonkin, and Manchuria. Soybeans in Indo-China and their use during World War I in England and France. Vegetable milk made by Li Yu-ying in France. A table gives the composition of three soybeans from Yun-Nan, Tonkin (Lang-Son), and Tonkin (Delta). Mr. Fr. de Roux recommends that soybean be more widely used in France and its colonies. Summarizes soybean research in Connecticut and New Jersey, and soybean production and yields in Ohio. More than 500 soybean varieties have been tested in the USA; the yellow varieties generally work best for human foods, oil and flour, while the brown and black are used for animal feeds. In 1917 cotton seed mills also used soybeans grown locally or in Manchuria. Milk made from soybeans is similar to animal milk and can be used to make cheeses. Soybean oil is used in the USA and England for making paints, but of greatest interest is its use in margarine and other food uses. In Japan, a society was founded with capitalization of 100,000 yen to extract soy protein for use as a substitute for celluloid. Conclusion: "In view of these many uses, it seems interesting to us to pursue in our colonies some cultural trials with this interesting legume. Could it perhaps be developed in certain temperate regions? É.D.W."

98. Rouest, Leon. 1921. Le soja et son lait végétal: Applications agricoles et industrielles [The soybean and its vegetable milk. Agricultural and industrial applications]. Carcassonne (Aude), France: Lucie-Grazaille. 157 p. Illust. No index. 25 cm. [42 ref. Fre]

• **Summary:** Contents: Preface, by Louis Forest. Introduction—What is soya? 1. History of the dissemination of soya: In 1712 the naturalist Kaempfer introduced soya,

introduction of soya to France and Europe, soya is cultivated in Austria in 1875 by Prof. Haberlandt, soya is the object of many trials in France from 1876 to 1881, the study and acclimatization of soya becomes widespread, the causes of setbacks in the cultivation of soya.

2. Cultivation of soya: Botanical characteristics of soya, the varieties of soya, Chinese varieties and soya in China, Japanese varieties and soya in Japan, American varieties and soya in America (varieties: Mammoth, Hollybrook, Ito San, Guelph, Haberlandt, Medium Yellow, Wilson, Peking, Tokio, Mandchu [Manchu], Black Eyebrow, Barchet), soya in Europe—France and Italy, seven varieties of soya tested in France, soya in the experimental farms for new crops (*les Fermes Expérimentales de Néoculture*; Many varieties from the USA were tested, including Manchu, Wilson Five, Haberlandt, Tokio, Virginia, Hato [Hahto], Early Medium Green), the cultural and geographical appearance of soya, its production worldwide, planting soybeans, heat units (*degré thermique*) and the germination of soya, the importance of spacing between plants, number of seeds per hectare, soya during its vegetative stage, the vegetation of soya compared with that of the haricot at high altitudes, rolling the seeds and types of crop maintenance, growth of the plant, acclimatization, the enemies of soya.

3. Composition of the soybean plant. 4. Soya forage: Green soya forage, soya hay, soya as a plant for soil improvement. 5. Harvesting soybean seeds: Maturity of the seed, harvesting soya, the food value and composition of soya seeds. 6. Soya as an oil plant: Richness in oil, defatted soybean cake, imports and exports of soya cake from 1915 to 1919 (Imports to: Sweden, Canada, Korea, Japan, Formosa. Exports from: England, China, Korea), production of soya cake from 1915 to 1919 (Denmark, Great Britain and Ireland, Netherlands, Sweden, USA, Japan, Formosa, Korea, Java and Madura).

7. Soymilk: Its manufacture (in 1910-1913 Li Yu-ying installed a factory named “La Caséo-Sojaïne” at Vallées {Asnière-Seine} near Paris. Rouest visited this factory and saw them make soymilk, which was filtered using a filter-press resembling those used in sugar refineries), its properties and composition, composition compared to other types of milk, powdered soymilk, soymilk in the nursing and feeding of animals, soymilk related to tuberculosis in animals and in humans, soymilk would allow the milk and butter from animals to be reserved exclusively for human foods and could be used for raising many piglets, manufacture of non-dairy milk in Canada (a factory is now under construction). 8. Soya in Industry: Soymilk and soy casein, Sojalithe (like Galalithe).

9. Soya in human nutrition: Soy flour and its applications (incl. Li Yu-ying’s usine de la Caséo-Sojaïne, and bread made of soya and wheat), soya compared to dry legumes (such as lentils, haricots, peas, beans), soya used as a legume (whole soybeans), the food value of soy sprouts,

preserves and confections made from soya, soya chocolate and coffee, the amount of nutrients produced by soya and other crops from a unit of land, a meal of soya served in France (prepared and served some years ago by Li Yu-ying’s soyfoods plant La Caséo-Sojaïne for the major print media, the medical press, the National Society for Acclimatization, etc.; it consisted of 2 soups {one with ‘soya meat’ and one with soymilk}, 2 entrees {an omelet with smoked soya ham, and fritters stuffed with soy meat}, soy [actually mung bean, *lūdou*] sprouts in a salad and sauteed, 3 desserts {soya cake, biscuits, and confection}, and soy coffee; a recipe for each is given; soya meat is smoked tofu).

10. Use of soya in East Asia: Tofu (*fromage végétal*), soy-based condiments (such as natto {Ping ming Natto and Tokio-Natto}, miso, Chinese miso or tao-tjiung [doujiang], and shoyu {Soyou or Schozou}), making soy sauce in Kwantung, China (from Groff).

11. The opinions of several authors concerning soya (from the French medical and hygienic press): Introduction—E. Maurel. Soya and soy bread in diabetic diets—Dr. Dujardin-Beaumetz, Dr. Bloch, Dr. J. Le Goff, L. Beille, M. Gautier. Soya used as a bean—M. Gautier. Soy sauce used in place of meat extracts. The state of cheese. The popularization of soya in Europe—A. Paillieux.

Conclusions: The influence of cultural technology on variation. Appendix: Advice to experimenters on the acclimatization of soya in France. Other methods of obtaining early-maturing soybeans.

The author concludes (p. 140): We must make every effort to acclimatize soya in France. We must develop the will and learn from past mistakes. Most soybean varieties now available in France are too late. We must get varieties from Manchuria, whose climate is similar to that of southeastern France, and from the northeastern USA. It is urgent that, in the near future, we start a Soybean Experiment Station to take responsibility for this work. The setbacks since 1830 can be overcome by present science and genetics. The first step is to introduce better varieties.

On the last page is a full-page advertisement for various seeds sold by Mr. Rouest, including 30 varieties of soybeans (*Soja hispida*); the names of the individual varieties are not given.

Illustrations show: (1) A soy bean plant with many pods (title page). (2) Flowers and pods of the soy bean plant (p. 29). (3) Soy pods and beans (p. 30). (4) A soy bean plant drawn by a Chinese artist (p. 32, from Li Yu-ying). (5) Pods of the Hato [Hahto] variety of soy bean (p. 51). (6) Germinating soy bean seeds (p. 54, from Li Yu-ying). (7) Soy bean roots with nodules (from a photo by Dr. Le Goff; p. 73). (8) Soy bean pods, opened to show 3 beans in each (p. 82).

Tables show: (1) Production of soybeans by color in China in 1916 and 1917 (p. 35, in quintals, from the

International Yearbook of Rome, Vol. 1, 1919): In 1917: Yellow 4,069,822. Other 953,012. Green 181,190. White 71,234. Black 40,066. Total: 5,315,324.

(2) Percentage composition of various oilseed cakes (p. 95, from Kellner). (3) Imports and exports of soybean cake, by country, from 1915 to 1919 (in quintals, p. 96). Imports are given for Sweden, Canada, Korea (from 1916), Japan, and Formosa [Taiwan]. Exports are given for England (6 quintals in 1915), China (including Manchuria, by far the biggest exporter, from 1916), and Korea (from 1916).

(4) Production of soybean cakes, by country, from 1915 to 1919 (p. 97, in quintals, based on statistics from the International Bureau of Agriculture, Rome, 1919). In descending order of production in 1915 (in quintals): Japan 5,439,337. Korea 3,209,238. Great Britain and Ireland: 1,513,059. Denmark 921,782. Java and Madura 503,025. Note that China is not listed. Netherlands 144,523. Formosa [Taiwan] 62,131. Sweden 1,733. USA 0, but 501,822 in 1916.

Note: When Alsace was occupied by the Germans during World War I, the Rouest family moved from Alsace to Paris. Mr. Rouest brought soybeans from Africa and adapted them to France. He paid for the publication of this book. Address: Directeur des Fermes Expérimentales de Néoculture, Carcassonne (Aude), France.

99. Rouest, Leon. 1921. *Le soja et son lait végétal: Applications agricoles et industrielles* [The soybean and its vegetable milk. Agricultural and industrial applications]. Carcassonne (Aude), France: Lucie-Grazaille. 157 p. Illust. No index. 25 cm. [42 ref. Fre]

• **Summary:** This is a summary of interesting points throughout this book. The main early use of soy in Europe was more therapeutic than nutritional (p. 3); it was used mainly in diabetic diets.

Nothing remains of the early trials conducted 20 years ago in France and Austria. The reasons for the crop's failure were lack of understanding of the laws of acclimatization and genetics, and the fact that soya (*soja*) was introduced as a new food legume, when actually it can only be utilized as a forage plant and industrially (for oil, cakes, and casein). Later, when the plant has been adapted, when it is understood that soya is not being propagated to compete with other dry legumes, that it is not being cultivated to extract from the seeds a vegetable milk for people, but simply as a forage plant—and the most remarkable one that exists (p. 3).

The English are trying to acclimatize soya to their colonies, especially those in southern Africa. In 1908 some 200,000 tonnes (metric tons) of soybeans were exported from China [including Manchuria] to Europe, followed by 500,000 tonnes in 1909. One can extract from soybean seeds a vegetable milk (*lait végétal*) which has the same value as animal milk for use in raising young animals. Its

seeds and forage are also fine for raising farm animals and for industrial products. The author thanks all those who have helped him to acclimatize the soybean to France and to create new varieties of soya in France (p. 4).

Introduction of the soybean to France and to Europe (p. 6-7): A good but brief review of the literature on this subject. In 1739 Buffon was made director of the Jardin des Plantes in Paris. Shortly thereafter, Christian missionaries in China sent him specimens of seeds and plants. The soybean must have been among them. The soybean has very probably been cultivated at the Museum since 1779, certainly in 1779 and later from 1834 to 1880. In 1855 Baron de Montigny was charged by the Society for Acclimatization to distribute five varieties of soya sent from China by Mr. Montigny; these were from northern China. The plants first bore seeds in France in 1854; their acclimatization is assured. In 1857 Mr. Lachaume transmitted to the Society for Acclimatization details of the success he obtained at Vitry-sur-Seine with soy culture. The seeds were planted in 1856. In 1858 a report to the Society for Acclimatization indicated that the acclimatization of the soybean was complete. In 1859 Mr. de Vilmorin reported on cultural trials sent from China by Mr. Perny. The varieties matured to late. The same year Dr. Turrel harvested soybeans at Toulon. In 1862 the Society for Acclimatization received seeds from Mr. Guillemin; the yellow soybean was said to be used for making tofu. Following the events of 1870, the cultivation of the soybean in France was apparently. Note: The brief war of 1870 between France and Bismark's Germany ended in France's defeat and the ceding to Germany of Alsace-Lorraine.

In the long section on Prof. Haberlandt's work with soya, starting with his cultivation of it there in 1875, is a quotation from him: "I don't know, in this history of cultivation, any example of a plant which has, in so few years and to such a high degree, excited such general interest" (p. 8).

From 1876 to 1881, the soybean was the object of numerous trials in France by the Society of Horticulture at Etampes (Seine-et-Oise). During this same period, one Dr. H. failed with varieties sent from Japan but succeeded in cultivating a yellow soybean sent from China, and used the latter to make his own tofu (*fromage végétal*) for use at home. In 1880 Messrs. Vilmorin-Andrieux introduced in their catalog a species cultivated in Austria-Hungary (p. 17-18).

In 1878, Japan, China, and the Indies (*les Indes*) presented all the varieties of Soya at the Universal Exposition, and their seeds filled more than 20 boxes. In 1880 the National Society for Acclimatization was able to distribute soy in France and tests were conducted in 24 regions; they were largely successful, especially in central and southern France (p. 19-22).

Tests were then abandoned from this time until about 1888, when the soybean started to grow in the southern states of the USA. That same year Messrs. Lecerf and Dujardin-Beaumetz first had the idea of using soy bread in diabetic diets (p. 22).

Causes of setbacks in soybean culture (p. 24-27): First, the varieties used matured too late and were not acclimatized in a progressive manner. We must choose varieties from northern China and adapt them to the south of France (*le Midi*) [which is on the same latitude as Toronto, central Wisconsin, or southern Minnesota]. From these, we must develop hybrids, and gradually move them northward.

The soybean has been ostracized in France. Major commercial, financial, and social interests have viewed with terror the production of an inexpensive food and have retreated into the egotistical “Malthusian agriculture. This is the truth!

Soy cheese is even feared by the cheese industry in France. They ask if they should abandon their excellent cheeses in order to adopt a vegetal cheese (*fromage végétal*).

A long quotation from the *Chinese Imperial Encyclopedia of Agriculture* gives the various colors of soybeans, including black, white, grey, and even some speckled / mottled with blue. The black ones can be used for medicine. And they are used as an ingredient in the condiment called soy nuggets (*Chi [douchi]*), made of soybeans, ginger, and salt.

In 1910-1913 a factory named “La Caséo-Sojaïne” was installed near Paris. I (Rouest) visited this factory in which were installed all the modern conveniences (*tout le confort moderne*), and presented the best guarantees of hygiene. The milk was filtered using a filter press similar to those used in sugar factories (p. 99).

Note: Rouest has borrowed a great deal of material from earlier publications by Li Yu-ying, usually without acknowledgment and often arriving at very different conclusions, especially on the question of using soya to make human foods (Li) vs. foods and milk for animals (Rouest).

Rouest strongly recommends the use of soymilk to feed young domesticated animals. For us, soy will not replace green beans, milk or cheese. During World War I, the Germans were actively involved with the study of soymilk. A translation of an article from the *Schweizerische Milchzeitung* (Nov. 1918) tells how to make soymilk and tofu (p. 102). By using soymilk, there is no fear of transmitting tuberculosis. Address: Directeur des Fermes Expérimentales de Néoculture, Carcassonne (Aude), France.

100. Rouest, Leon. 1921. L'étude et l'acclimatation du Soja deviennent générales [The study and acclimatization of soya becomes general (Document part)]. In: Leon Rouest. 1921. Le Soja et Son Lait Végétal [The Soybean and Its Vegetable

Milk]. Carcassonne (Aude), France: Lucie-Grazaille. 157 p. See p. 22-24. [Fre]

• **Summary:** From 1880 to 1896 frequent communications were published in agricultural bulletins from the United States.

The soybean was studied in Russia by Nikitin.

In 1905, Li Yu Ying, councillor 1st class at the Ministry of Agriculture in China, had the idea of soymilk in Europe. In 1906 he created a laboratory in Paris. This laboratory grew into the factory Caséo-Sojaïne, which made all the products derived from the soybean (*produits dérivés du Soja*).

In 1910-11 presentations of soy products (*produits de Soja*) at the expositions at Brussels, Turin, and Dresden.

Mr. Lechartier conducted cultural trials in Bretagne and in the Haute-Vienne, and gave the results of his chemical analyses of the plant.

Dr. J. Le Goff, in the *Gazette des Hôpitaux*, called new attention of hygienic doctors to the use of soya in diabetic diets.

In 1913 it seems to have been imported into Germany for the following note was published in several Frankfurt journals:

An institute has been founded under the name of Soyama-Werke for the purpose of making soymilk (*lait artificiel de graines de Soja*) and other soy products. Soya furnishes to Bockenheim the most important quantity, if not all of the artificial product. Some 5,000 liters per day will be sold on the market in Frankfurt, when the factory is in full swing. The head of this enterprise is a deputy of the Reichstag. The Society Soyama-Werke also makes cream, butter, and cheese. Samples of soymilk have already been used by various bakers in Bockenheim.

This note indicates that in 1913 soybeans had not yet been cultivated in Germany. Dairy farmers were said to fear competition from soymilk. Thus, no doubt, they tried the same thing in Germany that was tried in France, for during the same period a factory, “La Caséo-Sojaïne,” installed at Vallées near Asnières (Seine), conducted rather original publicity in favor of soy products. The soybeans processed in the Chinese factory were imported from China and it was realized in advance that the soyfoods, made from a plant absolutely unknown to the public, would not have its favor.

In 1910 Vilmorin had in its catalog Early Podolie soybeans [from Russia]; they had black seeds. But Early Podolie is still too late for the south of France (*midi*).

Dr. Le Goff published new medical articles about soy and tried cultivating it in the area around Paris. He introduced a rather early black-seeded variety (Tokio) that matured in this region.

Messrs. Boulanger and Dausse cultivated this variety at Etrechy (Seine-et-Oise, near Paris) in order to prepare conserves to be packed in boxes for diabetic diets.

Finally in 1918 Mr. Rouest, Director of the Experimental Farm of Neoculture, receive some soybean samples from the United States, via Messrs. Brioux and Semichon. He cultivated them, isolated the mutations, created hybrids, and tested the new varieties that had already been cultivated by Mr. Carles of Carbonnière / Carbonniere in the Tarn. Address: Directeur des Fermes Expérimentales de Néoculture, Carcassonne (Aude), France.

101. Guillaumin, A. 1922. Les variétés de soya d'Extrême-Orient: Origine probable du soya [The varieties of soybeans in East Asia: The probable origin of the soybean]. *Revue de Botanique Appliquée & d'Agriculture Coloniale* 2(10):254-58. June 30. [10 ref. Fre]

• **Summary:** "The soybean (*Le Soya*; *Glycine Soja* Sieb. et Zucc., *Dolichos Soja* L, *Soja hispida* Moench, *S. angustifolio* Miq.) has been cultivated in the Far East since antiquity. Shen-Nung (*le Shénon*), written up by Houandi in about 3,000 to 3,500 years before Jesus-Christ, already mentioned the soybean. Since then, its culture has expanded to Indochina, India, Malaysia, Europe, America, and Africa.

"Long ago, in Austria and in France, varieties such as *Soja d'Etampes*, were selected for their high yield. In America, efforts have long been made to obtain, for the diverse climates, both forage varieties and seed varieties. And the U.S. Department of Agriculture has assembled in its test fields more than 500 varieties, of which about 20 are currently in commerce. Among the forage varieties are (Ball 1907): Early Brown, Black Eye Brown, Peking, Wilson Five, Virginia, Barchet, Biloxi, Laredo, Atoo San [sic, Ito San?], Tarheel Black, and Wisconsin Early Black. Among those grown for their seeds are: Ito San, Manchu, Elton, Medium Yellow, Mikado, Hollybrook, Haberlandt, Mammoth, Tokyo, Guelph, Austin, Easy Cook, Morse, Hahto, Early Medium Green, Mandarin, and Chiquita.

Note 1. This is the earliest document seen (Oct. 2004) that mentions the soybean variety Black Eye Brown. However, it does not appear in Ball (1907) as stated, nor does any name even vaguely resembling it appear. The Black Eye Brown variety is mentioned in only 3 known documents, all published in France in 1922.

"Note that the forage varieties all have black- or dark-colored seeds, whereas the seed varieties have yellow or greenish seeds.

"In Turkestan it seems that the only varieties are ovoid (5.7 x 3.7 mm), brilliant yellow, with brown hilum and traversed longitudinally by a bright line." Note 2. Turkistan or Turkestan is an historical region of Central Asia, usually thought to comprise Turkmenistan, Uzbekistan, Kyrgyzstan, Tajikistan, southern Kazakhstan, western China, and northeast Afghanistan.

Note 3. This is the earliest document seen (April 2008) concerning soybeans in Turkestan, or the cultivation of soybeans in Turkestan (not including Chinese Turkestan).

This document contains the earliest date seen for soybeans in Turkestan, or the cultivation of soybeans in Turkestan (not including Chinese Turkestan) (1922). The source of these soybeans is unknown. Unfortunately, it is not clear in which part of Turkestan the soybeans were grown.

"In India, soybeans are cultivated in the United Provinces and at the foot of the Hamalayas from Kashmir to Darjeeling." David Hooper (1912) distinguished five different soybean races in India.

"In Cambodia, the only known variety is ovoid (6.3 x 4.2 cm), dull yellow, brown hilum, with a long, clear white line, known as *Sandek sieng* in Cambodian and *dau nanh* in Annamite. It is cultivated along the steep banks of the Mekong River.

"In Cochinchina, the soybean is cultivated only on the red soils of the provinces of Chau-doc, Baria, and Bien-Hoa; in the western provinces, cultivation is insignificant and the seeds come from Cambodia. It seems that there is only one variety, closely related to that of Cambodia, called *dau nanh* or *dau-xa*, but it is not well established / widely grown, for it bears black or brown seeds.

"In the province of Baria one can obtain two harvests in a wet year—one in September, the other in December-January. In the province of Bien-Hoa, there is only harvest.

"In Annam, there is one variety similar to that cultivated in the lower parts of the provinces of Bin-dinh, Thua-hien, Dong-hoi, and Tanh-hoa.

In Tonkin, the soybean is known as *dau tuong*; in the [Mekong] delta, one can distinguish a small, ovoid variety (5.1 x 3 mm), with a yellow seed coat and a hilum surrounded by a brownish black aura that sometimes overflows the sides. In the region of Lang-son, on the plateaus 100-500 meters in height, it is replaced by a larger variety, ovoid (7.1 x 5 mm), dull yellow, and a hilum that is uncolored [pale] or brownish; one variety is also cultivated at Lao-kay.

"In Laos, the soybean is known as *Mok toua kon* and *Ta tone*, according to Dr. Spire, but precise information is lacking.

In the territory of Kwang-cho-wan (French: *Kouang-tchéou-wan*, in southeast China) the soybean is cultivated in the region of Tai ping, at an altitude of 30 meters. It is planted in the spring and harvested in the summer. One can distinguish two varieties here. One is very elongated (8 mm x 4.6 mm), dull yellow with a very clear brown hilum, called *Wong tao* or *Wong tao tsaï* in Cantonese. The other is small, flat (6.4 mm x 3.7 mm), dull black, with a large hilum, called *Hat tao* in Cantonese; it is absolutely the same as the variety Nigra cultivated at the botanical gardens of Cluz (Romania), and in Trieste (Italy), but different from that which is cultivated under this name at the botanical gardens of Cracow / Krakow (French: *Cracovie*) (Poland), Tabor (Czechoslovakia), and Delft (Netherlands), which is

fatter, more round (7 mm x 4.8 mm) and of a velvety black color.

Note 4. This is the earliest document seen (Feb. 2005) concerning the cultivation of soybeans in Czechoslovakia (which became a country in 1918). This document contains the earliest date seen for the cultivation of soybeans in Czechoslovakia (June 1922). The source of these soybeans is unknown.

"In China, in Szechwan, only the yellow and green varieties are known. In the region of Shanghai, R.P. Courtois, of the Museum of Zi-ka-wei, has assembled an important collection of soybean varieties. Descriptions are given of varieties with the following colors and names: (1) Yellow: *Ta hoang téou* (large, yellow, almost round), *Kiu hoang téou* (ovoid, brilliant yellow). (2) Green: *Tsing pi téou* (roundish, 7.1 x 5.5 mm, clear green with clear hilum). (3) Brown: Large, ovoid (9.1 x 6.4 mm), reddish brown, with a slightly clearer hilum; no name given. (4) Black: Many varieties. (4A) Large ovoid seeds (9 x 4.3 mm), with large hilum; indigenous name unknown; (4B) A little smaller and bulging (8.3 x 5.4 mm), with ornate hilum and a longitudinal white line, named *Ta hé téou*; (4C) Ovoid (8.1 x 4.7 mm) with a wide hilum traversed by a white line, called *Hé téou*; (4D) Small (6.7 x 3.1 mm) and brownish black named *Siao hé téou*; (4E) And finally a very small, flat (6 x 2.7 mm), brownish black named *Ni téou*. By their shape, form, and color, the seeds of these last appear very similar to the American variety Laredo."

"In Europe, soya has its apostles, but it will never amount to anything more here than a small-time vegetable. Despite the Caséosojaïne at Vallées near Paris, France (Li Yu-ying, 1911) and the Soyama Werke at Bockenheim, Germany (1914), the milk, cream, butter, and cheese [tofu] made from soya will never be more than ersatz. The "soy bread" is only good for diabetics and the "soy ham" (*jambon de Soja*) in nothing but a weak imitation of pork. Soybeans themselves are indigestible and require a very long time to cook—even the yellow or white varieties. Soy sprouts (*germes de Soja*), which enjoyed some popularity before the war and deserved it, for they are a nice hors d'oeuvre, are actually nothing but mung bean sprouts."

Based on other sources (most of which are cited), the writer also discusses the soybean varieties of Manchuria (Hosie 1901), and Japan (Lemarié 1910), and discusses soybeans briefly in Korea, Philippines, Netherlands Indies. Also mentions foods made from soybeans in India, Indo-China, China, Japan, and Manchuria and speculates on the origin of the soybean. Address: Asst. to the Crop Service, Museum of Natural History (Assistant du Service de culture au Muséum d'histoire naturelle).

102. Crevost, Charles; Lemarié, Charles. 1922. Catalogue des produits de l'Indochine [Catalog of the products of

Indochina]. *Bulletin Economique de l'Indochine (Hanoi)* 25(155):387-430. July/Aug. See p. 426-30. [9 ref. Fre]

• **Summary:** In the section titled "Fats and vegetables" (*Matières grasses et végétales*) is a subsection titled "Soja-Soja max" (p. 426-30). It contains a general overview of the soybean, drawing much information from the publications of Li Yu-Ying and Grandvoinnet, including the names of the soybean in Cochin China, Annam, and Tonkin, Cambodia, Laos, China and Japan. Discusses the introduction by Li of soybean culture in the area around Paris, the laboratory and factory established by Li and its soy products, the characteristics of soy oil and its comparison with cottonseed oil, the use of soy oil in Great Britain to make soap and margarine, and the composition of soybeans cultivated in Laos, Tonkin, and Manchuria. The ash of the stem of the soybean, mixed with resin of *Canarium*, is said to be used to make joss-sticks for incense in Indo-China. Also discusses *Perilla ocimoides* (p. 407) and sesame (p. 422-26). Crevost was born in 1858.

Note: in 1920 Crevost was inspector of the agricultural and commercial services, and director-conservator of the agricultural and cultural museum in Hanoi; Lemarié, an Ingénieur-Agronome, was director of the agricultural and commercial services of Tonkin, and laureate of the national society for acclimatization. Address: 1. Inspecteur en chef des Services commerciaux, Directeur-Conservateur du Musée agricole et commercial de Hanoi; 2. Ingénieur agronome, Directeur-adjoint des Services économiques de l'Indochine, Lauréat de la Société nationale d'acclimatation.

103. Piper, Charles V.; Morse, William J. 1923. The soybean. New York, NY: McGraw-Hill Book Company, Inc. xv + 329 p. Feb. Illust. Index. 24 cm. Reprinted unrevised in 1943 by Peter Smith Publishers, New York. [563 ref]

• **Summary:** This is the first comprehensive book about the soybean written in English, and the most important book on soybeans and soyfoods written in its time. Contains an excellent review of the world literature on soybeans and soyfoods with a bibliography on soy that is larger than any published prior to that time (563 references), a good description of the present status of the soybean worldwide based on the authors' extensive contacts, and a great deal of original information. It quickly became a key source for people and organizations working with soybeans and soyfoods in all countries, and a major factor in the expansion of the soybean in the western world. Because of its scope and influence, Soyfoods Center considers the year of its publication to mark the end of the "Early Years" of the soybean worldwide. It remained in print until about 1986.

Contents: Preface. 1. Introduction: Name of the plant, origin, literature, use by the Chinese and Japanese, present importance, future prospects in the U.S., recognition of the possibilities. 2. The commercial status of the soybean: Manchuria and China, Japan, Europe, U.S., other countries,

summary of imports and exports of soybeans and soybean oil. 3. Botanical history of the soybean: History prior to Linnaeus' "Species Plantarum" 1753, Linnaeus' misunderstandings of the soybean, Prain's elucidation, other and the correct botanical name.

4. Agricultural history of the soybean: Vernacular names of the soybean, China, Korea, and Japan, India and neighboring regions, Cochin China, Malayan region, early introduction into the United States, later U.S. introductions, the early introduced varieties (grown in the USA by 1898—Ito San, Mammoth, Buckshot, Guelph or Medium Green, Butterball, Kingston, Samarow, Eda, Ogemaw or Ogema), soybean in Europe, varieties grown in Europe and identification, Hawaiian Islands, Australia, Africa, Argentina (p. 50), Canada ("Soybeans are grown in very small quantities in Canada and then usually as a forage crop"), Philippines, Egypt, Cuba (p. 52), British Guiana, Mauritius (p. 53), present culture distribution. 5. Culture of the soybean: Climatic adaptations, soil preferences, water requirement, preparation of seed bed, time of planting, methods and rate of seeding, seeding for pasturage, depth of seeding, inoculation, fertilizer reactions, cultivation, soybeans in mixtures (with cowpeas, sorghums, Sudan grass, Johnson grass, millet, corn, or sunflowers and corn).

6. Harvesting and storage of soybeans: harvesting soybeans for hay, silage, for the seed, seed yields, proportion of straw to seed, storing seed, separation of cracked from whole soybean seed, viability of soybean seed, pedigreed, inspected, registered, and certified seed. 7. Composition of the soybean: Proportions of stems, leaves and pods, composition of plant and seed, nutritive and mineral constituents, forms of nitrogen in soybean nodules, factors affecting oil content of seed. 8. Utilization of the soybean: Diversity of uses (a chart, p. 129, shows 59 products that can be made from soybean seeds, and 6 more that can be made from soybean plants), soybeans for green manure, pasturage, soiling, ensilage, hay, straw.

9. Varieties: Japanese, Manchurian, botanical classifications, vital characteristics, descriptions of important varieties, key for identification, breeding and improvement, genetic behavior, oil content.

10. Structure of soybean seeds. 11. Soybean oil: Methods of extraction [Manchurian, and solvent], American oil mills, methods of shipping and marketing, prices, utilization in soap manufacture, food, paint manufacture, miscellaneous. 12. Soybean cake or meal: Feeding value, composition, use for feeding for dairy cows, cattle, swine, sheep, poultry, digestibility, injurious effects, fertilizer.

13. Soybean products for human food: Food value of the soybean, digestibility of the soybean and its products, mature or dry soybeans, immature or green soybeans (a "nutritious green vegetable"), soybean flour, digestibility of soybean flour, soybean bran (p. 225-26), soybean sprouts, soybean coffee, soybean or vegetable milk [soymilk]

(preparation, composition, residue from the manufacture of vegetable milk [okara], utilization of soybean milk, condensed vegetable milk, vegetable milk powder, fermented vegetable milk), vegetable casein, tofu or soybean curd (names and brief history, method of manufacture, coagulating agents, manufacturing yields, digestibility, utilization of bean curd and manufactured products, bean curd brains or *tofu nao*, dry bean curd or *tofu khan*, thousand folds {*chien chang tofu*}, fried bean curd {*tza tofu*}, Fragrant dry bean curd {*hsiang khan*}, frozen tofu {*kori tofu*}, Chinese preparation, various dishes), natto, hamananatto [hamanatto], yuba, miso, shoyu [soy sauce], confections. 14. Table dishes of soybeans and soybean products: mature or dry beans, flour, tofu, sprouts (86 recipes). 15. Enemies of the soybean: bacterial, mosaic, fungous [fungus], and nematode diseases, insects, rodents. This last chapter is a comprehensive review of the literature on soybean diseases and insects published before 1922.

The Preface begins: "The soybean, also known as soya or soja bean, has assumed great importance in recent years and offers far-reaching possibilities of the future, particularly in the United States. It is, therefore, desirable to bring together in a single volume the accumulated information concerning this crop..."

"The aim has been to present the information so as to make it useful from both agricultural and commercial standpoints, not omitting, however, much that is mainly of historical or botanical interest..."

The introduction begins: "There is a wide and growing belief that the soybean is destined to become one of the leading farm crops in the United States."

Note 1. C.V. Piper lived 1867-1926. Note 2. This is the earliest English-language document seen (July 2003) that uses the term "soybean bran" to refer to soy bran.

Note 3. This is the earliest document seen (July 2003) in which Piper or Morse describe natto, Hamanatto [Hamanatto], yuba, or miso.

Note 4. This book was published by March 1923 (See *Ohio Farmer*, 10 March 1923, p. 313). Address: 1. Agrostologist; 2. Agronomist. Both: United States Dep. of Agriculture, Washington, DC.

104. Piper, Charles V.; Morse, William J. 1923. Soybean coffee (Document part). In: Piper and Morse. 1923. *The Soybean*. New York: McGraw-Hill. xv + 329 p. See p. 227-28. [1 ref]

• **Summary:** "When properly roasted and prepared, the dried beans of any variety of soybeans make an excellent coffee substitute. As such the soybean has been used to a slight extent for many years in Europe, especially Switzerland, and in the United States. It is recorded that during the period of the Civil War the soybean was used rather extensively in the southern states as a coffee substitute. For a considerable while seedsmen sold the Ito

San variety under the names Coffee Berry and Coffee Bean. In Japan and southern Russia soybean coffee is prepared and put up in small packages for the market. This product is ground very fine and has much the appearance of coffee essence.

“Prepared as coffee, the soybean gives a liquid of the same color and odor as coffee and somewhat the flavor of a cereal beverage. Those fond of cereal drinks pronounce the soybean beverage equal to the best of the preparations on the market. According to Li Yu Ying and Grandvoinnet (1911-1912) the soybean dried and roasted, such as is used in Switzerland, has the following composition: Water, 5.27; cellulose, 4.97; carbohydrates, 34.76; fat, 18.01; total materials soluble in water, 49.07.”

Note 1. This is the earliest document seen (Nov. 2005) which states that soybeans were used as a coffee substitute during the Civil War in the United States. The source of this information is not given—and that is very surprising, since Piper and Morse are so careful about citing their sources in this book. Why did they omit this citation? Perhaps they had heard the story several times but were unable to find an early document to prove it.

Our 20-year search for documentation to verify the above statement has been unsuccessful. Soybeans had been cultivated in 9 southern states by 1865, however none of those states grew a significant acreage of soybeans in 1909—when soybean acreage statistics were first recorded. Therefore its hard to know where to start looking.

Note 2. This is the earliest English-language document seen (March 2001) that uses the term “soybean coffee” to refer to soy coffee.

105. Piper, Charles V.; Morse, William J. 1923. Agricultural history of the soybean: China, Korea and Japan (Document part). In: Piper and Morse. 1923. *The Soybean*. New York: McGraw-Hill. xv + 329 p. See p. 36-37.

• **Summary:** “The soybean is a plant of very early cultivation in China. According to Li-Yu-Ying and Grandvoinnet (1911-1912) the soybean is described in the book of *Materia Medica* ‘She-non’ written over 5,000 years ago. Note 1. This is probably the *Shennong Bencao Jing* (abbreviated *Benjing*) [Classical Pharmacopoeia of Shennong, the Heavenly Husbandman], which appeared in about AD 100.

“The celebrated dictionary of Sui Sham describes the plant under the name of ‘*tchouan*.’ Note 2. The is the earliest document seen (July 2007) that mentions the name “Sui Sham.” We have been unable to find any dictionary compiled by a man who name sounds even vaguely like his.

In another ancient dictionary, the ‘*Kouang-ia*’ [sic, *Guangya*, by Zhang Yi, AD 230] dating from the time of the Christian era, the soybean is called *ta-teou* or grand pea and also *sou*. It seems very probable that the names *soi*, soy,

soya and soja are all derived from the ancient Chinese name *sou*.

“In Manchuria the soybean is grown to a greater extent than in any other country, and its culture there is doubtless ancient. From Korea there have been sent to the United States Department of Agriculture many distinct varieties, the large number indicating long cultivation in that country. The culture of the soybean in Japan is likewise very old and many species peculiar to that country are in cultivation.

“No comprehensive account of the agricultural history of the soybean in any of these countries has yet been attempted, but doubtless much information is contained in ancient Chinese and Japanese literature.

“Several varieties different from any secured elsewhere have been introduced into the United States from Formosa, and the plant has probably been cultivated there for a considerable period.”

106. Lewkowitsch, Julius. 1923. Butter substitutes—Margarine, “Oleomargarine” (Document part). In: J. Lewkowitsch. 1923. *Chemical Technology and Analysis of Oils, Fats, and Waxes*. Edited by George H. Warburton. 6th ed. Entirely rewritten and enlarged. Vol. III. New York, NY and London: Macmillan and Co., Ltd. viii + 508 p. See p. 31-54. [79 ref]

• **Summary:** An in-depth treatment of the subject. Margarine is called “Oleomargarine” in America, *Margarine* in French, *Margarine* or *Kunstbutter* in German, and *Burro di margarina* in Italian. Older English-language names suppressed by legislation are “butterine” and “Dutch butter.” “Margarine consists either of a mixture of animal fats alone or of animal and vegetable oils and fats churned with cow’s milk to a butter-like emulsion, and colored yellow (unless forbidden by law) with annatto, methylorange, etc. The cow’s milk is sometimes replaced by an emulsion prepared from the kernels of almonds [almond milk] (see Li Yu Ying, Belgian patent 231,588) or from soya beans, so that it is possible to prepare a margarine from vegetable products exclusively” (p. 32). In the UK it is prepared exclusively from beef fat (called “oleomargarine” in the UK or “oleo oil” in the USA).

“Amongst the vegetable oils, cotton seed oil and cotton seed stearine, sesamé oil, arachis oil, and even soya bean oil take the most prominent place... Arachis oil (also olive oil) and sesamé oil are used to a greater extent in Europe than in the United States (p. 33).

“A general recipe for the manufacture of margarine containing oleomargarine as a preponderant basis is as follows:—Mix 65 parts of oleomargarine, 20 parts of vegetable oils, and 30 parts of milk. The yield is 100 parts of finished product, 15 parts of water being eliminated in the course of manufacture. The more milk used, the better will be the flavor of the margarine.” “For still lower qualities maize oil is said to be used in the United States...

as it is extremely difficult to remove or to mask the peculiar flavour of maize oil. Lard [pig fat] is not used so extensively in Europe as in the United States. In this country [England] oleomargarine is prepared exclusively from beef fat. Mutton fat, which imparts an unpleasant (“animal”) flavour to the margarine, is, however, used in continental margarine factories. In Russia, sunflower oil is used in the manufacture of margarine... The use of soya bean oil has also been proposed” (Korentschewski and Zimmermann, *Chemiker Zeitung*, 1905, p. 777) for use in margarine (p. 37).

At the end of this section is one titled “Vegetable butters” (p. 55-58). These include “fats or mixtures of fats... which are exclusively of vegetable origin, and have at the ordinary temperature a consistence approaching that of butter or lard.” They may be made from “cotton seed stearine,” coconut oil, or palm kernel oil. They are sold, for example, in “countries where the inhabitants are forbidden by their religious tenets to consume beef fat or hog fat (India, Turkey). In commerce such vegetable butters are known as ‘vegaline,’ ‘cottonseed,’ etc. The manufacturing processes for producing cotton seed stearine have been describe in the preceding chapter (Vol. II. Chap. XIV.)” Address: 71 Priory Rd., London, N.W., England.

107. *China Weekly Review* (Shanghai; Millard Publ. Co.), 1924. Science bodies want fund for research. 29(3):81. June 21.

• **Summary:** An article on the previous page explains that the Congress of the United States recently passed a resolution, and President Coolidge signed it, providing for the remission to China of further [2nd round of] payments of the American share of the China Boxer Indemnity. This was a large amount of money and there was much discussion in China as to how it should be used.

This article prints, in full, a memorandum, signed by many Chinese leaders, urging that the money be used to create a fund for scientific research. One of the signers was: “Li Yu-ying of the Biological Society of the Far East.”

Note: The money was actually used to fund a scholarship that provided for Chinese students to study in the U.S. Approximately 1,300 students were able to study through the program from 1909 to 1929. It has been called “the most important scheme for educating Chinese students in America and arguably the most consequential and successful in the entire foreign-study movement of twentieth century China” (Source: Wikipedia, Aug. 2008).

108. Horvath, A.A. 1926. The soybean as human food. *Chinese Economic Monthly* 3(9):392-400. Sept. [Eng]

• **Summary:** Contents: Introduction. 1. General ingredients [composition] of the various Manchurian beans. 2. Composition of some Japanese soybeans and of the

common American varieties. 3. Value of the soybean as food.

Introduction: “The soybean is a plant of very early cultivation in China. Its use dates back to the beginning of China’s agricultural age under the Emperor Shen Nung. It is mentioned in the *Ben Tsao Gang Mu* [*Pen-ts’ao kang-mu*], the ancient materia medica, written by Shen Nung himself in the year 2838 B.C. The celebrated dictionary of Sui Sham describes the plant under the name of *tchouan*. In another ancient dictionary, the *Kouang-ia* [*Guangya*, 230 AD], dating from the time of the Han dynasty, the soybean is called *ta-teou* [*dadou*], or grand pea, and also *sou*. It seems very probable that the names *soi*, *soy*, *soya*, and *soja* are all derived from the ancient Chinese name *sou*.

Note 1. This brief history of the soybean in China (above) is largely borrowed from Piper and Morse. 1923. *The Soybean*. p. 36-37.

In numerous ancient books the philosopher Hamintze [Lord Liu An of Huai-nan], a prince of the Han dynasty, is given as the inventor of soybean curd. The soybean and the soybean curd (*tofu*) are mentioned in many of the ancient Chinese poems, as for example in the rhymes of the great poet Sou, of the 2nd century: ‘The tender jade* gets perfumed by it in the kettle’ and ‘to boil the pea to milk and the seed to butter’ (Li Yu-ying et Grandvoinnet).” (Footnote: *) “The poet emphasizes the resemblance of the fresh *tofu* with jade.”

“In 1921 China produced 80 per cent of the world’s soybean production, 70 per cent of the latter being harvested in Manchuria. The 1921 crop of soybean in Manchuria was approximately 4,500,000 tons. The total acreage of soybean in the three provinces was 8,000,000 acres, covering 25 per cent of the total cultivated area.”

In the section titled “General ingredients of the various Manchurian beans,” four long tables give the nutritional composition of some of the roughly 500 different varieties of Manchurian soybeans, including black soybeans. The Chinese names of the varieties are given. Most of the analyses were conducted by the South Manchuria Railway Co. Table 1 gives the names (all are Chinese names), composition (water, fats, and protein) of 26 Chinese soybean varieties. The averages are: Water 8.60%. Fatty substance 19.90%. Protein 42.84%.

Table II gives the composition of 15 soybeans grouped by color, including the Chinese name, place of production, water, protein, fat, carbohydrates, fibrous tissue, “ashy substance,” and analyst (incl. Fengtien Experimental Farm, Mantetsu Experimental Farm, and Mantetsu Central Exp. Farm). “Generally speaking, yellow beans are richest in protein and fat, especially the latter, then comes green beans with black beans last.

In Table III the “Kung Chu Ling Experimental Station classified the different kinds of yellow soybeans produced in Manchuria by the colours of navel [hilum] and compared

their chemical composition. No significant differences were found. Table IV shows the composition of mixed soybeans stored in Manchuria during 1919 and 1920. A Manchurian grading system is described based on five factors: Shape and size (15 points), weight of 1 *sho* (10 points), lustre (15 points), dryness (25 points), purity (cleanness) (30 points). Soybeans receiving a score of 90-100 points are graded as a Special Class, those with 80-90 points as First Class, and those with 70-80 points as Second Class (Nakao and Usami). This table shows the average composition to be: water 8.5%, fatty substance 18%, protein 40%, soluble non-nitrogenous substance and fibrous tissue 28%, ashly substance 5.5%. The higher grades contain more oil and protein.

In the section titled "Composition of some Japanese soybeans and of the common American varieties," table V (p. 397) gives the composition of four leading Hokkaido soybeans: Tsuru-no-Ko, Kanro, Yoshi-Oka, and Oh-Ya-Gi. The water content averages 16.47%, the protein content ranges from 39.34 to 36.86% (average 37.62%), and the fat content ranges from 19.08 to 17.86% (average 18.66%). Table VI gives the composition of six leading American soybean varieties: Mammoth, Ito San, Haberlandt, Guelph, Midwest, and Kingston. The water content averages 7.74%, the protein content ranges from 36.59 to 32.99% (average 35.00%), and the fat content ranges from 22.72 to 18.96% (average 20.37). Note that the Hokkaido soybeans contain more than twice as much moisture, 7% more protein, and only 91.6% as much fat.

The section titled "The value of the soybean as food," states: "One of the certain evidences that the soybean is making god headway in the Occident is the fact that about 10 years ago [during World War I] the French army replaced a large portion of the meat powder in the army ration pottage by soybean products, and has used it in several forms as part of the regular ration. Germany and Austria also tried to compensate the poor protein diet of their army and population during the Great War by using soybean products."

"The soybean contains a double amount of the protein and of calories present in beefsteak. Therefore, in Peking, where the retail price for soybean in 1925 averaged 4 cents (Mex.) per one pound, half of a pound, costing 2 cents, may provide for an adult the necessary protein minimum, which otherwise would have to be purchased in the form of one pound of meat, costing at least 20 cents. According to Li Yu-ying, author of the well-known monograph (in French), 'Le Soya,' and now connected with the Kai Cheng Bean Products Company in Peking, the market prices for an equivalent of 100 calories in soybean were, in Paris in 1912, thirty times cheaper than for the same 100 calories in beef." In Germany, Ehrhorn (a well-known soybean food specialist, formerly of the Aguma factories in Harburg, Germany) calculates that 500,000 tons of soybean residue

[meal and cake] are available every year. Soybean protein in Germany is now 25 times cheaper than beef protein. In China, where undernutrition is found on a large scale and famine is a common occurrence, soybean cake is used mainly as a fertiliser for rice fields and sugar plantations—rather than as a low cost source of protein. Numerous famine relief committees in China "have come to the conclusion that one key to the famine relief problem in China is to stop the waste of precious soybean cake for fertiliser." Note 2. This is the earliest English-language document seen (Nov. 2002) that uses the word "undernutrition."

Reprinted in 1927 as part of an 86-page monograph titled "The Soybean as Human Food" (Peking, China).

Note 3. This is the earliest document seen (May 2011) in which Dr. Horvath gives his title as "M.D."

Note 4. This is the earliest document seen (July 2000) that mentions the soybean variety Kanro. Address: M.D., Peking Union Medical College, China.

109. Horvath, A.A. 1927. The soybean as human food. *Chinese Economic Journal* 1(1):24-32. Jan. [17 footnotes. Eng]

• **Summary:** Contents: The whole soybean as food: Immature or green soybeans, mature or dry soybeans, the digestibility of the boiled soybean seeds, boiled soybeans as a food of predominant importance in China, soybean coffee, soybean chocolate, soybean sprouts.

Concerning mature dry soybeans: "In China the green seeded variety is soaked in fresh water or salted water and roasted, the product being eaten after the manner of roasted peanuts. In Japan the black soybeans are used chiefly for cooking, with sugar and soy sauce; the green variety is also used in this way, either in the fresh state or after being dried (Oshima). Generally speaking, the use of whole soybeans has not been attended with much success either in the Orient or Western countries, because, with the ordinary method of cooking, they remained hard and unpalatable. It has been found that cooking at a temperature somewhat above boiling breaks up the cellulose structure and develops a richness of flavor that is not obtainable at the lower temperature. Although this result can readily be secured in high pressure steam cookers [pressure cookers], the problem is to know how to accomplish this with ordinary household equipment." Dr. J.H. Kellogg cooks the beans in a saturated solution of salt at about 107°C. "The method of Durand does not require a special jar. The soybean seeds are soaked overnight in salt water and boiled in fresh water to which some sodium bicarbonate is added. If the foam is not allowed to flow over, the seeds will be ready for consumption in two hours." "The water in China is known to be hard as a rule and this may be the chief reason why the Chinese are not using boiled soybeans in a noticeable amount. If soda [a natural product of China, being collected

in Mongolia from soda lakes] were used in China for boiling the soybean seed soft, thus doubling the digestibility, it may revolutionize the nutrition of the Chinese population.”

Concerning soybean coffee (p. 30-31): “During the period of the Civil War in America, the soybean was extensively used in the southern states as a coffee substitute. For a considerable time seedmen sold the Ito San variety under the name of Coffee Berry and Coffee Bean (Piper & Morse [1923]). Soybean coffee has been used in Western Europe, in Switzerland, and in the Alpine Provinces of former Austria since the introduction of the soybean to Europe. Horvath, 50 years ago, was the first to prepare soybean coffee for the market in South Russia. In 1913 Marschner (Bohemia) put on the market a soybean ‘coffee without caffeine’ [caffeine] under the trade mark ‘Santosa.’ In Germany, Fischer and Follmann (Dresden) also manufactured soybean coffee for the market... In China an ‘artificial bean coffee’ is prepared by the Kai Cheng Bean Products Company, Peking. (Note: Li Yu-ying is connected with the company). It is claimed to be ‘a good substitute for real coffee, cures constipation, and improves the appetite.’”

Concerning soybean chocolate (p. 31): “In recent years the demand for cocoa has risen sharply and the supply has run short... Li Yu-ying’s soybean products factory in the vicinity of Paris* succeeded in preparing a chocolate from soybeans, sugar, and cocoa butter. The chemical composition, the aspect and the taste are close to that of real chocolate (Footnote: *”Formerly *L’usine de la Caseo-Sojaïne* [*Caséo-Sojaïne*], now *Société Française pour l’exploitation du soja et de ses derives*, 48 Rue Denis-Papin, Les Vallées-Colombes.)” Note: This is the earliest document seen (July 1996) that mentions Li’s *Société Française*...

Concerning soybean sprouts: “Soybeans soaked in water and allowed to sprout are much relished as a vegetable by the Chinese.” One kg of soybeans yields about 4 kg of sprouts. The yellow- or green-seeded varieties are generally used for growing sprouts.

Reprinted in 1927 as part of an 86-page monograph titled “The Soybean as Human Food” (Peking, China). Address: M.D., Peking Union Medical College, China.

110. Horvath, A.A. 1927. The soybean as human food. *Chinese Economic Journal* 1(3):298-309. March. [24 footnotes. Eng]

• **Summary:** Contents: Soybean milk for food: Introduction. Preparation of soybean milk. Properties (Yu-P’i is Chinese for yuba; Laxa). Market prices. Composition. Nutritive value. New methods in the manufacture of soybean milk (Prof. Laxa in Prague [Czechoslovakia], Li Yu-ying, Soyama). Some dietetical advantages and applications of the soybean milk. Condensed soybean milk and milk powder (Soy Lac soybean milk powder made in America by Chard). Soybean cake, soybean meal and soybean flour as

material for soybean milk. Yu p’i and yu ba (yuba; also fu chu).

“In 1905, Li Yu-ying submitted a paper on the subject [of soybean milk] to the 2nd International Milk Congress in Paris, in which he emphasized that the introduction of soybean milk to Western countries ‘will be highly beneficial to public health as well as to the budget of the poor.’ Also by those who advocate and urge a vegetarian diet, a very strong case can be made for this Oriental substitute” (p. 298).

According to Prof. Laxa: “Soybean milk, supplemented with lactose and inoculated with a culture of yoghurt [yogurt] bacteria, coagulates at 40° C. in 4 hours and gives a curd-like acid mass” (p. 300).

“Market prices. In Peking soybean milk is sold in small bottles in portions of about 200-220 cc. labeled ‘Bean milk, a Chinese product, the most nourishing food, made by... For such a bottle, delivered daily, the big factories of Peking asked in 1925 \$1.00 (Mex.) per month. One liter of such milk costs, therefore, about 15 cts. (Mex.)... A fine soybean milk powder, called *Soy Lac*, has recently been prepared in America by Chard” (p. 300-01). Note: This company (Chard) was first referred to by Piper and Morse in 1916 in *USDA Bulletin* No. 439, “The soy bean, with special reference to its utilization for oil, cake, and other products.” *Soy Lac* is mentioned again by Horvath on p. 307.

A table (p. 302) compares the composition of soymilk made in 3 locations (Tsinanfu, China; Peking, China; and Japan) with that of human, cow, and goat milk. Human milk has the lowest protein content (1.25%) and ash content (0.25%); soymilk has about the same protein content as cow’s milk (3.3%) but an ash content (0.40%) which is higher than that of human milk but lower than that of cow’s milk. Footnote: “To supplement the deficiency of the soybean milk in mineral constituents [such as calcium], it is recommended by von Noorden and Salomon to add to it the salt mixture of Pirquet, which consists of: sodium chloride, 0.3 gm.; potassium chloride, 1.1 gms.; calcium glycerophosphate, 1.7 gms.; magnesium lactate, 0.5 gm.; ferrum glycerophosphate, 0.1 gm. This mixture is called *Nemsalz*. If diluted in 1 liter of water it gives the same percentage of salts as in women’s milk” (p. 302).

“In Germany the Soyama factory (in Frankfurt) manufactures soybean fresh milk (mostly from soybeans), soybean normal cream, and also condensed bean milk and cream. Soyama bean milk looks like cow’s milk, contains the same constituents, even in larger amount and in a state of finer dispersion. Only its taste is different. According to Fuerstenberg, Soyama milk can be qualified as a special, very valuable dietetic nutrient. The high lecithin content of this preparation adds to its value too” (p. 306). A table (p. 306, based on the analyses of Dr. G. Popp of Frankfurt) shows the nutritional composition of 6 types of Soyama milk and cream preparations: Normal milk. Milk for

diabetics. Milk for baking purposes. Normal cream. Cream for diabetics. Cream extra rich in fat (especially for diabetics). "According to von Noorden and Salomon, Soyama preparations may be kept as long as almond milk and Paranut milk. Soyama milk looks just like cow's milk. By keeping, cream separates and it must be shaken before using" (p. 306).

"In using Soyama milk and cream preparations, v. Noorden confirms the following statement of Fischer (for vegetable milk in general): '1. In the stomach soybean milk gives a much finer flocculent precipitate than does cow's milk, produced by acid or even rennet. 2. The ingestion of soybean milk results in a feebler (smaller) secretion of gastric juice; the period of secretion is also shorter. 3. The period of stay in the stomach of the finely flocculent precipitate of the soybean milk is shorter than that of the casein-fat coagulum of cow's milk. 4. The peristaltic motion of the stomach is less after the ingestion of soybean milk and more coordinated than in the case of cow's milk, as shown by X-ray investigation'" (p. 307).

"On the basis of these observations soybean milk is recommended by v. Noorden in cases of gastric and duodenal ulcer, states of peritoneal irritation, hypersecretory conditions of the stomach, disturbances of the motility of the stomach, uric acid diatheses, kidney disturbances, conditions with edema where a food poor in sodium chloride is required, Basedow's disease, cholecystitis, cirrhosis of the liver, diabetes, and in cases where a very nutritious diet is required" (p. 307).

"Soybean milk powder will undoubtedly have a successful future in the Orient as well as in European countries and the United States. Its great advantage in comparison with cow's milk powders is its cheapness. Soybean milk powder can be easily stored and transported... It is believed that at present come of the commercial milk powders contain an admixture of soybean milk powder" (p. 307-08).

A table (p. 309) gives the nutritional composition of five types of yuba: Common yuba, Kyoto yuba, Shimada yuba, Peking yuba, and Fu chu. "In Japan, Kyoto and Nikko are noted for *Yu Ba*."

Reprinted in 1927 as part of an 86-page monograph titled "The Soybean as Human Food" (Peking, China). Address: M.D., Peking Union Medical College, China.

111. Horvath, A.A. 1927. The soybean as human food. Peking and Shanghai, China: Chinese Government Bureau of Economic Information. Booklet Series No. 3. 86 p. May. Reprinted from Chinese Economic Journal, Sept. and Nov. 1926, and Jan. to April 1927. No index. 21 cm. [38 ref]

• **Summary:** A very original and important book. Contents: Preface by Macey F. Deming, Tappan New York, from an address at a meeting of the National Soybean Growers', held at Washington, DC, Sept. 1925. Introduction. 1.

General ingredients of the various Manchurian beans. 2. Composition of some Japanese soybeans and of the common American varieties. 3. Value of the soybean as food. 4. Soybean oil for food. 5. Refined soybean oil: As substitute for salad or frying oil, as substitute for hardened oil and lard (hydrogenation), in oleomargarine and vegetable butters. 6. Whole soybean as food: Immature or green soybeans, mature or dry soybeans, the digestibility of the boiled soybean seeds, boiled soybeans as a food of predominant importance in China, soybean coffee, soybean chocolate, soybean sprouts.

7. Soybean cake, soybean meal and soybean flour for food: Soybean press cake, soybean extraction meal, soybean flour (Berczeller, Soyama, Aguma, lecithin, Ehrhorn), Sojawurze (Suppenwurze, Maggi cubes), digestibility of soybean flour, value for infants (p. 53, based on the research of Dr. Ruhrah in the USA), some medical aspects of the use of soybean flour, soybean flour in diabetes. 8. Soybean milk for food: Introduction, preparation of soybean milk, properties (incl. inoculation with a culture of yoghurt [yogurt] bacteria to give a curd-like acid mass), market prices, composition, nutritive value, new methods in the manufacture of soybean milk (Prof. Laxa in Prague [Czechoslovakia], Li Yu-ying, Soyama), some dietetical advantages and applications of the soybean milk, condensed soybean milk and milk powder (Soy Lac soybean milk powder made in America by Chard), soybean cake, soybean meal and soybean flour as material for soybean milk, *yu p'i* and *yu ba* (yuba; also *fu chu*).

9. Soybean curd (tofu) for food: Preparation and types (classical name is *li chi*), historical, present state (of tofu in China), chemical composition, digestibility, utilization. 10. Fermented soybean products for food. Soy sauce: Kibiki and sobiki tamari, composition of various soy sauces. Natto. Miso. Conclusion. Bibliography.

On page 9 we read: "An industry which promises to be of importance in a further utilization of the soy bean is the manufacture of 'vegetable milk.' At the present time a factory in New York State is being equipped for this purpose." Address: Peking Union Medical College, China.

112. Bois, Désiré. 1927-1937. Les plantes alimentaires chez tous les peuples et à travers les âges. Histoire, utilisation, culture. 4 vols. [The food plants of all people across the ages. History, utilization, culture. 4 vols.]. Paris: Paul Lechevalier. See vol. 1, p. 119-30. Vol. 3, p. 153-55 (shoyu). (Encyclopedie Biologique, vol. I, III, VII, XVII. Fourth edition of Le Potager d'un Curieux by Paillieux and Bois). Illust. Index + Index of Illust. 25 cm. [12 ref. Fre]

• **Summary:** Vol. I. Phanérogames légumières. The section on the soybean (*le Soya*) (p. 120-130), discusses the history of the plant in various countries, the oil and its uses, the preparation of soybean cheese and soy sauce, the nutritive value of the soybean, the place of the soybean in the culture

of various countries including the United States, yields of various varieties, and use as a forage crop.

At its annual lunch on 15 May 1911, following its tradition of introducing new products from little-known plants, the Society for Acclimatization (in France) served samples of various soyfoods (*plusieurs préparations à base de Soya*) prepared by Mr. Li Yu-Ying, technical director of a factory established on the outskirts of Paris for the preparation of various products from this legume: vegetarian ham (*jambon végétal*), soy cheese (*fromage de Soya*), soy preserves (*confitures de Soya*), soy bread (*pain de Soya*), etc. (p. 126).

Vol. III. Plantes à épices, à aromates, à condiments. The section on shoyu (p. 153-155) describes soy sauce and its preparation. Note: Désiré Bois lived 1856-1946. Address: Prof., France.

113. Nouelle, Georges. 1929. Les emplois du soja [Uses of soybeans]. *Annales Coloniales (Les)* No. 137. Sept. [Fre]*

114. Nouelle, Georges. 1930. Les emplois du soja [Uses of soybeans]. *Revue Agricole (Guadeloupe)* 3(4):118-20. April. Reprinted from *Les Annales Coloniales*, No. 137, Sept. 1929. [Fre]

• **Summary:** Describes the various food uses of the soybean, including soymilk, concentrated, powdered, or fermented soymilk, soy flour, soy oil, soybeans consumed as a vegetable (fresh soybeans are prepared like peas), soy sprouts, soy sauces, soy confections, soy chocolate, and soy coffee.

The soybeans also has uses other than for food, in making candles, colors, and in the form of Sojalithe as an electrical insulator.

115. Woodhead, Henry George Wandesforde. 1931. China year book. Shanghai, China: North China Daily News & Herald. xiv + 728 p.

• **Summary:** In Chapter 7 is a long section on “Soy-beans and products” (p. 133-37), which includes: History of the soybean in China and Europe, the different types of soybeans, bean cake and bean oil are the other main articles of trade, overview of exports, graph (p. 135) of exports (in piculs) from all of China in 1927, 1928, and 1929, Manchuria’s soy-bean crop in 1929 divided into South Manchuria and North Manchuria (production in the latter region is 50% larger than in South Manchuria), tables showing export of beans, bean meal and cake (in piculs and Hk. tael) in 1928 and 1929; the main types exported in 1929 are (in million piculs, in descending order of predominance): Yellow [soy] beans 41.015 Bean cake [soy] 18.715. Read beans [azuki?] 1.274. Broad beans 1.165. Bean meal [soy] 0.654. Green [small = mung] beans 0.564. Green [soy] beans 0.347. Black [soy] beans 0.261. White beans 0.218.

Li Yu-ying is mentioned in three places: Page 454 (left column), under Academia Sinica: “In May, 1927, Dr. Ts’ai Yuan-p’ei, Mr. Li Yu-ying and Mr. Chang Jen-chieh—all veteran Kuomintang leaders—were commissioned by the Nationalist Government to draw up plans for the establishment of a National Central Academy for Scientific Research.” The various organs of the Academia Sinica are “in the three cultural centres of Nanking, Shanghai, and Peking.”

Page 584 (both): Li is listed as a member of the Central Supervisory Committee, and of the Central Political Council.

Page 626 (right), a biography of Li states: “Courtesy name: Shih-tseng. Born 1882; native of Kaoyang, Chihli. Studied in France and established first beancurd [tofu] factory at Paris; associated with Wu Chih-hui, Wang Chao-ming, Ts’ai Yuan-p’ei and other revolutionary leaders. One of the most influential Kuomintang’s ‘Elder Statesmen.’ 1919, dean, law department, Peking National University. 1928, chairman, Peking branch, Kuomintang Central Political Council. Member, Kuomintang Central Supervisory Committee, since 1924. Member, Kuomintang Central Political Council, since 1926. Aug. 1928 to Nov. 1930, president Peking National University. President, Franco-Chinese University, Peking, since 1925.” Address: C.B.E., China.

116. Abadal, D. Jose; Soroa, Jose Maria. 1932. Cultivo y aplicaciones de la soja [Cultivation and applications of the soybean]. Madrid: Patronato Central para la Proteccion de Animales y Plantas. 44 p. Illust. [Spa]

• **Summary:** Contents: Introduction (preliminary notes). Part I: Cultivation and applications of soya. Chart of utilization of the soybean seed. Agronomic notes and details on soybean cultivation. Part II: Soya as a food. Nutritional value, soya as a vegetable (green vegetable soybeans; *Soja, como verdura*), soy sauce (*salsa de soja*), soymilk (*leche*), condensed soymilk (*leche concentrada / condensada*), powdered soymilk (*leche en polvo*), fermented soymilk (*leche fermentada*), soy cheese (*queso de soja*) [tofu], soy casein (*caseina de soja*), soy flour (*harina de soja*), soy bread (*pan de soja*), Soyolk (soy flour made by Dr. Berczeller), whole-grain soy bread (*pan integral*), soy flour tablets (*comprimidos*), pastries, biscuits, puddings, etc. (*pasteles, bizcuchos, puddings*), soy oil (*aceite de soja*), fermented soy products (*productos de la soja fermentada: natto, miso, shoyu*), confectionery products (*productos de confiteria*), chocolate (*chocolate*), coffee (*café*), soy ferments/enzymes (*fermentos de soja*), products made by Caséo-Sojaïne (*Caseo-Sojaïne de Paris*). Soy as a livestock food. Appendix.

“As early as 1918 a Spanish public official, Don Julio de Palencia, the Spanish Consul in Shanghai, sent the State Department (*Ministeria de Estado*) a magnificent report

specifying the great attention that representatives of the principal countries of the world were giving to this crop [the soya bean], and the relevance that it would have in the agricultural economy of the future. What a pity that Spain has been the only civilized country to ignore the study of the soya bean and its exploitation on a large scale" [p. 5].

"Finally we must make public our thanks to the spokesmen of this foundation/board (*Patronato*) for the special work they have done in writing this booklet: Don José Maria de Soria, secretary of the Special School for Agricultural Engineers (*Escuela Especial de Ingenieros Agrónomos*), and Dr. Don José Abadal, chief of the Bureau for the Inspection of Pharmaceutical Services of the Ministry of War (*Negociado de la Inspección de Servicios Farmaceuticos del Ministerio de la Guerra*)" [p. 6].

"In 1917 the Spanish Consul in Shanghai, Don Julio Palencia, sent to the State Department a study on cultivation of soya, proposing that tests be done to acclimatize this valuable crop to our country.

"In Motril and later at the southern agricultural station of Malaga, the agricultural engineer D. Arsenio Rueda has been cultivating soya for the past 10 years [i.e. since 1923] in plots of 5 ares [1 are = 100 square meters], obtaining 60 liters (each liter weighing 780 gm) in each one.

"The white as well as the black varieties give good results, though the white ones do best. The seeds have been distributed to farmers who have noticed that, even though at first the goats that were given them as food rejected them, after a few days of getting used to this grain preferred them to such an extent that one must avoid growing this plant near the herd's path lest the herd be attracted and devour it all.

"Although soya is a legume which draws many nutrients out of the soil (*esquilante*), it has according to Mr. Rueda, sufficient interest since it allows usage of terrains where field beans cannot be used due to the invasion of the pest called *Orobanche speciosa*, commonly called 'Jopo.' This parasite does not attack soya...

"Besides the quoted trials, it have been more than 25 years since soy has been grown in Spain with success due to the interest and zeal that in their patriotic work, the agricultural engineer Mr. Eduardo Noriega undertook with his partner, Mr. Ortiz, on the farm of 'Jerez.'

"He was successful during many years using the yellow and black varieties, later on also cultivating it in the Spanish central region.

"We think it useful also to state in writing the following data about soy grown by Dr. D. Jose Abadal in Lerida during the years of 1925-1926.

"The experiment was done only out of curiosity, with the intention of seeing if it could be grown in said province. Japanese seeds of the hirsute soy variety, yellow seed, used as food for diabetes, were used. The planting was done in a garden with seeds that had been soaked for ten hours, with

no more care or fertilizers than those used for all the existing plants of that garden. The terrain of course was one of easy irrigation and located in Lerida where it is very hot all during the summer.

"This brief essay demonstrates that soy can be grown in irrigated terrain in very hot places and with little care.

"Fifteen years ago, the agricultural Engineer D. Jesus Andreu, in the province of Pontevedra [in the northwest corner of Spain, just north of Portugal, bordering the Atlantic ocean], did some tests with good results on growing soy as a forage plant.

"We also have news, though not concrete, of other successful tests done in the provinces of Madrid and Toledo." Address: 1. T.C. Farmaceutico Militar; 2. Ingeniero Agronomo e Ingeniero Sanitario, Spain.

117. L'Heureux, L. 1933. Le soja [Soya]. *Congo: Revue Generale de la Colonie Belge* 1(2):214-36. Feb.; 1(3):365-83. March. (Bulletin de l'Office Colonial, Bruxelles). [14 ref. Fre; eng+]

• **Summary:** This early publication on soyfoods in Africa describes food uses and methods of preparing soymilk, in both condensed and powdered forms. Tunisia was a French protectorate from 1881 to 1956, when it became independent. France grew soybeans there, apparently at about the same time it started growing them in Algeria (p. 214).

At the exposition of Nanking in 1910 some 400 varieties of soybeans were assembled (p. 214).

In 1908 the firm of Mitsui was the first to try to transport, by sea, soybean seeds from Dairen to Liverpool. It was the beginning of a new industry in England (Liverpool and Hull), in Germany, Denmark (Copenhagen), and Holland (Rotterdam & Amsterdam).

A former Belgian missionary in Jehol (West Mongolia), Father De Preter (*Le T.R.P. Fl. De Preter, Supérieur de la Maison des Pères de Scheut à Yvoir*) has corresponded with the author about soybeans, tofu, and soybean cake in that city. Soybeans are not cultivated on the best soils, which are reserved for wheat. One of his colleagues at Jehol, Father Cyr. De Puydt has worked to improve the soybean crop (p. 219).

Father De Preter has often helped in making tofu (*fromage de soja*), using magnesium chloride as a coagulant. If one uses calcium sulfate, the tofu is softer and the taste seems better. Father de Puydt has improved the manufacture of tofu by using magnesium salts (probably Epsom salts) in place of magnesium chloride. The tofu is eaten after being boiled in water or fried in fat. It is best when fresh. In winter, it is allowed to freeze [frozen tofu in northeast China] so that it can be kept for a long time; it becomes spongelike. But fresh tofu has a special aftertaste to which the European palate finds it difficult to get accustomed. This taste does not come from the coagulant

but from the soybeans. When one eats more than two pieces of tofu in succession, one experiences indigestion. It does not produce gas like the beans. Notes that the factory of the Caséo-Sojaïne near Paris, of which Mr. Li Yu-ying is the director, makes tofu and various tofu products. Cooked with eggs, tofu makes an excellent omelet. Cooked with the juice of meat, it takes on entirely that flavor. It can be used to make patés or smoked. Use firm tofu and cook in a mixture of 4:1 water to soy sauce. Then smoke it like meat. This can, for example, replace ham or bacon in an omelet. Tofu paté has much the same consistency and taste as paté de foie gras. Thus, there are many ways that tofu can replace meat (p. 221-24).

Using caséine or légumine of soymilk, the French pioneered industrial soy protein isolates in 1911 (see Beltzer). They were used in various glues, and in coating paper (p. 224-25).

The margarine industry employs only the finest quality oils. Soy oil was not introduced to margarine manufacture in Europe until about 12 years ago [i.e., 1921], but it has rapidly taken an important place on account of its good properties and low cost. Describes how to make synthetic rubber from soy oil. One of the main uses of soy oil in Europe is in making soaps. Some is also used to make explosives. Mr. Tihon is the distinguished director of the Laboratory of Industry and Commerce at Leopoldville, Belgian Congo (p. 227-28).

Soybean cake (*Tourteau*): Father de Preter in Jehol has assured me that soybean cake is used there to nourish and fatten beasts. For horses, this cake has a surprising effect. If a horse, returning from a trip lean and exhausted, is put on a regimen of soybean cake, it will return to normal in 15 days (p. 230).

Just like the oil, the cake is more and more in demand in Europe, and in certain countries the effect of soybeans on the economy is quite remarkable. Until about 30 years ago, Denmark was a super producer of wheat. But Dutch products were defeated by the lower prices of American goods. Aided by soybeans, the Danes were able to expand their livestock. Soybeans are now imported, the oil is extracted and used to make margarine, while the cake is used to feed livestock—some 18.5 million heads in 1926, not including poultry. The result has been the development of an enormous trade in animal products, butter, cheese, ham, bacon, lard, eggs and even livestock—all accounting for about 70% of Danish exports. Holland is in a similar position (p. 230-31).

In 1912 the “Dairen Mill Owners Association” was founded. By June 1923 all but 7 of the mills in Dairen were members of the association. The oil in the Suzuki mill is extracted using benzine solvent, the most modern method. 32 of the mills, mostly owned by Japanese, use hydraulic presses, while those owned by the Chinese generally use hand-turned screw presses (p. 231-32).

A large table (p. 323) shows exports of soybean seeds, cake, and oil from the ports of Dairen, Newchwang, Vladivostok, and total, from 1908 to 1917. During this time, because of Manchurian mills, the amount of seed decreased, while the exports of cake and meal increased.

Condiments: Shoyu (*shoyou*) is the main one. Several processes for making soy sauce are described in detail. Lea & Perrins Worcestershire Sauce is nothing but a highly seasoned soy sauce (p. 234).

Continued (p. 365): Mr. L. L’Heureux is director of the chemical service of the Belgian Congo. Let’s see what the soybean is doing in the Congo. M. Tihon of Leopoldville, said in an interesting report titled *A propos du soja hispida*: Encountered 30 years ago [i.e., about 1903] at Stanleyville by commander Lemaitre, it figured in the collection of the botanical garden of Eala and was the object of experiments at Sankuru in 1914-15 (p. 365).

In this report, Tihon analyzed 3 varieties of soybeans from the plantations of Eala. The soybean would be good for all our [Belgian] colonies; it could replace meat and be used in the rations of black workers (p. 366-67).

Soymilk: Describes how to prepare it and its properties. According to Prof. Laxa of Prague, fresh soymilk has an acid reaction. Mentions the work of Li Yu-ying. Notes that by adding lactose and a bacterial culture, Yogourth [yogurt] can be made from soymilk (p. 370).

In Peking, soymilk is sold in small bottles of 200-220 cc carrying the title *Lait de pois—Un produit chinois. La nourriture la plus nourrissante. Préparé par ____*. In 1925 one bottle of soymilk daily cost 1 dollar Mex per month. In 1919 in Shanghai, Peking and Dairen, Chinese companies furnished hospitals and private individuals 8-10 oz of concentrated soymilk in bottles (p. 371-72).

A table (p. 373) compares the composition of 3 types of soymilk with mother’s milk, cow’s milk, and goat’s milk; all but the cow’s milk (87.00%) contain 90.71% water. The soymilks are: (1) From Tsinan fu, China. (2) From Peking, China. 3. From Japan. The soymilk from Peking was low in fat, so yuba had probably first been removed from it (p. 372).

In China, soymilk is habitually drunk sweetened with sugar. Li Yu-ying reports that one of his parents was nourished from birth with soymilk and for 37 years he has always been in excellent health (p. 374).

A new method for making soymilk. In 1916 Prof. Laxa of Prague develop a method for making soymilk in homes in Europe. The cost of a liter of soymilk in Prague in 1916 was estimated by Laxa as being about 40 centimes if it was homemade. Before the war, there was in London a soymilk factory which intended to place its products regularly on the market. Plans were made to construct two other plants, one in Manchester and one in Liverpool. The synthetic milk syndicate launched a soymilk on the market that was adapted to European tastes. The syndicate’s factory,

established in Liverpool, used the method of F. Goessel to make 100 liters of soymilk using the following formula (which is given). A Dutch patent (No. 2122 of Sept. 1917) and a Japanese patent (No. 28346) are also cited (p. 375-77).

A table shows the composition of 6 types of Soyama soymilk according to the analyses of Dr. G. Popp of Frankfurt. The protein ranges from 2.5% to 3.77%. Normal soy cream contained 11.5% fat, whereas that which was extra rich for diabetics contained 30% fat. It is very difficult to tell the difference between tea, coffee or chocolate to which one has added Soyama soy cream compared with regular dairy cream (p. 379).

In using the Soyama milk and cream, von Noorden confirms the following statement of Fischer, who studied vegetable milks in general: 1. In the stomach, soymilk gives a flocculent precipitate which is finer [smaller clumps] than that produced by cow's milk. 2. The digestion of soymilk requires only a weak secretion of gastric juice; the period of secretion is therefore short. 3. The time that soymilk protein resides in the stomach is shorter than that of cow's milk protein. 4. The peristaltic action of the stomach is less after ingestion of soymilk and better coordinated. Therefore, based on these observations, von Noorden recommended soymilk over cow's milk (p. 380).

Hatmaker made powdered soymilk. A table shows its composition, as analyzed by a laboratory in Paris (p. 380).

Yu P'i and Yu Ba are the Chinese and Japanese names of yuba, respectively. Recently a new method for making yuba has been patented in Japan. It consists in the use of an electric ventilator placed above the surface of the cooking pot containing soymilk that is not heated above 90°C. A table (based on analyses of the Tokyo Laboratory of Hygiene, of Embrey, and of Adolph) then gives the nutritional composition of 5 types of yuba, including Fu Chu (dried yuba sticks) which (surprisingly) contain 53.68% water. Address: Directeur du Service Chimique du Congo Belge.

118. Hou, Kia-wo (Hu, Chia-mo). 1933. Contribution à l'étude de l'action des ferments de la graine de soja sur les lipides [Contribution to the study of the action of soybean enzymes on soybean lipids]. PhD thesis, Faculté des Sciences, Paris. 76 p. Printed as a book by Les Presses Modernes, Paris. No index. 28 cm. [92 ref. Fre]

• **Summary:** Contents: Introduction. 1. The soybean from botanical, agricultural, chemical, physiological, and biochemical viewpoints. 2. Soy-based food and industrial products. 3. Study of the transformations undergone by lipids in the production of soymilk and tofu. 4. The existence of oxidative ferments of lipids or "lipoxydases" in soybean seeds and in common beans. 5. Study of soybean lipoxydase. 6. Comparative study of normal soy oil and that oxidized by soy lipoxydase. 7. The action of soy lipoxydase

on various other animal and vegetable oils (non-drying, semi-drying, drying, from marine animals, from terrestrial animals). 8. Gas-volumetric studies concerning the action of lipoxydase. Conclusion. Bibliography.

In the book, the author (who is from Kirin [later called Jilin], Manchuria) pays homage to Gabriel Bertrand (his "president of thesis") and his "maitres" Richard Fosse (a professor) and Emile Andre.

In the Introduction we read: "It was right after the first foreign threats that a group of young Chinese decided to come to Europe to study under the patronage of the Franco-Chinese Society for Education (Société Franco-Chinoise d'Education) in order to acquire the new knowledge which would better allow us to assure the defense of our country. Let us render a just homage to the founders of this society: Tsai Yuen-Pei, Li Yu-Ying, Painlevé and Herriot... At the time of my return to China 4 years ago (i.e. 1929) it was thanks to the recommendations of Doyen Maige and of professors Pelabon, Pariselle and Fosse that I was able to find a good welcome near to Presidents Li Yu-Ying and Li Shou-Hua, and to obtain a grant/scholarship from the Académie Nationale de Peiping which had just been created at this time... My thanks go also to the address of presidents Li Yu-Ying and Li Shou-Hua for the aid and encouragement which they have so well accorded me.

This study has as its point of departure a study of the transformations which are undergone by the lipids in soybeans in the production of soy milk and cheese [tofu]. That study, conducted under the direction of Emile Andre, was published (with Andre as the primary author) in 2 articles in 1932 in the *Comptes Rendus des Seances de l'Académie des Sciences (Paris)*. Address: Paris.

119. Woodhead, Henry George Wandesforde. ed. 1934. China year book. Shanghai, China: North China Daily News & Herald. xxvi + 854 p. Vol. 16. Index. 22 cm.

• **Summary:** In Chinese, the title of this book is *Chung-hua nien-chien*. In chapter III, "Soy-beans and bean products are discussed on pages 41-42.

A table (p. 55) shows exports of vegetable oils from China in 1931. In descending order of weight (thousand piculs) they are: [Soy] bean oil 1,463. Wood oil 865. Groundnut oil 814. Unclassified 36. Tea [seed] oil 21. Castor oil 14. Sesamum seed oil 3.

The three most valuable oils in descending order of value (1,000 H. Taels) are: Wood oil 20,416. [Soy] bean oil 16,991. Groundnut oil 12,734.

In Chapter 5, a multi-paged table titled "Principal exports, 1932 and 1933," shows (p. 129): Exports of yellow [soy] beans to Egypt (incl. Anglo-Egyptian Sudan), Formosa, Germany, Great Britain, Hongkong, Italy, Japan, Korea, Netherlands, Netherlands India [Dutch East Indies; Dutch: *Nederlands-Indië*], Philippine Islands, Straits Settlements and F.M.S. [Federated Malay States], U.S.S.R.

(Russia) Asiatic Routes, Other countries. The five leading importers of yellow [soy] beans, in descending order of weight imported (in million piculs), are: U.S.S.R. (Russia) 4.479. Japan 3.331. Germany 3.222. Korea 0.759. Netherlands India 0.555. Total: 17.269.

On the same page are exports of beancake to Japan, Korea, Norway, USA, U.S.S.R. (Russia) Asiatic Routes, Other countries. The three leading importers, in descending order of weight imported (in million piculs) are: Japan 5.854. U.S.S.R. (Russia) 2.119. Other countries 1.979.

In Chapter 7, a table (p. 153) shows the foreign and domestic trade at seven major Manchurian ports: Aigun, Harbin, Hunchun, Lung-Chingtsun, Antung, Dairen, Newchwang. Dairen does by far the largest volume of trade, followed by Harbin, then Newchwang.

On page 153 a table shows the quantity (piculs) of [soya] beans, bean oil, and beancake exported from (1) China including Manchuria, and (2) Manchuria alone. For each of the three products and two categories the amount sent to Japan, Europe, and Other countries is given. Europe imports almost all of the bean oil. Other countries get the largest amount of the beans and the beancake.

Also discusses Mongolia: Religious organization (Chapter 4, p. 70-71), including Lamaist Buddhism and "Living Buddhas." Also discusses Tibet (Chapter 4, p. 88-91). This section begins: "Geography: Tibet, sometimes called the 'Roof of the World,' consists of (1) the Lama kingdom of Tibet with its provinces and dependencies; (2) the semi-independent native states of Kam, under Chinese protection; and (3) the Kokonor [Koko-nor / Koko Nur] Territory, under the control of the Chinese Amban [a Manchu word meaning "high official"] residing at Hsi Ling, in Kansu. Note: Wikipedia states (June 2008): "The Qing Emperor appointed the amban in Tibet, who represented Qing suzerainty over the Buddhist theocracy of Tibet, and commanded over 2,000 troops stationed in Lhasa. The chief amban was aided by an assistant amban (Bangbàn Dàchén) and both of them reported to the Qing Court of Colonial Affairs. Their duties included acting as intermediary between China and the Hindu kingdom of Nepal (Ghorkhas Country); a secretary (Yíqíng zhangjīng) dealt with native affairs. Three Chinese commissioners (liángtái), of the class of sub-prefects, were stationed at Lhasa, Tashilumbo and Ngari.

"The Qing imperial resident in Tibet was introduced in 1727 and most ambasa [high officials; A Manchu word, plural of amban] were appointed from the Manchu Eight Banners, a few were Han Chinese or Mongol. The Emperors used ambasa to influence Tibetan politics, and the Qianlong, Jiaqing and Daoguang Emperors each decreed that the Dalai Lama and Panchen Lama were bound to follow the leadership or guidance of the ambasa in carrying out the administration of Tibet."

A brief biography of Li Yu-ying (Courtesy name: Shih-tseng) appears on p. 693. Address: 1. B.A., formerly editor of the "North-China Daily News"; 2. M.J.I., Editor of the "Peking and Tientsin Times".

120. The international who's who. 1935. London: Europa Publications Ltd. See p. 627.

• **Summary:** "Li Yu-Ying: Chinese educationist; b. 82 [born: 1882]. Educated: Paris. Member: Kuomintang Central Supervisory Committee. 1924- and Chair. Peiping branch Political Council 1928; President: Peking National University 1928-30; President: Franco-Chinese University 1925-. Peking, Franco-Chinese University."

Note: This same entry appears in the 1937 edition (p. 654), the 1938 ed. (p. 683), and the 1940 ed. (p. 669).

121. Institut International d'Agriculture (International Institute of Agriculture). 1936. Le soja dans le monde [The soybean in the world]. Rome, Italy: Imprimerie de la Chambre des Deputes, Charles Colombo. viii + 282 p. Bibliography, p. 276-82. No index. 25 cm. [90 ref. Fre]

• **Summary:** A superb early work, containing extensive original information, looking at developments with soybeans and soyfoods country by country, worldwide. Contents. Preface (p. 1). A. Culture of soy (*soja*; p. 4): 1. Botanical description, selection, classification of the varieties. 2. Culture properly said. 3. Enemies and illnesses.

4. Culture in the various countries: 4a. The Americas (p. 38): Antigua, Argentina, Bermuda, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, USA (gives details on all varieties grown, and describes production, history, varieties, and cultural practices in North Carolina, Illinois, Indiana, Iowa, Maryland, Massachusetts, Mississippi, Missouri, New York, Ohio, West Virginia, Wisconsin, Conclusion), Guadeloupe, Guatemala, British Guiana, Dutch Guiana, British Honduras [Belize], Jamaica, Barbados, Martinique, Mexico, Montserrat, Peru, Puerto Rico, El Salvador, Trinidad and Tobago, Uruguay.

4b. Europe (p. 101): Germany, the Danubian countries, Austria, Spain, France, Great Britain, Hungary, Italy, Netherlands, Poland, Romania, Switzerland, Czechoslovakia, Turkey, USSR.

4c. Asia (p. 128): Ceylon, China and Manchuria, Cyprus, Federated States of Malaysia, British India (incl. Punjab, Bihar and Orissa, Burma, Berar, Madras Presidency, Bombay Presidency, Bengal (incl. Nepal, Bhutan, Sikkim, and the district of Darjeeling), Assam, North-West Frontier Province, United Provinces), Netherlands Indies, Indochina (incl. Tonkin, Annam, Laos, Cambodia, and Cochinchine), Japan, Palestine, Siam.

4d. Africa (p. 146): French West Africa, Algeria, Belgian Congo, Cyrenaica, Egypt, Eritrea, Madagascar, Morocco, Mauritius (Ile Maurice), Reunion (Réunion),

Rhodesia, Anglo-Egyptian Sudan, Tripolitania, Tunisia, Union of South Africa.

4e. Oceania (p. 153): Australia, Fiji Islands, Hawaii, New Caledonia, New Zealand, Philippines.

B. Utilization of soya (p. 158): 1. The soybean in human nutrition and in industry: Whole soybeans, chart of the uses of whole soybeans, use of soya in the green state (green vegetable soybeans), soy sauce (*dau-tuong* of the Annamites, or *toyo*, named shoyu by the Japanese, or *chau-yau* or *chiang yoo* by the Chinese), condiments and sauces based on soya in the Netherlands Indies (*tempe*, *ontjom*, *tempemori* and *tempe kedele* [various types of tempeh and onchom, p. 168-70]), *tao tjo* [Indonesian-style miso], *tao dji* [soy nuggets], *ketjap*, *ketiap benteng* [Indonesian-style soy sauce], soymilk (*le lait de soja*), yuba (*crème de lait de soja*), tofu (*le fromage de soja*) and fermented tofu (*des fromages fermentés*, made by Li Yu-ying near Paris), soymilk casein (*caséine du lait de soja*, for industrial use, including vegetable albumin, or galalithe [galalith] [isolated soy protein], and artificial wool), soy lecithin (*lécithine de soja*), soy flour (*la farine de soja*, incl. soy bread, soy pastries, and soy cocoa).

Note: This is the earliest document seen (Sept. 2010) that uses the term *benteng ketiap benteng* to refer to an Indonesian-style soy sauce.

2. Soy oil (p. 194): Food uses, industrial uses (including soaps, products resembling petroleum, paints, varnishes, linoleum, and artificial rubber), extraction, directory of U.S. manufacturers of materials and equipment for soybean processing, directory of U.S. and Canadian manufacturers of food products based on soya (*produits alimentaires à base de soja*, p. 205-06), directory of U.S. manufacturers of industrial soy products (p. 206-07).

3. Soybean in the feeding of domestic animals (p. 207): Forage, hay, silage, pasture, soybean seeds, the minerals in soybeans, soya as a feed for dairy cows, cattle, buffaloes, sheep, hogs, horses and mules, poultry.

4. Use of soya as fertilizer (p. 257). C. The trade of soya and of its by-products (p. 363): Production of soybeans in the principal countries, economic importance of soybean culture in the USA, soybean trade/commerce including tables of the major importers and exporters, and amounts traded annually in 1931-1934, price of soybeans, cost of production.

List by region and country of people and organizations that responded to a questionnaire sent by IIA (p. 273-76). Bibliography of main publications consulted, listed by region and country of publication.

Reunion (*Ile de la Réunion*): "The soybean (Le Soja) is only cultivated as an experimental crop, on a few square meters at the agronomic station" (p. 148).

Fiji (*Iles Fidji*): Soybean cultivation is not yet practiced in this colony; however soybean seeds are currently being imported in order to conduct a trial.

New Caledonia: In 1928 soybean cultivation was introduced to New Caledonia.

Note 1. This is the earliest document seen (Dec. 2007) concerning soybeans in Bhutan, Costa Rica, Dominican Republic, El Salvador, Guatemala, Israel, Jamaica, Madagascar, Morocco, New Caledonia, Palestine, Peru, or Réunion, or the cultivation of soybeans in Bhutan, Costa Rica, Dominican Republic, El Salvador, Guatemala, Israel, Jamaica, Madagascar, Mexico, the Middle East. Morocco, New Caledonia, Palestine, Peru, or Réunion. It is also the earliest document seen (Dec. 2007) concerning soybeans in connection with (but not yet in) Cyprus; it is stated that soybeans are not grown on the island of Cyprus. Soybean culture is not practiced in the Italian colonies of Eritrea (Erythrée, now part of Ethiopia) or Cyrenaica (Cyrénaïque, now part of Libya).

Note 2. This document contains the earliest date seen (June 2007) for soybeans in Bhutan, New Caledonia, or Réunion, or the cultivation of soybeans in New Caledonia (1928), or Bhutan or Réunion (1936) (One of two documents).

Note 3. This is the earliest French-language document seen (June 2000) that mentions tempeh, which it calls "tempe" (p. 168). It notes that, in general, the indigenous people of the Netherlands Indies use soybeans mainly to make *tempe*, a product which, throughout central and eastern Java, takes the place reserved for *ontjom* in western Java. Tempeh is found in two forms: either in large flat cakes which are cut at the time of sale into small square morsels, or wrapped in folded banana leaves. A detailed description of the preparation of each of these two types of tempeh is given as well as another type of tempe, called *tempemori*, which is made with soybeans and coconut presscake.

Soybean culture is not known to be practiced in the following countries or colonies: Antigua, Barbados, British Honduras (renamed Belize in about 1975), Trinidad and Tobago. Address: Rome, Italy.

122. Hudson, Manley Ottmer; Bacon, Ruth E.; Sohn, Louis B. eds. 1938. International legislation: A collection of texts of multipartite international instruments of general interest beginning with the Covenant of the League of Nations. 9 vol. Washington, DC: Carnegie Endowment for International Peace. See Vol. 8. Instrument No. 539. p. 208-215 (3 Dec. 1938).

• **Summary:** No. 539 (written in both English and French in facing columns) is titled "International Act concerning Intellectual Co-operation. Opened to signature at Paris, December 3, 1938." Editor's Note (p. 208): "The Institute of International Cooperation, created in 1924 by an agreement between the League of Nations and the French Government, was closely associated with the League of Nations." This act entered into force on 31 Jan. 1940. "Text

from 200 League of Nations Treaty Series, p. 249.” Among the many governments that signed the agreement were China and “the French Republic”; the USA did not.

China designated two “Plenipotentiaries: Li Yu Ying, and M. Siaoyu (p. 210-11). Li Yu Ying signed the Act (p. 214).

Note 1. Manley Ottmer Hudson (1886-1960) was an American jurist, member of the American Commission at the Paris Peace Conference (1919), member of the legal section, secretariat of the League of Nations (1919-1923), and Judge, Permanent Court of Arbitration (1933-1945), and Permanent Court of International Justice (1936-1935).

Note 2. The 9 volumes in this series were published from 1931 to 1950.

123. Woodhead, Henry George Wandesforde. 1939. China year book. China: North China Daily News & Herald. xxiv + 663 p. Index. 22 cm.

• **Summary:** Li Yu-ying is mentioned on page 187 (left column): “Courtesy name: Shih-tseng. Born 1882; native of Kaoyang, Hopei. One of the Kuomintang’s ‘elder statesmen.’ Studied in France and established first bean-curd [tofu] factory at Paris. 1928, chairman, Peiping branch, Kuomintang Central Political Council. Member, Kuomintang Central Supervisory Committee, since 1924. Director, Peiping Research Academy, since 1929.”

Note: On pages xiii to xxiv is an interesting “Calendar for the year—January to December—of major events in Chinese and world history,” arranged by day of the month rather than chronologically. For example: January (first month; 11th + 12th moon). 27th day. “Great opium burning at Shanghai 1919. Japan repudiated Central Government 1938.” Address: C.B.E.

124. Chouard, Pierre. 1941. Un plan d’action sur le problème du Soja en France pour 1941 [A plan of action on the problem of Soya in France for 1941]. *Revue des Agriculteurs de France* 73(1):14-18. Jan. [Fre]

• **Summary:** Discusses: What is the soybean? A brief history of soybean culture, with emphasis on Europe. Cultural needs of the soybean. Uses of the soybean: forage, etc.

“In Europe, the first attempts at commercial soybean culture date from 1856, by the members of the *Société d’Acclimatation*, in France, at Vitry-sur-Seine, at Verrières-le-Buisson, in Gironde, attempts crowned sometimes by success, sometimes by failure, according to the seeds and circumstances. At the end of 1875, similar experiments were pursued actively in Central Europe under the impetus of Haberlandt, while the French trials were resumed starting in 1874, notably by the *Société d’Horticulture d’Etampes*, at Etréchy. A major effort was undertaken, from 1907 to 1930, by Rouest, selecting for France a good 100 interesting varieties from among the 2,000 tested. Experimental cultivation was undertaken at the same time at Percy-en-

Auge by Henry de Guerpel, by the agricultural station at Rouen with Mr. Brioux, and by the seed companies, especially Clause, Vilmorin, and Denaiffe. At this time the Chinese man Li Yu-ying created at Colombes the factory ‘La Caséo-Sojaïne,’ to make soy-based food products.”

“Among the private organizations doing soybean promotion or culture are the Institut National de Soja, the Institut International du Soja, the Société agricole et industrielle du Soja, and finally the Centre National du Soja (headquartered at 8, cours de Gourgne, à Bordeaux, France), which has been charged by the officials of various organizations to ensure the practical execution of the politics of soybean culture in France.” Address: Professeur d’Agriculture au Conservatoire National des Arts et Métiers.

125. Matagrín, Am. 1941. Réponse aux objections françaises à une culture nationale du Soja [Response to French objections to the nationwide cultivation of soybeans]. *Revue Internationale du Soja* 1(4):135-49. July. [5 ref. Fre]

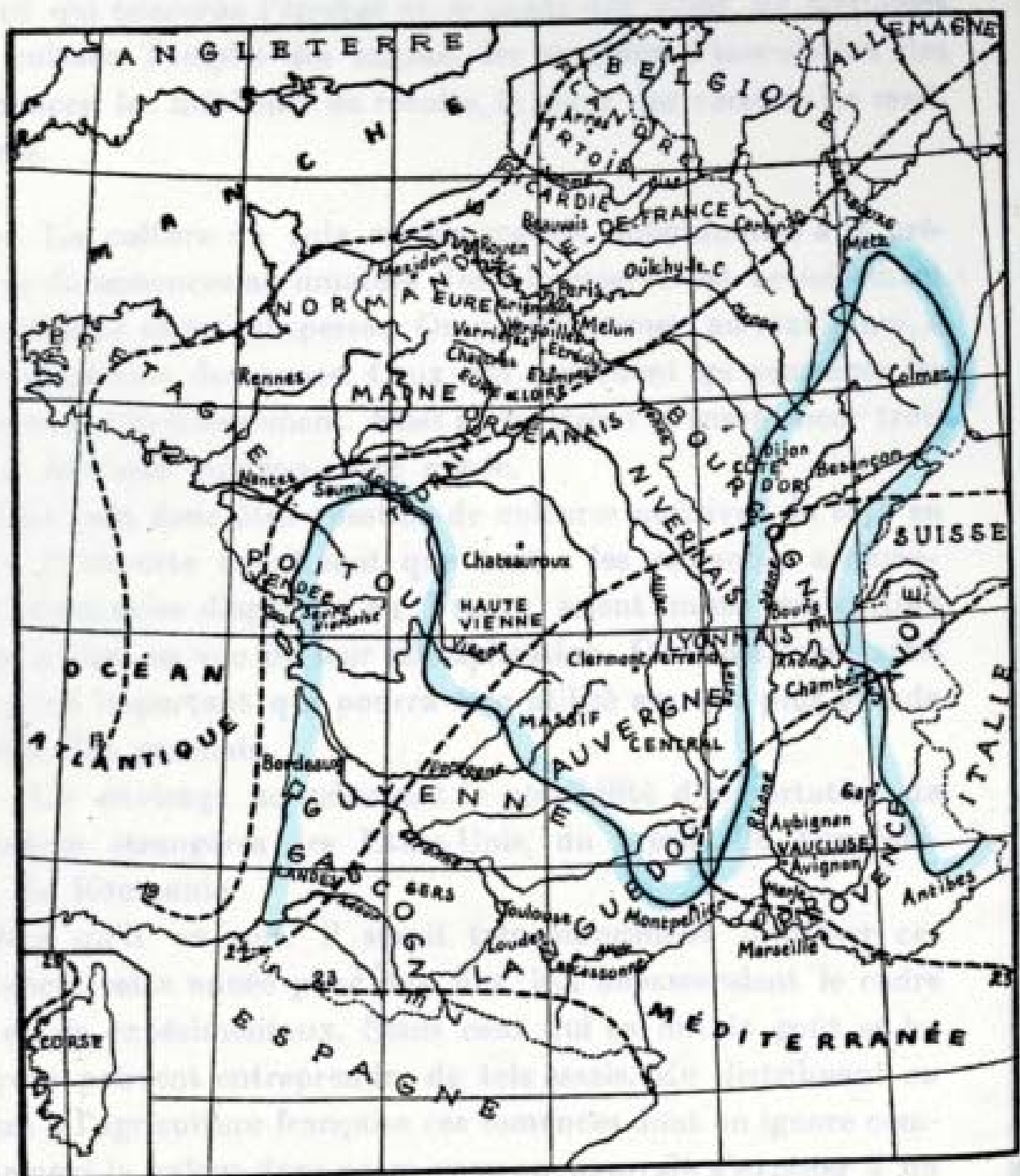
• **Summary:** Li Yu-ying is presently staying in Provence. Since his return from Russia, Léon Rouest has been in Vaucluse, where Messrs. Roudet and Bataillet (of *La Maison du Soia* {The House of Soya} at Aubignan) have, for the past 6 years, obtained good harvests with many different varieties, well selected and perfectly acclimatized, to Indre [a département in central France] where a National Syndicate of Soya Producers (*Syndicat National des Producteurs de Soja*) was founded in Feb. 1938 by Mr. E.-P. Chéron, director of an agricultural bank.

The use of soy and peanuts together is also discussed.

126. Blanchard, Marcel. 1941. Le soja en France: Ses possibilités culturelles. Ses débouchés industriels. Son intérêt économique [The soybean in France: Its cultural possibilities. Its industrial outlets. Its economic interest]. Paris. Société d’Editions Géographique, Maritimes et Coloniales, 17 rue Jacob, 6ème. ii + 200 p. Illust. 22 cm. [158 ref. Fre]

• **Summary:** Contents: Introduction. Part 1: Cultivation of soya. 1. The soybean. 2. Soybean cultivation worldwide. 3. The varieties of soybeans. 4. The requirements of the soybean crop. 5. Sowing soybeans. 6. The soybean during its vegetative stage. 7. Harvesting soybeans. 8. Mixed cropping and intercropping of soybeans. 9. The enemies and diseases of the soybean.

10. History of soybean cultivation in France (introduction in 1739 at Jardin des Plantes under direction of Buffon, 1850–National Society for Acclimatization, around 1880 MM Vilmorin-Andrieux, M. Pailleux, M.P. Olivier-Lecq, Messrs. Lechartier, Denaiffe, Dr. Le Goff, Boulanger & Dausse, Brioux, Semichon, Carle de Carbonnières, Rouest, de Guerpel).



11. The vegetative cycle of the soybean in France. 12. The soybean at the various French agricultural research centers (*les Centres de Recherches agronomiques français*) including Centre de Versailles, Station de Dijon, de Colmar, de Clermont-Ferrand, d'Antibes. 13. The possibilities of soya in France in terms of its cultivation.

Part 2: The nutritional value of the soybean. 1. The nutritional value of the soybean.

Part 3: Utilization of soya. 1. Soybeans in the farm economy. 3. The soybean in human nutrition and in industry.

Part 4: The soybean from an economic viewpoint. 1. Commerce and trade in soybeans and soybean products up to Sept. 1939. 2. The present economic possibilities of the soybean in France. Conclusion. Bibliography. 16 illustrations. 8 maps.

The introduction begins: "In a letter written on 15 Jan. 1935, on board the *Chenonceaux* which was sailing toward Shanghai, Li Lu-Ying [sic, Li Yu-ying], president of the National Academy of Peiping (l'Académie Nationale de Péping) offered to furnish us with the translation of important documents in the Chinese, Japanese, and Russian languages concerning all aspects of soya. Let him find here the expression of our gratitude, because he introduced us to a plant, in which there is more interest abroad than in the country of its origin."

The publisher was formerly named Maison Challamel, founded in 1839.

Illustrations show: (1) The branch of a soybean plant, with the flowers and young pods, enlarged 3x. (2) The flower of a soybean plant as it is about to open, enlarged 5x. (3) A soybean branch with mature pods and leaves, enlarged 2x. (4) Two views of a soybean seed with parts labeled. C = chalza (*chalze*). H = hilum (*hile*). M = micropyle (*micropyle*). R = radicle (*radicule*). A-H = hypocotyl axis (germ) (*axe hypocotylé*). G = raphe, bud, leaf-bud (*gemmule*). Enlarged 3x. Note: The raphe is a small groove extending to the chalza, where the integuments were attached to the ovule proper.

(5) Microscopic view of a transverse section of the seedcoat: C.P = pallisade layer of cells (*cellules en pallisade*). C.S = hourglass cells (*cellules en sablier*). P.E = spongy parenchyma (*parenchyme externe*). C.A = aleurone layer (*cellules à aleurone*). P.I = remains of parenchyma cells of endosperm or internal parenchyma (*parenchyme interne*). Enlarged 247x. (6) Cells of the epidermis facing the microscope. Enlarged 460x. (7) Microscopic view of a transverse section of a cotyledon, two views, showing starch grains (*grain d'amidon*), oil droplets (*oléolaste*), and aleurone grains (*grain d'aleurone*; high in protein). (7a) Six large maps of soy in Asia and in Oceania, in North America and in South America, in Europe and in Africa in 1939 (p. 12-36). (8) Nodules containing nitrogen-fixing bacteria on the roots of a soybean plant (p. 66). (9) Planting soybeans; a

man walks behind a planter pulled by two horses (p. 84). (10) Cultivating soybeans; a man sits on a cultivator pulled by two horses (p. 89). (11) A field of long, straight, weed-free rows of soybeans in the United States. (12) Drying of soybean hay in shocks. (13) Harvesting soybeans; a man sits on a harvester pulled by two horses. (14) Threshing soybeans using a machine (p. 99). (15) Intercropping of soya and maize. (16) The soybean variety Lisbonne growing at the Central Station for Seed Trials (*Station Central d'Essais d Semences*) (p. 122). (17) Map of France with isotherm lines of July and a line showing the northern limit of maize cultivation (see previous page) (p. 134).

Tables: 1. Asiatic varieties: Chinese and Manchurian varieties, varieties from the British Indies, from the Dutch Indies, Japanese varieties. 2. American varieties: Canadian varieties, U.S. varieties (for each is given: Days to maturity, flower color, seed color, color of the oil, oil content, protein content, weight of 1,000 seeds in grams, seed yield (in kg/ha), yield of hay containing 15% moisture (in kg/ha)). 3. European varieties: German, Austrian, English, Italian, Polish, Czech, Soviet Russian. Mineral needs of the soybean. Yield of two soybean varieties, with and without inoculation. Yield of three soybean varieties with and without inoculation. Germination percentages of 8 French soybean varieties at the Station Centrale d-Essais de Semences in 1938-39 (ranges from 91% to 100%). Variation in the composition of soybean hay at 4 stages of maturity. Weight of seeds vs. straw for 10 U.S. soybean varieties (the straw weighs 1.5 to 2.7 times as much as the seeds). Average yield of soybeans in four countries in 1933 (in kg/ha): Manchuria 1,200. Japan 1,000. Korea 650. China 950. Length of the vegetative cycle at four stations with 10 varieties in France (ranges from 98 to 157 days). Length of the vegetative cycle at four more stations with 16 varieties in France (ranges from 95 to 172 days). 18 varieties that completely matured their seeds at 2 stations in 1921 and in 1922. Oil and protein content of 7 French soybean varieties at Station de Clermont-Ferrand. The seed yield of 10 soybean varieties at the same station. The seed yield of 6 soybean varieties at Station d'Antibes. Six tables (p. 138-42) on the nutritional value of soybeans. Six tables (p. 148-61) on the utilization of soybeans in the farm economy and for feeding animals 2 tables (p. 162-42) on the soybean in the human diet and in industry. 5 tables (p. 175-42) in trade in soybeans and its by-products. 7 tables (p. 181-86) on the present economic possibilities of the soybean in France.

Chinese and Manchurian varieties soybean varieties (p. 48): Chu Yen Tou Erh, Kung-Chu-ling pai Mei, Pai Hoa Tso Tse, Su Li Huang, Ta Li Huang, Tieh Chia, Tou Tse.

Soybean varieties from the British Indies (*des Indes britanniques*) (p. 48): Behrum, Hto-nao, Hto-nang, Mirjanhat, Pekyat-pyin, Pe-Ngyi [pè-ngapi], and Santonauk. Note: According Thompstone & Sawyer (1914),

some of the above names are the names of the yellow soybean in different parts of Burma.

Soybean varieties from the Dutch Indies (*des Indes néerlandaises*) (p. 48): Djepoen, Idjo, Ireng, Krawe, Mentik, Poetik, No. 16 sélectionné, No. 17 sélectionné, No. 27 sélectionné, No. 28 sélectionné, No. 29 sélectionné.

One variety from Indochina (p. 48) is Langson.

Soybean varieties from Japan (p. 50): Akasaya, Banseihikarikuro [Bansei hikari kuro], Chinseihikarikuro [Chinsei hikari kuro], Gindaizu [Gin daizu], Ishikarishiro [Ishi kari shiro], Kanro, Kurosaya, Mitsuishidaizu [Mitsuishi daizu], Naktchadaka, Oyachi no. 2, Rankoshi no. 1, Shimoshirazu no. 1 [Shimo shirazu no. 1], Shirokotsubu, Shiroturunoko, Tsurunoko, Wasehodaka / Waschodaka, Yoshiokatairin [Yoshio katairin].

Soybean varieties from Canada (p. 50): A.K. (Harrow), Brun du Manitoba, Soja jaune de Montréal / Montreal, Soja jaune de Québec / Quebec 92, Manchu (Hudson), Mandarin (Ottawa), O.A.C. No. 211. Address: Directeur interimaire, Station d'Essais de Semences (Ministere de l'Agriculture), France; In 1946 Chef de Travaux at this station.

127. The international who's who. 1941. London: Europa Publications Ltd. See p. 654.

• **Summary:** "Li Yu-Ying: Chinese educationist; b. 82 [born: 1882]. Educated: Paris. Member: Kuomintang Central Supervisory Committee. 1924- and Chair. Peiping branch Political Council 1928; President: Peking National University 1928-30; President: Franco-Chinese University 1925-. Director: Peiping Research Academy 1929-. Chungking, c/o Department of Education."

Note: This is the last year in which an entry for Li Yu-Ying appears in this annual periodical.

128. Vergnaud, Henri. 1942. Ressources apportées par le haricot d'Asie à l'alimentation humaine [Resources supplied by the Asiatic bean (soybean) to the human diet]. *Chimie et Industrie (Paris)* 48(3):126-33. Sept. (Chem. Abst. 37:6049). [9 ref. Fre]

• **Summary:** Repeats, with minor modifications, the history of the arrival of the soybean in various countries, given in Letzgus and Vergnaud 1941. Address: Ingénieur E.C.A.T. Secrétaire général de l'Institut Agricole et Industriel du Soja (Paris).

129. Li, Yu Ying. 1942. Making the world ready. *Free World* 4(2):127-28. Nov.

• **Summary:** Prof. Li Yu Ying is President of the Chinese Academy of Peiping, and member of the Central Committee of the Chinese Democratic Party (Kuomintang). He was one of the founders of an organization called World Cooperation, which was created 36 years ago [i.e., ca. 1906]. He presently "advocates the creation of a popular world confederation which will be of great value in

educating the people of all countries in the basic principles of the United Nations."

Li, like many others of who have lived through the great crises of the 20th century, believes "deeply that it is indispensable to examine immediately the different problems of post-war reconstruction."

A widely debated question in democratic groups is "whether humanity is ready for world organization." Li has no doubt that world organization is a historic necessity, which should be based on federalist principles. Corresponding to the United Nations, an organization of governments, he would like to see a world confederation of private organizations—one good example of which is the International Labor Office.

A popular world confederation will teach people to live together "without inequality, without class or race prejudices. As a matter of fact, this new world confederation will be a school of new living, without which the great principles of liberty, equality, and fraternity will never become a reality. The popular world confederation will consist of federations, groupments, organizations, and associations of all kinds from all continents and from all nations... Here is a constructive way of preparing and starting the reconstruction of the world."

Note: The title page states: "Free World: A monthly magazine devoted to democracy and world affairs."

130. Li, Yu Ying. 1942. Federalism and world confederation. *Free World* 4(3):231-33. Dec. [1 ref]

• **Summary:** Discusses the principles of federalism as they apply to the world confederation. "Federalism is a political system which can be at the same time economic and social." Contains a long definition of the "composite state" (which includes both federation and confederation) from *Diderot's Encyclopedia*. A system of federalism will certainly succeed on our planet; it will be a federative world in which all people will live as brothers. Li believes there will be two complementary world confederations: (1) an international governmental organization; and (2) "popular groupments of all men from all corners of the earth." "Individuals will form themselves into small groups; groups become parts of groupments; and the groupments form the world confederation." All people ultimately want freedom, democracy, and peace.

131. Li, Yu Ying. 1943. Where is China going? *Free World* 6(4):321-22. Oct.

• **Summary:** An introduction to the writer of this article (presumably by the editor of this magazine) gives many insights into Li: We "are happy to present the optimistic and highly encouraging words of one of her [China's] greatest thinkers and statesmen, Professor Li Yu Ying.

"Li Yu Ying can speak for China with full authority. The scion of one of the country's noblest families and son

of the last Prime Minister of the Chinese Emperors, he went abroad at the age of twenty-two to work for the establishment of a democratic Chinese Republic. As intimate friend and collaborator of Dr. Sun Yat-sen, he was active in the national revolution and became one of the founding fathers of modern China.

“During his entire life, Li has worked for close collaboration between China and the West. For many years, he headed the Chinese Delegation for the International Intellectual Cooperation at the League of Nations. He became, to use his own words, a ‘citizen of China and of the world.’ But he has remained an immense moral power in China, respected and beloved by both the people and their political leaders.”

Li is writing to dispel three false rumors about China. He adds: “It may be useful to remember that Chiang Kai-shek is Sun Yat-sen’s successor [Sun lived 1866-1925] as president of China’s democratic party (Kuomintang) which has adopted democracy as its basic constitutional concept.”

132. Barthélemy, M. 1944. Contribution à l’étude du soya en France [Contribution to the study of soya in France]. Clermont-Ferrand, France: Jean de Bussac. 91 p. June 20. Based on his thesis, Strasbourg Univ., Faculty of Pharmacy. [34 ref. Fre]

• **Summary:** This is a published thesis, presented to the Faculty of Pharmacy at Strasbourg. Contents: Introduction. Part I: The cultivation of soybeans. 1. History of cultivation (its origin and importance). 2. Botanical characteristics. 3. Soybean cultivation in detail. 4. Conclusions. Part II: Chemical composition of soybean seeds. Proteins, lipids, oil and lecithin, carbohydrates (*glucides*), minerals, diastases, vitamins, sterols—soyasterol.

Part III: Utilization of soya as a food and in industry. 1. As food (nutritional value, whole soybeans, soy sprouts, roasted soybeans, soy coffee, condiments liquid and solid, soymilk, Li Yu Ying, products derived from soymilk {kefir, yogurt, tofu}, shoyu, miso, natto, soy flour, soy confections, recipes and formulas). 2. In industry: Oil, lecithin, cake. 3. Other uses of the plant.

Part IV: Laboratory work. 1. In human nutrition. 2. Animal feeds for the farm. 3. In industry. General conclusions. Address: Univ. of Strasbourg, France.

133. Hummel, Arthur W. 1944. Eminent Chinese of the Ch’ing [Qing] period (1644-1912). 2 vols. Washington, DC: Library of Congress (U.S. Government Printing Office). 1103 p.

• **Summary:** Though somewhat dated, this is still the best single work for biographies of major Ch’ing figures. Li Yu-ying is mentioned on pages 472 and 1011-12. He is a son of Li Hung-tsaio. Address: China.

134. Sun, Fo [Sun Ke]. 1944. China looks forward. New York, NY: The John Day Company. xvi + 276 p. See p. 73. Introduction by Lin Yutang. Illust. Map. No index. 21 cm.

• **Summary:** Chapter 6, “China marching toward democracy,” focuses on the work of Dr. Sun Yat-sen and the Kuomintang. In Oct. 1911 the revolution took place that gave birth to the Republic of China. On New Year’s Day, 1912, when the republic was proclaimed in Nanking, Dr. Sun Yat-sen, who was provisional president, had willingly resigned power to Yuan Shih-kai, the northern warlord, because of a major division among the revolutionaries. Yuan Shih-kai had organized and trained China’s modern army during the last days of the Manchu empire; he now succeeded to the presidency. But almost immediately there was conflict between him and the republican parliament that sat in Peking with a Kuomintang majority. Yuan dissolved the parliament, killing and banishing dissident members.

In 1913 the so-called Second Revolution broke out in the Yangtse Valley when military governors that Yuan had dismissed rose up in revolt. A civil war ensued, but Yuan’s superior forces crushed the rebels. In 1915, while the war in Europe raged on, Yuan Shih-kai proclaimed himself emperor of the Chunghua Empire.

After the death of Sun Yat-sen in 1925, the national government in Canton was recognized as the government of the Republic.

In the summer of 1928, with the capture of Peking and the preliminary unification of China under the brilliant leadership of Generalissimo Chiang Kai-shek, the revolutionary war seemed to have been brought to a successful conclusion.

At that time, the author, Dr. Li Yu-ying, and other members of the Central Committee, were in Europe. “On the proposal of the late Mr. Hu Han-min and at the invitation of Dr. Li Yu-ying, the group met in a suburb outside Paris [France] one summer morning and began an all-day session to exchange views and prepare a proposal to be submitted to the Central Committee in plenary session. As a result, a proposal calling for the setting up of the Five-Yuan system in the National Government was drafted by the writer and telegraphed to Nanking in their joint names.” The proposal was approved and passed *in toto* by the plenary session.

But new threatening forces now loomed on the horizon: The Japanese and the communists under Mao Tse-tung.

Note: This book is crippled by lack of an index. Address: Son of Dr. Sun Yat-sen, “Father of the Chinese Republic”.

135. *Revue Internationale du Soja*. 1946. Pourquoi il n’y a pas de lait de soja en France [Why there is no soymilk in France]. 5(23-24):19. Jan/Feb. [3 ref. Fre]

• **Summary:** The celebrated soyist (*sojaïst*) Li Yu-ying, after having spoken about soymilk in 1905 at the Congrès de la

Laiterie, founded a laboratory for studies in Paris in 1908. Then he created at Vallées, near Colombes (Seine), a factory named *La Caséo-Sojaïne* which produced a beautiful line of soyfoods (*aliments sojaïques*). This company went bankrupt fairly quickly, because certain “sharks” in our trade worked to suffocate it.

“Later other idealists have taken up the work of the Chinese scholar and scientist. Too bad for them. The same big businessmen attacked again and spread death and destruction. On this subject, see the article by Mr. René Bataille in the *Eclaireur de Nice et du Sud-Est* (No. 268, 24 Sept. 1940).

Will trusts [a powerful combination of firms designed to reduce competition] still today be able to prevent the manufacture of soymilk products? The shortage of animal milk will continue and soymilk could really help us. Of course, soy flour mixed with water is not soymilk. We need a real soymilk, made in the proper way, checked, graded, and standardized. It is not to be confused with the soymilk used as a calf milk replacer.

“Likewise, we will need soy cheeses (*fromages de soja*), made in factories. The late Dr. Alexis Carrel said during this war that the French youth would not have become [nutritionally] deficient if the Third Republic [1870-1940, proclaimed after Napoleon III was captured by the Prussians] had not strangled all attempts at soybean production and developing soyfood industries.” Address: Paris, France.

136. *Soybean Digest*. 1946. The culture of soya in France. Aug. p. 6, 16.

• **Summary:** “Information concerning the status of the soybean in France used in the accompanying article was kindly supplied to us by Am. Matagrín, formerly scientific librarian at Lyons and technical advisor to the National Soya Center. Mr. Matagrín is author of *La Culture du Soja* and other books.” A portrait (illustration, line drawing) shows Matagrín, bearded and with monocle.

“Soy sprouts were furnished to the Parisian markets in 1875. In 1900 French physicians were prescribing soy bread for diabetics. Prior to the first world war a Chinese scientist [Li Yu-ying] was running a small factory near Paris which manufactured such soy foods as oil, flour, milk and cheese... During the first world war Am. Matagrín was collecting all the information he could find on soybeans in the English, French, German, Italian and Spanish languages. In 1936-38 he was growing a large number of varieties from different countries in Choutagne...

“But in spite of all the effort by enthusiasts there was little general interest in soybeans until France was defeated by Germany in 1940 and began to go hungry. Then an excessive interest in the crop developed. But most attempts to grow soys were ill advised and failed... Newspapers carried extravagant accounts of the returns that might be

obtained from soya. People quickly bought out editions of books on soybeans by Matagrín and the author Rouest. (The puppet Vichy government prohibited reprinting of Matagrín’s book, since it looked on him as a ‘resistant.’)

“The National Soya Center (C.N.S.) was founded by Jo Philippart, a big oil miller. The large mills of Chartres and soybean cooperatives at various places encouraged farmers to grow the crop. Many organizations distributed seeds. There was a surprising increase in garden plantings, or ‘little cultures’ as the French call them. Garden and horticultural societies distributed over 125,000 packets of soybean seed in 1943, while Matagrín personally gave away more than 200 kilograms of selected seed in small lots.

“A monthly magazine, *Revue Internationale du Soja*, began publication in 1941. It is still being issued. Thus the soybean became almost fashionable under German occupation. But growers were disappointed as in most cases returns were small... But one-fourth of the French people became acquainted with the soybean during the war—a great advance... In 1945 the total crop amounted to perhaps 5,700 tons.

“[Matagrín] asserts the French soybean will always cost too much to produce for technical uses, and will be grown preferably for fine food products. France is adapted to intensive rather than extensive production.”

137. Yang, Jialuo. 1946. Ya lan ting de sheng dan lao ren “wei Li Shizeng xian sheng er meng” zhi yi, [The Santa Claus of the Yalanting (Pavilion of Elegant Orchids) “Dreaming for Mr. Li Shizeng” No. 1]. n.p. Shi jie shu ju. 22 p. 19 cm. [Cht]*

• **Summary:** Note: Li Yu-ying, a soyfoods pioneer in Paris, France, lived 29 May 1881 to 3 Sept. 1973. It is not clear what this book is about. The East Asian Library at Princeton University owns the only known copy in the Western world.

138. Chin, Kuo-Chun. 1947. Nature du lait végétal de Soja et précautions à prendre dans son emploi [The nature of soymilk and precautions to take when using it]. *Comptes Rendus des Seances de l’Academie des Sciences (Paris)* 224(4):288-90. Jan. 27. [2 ref. Fre]

• **Summary:** Soymilk was prepared by the Chinese philosopher Whai-Nan-Tze well before the Christian era. Its production was described by Champion (1885), Li Yu-Ying (1905), Miller (1941), Mildred Lager (1946), and others. Starting in 1888 many authors (Balland, Cazalis, Dujardin-Beaumetz, Graux, Labbé, Lecerf, Maurel) and other partisans of vegetarianism, right up until the present (1930-46, Dr. Dresses, Donela, and Yen 1933) have recommended the use of soy flour or milk in infant feeding (*dans l’alimentation des nourrissons*).

Tables show: (1) A nutritional analysis of soymilk conducted by the Municipal Laboratory of Paris (*le Laboratoire Municipal de Paris*). (2) A nutritional analysis

of cow's milk. (3) A nutritional analysis of soymilk conducted by Prinsen (1896). (4) Two nutritional analyses of soymilk conducted by Li Yu-Ying in the factory *caseo-sojaïne*.

Conclusion: It appears that the chemical composition of soymilk varies considerably.

139. Chin, Kuo-Chun. 1947. Nature du tourteau de Soja et son emploi judicieux [The nature of soybean cake (okara) and its judicious use]. *Comptes Rendus des Seances de l'Academie des Sciences (Paris)* 224(5):361-63. Feb. 3. [2 ref. Fre]

• **Summary:** The "cake" (*tourteau*) is the residue of vegetable milk. It is very rich in nitrogen, fats, carbohydrates (*glucides*), and mineral salts. In 1907 Dr. Bloch determined that the cake contains 88.75% moisture; he denied that it contains any starch. Tables show analyses made by Bloch (1907), Prinsen Geerligs (1896), and the Paris Municipal Laboratory using "cake" obtained from the factory of *Caseo-sojaïne* (1912, run by biologist Li Yu-ying). In the production of tofu and soymilk, the vitamins are probably destroyed by the heat of the boiling water. In the production of the cake (okara), there is no reason to be concerned with that drawback. This is confirmed by an analysis made by the municipal laboratory of Paris in 1946. Okara was found to have the following composition: moisture 85.5%, fats 1.9%, total nitrogen expressed as protein (N x 6.25) 4.0%, amylaceous materials expressed as starch 3.0%, minerals 5.6%, vitamin C (ascorbic acid) absent, vitamin A active 240 mg.

140. *Revue Horticole: Journal d'Horticulture Pratique (Paris)*. 1947. Le grand congrès du soja à Paris [The great soy congress in Paris]. 119(2140):277-78. April. [Fre]

• **Summary:** On Monday, March 16, 1947, at 2:30 p.m., at the City University, the first Grand Soya Congress ever held in Europe took place. It was organized by the French Bureau of Soya (*Bureau Français du Soya*), the Laboratory of Soya Experiments (*Laboratoire d'Essais du Soya*), and the France-China Association (*l'Association France-Chin*). Mr. Marius Moutet, the Minister of French Colonies and Territories (*Ministre de la France d'Outre-Mer*) presided. The two presidents were Prof. Blaringhem, president of the Academy of Sciences, and his excellency the Chinese Ambassador to France.

It was indeed a brilliant assembly of numerous scientific and agronomic personalities, including Mr. Lévêque, delegate from the Belgian Soy Group (*Groupe Belge du Soya*).

Includes a brief summary of the presentations by the following people: René Brochon, president of the French Bureau of Soya (*Bureau Français du Soya*). Mr. Schad, director of the Agronomic Research of Clermont-Ferrand (*la Station de Recherches Agronomiques de Clermont-*

Ferrand). Mr. Simonet, Director of Scientific Research for Vilmorin (*Etablissements Vilmorin*), who discussed the varieties he had developed at the Center for Agronomic Research of Antibes (in southeastern France). Mr. Salaberry, an agronomic engineer. Mr. Blanchard, head of works at the Station for Seed Trials at the Ministry of Agriculture. Mr. Chouard, Prof. of Agriculture at National Conservatory of the Arts and Crafts. Messrs Brochon and Matagrin discussed the nutritional value of soy.

Mr. Chin Kuo Chun, director of the Laboratory of Soya Experiments (*Laboratoire d'Essais du Soya*), discussed the results of his work on manufacturing soymilk, tofu, and soy sauce in France, using traditional Chinese processes. Prof. Gounelle, Director of the Foch Hospital gave a brilliant discussion on the use of soy flour to combat nutritional edema and diabetes. Mr. Boutroux showed brilliantly that soymilk can successfully replace cow's milk in the feeding of defective babies.

Mr. Siao Yu, former Chinese Minister of Agriculture, recounted how Mr. Li Yu Ying, presently vice-chancellor (*recteur*) of the University of Peking, established in 1908, near Paris, a soyfoods factory; it made soymilk, tofu, cakes, etc. He saluted with emotion the members of this first Soy Congress to be held in Europe.

Mr. Villars, director of a cooperative for the production of soybean seeds. Mr. Matagrin, technical consultant to the French Bureau of Soya. Mr. Vançon, president of the Family Association of the Gardens of the north of France (*du Nord de la France*).

The Congress was closed by three excellent speeches by conference leaders Blaringhem, Bineau, and the Chinese Ambassador.

A reception in honor of China, cradle of the soybean, was then held and a buffet was served consisting of soy pastry and cakes, soy chocolates, and soymilk.

141. *Revue Internationale du Soja*. 1947. Congrès du Soja [Soy Congress (Europe's first, held in Paris, March 16, at the City University)]. 7(37-38):30-31. March/April. [Fre]

• **Summary:** Li Yu-ying (President of the National Peiping Research Academy) was there, along with a luminous throng of the greatest soy devotees in France, including: M. Brochon (President du Bureau Français du Soja), M. Simonet (director of scientific research at Etablissements Vilmorin), M. Blanchard (chef de travaux à la Station d'Essais de Semences of the Ministry of Agriculture), and M. Chouard.

Mr. Chin Kuo Chun (director of the laboratoire d'Essais du Soja) discussed the results of his work on the production in France of soymilk, tofu, and soy sauce using the traditional Chinese processes, and of projects to organize family gatherings to taste these products. Prof. Gounelle (director of the Foch Hospital) showed how soy flour can be extremely beneficial in curing edema and malnutrition, and

is perfectly suited for diabetics. Mr. Boutroux showed brilliantly that soymilk (*lait de soja*) is beneficial in replacing cow's milk in the diets of undernourished babies, and spoke of the industries presently producing soy products (*produits au soja*) in France. Note: This is the earliest English-language document seen (Nov. 2002) that uses the word "undernourished."

Mr. Siao YU, former Minister of Agriculture in China, recalled how Li YU Ying created in 1908 near Paris a factory for food products from soya: milk, cheese (tofu), cakes, etc. He saluted with emotion the First Soy Congress to be held in Europe. Address: Paris, France.

142. Chin, Kuo-Chun. 1947. Contributions à l'étude du soja [Contributions to the study of the soybean]. *Revue Internationale du Soja* 7(39-40):51-54. May/June. [Fre]

• **Summary:** Contents: I. First attempts at production of soy sauce. II. The nature of soya, and vegetable meat (tofu). III. The nature of soymilk (*lait végétal de Soja*) and precautions to take in its use. IV. The nature of soybean cake and its judicious use. Address: Directeur du Laboratoire d'Essais du Soja, France.

143. *Soybean Digest*. 1947. Paris soybean meeting. July. p. 30.

• **Summary:** According to Am. [Amédée / Amadee] Matagrín, the first Congress of Soya was held on 16 March 1947 at the Maison Internationale of the City University of Paris. The meeting, an indication of the French interest in soya, was organized by the French Bureau of Soya and its president, Mr. René Brochon, with the cooperation of the Experimental Laboratory of Soya and the France-China Association.

"The honorary presidency of the Congress was divided between M. Marius Moutet, French foreign Minister, and Li-Yu-Ying, president of the French-Chinese Society of Education and warden of the University Peking [Peking], who as long ago as 1912 published with the agronomist Grandvoinet a work on soya in French, and set up a little factory making soy milk, flour and oil in the suburbs of Paris.

"But the real presidency of the Congress was conferred on Prof. Louis Blaringhen, of the Sorbonne, president of the Academy of Sciences. Speakers were French research men and members of Universities, and the former French minister of agriculture. A paper from A.A. Horvath of the United States was read. There were addresses by President Blaringhen and the ambassador from China.

"The agricultural attache of the U.S. and a delegate from the Belgian Association of Soya assisted with the Congress."

144. Ray, Georges. 1951. *Technologie laitière*. 2e éd. [Dairy technology. 2nd ed.]. Paris: Ed. Dunod. vii + 743 p. See p.

703-09. Illust. Index. 25 cm. [Fre]

• **Summary:** The chapter on "Milk substitutes" (p. 696+) contains a subchapter titled "Soymilk (*Lait de soya*)" (p. 703-09), which has the following contents: Introduction. General rules to follow in the preparation of soymilk. The North Vietnamese (*Tonkinoise*) method. Method of preparation used in dairies in the Far East: Castagnol process. Modern methods for the preparation of soymilk. Composition of soymilk. Properties of soymilk. Fermented soymilk (using *Bacillus acidophilus*, British patent No. 441,574, 22 Jan. 1936). Concentrating / condensing and drying soymilk (including yuba). Soymilk curds (*Caillebotte de soya*). The future of soymilk.

Contains two full-page ads by Alfa-Laval for dairy milk equipment.

Vegetable milks have certain advantages over animal milks. They are easily made in a state of microbial purity, free of tuberculosis bacteria. Their casein precipitates more rapidly than that of cow's milk and does not coagulate in the same manner in the stomach. And it can be sold at a lower price. Later: It contains no cholesterol, and makes better use of world food supplies. Disadvantages: It has a lower calcium content and many Westerners prefer the flavor of animal milks.

Here is a quick review of the processes for making soymilk, described at length in a monograph (written under the direction of G. Ray) by D. Kaltenbach and J. Legros [1936]. Precise information about the soya industry is assembled in a more recent work by A. Matagrín. Soymilk pioneer in France were [Li Yu-ying], L. Rouest, and H. de Guerpel (p. 703).

The Castagnol process was developed by Ray at the agronomic research Institute in Indochina (p. 704).

Starting in 1910, a Franco-Chinese society was founded for the study of the utilization of artificial milk from the soybean. The experiments were abandoned in 1912. In 1916 Prof. O. Laxa of Prague recommended for making soymilk on a small scale. Note: It is not important (p. 705).

In London, before World War I, a synthetic milk syndicate launched a type of [soy] milk adapted to European tastes. It applied the process of F. Goessel [of Germany]; 100 liters of soymilk were obtained from 10 kg of ground soybeans, 5 gm of sodium phosphate, 2.4 kg of lactose [milk sugar], 2 kg of sesame oil, 6 gm of salt, and 60 gm of sodium bicarbonate [also known as baking soda or bicarbonate of soda]. Melhuish, an Englishman, patented a process for enriching the [soy] milk with various oils that did not change its taste. Some years after World War I, Bertrand received a patent for the manufacture of deodorized soymilk. Among the American processes are those of Horvath and Kloss (p. 705).

In Germany, the Soyama factory in Frankfurt makes a fresh soymilk very similar to cow's milk but with a different flavor. A table shows the nutritional composition of three

different types of milk. After standing, the cream of Soyama soymilk separated. This soymilk has a more neutral and softer flavor than that of cow's milk. Bread made with this soymilk is excellent. In 1932 the French engineer Max Adler patented a process for soymilk without the characteristic flavor and odor (p. 706).

In China during World War II, soymilk was used extensively in refugee camps and saved many lives, especially those of children (p. 708).

The Annamites are fond of soymilk during the hot season. Each morning soymilk merchants can be seen circulating through the streets of the native villages of Hanoi. The product is consumed sweetened or unsweetened, cooked with rice, or added to various soups (p. 708).

Fermented soymilk: John H. Kellogg received a British patent for acidophilus soymilk. No. 41,574. 22 Jan. 1936. Yuba is the concentrated film of dried soymilk lipo-proteins (p. 708).

In France, Rene Jarre is specializing in the preparation of soyfoods (*produits alimentaires à base de soja*). In Monahan and Pope (1915) added to soymilk powdered malt, cacao and chocolate—U.S. patent 1,165,199 of 21 Dec. 1915 (p. 709).

The future of soymilk: The main challenge now is to find a way to deodorize soymilk. Note: And to remove the flatulence factors (p. 709). Address: Honorary Prof. (Tunis, Rennes, Grignon), former Head of Technical Services, International Institute of Agriculture, Rome (Ex-Chef du Service Technique, a l'Institut d'Agriculture de Rome).

145. Bening, W. 1953. Soy flour and milk powder in Europe. I. *Soybean Digest*. Feb. p. 18-19. See also Part II. March, p. 20-21. Part III. April, p. 20.

• **Summary:** Discusses the pioneering work with soya done by six Europeans: 1. A. Urbeanu, a medical doctor in Bucharest, Romania, published his first Romanian booklet on soya in 1905. It recommended the bean for systematic fortification of the national diet. Urbeanu's publication was the first suggestion of a complete soya project in Europe that included growing and processing. Little attention was paid to it. Its ideas were too strange. Thirty years later the Rumanian government successfully developed a large-scale soybean-growing program, for export. A subsequent book titled *Soia*, by Iona Mavrodi Cornea and Mihai Gr. Romanscanu contained Urbeanu's earlier report.

2. Friedrich Haberlandt, an Austrian botanist, first noticed soybeans at the Vienna World Exposition of 1873. He procured 19 soybean seed varieties there for planting in test plots at the High School for Soil Cultivation in Vienna. These were successful and by 1877 there were 144 soybean test plots using seed obtained from Haberlandt scattered throughout Europe. Haberlandt cooperated with the physiologist Heck to develop food uses of soybeans. They developed a potato-soya dish that their families and

professor-friends ate with relish. Haberlandt died in 1878 and with him his work—except for his book *Die Sojabohne*.

3. Laszlo Berczeller was a doctor in Budapest, Hungary. He was interested in providing sufficient low-cost protein for all people. 4. Li You Ying, the famous Chinese soya specialist and Dr. L. Grandvoinnet built a factory in Paris, France, to make foods from soybeans and wrote an excellent monograph on the soybean.

146. Perleberg, Max. 1954. Who's who in modern China (From the beginning of the Chinese Republic to the end of 1953). Hong Kong: Ye Olde Printerie, Ltd. 428 p. See p. 132-33 for Li Yu-ying. [Eng]

• **Summary:** "Li Yu-ying. Courtesy name: Shih-ts'eng. Born in 1882 in Hopeh. Government official and one of the Kuomintang's elder statesmen. Studied in France and founded there in 1928 [sic, probably in late 1910 or early 1911] the first Bean Curd Factory at Paris [sic, at Vallées, Colombes (near Asnières, Seine), northwest of Paris]; since 1924, Member, Kuomintang Central Supervisory Committee; 1928, Chairman, Kuomintang Central Political Council, Peking Branch; and concurrently Director, Peking Research Academy; since 1948, Advisor to President Chiang Kai-shek. Now in France."

Note 1. For a brief description and history of the Kuomintang or "National People's Party" see Fairbank, Reischauer and Craig (1973) *East Asia: Tradition and Transformation*.

Note 2. Li Yu-ying is not mentioned in any of the following books: *Who's Who in China* (1920, ed. 2; 1925 ed. 3 or its supplement; 1931 ed. 4). *Who's Who in France—Dictionnaire Bibliographique* (1936, 1954, or 1965-6 editions).

147. Blanchard, Marcel. 1956. Recherches sur la biologie et la culture du soja en Algérie [Research on the biology and culture of soybeans in Algeria]. *Annales de l'Institut Agricole et des Services de Recherches et d'Experimentation Agricoles de l'Algérie* 9(7):1-115. May. (Algiers: Institut Agricole d'Algérie. Impr. Barbry). [162 ref. Fre]

• **Summary:** Contents: Introductions by M. Barbut (Inspector General of Agriculture), and C. Munck (President of the Agricultural Associations of Bône). Introduction by the author. Overview of the soybean and its study in Algeria: Scientific names, origin, area of dispersion, forms and varieties, classification, history of soya in Algeria, the varieties studied and the conditions of the experiments. 2. Classification of varieties and characters used: Morphological characters, physiological characters. 3. Determination of varieties: Key to determination of groups, key to determination of varieties, synonyms and the place from which varieties were obtained. 4. Biology of soya in Algeria: Observations made, trials conducted, results

obtained and interpretation of those results. 5. The cultivation of soya in Algeria: Needs of the plant, the culture, agronomic trials and possibilities for the future. 6. Outlets for the soybean in Algeria: Soya in the farm economy, the commerce of soybean seeds, industrial uses of soya. Summary and conclusions. Bibliography. 8 tables showing different varieties.

Before World War II, Leon Rouest was the veritable apostle of the soybean in France. He studied more than 3,000 samples from around the world and selected the most interesting varieties. In addition, Mr. Guerpel cultivated about 50 varieties of soya in Normandy. In 1941 the author wrote *Le Soja en France* to popularize the soybean there. He thanks many people for their help since 1935, including Li Yu-ying (presently of the National Academy of Peking, China), Mr. François (director of the laboratory of the National Institute of Agronomic Research, which since 1935 has been at the base of his studies on soya), Messrs. Demolon, Crépin, Bustarret, Simonet, Voisenat, Vilmorin, Barbut, Guinochet, Ozenda, Bernard, Munck, Pasquier, and Frezal; a brief description of the position and contribution of each is given.

"In 1894 Dr. L. Trabut conducted the first experiments with soya in Algeria at the former School of Agriculture of Rouïba. These very careful trials, using a large number of varieties, were subsequently pursued at the Botanical Station of Maison-Carrée. The agricultural laboratory of the Agricultural Institute of Algeria was involved at various times with soya, especially after 1930.

"In 1936-37, under the initiative of inspector general Vivet, in the search for new irrigated forage resources, additional trials were conducted at the Central Station of Maison-Carrée, at various regional experiment stations and by some colonists in Chélif, in the regions of Orléansville and Inkermann.

"In 1938 Mr. J. Serda conducted trials for the introduction and cultivation of soya. In 1940 he successfully cultivated a dozen acres intercropped with citrus fruits at Chebli, in the Mitidja. In 1941 Prof. Laumont, at the Central Station for Seed Trials and Plant Improvement at Maison-Carrée, undertook trials with a large number of varieties from France, the USA, and the Balkans. This careful experimentation could not be continued until near the end of 1943 due to the actions of the Allies in North Africa during World War II. In 1948 we introduced at the Central Station 112 varieties of soya from the collection at the Station for Seed Trials in Paris, varieties which had been studied starting in 1935.

"The soybean collection at Maison-Carrée presently consists of 153 varieties [including 97 varieties originally collected and studied in Paris]. During the last campaign, the most interesting varieties have been sent for trial in the various regional stations connected to the Agricultural

Experimentation Service of Algeria. This the soybean has been studied in Algeria for more than 60 years."

The morphological characters associated with the soybean seed, and with the young, adult, and mature plants, and with the pods, have been combined into as key for determining varietal names and eliminating synonyms. The varieties have been classified into 3 groups based on the ratio of the number of days from planting to flowering (or to maturity) in Paris to the corresponding number at Maison-Carrée. The comparison of the characters under the two environments focused attention on photoperiodism and temperature. The "heliothermic index" is calculated as follows: number of days of vegetation x mean daily temperature x mean day length. Address: Chef de Travaux, Service de l'Experimentation Agricole en Algerie.

148. Chen, Philip S.; Chen, Helen D. 1956. Soybeans for health, longevity, and economy. South Lancaster, Massachusetts: The Chemical Elements. xii + 241 p. Illust. Index. 21 cm. 2nd ed. Jan., 1962, 242 p. [24 ref]

• **Summary:** A comprehensive review of the subject. Contents: Preface, by the author (South Lancaster, Massachusetts, July 1956). Foreword, by Geo. M. Strayer, Vice-President and Secretary-Treasurer, American Soybean Association. Introduction. Part I: Nutritive value of the soybean. 1. Protein (incl. Dr. Wolfgang Tiling of Hamburg, Germany; Dr. Harry Miller). 2. Fat (incl. phosphatides, sterols and hormones). 3. Carbohydrates and caloric value. 4. Minerals. 5. Vitamins. 6. Soybeans and world population. 7. Soybeans and disease (incl. Dr. Wolfgang Tiling of Germany).

Part II: Soy products. 8. Soybean oil: Composition and properties, processing and refining, reversion, uses, phosphatides, margarine, mellorine (vegetable frozen dessert). 9. Soybean oil meal: Heat treatment, Gelsoy, Multi-purpose Food. 10. Soy flour: Uses, soy bread vs. enriched white bread. 11. Soy milk. 12. Soy cheese (or soybean curd, "aptly described by the Chinese as 'the meat without bones'"—incl. pressed tofu sheets and yuba). 13. Soy sauce: Preparation of kojis, brine fermentation, production yields, microorganisms are available. 14. Soybean sprouts.

Part III: Soybean culture and preservation. 15. Soybean culture: Two types of soybeans (commercial field vs. edible or vegetable varieties), inoculation, fertilizer, cultivation, harvest. 16. Preservation of soybeans: Shelling, canning, freezing, dehydration, harvesting dry mature soybeans.

Part IV: Recipes. 17. Soybeans and soybean pulp: Green or fresh soybeans, dry soybeans, soybean pulp ("prepared by pressing cooked soybeans through a coarse sieve or by grinding them in a food grinder"), recipes (incl. Soyburger, Scalloped green soybeans, and Roasted soybeans—dry roasted or deep-fried. Describes how to make wheat gluten at home and praises monosodium glutamate

for its ability to improve the flavor of recipes—though its use is called for only in the recipe for Soyburger). 18. Soy flour: Breads, cakes, cookies, pies, soups, other recipes. 19. Soy grits and soy flakes. 20. Soy milk. 21. Soy cheese. 22. Soybean sprouts.

Appendices: A. Soybean utilization (chart). B. Manufacturers and handlers of soy foods (Source: 1956 *Soybean Blue Book*). C. References.

Chapter 1, “Protein,” begins: “The soybean is best known for its high protein content (p. 7). It then discusses the work of Dr. Harry Miller (p. 14-15).

Chapter 15, “Soybean Culture,” describes how to grow soybeans in a garden. Pages 126-27 discuss the two types of soybeans: the commercial field type and the edible vegetable type. Five major differences between the two types are discussed (p. 126). The edible varieties are larger in size, do not yield as heavily (though they yield more heavily than snap beans or lima beans), are more prone to shatter as they near maturity in the field, are superior in flavor, texture, and ease of cooking, and some edible varieties are also superior in the manufacture of soybean flour, soybean milk, roasted beans and other products. Table 31 (p. 130) lists eleven varieties of edible soybeans: Very early—Giant Green. Early—Bansei, Fuji. Midseason—Hokkaido, Jogun, Willomi. Late: Illington, Imperial, Funk Delicious, Emperor, Higan. Commercial—Illini.

Chapter 16, “Preservation of Soybeans,” describes how to preserve “green soybeans” by canning, freezing, and dehydration.

Photos show: (1) A sack of Lincoln soybeans (facing p. 1). (2) Soybean plants, showing pods and leaves (p. 3 and 4). (3) A beam balance with a small amount of soy flour balancing many animal products. “The protein value of soy flour: 1 lb. of soy flour contains protein values equal to 2 lbs. beef, or 34 eggs, or 6 quarts milk.” Source: Health and Character Education Institute (p. 6). A similar photo (p. 24) states: “1 lb of soy flour contains food calories equal to 3½ lbs beef, or 3 quarts milk, or 29 eggs. (4) Two views of a child. Left, suffering from marasmus. Right, after six months on a soy milk diet. Courtesy Dr. Wolfgang Tiling (p. 62). (5) A machine at the Northern Utilization Research Branch of USDA treating soybean oil with alkali (p. 72). (6) The distribution of MPF [Multi-Purpose Food] to starving Indian children (p. 91; Courtesy Meals for Millions Foundation). (7) Quaker City No. F4 grinding mill (p. 102; Courtesy Straub Co., 4059 Ridge Ave., Philadelphia, Pennsylvania). (8) Early soy cheese (tofu) production in the United States (p. 108; perhaps at Madison Foods). (9) The Northern Utilization Research Branch, Agricultural Research Service, USDA—shows outside of the huge building (p. 113). (10). How to grow soy sprouts in a glass jar at home (p. 119). (11) Well nodulated soybean roots (p. 129; Courtesy The Nitragin Co.). (12) Baked soybeans in a crock (p. 144). (13) Soy flour used in numerous baked

products (p. 159; Courtesy ADM). (14) Griddle cakes [pancakes] made with soy flour brown quickly (p. 173). (15) Soy peanut butter cookies (incl. peanut butter and soy flour; p. 185). (16) Soy grits in a glass jar (p. 198). (17) Freshly-cooked crisp soybean sprouts in a raw vegetable salad (p. 219).

Note 1. The first printing of this book (1956) was dedicated “To Li Yu Ying and William J. Morse, *The Soybean Champions of the Eastern and Western Hemispheres*,” but by the second printing (April 1957) the dedication had changed “To William J. Morse and Harry W. Miller, *The Soybean and Soy Milk Champions of Our Time*.”

The publisher of this third printing was unable to sell all the books printed, so Chen apparently arranged for a company named “Outdoor Pictures” (Box 1326, Escondido, California) to sell them. On the title page, Outdoor Pictures pasted their name and address over that of “The Chemical Elements.”

Note 2. According to the *National Union Catalog*, Philip Stanley Chen was born in 1903. The rear cover states that he was born in China and is now a naturalized U.S. citizen. He is a graduate of Emmanuel Missionary College [in Berrien Springs, Michigan] and Michigan State University. Before writing this, his first book on diet, health, or soybeans, he wrote several books on chemistry: (1) *The Chloro Derivatives of m-cresol*. 1933. Easton, Pennsylvania: Mack Printing Co. 7 p. (Abstract of his PhD thesis, Michigan State College of Agriculture and Applied Science); (2) *The Chemical Elements, Rev. ed.* 1948. South Lancaster, Massachusetts: Chemical Elements (fold chart). (3) 500 Syntan Patent Abstracts, 1911-1950. 1950. South Lancaster, Massachusetts: Chemical Elements. 125 leaves. (4) Syntans and Newer Methods of Tanning. 1950. South Lancaster, Massachusetts: Chemical Elements. 128 p.

In 1962 Chen wrote *A New Look at God*, published by Chemical Elements (288 p.). Address: 1. Prof. of Chemistry, Atlantic Union College, South Lancaster, Massachusetts; 2. National Science Foundation Fellow, Cornell Univ.

149. Chow, Tse-tsung (pinyin: Zhou, Cezong). 1960. *The May Fourth Movement: Intellectual revolution in modern China*. Cambridge, Massachusetts: Harvard University Press. xv + 486 p. Index. 25 cm. Harvard East Asian Series 6. [1072* endnotes]

• **Summary:** On 4 May 1919, “students in Peking demonstrated in protest against the Chinese Government’s humiliating policy toward Japan.” The result was a series of strikes and an intellectual revolution which covers the period from roughly 1914 to 1923, and which has shaped modern China. Well written and documented, with a chronology from 1914 to 1923.

In the index: For “Li Yu-ying: See “Li Shih-tseng” (his “courtesy name”).

Page 33: Li Shih-tseng is listed as one of four Chinese anarchists in Japan [sic, France].

Page 36: In early 1907, Chinese students in Paris established the *New Century* (*Hsin shih-chi*) weekly. During the next 15 years “a movement for study in France, led by prominent Chinese anarchists, absorbed the attention of many able and ambitious young Chinese students. In 1912, in Peking, Li Shih-tseng and two other believers in anarchism, along with Wang Ching-wei, organized the Society for Frugal Study in France, to encourage and to help Chinese students travel to France. About 120 students went to France in one year alone (1912-13). Shortly thereafter, the society was disbanded under pressure from Yüan Shih-kai. But in June 1915 the Society for Frugal Study by Means of Labor was organized in Paris, to help poor students study in France, while working there. By the end of 1919 some 400 students were in France on this program, The next year (after World War I) there were 1,200 more.

Pages 48-51: Major reforms were carried out at Peking University. To improve moral standards, a Society for the Promotion of Virtue (*Chin-te hui*) was established in 1918 on the pattern of a similar organization founded in 1912 in Shanghai by Wu Chih-hui, Li Shih-tseng, and Wang Ching-wei. The members agreed not to consort with prostitutes or concubines, and not to gamble.

Page 75: Many of the intellectuals in the May Fourth Movement, such as Li Shih-tseng, were members of the Kuomintang (political party).

Page 251: In early 1920, the New People's Society, led by Mao Tse-tung, began to divide into right and left. Some of those on the right later joined the Kuomintang; Hsiao Tzu-sheng became a follower of Li Shih-tseng.

Page 294: During the two decades before 1919, many Western philosophic ideas had been popularized in China. Some intellectuals such as Li Shih-tseng, who had been in middle age in 1919 at the time of the May Fourth Movement, introduced important French philosophic works into the movement.

In April 1922, a conference of the World's Student Christian Federation was scheduled to be held at a college in Peking. The event immediately provoked anti-Christian agitation and subsequently an antireligious movement. “A Great Federation of Antireligionists was organized in Peking in March [1922] under the leadership of the veteran anarchist, Li Shih-tseng, and supported by communists and left Kuomintang leaders...” Address: Center for East Asian Studies, Harvard Univ., Cambridge, Massachusetts.

150. Scalapino, Robert A.; Yu, George T. 1961. The Chinese anarchist movement. Berkeley, California: Center for Chinese Studies, Institute of International Studies, University of California. v + 81 p. Feb. No index. 23 cm. [155 ref. Eng]

• **Summary:** Contents: Author's preface. The origins of Chinese anarchism: The Paris group, influences upon the Paris group, the *New Century* and its message, Sun and the Paris anarchists, the mounting struggle against the government, the Chinese anarchist movement in Tokyo.

Anarchism and the national revolution: Shih-fu and his movement, the Society to Advance Morality and its impact, anarchist Communist themes—the prelude to Marxism-Leninism.

The work-study movement: “Frugal Study” in France, the “Diligent Work-Frugal Study” movement, the decline of the work-study movement.

The rising Communist tide: Communist-anarchist debate—Ch'en Tu-hsiu versus Ou Sheng-pai. A summing up. Notes. Glossary.

Between 1905 and 1920, anarchist thought was considered by Chinese intellectuals and radicals as “the most scientific, most ‘progressive,’ and most futuristic of all political creeds” (p. 1).

The Paris group: Paris became “the center of the early Chinese anarchist movement. When Sun Pao-ch'i went to France in 1902 as Chinese Minister, over twenty government and private students travelled with him. Included in this group were Li Shih-tseng and Chang Ching-chiang, both young men from prominent families Li was the son of Li Hung-tsao who, for some 25 years prior to his death in 1897, had been a powerful figure in the national administration. Li had come to France as an attaché in the Chinese legation, but he soon gave up this position to study biology and promote anarchism.”

In 1902 Chang, who came from a wealthy family, used some of “his money to found the T'ung-yun Company as a Chinese commercial firm in Paris. Between 1902 and 1906, a number of young men from Chang's village came to Paris with assurances of work while they continued their studies... A Chinese restaurant-tea house was established under the auspices of Chang's ‘Company’ as an additional outlet for private students from China.

In 1906-07 the entrepreneurial activities of the young Chinese in Paris underwent further expansion. “A printing plant (Impremerie Chinoise) was organized in Paris in 1906 by Chang, Li, Ch'u, and Wu Chih-hui.” In 1907 they began publishing a Chinese pictorial *Shih-chieh* (*The World*). But only two issues and one supplement were ever printed.

Also in 1907 “Li, Hsia Chien-chung, and several others organized the Far Eastern Biological Study Association, with a laboratory alongside the printing plant. Two years later [in 1909], after various chemical experiments with [soy] beans, Li established a bean-curd [tofu] factory which produced assorted [soy] bean products in addition to the traditional Chinese bean-curds. The idea of work-study was prominently involved in this experiment. In the evenings and when not on duty, the workers were to practice Chinese and French, as well as studying such subjects as general

science. Smoking, drinking, and gambling were strictly forbidden. Initially, five Chinese were employed, but the number eventually reached thirty.

"These ventures had their very practical aspect; they represented attempts to finance the education of as many fellow countrymen as possible. But underlying them also ran a strong current of idealism and the ideological basis of this idealism lay in anarchism as it was currently being propagated in Europe. All the young Chinese associated with the enterprises noted above became ardent converts to the anarchist creed." And to espouse this creed, on 22 June 1907, Li, Chang, Ch'u Wu began the publication of a weekly known as *Hsin Shi-chi* (*The New Century*). "For three years this journal was to champion the causes of anarchism and revolution, reaching Chinese students and intellectuals in all parts of the world."

"Senior in age and experience, Wu Chih-hui became the primary organizer of the Paris Anarchist Group, although Li Shih-tseng was perhaps its driving spirit... Wu was born in 1864 in Kiangsu province. His early education was of the traditional Chinese type. He reached the Chih-shih examinations in Peking, but failed. (Li's father was one of the four examiners)." In 1906 Wu moved to Paris, where he lived with Li Shih-tseng and Ch'u Min-i. Li had first met Wu in Shanghai while en route to France in 1902." With their various enterprises and organizations, "the young conspirators were in a new business-that of turning out revolutionary propaganda.

"Influences upon the Paris group: Li Shih-tseng has given us some later recollections of the varied influences that played upon him and his colleagues during this period. [Note 12: Scalapino interviewed Li Shih-tseng on 16 July 1959 in Taipei]. Perhaps these can be divided into three major categories: the Chinese classical philosophers; Darwin and the Social Darwinists; and the radical libertarians, brought up to date by the anarchism of Proudhon, Bakunin, and Kropotkin. As we shall note, the Paris group were in certain respects fervent anti-traditionalists who decried any attempt to equate Lao Tzu with the modern Anarchists, or the ancient well-field system with modern communism Yet almost without exception, these were young men who had received an excellent classical education. They had been exposed to a range of political ideas almost as broad as that existing in classical Western philosophy."

"This was the age of Darwinism. Li now recalls how greatly he was influenced by the writings of Lamarck and Darwin, how these men opened new doors for him in history and philosophy as well as in science. The influence was especially strong upon a young man studying zoology, botany and biology, but Li would have felt the Darwinian impact, no matter what his field" (p. 5).

"And certainly no single work had greater influence upon the young Chinese Anarchists than Kropotkin's

Mutual Aid. If their movement had a bible, this was it.

"It is easy to understand how men like Wu, Li, and Chang might make a personal identification with such figures as Bakunin, Kropotkin, and Reclus. Despite the seeming cultural chasm, there were many common bonds. These were aristocrats, by birth as well as by intelligence. They represented the most sensitive and concerned segment of the leisure class. Another bond was that of science. All of these men were committed to science—either as a profession or as a way of life. Kropotkin, for example, was an eminent geologist, Reclus a world-famous geographer, Li a budding biologist. Science, not Esperanto, was the true international language of this age."

The *New Century* and its message: The philosophy of this periodical "was Anarchist Communism, with some special Chinese emphases. It can best be set forth in terms of 'anti's' and 'pro's.' The young Chinese anarchists were anti-religion, anti-traditionalist, anti-family, anti-libertine, anti-elitist, anti-government, anti-militarist, and anti-nationalist. They were pro-science, pro-freedom, pro-humanist, pro-violence, pro-revolution, pro-communist, and pro-universalist" (p. 7).

Anti-libertine means that the young Chinese anarchists had a fairly rigorous ethical code. Theirs was a call to hard work and hard study, the protection of one's body, and in general, a Spartan life. The Anarchists were vigorously opposed to visiting prostitutes, smoking, drinking, and gambling, and as we have noted, these activities were prohibited in Anarchist-run establishments. Some Anarchists like Li Shih-tseng also espoused vegetarianism. Physical exercise was greatly encouraged. The contrast between these rules of personal conduct and those of the orthodox Chinese scholar-gentry class was striking. And in this sense, conversion to Anarchism was similar to religious conversion involving the attempt to follow a whole new way of life." This "'conversion' was an intensely personal act" (p. 9-10).

"The strength of anarchist faith in science can be indicated by the remark of Li Shih-tseng: 'There is nothing in European civilization that does not have its origin in science.' To the anarchists, science was truth, knowledge, and progress. It was the only legitimate cornerstone of education, the only proper basis of values. It separated the barbarian from the civilized man" (p. 14). Address: Center for Chinese Studies, Univ. of California, Berkeley, California.

151. Scalapino, Robert A.; Yu, George T. 1961. The Chinese anarchist movement (Continued). Berkeley, California: Center for Chinese Studies, Institute of International Studies, University of California. v + 81 p. Feb. No index. 23 cm. [155 ref. Eng]

• **Summary:** "The appeal of assassination to Chinese radicals as a revolutionary technique was due in major part

to the problems involved in organizing any effective mass movement in contemporary China, and the difficulties of peaceful change. Assassination was an immediately practical individual action... In another source, *La Révolution*, probably written by Li Shih-tseng and Ch'u Min-i, five means of effectuating revolution were listed: books and speeches 'so as to move people'; meetings and gatherings 'whereby the people's power may be brought together'; public resistance in the form of refusal to pay taxes; opposition to conscription, and strikes; assassination; and mass uprisings" (p. 16).

"Sun and the Paris anarchists: The ideological position of the Paris group should have placed them in sharp conflict with Sun Yat-sen. In fact, however, Sun developed a warm personal friendship with the young Anarchist organizers, induced most of them to join his T'ung Meng Hui, and received various types of aid from them. And in later years' men like Wu, Li, and many other young Anarchists gradually affiliated themselves with the Kuomintang. At the end, indeed, some were to be found in the so-called 'right wing' of the Kuomintang. How are these seeming contradictions to be explained?

"Some critics are prone to see the Paris group as faddists who in their youthful enthusiasm plunged into anarchism as into all things left-bank French, with tremendous spirit but in an essentially superficial fashion. There is some truth in this evaluation, but it is not wholly fair. Many of the young Chinese in Paris during this era did fall in love with France and did become ardent Francophiles. In a sense, anarchism for them was only a part of a much broader conversion—a conversion to Western, particularly French, civilization. Li Shih-tseng is an excellent example. Even now [1959], he effects the French manner, down to beret and goatee (though not to food and drink). With him at least the fad endured. But while these faddists may have been superficial Frenchmen, they were not superficial anarchists—at least not initially. The doctrines which they preached, they understood. In heated argumentation with opponents, they held their own very well" (p. 21).

The more serious charge perhaps is that of opportunism. It is alleged that men like Wu and Li betrayed a basic insincerity in professing anarchism and yet affiliating themselves increasingly with the nationalist movement, and a centralized political organization, the Kuomintang, which was antithetical to their anarchist beliefs." But maybe men like Wu and Li were just changing, adapting to reflect the dominant the "dominant pressures of the society" (p. 22).

"Despite their anti-nationalist position, the young anarchists could not avoid a natural link with Sun's revolutionary movement. After all, it did represent the first step: it was anti-Manchu and hence anti-authority in terms of the contemporary Chinese scene. The anarchists,

moreover, always hoped that they could win over this movement to their side, both with respect to tactics (assassination, strikes, and revolution) and with respect to ultimate goals. And in tactical terms, they scored some successes." [Footnote 63: "When posed with this general question, Li Shih-tseng asserted that in each era, one struggles for freedom and the liberation of the individual spirit in a different manner, relying upon different tactics and approaches—but that the fundamental struggle is still the same. Interview, July 16, 1959"]. (p. 23, 67-68).

"The Society to Advance Morality and its Impact:... In January 1912, the *Chin-te Hui*, 'Society to Advance Morality,' had been founded by Wu Chih-hui, Li Shih-tseng, Chang Chi, and Wang Ching-wei. [5] Most of the Paris group had returned to China shortly after the 1911 Revolution. They were making their political impact felt in a variety of ways. None was more interesting than the *Chin-te Hui*. In propagating their Society, Wu and the others argued that basic social reform had to accompany political change. The reason for the corruption of the Ch'ing regime, they argued, was due to the corruption of Chinese society; its most common forms being prostitution, gambling, and the concubine system. Hence China must build a new morality attuned to the new society that had to be created" (p. 37).

"The work-study movement: Li Shih-tseng and others argued that "France was an ideal area for Chinese overseas education."

"'Frugal Study' in France: To forward their causes Wu Chih-hui, Wang Ching-wei, Li Shih-tseng, Chang Ching-chiang, Chtu Min-i, Chang Chi, and Chi Chu-shan founded the Liu-Fachien-hsueh Hui, 'The Society for Frugal Study in France,' in 1912. The second phase of the overseas work-study movement had begun. The purpose of the Frugal Study Society was to promote simple living and low costs for the students, thus enabling them to find the means to go to France and remain there for the time necessary to complete their studies" (p. 45-46).

"The failure of the nationalist revolution [1911+] and the rise of Yuan Shih-k'ai seriously interfered with the Frugal Study Movement. Moreover, with the outbreak of the European war [1914], Chinese students could not be sent to France. Hence, organized activities in China were largely abandoned although Li and some others continued to propagate the cause. As the war dragged on, however, France began to face an acute manpower shortage. Consequently, the French government negotiated with the Chinese government for Chinese workers. Tens of thousands of laborers were sent. Under these circumstances, Li and his friends saw another opportunity whereby they could recruit students willing to work in order to study abroad. The hope was that for each year's work, a Chinese student would be able to afford two years' study" (p. 47).

“The ‘Diligent Work-Frugal Study’ Movement: Thus in June 1915, the old Paris anarchist Group and their supporters organized a new society, *Ch’in-kung chien-hseh Hui*, ‘The Association for Diligent Work and Frugal Study.’ In the earlier Society, as was noted, there had been no special premium upon the students working if funds could be acquired by other means. This new program was specifically geared to a work-study movement. However, other categories of students continued to go to France: those with private means and a few with government scholarships. In 1916, Li was able to conclude an agreement with French authorities for his own recruitment program. Once again, preparatory schools were opened in Peking [Beijing] and elsewhere.

“The Diligent Work-Frugal Study Association also established branches in various Chinese cities. In addition, certain Frenchmen cooperated with the old Paris group to found the Sino-French Educational Association. Ts’ai was made head, and Li served as secretary. In France, this Association was to make arrangements for the students, and help them with their problems. In China, it was to help in recruitment and general cultural relations. Headquarters were established in Peking [Beijing], with branches in Canton, Shanghai, and other areas” (p. 49).

By Oct. 1919, Li Shih-tseng in Paris was in complete charge of the work-study movement. It was reported that all the students had great respect for Li (p. 52).

By 1920 the Chinese Communist tide was rising. “Indeed, after 1920, Communism appeared increasingly as the wave of the future for Chinese radicals.” In July 1921, the Chinese Communist Party (CCP) founded in Shanghai, China and its first Congress was held there (p. 54-55). “Anarchism had as its central quest the freedom of every man” (p. 58).

“Chinese anarchism suffered from two massive defects,...” First, “it was a movement forced by its most essential theories to denounce and by-pass nationalism in an era when nationalism represented the wave of the future. No political movement in modern Asia has succeeded unless it has been able to use nationalism. Anarchism, moreover, had a deep aversion to power and authority. The very concept of an Anarchist Party was to the true anarchist a contradiction,...” Yet: “Without coercion, how was the discipline and sacrifice necessary to rapid progress to be attained?”

“But anarchism, whatever its utopian qualities for modern China, was in many respects also naturally Chinese. It was the other side of the Confucian, educative, centralized, authoritarian state. It was the scholar in contemplation and out of office, the peasant out of reach of his landlord, the wanderer beyond the outstretched hands of the state. Indeed, it was the imperishable goal of all men at all times—complete freedom for self realization within the

limits of social justice, to the limits of one’s capacity” (p. 61).

Note: Was it not also the teaching of Lao Tzu [Laozi]? Read the *Tao Te Ching* [*Dao De Jing*].

Note: This book was reprinted in about 1980 by Greenwood Press (Westport, Connecticut), with 6 pages of new front matter. An online version is available at http://dwardmac.pitzer.edu:16080/anarchist_Archives... George T. Yu was born in 1931. Address: Center for Chinese Studies, Univ. of California, Berkeley, California.

152. Chow, Tse-Tsung (pinyin: Zhou, Cezong). 1963. Research guide to the May Fourth Movement: Intellectual revolution in modern China, 1915-1924. Cambridge, Massachusetts: Harvard University Press. xi + 297 p. 24 cm. Harvard East Asian Series 13. [1420 ref]

• **Summary:** The Preface begins: “This book, a companion volume to *The May Fourth Movement: Intellectual Revolution in Modern China*, is intended not only to document the first volume, but also to furnish materials to those who are interested in the study of the intellectual, cultural, and sociopolitical history of modern China, especially of the crucial period from 1915 to 1924.”

For “Li Yu-ying: See Li Shih-tseng.” This book gives details about nine periodicals to which Li contributed. They are listed here (as in the index) by sequential number, rather than by page number: #60. Study in Europe magazine. Published semimonthly in Paris by Chinese, especially members of the Society for Frugal Study by Means of Labor. Issued from 15 Aug. 1916 to 1 March 1918.

#99. Chinese Laborer magazine. Published semimonthly in Paris by the Society for Frugal Study by Means of Labor. Issued from 10 Jan. 1917 to 25 Jan. 1919.

#118. Labor. Published monthly in Shanghai. Issue from March 20 to July 20, 1918.

#139. Young China. Published monthly, journal of the Young China Association. Issued from 1 July 1919 to May 1924.

#195. The Construction. Published monthly in Shanghai, organ of the Kuomintang. Issued from 1 Aug. 1919 to 1920.

#223. The Sunday Review. Published weekly in Chengtu, Szechwan, by members of the Chengtu branch of the Young China Association. Issued from 13 July 1919 to mid-1920.

#248. Study in Europe or Journal Chinois Hebdomadaire. Published weekly in Paris by the Society of the Study in Europe Weekly. Issued 15 Nov. 1919 to Nov. 1920.

#506. The People’s Bell. Published monthly then irregularly in Canton then Shanghai. Issued 1 July 1922 to 25 July 1927.

“#568. The New Age. Published monthly in Changsha, organ of the Self-Culture College of Hunan. Issued 10 April

1923 to July 1923.

Note: The May fourth movement took place in China starting on 4 May 1919. An anti-imperialist, cultural, and political movement, it “marked the upsurge of Chinese nationalism and a re-evaluation of Chinese cultural institutions, such as Confucianism. The movement grew out of dissatisfaction with the Treaty of Versailles settlement, termed the Shandong Problem [the treaty awarded Shandong province to Japan]. Coming out of the New Culture Movement [which started in 1915], the end result was a drastic change in society that fueled the birth of the Communist Party of China” (Source: Wikipedia). Address: Center for East Asian Studies, Harvard Univ., Cambridge, Massachusetts.

153. André, Émile; Hou, Kia-Wo. 1964. La lipoxydase. Sa découverte dans le résidu de la préparation du lait de soja [Lipoxidase. Its discovery in the residue by-product of soybean milk production]. *Oleagineux* 19(3):187-93. March. English-language summary, p. XXVII. [Fre; eng]
• Summary: “The cheese called *Teou-fou* in China is somewhat consumed in Paris and the region surrounding it, where the number of Chinese restaurants is greater than one could believe.” Of the total restaurants in this area, about 35 are Chinese restaurants, 10 at Vietnamese, and only 5 are Japanese. They are visited both by people of those countries and by western consumers who are curious to taste exotic foods. “There were, and still are, two or three shops in and around Paris, where tofu (fromage de soja) is prepared daily and delivered to the restaurateurs who have ordered it. Mr. Kia-Wo Hou had friendly relations with one of the two established at Colombes and was able to easily procure the materials he needed.”

Note: In about 1910 Li Yu-ying, a Chinese soyfoods pioneer, established a soyfoods manufacturing company named Usine de la Caséo-Sojaïne, at Vallées, near Colombes, outside of Paris. It is not clear how the current companies at Colombes are related to the earlier company. Address: 1. Conseil scientifique a l’R.H.O.; 2. Docteur es-Sciences de l’Université de Paris.

154. Boorman, Howard L.; Howard, Richard C. ed. 1967-79. The biographical dictionary of Republican China: Li Shih-tseng (Orig. Li Yu-ying). New York City, NY: Columbia University Press. See vol. 2, p. 319-21 + index volume. 28 cm. [Eng]

• Summary: Volume 5 of this excellent 5-volume work is a personal name index by Janet Krompart. Li Yü-ying appears under Li Shih-tseng. Original name: Li Yü-ying. The Chinese characters for each name are given. Born in 1881, Li Shih-tseng was leader of the work-study movement in France and became known as one of the “four elder statesmen of the Kuomintang.” Thus, he was a very important political figure in 20th century Chinese history.

Note: The Kuomintang or “National People’s Party” was formed in 1912 in China. It won the elections of 1913 and ushered in the short-lived Chinese Republic. In 1923-24 Sun Yet-sen reorganized the Kuomintang (KMT), orchestrated its rise to power, and was strongly associated with it until he died unexpectedly in 1925. Thereafter Chiang Kai-shek was its leader. On 8 Dec. 1949 the Kuomintang government, under Chiang Kai-shek, moved to Taiwan, as the Chinese Communist Party under Mao Tse-tung took control of mainland China.

Li Shih-tseng was born in Peking, although his native place was Kaoyang, Chihli (Hopei). His father, Li Hung-tsao, held important offices in the Ch’ing government, such as Grand Councillor and tutor to Tsai-ch’ien, the T’ung-chih emperor. Li Shih-tseng and his elder brother, Li Kun-ying, were exposed to reformist ideas at an early age. When their father died in 1897, the Ch’ing government awarded both of his sons the rank of *lung-chang*, which qualified them to hold posts on the level of a departmental head in a government board.

In 1901 Li Shih-tseng met Chang Jen-chieh, and the two established a life-long friendship. The two young men shared many common interests, the most important of which was the desire to travel overseas. Thus, when Sun Pao-ch’i was appointed minister to France in 1902, they became attachés on his staff. In June of 1902, on his way to France, Li stopped in Shanghai, where he met Wu Chih-hui and Ts’ai Yuan p’ei; they also became his life-long friends. In later years these four men, Li, Chang, Wu, and Ts’ai became known as the “four elder statesmen of the Kuomintang.”

In about 1902, after arriving in Paris, Li Shih-tseng enrolled at the Pasteur Institute to study biology. In 1905 he met Sun Yat-sen and joined the French branch of the T’ung-meng-hui later that year. In late 1905 Wu Chih-hui arrived in Paris and joined with Li Shih-tseng and Chang Jen-chieh in founding the Shih-shie-she (World Society), a cultural and revolutionary publishing house with an affiliated printing company. Chang financed the *Hsin shih-chi* (*New Century*), a magazine which began publication in June 1907 and published 121 issues before ceasing on 21 May 1910 because of heavy financial losses. Li and Wu, both of whom were strongly attracted to anarchism, wrote most of the articles.

In 1907 Li Shih-tseng and Hsia Chien-chung established the Far Eastern Biological Society. Li did extensive research on the soybean at the Pasteur Institute and in 1908 he became a vegetarian. He also decided to found a company to manufacture soybean products, so in 1909, after a trip to China to obtain supplies and workers, he established the Usine Caseo Sojaïne [Usine de la Caséo-Sojaïne] at Colombes, near Paris. More than 30 Chinese worked at the factory; they used their wages to pay for their studies in France. They were escorted to France by Ch’i Ju-shan, whose elder brother, Ch’i Chu-shan, managed the

factory. Li Shih-tseng later [1912] published the results of his studies on the soybean as a book titled *Le soja: Sa culture. Ses usages alimentaires, thérapeutiques, agricoles et industriels*.

When news of the Wuchang revolt of October 1911 reached France, Li Shih-tseng and his associates, one of whom was Chang Chi, hurried back to China. Upon arriving in Peking, Li was elected vice president of the Peking-Tientsin branch of the T'ung-meng-hui. In Jan. 1912 he and some fellow anarchists established the Chin-te hui [Society to Advance Morality]. Its basic tenet was that social reform must accompany political change, and its members pledged to refrain from eating meat, drinking alcoholic beverages, visiting prostitutes, taking concubines, gambling, and accepting government office.

In April 1912 Li Shih-tseng and his four close friends (Wu, Chang, Wang, Chang, and Ch'ih) founded the Liu-fa chien-hsueh hui (Society for Frugal Study in France), known in French as *la Société Rationelle des Etudiants Chinois en France*. The five founders created a plan, known as the thrift-study program, that enabled Chinese to study in France for \$600 a year. A preparatory school, run by Ch'i Ju-shan, was established in Peking to teach French for 6 months to aspiring students. In Jan. 1913 the first group of 30 students arrived in France; Li Shih-tseng had arranged for them to be admitted to the Collège de Montargis, south of Paris. More than 100 Chinese studied in France under this program.

In Sept. 1913, when the second so-called second revolution collapsed, most Kuomintang leaders were forced to flee China. Li Shih-tseng, Wang Ching-wei, and Tseng Chung-ming took their families to France. Wang, who lived with Li in Montargis, lectured to the thrift-study students.

In the spring of 1915 Li, Wu, Ts'ai, and Wang met in Toulouse to discuss the establishment of some publications. Later that year, *la Société Franco-Chinoise d'Education* was organized in Paris. Taking advantage of a labor shortage in Europe, the group enabled more than 2,000 students (many from Hunan or Szechwan) to work in French factories and other business to finance their studies.

In 1916, when Ts'ai Yuan-p'ei became chancellor of Peking University, he invited Li Shih-tseng to join its faculty as professor of biology. Wartime conditions [World War I] forced Li's soybean products company to suspend operations. In 1917 Li returned to China. In 1920 Li sponsored the founding of the Sino-French University near Peking, and the Institut Franco-Chinois de Lyon in France. He served as chairman of the board of directors of the Sino-French University.

Li devoted considerable time to securing the return to China of the French portion of the Boxer Indemnity Fund for use in cultural and educational activities. In 1925, after long negotiations, a Sino-French agreement was signed.

155. Boorman, Howard L.; Howard, Richard C. ed. 1967-79. The biographical dictionary of Republican China: Li Shih-tseng (Orig. Li Yu-ying) (Continued). New York City, NY: Columbia University Press. See vol. 2, p. 319-21 + index volume. 28 cm. [Eng]

• **Summary:** In Jan. 1924 the First National Congress of the Kuomintang was held at Canton. Li Shih-tseng and Wu Chih-hui were elected to the party's Central Supervisory Committee.

In Oct. 1924 Feng Yü-hsiang occupied Peking and took control of the government. He decided to expel P'u-yi, the last Manchu emperor, from the Forbidden City. Li Shih-tseng was appointed the civilian representative to the eviction, which took place on Nov. 5. Li was then appointed chairman of the committee in charge of the inventory and custody of the palace treasures. In 1925 the Peking Palace Museum was founded; Li was chairman of the board. In 1925, Li was honored as a *Commander de la Legion d'Honneur* in recognition of his efforts to further Chinese-French cultural cooperation. Also in 1925 Sun Yat-sen came to Peking for discussions; he appointed Li to the Central Political Council. Sun died in Peking on 12 March 1925, and his body was kept in temporary custody on the Sino-French University campus.

In 1926 the arrest of Li and four others was ordered on charges of instigating a demonstration and disseminating Communist propaganda. Li took refuge in the French hospital, then escaped to Canton.

In 1927, during the Kuomintang split, Li (and 3 close friends) staunchly supported Chiang Kai-shek's conservative faction. They were on the Central Supervisory Committee, which met in Shanghai in April and adopted a resolution demanding the expulsion of all Communists from the Kuomintang. They also supported the government established by Chiang Kai-shek on April 18 at Nanking, in opposition to the Wuhan regime.

Li and two friends sponsored the creation of a board of universities and university districts. In 1928 three such districts were established and Li was head of the Peiping district, but in 1929 the system was abolished by the minister of education. Li Shih-tseng was also a sponsor of the Academia Sinica [Academy of Sciences], established in 1928, and the National Peiping Research Academy, established in 1929. In Oct. 1929, Chiang Kai-shek's new National Government at Nanking drew up regulations for the Palace Museum and confirmed Li as chairman of the museum's board of directors. He held that position until Nov. 1932.

In 1932 Li Shih-tseng went to Geneva to organize the Chinese delegation to the International Committee on Intellectual Cooperation sponsored by the League of Nations. He had not been in Europe for 15 years. While in Geneva, he established the Sino-International Library. Returning to China, Li commuted regularly between

Shanghai (where he lived) and Nanking (where he participated in Kuomintang government and party matters).

In July 1937, when the Second Sino-Japanese War began (the Japanese attacked Peiping on July 7, then Shanghai in August), Li was in Europe, traveling between Paris and Geneva. He returned to China, but left his war-torn homeland in 1941 and went to New York. Working with an American named Dolinet, who was publisher of the magazine *Free World*, they established a Chinese edition. In 1941 his first wife died in Paris, France. In 1943 he established the Wood Shi-fee Institute to honor his long-time friend Wu Chih-hui. Although Li maintained a residence in New York until mid-1945, he made several trips to Chungking and Kunming during the war.

In 1945 Li returned to China, then joined Yang Chia-lo in compiling an encyclopedia, the first volume of which was published in 1946. On 14 Feb. 1946 he married for a second time in Shanghai, China. [Note: On 16 March 1948 Li attended and was honored at the first European Soy Congress held in Paris.] In Sept. 1948 he went to Peiping to celebrate the 19th anniversary of the National Peiping Research Academy. But when the Chinese Communists began to threaten the old capital [Peking], he fled China and went to Geneva, where he remained until 1950 when Switzerland recognized the People's Republic of China.

Li then moved to Montevideo, Uruguay, taking the Sino-International Library collection with him. In 1954 his second wife died in Montevideo. After 1954 he maintained a second home in Taiwan and served as national policy advisor to Chiang Kai-shek and a member of the Central Appraisal Committee, which superseded the Central Supervisory Committee.

Li Shih-tseng married three times. He and his first wife, née Yao T'ung-yi, had a son, Li Tsung-wei, and a daughter, Li Ya-mei. In 1941 his first wife died in Paris. On 14 Feb. 1946 he married Lin Su-shan in Shanghai; she died in 1954 at Montevideo, Uruguay. In 1957, at age 76, he married T'ien Pao-t'ien, who was about 40 years younger than he, in Taipei, Taiwan. Li Shih-tseng was apparently still alive when this book was published in 1968.

Li Shih-tseng is also mentioned under Wu Chih-hui (p. 418).

156. Hymowitz, T. 1970. On the domestication of the soybean. *Economic Botany* 24(4):408-21. Oct/Dec. [131 ref]

• **Summary:** The first of Hymowitz's many pioneering and brilliantly researched, and very well written and documented articles on the early history of the soybean, this is an extremely important and influential contribution to the subject. Contents: Introduction. The current status of the soybean. Speciation, chromosome numbers, and geographic distribution of the genus *Glycine*. Physio-agricultural geography of China: Kaoliang-soybean region, winter

wheat-kaoliang region, winter wheat-millet region, Szechwan-rice region. The myth of the Emperor Shun Nung. The antiquity of the soybean. The gene center. General conclusions.

"It is unfortunate that the literature concerned with the antiquity and historical development of the soybean and its agricultural consequences is fraught with errors and misconceptions... This paper is an attempt to reconcile the old archaeological, historical, agricultural and botanical literature with the more recent data and to establish a working hypothesis on the domestication of the soybean."

"According to Chinese tradition, Emperor Shen Nung, the Father of Agriculture and Medicine, lived and ruled in an area which today is approximately the Chinese winter wheat-kaoliang region. The legend fosters the belief that before Shen Nung the Chinese were nomadic food gathering people. With the onset of the reign of Shen Nung, the Chinese became sedentary food producing agriculturists. Supposedly, Shen Nung taught his subjects how to use the plow, sow grain and he kept his people healthy by prescribing for their ailments native herbs that had medicinal value.

"The earliest record of man's use of the soybean, dating back to the herbal *Pên Ts'ao Kang Mu* (Materia Medica) of the legendary Emperor Shen Nung, is an often repeated statement in soybean literature. No fewer than 6 different years 2838 B.C., 2828 B.C., 2737 B.C., 2700 B.C., 2448 B.C., and 2383 B.C. have been acclaimed as the publication date for Shen Nung's book."

"Chang (1965) and Watson (1966) concur that absolute dates recorded in history after 841 B.C. should be accepted as accurate. An accurate chronological dating system for China prior to 841 B.C. just does not exist. At present, it is believed that the legendary history of China is for the most part the result of ethnocentric interpretations by Han historians. Hirth (1908) is adamant in his belief that the value of the works of Shen Nung, who is sometimes represented as having the body of a man and the head of an ox, appears to be a fabrication of historians, as is the emperor himself.

"The antiquity of the soybean: 'The soybean is one of the oldest cultivated crops' (Martin & Leonard 1967) and 'The soybean has been known to man for over 5000 years' (McKie & Anderson 1967) are statements repeated from one agronomic publication to another without citation or explanation. Ho (1969) quite clearly placed the above statements in proper perspective by asserting that 'no trace of legumes has been found in any Neolithic site in North China or in records of Shang oracles.'"

"The current evidence for the antiquity of the soybean lies in the pictographical analysis of the archaic Chinese word for soybeans (shu), the Book of Odes, and bronze inscriptions.

“The analysis of the development of the archaic character for soybean (shu) reflects the observation and knowledge of the ancient Chinese at a given period. The character shu pictographically depicts the following concept: (1) the horizontal line in the middle symbolizes earth; (2) the upper and lower parts represent the stem and root respectively; (3) around the root the three tear drop like lines illustrate the nodules. It is the opinion of T.C. Hu (1963) that the shu pictograph can be traced back to approximately the 11th century B.C.

“The Book of Odes spans the period from the 11th century to 7th century B.C. during the reign of the royal house of Chou. The geographical area covered by the Book of Odes is essentially the winter wheat-kaoliang and winter wheat-millet regions... The character shu appears in odes 154 (8th–7th century B.C.), 196, 207, 222 (9th–8th century B.C.), and 245 (10th–9th century B.C.), and 300 and was found in bronze inscriptions dating from [the 10th–9th century B.C.].

“It is quite evident that the three lines of evidence presented point to the emergence of the soybeans as a domesticate during the Chou Dynasty [1027–221 B.C.]... However, emergence of a domesticate carries with it the connotation of a trial and error process. This process for soybeans probably took place during the Shang Dynasty or earlier.”

“Conclusions. Historical and geographical evidence developed in this paper point to the eastern half of North China, what is essentially today’s winter wheat-kaoliang region, as the area where the soybean first emerged as a domesticate around the 11th century B.C. During the Chou Dynasty, the winter wheat-kaoliang region was probably the gene center.”

Note: This document contains the earliest date seen for soybeans in China, or in East Asia, or in the world, or the cultivation of soybeans in China, or in East Asia, or in the world (11th century B.C.). The source of these soybeans was probably wild soybeans from China that were gradually domesticated over the centuries. Fukuda (1933) argues that the soybean was first domesticated in Manchuria. Hymowitz attempts to refute this argument as follows: Historically, Manchuria “was sparsely populated by Nomadic tribesmen rather than agricultural people. It was not until the Han Chinese populated the area that agriculture flourished in Manchuria. The intensive cultivation of soybeans in Manchuria is a recent phenomenon. Secondly, the presence of *G. gracilis*, the weedy form, in Manchuria is the consequence of highly intensive cultivation of *G. max* and not visa versa. *G. gracilis* is found wherever there is an overlap in distribution between *G. max* and *G. ussuriensis*. *G. gracilis* most likely evolved as the consequence of outcrossing between *G. max* and *G. ussuriensis*.” Address: Dep. of Agronomy, Univ. of Illinois.

157. Chen, Joseph T. 1971. The May fourth movement in Shanghai: the making of a social movement in modern China. Leiden, Netherlands: E.J. Brill. xii + 221 p. Maps. 25 cm. Series: T’oung Pao, Monographie No. 9. [130* ref. Eng]

• **Summary:** The May Fourth Movement (pinyin: *wusi yundong*) was an anti-Japanese imperialist, anti-Peking warlord, cultural, and political movement growing out of student demonstrations in Beijing on May 4, 1919 protesting the Chinese government’s weak response to the Treaty of Versailles, especially the Shandong Problem. These demonstrations sparked national protests and marked the upsurge of Chinese nationalism, a shift towards political mobilization and away from cultural activities, and a move towards populist base rather than intellectual elites (Source: Wikipedia, Sept. 2009).

This book “is a study of the inner dynamics of the making of the Movement in Shanghai, and an attempt to reveal this movement, in contrast to the Movement in Peking, as a true, rational, calculated, orderly, and non-violent popular movement involving the participation of all classes” (p. 1).

We must regard the metropolis of Shanghai as five separate ‘cities.’ (1) The International Settlement governed by the Shanghai Municipal Council. (2) The Japanese Hongkew area of the International Settlement; they obeyed the Japanese consul general first. (3) The French Concession, located south of the International Settlement and governed by the French Municipal Council. (4) The Chinese native city of Nantao to the south. (5) The Chinese native city of Chapei to the north. See maps.

Page 70: “Early in April [1919], Li Shih-tseng, a former student of the study-work group in France and one-time anarchist, now serving as a member of the Chinese delegation to the Versailles Peace Conference, sent a telegram from Paris to Shanghai...”

Fold-out maps at the end of the book show: (1) Shanghai city plan, including the International Settlement, French Concession, Chinese native city, and Whang Poo [Huangpu] River. (2) Lower Yangtze region, including Shanghai, Nanking, Hangchow, and the East China Sea. (3) Central Shanghai incl. Chinese native city, various consulates, streets, and settlement boundaries. Address: Northridge, California.

158. Guillerma, Jacques. 1972. A history of the Chinese Communist Party, 1921–1949 [Vol. 1]. Translation of *Histoire du parti communiste chinois*, by Anne Destenay. London: Methuen & Co.; New York, NY: Random House. xviii + 477 p. Illust. (24 plates). Maps. Index. 25 cm. [169* ref. Eng]

• **Summary:** This book was first published in 1968 as *Histoire du parti communiste chinoise (1921–1949)* by Payot, Paris.

On pages 12-13 is a topographical map of China and provinces.

Page 23: The first nucleus of anarchists in Paris appeared in about 1907. Its most important members were Li Shih-tseng, Wu Chih-hui, and later Chang Chi. They published a newspaper (in Chinese) titled *The New Century*, with a subtitle in Esperanto (*La Tempo Novaj*). Li also translated *Mutual Aid: a Factor in Evolution*, by Prince Peter Kropotkin.

Page 24: In 1915-1916, the Chinese anarchists dispersed. Li Shih-tseng was for many years in charge of Sino-French cultural relations and Chairman of the National Peking University; he is now in Taiwan.

The section titled "The Chinese Communist Party abroad" states (p. 61): In 1912 a student-worker movement was launched by former anarchists Li Shih-tseng, Wu Chih-hui, and others. In 1915 this movement obtained a new lease on life when the Society for Frugal Study by Means of Labour (*Ch'in Kung-chien hsüeh-hui*) was re-established in Paris. By 1919, Chinese students in France (mostly from Hunan and Szechuan) numbered over 300. In 1900 they probably amounted to 1,600 or 1,800; the movement was active until 1923.

Relations between the Kuomintang and the Chinese Communist Party (CCP) were difficult after the incident of March 20, 1926, and resolution adopted by the Kuomintang Central Executive Committee on May 15 of the same year. Then, on April 12, 1927, the Communists were expelled from the Kuomintang (by its right wing led by Chiang Kai-shek and centered in Shanghai) and the Nanking government. Many Communists were killed at about this time; this book calls the event a "coup" (p. 112-13). "The official communist figures for the April 12 incident stand at 300 dead and 5,000 missing. Among them were many leading communists and men of promise" (p. 125). The CCP established its government in Wuhan, the capital of Hubei province.

Chiang Kai-shek "set up a formal government at Nanking [Nanjing] with the support of the right wing faction of the Kuomintang—Hu Han-min, Wu Chih-hui, Ts'ai Yüan-p'ei, Li Yü-ying, etc. On 25 April an immense protest meeting, presided over by Wang Ching-wei and attended by 300,000 people, was held in Wuhan" (p. 128).

159. Fairbank, John K.; Reischauer, Edwin O.; Craig, Albert M. 1973. The Kuomintang or "National People's Party" (Document part). In: J.K. Fairbank, et al. 1973. *East Asia: Tradition and Transformation*. Boston: Houghton Mifflin Co. xvi + 969 p. See p. 752-791.

• **Summary:** The Kuomintang was a political party formed in 1912 in China by Sung Chiao-jen. In elections held in Feb. 1913 it obtained a majority. But Sung, not yet age 31, was assassinated on 20 March 1913 by henchmen of his political opponent, Yüan Shih-k'ai. Yüan was formally

inaugurated as president of the Chinese Republic on 10 Oct. 1913. In November he ordered the Kuomintang dissolved and by Feb. 1914 he was dictator. The Republic had been short lived. Yüan died on 6 June 1916 a broken man. In 1923-24 Sun Yet-sen reorganized the Kuomintang (KMT) and formed an alliance with the Soviet Comintern. With Soviet advice and the help of the able Soviet adviser, Michael Borodin, Sun now began the creation of a party army and sent his devoted military assistant, Chiang Kai-shek, to the Soviet Union to study its methods. The KMT began to be represented at Comintern meetings. In July 1921 the Chinese Communist Party (CCP) was founded in Shanghai at its First Congress, and Marxism-Leninism was introduced into China. Now the KMT and the CCP represented alternative revolutionary political programs. Headed by Mao Tse-tung, the CCP formed a bloc within the KMT and attempted to capture it from within.

After Chiang Kai-shek's return from 4 months in the Soviet Union, he became head of a new military academy at Whampoa below Canton, aided by a corps of Soviet advisers. Sun Yat-sen died unexpectedly on 12 March 1925. By the summer of 1925 the two revolutionary parties, the dominant KMT and the small CCP, faced an explosive opportunity: an upsurge of patriotic anti-imperialism combined with a militant anti-capitalist labor movement. Foreign imperialists, especially the treaty powers (often aided by Chinese warlords), still ruled China and kept it in a humiliating, semicolonial state. The CCP began to organize laborers and strikes. Its membership rapidly increased. In March 1926 a split between the KMT and the CCP began, with Chiang Kai-shek assuming control of the KMT and the principal proponent of China's military unification. By 1927 the KMT and the CCP were engaged in a civil war with one another and much of the CCP was destroyed. Chiang Kai-shek now built up his KMT regime in Nanking (located on the Yangtze River 150 northwest of Shanghai), which in 1928 he declared to be the new capital of China; Peking was renamed Peiping, a name which it kept until 1949. Warlordism had not yet been wiped out but China was more united than it had been for a decade. The KMT now became China's ruling party, with Chiang Kai-shek at its head. The KMT had a right-wing ideology and it actively promoted the growth of militarism.

"After his marriage in 1927 to Soong-Mei-ling, a Wellesley graduate and sister of Sun Yat-sen's widow, Chiang became like her a confirmed Methodist" and maintained extensive contacts with the West (especially the United States) and with Christianity. Christian missionaries were welcomed in China. Some 2,400 Chinese entered American universities between 1901 and 1920; 5,500 did so between 1921 and 1940. Most returned to China to work in Shanghai firms or Nanking agencies.

In 1937 the KMT removed their capital to Chungking after Nanking was occupied by the Japanese. Nanking

became China's capital again in 1946 and remained so until 1949, when it was occupied by Communist forces. In 1949 the KMT, still under Chiang Kai-shek, fled from China and moved the seat of its government to Taiwan. Address: Harvard Univ., Cambridge, Massachusetts.

160. Li Yuying xian sheng shi lue [Brief biography of Mr. Li Yuying]. 1973. Taipei, Taiwan: Zhi Sang Hui. 3 p. 26 cm. [Cht]*

• **Summary:** Note: Li Yu-ying, a soyfoods pioneer in Paris, France, lived 29 May 1881 to 3 Sept. 1973.

161. Treadgold, Donald W. 1973. The West in Russia and China: Religious and secular thought in modern times. Vol. 2. China, 1582-1949. Cambridge, England: Cambridge University Press. xxi + 251 p. Map. Index. 24 cm. [Li ref. Eng]

• **Summary:** In Vol. 2, Chapter 6, titled "Socialism: Anarchism (1907-1922) and Marxism-Leninism (1920-1949)" mentions Li Shih-tseng [Li Yu-ying] several times. A key event in Chinese intellectual history was the May Fourth demonstration of 1919; it led to the search for new cultural footings and debates that engaged the interest of China's entire intellectual class. The anarchists lived mostly outside China—in Paris and Tokyo. The acknowledged leader of the Paris anarchists was Wu Chih-hui. Born in 1865 in Kiangsu, he moved to France in 1906 and "embraced anarchism in a circle that included Li Shih-tseng, Chang Ching-chiang and others" (p. 143).

In 1907 the Chinese anarchists began to publish a weekly titled The New Century (*Hsin Shih-chih*), which included the title in Esperanto. Condemning all government, religion, the family, militarism, nationalism, and the Confucian tradition, it lasted until 1910.

After the 1911 Republican revolution in China and the return of most of the Chinese anarchists to Paris, in early 1912 they "founded a Society to Advance Morality (*Chin-te Hui*), which included Wu Chih-hui, Li Shih-tseng, Chang Chi, and Wang Ching-wei" (p. 145).

The Chinese "anarchists unequivocally opposed religion as 'unscientific.'" In March 1922 "a new Great Federation of Non-Religionists (*Fei-tsung-chiao Ta-t'ung-meng*) supplanted the Shanghai group [of similar intent]. The leader was the anarchist Li Shih-tseng and Wu Chih-hui was a prominent member..." (p. 146).

Note: Vol. 1 is Russia, 1472-1917. Address: Inst. for Comparative and Foreign Area Studies, Univ. of Washington.

162. Li Shizeng xian sheng ji nan ji [Zhi sang wei yuan hui bian]. [Essays in memory of Mr. Li Shizeng]. 1974. Taipei, Taiwan: s.n. 258 p. Illust. facsim. Portrait. 21 cm. [Cht]*

• **Summary:** Note: Li Yu-ying, a soyfoods pioneer in Paris, France, lived 29 May 1881 to 3 Sept. 1973. Contents:

Photos of Li Shizeng = Li Yu-ying while he was alive. Li's own brush calligraphy. Color funeral photos. Elegaic couplets. Contents of telegrams received at funeral. On pages 189-90 are descriptions of Li's tofu company in France and the book that he published; these descriptions are similar to those found in books about him published previously.

Captions of sepia photos at front of book:



(1) Marriage of Li Shizeng and Tian Bo Tian (28 July 1957). Mr. Li and his wife are in the front row, center.



(2) Mr. Li with his granddaughter's family (1961). (3) Duplicate of previously published photo.



(4) Mr. Li with his friend Zhe Hui in 1953.



(5) Mr. Li meeting Vice President in 1955.



(6) Mr. Li (center) in 1955. Two other people in photo are unknown.



(7) Mr. Li demonstrating his brush calligraphy.



(8) Mr. Li in front of Shi Men Reservoir (October 1956). (9) Mr. Li hosting "January Gathering" in Taipei. (10) Mr. Li at unveiling ceremony of Mr. Wu Jing Heng's statue.

Color photos of Mr. Li's funeral: (1) Where his funeral took place. (2) His coffin. (3) People paying respect to Mr. Li's remains. (4) Li's Coffin being covered by China Republic Party flag. (5) Coffin being covered by party flag. (6) Secretary Zhen representing President at funeral. (7) Vice President Yan at funeral. (8) Central committee of China Republic Party at funeral. (9) Committee that hosted funeral. (10) Prime Minister Jiang at funeral. (11) Presidential Cabinet at funeral. (12) Attorney General Ni at funeral. (13) Chief of Chinese Forbidden Palace Museum Mr. Jiang at funeral. (14) Former students of Beijing Student University at funeral. (15) Students of Yu Da Business School at funeral. (16) Monk praying at funeral. (17) Coffin arriving at graveyard. (18) Coffin being lowered into ground. (19) Picture of grave. Where he is buried is not recorded.

163. Li, Shizeng. 1980. *Li Shizeng xian sheng wen ji*. 2 vols. [Collected works of Li Shizeng. 2 vols.]. Taipei, Taiwan: Zhongguo guo min dang zhong yang wei yuan hui dang shi wei yuan hui; jing xiao chu Zhong yang wen wu gong ying she [Party History Committee, Central Committee, Republic Party of China (Guomindang)]. 11 +

[8] + 495 p. Illust. Portraits. 22 cm. Reprinted in 1990. [Cht]

• **Summary:** These two volumes contain a collection of Li's works, mostly expressing his political opinions and comments, plus lists of rules of the many associations and universities that were written by Li.

The two volumes contain a total of five sections.

Volume I contains sections 1 and 2. Section 1 (p. 1-174) is titled "New century" collection. Section 2 (p. 175-493) is "Political comments."

Volume II contains 3 sections. Section 1 (p. 1-226), titled "Li's notes," is Li's essays and writing (mostly non-political). For example. His birth place (p. 17). Establishing the World Society in Paris (p. 37+). Travels from age 22 (p. 68-76; includes Learning French, attending school, and doing research on soybeans {p. 73}, and his tofu company in France {p. 76}). Chinese New Year (p. 83). Section 2 (p. 227-84) is Li's "Public speeches." Section 3 (p. 285-387) is "Telegrams." One telegram of 5 June 1915 (p. 306) from Li in France to Wu Zhi Hui (apparently not in France) states: Sales of tofu are getting better. During the first 5 years, tofu sales averaged 500 pieces a month, but they have been increasing ever since. Sales of tofu have averaged 10,000 pieces a month this year, and sometimes they are more than 17,000 pieces a month. If sales will continue like this, the tofu company will never go out of business.

Another telegram of 2 Feb. 1947 (p. 374-76) was sent from Shanghai to many of his friends immediately after his 2nd marriage. He has ended his 2-year relationship with Ru Su in New York City. Li was married to his 1st wife, Yao, for 45 years; then she passed away. Today (in Shanghai) he married his 2nd wife Lin Su Shan; she had been married before and divorced. Li is now almost 70 years of age.

Another telegram (p. 343) is about his tofu company. Li had three reasons for starting this tofu company: (1) To raise funds for Chinese organizations, or to sell the factory and use the profits to help fund the World Society. (2) To find a French business partner. (3) If neither of the above works, the company can be used as part of a work-study program for Chinese students in France. By working at the tofu company, Chinese students can earn money to support their studies and pay for their food, rent, and other basic expenses.

Appendix 1 (p. 387-401) is a biography of Li by the publisher, including (p. 388) his five names: (1) Li Yu-ying. (2) Li Shizeng, probably given to him by his parents at birth. (3) Li Shizeng, pronounced the same as his 2nd name but the 2nd character of his given name is the character for "monk," implying perhaps selflessness or simplicity. (4) Li Zhenming. (5) Kuowu, a name he called himself in later life; many people had such a name in old China. And (p. 389) attending school in France, publishing a book about soybeans, the tofu company, Mr. Li has been in France for 6 years, he only returned to China once in 1908 for a few

months. In 1909 he founded a tofu manufacturing company near Paris. One of his friends, Qi Shu Shan helped Li to start the tofu company. Qi was a follower of Cai Yuan Pei (a very famous man in China). He founded and was chancellor of many universities, incl. Beijing University. Li Yu-ying was a vegetarian; Cai Yuan Pei agreed with Li's ideas about vegetarianism.

There is not much description of Li's work with soyfoods in Paris. There is also no information as to whether he did any work with soy after he returned to China. And there is no description of his genealogy or family.

Photos 1-3 and 6 are all in *Legend of a Generation—A Biography of Li Shizeng*, by Chen Jiying (1982). (4) Li Shizeng (far right) with Zhang Jing Jiang, Cai Yuan Pei, Wu Zhi Hui, and others in 1933. (5) 19th anniversary of Beijing Research Institute, 1948.

Note: Li Yu-ying, a soyfoods pioneer in Paris, France, lived 29 May 1881 to 3 Sept. 1973. Near the front of the book are six photos of Li Yu-ying.

Note: In old China, it was not uncommon for a man to have more than one wife or to have concubines. If a man had a wife and 3 concubines, and if the man approved, each could use his surname. They could also be called: Wife #1 (his real wife), wife #2, wife #3, and wife #4. All might be present at his funeral.

164. Yang, Kailing. 1980. *Min guo Li Shizeng xian sheng Yuying nian pu* [A chronicle of Li Shizeng's life]. Taipei, Taiwan: Taiwan shang wu yin shu guan. 8 + 200 p. + [2] leaves of plates. Illust. 19 cm. Series: Xin bian Zhongguo ming ren nian pu ji cheng; Di 8 ji. [Cht]

• **Summary:** This entire book is a chronology of Li's life. It discusses his life year by year, one after the other in chronological order. This biography of a Chinese statesman contains no table of contents, and there is no record of the author's title of affiliation.

Li's work with soyfoods in France is first described on pages 17-18: 1906—After graduating from the school of agriculture in France, Li Shizeng enrolled in the Pasteur Institute to study biochemistry, specifically to do research on soybeans. His professor was Gabriel Emile Bertrand.

The story continues on pages 20-23:

1907—Li continued to study biochemistry and conduct research on soybeans. He discovered soybeans can be used to make many nutritious foods. Mr. Li published his first book, *The Soybean (Le Soja)*.

1908—Li founded the Tofu Manufacturing Company (*Usine Caseo-Sojaïne*). He went back to China to raise money for his company. A few months later, he returned to France with 5 workers. The company was located in Colombes, northwest of Paris.

1909—More workers traveled to France to join the tofu company. The founder of the Republic of China, Sun

Zhong-shan [Sun Yat-sen], visited the company and wrote an encouraging article that said, "My friend Lin Shizeng studied abroad in France and researched agriculture and soybeans. He stands for replacing meat with soyfoods."

1910—A third round of workers arrived in Paris from China to join the tofu company. The total number of workers was now more than 30. When the workers weren't working, they were studying Chinese and French. The workers weren't allowed to smoke, drink, or gamble. Also in 1910 Mr. Li's book, *The Soybean*, was published in Chinese.

1911—The tofu company attended an exhibition at a park in France [whose name sounds like Linan or Rinan] to show people all kinds of foods made from soybeans. Later in 1911, Li traveled back to China.

Li did not do any work with soy after he returned to China.

Li's genealogy and family are discussed on pages 2-5, 12, 14, 23, 100-103. Father: Li Hong-Zao (died 1897) (p. 12). Mother: 2nd wife of Li Hong-Zao, Mrs. Yang. Li was the fifth of five brothers. (1) Li Zhao-Ying. His 2nd and 3rd brothers each died at early age. (4) Li Kuan-Ying. (5) Li Yu Ying (Li Shizeng). Li had 3 sisters: (1) Li Zhu-Yi. His 2nd, 3rd, and 4th sisters each died at early age.





Li's first wife: Yao Tong-Yi (She was Li's older cousin). Li and Yao married in 1897 (p. 12). Li and Yao had two children, a boy and a girl. Son: Li Zong-Wei (born in 1899) (p. 14). His son's wife: Ji Xieng-Zhan. Daughter: Li Ya-Mei (born in 1910) (p. 23). Grandsons: Li Da-Yang. Li Er-Yang. Granddaughter: Li Ai-Lian. Li's first wife, Yao, died in 1940 (p. 94).

Three years after Li's first wife died, he met Mrs. Ru Su, who was Jewish, in New York. She became his partner, but they never married. They were involved from 1943-1947, but Li only lived in the USA from 1943 to 1945. In 1947 he telegraphed Mrs. Ru Su from China that he had decided to marry a Chinese lady. (p. 100-103).

Li's second wife: Lin Su-Shan. Li married Lin in 1947 (p. 104). Lin passed away in 1954 (p. 120).

Li's third wife was Tian Bao-Tian. Li married Tian in 1957 when Li was 77. Tian was 42 (p. 133). This biography includes a chronology of Li Shizeng.

Near the front of the book are four portrait photos which show Li: (1) In 1922 when he was age 42. (2) In 1932 when he was age 52. (3) In 1962 when he was age 82. (4) In 1970 when he was age 91.

Note: Li Yu-ying, a soyfoods pioneer in Paris, France, lived 29 May 1881 to 3 Sept. 1973 (p. 6, 76).



165. Shurtleff, William; Aoyagi, Akiko. 1981. History of fermented soymilk and its products. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 19 p. June 28. Unpublished typescript.

• **Summary:** A comprehensive history of the subject.

Contents: Introduction: Relatively recent, advantages of fermentation. History of acidophilus soymilk from Li Yu-ying and Beltzer (1910-1912). History of investigations on the growth of lactic acid bacteria in soymilk from Gehrke and Weiser (1947). History of soymilk yogurt. History of fermented soymilk cheeses. History of soymilk piima and viili. History of soymilk kefir, kumiss, and buttermilk. Address: Lafayette, California. Phone: 415-283-2991.

166. Shurtleff, William; Aoyagi, Akiko. 1981. Li Yu-ying and Usine de la Caseo-Sojaïne, Paris: History of work with soyfoods. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 13 p. Sept. 15. Unpublished typescript.

• **Summary:** A comprehensive history of the subject.

Contents: Introduction: Contribution. Early life and work: Birth date and place, 1905 soymilk paper at Second International Dairy Congress in Paris, 1908 establishment of laboratory for soymilk studies in Paris. Early soyfoods

patents: Description of five British patents applied for in 1910 and granted by 1912, U.S. patent for “Method of Manufacturing Products from Soja” applied for in 1911 and granted in 1913. Major books and articles: First book *Dadou* in 1910 written in Chinese, 1911-1912 article series, published 1912 as book *La Soja*, basic concept and contents. Introduction of soyfoods in Paris: Start of Usine de la Caséo-Sojaïne northwest of Paris, products made, serving products to distinguished groups, presentation of food at 3 international expositions, trip to Nanking Exposition 1911, decline in popularity by 1916. Effects of Li’s work: Influence on books, fears of products, Soyama-Werke in Germany. Work with soy in China after 1927. Address: Lafayette, California. Phone: 415-283-2991.

167. Shurtleff, William; Aoyagi, Akiko. 1981. History of the Society for Acclimatization, France. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 16 p. Sept. 22. Unpublished typescript.

• **Summary:** A comprehensive history of the subject. Contents: Introduction. The Society and French interest in soy: Funding, purpose, *Bulletin de la Society Zoologique d’Acclimatation*, reasons for early interest in France (early soybean cultivation, early interest in Asia, long tradition of cheese and fermented foods, and help from the leisured nobility), introduction of soybeans as food rather than fodder and oil, difficulty in finding a name for the soybean. Early articles on soy (before 1880): Summary, first article in 1855 by Montgaudry, other articles from 1855-1880. Paillieux’s “Le Soya” (1880): Description, purpose, causes of its publication, summary of article by chapters. About Paillieux: Biographical sketch, book *Le Soya* in 1881, *Le Potager d’un Curieux* written with Bois in 1884. Subsequent work with soy in France: Vilmorin, Li, Carles, Mollieux, Rouest, Bordas, brief summary. Address: Lafayette, California. Phone: 415-283-2991.

168. Storup, Bernard; Ruel, Françoise. 1981. Re: Studying tofu in America and starting work with tofu in France. Letter to William Shurtleff at Soyfoods Center, Oct. 31. 6 p. Plus 4 pages of English-language summary of two French books. [2 ref. Eng]

• **Summary:** Bernard and Françoise enjoyed the 8 months they spent studying soyfoods in the USA, and have now been back in France for nearly 10 weeks. “During the time we were in the U.S., we had a rather good survey of the small and medium scale tofu industry, and I think we learned a lot from all the people we met, and very often what not to do.

“I have been really surprised by the quality of the welcome we had all along our way, as well as the spirit prevailing among most of the people involved with soyfoods (we did not visit the big factories). This too has been a good lesson. Another small surprise has been the

general lack of technical experience of most of the people working with tofu... They could learn a great deal from the dairy industry—chiefly the small and medium scale cheese-making industry—by using the techniques and the equipment (very often not expensive) employed when curdling, putting in pressing boxes by gravity, pressing, etc.”

Concerning Li Yu-ying, “we went with Jean de Preneuf to the location of ‘La Société Française pour l’exploitation du soja et de ses dérivés,’ located at 48 Rue Denis Papin, Les Vallées, Colombes (west of Paris). The buildings had been pulled down about 20 years ago, but were used for other manufacture since at least the beginning of the thirties. We met an old man who has always lived in the neighborhood and remembers that ‘some Chinese people were making cakes there before the first world war.’ So, it is certain that this address was the one of Li’s plant in 1912. We have been to the town hall of Colombes, but nobody was able to help us. We have to come back there at the end of November...”

“Since our return to France, we had have, with Jean de Preneuf, a lot of contacts with different people to introduce, at least, the idea of soyfoods. We met people of the medical corps, all having an important role in scientific research (Dr. Sautier, INSERM, Hôpital Bichat, Paris; Dr. Mirouse, Dean of the Faculty of Medicine in Montpellier—the most important in France) working on plant proteins for years (as Dr. Cheftel, Université de Montpellier, who has been to Japan several times and has worked on soymilk with experimental equipment made by Alfa-Laval) and people from INRA (Institut National de la Recherche Scientifique). All these people knew or at least had heard about tofu, and are ready to help us in their own field (analysis or sometimes technical assistance).

“We also met people from large industry (researchers for Nestlé, and an executive of Prolait) to ask if they had worked on soy products other than T.V.P. and soymilk formulas for infants. They all knew tofu and other soyfoods very well but said that ‘the market in Europe is not ready yet for this.’ Finally, we met organic soybean producers (and non-organic too); we wanted to know more about the future policy of the Economic European Community on soybeans...”

“Actually, 9000 hectares of soya (22,500 acres) are cultivated in France, mostly in the south of France. Soya represents in value the second largest (after oil) national import for the French budget.

“In France, we can find tofu only in very few places, most of the time at a prohibitive price, between \$4 and \$7 a kilo. Vietnamese shops in all big cities have tofu, but their tofu is rather special with a sandy texture and a strong (sour) taste. We found only one (bad) tempeh producer in Paris. For these reasons, we have thought more and more that it would be a good thing to open a tofu shop and to work at the same time on the informational level. We are

now working on a small recipe book (adapted to the French habits) as well as on a technical flyer, a pamphlet and other things...

"We are thinking of starting a Soyfood Center in France but we will tell you about this in the future as soon as we have found a new place to settle (it should be near Paris). We have already made an application.

"Jean de Preneuf contacted different (good) publishers, and one said *The Book of Tofu* has been found to be very interesting by a committee of readers. We are now waiting for a definitive answer from this publisher (Editions Denoel, one of the best in France, by quality and volume)."

Accompanying the letter are photocopies of books by Li Yu-ying and Grandvoinnet (1912) and Rouest (1921) which Shurtleff had been unable to find in America. Key portions were highlighted in yellow and translated into English.

Note: This is the earliest document seen (Feb. 2003) concerning Société Soy or its founders, Bernard and Françoise. The company's first soy product was launched in June 1982. Address: 48 Rue Bouffard, 33000 Bordeaux, France.

169. Sturup, Bernard. 1982. Re: Work with tofu in France. Letter to William Shurtleff at Soyfoods Center, Aug. 19. 2 p. [Eng]

• **Summary:** Bernard and Jean Preneuf have been making tofou [tofu] since mid-June. Bernard has been so busy for the last 6 months that he has had no time to write. He and Françoise had to change addresses (move) four times before they found a place to live rather near their tofu shop. This shop is: SOY SARL (or Société SOY), Plateau de l'Ardenay, 91590 Cerny, France. Phone: (6) 457 52 01. Their personal residence is 16 avenue de la République, 91290 Arpajon, France. Phone: (6) 490 24 44.

On 9 May 1982 Françoise gave birth to a baby girl named Aurore.

In recent months Bernard and Jean have had to organize everything for the new tofu shop, develop contacts with other shops, distributors, journalists, etc. "But we won't really begin before September 1981 as all is dead in France during July and August. Only the two of us are working, Jean and I, and it's a rather good association. In fact, we are completely different from one another; he has no real discipline, is afraid of anything related to administration, papers or figures, has no real practical background, but he is much more inventive than I am, dares to meet people and do things that I don't, has great common sense, has a more futurist vision of what things can be, is very generous, and believes in Soyfoods at least as much as I do.

"As I said to you a few days ago, I think things will go quicker for soyfoods in Europe than in the U.S. Most of the soycrafters who will set up a shop in the next few years will

take advantage of the American experience and will avoid some mistakes. Same thing with the media and a lot of potential customers who have heard about TOFU."

Bernard then answers some questions about Li Yu-ying, a French translation of *The Book of Tofu*, and a French-language pamphlet about tofu. He is waiting for information about the history of macrobiotics and soyfoods from *Institut Tenryu* (run by Mme. Rivière, an old disciple of George Ohsawa). Address: SOY SARL (or Société SOY), Plateau de l'Ardenay, 91590 Cerny, France. Phone: (6) 457 52 01.

170. Chen, Jiying. 1982. Yi dai zhen qi ren: Li Shizeng zhuan [Legend of a generation: Biography of Li Shizeng (Li Yu-ying)]. Taipei, Taiwan: Jin dai Zhongguo chu ban she: Zong jing xiao Zhong yang wen wu gong ying she, min guo 71 [1982]. 4 + 4 + 4 + 350 p. + [8] p. of plates. Illust. 22 cm. Series: Xian lie xian xian zhuan ji cong kan, Jin dai Zhongguo cong shu. [5 ref. Cht]

• **Summary:** Li Shizeng is the "courtesy name" of Li Yu-ying. Li's courtesy name was used mostly in his political and public life. This book is written using the Taiwanese form of Chinese characters, which most Chinese from mainland China have great difficulty reading. The author of this book is a woman.

Contents: 1. Ancestry. 2. Birth and childhood. 3. Life as a young adult. 4. From Yi He Tuan to founding of Republic of China. 5. Political life while studying abroad. 6. Cruise on Xin Ming and others. 7. Jin De Club and the Work-Study Club. 8. World Club. 9. Li Huang-works while studying abroad. 10. Summary of the life of work-study students in France. 11. Club of Chinese in France and Communist Party in France. 12. Li Shuhua-works while studying abroad. 13. End of the Ch'ing Dynasty and the National Palace Museum. 14. Revolutionary Army and University of China-France. 15. The meaning of Revolution and Social Movement of Saving the Republic Party and the Country. 16. Start and end of Beijing University. 17. Founding of Federal Beijing Research Institute and Development, and the Result. 18. Transformation of Pan Yang and Government movement to Taiwan. 19. Late life of Li Shizeng and Mung Do. 20. Li's legacy.

Li's work with soybeans: Page 41. Li attended a university in France, where he majored in biochemistry. He discovered that, not only could many kinds of nutritious food be made with soybeans, but soybeans could also be used to make fake ivory, which no one had ever discovered before. He wrote his first book, *The Soybean*, which was published in France. Note: There is no mention that Li did any work with soybeans when he returned to China.

Pages 42-43: After staying in France for 6 years, Li Yu-ying went back to China in order to raise funds for his tofu company. Six months later, he returned to France with 5 workers. They bought machines and set up the tofu

company at a place near Paris, called Colombes. The name of the company is *Usine Caseo-Sojaïne*, and it produces foods made from soybeans.

Page 44. In 1909, Sun Zhong-shan [Sun Yat-sen] (founder of the Republic of China) visited the company and wrote, "My friend Li Shizeng has conducted research on soybeans, and advocates eating soybean foods instead of meat." That is the principle of the tofu company.

Pages 110-11: Mr. Li was a biochemistry major while he was studying in France. The company only made sweet soy bean cake for Chinese workers and dried bean curd. He tested the nutritional composition of soybeans. The result: Soy beans contain more oil and protein than milk. He founded a tofu company in Paris and a vegetarian restaurant. Unfortunately the French didn't like to eat tofu; they didn't even like soy milk. So the business of the tofu company was not so good towards that end.

Li Shizeng's genealogy: Father: Li Hong-Zao (1819-1897), who had 2 wives. The 2nd wife (Yang Shao-Ji) was the mother of Li Shizeng (Li Yu-Ying). Li Yu-Ying had 5 brothers and 4 sisters. Li was the 5th boy in the family. Brothers (Birth and death dates not given): (1) Li Zhao-Ying. 2nd and 3rd brothers died at early age. (4) Li Kuan-Ying. (5) Li Yu-Ying (Li Shizeng). Sisters (Birth and Death dates not given): (2nd sister) Li Shu-Yi; died at early age. (4th sister) Li Shu Lian; died at early age.

There were four women involved in Li Shizeng's life. He was married 3 times, and lived with one other woman. First wife: Yao Tong-Yi. Married in 1897 when Li was 17. Yao, who was Li's cousin, died in 1940. They had two children, a boy (Li Zongwei) (1899-1976) who married Ji Xiang-Zhan, and a girl (Li Yamei) (birth and death dates not given) who married Zhu Guangyi. Li Shizeng had two grandsons and one granddaughter from this marriage: Grandsons: Li Da-Yang. Li Er-Yang. Granddaughter: Li Ai-Lian.

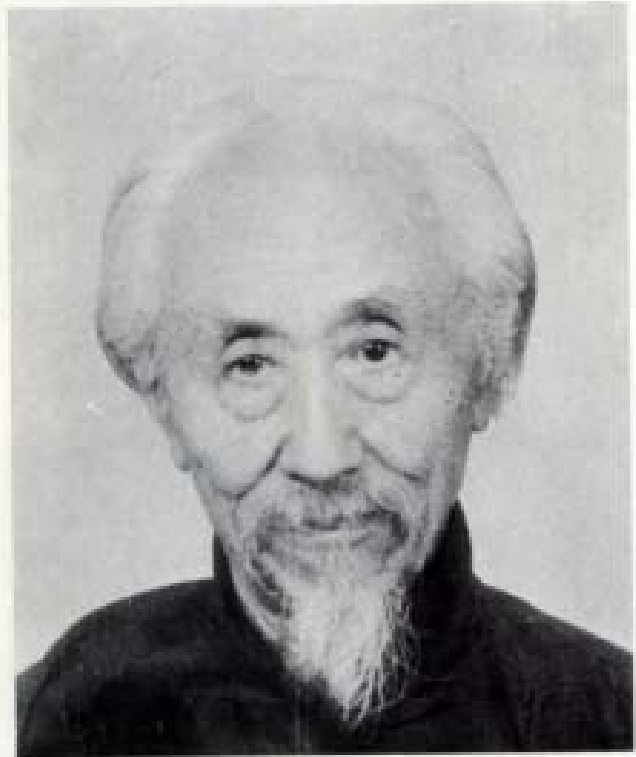
After Yao died, Li Shizeng was in a relationship with an American woman called Mrs. Vegetarian (Ru Su). They met in New York and were involved with each other there from 1943-1947. Li's second wife: Lin Su Shan. Married in 1947. Lin died in 1954. Li's third wife: Tian Baotian. Married in 1957 when Li was 77. Tian was 42. Tian later moved to the USA and stayed there for the rest of her life.

On page 349 is Li's biography.

Note: Li Yu-ying, a soyfoods pioneer in Paris, France, lived 29 May 1881 to 3 Sept. 1973.

Of the 8 glossy pages of plates, there are 7 photos of Li, including one portrait and three in considerable detail.

These photos show:



像遺生先曾石李

(1) Li Shizeng in about 1961. (2, top): Li Shizeng and classmates in 1900; Li is in the top row, far right. (3, bottom): Founders of World Club (right to left): Li Shizeng, Zheng Jing-Jiang, Wu Zhu-Hui.



(4) Li Shizeng and the president of Republic Party [in Taiwan] in 1953.



(5) Li Shizeng and his third wife Tian Baotian in 1958.
(6, top): Li Shizeng in 1972.



(7, bottom): Li Shizeng giving a speech in Taiwan in 1973. Address: Big Lake Road, Inner Lake, Taipei, Taiwan (ROC).

171. Fairbank, John K. ed. 1983. *Republican China 1912-1949, Part I*. Cambridge, England; and New York, NY: Cambridge University Press. xviii + 1002 p. Maps. 24 cm.

Series: The Cambridge history of China, Vol. 12. [1340* footnotes. Eng]

• **Summary:** Contains 12 chapters by various experts in their respective fields. Li Shih-tseng (Li Yu-ying) is mentioned on pages: 380, 385-87, 394 (on family); 622-23, 625 (on communists), 639 (on Nanking government), 665 (footnote), 682 (on Chiang Kai-shek's retirement), 688 (on the Canton Coup).

John King Fairbank lived 1907-1991. Address: Harvard Univ.

172. Pusey, James Reeve. 1983. *China and Charles Darwin*. Cambridge, Massachusetts: Council on East Asian Studies, Harvard University. Distributed by Harvard Univ. Press. xi + 544 p. Index. 24 cm. Series: Harvard East Asian Monographs, No. 100. [1420* endnotes. Eng]

• **Summary:**

Li Shih-tseng 李石曾

Li Shih-tseng, like most of the Chinese anarchists, was an avid, if not rabid, believer in the theory of evolution—and he was deeply interested in it. Li had formally studied biology, zoology, and botany in France, and he had supposedly read the writings of both Lamarck and Darwin. He worked hard to see that Darwin's theory was accurately (as he understood it) communicated to China.

Li Shih-tseng is mentioned on pages 371, 373, 374, 412, 413, 421, 422, 429, 430, 431, 452, 501, 504, and 520. Address: Harvard Univ.

173. *SoyaScan Notes*. 1984. Early tofu manufacturers in Europe, listed chronologically by country (Overview). Compiled by William Shurtleff of Soyfoods Center.

• **Summary:** All of the following started making tofu before 1985. Countries with the earliest tofu manufacturing are listed first. The month production started, when known, is given after a slash following the year. Thus 1977/09 is Sept. 1979.

France: Usine de la Caséo-Sojaine (run by Li Yu-ying) 1911/05, Two or three tofu shops in and around Paris, including 1-2 at Colombes 1964/03. Alimentation Japonais Osaka 1972, Le Bol en Bois 1975/12, La Rousselie 1978/02, Institut Tenryu 1981/01, Société Soy 1982/06, Les Sept Marches 1982/09, Sojatour Tofu Shop 1982/09, Ets. Co-Lu 1983/06, Lagadec Tofu 1983/06, Soja d'Oc 1983/10, Nyingma Dzong 1983/11, Tofu Kuehn 1983?, Sojagral Ouest 1984/12.

Netherlands: Vanka-Kawat 1958, FA. L.I. Frank: Frank Soya 1959?, Heuschen B.V. 1964, Firma Post & Teekman 1965, Stichting Natuurvoeding Amsterdam (renamed Manna Natuurvoeding B.V. in 1982) 1977/09, Hwergelmir: Foundation for a Natural Life 1979/07, Firma Ergepe 1981/

01, Stichting Oost West Centrum 1981/01, Michel Horemaus Tofu 1981/01, Witte Wonder Products 1981/04, De Morgenstond 1981/12, Soy-Lin or F.M. Lin 1982/09. Jakso: Center for Agriculture & Craftsmanship (later called Yakso) 1983/06, Vuurdoop 1983/07.

England, UK: Dragon & Phoenix Co. 1966, Wong Chung 1975 or before, Lung Kee 1975 or before, Full of Beans Wholefoods 1978/08, Paul's Tofu & Tempeh 1981/01, Yu's Tofu Shop 1981/01, Cauldron Foods Ltd. 1981/09, The Regular Tofu Co. Ltd. 1981/12, Bean Machine (Wales) 1982, Hong Kong Supermarket 1982/09, Stewart Batchelder Tofu 1983/06.

Belgium: Etablissements Takanami (Takanami Tofu Shop) 1976, Jonathan P.V.B.A. 1977/01, De Brandnetel 1979/07, Unimave Tofu 1980, Aversano Tofu Shop 1981/01, Alternatur 1981/01, Seven Arrows Tofu 1982/04, 1983/10, Vajra 1983/11.

Switzerland: La Moisson 1978, Le Grain d'Or 1981/01, Genossenschaft Sojalade (later renamed Genossenschaftstofurei) 1981/09, Soyana 1982/02, Soy Joy 1982/04, Restaurant Sesam 1982/04, Opplinger Tofu 1982/09, Natural Products Promo Carouge 1982/09, Joya 1982/09, Centre Macrobiotique de Lausanne 1982, Osoja: La Maison du Tofu (later renamed Tofushop Centanin SA) 1983, Tofurei Pfannenstiel 1983/11, Thieu's Soja Spezialitaet 1983/11, Conserves Estavayer S.A. (Sold at Migros Supermarkets) 1984/06, Galactina Ltd. 1984/11, Berner Tofurei 1984?

Italy: Roland A. di Centa 1978, Gilberto Bianchini of Centro Macrobiotico ed Alimentazione Organica (Community Food). Renamed Centro Macrobiotico Tofu 1978/11, Ohnichi Intl. Foods Co. Lotizzazione Industries 1982/09, Circolo L'Aratro 1982/09, C.D.S. Pianetta Terra Soc. Coop. A.R.L. 1982/12, Aldo Fortis Tofu 1983/06, Fondazione Est-Ouest 1983/06.

Germany: Svadesha Pflanzen-Feinkost 1979, Alexander's Tofu Shop [Nabben] 1981/01, Biogarten 1981/01, Auenland Tofu & Soja Produkte 1982/03, Tofuhaus Belsen (renamed Yamato Tofuhaus Sojaprodukte in Jan. 1984) 1982/07, Thomas Karas und Ingeborg Taschen (associated with Bittersuess; renamed Soyastern Naturkost GmbH in Dec. 1985) 1982/11, Albert Hess Tofuhaus Rittersheim (Later in Tiefenthal) 1983/07, Tofukost-Werk TKW GmbH 1984/05, Christian Nagel Tofumanufaktur 1984/08, Sojatopf (renamed Soto in April 1989) 1984/09.

Austria: Weg Der Natur 1980/05, Tofurei Wels (renamed Schoen Tofurei in 1987) 1982, SoyVita Austria 1983/05, Taiwan Restaurant 1983/06, Walter Brunnader Tofu 1983/06, Soyarei-Erich Wallner Tofu 1983/06, Tofurei Ebner 1983/11, Soyarei Wallner Ebner 1984/02, Fernkost Markt Nippon Ya Kondo GmbH 1984/02, Naturkostladen 1984/02, Sojarei Ebner-Prosl 1984/04, Sojvita Produktions GmbH 1984/06.

Sweden: Aros Sojaprodukter 1981/02.

Denmark: Tofu Denmark (Soy Joy?) 1982/03, Dansk Tofu 1983/06.

Portugal: Unimave Tofu 1980, Shogun Produtos Aliment. 1982/09, Jose Parracho Tofu 1982/09, Próvida Lda. 1984.

Spain: Zuaitzo 1984/03.

174. Wilbur, Clarence Martin. 1984. The nationalist revolution in China, 1923-1928. Cambridge and London, England, New York, NY, etc.: Cambridge University Press. viii + 232 p. Maps. Index. 24 cm. [266* ref. Eng]

• **Summary:** See Li Shih-tseng: p. 96, 97, 99, 113, 139, 156, 162, 163(fn). Address: George Sansom Prof. Emeritus of Chinese History, Columbia Univ. [New York City].

175. Qin, Xiaoyi. comp. 1986. Li Shizeng xian sheng yi zeng shu hua mu lu [Art donations by Li Shizeng]. Taipei, Taiwan: Zhonghua min guo Taibei Shi Shilin qu Waishuangxi [National Palace Museum]: Guo li gu gong bu wu yua. Edition: Chu ban. 146 p. Aug. Illust. (some color). 31 cm. [Cht]

• **Summary:** Note: Li Yu-ying, a soyfoods pioneer in Paris, France, lived 29 May 1881 to 3 Sept. 1973. This is a catalog of his private art collections. It contains paintings and calligraphy from the Ming and Qing dynasties, and a history of calligraphy during these dynasties.

The first 47 pages are in color; pages 49-145 are in black and white. Mr. Li apparently inherited some of these art works from his family. They are now in the National Palace Museum (Taipei, Taiwan); Mr. Li was a founder of this museum. Mr. Li was also chairman of the Rehabilitation Committee of the Qing Dynasty.

176. Fairbank, John K.; Feuerwerker, Albert. 1986. Republican China 1912-1949, Part II. Cambridge, England; and New York, NY: Cambridge University Press. xix + 1092 p. See Li Shih-tseng on p. 133, 396-97. Maps. 24 cm. Series: The Cambridge history of China, Vol. 13. [Eng]

• **Summary:** Page 133: A third skill that contributed to Chiang Kai-shek's rise in the Nationalist movement was his mastery of techniques of factional and warlord politics. "He easily accommodated himself to—without becoming part of—any faction if it was politically advantageous to do so. In late 1927 and early 1928, he associated himself with the Left Kuomintang and the *yüan-lao* (... a group of former anarchists and elder statesmen represented by Chang Jen-chieh [pinyin: Zang Renjie], Wu Chih-hui [Wu Zhihui], Ts'ai Yuanpei [Cai Yuanpei], and Li Shih-tseng [Li Shizeng]); by August 1928, he was allied with the *yüan-lao* and the right against the left; and by March 29, he had allied with the right, against both the *yüan-lao* and the left."

Page 396: "Advanced research: With the advent of the Nationalist government the scholarly community was encouraged in its hopes by the creation of a central research

academy, the Academia Sinica. Plans for the founding of a national research institute had been discussed in 1927, initially by Ts'ai Yuan p'ei, Chang Jen-chieh (Chang Ching-chiang), and Li Shih-tseng, all veteran KMT members with years of experience in modern education."

Page 397: However Academia Sinica had no monopoly on the top scientists and scholars. "As differences widened between Ts'ai Yuan-p'ei and Li Shih-tseng (Li Yü-ying, who had received advanced training in France) over the proper structure of higher education and research, Li left the original Academia Sinica group and in 1929 founded the National Peiping Research Academy, a separate entity under which for the next two decades half a dozen scientific institutes carried out advanced research and publication."

John King Fairbank lived 1907-1991. Address: 1. Harvard Univ., Cambridge, Massachusetts.

177. *SoyaScan Notes*. 1987. New Trend: Europe's hottest new soyfood product, smoked tofu, is almost unknown in America (Overview). Oct. Compiled by William Shurtleff of Soyfoods Center.

• **Summary:** Recent European visitors and letters to the Soyfoods Center have praised the new varieties of smoked tofu made by many European tofu companies. They are surprised that this product is not better known in America. The earliest known commercial smoked tofu was produced in France in 1911 by Chinese soyfoods pioneer Li Yu-ying. In 1974 Komatsugawa Tofu in Japan made a smoked tofu inside a deep-fried tofu pouch, sold in oil in a sardine can. The earliest known smoked tofu in the Western world was introduced in June 1984 by L'Herberie in Montreal, Quebec, Canada. All of the recent European brands have been introduced since 1986. They are made in England (Caldron Foods, Regular Tofu Co., Full of Beans Soyfoods), Germany (Soyastern, Morgenland Pflanzenkost, Christian Nagel Tofumanufaktur), Netherlands (Manna Natuurvoeding, Heuschen-Schrouff B.V.).

178. Barman, Genevieve; Dulioust, Nicole. 1987. Un groupe oublié: Les étudiantes-ouvrières chinoises en France [A forgotten group: The Chinese student-workers in France]. *Etudes Chinoises* 6(2):9-46.

• **Summary:** The article begins: For some years now, articles dedicated to the movement of overseas Chinese in France (*qingong jianxue yundong*) largely due to the French branch of the PCC and its leaders, have been increasing, largely because of the French branch of the PCC [perhaps *Parti Communiste Chinois*].

In 1912, when Li Yuying, Wu Zhihui, and Cai Yuanpei founded in Peking the *liuFa jianxuehui*, of the Society for Rational French Education, with the intent of preparing the young people for low-cost studies in France, one important goal was the education of young women. The same year a more specific society was established, the Society of Frugal

Studies (*liuFa nüzi jianxuehui*). Resolute innovators, its goal was to promote not only the education of women, but also the reform of the family and social equality (p. 10; see also endnote 1).

The first four student workers, Fan Xinquan, Fan Xinqun, Li Zhixin and Xiong Shubin, all from Hunan province, embarked from Shanghai in November 1919 with 70 young people, including Nie Rongzhen and Yan Changxi (Endnote 25). Upon their arrival in France, the cousins Fan were admitted as workers at the tofu factory Caséo-sojaïne at Garenne-Colombes. The arrival of two young ladies, both from good families, one of whom was the daughter of the director of the customs house at Changsha, in this sacred place of the utopian anarchist Li Yuying, was saluted by the Chinese press as an event without precedent in the history of Chinese women (p. 20; endnote 26). See article in *Shenbao* of 10 Dec. 1919. Also FFQG (*FuFa qingong jianxue yundong shiliao*) [Documents on the Diligent Work-Frugal Study Movement in France. Beijing: Chubanshe, 1980. 3 vols.].

Senator Hugues Le Roux [lived 1860-1925; a French journalist, he was a senator during the Third Republic from 1920 until his death on 14 Nov. 1925] came from a line of Norman shipowners who had long had good dealings with China. Having himself spent some time in Peking, he was interested from the outset in the Franco-Chinese education projects organized by Li Yuying and his friends (p. 20; see endnote 32).

Fan Xinquan, one of the two workers from Li Yuying's tofu factory (*de l'usine Caséo-sojaïne*), in 1924 won a silver medal in the painting competition at the School of Fine Arts in Lyon (*l'École de Beaux-Arts de Lyon*) (p. 29).

179. Yang, Kailing. 1987. *Min guo Li Shizeng xian sheng Yuying nian pu*. Er ban. [A chronicle of Li Shizeng's life. Revised ed.]. Taipei, Taiwan: Taiwan shang wu yin shu guan. 8 + 210 p. + [2] leaves of plates. Illust. [Cht]*

• **Summary:** Note: Li Yu-ying, a soyfoods pioneer in Paris, France, lived 29 May 1881 to 3 Sept. 1973. This revised 1987 edition contains 10 pages more than were in the original 1980 edition.

180. Bailey, Paul. 1988. The Chinese work-study movement in France. *China Quarterly* 115:441-61. Sept. [93 ref]

• **Summary:** By 1920 Chinese overseas students could be divided into two broad groups: (1) Those studying in the USA, having been influenced by the philosophy of "worshipping money" (*baijin zhuyi*) wanted to build China on the American capitalist model when they returned. These students received government scholarships and enjoyed material comforts.

(2) In France, however, the work-study students were concerned with practical training and participating in the

world of labour. They lived frugally, spending their time “sweating and working in factories.”

Between 1919 and 1921, more than 1,500 Chinese students went to France on a work-study program. Among these were many future Chinese Communist and government leaders incl. Zhou Enlai, Deng Xiaoping, Chen Yi, etc.

While in Paris many Chinese students first became acquainted with Marxism, and in 1922 the Chinese Communist Youth Party was founded in Paris. Also while in France, many Chinese students first participated in organized demonstrations against western encroachment in China.

“Origins of the movement: The founder of the work-study movement was Li Shizeng [Li Yuying] (1881-1973), the son of Li Hongcao, a Grand Councillor and one-time tutor of the Tongzhi Emperor.” In 1902 was given the opportunity to study abroad when he accompanied Sun Baoqi, the newly-appointed Chinese minister to France, as an “embassy student” (*suiyuan xuesheng*). With Li went two young men who later rose to high positions in France. Later, through important contacts as these, Li was able to promote his work-study program.

“While in France Li enrolled at the Ecole Pratique d’Agriculture in Montargis, just south of Paris; upon graduating in 1905 he studied chemistry and biology at the Institut Pasteur in Paris.” During this time Li became interested in the philosophy of anarchism, and particularly in the thought of Elisée Reclus (1830-1905) with whose nephew he was personally acquainted. “Li was especially impressed with Reclus’s confident prediction that science and education would bring about an equal society in which the ideas of ‘mutual assistance’ (*huzghu*) and ‘cooperation’ (*hezuo*) would be realized.

“At the same time Li became an enthusiastic Francophile and his admiration for French culture and ideals never wavered through his life.” In contrast, he saw German culture as autocratic, utilitarian, and militaristic. During the years that followed, Li built up a wide network of contacts among French intellectuals and politicians, which was to be of considerable benefit when he established the work-study program.

In 1906 Li Shizeng, with two young Chinese colleagues, began to publish *Xin Shiji* (*New Century*), a periodical which served as a forum for their anarchist philosophy. The same year, all three joined Sun Yet-sen’s revolutionary anti-Manchu organization. In 1908, in addition to his publishing activities, Li opened a bean curd [tofu] factory (*Usine Caseo-Sojaine*) at Colombes, just outside of Paris, “and recruited 30 Chinese workers from his native village in Zhili. Li, who became a strict vegetarian, was confident that France would appreciate the nutritional value of bean-curd.” In 1909 Li returned to China. Taking advantage of his father’s acquaintance with the governor of

Zhili, Yang Lianpu, Li was able to arrange a personal interview with Yang, who became enthusiastic about the project and contributed funds.

“It was among the Chinese workers at the bean-curd factory that Li first promoted “diligent work and frugal study” (*qingong jianxue*). A workers’ school was opened near the factory in which Li and Wu Zhihui taught Chinese, French, and general scientific knowledge. A strict regimen was imposed on the workers—no smoking, gambling, or alcohol was permitted—and they were expected to devote their spare time to study. For Li, work-study was to have a moral as well as an educational function. In addition to making workers more knowledgeable, work-study would eliminate their ‘decadent habits’ and transform them into morally upright and hard-working citizens.

“Li was, in fact, echoing a concern prevalent among Chinese reformers since the end of the 19th century.” These are summarized. “Finally, work-study also accorded with Li’s belief in the unity of intellectual and manual work as the means to bring about mutual assistance, co-operation and equality in society.

Frugal study in France: In 1912 Li organized the Association for Frugal Study in France (*Liufa Jianxue Hui*) to reduce expenses in order to expand overseas study, and by labor and a simple life, to cultivate habits of diligence and hard work.

“Li was supported in his venture by Cai Yuanpei (1868-1940), who had studied in Germany before 1911 and was now education minister, and Wang Jingwei (1883-1944), a prominent member of the Tongmenghui and a close associate of Sun Yat-sen. Like Li Shizeng, Cai and Wang were both fervent admirers of France, describing it as a model republic free from the corrupting influences of monarchism and religion.

“A preparatory school, financed by the founders of the Association, was opened in Beijing in which students were taught French and other general subjects for six months in preparation for their sojourn in France... Between 1912 and 1913 approximately 100 ‘frugal study’ students went to France, most of them going to Montargis College, the principal of which was a personal acquaintance of Li’s.”

Note: Author Paul Bailey is currently completing a book on popular education in early 20th century China. Address: Lecturer in Chinese and Japanese History, Univ. of Edinburgh, Scotland.

181. Chan, Ming K.; Dirlik, Arif. 1991. Schools into fields and factories: Anarchists, the Guomindang, and the National Labor University in Shanghai, 1927-1932. Durham, North Carolina: Duke University Press. [xi] + 339 p. Index. 25 cm. [176* + 651 endnotes]

• **Summary:** The short-lived National Labor University in Shanghai opened in Sept. 1927 and was forced to close in mid-1932. It was “both a reflection of the revolutionary

concerns of its time and a catalysts for future radical experiments in education. Under the slogan: 'Turn schools into fields and factories, and fields and factories into schools,' the university attempted to bridge the gap between intellectual and manual labor which its founders saw as the central problem of capitalism and which remains a persistent theme in Chinese revolutionary thinking."

The Labor University was inspired by Chinese anarchists, who also played a central role in its founding. The most important founders were Li Shizeng [Li Yuying], and Wu Zhihui, who were also the most prominent figures among the Chinese intellectuals who (in the early 1900s) had introduced anarchism into Chinese radicalism while they were students in Paris. Li and Wu had close ties with Sun Yatsen (Sun Zhongshan), ties which they retained until, by the mid-1920s, they were widely regarded as "elders" of the Guomindang (p. 7).

"The Paris anarchists were a group of intellectuals who had been baptized into revolutionary activity in the early 1900s. Li Shizeng, the moving intellectual spirit of the group, had been living in Paris since 1902." Li studied biology in France, showed an internationalist orientation at an early age, and became a close friend of the family of French anarchist geographer Elisée Reclus, which probably started him on the path to anarchism. Li's beancurd factory in Paris was run by 30 Chinese laborers recruited from Li's village in China (p. 17).

The Paris anarchists believed deeply in progress and thus in science—the key to progress. "Revolution is nothing but cleansing away obstacles to progress." The two major ideologies of China—Confucianism and Daoism—had both advocated minimal government intervention in the affairs of society (p. 18).

Page 26 states that "Li first promoted his idea among the workers in the doufu [tofu] factory in Paris."

Li Shizeng is mentioned on pages 6-7, 18-20, 24-26, 43, 47, 51, 56-59, 61-68, 72, 84, 125-26, 132-33, 228-231, 174, 245, 233-34, 240, 248, 262-63, 273, 296, 299-301, 319, 327, 333, and 336. Address: 1. Senior Lecturer in History, Univ. of Hong Kong; 2. Prof. of History, Duke Univ., Durham, North Carolina.

182. Pan, Lynn. 1994. *Sons of the Yellow Emperor: A history of the Chinese diaspora*. New York: Kodansha International. xx + 418 p. Illust. (16 pages of plates). Index. 22 cm. [174* ref]

• **Summary:** On page xiv is a very interesting map of southern China, with a blowup of southern Kwangtung [Guangdong] province, the area around Canton the Pearl River, the South China Sea, Macao, and Hong Kong. For this area was at the heart of the Chinese diaspora—especially in the 19th and 20th centuries and especially from two small areas southeast of Canton: (1) Sam Yap (Three Districts) of Punyu, Shuntak, and Namhoi—the more affluent counties.

(2) Sze Yap (Four Districts) of Hoiping, Sunwui, Toishan, and Yanping—the poorer and ruder area southwest of Sam Yap. Although the people from both areas speak Cantonese, they have difficulty understanding each other's speech. Other important languages of the diaspora were Hakka and its numerous variants (spoken in Guandong, Fujian, etc.) and Hokkien (spoken in southern Fujian, Taiwan, and by many overseas Chinese throughout Southeast Asia). It is closely related to Teochew / Teochiu, though mutual comprehension is difficult.

In Part Four: 1960s to 1980s, Chapter 16, titled "Food" contains a history (p. 320-23) of Amoy Food Limited, now an international firm, with its headquarters in Hong Kong, owned largely by overseas Chinese. For many overseas Chinese, "perhaps no label has quite the resonance of Amoy." In 1908, T'ao-hua Ta-t'ung, the predecessor of the company, was founded in Xiamen for producing bottled soy sauce and dairy milk. Its founder was Yang Ko-fei, who soon brought in other shareholders. In 1911 clashes between the founder and other shareholders lead to a break-up of the company, with one party going it alone as T'ai-hua (Tao Fia), and the other as Ta-T'ung. Yang Ko-fei went with the latter company, who chief shareholder was Tan Kah Kee, the rubber and pineapple magnate.

It became increasingly apparent, however, that the two companies would do much better if they operated as a single unit. So in 1928, when a new rival appeared, they merged, with the smaller of the two now located in Hong Kong. Thereafter the company experienced steady growth. Eventually the branch in Hong Kong came to eclipse the parent company in Amoy. In 1937, when the Japanese invaded China and war broke out, almost the entire canning plant was moved to Hong Kong from Amoy. In 1951, when the company went public, the ownership passed mainly into the hands of overseas Chinese.

Today Amoy Foods' products are on the shelves of supermarkets and Asian markets in 37 countries. Half of Amoy Foods' shares are owned by the American food giant Pillsbury (owner of Haagen-Dazs and the Burger King hamburger chain) and the other half by Hang Lung (a Hong Kong real estate company). Amoy's line of 34 sauces include dark soy sauce (lau-ch'ou), light soy sauce (*sheng-ch'ou*), black beans sauce (made of fermented black soybeans), sweet and sour sauce, etc.

On the roof of the Amoy factory's main building a visitor can see a demonstration of the old-fashioned process; "here, an old man with sleeves rolled up goes from earthen vat to earthen at plunging his arm into the thick brew of black and yellow soy beans to give it a gentle, almost loving stir. He works rhythmically, with deep concentration. A Soy Master with thirty or forty years behind him, he stands in a line which goes back to the fifth century, from when dates the earliest surviving soy sauce recipe."

Companies like Amoy have helped to make Chinese foods more widely available in the West. Not so long ago, Chinese cookbooks published in England said that Worcestershire sauce was an acceptable substitute for soy sauce, because the latter was available only at delicatessens and specialty shops [Asian grocery stores] in London. Even during the last five years, the range of Chinese foods available in London's Chinatown has grown remarkably. In Chinatowns in the United States [and especially those in San Francisco {California} and New York] the selection of Chinese foods has long [perhaps always] been greater than at those in London or other places in Europe.

Page 324: The first person to make tofu in Europe was Li Shih-tseng [Li Yü-ying, Li Shizeng], a Chinese intellectual and educator. As a young student of biochemistry in France in 1900, Li was to be greatly influenced by the writings of Nietzsche and Bergson. A Francophile, Li was one of the founders of the Work and Study Program, which sent Chinese students abroad for part-time work and part-time study. One of these students, who would later become famous, was Deng Xiaoping. While establishing his tofu [beancurd] factory in France, Li drew on his knowledge of biochemistry; the factory provided jobs for many students in the Work-Study Program.

Li, a vegetarian, was a firm believer in the nutritional value of tofu and other soybean foods. His factory also made and sold soybean flour, fermented tofu, soy-bean milk, and soy-bean jam, and these foods nourished not just Chinese, but also Westerners, including American soldiers who fought in France during World War I (Lin Hai-yin 1971, p. 125). "All this was before the faddish demand for tofu by health food enthusiasts, and before it became widely known as an unbeatable source of protein. The company closed after the war, but among certain Chinese *émigrés* [emigrants from China] France was never to lose its reputation for beancurd. In Europe up to the 1980s *tofu kan*, a particular variety of fermented beancurd [sic, pressed tofu] much demanded by eastern Chinese palates, could only be had in Paris, and the handful of *émigrés* in London had to send over for it."

Li was also a founder of the Université Franco-Chinoise at Lyons, a sort of accommodation and placement agency.

About the author (facing p. 418). Lynn Pan was born in Shanghai; she left as a child. She "has lived as an immigrant in North Borneo and England, and worked as a social scientist, journalist and writer in London, Geneva, Helsinki, and Hong Kong." In 1981 she returned to Shanghai for the first time, and was gripped by deep, haunting sensations of nostalgia. She had found the place where she belonged, her inheritance, and she began to write this book. She is the author of at least five other books—all listed facing the title

page. Her Epilogue and Afterword at the end of this book are both very interesting.

183. Pairault, Thierry. 1995. *L'intégration silencieuse: la petite entreprise chinoise en France* [Silent integration: Chinese small business ventures in France]. Paris: L'Harmattan. 250 p. Illust. 22 cm. [Fre]*
Address: France.

184. Balinska, Marta Aleksandra. 1998. *For the good of humanity: Ludwik Rajchman, medical statesman*. Translated by Rebecca Howell and revised by the author. Budapest, Hungary: Central European University Press. xvii + 293 p. Illust. Index. 24 cm. [990 endnotes]

• **Summary:** Li Yu-ying is mentioned in two places. Pages 127-28 (with endnote): "Shortly after Oct. 1937, Rajchman was officially delegated by the Chinese to speak with the French about renewed collaboration. Rajchman went to Paris in May 1938; there he met with General Georges. "Before returning to Geneva, Rajchman suggested that the question could be usefully pursued with Li Yu-ying, with whom both he and Soong worked closely.

"Li, whom Rajchman described to Georges as an 'important person,' was president of the *Union franco-chinoise* in Peking and Shanghai, and has gone down in history as one of the four most senior members of the Kuomintang who surrounded Sun Yat-sen after 1905. As a student, he had spent several years in France, following, like Rajchman, the *Cours supérieur de microbiologie* at the Pasteur Institute. His research on soya had led him to set up, in 1909, a factory to produce products derived from the plant. Known as the 'Casei Sojaïne' it was located in Colombes, a suburb of Paris and employed only students who financed their education by working there. He was already known at the Quai d'Orsay [French Ministry of Foreign Affairs] as a staunch defender of France, invariably backing French interests in China, and, thus, could be 'very useful' in the future."

"Rajchman's conversation with General Georges was rapidly followed by a visit from Li, who was passing through Paris. He explained to the General that the aid proposed by Rajchman could take the more specific form of assembling French airplanes in Indochina for delivery to China, developing air routes between the French colony and China, producing munitions in Indochina for both countries and dispatching a French military mission to Nanking... He confirmed that he was authorizing Rajchman to continue the negotiations in his absence, specifying that he himself had been empowered by Chiang Kai-shek and H.H. Kung 'to initiate discussions [with the French government] regarding... a series of agreements to which T.V. Soong was to put the finishing touches and his signature."

Pages 131-31 [Concerning World War II]: Georges Bonnet rejected the plan proposed by Rajchman and Li.

Mandel “promised to send a French military division to Chunking to ‘infiltrate’ and ‘train’ Chinese troops in case of war [against Japan]. This agreement, according to the Asia-Oceania Department, was the fruit of Li Yu-ying’s conversations with General Georges a year earlier. The Department was not mistaken. It was definitely at the insistent request of Li (whom Bühner described as a ‘very cultivated Asian..., Admirably informed about world politics’)...”

About this book: “Born in Poland in 1881, Ludwik Rajchman was an exponent of humanitarian intervention and a defender of colonized people, as adept in secret diplomacy as in organizing vast antiepidemic campaigns. A true hero of our times, he inspired the creation of WHO and UNICEF, of which he was the first chairman. As the story of this remarkable life unfolds, the author—who is the great-granddaughter of Rajchman—provides behind-the-scenes glimpses of the major events that shaped the twentieth century. Using family archives and documentary sources, she brilliantly recreates the career of a man who was not only the first *medecin sans frontieres*, but also an intellectual with an exceptional sense of the universal.” Address: Great-granddaughter of Ludwik Rajchman.

185. Huang, Hsing-Tsung. 2000. The ancient Chinese concepts of original name, courtesy name, native place, and ancestral temple. How to apply these to soyfoods pioneer Li Yu-ying (Interview). *SoyaScan Notes*. Dec. 30. Conducted by William Shurtleff of Soyfoods Center.

• **Summary:** When a person is born in China they are given their “original name.” As soon as possible, this name is recorded at the family’s “ancestral temple” which is located at the family’s “native place.” Many Chinese families have strong ties with an ancestral temple and native place that goes back 1,000 years or more. This makes it easy for such families to trace their genealogy back to ancient times.

Every Chinese man has two strong desires that are part of traditional filial piety: To marry and have a son that will carry on his family name, and to be buried with his ancestors at his ancestral temple at his native place. “Buried” means that one’s body will be buried in a proper burial plot in the earth; burial (at least traditionally) does not mean that one will be cremated and one’s ashes placed in an urn in the ancestral temple or nearby. When a woman marries, she becomes part of her husband’s family, so she will be buried with her husband at his ancestral place. If a couple is unable to have a male heir, they will try to adopt one, often from a blood relative, such as an uncle. These customs and practices began to weaken in China after World War II; they were not emphasized after 1949 when the Communists took power, but they are still deeply ingrained.

Traditionally, on a man’s “calling card” or “name card” will be printed his original name and his native place. But nowadays the native place is often omitted.

Every Chinese has an “original name,” which is written with the family name first followed by the given name. Many Chinese also have a second, and sometimes a third name; these are called “courtesy names.” Most courtesy names are created by the person himself, not by others. A person “assumes” a courtesy name. A courtesy name is typically created in connection with a new facet of a person’s life, as (for example) when he becomes a political figure, a poet, or an artist. In the courtesy name, the surname always remains unchanged. Only the given names are changed, and the characters in these given names usually have meaning for the person who creates them for himself.

In the case of Li Yu-ying, that was his given name. He was born in Peking in 1881, but his native place was Kaoyang, Chihli (Hopei). He probably gave himself the courtesy name Li Shih-tseng (pronounced Lee su-jung) when he got involved with politics and the Kuomintang in China. In the excellent book titled *The Biographical Dictionary of Republican China*, edited by Boorman and Howard (1967-79) Li is indexed under his courtesy name Li Shih-tseng, not under his original name Li Yu-ying—although the latter name appears prominently near the beginning of his entry.

In a genealogy, one should list the original name first, followed (if possible) by the best known courtesy names. In a genealogical database, one might consider two separate entries. Address: Goodwin House, 4800 Fillmore Ave., Alexandria, Virginia 22311. Phone: 703-824-3652.

186. Huang, Hsing-Tsung. 2001. Chinese dictionaries and indexes to Chinese books (Interview). *SoyaScan Notes*. April 1. Conducted by William Shurtleff of Soyfoods Center.

• **Summary:** One of the basic problems with a character-based writing system (such as Chinese) is that, unlike a system based on an alphabet, there is no easy way of placing the characters in “alphabetical order.” Therefore complex systems had to be devised, usually based on the traditional Radical Priority System. Some 300 years ago the Chinese developed a system for classifying their characters according to 214 elements or radicals. To oversimplify, radicals with few strokes come before those with many strokes. For each radical there is a series of characters, ordered by the number of strokes in each character. Other systems were called the “Four Corners” (which originated in Taiwan) and a syllabary.

The earliest Chinese dictionary was the *Erh Ya*, a dictionary of classical terms written in about the third century B.C. The order of the terms was based on the Four Corners system; it very cumbersome and not nearly as easy to use as a dictionary based on an alphabet. Even the early Western dictionaries of Chinese, such as the famous one by Matthews, was arranged according to radicals.

The first indexes to Chinese books were created during the 1930s as part of a cooperative project between Harvard University and the Yenching University in Beijing (the most famous missionary university on China). They began by creating indexes for the Chinese classics—in part because the Westerners realized it would be very difficult to study these classics without an index. Today, the Harvard-Yenching Institute in Massachusetts has an entire library of these indexes that it helped to create. Before the 1930s, the concept of an index in Chinese books did not exist. The development of the pinyin system of romanization also provided a new way of indexing based on the Roman alphabet combined with the various tones. So modern Chinese dictionaries developed after the 1960s are very easy for both Chinese and Westerners to use. Modern word processors also use pinyin to access the many Chinese characters.

The absence of indexes in Chinese books (including all the Classics) before the 20th century was a major problem for scholars. Good scholars would simply memorize entire books. To find information on a particular subject, the reader typically used the table of contents. But even so, it was very difficult to find information on a particular subject. Address: Goodwin House, 4800 Fillmore Ave., Alexandria, Virginia 22311. Phone: 703-824-3652.

187. Shurtleff, William. 2002. Tofu from China to America: Episodes in global diffusion. *Repast: Quarterly Newsletter of the Culinary Historians of Ann Arbor (Michigan)* 18(3):4-7. Summer. [23 ref]

• **Summary:** A chronology of tofu from 220 AD to the present. Contains 3 illustrations by Akiko Aoyagi from *The Book of Tofu*. Photos show: (1) Portrait of Li Yu-ying. (2) House Foods America Corporation's ceremonial opening in Garden Grove, California. (3) Seventh Annual Tofu Festival in Los Angeles. Address: Founder, Soyfoods Center, Lafayette, California.

188. Goldman, Merle; Lee, Leo Ou-Fan. eds. 2002. An intellectual history of modern China. Cambridge, England; New York, NY; etc.; Cambridge University Press. vii + 607 p. Index. 24 cm. [Eng]

• **Summary:** The year 1898 was a watershed in the history of China's institutional break with the values of Confucian civilization. It was an effort at institutional change by high-ranking literati. It began as a response to China's military defeat by Japan in 1895 (in the Sino-Japanese War), "but ended in the abandonment of the traditional Sinocentric world-view and a large-scale effort to assimilate the 'new learning' (hsin-hsueh) of the West.

Another such watershed year was 1919, the year of the May Fourth demonstration, which was an intellectual campaign for a totally 'new culture,' purged of all elements of China's feudal past. The leadership for this movement

came from China's newly modernised universities and schools.

Li Shih-tseng (Li yu-ying) is mentioned as follows: Page 71: Li, a founder of the Paris group, was a student of Biology at the Pasteur Institute and a friend of Paul Reclus, the nephew of anarchist thinker Elise Reclus. This group, which published the journal *New Century (Hsin shih-chi)*, believed itself to be "on the most advanced frontier of modernism, in touch with industrial civilization, and with its social and moral vanguard in the anarcho-communist movement led by Peter Kropotkin, Elisee Reclus and Errico Malatesta.

Page 76: Li Shih-tseng, like other anarchists, attacked the Confucian family system, contending that it was based on coercion rather than "legitimate moral feelings."

Page 77: As part of the transformation of the family (the most basic social goal of anarchists), all anarchists and utopians advocated some form of feminism. Some, like Li Shih-tseng, considered women the weakest of all persons in the family hierarchy, and so the greatest victims of the system.

Page 78: In Chinese Confucian funeral ceremonies pious children ritually blame themselves for the death of a parent. But how can the children be to blame, ask Li Shih-tseng. These false social attitudes are caused by a corrupt environment.

Page 85-86: The original *New Century* group in Paris continued to be active after 1915. Although its leaders, Li Shih-tseng and Wu Chih-hui kept their base in Europe, it "had a significant impact on the Chinese student movement through its sponsorship of a series of innovative work-study programmes in France, where wartime mobilization" had created a need for laborers. Between 1912 and 1920 several hundred Chinese students pooled earnings in this way to support themselves and their fellows while learning abroad. Address: 1. Boston Univ.; 2. Harvard Univ..

189. Nordquist, Ted A. 2004. Dairy alternatives: Turning fluid soy base into quality cultured products. How dairy like products evolved, what is their potential, and what is next. Paper presented (Powerpoint presentation) at Soyfoods Summit 2004. 25 p. Held 17-19 Feb. 2004 in San Diego, California.

• **Summary:** Contents: Brief history of cultured soy products in the USA: Early manufacturers (including fermented soymilk made by Li Yu-ying in 1911 near Paris, France), three basic types of soy yogurts (Fermented soy yogurts with live cultures—with live cultures remaining active in the finished product, non-fermented yogurt like products, pasteurized fermented soy yogurts).

Technical requirements of cultured soy products: Standards should specify meaningful counts of each fermentation microorganism, National Yogurt Association recommends that the minimum total count at the end of

code should be at least 10 million/gram total bacterial counts, yet most yogurt manufacturers have other concerns—flavor, consistency or viscosity, mouth feel or smoothness, pH or acidity, shelf life—microbial and quality issues, and cost. WholeSoy creamy cultured soy in Peach flavor had the following counts when tested by an independent lab: *Lactobacillus acidophilus* 34 million/gram. *Bifidobacterium* 67 million/gram. *L. thermophilus* 10 million/gram. *L. bulgaricus* 1.3 million/gram. Total: 112.3 million counts 25 days from end of code, which was 64 days from date of production. “Our goal is to increase the counts of *L. acidophilus* is relationship to the other bacteria, since studies have indicated that it is the *L. acidophilus* and *Bifidobacterium* which are the most positive probiotic bacteria while” the other two are used to control pH and flavor in the final product.

Evolving cultures used in fluid soy products. The health benefits of cultured soy as “probiotic” and their potential for the future. Case of Swedish milk company Arla and dairy yogurt. Dannon success with Actimel in Europe. Stonyfield farms has accelerated Actimel sales in the USA by marketing to the natural foods industry. Importance of identifying strain of bacterium used. “There is a great opportunity for food manufacturers to formulate a new generation of probiotic products.” They should consider: choice of strains, recommended use and dosage, a definition of the active principle of the probiotic principle, detailed consumer information related to the product, such as reference to a website.

The next generation of cultured soy products: Issues and challenges—flavor, sweetener, nutritional content, stabilization, quality control. Ideas for new cultured soy products. Address: PhD, TAN Industries, Inc., 49 Stevenson St., Suite 1075, San Francisco, California 94105-2975; 660 Vischer Ct., Sonoma, CA 95476. Phone: 415-495-2870. Fax: 415-495-3060, Email tedalan@sirius.com.

190. *Bulletin d'information de la DGER sur les événements de l'enseignement agricole*. 2004. Citoyenneté [Citizenship]. No. 1. Sept. http://www.portea.fr/fileadmin/user_upload/PDF/ca_bouge/Cabouge1.pdf

• **Summary:** The original brief article reads: “10 septembre—célébration du centenaire de l'arrivée à l'École pratique du Chesnoy de 1904 à 1906 de Li Yu Ying, étudiant chinois à l'origine d'un vaste mouvement d'ouvriers chinois en France. A cette occasion, le carrefour sera baptisé “Carrefour Li Yu Ying”

“Lieu: Salle Roux Fédry, EPL Le Chesnoy les Barres (Loiret).

Our translation: Sept. 10—The centenary celebration of the arrival at the practical [agricultural] school of Chesnoy of Li Yu-ying, a Chinese student at the origin of a vast movement of Chinese workers in France. On this occasion, the crossroads will be baptized “Li Yu Ying Crossroads.

“The place: Salle Roux Fédry, EPL Le Chesnoy les Barres (Loiret).

Note 1. Loiret is a department of France, located just south of Paris.

Note 2. DGER probably stands for “direction générale de l'enseignement et de la recherche.”

191. Weston, Timothy B. 2004. *The power of position: Beijing University, intellectuals, and Chinese political culture, 1898-1929*. Berkeley, Los Angeles, and London: University of California Press. xiii + 325 p. [1000+* ref]

• **Summary:** For Li Shizeng see p. 98, 126-27, 135, 143, 197, 232, 235, 247. and 274.

On 4 May 1998 Beijing University (Beida) commemorated the 100th anniversary of its founding. The celebration, attended by some 50,000 people, “was a veritable extravaganza that made it abundantly clear that Beijing University occupies a particularly distinguished place in modern Chinese history.” Moreover it “was presented as a world-class institution of higher learning” (p. 1).

Li Shizeng (Li Yuying) played an important part in the history of this university and is mentioned throughout this book.

On 10 Oct. 1911 there was a revolution in China; On 1 Jan. 1912 Sun Yatsen declared the Republic of China (1912-1949), which overthrew the Qing / Manchu dynasty (1644-1912). In 1913 Yuan Shikai was President of China. The “Second Revolution” in China was “the failed attempt on the part of Guomindang [Kuomintang] politicians and military leaders to forcibly remove Yuan Shikai from office.”

On 4 Jan. 1917, Cai Yuanpei, a famous scholar and former Minister of Education in the Republic (briefly in 1912), was appointed chancellor of Beida. He was well known as an advocate of high moral standards and “gradual change through education. While in France he had delivered a series of lectures at the School for Chinese Workers... which stressed the importance of self-discipline and the need to take responsibility for one’s freedom.” [Footnote 6: “With Li Shizeng, Wu Zhihui, and others, Cai had founded the School for Chinese Workers (*Huagong xuexiao*) to offer education to Chinese workers who had been brought to France to work in wartime industries” [during World War I]] (p. 117, 274).

At Beida, Cai had to deal with contending forces and ideologies. He was deeply admired for the way he hired professors, based on the German philosophy “that all ideas grounded in reason equally deserve a hearing.” He spoke of the need for “freedom of thought” and “broad-minded tolerance.” His hiring policy helped to move the “the nascent New Culture community from the margins of China’s cultural and political arena to the very center.” In 1917, to help him create a new atmosphere at Beida, he

invited various old friends to come to Beida, including Jiang Weiqiao, plus “Wang Chonghui, Wu Zhihui, Wang Jingwei, and Li Shizeng, Guomindang members all, and the latter three his principal collaborators in Paris [in 1915 and 1916] during the Yuan Shikai era.” But of these collaborators, “only Li Shizeng, who was highly interested in anarchist thought, joined him at Beida” (p. 122-27, 135).

Cai wanted students at the university to take more responsibility for their own lives. The first organization to meet these goals was the Frugal Study Society (*Beida daxue tongxue jianxuehui*), founded in the summer of 1917. This society, which reflected the influence of anarchist thought, had no leaders, only comrades. Their values had much in common with those of Neo-Confucian moralism. “To stay in good standing, members of the Society had to eschew gambling, prostitutes, opium, alcohol, and rickshaws; they also had to pledge to use Chinese currency, to eat and dress simply, to keep themselves neat and clean, and to maintain regular sleeping hours.” In 1917 Beida was also home to the Truth Society (*Shishe*) until Cai Yuanpei and Li Shizeng arrived (p. 134-35).

Cai continued to make major reforms at the university. He established it as an autonomous district at the heart Beijing, in the calm, verdant setting of a western University town. After his dress code was made public, “Cai Yuanpei announced the formation of the Beijing University Society for the Promotion of Morality (*Beijing daxue jindehui*). This society was modeled on similar groups that Cai has established in 1912, together with Wu Zhihui, Li Shizeng, Wang Jingwei, Zhang Ji, and others.” Members were to become model citizens by declaring that they were against prostitution, gambling, and taking concubines; that they would not become government officials or members of parliament; and that they were willing to live without opium, wine, and meat. The more things a person declared and adhered to, the higher their rank. The strong emphasis on asceticism calls to mind Neo-Confucian “precepts for character discipline (p. 143-45).

Education for women: In 1916 only 8,000 women were enrolled in secondary schools throughout China. Many members of the New Life Movement favored bringing women into the Movement and into Beijing University. In Dec. 1918, at a ceremony marking the 21st anniversary of Beida’s founding, “Li Shizeng argued that the university enroll female students, but the subject did not attract widespread attention until spring 1919, when Cai Yuanpei delivered a series of speeches on the importance of female education” (p. 197).

Eventually Cai Yuanpei helped transform the university into the country’s largest institution of higher learning, with 14 departments and an enrollment of more than 2,000 students.

In 1919, students of Peking University formed the bulk of the protesters of the May Fourth Movement. Efforts by

the Beiyang government to end the protests by sealing off the Peking University campus led to Cai’s resignation.

In 1920, Peking University became the second Chinese university (after Nanjing University) to accept female students.

In 1924, when polled as to which public figure they admired most, Beida students voted: (1) Sun Yatsen, 473 votes. (2) Chen Duxiu, 173. (3) Cai Yuanpei, 153.

The Guomindang, which was leading the revolutionary movement, was moving to the left. Student members of the Socialist Youth Corps had entered its ranks. “On May 1, 1924 several hundred students and professors involved in the United Front revolutionary movement held a rally at the Normal College [for training teachers] in Beijing to commemorate International Labor Day. According to a police report, the leaders of the rally were members of the Socialist Youth Corps, many of them current or former Beida students. The students posted banners calling for the overthrow of warlords, imperialists and capitalists, and invited Li Dazhao, Gao Yihan, and Li Shizeng to speak on the importance of Labor Day to the international proletarian revolutionary movement” (p. 232).

In the mid-1920s Beijing University’s faculty was divided into camps based on where people had done their foreign study. Those who had studied in France comprised one bloc, led by Li Shizeng, chair of the Biology Department (p. 235).

Between the fall of 1926 and the summer of 1927 the warlord forces of Zhang Zuolin instituted a reign of terror and political violence at Beijing University, essentially destroying it. By the late 1920s it had become clear that Shanghai University (in the south) had eclipsed Beida (in the north) as China’s leading seat of higher education.

Then in June 1928 the Guomindang took control of Beijing. But rather than restoring Beijing University, Guomindang leaders, seeking to impose discipline on China’s college campuses, “announced plans for a University Council, headed by Cai Yuanpei. The new system mandated that Beida be combined with nine other colleges to form a National Beiping University, which, under Li Shizeng’s leadership, was to be the leading higher educational institute in the Beiping ‘university district.’ Many Beida students assumed the Guomindang was out to dismantle their university because it feared the tradition of protest that had flourished there after the May Fourth Movement [in 1919]. The announcement of the university district plan, along with the Guomindang’s staunch opposition to the Communist party and its movement to indoctrinate students in nationalist ideology, alienated many Beida faculty members and students” (p. 247). Address: Asst. Prof. of History, Univ. of Colorado at Boulder.

192. Guyotat, Régis. 2005. Week-end “chinois” à Montargis [A Chinese weekend at Montargis]. *Monde (Le) (Paris)*.

March 10. [Fre]

• **Summary:** This document, which mentions Li Shizeng, is published in full on the website of Amite Chine-Montargis (www.chinemontargis.fr/france/presse.html).

Note: Montargis is a commune in the Loiret department; the town is located about 110 km (68 mi) south of Paris and 70 km (43 mi) east of Orléans in the Gâtinais. Address: Regional correspondent, Le Monde.

193. AFP (Agence France-Press; French Press Agency). 2006. Montargis et les touristes chinois [Montargis and the Chinese tourists (News release)]. Paris. 2 p. Oct. 2 [Fre]

• **Summary:** This document, which mentions Li Shizeng, is published in full on the website of Amite Chine-Montargis (www.chinemontargis.fr/france/presse.html).

194. Guyotat, Régis. 2006. Montargis berceau de la Chine nouvelle [Montargis, cradle of the new China]. *Monde (Le) (Paris)*. Oct. 9. [Fre]

• **Summary:** This document, which mentions Li Shizeng, is published in full on the website of Amite Chine-Montargis (www.chinemontargis.fr/france/presse.html). A photo shows young Chinese intellectuals relaxing in the Durzy garden at Martargis, in July 1920. Address: Regional correspondent, Le Monde.

195. *Croix (La) (Paris)*. 2008. Montargis, l'un des berceaux de la "chine nouvelle" [Montargis, one of the cradles of the "new China"]. May 13. [Fre]

• **Summary:** This document, which mentions Li Shizeng, is published in full on the website of Amite Chine-Montargis (www.chinemontargis.fr/france/presse.html).

196. Bibliothèque municipale de Lyon. 2009. Le mouvement travail-études. [The work-study movement (Website printout—all)]. fr.wikipedia.org/wiki/Mouvement_Travail-%C3%89tudes. Printed Aug. 17.

• **Summary:** The 3rd photo from the top on the first page shows the outside of the building housing La Caséo-Sojaine. A large sign atop the near end of the building displays the company's name. Six people (who appear very small) are standing in front of the huge building. The photo is taken from *Lü Ou jiaoyu yundong* (The Movement for Education in Europe) (published in Tours, France, in 1916).

The text (in French) states: The work-study movement (*Qingong jianxue yundong*) takes its direct place in the history of the movement for education abroad that involved several thousand young Chinese, starting at the end of the 19th century. Studies abroad had, as their first goal, the creation of an intelligentsia necessary to enable China to gain access into modernity. These students of a new mold first went to study in Japan, then in the United States and in Europe.

The approximately two thousand students who took part in the work-study in France are alive at a crucial moment in the history of China. The passage between the end of the Manchu dynasty and a start of the Republican era generates confusion and instability; it is followed by combats among the war lords and their exactions. To these disorders and to great uncertainty, is added the enormous difficulty of building a new country paralyzed by a disastrous economic situation.

The core idea of the work-study movement is conceived by Li Shizeng (1881-1973) who knows France well, having completed his studies there as early as 1902, first at the *Ecole Pratique d'Agriculture*, on the outskirts of Paris at Montargis, then in the Paris capital, at the Pasteur Institute. The influence of anarchist ideals well disseminated in France at the time and his deep admiration for the French culture, next to the vast network of relationship that he created among important representatives of the political, cultural, economic and diplomatic circles, can easily explain that he was able to bring to fruition his plan to enable a large number of his compatriots to achieve studying in France all the while working to pay for their studies.

In 1908 in La Garenne Colombes (in the Paris suburbs), Li started a factory for processing soybeans into tofu and other soyfoods; this factory provided work to about thirty persons from his village of origin in China. In 1909 Li returned to China to plead his cause with the General Governor of the province of Zhili. Indeed the experience of the factory at La Garene illustrates well the principle of *qingong jianxue*—a school is opened not far from the factory for the benefit of the workers where Li Shizeng and Wu Zhihui (1864-1953; this movement's other founder) teach courses in Chinese, French and scientific subjects.

In a very frugal framework, there is also a very strict moral code (with, among others, the following prohibitions): no alcohol, no tobacco, no gambling, no prostitutes, etc. This framework provides rhythm to the life of the student-workers who share their daily life between laborious work and applied studies during their free time. According to the vision of the founding members of this movement, such a principle thus divided between work and study would permit the building of a new man: a citizen devoted to work and of an irreproachable moral rectitude. Similarly, this formula would have enabled to release, in the social life of each person, values of mutual help, cooperation and equality among men—which recalls the values advocated by certain anarchists.

At the fall of the Manchu dynasty, Li Shizeng creates in France in 1912 the Association for Work-Study (*Liu Fa jianxuehui*) with the support of Cai Yuanpei (1868-1940), at the time Minister of Education, and Wang Jingwei (1883-1944). A preparatory school is opened in Peking, where students, paying a very small enrollment fee, receive courses in French and general culture for six months with

the goal in mind to continue their studies in France thanks to the arrangements made by Li so that they would be received in the schools and lycees of Montargis, Paris and Fontainebleau. Within two years, about 140 Chinese students will have come to France.

197. Pasteur Institute, France. 2009. Repères chronologiques Li Yu Ying (Li Shizeng) 1881-1973 Chronological milestones for Li Yu-ying (Li Shizeng) 1881-1973 (Website printout-all). www.pasteur.fr/infosci/archives/liy0.html. Printed Aug. 17.

• **Summary:** In the upper left corner is a small portrait of Li Yu-ying. We are not told when or where it was taken. The text reads:

1881 May 29—Chinese agronomist and pedagogue born on this date at Goayang (in China). His father was a dignitary at the Imperial Court of Manchuria [Manchu dynasty].

Li studies in China in a milieu open to Western / Occidental culture.

1903—Accompanies the Chinese Empire Ambassador to France.

1903-1906—Abandons his intention of becoming a Mandarin in order to undertake studies in agronomy at the Chesnoy School of Practical Agriculture (*Ecole pratique d'agriculture du Chesnoy*) at Montargis, located about 60 miles southwest of Paris. Drawing inspiration from the thought of Kropotkin and Proudhon, he creates the “Society for Moral Advancement” and takes part at the publication of the journal ‘Xin Shiji’ (The New Century).

1906-1910—Leaves Montargis for Paris where he enrolls in courses in chemistry and biology at the Sorbonne and works as an intern in the laboratory of Gabriel Bertrand at the Pasteur Institute.

1907—Joins the Tongmenghui, a clandestine resistance movement founded by Sun Yat Sen that aims at “giving back China to the Chinese (people), establishing a Republic and equally redistributing the land.”

1908—Creates at La-Garenne-Colombes the “Caséo-Sojaine,” a soya processing factory, thinking that soya could indeed help China meet its dietary needs. He will provide there work for about thirty worker-students that he brings from China to whom he provides additional intellectual training by setting up evening classes.

1909—Welcomes his friend Sun Yat Sen, on a visit to Paris, to his “Caseo-Sojaine” factory at La-Garenne-Colombes.

1911—Returns to China as the revolution puts an end to the Qing dynasty

1912—Publishes with L. Grandvoinnet: “Soya—Its Cultivation, Dietary, Therapeutic, Agricultural and Industrial uses.”

1912—With the support of the Minister of Education, Cai Yuanpei, creates the Association for Work-Study in

France. And thus, through 1914, one hundred and forty young Chinese, having undergone an introduction to the French language in a preparatory school in Peking will travel to France to study there.

1914—Opens the first Chinese restaurant in Paris.

1915—Creates in China the Society for Diligent Work and Frugal Studies.

1916—Creates in Paris, in collaboration with Yuanpei, the Franco-Chinese Society for Education in order to promote cultural exchanges between France and China.

1920—Takes part in the creation of the Franco-Chinese University in Peking.

1921—Takes part in the creation of the Franco-Chinese University in Lyon, France.

1922—On the occasion of Louis Pasteur centenary, Li favors the idea of a Pasteur Institute in Shanghai. The project is postponed for lack of funds. L. Boëz / Boez will take up the idea again in 1929 and the project will finally see the light of day in 1937.

1925—Becomes the first President of the administrative council for the Peking Imperial Palace Museum.

1929—Creates the Peking National Academy.

1932—In Peking meets Paul Langevin, entrusted by the League of Nations with a mission to reorganize public schooling in China.

1933—Under his (Li Yu-Ying’s), as well as Zhihui’s and Cai Yuanpei’s initiative, a permanent Chinese delegation to the international organizations for intellectual cooperation sees the light of day as well as the Sino-International Library installed in Geneva, Switzerland.

1937-1944—Travels back and forth between China and Europe to aid in the fight against totalitarian powers and promote cultural exchanges.

1948—Travels for the last time to Peking to organize the 19th anniversary of the Peking National Academy.

1949—Leaves China to settle in Uruguay, where he lives until 1955.

1954—Creates and manages the International Chinese Library of Montevideo.

1956—Settles in Taiwan where he becomes the first General Manager for the National Palace Museum.

1966—Travels to France to try to restart again the Franco-Chinese Institute of Lyon. 1973—Li dies in Taiwan.

Bibliographical references and sources:

Zhu Min Da, Chronological notes on the life of his grandfather Li Shizeng (at Pasteur Archives).

Ministry for Foreign Affairs website, “Archives and Patrimony.” “France-Diplomacy”.

Lyon Municipal Library website, “Lyon Franco-Chinese Institute”.

60 Years of UNESCO History, colloquy proceedings, Nov. 2005.

This is a service of the Archives of the Pasteur Institute.

198. Visas for Life. 2010. The righteous and honorable diplomats: Yu-Ying Li. Chinese Consul, Marseilles, France, 1940 (Website printout-part). www.visasforlife.info/id101.html. 1 p. Printed Jan. 30.

• **Summary:** “Yu-Ying Li was the acting Chinese Consul in Marseilles in 1940. Li was also the President of the National Academy there. Many refugees in Marseilles received a visa stamp from Yu-Ying Li. In Chinese characters that virtually no one could read, the stamp read, “Under no circumstances is this person to be allowed entrance to China.” Anxious refugees used the visa stamp as an exit visa. Frank Bohn, of the American Federation of Labor (AFL), Varian Fry of the Emergency Rescue Committee (ERC), and other rescue and relief agencies utilized many of these Chinese visas to help refugees leave France for Spain, Portugal and other parts of Europe.

“Information compiled as part of an ongoing research project of the Institute for the Study of Rescue and Altruism in the Holocaust, a nonprofit corporation (ISRAH).”

“The Institute for the Study of Rescue and Altruism in the Holocaust, a nonprofit corporation (ISRAH), is an educational organization formed for the purpose of conducting research, disseminating information, promoting awareness of, and honoring groups and individuals for the rescue of Jews and other victims of the Nazis and their collaborators, 1933-1945.”

199. Williams, Bruce. 2011. Background information on Li Yü-ying (Li Shizeng) (Interview). *SoyaScan Notes*. May 28. Conducted by William Shurtleff of Soyinfo Center.

• **Summary:** In China a child gets his or her “original” name at the naming ceremony when the child is one month old.

When does a person get their “Courtesy name”?

Traditionally there used to be a thing called a “capping ceremony,” which was a coming-of-age rite. It generally happened when the young man of a literate family of means reached the age of adulthood / majority (around 18-20) years of age. The person did not have to be famous, and in the early 1900s only about 1-2% of all young men in China went through such a ceremony. The parents usually give the young man his name; only rarely did he choose it for himself.

A “courtesy name” should be used by ones peer or those who are younger. A person can decide when they wish to use which name. Note: Li Yü-ying chose to use only that name in all of his writings about soy.

The situation with Li Yü-ying (who is generally known to the world by his “courtesy name” or “style,” Zi), Li Shizeng, is a little tricky because he was born and first educated in the old educational system.

If Li was born in 1881, then he turned 20 in 1901, which was before the educational reform edict was officially announced in 1906—and before the Republican revolution of 1911-12. The reform basically disenfranchised

an entire generation of people who were preparing for the exams and careers as government officials.

Note: In China’s educational reform, the ancient system of literary examinations was completely abolished and replaced by a more modern and more Western system based on universities, libraries and museums. Previously there had been no school system in China, with the exception of Buddhist schools (from about 900 A.D. to the present) and Christian schools and colleges (more recently). Families of means had their own libraries and tutors for their children. China made literary attainment a condition of office holding.

After 1906, prominent families who had libraries but no longer needed them for their children, were often forced by circumstances those libraries. Western Libraries (e.g., Harvard, Yale, Princeton, Colombia, Chicago, Berkeley) picked up huge numbers of valuable old books, at very low prices, to add to their libraries. Why didn’t Chinese Libraries buy these books? The concept of building libraries took time to develop; they just didn’t have the concept. But also, as the Boxer Indemnity money came in (it could only be used for cultural and educational projects), starting in the 1910s, the Chinese used this money to build libraries, museums, and universities.

The fact that Li was considered one of the “four elder statesmen of the Kuomintang” is of pivotal importance. That is how most Chinese know him; they don’t generally know of his involvement with tofu (doufu) or soy. These four elder statesmen were Wu Zhihui (Wu Chih-hui), Cai Yuanpei (Ts’ai Yuan-p’ei), Zhang Renjie (Chang Jen-chieh), and Li Shizeng (Li Shih-tseng).

Li was not an unproblematic person—in part because he had power. Given the modern state of the debates, a lot of the stuff he did was very incorrect—politically. So they don’t want to talk about this side of him.

Understanding Li is essential for understanding early Kuomintang (pinyin: Guomindang) and Communist politics in the 1910s and 1920s, which is where most Taiwanese and mainland Chinese historians don’t go; it’s too sensitive. They don’t want to deal with that 10-15 year period where a lot of the most important issues really take shape. They start their research in the mid- to late-1920s. Both sides were involved in a lot of skullduggery (underhanded dealing) back in the good old days.

Bruce’s wife has done some work on Li because he was the major strategist for the Kuomintang in the early days. He’s the one who made the decision to have Puyi (the last Emperor of China) kicked out of the Imperial Palace, and negotiated the deal to get the inventory / treasures out of the Imperial Palace / City. People suspect that he is largely responsible for allowing it to be looted of its treasures, and the allowing the money to be used to finance the Kuomintang. It’s very likely that a significant proportion of China’s treasures actually went through antique dealers in

Paris, London, etc. Many good duplicates / forgeries of originals were made, and it is now unclear which of the two great national museums in Taipei and Beijing, if any, has legitimate treasures. Neither side wants to raise the debate because the public documentation on this is rather appalling.

Li developed the Work-Study Program in France, but many people accused the program of being a sham. Many students, after arriving in France, had to work as “slave labor” in the French labor market; he didn’t have a support network for them. Not all the Chinese who participated in this program came out of it with good experiences.

However Li met many high French officials, and in fact when the Boxer Indemnity money started to be returned to China he was the funnel through which all of the French-speaking (French and Belgian) money went. That was probably his major basis for power; he never gave that up—at least not until World War II. So when China consolidated a lot of the indemnity funds under the ministry of education in the 1930s, he was not part of that. He eventually got pushed aside. One of the big debates is whether Li used any of this money for his own projects, and if so, how much. Among officials, it’s always okay (it’s “official corruption” but it’s a standard form of corruption, even today) to use public money for private purposes—such as setting up your own businesses. If it makes money, you take the money; if it loses money, you write it off to the government.

Note: Hu Shi maintained control over the British and American Boxer Indemnity money all the way through World War II.

Because of his political background, and his scholarly tendency to collect documents, and the Sino-International library that he owned, he had a lot of really sensitive political documents. Very shortly after he died there was a very suspicious fire in his office. The debate is: Were the documents actually burned or were they taken by the Kuomintang and deposited in some archive. Li had access to a lot of the old state secrets and he knew where all the skeletons were buried. They were concerned that if these documents ever got out, the early history of the Kuomintang would have to be totally rewritten.

Li was an entrepreneur; he just thought like one. He was a risk taker. Because he came from a wealthy family, he had the resources, for example, to set up a tofu factory near Paris while he was still young. Address: PhD, Librarian, East Asian Library, University of California, Berkeley. Phone: (510) 642-2556.

200. *SoyaScan Notes*. 2011. Chronology of soymilk worldwide—1500 A.D. to 1949. Part I. Compiled by William Shurtleff of Soyinfo Center.

• **Summary:** 1500 A.D.—The earliest known written reference to soymilk appears in China in a poem titled “Ode to Tofu,” written by Su Ping

1665—Soy milk is first mentioned by a Westerner, Domingo Fernández de Navarrete, in his book *A Collection of Voyages and Travels*. Navarrete served as a Dominican missionary in China.

1790—Soy milk is mentioned by Juan de Loureiro in his book *The Flora of Cochín China*. Loureiro was a Portuguese Jesuit missionary who lived in what is now Vietnam. Note that each of these and many other early references mentioned soymilk as part of the process for making tofu.

1866—Soy milk is first discussed as a drink in its own right by the Frenchman Paul Champion, who traveled in China. In a French-language article he stated that the Chinese had taken their cups to tofu shops to get hot soymilk, which they drank for breakfast.

1896 June—Soy milk is first referred to in the United States by Henry Trimble in the *American Journal of Pharmacy*.

1909—The first soy-based infant formulas and soymilk made from full-fat soy flour are developed in the United States by John Ruhräh, a pediatrician. He reports his results in the *Archives of Pediatrics* (July 1909).

1910—The world’s first soy dairy, named *Caséo-Sojaïne*, is founded by Li Yu-ying, a Chinese citizen, biologist and engineer, at 46-48 Rue Denis Papin, Les Vallées, Colombes (near Asnières), a few miles northwest of Paris. In December 1910 he applies for the world’s first soymilk patents (British Patents No. 30,275 and 30,351). The first patent is titled “Vegetable milk and its derivatives.” He is issued both patents in Feb. 1912.

1913 June 13 Li Yu-ying is issued the first U.S. soymilk patent (No. 1,064,841), titled “Method of manufacturing products from soja.” He filed the application on 10 Oct. 1911.

1917—Soy milk is being produced commercially in the U.S. by J.A. Chard Soy Products in New York City.

1929 Nov.—T.A. Van Gundy, founder of La Sierra Industries in Arlington, California, launches La Sierra Soy Milk, and becomes the first Seventh-day Adventist worldwide to make soymilk commercially. The product was canned and the beany flavor removed by live steam processing.

1931—Madison Foods of Madison, Tennessee, introduces Madison Soy Milk—the world’s earliest known soymilk to be fortified with calcium and the second commercial soymilk product made by Seventh-day

Adventists in the USA. Madison Foods is a company run by students and faculty within Madison College, a pioneering work/study school.

1936 Jan.—Dr. Harry W. Miller and his son, Willis, start making Vetose Soya Milk, sold in natural or chocolate flavors in sterilized half pint or quart bottles at their Vetose Nutritional Laboratories in Shanghai, China. Dr. Miller is a Seventh-day Adventist physician, a student of Dr. John Harvey Kellogg, and a medical missionary living in China. The world's first “soy dairy,” this company also made soy ice cream and Acidophilus Vetose (a cultured soya milk)—both launched in Jan. 1936. But Japan was invading China. Within months after the soy-milk business began booming, a Japanese bomb blew up the soy dairy.

1936 June—Sobee, the world's earliest known branded soy-based infant formula, is launched by the American Soya Products Corp. of Evansville, Indiana.

1939 autumn—Dr. Harry W. Miller, forced by the war in China to return to the USA, starts making soymilk at Mt. Vernon, Ohio, in a large brick plant which he and coworkers built from the ground up. The first two products were canned liquid soymilk (made in a pressure cooker and fortified with vitamins and minerals) and malted soymilk (Soy-A-Malt). Pressure from the powerful U.S. dairy industry and the USDA convinced Miller not to call his product ‘soymilk,’ so he latinized the name to Soya Lac. This term was first used in late 1939 for Miller's first American soymilk.

1940 March—K.S. Lo, founder and managing director of the Hong Kong Soya Bean Products Co. Ltd. starts to make soymilk in Hong Kong. His product, originally named Vita Milk (*Wai-ta-nai* in Chinese) was fortified with calcium, cod-liver oil, and vitamins, and sold in milk bottles, primarily as a nutritious, affordable beverage for refugees. In June 1940 the product was renamed Sunspot, and in 1953 it was renamed Vitasoy. Continued.

201. *SoyaScan Notes*. 2011. Chronology of tofu worldwide—965 A.D. to 1929. Part I. Compiled by William Shurtleff of Soyinfo Center.

• **Summary:** 965 A.D.—Tofu is first mentioned in China in a document, the *Ch'ing I Lu* [Anecdotes, simple and exotic], by T'ao Ku. It states: “In the daily market were several catties of doufu. People of the region called doufu the ‘vice mayor's mutton.’” It goes on to tell the story of a vice mayor named Jishu, who was so poor that he couldn't afford to buy mutton. Instead he bought a few pieces of tofu every day and ate them as a side dish with rice. Soon people in the area came to call tofu the “vice mayor's mutton.” The story implies that tofu was widely consumed in China in those days and that it was less expensive than mutton.

1183 A.D.—Tofu is first mentioned in Japan in the diary of Hiroshige NAKAOMI, a Shinto priest of the shrine at Nara; the tofu was used as an offering at the shrine's altar.

1489—The word “tofu” is first written in Japan with the characters used today.

1603—The word “tofu” is first mentioned in a European-language (Portuguese) document, *Vocabulario da lingua de Iapam...* [*Vocabulary of the language of Japan*], the earliest dictionary of the Japanese language compiled by Europeans (Jesuits living in Nagasaki, Japan). Tofu is referred to as *Cabe*, *Tôfu*, or *Taufu*.

1613—The word tofu is first referred to (though indirectly) for the second time by a Westerner, Captain John Saris, in the log of his trip to Japan. He wrote “Of Cheese [probably tofu] they haue plentie. Butter they make none, neither will they eate any Milke, because they hold it to bee as bloud [blood], nor tame beasts.” This is the earliest English-language document that mentions tofu in connection with Japan.

1665—Tofu is first mentioned specifically by a Westerner, Domingo Fernández de Navarrete, in his book *A Collection of Voyages and Travels*. Navarrete, who served as a Dominican missionary in China, wrote: “Before I proceed to the next chapter, because I forgot it in the first book, I will here briefly mention the most usual, common and cheap sort of food all *China* abounds in, and which all men in that empire eat, from the emperor to the meanest *Chinese*, the emperor and great men as a dainty, the common sort as necessary sustenance. It is call'd *teu fu*, that is, paste of kidney-beans. I did not see how they made it. They draw the milk out of the kidney-beans, and turning it, make great cakes of it like cheeses, as big as a large sieve, and five or six fingers thick. All the mass is as white as the very snow, to look to nothing can be finer. It is eaten raw, but generally boil'd and dressed with herbs, fish, and other things. Alone it is insipid, but very good so dressed and excellent fry'd in butter. They have it also dry'd and smok'd, and mix'd with caraway-seeds, which is best of all. It is incredible what vast quantities of it are consum'd in *China*, and very hard to conceive there should be such abundance of kidney-beans. That *Chinese* who has *teu fu*, herbs and rice, needs no other sustenance to work; and I think there is no body but has it, because they may have a

pound (which is above twenty ounces) of it any where for a half-penny. It is a great help in case of want, and is good for carriage. It has one good quality, which is, that it causes the different airs and seasons, which in that vast region vary much, to make no alteration in the body, and therefore they that travel from one province to another make use of it. *Teu fu* is one of the most remarkable things in *China*, there are many will leave pullets for it. If I am not deceiv'd, the *Chineses* of *Manila* [Philippines] make it, but no *European* eats it, which is perhaps because they have not tasted it, no more than they do fritters fry'd in oil of *Ajonjoli* [sesame seed] a very small seed they have in *Spain* and *India*, which we have not) which the *Chineses* make in that city and is an extraordinary dainty."

1704—Friar Domingo Navarrete's book is published in English. This is the earliest English-language document that mentions tofu in connection with China.

1770 Jan. 3—James Flint in Capringe writes Benjamin Franklin in London (in response to an inquiry from Franklin) a detailed description of how the "Chinese convert Callivances into Towfu" (soybeans into tofu).

1770 Jan. 11—The earliest document seen in which an American mentions tofu is a letter written by the famous Benjamin Franklin (who was in London) to John Bartram in Philadelphia, Pennsylvania. He sent Bartram some soybeans (which he called "Chinese caravances") and with them he sent "Father Navarrete's account of the universal use of a cheese made of them in China, which so excited my curiosity, that I caused enquiry to be made of Mr. [James] Flint, who lived many years there, in what manner the cheese was made, and I send you his answer. I have since learned that some runnings of salt (I suppose runnet) is put into water, when the meal is in it, to turn it to curds."

1821—The second earliest reference seen to tofu in America, and the first to be published in the USA, appeared when A.F.M. Willich of Philadelphia mentioned it in *The Domestic Encyclopedia*. Speaking of soybeans (which he called "the seeds of the Chinese plant *Dolichos soja*"), he wrote: These seeds are used in China and Japan as food; they are made into a kind of jelly or curd, which is esteemed very nutritious, and which is rendered palatable by seasonings of different kinds."

1870 Dec.—The term "Bean curd" is first used by Emil V. Bretschneider, writing in English in the *Chinese Recorder and Missionary Journal* (Foochow, p. 173). He said: "Bean-curd is one of the most important articles of food in China." Then he gave an accurate description of how it was made.

1880—Tofu is first made in Europe by Paillieux, in France, for the Society for Acclimatization (but not on a commercial scale).

1878—The earliest tofu company in the USA, Wo Sing & Co., is in business at 708½ Dupont St. in San Francisco, making both fermented and regular tofu.

1895—Hirata & Co. in Sacramento, California, the earliest known Japanese-American company in the USA, starts making tofu.

1896 June—Tofu first appears in print in an American scientific journal (*American Journal of Pharmacy*), in an article by Henry Trimble, a pharmacist, titled "Recent Literature on the Soja Bean."

1906—Quong Hop & Co., the oldest existing tofu maker in America today, starts making tofu in San Francisco, California.

1910—Europe's first commercial soyfoods manufacturer, named *Caséo-Sojaïne*, is founded by Li Yu-ying, a Chinese citizen, biologist and engineer, at 46-48 Rue Denis Papin, Les Vallées, Colombes (near Asnières), a few miles northwest of Paris. By May 1911 he was making and selling tofu, and by August 1911 he had added smoked tofu, pressed tofu sheets, fermented tofu cheese (in Gruyere, Roquefort, and Camembert flavors), and soymilk.

1923—The two oldest existing Japanese-American tofu companies (House Foods & Yamauchi Inc. of Los Angeles and Aala Tofu Co. of Honolulu) are founded in Hawaii. They both began as H. Iwanaga Daufu at 1031 Aala St. in Honolulu. In 1926 the company was renamed Shoshiro Kanehori Tofu, and in 1937 Haruko Uyeda Tofu, still at the same address. In about 1939 the company was purchased by Mr. and Mrs. Shokin Yamauchi, who later renamed it Aala Tofu Co. Their son, Shoan Yamauchi, made tofu at the family company until 1946, when he went to Los Angeles, purchased the Hinode Tofu Co., and began making tofu there in 1947. After becoming Matsuda-Hinode Tofu Co. in 1963, the company was renamed House Foods & Yamauchi Inc. in 1983.

1929 Nov.—T.A. Van Gundy, a Seventh-day Adventist and founder of La Sierra Industries in Arlington, California (near Riverside), becomes the first Westerner to make tofu commercially when he introduces La Sierra Soya Cheese. This tofu was canned and pimienta was added to prevent graying after canning.

202. *SoyaScan Notes*. 2011. Chronology of soy sprouts worldwide. Compiled by William Shurtleff of Soyinfo Center.

• **Summary:** 100 A.D.—Soy sprouts are first mentioned in China in the *Shen-nung Pen-tsao Ching* [Classical pharmacopoeia of Shen Nung, the Heavenly Husbandman]. Four Chinese characters [yellow + curls + big + bean] are used to refer to soy sprouts, whose use is mentioned only as a medicine, not as a food. The use of soy sprouts as a food in China did not become popular until the Sung dynasty (A.D. 960-1127). This pharmacopoeia was compiled starting in the Early/Western Han Dynasty [206 B.C. to A.D. 8] from material that had existed long before. Today it is considered by Chinese authorities as a genuine work.

1767—Soy sprouts are first mentioned in an English-language publication or in the American colonies by Henry Yonge of Savannah, Georgia. Yonge got his information from Samuel Bowen, for whom he grew the first soybeans [called Chinese vetches] ever cultivated in North America in 1765. Bowen got his soybeans while traveling in China. Yonge writes:

“They put about two quarts of the vetches into a coarse bag, or hair-cloth bag, that will hold about a peck [2 gallons], and after keeping them in it a little time in warm water, they lay the bag on flat grating, or a wooden lattice, placed about half way down a tub; then every four hours they pour water on them, and in about 36 or 40 hours they will have sprouted about three inches in length; they are then taken out and dressed with oil and vinegar, or boiled as other vegetables...” Mr. *Flint* and Mr. *Bowen* having found them an excellent antiscorbutic prepared in this manner, was a principal reason for his introducing them in *America*, as it would be a most valuable remedy to prevent or cure the scurvy amongst the seamen on board his majesty’s ships.” Note that in America, as in China, soy sprouts are first recommended for use as a medicine; It is their vitamin C that prevents or cures scurvy.

1830—Soy sprouts are first mentioned in Europe by Philipp Franz von Siebold, an early traveler in Japan, in his book on the economic plants of Japan. In a large fold-out table, he states that soybeans (*Sooja Japonica*, Sieb.) can be artificially germinated to make “Mogasi” [sic, Moyashi]. He includes the word *moyashi* written in both katakana and Chinese characters.

1871—Frederick Porter Smith, a medical missionary from England living in China, states in his book *Contributions toward the Materia Medica and Natural History of China*, that soy bean sprouts (*Tau-ya*) are “artificially raised in large quantities for food in the winter” when green vegetables are scarce in China. This is the second earliest English-language publication that mentions soy sprouts.

1905-06—Soy sprouts are first produced commercially in the United States by two Chinese food companies in California: Wing Chung Long in Los Angeles, and Quong Hop & Co. in San Francisco.

1911—Soy sprouts are first produced commercially in Europe by Li Yu-ying, a Chinese scholar and soybean expert, at his plant *Usine de la Caseo-Sojaine* at Vallées, Colombes, northwest of Paris, France.

1914—D. Bois in France publishes the earliest illustration seen of a soy bean sprout.

1917-1918—During World War I, interest in soy sprouts in the United States grows. Yamei Kin, a Chinese-American woman with an M.D. degree from an American college, is sent to China in June 1917 to study and report back on soyfoods—including soy sprouts, which she says can be used in a nutritious salad with fermented tofu.

Writing in *Country Gentleman* (28 Sept. 1918), Sam Jordan of Missouri states: “Another dish which tastes as good as it looks or sounds is soy-bean sprouts. The smaller beans, of some yellow or green variety, are usually used.” They are excellent because of “their use in the winter, acting as a green vegetable, and the fact that the vegetable can be had whenever wanted.”

William Morse, the USDA’s soybean expert, writes in the *Yearbook of the U.S. Department of Agriculture* (1918) in a special section titled “Soy-bean sprouts” that in China soy beans are widely used for sprouting. “Bean sprouts can be used as a home winter vegetable, for the dried beans are sprouted easily in a short time under proper conditions of heat and moisture. It is quite possible that sprouted soy beans utilized in various vegetable dishes would appeal to the American taste.” A full-page photo shows a large basket of sprouted soy beans. Taken by Frank N. Meyer, it is the first photo of soy sprouts ever published.

1921—Dr. John Harvey Kellogg, in his book *The New Dietetics*, has a special section titled “Soy bean sprouts” in which he is the first to use the word “vitamins” in describing the nutritional benefits of soy sprouts, and the first to note that “Sprouted soy beans is one of the constituents of the famous chop suey.”

1941-45—During World War II, awareness of soy sprouts again increases. Their champion is Prof. Clive McCay of Cornell University. His first brochure on the subject (April 1943) begins: “Our daily paper would surprise us if it carried an ad: ‘WANTED: a vegetable that will grow in any climate, rivals meat in nutritive value, matures in 3 to 5 days, may be planted any day in the year, requires neither soil nor sunshine, rivals in vitamin C, has no waste (in preparation), can be cooked with as little fuel and as quickly as pork chop.’ The Chinese discovered this vegetable centuries ago in sprouted soy beans.”

Prof. McCay and his wife, Jeanette, worked closely with the New York State Emergency Food Commission, to publicize soy sprouts and other soyfoods during the war years. Governor Thomas E. Dewey hosted a famous “soy bean lunch” at the governor’s mansion in Albany, New York, to demonstrate the value of meat substitutes. Soy sprouts were in two of the dishes served to the 67 media representatives.

1960s-2000—Soy sprouts benefit from the rapid growth of interest in all kinds of sprouts in the USA and Europe, and from the growing number of Asian-Americans.

203. *SoyaScan Questions*. 2011. Questions about the life and work of Li Yu-ying (Li Shizeng / Li Shih-tseng), Chinese soyfoods pioneer in France and China. Compiled by William Shurtleff of Soyinfo Center.

• **Summary:** The following questions are listed in approximate descending order of importance:

Find several good obituaries of Li Shizeng, in part to show his surviving descendants and where each was residing when he died on 3 Sept. 1973. Did he die in Taipei? Also try for a death certificate.

He had grandchildren: Does he have any living descendants? How can I contact them? Or are they living in fear and hiding because Li was such an important person in the Kuomintang? Li and his first wife had two children (a son and a daughter) before she died in 1941. Are they still living? Try to contact them to learn more about his life, early education, and work. Try to get a photo or illustration of him from them.

Concerning the *Société Biologique de l'Extrême Orient*? Is it still in existence? Are its records stored in any archive? A possible contact is: *Société de Biologie*, College de France, 75231, Paris Cedex 05. This Societe was founded in 1848.

On what exact date did his company start manufacturing soyfoods? When—in about 1916—did it stop? Recall that in 1916, when Ts'ai Yuan-p'ei became chancellor of Peking University, he invited Li Shih-tseng to join its faculty as professor of biology. Wartime conditions [World War I] forced Li's soybean products company to suspend operations. In 1917 Li returned to China.

Try to get a copy of the document titled *L'évolution de l'alimentation*, by Li, published in about 1911-1912. It was cited in the book titled *Le Soja*, by Li and Grandvoinnet (1912), on the last page as a footnote at the end of the "Conclusion."

Concerning his courtesy name: Did his parents choose it? Why did they choose those words?



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.

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