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Main Importations

DURING the nineteenth century, wheat was frequently imported from Europe to supplement American crops. Samples of these shipments were often planted for trial, along with other European varieties brought into the country by immigrants and other travelers.

For several years prior to 1792, *Siberian wheat* was introduced into New Hampshire from England. However the wheat degenerated and new importations had to be made.

A bearded red winter variety called *Mediterranean wheat* was the most popular new wheat during the first half of the nineteenth century. It was introduced in 1819 from islands in the Mediterranean as part of a search for an early maturing variety that could be sown late in the season. Its chief competitors were the white soft wheats, commonly grown during this period and the favorites of millers and flour users. The Mediterranean was a red wheat producing a fine, red bran, difficult to separate because of the poor milling methods then in use. Farmers liked the Mediterranean because of its resistance to the Hessian fly.

The records of *Purplestraw,* whose origin is unknown, date back to 1822. It was planted to 116,000 acres in 1924. The *Gold Drop* variety was imported from England prior to 1843; and *China wheat,* which is still being grown, came from China about 1845.

The *White Australian* or *Pacific Bluestem,* decended from the *White Lamma* of England. It reached California from Australia before 1850, and proved to be superior to the other varieties then being grown on the Pacific Coast. Another wheat, *White Winter,* which is probably of English origin, was being widely grown in the Willamette Valley of Oregon by 1855 and is still found there. (1)

Some of the varieties imported during this period still are grown extensively in the United States, and have served as breeding stocks for other successful varieties. The Mediterranean wheat, for example, was planted to 2,770,000 acres only a hundred years after its introduction to American agriculture.

Agriculturists of the nineteenth century were keenly interested in improving the familiar varieties of wheat. Even before 1860 they were making selections from admixtures, mutants, and the natural hybrids found in their fields.

Some of the most important varieties were discovered from these selections. Zimmerman of Frederick, Maryland, selected in 1837 a variety of either red or white wheat. Which variety was the original is not known, but both soon came to be widely grown under his name. The *red Zimmerman wheat* was still in cultivation a hundred years later.

Red Fife, a hard red spring wheat, came to America from Scotland, although it was grown previously in Danzig and Poland. It was selected by David Fife of Ontario in 1842 from a small packet of what proved to be winter wheat brought from Glasgow. The Red Fife entered Wisconsin in 1860 and became the basis of the great flour industry of Minneapolis after the introduction of the roller mill and the purifier.

Marquis wheat, "the outstanding hard red spring wheat of the world," was developed in Canada from Red Fife which was its male parent.

During the 1850's the Patent Office tried many new wheat introductions in a search for productive varieties that would withstand rust and the attacks of the Hessian fly. The *Turkish Flint* wheat, from near Mount Olympus, proved to be hardy and prolific in the states along the Mason-Dixon line and the extension of its culture was recommended. This wheat was approved as a hardy, productive fall variety which ground into excellent flour. The hard grain gave it protection in the storage bin.

Algerian Flint, a large grain wheat from the province of Oran, was sown in the valley of Virginia and produced a large yield. *Pithusian Flint,* a fall wheat producing a large "berry," came from the island of Ivica. *Syrian spring wheat* from the Holy Land proved to be an early maturing variety.

The *"Cape Wheat,* from the Cape of Good Hope, procured by Com. Perry of the Japan Expedition," was sown but not commented upon. *Spanish spring wheat* was a fine variety from

Alicante. Still other wheats came from France, England, Chile, and Mediterranean areas.

After the Department of Agriculture was established and an experimental farm set up, the Federal government took a hand in solving the problems surrounding the national wheat crop. Various state governments cooperated in the study of wheat on their own experimental farms. Dozens of wheat varieties were distributed among growers and sown by the Department in search of desirable qualities. During 1861, approximately 1,000 bushels of wheat were imported from different agricultural regions of Europe and tried throughout the country.

Isaac Newton imported several hundred bushels of choice wheat and other cereals in 1864 from England, France, Belgium, Russia and Sweden. The results were so satisfactory that Newton distributed a similar shipment the following year.

DURUM WHEATS

The first Russian macaroni (durum or hard) wheat was introduced into America from Odessa in 1864 by the Department of Agriculture. Two varieties called *Arnautka* and *Sandomirka* were distributed by the Department for several years after 1864. The Sandomirka and Arnautka were considered superior wheats wherever grown. Favorable accounts of their strong growth, early ripening, and high yield were still being received in 1871. But culture of the Arnautka was abandoned because of opposition to its hardness. Its possibility as a macaroni wheat was not considered at this early date. The Sandomirka was introduced again from Hungrary by Le Duc in the summer of 1877, because it was famous in Europe and the flour was being imported into the United States for special purposes. The seed, distributed with great care in the fall of 1877, did not secure favorable results except in Tennessee and North Carolina.

In 1865, the best varieties of English wheat were reported as not adaptable to the climate here. Wheats which succeeded in the long, mild growing season in England did not give good results in America, with the sudden variations of cold and heat, moisture and aridity.

Sixty-five varieties from France, Prussia, Russia, Great Britain, Chile, and China were seeded in 1865 for trial. Of the fifty-five varieties of winter wheat grown, six proved worthy of notice by

the Department. Leading producers were the red and white Mediterranean, the *Tappahannock* (of American origin), and the *Russian Scheffel.* Of sixty-seven varieties of spring wheat sown in 1866, forty-six did well while the *Red Chili* and *Black Sea* varieties scored special commendation.

Many varieties of wheat from the Royal Agricultural Exhibition at Vienna were procured for trial by the Department in 1866. They were part of a shipment of cereal and vegetable seeds. Eight of these were sown in the autumn of 1866, and others were sown the next spring. A number of suitable varieties were found from tests conducted on forty-three varieties of winter wheat and sixty-six of spring wheat grown experimentally in 1867. Capron gave samples of these importations to the governor of Minnesota in an effort to find one suitable for that state.

Generally favorable reports were received after 1870 from two distributions of *Touzelle,* a beardless white winter wheat procured by the department from Marseilles, France, in 1869. Another variety called *Soisette* was also imported from France in 1870 and grown with good results.

AMERICAN WHEATS

The most successful wheats during the next two decades proved to be of American origin. Individuals were selecting and breeding new varieties to meet the demand for better crops. This search for suitable varieties was stimulated by an increase in agricultural education and the need for regional varieties. The government, however, did not depend entirely upon native stocks for experimentation, and continued to make importations from abroad.

The search for new wheat varieties was not the only factor that helped increase wheat production after 1865. There was an emigration to the West due to the Homestead Act and the end of the Civil War. The markets for wheat increased. Methods of cultivation were improved and refinements added to the reaper.

Most of the wheat varieties developed in America were produced by pure-line selection. The *Fultz,* a beardless, soft red winter wheat, is an important example of this method. It was selected in 1862 by Abraham Fultz from a field of Mediterranean and was later grown extensively in the central section of the eastern wheat belt. During this same period, crop breeders were searching Canada for new wheat varieties. A shipment of 100 bushels of

Arnold's Hybrid No. 9 was imported for the fall sowing of 1872. However, the results proved this hybrid to be similar to the Mediterranean.

After 1870 many breeders turned their attention to hybridization or artifical crossing. Out of their efforts came two varieties which aroused much interest among wheat growers. These were the Fultz, and a variety from Virginia called the Tappahannock.

Commissioners Le Duc and Colman realized the need for varieties adapted to particular regions. Le Duc wanted a rustproof wheat for the South, and a wheat that would not winterkill on the prairies. Rusk renewed the interest shown in the Mediterranean and winter wheats, and five varieties of the Mediterranean were procured in 1889 for distribution.

OATS

Although several varieties of oats were imported during the 1850's, little information is available about their effect on the oat industry. It was not until the following decade that a number of superior oat varieties made their appearance in this country. The *White Swedish, Yellow Lithuanian, Black Tartarian, Black Prussian* and *Nun's* were considered the best of seventeen varieties sown in 1866.

During the period 1865 to 1870 a number of other importations were tried. The *Potato, Scotch Dun,* and *New Brunswick* oats were brought from Scotland. Denmark contributed the black and white *Swedish* oats. From England came the *Excelsior* and *Somerset* varieties, and Germany's outstanding contribution was the *White Schonen.* From these the Excelsior and the White Schonen were chosen as the best. The Excelsior was suited to a wide variety of soil and climate conditions, while the Schonen withstood rust.

When the *Fellow* oat from Scotland was first distributed in 1873, it was acclaimed in some parts of the country as superior to the White Schonen. Another English importation, the *Board of Trade* oat, also made its appearance during the 1870's. The value of these importations can be judged from an estimate made in 1879 of the increase in the yield of the nation's oat crop. It was claimed that the White Schonen had raised the yield by two and a half bushels per acre, and that the Board of Trade and *Rustproof* varieties were worth $15,000,000 yearly to oat raisers.

RYE, BARLEY, AND BUCKWHEAT

Charles Mason was instrumental in bringing a number of new varieties of rye, barley, and buckwheat to this country. He imported the *Large Northern Prolific Rye* from Germany to be sown in the central states, barley from southern Spain, and the *Silver Buckwheat* from France in 1854. The *Saxony* rye was considered the best of sixteen varieties sown experimentally in 1866. *Oderbruch* barley from the Oder Valley and other barleys were tried with fair results. By 1872 the barleys, *Chevalier, Probstier,* and *Saxonion* had been established as preferred varieties.

The origin of barley varieties in this country, like many of our familiar crops, is difficult to trace. Many of the present varieties have been bred as hybrids by individuals and experimental farms. Aberg and Wiebe, in a study of the history of barley, have traced the present commercial varieties back to Colonial times, but many of the importations were brought in by individuals and the details were not recorded. (2)

FIBER CROPS

RAMIE

The high prices and planting difficulties surrounding cotton at the close of the Civil War led to the trial of ramie as a cotton substitute. The ramie plant (*Boehmeria nivea*), is a member of the nettle family. It produces a fine fiber used in the orient in weaving clothing. The western world was first drawn to ramie in 1851 at an exhibition of its fibers in England. Plants were brought to Jamaica in 1854 and from there to the Botanical Garden in Washington the following year. Ten years later, ramie seeds were imported from China.

The first *plants* brought to Louisiana, according to Emile Le Franc, came from Mexico in 1867 through the help of Ernest Godeaux, the French consul in New Orleans. Benito Roezl, a Bohemian botanist, returned from Java the same year with a lot of ramie roots for sale.

Interest in ramie cultivation in New Orleans soon after its introduction forced the price up to one dollar for each subdivision of roots. The fiber sold for $375 per ton and was used as imitation silk. A group of ramie enthusiasts in New Orleans in 1873 organ-

ized the Southern Ramie Planting Association to promote their interests. In 1868, the Commissioner of Agriculture imported from Paris seed of two other varieties of Boehmeria for experiment—but many of the small, easily damaged seeds failed to germinate. Ramie was reported in 1869 to be growing in extensive plantations throughout the South.

TABLE 3

DISTRIBUTION OF TEXTILES AND CEREAL SEEDS BY THE FEDERAL GOVERNMENT 1868–89

Year	Cereals*	Textiles†	Year	Cereals*	Textiles†
	No. of packages	*No. of packages*		*No. of packages*	*No. of packages*
1868	31,220	10,498	1879	100,068	2,516
1869	46,763	5,676	1880	.....	.....
1870	38,701	744	1881	216,157	31,590
1871	61,204	1,638	1882	290,862	31,144
1872	86,014	1,133	1883	102,267	23,828
1873	149,696	2,612	1884	100,456	587
1874	112,562	2,367	1885	59,585	36,103
1875	137,468	5,551	1886	38,858	7,626
1876	156,493	1,357	1887	21,203	3,769
1877	132,181	6,118	1888	17,862	6,219
1878	112,026	816			

* Includes varieties of wheats, corn, oats, rye, and barley.
† Cotton, hemp, flax, jute, and ramie.

Despite the successful cultivation of the crop, ramie did not become important commercially. No one was able to perfect a machine that would do a thorough job of separating the fibers from the stalks and bark. Finally, the interest in ramie died out during the 1890's and the crop was practically abandoned. In the 1940's, several thousand acres of ramie were cultivated, and there were reports of new machinery capable of separating the fibers efficiently. (3)

COTTON

The growth of the cotton industry in the South awaited the invention of an efficient machine for processing the fiber. Eli Whitney's cotton gin made it possible for growers to expand their acreages and compete successfully with foreign suppliers. Agriculturists hailed the profitable cultivation of this crop, in competition with cheap foreign labor, as an example of what might be done by machinery in other crop industries.

Many introductions were made by individuals, and the Department of Agriculture tried to find foreign varieties superior to

those commonly grown in this country. Cotton seeds were brought from Egypt and India for trial, for American growers hoped to recapture part of the market which Egypt had come to supply. The results from the trial of Egyptian seeds in Louisiana were so poor that growers did not care to replant the seed. Mildly favorable reports of the Egyptian varieties were received from Texas, Mississippi, and Florida. Generally, the Indian and Egyptian varieties did not mature soon enough in this country.

Spurred on by the high prices American mills were paying for Egyptian cotton, the Department of Agriculture made a number of new introductions between 1892 and 1894. It had previously been urged to import varieties from India in 1868, but the Department found that manufacturers claimed American cotton was superior and that it was preferred even in India. Cotton seeds also were imported from Tahiti, but their cultivation was not extended.

Seeds of three varieties prominent in Egypt were distributed in the South by C. R. Dodge, fiber expert of the Department for many years. These plantings were stopped and the stocks were lost except for trials continued by W. H. Wentworth of Floresville, Texas. Wentworth selected a product of high quality, but the difficulty he had in marketing his cotton caused him to eventually discontinue the undertaking.

H. J. Webber, in charge of plant breeding for the Department of Agriculture in 1897, continued the trials of Egyptian cotton, and extended tests to the river valleys of the Southwest. He used plant stocks of the *Jannovitch* from Egypt, under climatic conditions similar to those in its original home. After 1900, these breeding experiments were continued with fresh seed of several varieties obtained by David G. Fairchild. These experiments were extended to Arizona where the crop is now established as a result of this work by plant breeding scientists in the Department.

JUTE

Jute became the subject of widespread experiment in the South after it was sent there from Calcutta in the winter of 1869-70.

The following year a number of successful experiments in raising jute were reported. Jute cultivation was a pet project of Commissioner Watts, who was enthusiastic about its value to the South because of the quality of the fiber and its superiority to flax and hemp. He felt assured it would become an important crop and hastened to claim credit to the Department for encouraging it.

Watts imported more jute seed from India in 1874, and sent them to farmers in California and the southern states where the crop could be grown. The rotation of plantings of jute with rice every other year was suggested as of possible advantage to both crops. Samples of jute manufactured in Louisiana were sent to the Department in 1874 by President Le Franc of the Southern Ramie Planting Association. An inexpensive separation process was thought to have been perfected, and in 1877 imported jute was made subject to tariff duties in order to raise its price in America. More than 900 papers of the seed were sent out for trial in 1881. Eight years later, Rusk was convinced that the problem of separating the fibers was on the verge of solution, but admitted the production of jute remained in the experimental stage. Jute production subsequently failed to receive notice in the reports of the Department of Agriculture.

FLAX AND OTHER FIBER PLANTS

Several other fiber possibilities were investigated by the Department. A plant called *New Zealand flax* was found to flourish in the South. Like the ramie plant, the use of this flax was hindered by a lack of technological progress in processing the plant.

Increasing public interest in fiber crops led to the assignment of Charles R. Dodge, fiber expert in the Department, to write a special report on "Vegetable Fibers in the Collection of the Department of Agriculture." Dodge discussed dozens of materials including basket-weaving and stuffing materials.

There also was a search on for paper-producing plants during these years. The *Esparto grass,* from which paper was made in England, was one of several plants introduced for this purpose. Seeds of this grass procured in 1868 from Vilmorin, Andrieux and Company, Paris, were distributed in the South. By 1870 several species of palms had been imported for paper making. Other fiber plants, some with names meaningless except to a plant specialist, were procured by the Department in 1870. These included the *Manila hemp plant,* the *Paederia Foetida,* and various species of *Hibiscus, Asclepias, Bromelia,* and *Urtica.* The *sisal hemp* and the *cabuya fiber* were received from San Domingo and distributed about 1885.

GRAPES

Discovery of the *Isabella* grape by Mrs. Isabella Gibbs about 1818, paved the way to an extensive development of the native

grape. Growers interested in developing a wine industry in this country had been hoping for years to find a grape that would grow everywhere. But no European grapes hardy enough to withstand the fluctuations of humidity and temperature in this country had been found. If the foreign grapes were not grown in greenhouses, they suffered from rot and blight. Native grapes flourished under cultivation, but did not produce wines comparable to the European vintages.

Soon after the discovery of the Isabella, a Major Adlum living in the District of Columbia introduced the *Catawba,* supposedly a native of the Catawba River in North Carolina. He had found this variety growing in the vicinity of the Potomac. The famous *Concord* grape was a chance seedling developed by selection from a choice native grape. It was named after its discoverer, Ephraim W. Bull of Concord, Massachusetts. All of these varieties were extensively and successfully cultivated.

The mild California climate lent itself to the development of European grapes during the nineteenth century. Although the *Mission* grape of the padres predominated for many years, the new introductions were almost exclusively European varieties. Colonel Agoston Haraszthy, the father of the California grape industry, introduced more Mediterranean grapes into California than any other individual. Given a commission in 1861 by the governor of California, he brought back 100,000 vines of 1,400 varieties from Persia, Asia Minor, and Egypt.

Attempts at Hybridization—The problem of producing wine in the eastern part of the country was approached in 1858 by the hybridization of American and European varieties. Expert wine-makers and chemists made tests to find suitable varieties. No significant results were achieved, but the cultivation of native grapes was rapidly extended in Virginia. Isaac Newton realized the importance of the grape as a fruit for general consumption, and in 1863 corresponded with growers all over the country seeking information about their results.

The "celebrated *Yeddo* grape from Japan" was received in 1864 from the American Resident-Minister, Robert H. Pruyn, who sent hundreds of grape cuttings to the United States. The Yeddo was propagated and plants sent to various localities to be tested for adaptability.

The public developed a keener appreciation for quality grapes as new varieties made their appearance on the market. Native grapes contained too much tartaric acid for wine and table use,

but Newton claimed that their acid content had been reduced by hybridization with European varieties. Good native seedlings were hybridized with the choice imported varieties to produce a number of fine grapes. The *Black Hamburg* is mentioned as one of the imported varieties used in crossings. Ninety different foreign grapes were planted in glass structures in the spring of 1870.

Those varieties which proved unsuccessful were replaced from time to time with other importations. Additional plantings of foreign varieties were made in Texas and California in 1880. Plans were made in 1889 to secure grapevines from Turkey and Palestine through diplomatic officials. The Section of Seed and Plant Introduction imported 119 varieties from Europe in 1899, which were grafted on American stocks for testing.

OPIUM POPPY

Experiments with opium in this country during the latter part of the nineteenth century indicated that the plant could be grown successfully. Quantities of opium were being imported regularly for medical use, but the supplies were frequently adulterated. Charles Mason was the first to arouse interest in its cultivation, and Isaac Newton later suggested that opium might be grown profitably. An article in the *Annual Report* for 1870 instructed growers in the cultivation of the poppy and methods for collecting the drug.

Experiments conducted in Jefferson County, New York, indicated that the opium poppy could yield a higher money return per acre than any other crop then being cultivated. Growers reported that the poppy had been cultivated in Kansas, Connecticut, and Vermont. The crop was never grown commercially, however, because the intensive cultivation necessary for a successful crop was too expensive using American labor.

EUCALYPTUS

At the close of the Civil War the Department of Agriculture was searching for "anti-periodic" medicines for the treatment of malaria. Reports from German hospitals indicated that the *Eucalyptus globulus* (the *Australian blue gum,* or anti-fever tree) had antimalarial properties. Specimens of this tree were brought from Australia by William Saunders and were kept growing for several years. Seeds of the tree also were obtained from Walter Hill, botanical gardener at Brisbane, and planted in the spring of

1866. Several thousand trees grown from the seed were given out during the years following 1870. The expected cure-all did not materialize, however, for tests proved that the trees did not contain the cinchona alkaloids.

The roots of the Eucalyptus do have absorbent powers, and the trees were found to be useful in drying up marshlands by rapid transpiration. The tree also gained popularity because of the real and imagined antimalarial properties it possessed. Many thought that the leaves gave off a volatile oil and an acid which made the atmosphere healthful and invigorating.

Large plantings have been made, especially in California where it is now one of the most familiar trees of the landscape. Planting the Eucalyptus became a craze in California during the 1870's and in Oakland alone over 100,000 trees were sold in 1875. The tree did not spread widely, however, because it is easily killed by frost. It has proved very valuable in California for timber, windbreaks, shelters, and landscaping and is now voluntarily replanting itself.

BAHIA (NAVEL) ORANGE AND OTHER CITRUS FRUITS

Credit for the introduction of the navel orange is shared by an American missionary, the Department of Agriculture, and the State Department. The first step was taken by the Reverend F. I. C. Schneider, first Presbyterian missionary to Bahia, Brazil, who wrote a letter about this orange to the Commissioner of Agriculture. The story is continued in this excerpt from the Journal of William Saunders.

Sometime in 1869 the then Commissioner of Agriculture, Horace Capron . . . read to me a letter . . . from a correspondent at Bahia, Brazil. Among other matters, special mention was made of a fine seedless orange of large size and fine flavor; thinking that it might be of value in this country I . . . sent a letter asking to be the recipient of a few plants of this orange. This request brought me in course of time a small box of orange twigs utterly dry and useless. I immediately sent a letter requesting that some one be employed to graft a few trees on young stock, and that all expenses would be paid by the Department. Ultimately a box arrived containing 12 newly budded trees, and being packed as I had suggested, were found to be in fairly good condition. I believe that two of them failed to grow. No expenses were charged, so I presume that the correspondent sent them as a gift. . . .

I had a supply of young orange stocks on hand and as fast as I could secure buds, they were inserted on these stocks. The first two young plants that were sent out were sent [in 1873] to a Mrs. [Luther C.] Tibbetts, Riverside, California. That lady called here and was anxious to get some of these plants for her place, and I sent two of them by mail. They prospered with her and when they fruited attention was directed to their size and fine appearance, and when ripe their

excellence was acknowledged, and the fruit was called Riverside Navel, thus ignoring the label attached to the plants which was Bahia, a very distinctive name which should have been retained. Afterwards other Californians, not wishing Riverside to be boomed with the name, changed it to Washington Navel, all of which was uncalled for but this Dept. could not alter it, and it was considered best to adopt the name, and so avoid further confusion. We budded many hundreds from time to time and sent them to Florida where it has never become very popular owing to its not bearing plentifully.

The second introduction of the navel orange was made by Richard A. Edes, the United States Consul at Bahia. Edes wrote Capron in April, 1871: "I have the honor to acknowledge receipt of your letter of February 26th and by the American Steamer which leaves this port in May. I will forward to you as directed the cuttings of the navel orange tree of this province." Commissioner Watts, who had replaced Capron, wrote Edes that summer that the trees had arrived in good condition with but one lost. ". . .you have placed the department in possession of one of the most desirable varieties of Orange known; and one which it has desired."

When the trees mailed to Mrs. Tibbetts came into bearing, the quality of the orange as a market variety was promptly recognized. By the end of the century many thousands of acres had been planted in California, hundreds of carloads of the fruit were being transported to the East annually, and it already had been favorably received in the English market. Saunders called it in 1899 "perhaps the most valuable introduction ever made by the Department of Agriculture in the way of fruits." The Bahia navel orange, making up the bulk of the California orange industry in 1920, had an annual value of $16 million and the average annual production in 1921 was computed at 8,600,000 boxes. A bronze plaque was set up at Riverside, California, in honor of Mrs. Tibbetts' work; an oversight omitted the name of William Saunders!

The Department of Agriculture was urged in 1870 to use ships to introduce various tropical fruits for cultivation at St. John's, Florida. Orange and lemon culture was promising to become important by 1878, and a small glass house for fruiting was set aside by the horticultural division to determine the value of different varieties for propagation. A large collection of citrus fruits was imported from Europe in 1870 and 1871 including the "Tangerine oranges" and the *St. Michael* orange from the Azores. Hundreds of plants were grafted and sent to the Southern and Pacific states. A collection of grafted orange trees received from

Japan in 1868 proved valueless. One of the lot, the *Citrus trifoliata,* was in great demand in 1895 as rootstocks for grafting. But Saunders discredited the plant since it dwarfed the growth of the grafts placed on it. Nearly 14,000 orange, olive, fig, and semi-tropical plants were distributed in 1879.

During the 1880's the demand for citrus plants brought more valuable importations from abroad. The production of lemons was encouraged in Florida and California in 1888 when seedlings of the best European varieties were imported and distributed among intelligent experimenters. Five trees of the *Selecta* orange from Brazil were introduced in 1892 and placed in Florida, Louisiana, Arizona, and California.

JAPANESE PERSIMMONS

The Japanese persimmon tree, or *Diospyros kaki,* bearing the familiar, orange colored fruit resembling a tomato, was first grown from seed sent by Commodore Perry to "Lieutenant Maury" in 1856. From the seed planted at the Naval Observatory in Washington the first fruit was produced on the trees in 1860. None of the progeny of these trees were distributed. It is not known whether the *plants* Commodore Perry brought back from Japan in 1855 survived the voyage.

The successful introduction and distribution which aroused a general interest in this fruit was made by William Saunders, who recollected his work with this fruit in 1899 as follows:

> It has long been known that the persimmon of Japan, Diospyros kaki, had been improved as an edible fruit, and that many fine varieties were grown in that country. Wishing to attempt its introduction, I requested the U. S. Legation in Japan . . . to send some seeds to this Dept. Consequently early in the year 1863, a package of seeds were received and planted. They furnished a great number of plants which made growths from one to two feet in length.
>
> The real introduction of this fruit commenced about ten years after the above date. A young Japanese who had spent some time in European nurseries, and also studied nursery work in this country, and whom I had met in Washington, went to Tokio and started a nursery. He was well educated and a good correspondent in English. One of his first works was to select and propagate the best varieties of persimmons. As soon as he had plants for exportation I ordered 5,000 plants of his best named varieties which came here in fine condition and were distributed mainly south of the Potomac River, my experience with the seedling satisfied me that they would not prosper further north. Other importations were made, and in 78 or 79 an order for 10,000 plants was made and when they reached San Francisco about the half of them was distributed in that State (California) where they prosper. About 100 of this invoice were placed in Norfolk, Va., where they perfect fine fruits.

Many of the trees distributed by Saunders did so well that nurserymen imported other kinds from Japan and sold the trees. There are a great many varieties of this persimmon in the Far East. The Department of Agriculture continued to import plants in order to find some able to endure the cold weather of the middle and northern states. Five thousand plants were distributed in 1879 and the following year the Department considered that the value and good reputation of the persimmon had been established. Fruit growers and the Department, expecting a marketable fruit to materialize in a few years, continued to import plants. After 1873, yearly introductions were made from a nursery at Tokyo, but by 1889 new plants were being supplied by nurseries in America.

Efforts of the Department of Agriculture to find persimmons suited to northerly climates were supported by further introductions in the last decade of the century. Fifteen varieties received in 1891 from the Minister of Agriculture of Japan were selected with care from different parts of the Japanese Empire. The trees were divided and one set was sent to the Florida Experiment Station at Lake City and the other to an individual grower, R. D. Hoyt of Seven Oaks, Florida. They were propagated there so the progeny could later be sent to the North for trial. More hardy varieties of this valuable addition to our fruits from Japan, Korea, and China were placed in the hands of propagators from 1892 to 1897.

CINCHONA

Many attempts were made to introduce the cinchona tree into the United States during the nineteenth century when it was discovered that the sources of quinine in South America were facing extinction.

Britain, Holland, and other countries had shown that new plantations could be readily established. Extensive preparations by the British Government for cinchona plantations in the West Indies excited American interest, and an arrangement was made with Jamaica to exchange other plants for 3,000 cinchona plants for the South. Several hundred plants of different varieties were grown and disseminated by the Department of Agriculture in 1864. A plan for a cinchona plantation was approved in 1866. Two years later, an appropriation was recommended for the establishment of a plantation by the Department.

By 1871 the problems of growing cinchona in this country were well known. It was sensitive to cold and required winter protection, except in southern California where cultivation was carried on for more than a generation. Despite these difficulties many requests for the plants were received. A medical association memorialized Congress in 1872 urging the introduction of cinchona. But William Le Duc discouraged further attempts to grow cinchona, and in 1877 stopped the distribution of the plants.

Congress was repeatedly asked for money for further experiments with the cinchona plant. The House of Representatives passed a resolution in 1882 asking the Commissioner of Agriculture whether it was feasible to grow cinchona in the United States. A letter from a plant authority alleged that the trees would stand frost, but needed exacting conditions of soil and climate. The Department had no faith in the new plant, but continued the experiments to satisfy an unwise demand and give the trees an exhaustive trial. By 1891, the cultivation of cinchona had been abandoned as unprofitable, for the bark could be imported cheaply from British India.

TEA

The records of the Department of Agriculture covering tea culture in the middle of the nineteenth century are rather sketchy. Either Isaac Newton's interests during this period did not extend to the promotion of the tea industry, or the war between the states prevented contact with the southern planters. During his commissionership the Department merely supplied requests for plants. Tea culture in British India was watched with interest, and labor-saving devices adopted there encouraged the belief that tea might be profitable in the United States. Fresh supplies of seed from Japan led to the distribution of more thousands of plants up to 1867. After this date, the plants were grown mostly from seed produced in the southern states, from the plants sent there by Robert Fortune.

Horace Capron, Newton's successor, knew that the southern states were congenial to the tea plant, but he observed that ". . .the amount of manual labor required in its preparation for commerce precludes the possibility of competition with the very cheap labor of China." (4) In California, several hundred Japanese settled with the intention of growing tea and other plants native to their former homeland. They put out 140,000 tea plants at

El Dorado, but by 1872 their experiences had proved the climate unsuitable to the tea plant.

The Department of Agriculture's hopes for the tea industry died a lingering death. Experiments continued under Commissioner Watts in 1873, but the high labor costs could not be overcome. In spite of this, tea growing continued to attract interest. The arboretum annually increased the number of plants distributed, and received encouraging reports from widely scattered areas. The following year the reduced appropriation for the garden prevented further introductions, but 20,000 plants were distributed. Even careful William Saunders now believed tea would become widely cultivated.

When William Le Duc succeeded Watts in 1877, he confidently accepted from his predecessor the challenge of the tea industry. Because he believed that American tea could be put on the world market, he had over 100,000 plants distributed during 1877 and 1878, and 120,000 plants were given out the following year.

South Carolina and Georgia were indicated as favored centers for tea cultivation. The plant was publicized by the Department of Agriculture and information supplied regarding its cultivation in China. Le Duc pointed to the unemployment of 1877 as proof that there was labor available to produce tea in America. Plants were distributed to increase the dissemination of tea and to find which localities were best suited to it. Invention was expected to provide machines for processing the tea leaf, but even without machines it was thought that every family should cure its own tea supply.

THE EXPERIMENTAL TEA FARM

The enthusiasm over tea reached a climax in 1881. Congress had provided $5,000 the year before to "be devoted to experiments in connection with the culture and manufacture of tea." Another appropriation of $10,000 was made in March, 1881, and with these funds an experimental tea farm was established at Summerville, South Carolina.

At the request of Le Duc, John Jackson, a native of Aberdeenshire, Scotland, visited the South to see if tea raising was possible there. Jackson had fourteen years' experience in tea cultivation and in perfecting machinery for processing tea. He became convinced that American tea could be made to compete in price and quality with foreign varieties. Jackson purchased the estate of

Dr. Jones in Liberty County, Georgia, on which neglected tea plants were growing from shrubs set out by Jones about 1850.

From a dense mass of plants growing there, Jackson set out a tea garden of 160,000 plants occupying forty acres of ground. Samples of tea were sent to tea distributors in the United States and England. Jackson's experience therefore made him the logical choice for the superintendency of the tea farm at Summerville. As Le Duc explained:

> Acting under authority of Congress, I have selected, after a careful examination, with the aid of Mr. Jackson's experience, a tract of land suitable for an experimental farm on which the raising of tea on an extended scale will be carefully and thoroughly tried. Of the result there can be no reasonable doubt. American tea, grown and manufactured on our own soil by ourselves, is destined at no late day to supply the demand of our own people and to enter the world's market in favorable competition with that produced by any other country.

New seeds were obtained by importations from Japan, India, and China, but the shifting fortunes of individuals and programs incident to American presidential elections brought a sudden end to this venture.

Commissioner Loring, the Massachusetts conservative, did not share Le Duc's enthusiasm for tea. Believing that climatic conditions were not favorable for tea growing, he directed William Saunders to examine the Department's tea plantation at Summerville. Saunders found that only fifteen acres of poor land had been cleared for cultivation. The tea plants were not thrifty, and he advised cutting the appropriation. Saunders concluded that good quality teas could not be produced in the South. He pointed out that a warm climate with much summer rainfall is needed to produce a strong, well-flavored tea. Jackson's own plantation in Georgia had not produced teas of sufficient strength. Work was curtailed at Summerville. The Department distributed fewer plants than in previous years and these were only to encourage production for the growers' consumption at home. The tea farm in South Carolina was closed in 1887. About the only results were that some hundreds of households had come to grow their own tea.

RUSK RENEWS INTEREST IN TEA

In spite of past results, the new Commissioner, Jeremiah M. Rusk, revived the tea researches in 1889. Rusk believed the previous experiments with tea culture had been arrested before

reaching any definite conclusion, and that better cultivation and preparation might bring success. Seed from the best tea in Asia were secured through the State Department. Special attention was given to climate as a limiting factor in the production of good quality tea. Merchants took an interest in the samples produced, tea tasters judged the brews, and the press published reports on the progress made.

The Department of Agriculture began cooperating with Dr. Charles U. Shepard, in charge of his own Pinehurst Experimental Tea Garden, near Summerville, South Carolina. Varieties tried at Pinehurst came from Japan, China, Formosa, and Assam. Because the cost of picking a pound of tea at Pinehurst proved to be six times greater than the cost in the orient, any tea marketed would be able to compete with foreign tea only on a basis of quality. But testimonials of tea merchants praised the tea as equal to the best foreign teas.

The commercial production of tea was again presented as a tantalizing possibility in the publications of the Department of Agriculture in 1899. It was Secretary of Agriculture James Wilson who then promoted the industry. Dr. Shepard, with machinery furnished by the Department, processed tea which he sold to a distributing house in the North at a profit. A company with assets of $50,000 was being organized in 1900 to produce tea on a more extensive scale. Much experimenting was done to improve the quality of the tea, which could be produced and marketed for fifteen cents per pound, it was claimed—but the enterprise did not succeed.

By 1903, when 8,369 pounds of tea were produced at Pinehurst, the attention of the Department of Agriculture came to be concentrated more than ever on reducing costs of processing the leaves by the invention of labor saving machinery. Study was given to the cup qualities of tea as affected by chemical changes during processing. A tea garden was established at Mackay, Texas, by 1903 in order to test the plant in another climate. In 1905 Dr. Rodney H. True, in charge of the tea culture investigations, continued work along lines of the two previous years. Dr. Shepard had about a hundred acres planted to tea at Pinehurst in 1907, although in previous years he had been harvesting annually about 12,000 pounds of dry tea.

Another garden opened at Pierce, Texas, indicated that the

Texas climate would produce a strong brew, but recurrent floods brought the abandonment of this farm by 1909. In this and the following year it was reported that tea produced found a ready sale in America, but work to lower costs had to be continued. By 1911 George F. Mitchell had introduced successful pruning machinery, and machine picking was being tried. Other optimistic results in 1912 concluded abruptly the mention of the tea experiments in the publications of the Department. The efforts of more than a century have not yet established an American tea industry.

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