

DEVELOPMENT OF EUROPEAN AGRICULTURE AND ITS INTRODUCTION INTO THE PACIFIC NORTHWEST AND THE YAKIMA VALLEY

INTRODUCTION

A survey of the introduction of European agricultural methods into the Yakima Valley extends back through the development of farming to the first farmers, their crops and practices of the beginnings of agriculture - 10,000 years ago. Some of the first agricultural crops ever raised are important harvests in the Columbia River Basin today: emmer and einkorn wheat, barley and lentils. Some of the first farmers in the Yakima Valley plowed with the same technology used 3,500 years ago - plows pulled by yokes of oxen.

This essay is but a brief summary of a small portion of the study of agriculture history. This results in a great deal of information being left out or set aside for later study. The magnitude of the research and publishing done on agriculture results in information that may conflict in date, locations and the planters of various crops. There are entire libraries devoted to publications on specific crops, sections of libraries and shelves of books to study about individual grains and fruits. A list of references is provided on page 36. For an outstanding scholarly study of agricultural history consider the Fineberg works, especially the sections by Joan Thirsk. More accessible and very readable is Dunmire's Gardens of New Spain.

In spite of the huge amount of research having been published, there are areas that would warrant further study.

- 1.) A report of the first settlers' selection of the crops and animals they brought across the plains in their wagons or in their ship. What was it like to travel for months in a wagon with a cage of chickens, or a hive of bees and a collection of saplings along with the babies, dogs and cats?
- 2.) There is still a need to gather the tales of the settlers who followed the plow, walked with one foot in the furrow and brought the first two-wire hay baler to the valley. What was it like to break the sod and sow the seed and swing the scythe?
- 3.) A great amount of material has been printed about the crops selected and successfully farmed in the valley. Little has been found about the reasons for not farming some of the domesticated plants imported for food but not planted, such as taro, casava and breadfruit. Nor has there been much reported about the reasons for not domesticating or farming some of the indigenous food crops such as wapato, camas, or huckleberry. Other North American indigenous food crops such as squash and cranberry were domesticated and farmed commercially with very good success.

The arrival of Europeans in the Pacific Northwest made huge changes in the culture, society, economics and life of natives, but few changes were as profound as the transformation made by the introduction of European foods, diet and agricultural practices. The development of European style agriculture in the Pacific Northwest and the Yakima Valley occurred in five major periods.

1. The beginning of agriculture and its distribution through Europe, starting from about 8,000 BCE or 10,000 years ago and developing into the agricultural systems of Spain, France and Britain that were exported to North America.
2. North American Period: beginning with the arrival of Columbus in 1492, including the early attempts to grow European foods by the first explorers.
3. Pacific North West Period: fifty years from 1786 when European plants and gardening were first introduced by ships' crews, to the late 1830's when commercial agriculture was started on the Pacific Northwest Coast.
4. Columbia River Commercial Period: beginning on the Columbia River in 1839 when George Simpson of Hudson's Bay Company contracted to sell wheat, butter and other agricultural products to Russian-American Company at Sitka, Alaska.
5. Yakima Valley Period: 1847-1900: After some small trial gardens, a Priest, an Indian Chief and an Army Lieutenant began gardening in the valley, followed by a period of agricultural experimentation leading to farming being established in 1900.

Though the five major periods of agriculture and farming reaching the Pacific Northwest and the Columbia River Basin are of great importance, they were only possible because of the preceding 10,000 years as crops and agricultural practices developed and were distributed in the Mediterranean regions and in Europe. This essay reviews and summarizes these five agricultural periods and includes a brief review of the importance of oxen in agricultural history including in the Columbia River Basin. The focus is on the introduction of food crops, though animal husbandry, timber and non-nutrients such as dyestuffs and fiber crops are included.

I. BEGINNINGS OF AGRICULTURE

The development and distribution of agriculture practiced by humans including the selection, storage and planting of seeds, from the beginning in Asia, Africa and Europe, to its arrival and successful practice on the Columbia River shores occurred in a relatively brief 10,000 year period of the several million years of human history.

Early human-type beings appear in archaeological records between 2 and 1.8 million years ago according to Scarre; or, by Hublin, about 3 million years ago. The records suggest the appearance of early humans began in northern or north eastern Africa. Human type beings occupied the region for millions of years, and, for

hundreds of thousands of years, as Homo Sapiens, the ancestor of modern mankind. For most of this period, existence was based on the finding of food-scavenging, hunting, gathering, and fishing, with no evidence of planting, farming or agriculture. Barker, Zohary, Cohen and others discuss the evidence of the earliest appearance of farming. Until about 10,000 years ago, when agriculture began, all humankind lived by gathering wild foods. By two thousand years ago, all lived by farming. In the three million years of human evolution, the transition from total dependence on hunting and gathering to total use of agriculture took place in only eight thousand years, a segment of less than one tenth of one percent of the total evolutionary span of time.

Two sites are suggested as the locations of the beginnings of agriculture. The Levant, the western most sections of the area known as the Fertile Crescent is considered most probable. The Fertile Crescent includes portions of Iraq, Jordan, Israel, Palestine, Egypt, Syria, Lebanon, Cyprus and Turkey and Iran. The Levant is the section of the Fertile Crescent bordering on the eastern Mediterranean Sea. The difference between wild and domestic crops is determined by changes in size and shape of seeds when domesticated, and identified as to time by the age of the archaeological sites where they are found.

Markey writes that the first of the domesticated crops was barley, grown in southwest Asia. It then was grown in central Europe by 4000 BCE, and northern Europe by 3000 BCE. It is a hardy, early maturing and saline tolerant plant. Rye and oats were second to barley, rye being cultivated by 1500 to 1800 BCE. Zohary writes that three plants: emmer wheat, barley and einkorn wheat were "founder crops" in southwest Asia in the 8th and 7th millennia BCE. The domestic planting of the wheats and barley are also dated at 10,500 to 10,100 years ago.

Western India is also discussed as the location of the beginnings of agriculture by Sauer. Though archaeological support for his statements is not provided, he suggests that the vast diversity and number of different plants available for cultivation make it probable. He also considers that cultivation began, not with seeds, but with root cuttings, such as yams, bananas, palms, etc. that could have been left after harvesting wild plants. Agriculture began not with nomadic peoples, but with settled farmers who could be present to protect crops of desirable plants from other people, animals and insects. The planters were possibly fishermen, near fresh, not salt, water, in a mild climate.

Zohary indicates that the first crops of wheat and barley were followed by lentils, peas and vetch, chickpeas and flax. The expansion of farm crops to Europe, Central Asia, and the Nile Valley was based on the same eight crops. Flax was domesticated 9,900 to 9,500 years ago, and used for oil and fiber. Eastern Asian agriculture, according to Scarre, originated 8,000 - 6,000 BCE in central and southern China. Millet was

developed in the north of China, rice in the south. Southeast Asia developed wheat and barley. Rice was raised in the Yangzi Valley. Zohary adds, "rice has supported a greater number of people for a longer period of time than any other cultivated crop."

Over 80% of the world's tonnage of food crops, reports Barker, is made up of only twelve plants: barley, wheat, rice, maize, potato; banana, manioc, sugar beet, sugar cane, sweet potato, sorghum and soybean. Globally, only five large animals are important: cow, sheep, pig, goat and horse. Of the first primitive or founder crops, barley, emmer and einkorn wheat, maize, soybean, potato, and also lentil are important crops in the Columbia Basin.

Some of the dramatic agricultural and dietary changes made in Europe in the 5th to 2nd millennium BCE are summarized by Brothwell. The greatest change was the cultivation and use of cereals. Vetch, peas and horse beans were added in the 3rd millennium BCE. Olives were established in Crete in the 3rd millennium BCE and figs appeared in Crete and Greece. Onions appeared as a crop in Bronze Age Greece. The "Mediterranean Tryad," of olives, grapes and grains is referred to by Donahue as defining the ancient diet more than any other commodities. Olives were grown on all perimeters of the Mediterranean according to Epstein. In addition to being used as a food, olive oil was used for lighting as there was little tallow or beeswax, and no petroleum available. Beeswax was reserved for candles for lighting church altars for mass.

Brothwell also notes that there was probably movement back and forth between planting and harvesting and the gathering of wild foods as agriculture succeeded or failed to produce sufficient food. By the 2nd millennium BCE some of the food collecting and gathering ingenuity of the ancestors may have been lost. As hunting and gathering for larger populations began to over extend the supply and bountiful areas no longer provided adequate plants and animals, horticulture became more critical. This occurred, writes MacNeish, in 6,200 to 3,000 BCE. Local spelt wheat, millet and apples were domesticated, then emmer, lentils, vetch and barley from the near east were added. Apples were part of Northern European agriculture by 2,500 - 2,000 BCE. Some sugar was produced in Cyprus by the late Medieval period.

Smith reports that in eastern North America changes in seeds of some plants including sunflower, marsh elder, squash and chenopod indicate they had been domesticated 4,500 to 3,500 years ago. The Chenopod family, which includes amaranth, quinoa and goosefoot, was a significant food grain. It grows now in North America primarily as a wild plant causing pollen allergies. The seed changes, he states, indicates a deliberate planting of stored seed. In western Mexico, corn was domesticated over 5,000 years ago. In Central Mexico, squash, avocado, chili, amaranth and maize were all being cultivated between 7,000 and 5,000 BCE. The dates that potatoes were domesticated and farmed in Bolivia and Peru varies from 8,000 to as recent as

3,000 BCE. These significant food crops were all domesticated in parts of the Americas during a two thousand year period.

In Fineberg, prehistoric harvests are described: "Cereals, and specifically wheat and barley were far and away the most common crops." Initially barley predominated over wheat, but wheat eventually became the favored crop. For much of the continent, grains were the main source of nutrition, wheat and barley, boiled, baked or brewed formed major parts of the peasants' diet. At the beginning of the 14th century in Medieval England, reports Stone, grain accounted for 70% - 80% of the calories in the diet. Grain was generally prepared as bread, ale, or pottage - a cereal soup. Bread was most important. The 16th Century monks at Westminster received 35%-- 45% of their calories as bread. In the great manor houses, bread was baked 6 - 11 times per month in batches of 300-400 loaves. Ale was prepared 6-11 times per month. A Celtic ale was described as being made with barley, but at times from rye, oats or wheat, and flavored with cumin. Flour, bread and ale were each prepared in at least three different grades. Social position determined the grade of bread or ale received.

Wheat was preferred for bread because the gluten level made a better loaf. There is little gluten in oats, the gluten in barley dissolves in water and rye gluten doesn't aid the dough to expand. Rye bread, however, was listed as a staple for farmers in medieval England, barley bread was common and also barley/wheat mix. Pottage was made with oats, or sometimes, a mixture of oats with beans or peas. To make the bread rise, the baker used liquid, or "barm", from the batch of ale being prepared. There is reference to "hop-rising bread," made with the liquid from cooked hop buds with some added yeast and flour, a preparation also referred to as "barm." When ale began to be prepared commercially rather than in homes, the source of barm was lost and bakers needed to find a reliable supply of yeast.

The 15th Century Spanish diet was similar. Dunmire states that peasants ate over a pound of bread each day. A study of 16th Century eating habits is cited that indicated grains were more than three quarters of each person's caloric intake; meat and fish another seven percent, and wine, ten percent. Dairy products and olive oil are not reported. Pottage made with some meat, cabbage, garbanzos, onions, and carrots and sometimes olive oil. Wine, or diluted wine, was sometimes available.

Apicius's Roman Cookery Book, written in the first century and translated and modernized by Flower and Rosenbaum, not only describes the Roman kitchen and provides cooking instructions for a variety of foods, the index provides a listing of the various food crops grown and available during the first century. These range from artichokes and asparagus through melons, mallows and marrows, a kind of squash, to carrots, beets, leeks and cabbages. Instructions are given for preparing lentils and four kinds of beans. There is

lettuce, celery, cucumbers and endive, onions and parsnips and pumpkins and radishes. Less common foods include taro and stinging nettles. Instructions for preparation of apricots, pears and apples, plums, peaches, pomegranates and quinces, cherries and berries are provided. Cooking directions are listed for hare, suckling pig, boar, kid, sheep, goat, beef and veal. A recipe for stuffed dormice is included. There is no mention of horse meat. Though he doesn't explain whether the various birds are domesticated or wild, a broad range of poultry were prepared for eating, including crane, flamingo, ostrich and parrot as well as duck, goose and chicken. Recipes are included for eggs, fried, boiled and soft boiled, as well as eggs included as ingredients with other foods. The authors also discuss the various cheeses available to the Roman cooks. Dairy and poultry farming had been established. Though an exact date is not known, it is believed that he wrote in the first century, possibly using recipes from earlier centuries. The foods and crops he used would have been common before the beginning of the Christian calendar. The cookery book was first a hand copied manuscript, then in printed form after the printing press was in use about the mid 1400's, and continues to be printed today.

Cotton production was begun in Cyprus in the late medieval period and expanded to Sicily and southern Spain. Dye stuffs for coloring fabric included crocus for saffron for yellow, grown in Tuscany, woad for blue, grown in Picardy, and in England, madder for red, and weld for yellow.

Farming in Britain began, writes Fowler when, "At some moment before 4,500 BC the first boat arrived from the European main land containing people who expected to live by farming." There were no cereals, no sheep, goats or domestic cattle. Over a short time in 4,000-3,500 BCE, possibly thousands of people arrived.

Wine first began to appear in Southern Italy by the 8th century BCE; and in Tuscany in the 7th century BCE. By the 1st century BCE wine was found throughout the Mediterranean region. In Roman Britain, grape vines were grown, and some wine was imported reports Donahue. Wine, in barrels, was imported to Britain from Italy, France and Spain by the 2nd and 3rd centuries. In Anglo Saxon Britain some low-alcohol wine was produced. Vineyards were associated with monasteries, the wine was produced for medicinal or religious use. The Domesday Book reported 38 vineyards, but wine was still a rarity for use as a beverage. Beverages in use in Anglo-Saxon Britain included, "win, meodu, beor, and ealu,"¹ wine, mead, beer and ale; also cider and buttermilk. It was centuries before stronger alcoholic drink was available, the still was invented in the 12th century. In England in the late 1600's tea, chocolate and coffee were being served.

*in historical quotations vernacular spellings and punctuations are retained.

II. North American Period: 1492-1786.

Farming practices of European immigrants to North America were brought to the Pacific Northwest and the Columbia Basin by the settlers and immigrants traveling across the plains from the east coast of North America or traveling across Canada on the Hudson's Bay Company route. Later the farming practices of Spain would arrive via Mexico and the California Missions and settlements. The practices of the east coast settlers and farmers had been shaped by the agricultural practices and economics of 17th and 18th century Britain. The status of the rural economy in 17th Century England is described by Thirsk as, "a hundred years of economic difficulty and prolonged agricultural depression" which carried on into the first half of the 18th century. Wool and grain prices declined from 1500 to 1640 by 33% and 12%. The innovative plans, practices and crops that developed out of this period were carried to North America by the immigrants. In America, clover, mulberry trees, tobacco, grains, mangel, and sugar beets were planted. Olive groves were planned. Inter-planting was introduced. The settlers were immigrants, they had decided to move, relocate, they were mobile, not tied to a particular manor or estate and landowner. They came from a culture that accepted agricultural innovation and new crops.

When Columbus left North America for his return to Europe on his first voyage, a small group of men remained to build a settlement. They were supplied with bread, biscuit and wine, and some unspecified "seeds to sow." The seeds possibly included some of the wheat, rye, barley and oats carried by the expedition. Neither the men, the settlement, nor the crops survived. The second expedition of Columbus, in 1493, was directed to plant crops as well as seek riches and spread Christianity. One writer explained, "...we brought with us from Spain all sorts of seeds, all of which we sowed and tried those that would do well and those that could not. Those which do well are the following: spring melon and cucumber, squashes, radishes; the others, like onions, lettuce and other salad plants do very ill...." Broad beans, garbanzos, cabbage, beets, wheat and barley, grapes, lemons, lime and oranges were also planted. Olive trees were planted but failed to grow. Sheep from the Canary Islands were taken to Hispanola on the second voyage in 1493, and on to New Spain in 1540.

When Spanish explorers reached Mexico in 1517, they found the foods there were nearly totally based on the indigenous crops, maize (corn), and frijoles (beans). Both were well adapted to grow in differing climates with short rainy seasons. The indigenous agriculture of Mexico had developed slowly beginning about 7,000 B.C. according to Barker. In Central Mexico "domestication and plant cultivation were being practiced from about 7,000 B.C." Between 7,000 and 5,000 there was the first evidence of agriculture with squash, avocado, cotton, chili, amaranth and maize being raised. From 5,000 to 3,400 B.C., in Mexico, people were still basically foragers. About a quarter of the diet was from agriculture practices between 3,400 and 2,300 B.C. Village life based on agriculture developed between 1,500 B. C. and 900 B. C.

Over 70 food plants that were introduced into Mexico by Europeans are listed by Dunmire. These include 3 nuts, 29 vegetables, 25 tree fruits, 20 herbs and spices, plus miscellaneous items such as coffee, sugar cane, woad - a dye plant, and mulberry trees for silk worms. Spanish land holders soon introduced wheat for bread for local use, and sugar cane for sugar for export to Seville, Spain. Local production and use of sugar expanded with the manufacture of jams and candies. Indigo for dye became a prominent crop in Yucatan in the 1570's and 1580's, with over 48 indigo mills. By 1540, reports Baskes, a red dye, cochineal, was the second most valuable export from Mexico. The most valuable was silver.

After the conquest of Mexico in 1521, Hernan Cortez was established as a land holder with large estates in Mexico. His farms grew carrots, turnips, cauliflower, horseradish and lettuce in addition to native crops of beans, corn and chiles. Orchards of apple, peach, plum and citrus were planted, reported Dunmire. Champlain reported seeing melons, cucumbers, artichokes, lettuce and cabbage during his 1599-1602 visit to Mexico. Wheat for flour to make European style bread was grown as were olives and grapes. Mulberry trees to feed silkworms were well established in Mexico on estates, including Cortes'. Mexican silk production was reported as 20,000 pounds in 1573. Chinese silk, coming via the Philippines, undersold the Mexican silk and the silk industry disappeared by the 17th century. Few grapes and olives were produced wrote Chevalier. Wheat was planted with the same techniques used for corn, by digging a hole with a planting stick called a *coa*, and dropping a few seed grains in the hole. In 1597 simple plowshares, an iron tip for a primitive wooden plow, were shipped to Mexico.

As significant as the crops and foods taken to Mexico and New Spain were, the food crops taken back to Europe from the New World were at least as important. On his return, Columbus took cayenne chiles, cocoa beans, and sweet potatoes. Corn was taken to Europe on his return from the second voyage, in 1495. Both turkeys and white potatoes were exported to Europe then reimported to North America. Turkeys from Mexico were carried to Europe in 1519, then reintroduced to North America by Pilgrims in 1620, even though they were native to the eastern regions of North America. Columbus had recorded seeing turkeys on his fourth voyage in 1502, referring to them as, "gallinas de la tierra," or "chicken of the earth." Asian and African food plants including banana, yam, watermelon, coffee, coconut and mango were also introduced to Mexico by Spaniards. Rice, domesticated in Asia more than 7,000 years ago, was a luxury food in Spain in the 8th century and a staple by the 18th. Spanish sailors took it to the Caribbean in 1512, and on to Mexico.

The white potato, sometimes referred to as the Irish potato or Virginia potato, originated in Peru and Chile on the west coast of South America reported Salaman. It was taken to Europe in the last half of the 16th century. Spanish settlers took potatoes to Florida in 1560. After English ships raided the Spanish settlement a few

years later, potatoes were taken to England. Jamestown settlers took potatoes to Virginia in 1607. It is also reported by Salaman that potatoes were first taken to North America in 1719 by Irish Presbyterians. Potatoes were generally used as animal feed at that time. The early and extensive farming of potatoes by Northwest Indians and settlers beginning in 1791 is discussed by Suttles.

Jacques Cartier first explored on the St. Lawrence River of eastern Canada in 1535. When he returned in 1541 a colony was established with some cattle. Turnips, lettuce and cabbage were planted. It was all abandoned in 1543. Samuel Champlain, who established Quebec, encouraged Louis Hebert to begin a farm there in 1617. Hebert cleared land, planted a garden of maize, peas, beans and other vegetables, and started an orchard. When Champlain visited the next year he was pleased to see a field filled with "fine grain."

At the time settlement began on the St. Lawrence Valley of Canada, the Seigneurial system of land grants, practiced in Normandy, was implemented in Canada. In this feudal system, the central government or royalty made grants of land to deserving patrons. The Seigneur provided grants of land to families for homesteads. In turn they were obligated to work on his land holdings. This system was used from 1627-1854 in Canada.

In the 17th and early 18th centuries, reports Harris, in eastern Canada, everyone raised peas, oats and barley; flax and wheat were grown, though corn and potatoes were not favored crops. Kitchen gardens were common as were small plantings of tobacco. Settlers kept a few sheep, dairy cows, poultry and pigs. He wrote that most wheat was produced within a thirty mile radius of Montreal and Quebec.

LAND MANAGEMENT

The division, distribution or allocation and maintenance of land for agricultural use varied over time and by location. These practices and their effect on crop production would warrant a substantial study. A few observations suggest the wide range of practices.

In England, at the end of the 8th century, Saxon farmers were using a two field rotation, alternating between a crop and a fallow field. Later they went to a three field rotation alternating between a fallow field, then wheat, then a crop of oats, barley, peas or beans, a practice that continued through the Middle Ages. During the same period, families began to receive more permanent grants of land rather than an annually changing allotment. The farmer, or his family could own crop land. Manor farms with a great house and ten or more tenant houses or huts for a community of fifty or more people, appeared from 1000 - 1300.

In 18th century Spain, in some provinces, farmers could obtain longer term rights to land, a sort of lease - for as long as the life of the vines. Some locations required farmers to place a portion of the crop in the public granary and receive payment a year later, to protect against poor harvest years or drought.

The first Monday after the twelfth night in January was designated Plough Monday when the first plowing began. Land allotments were long narrow strips to minimize the amount of land lost to allow space to turn a plough and oxen. Fields were the length of a furrow an ox team could plough before requiring a stop for rest. The distance, 220 yards, is reported to be the origin of the length measurement of a long furrow, or furlong.

Land management practices in North America did not incorporate the agricultural practices of crop rotation and fertilization of France. Without the fertilization and crop rotation, "soils were soon overworked; reports of soil exhaustion appeared in the 1660's..." The neglect of care for the land resulted both from the settlers being from the urban poor, not farm families, and the availability of plentiful land. As land was exhausted, the crop was moved to nearby fertile soil and the old crop land became pasture or meadow. Farmers in North America in the 17th and early 18th centuries, he notes were not aware of the European agricultural practices.

If crop land did not produce well, though it could be from natural causes, it was also some times suspected to be caused by sorcery or witchcraft casting a spell on the land. The 5th and 6th century Anglo Saxon farmer could call on a combination of his own Christian and non-Christian rituals for a remedy for harmed land. Grendon details a charm for land remedy for fields damaged or unfruitful due to sorcery or witchcraft. The process began before daybreak with gathering of sods from four sides of the field, taking them to church, preparing a special holy water for sprinkling on all trees, herbs, oil, honey, barm and milk, and the sods. Mass was said by the priest, prayers were made over the sods, seeds were gathered, incantations were made; soap, salt, incense, fennel, and the seeds were placed in a hole bored in the plough and more prayers were said and incantations were chanted. A furrow was made and a special loaf, baked with meal of every kind and milk and holy water was placed in the first furrow. The farmer then asked - along with numerous prayers - "May God who made these grounds, grant growing gifts, That all our grain may come to use!" "Then say...Amen, and Paternoster Thrice." It was a hopeful, day long ritual blending Christianity, superstition, remnants of paganism and simple superstition.

Champlain also traveled to Mexico. In the book about his journey he described grinding commel, making tortillas and seeing herds of goats, cows, horses, mules and sheep. He saw melons, cucumbers, artichokes, lettuces and cabbages as well as other vegetables.

The early gardening in New Mexico that included European plants is reviewed in Dunmire. He reports on the grand expedition of Cristobal Onate to establish San Gabriel in 1598, and Santa Fe in 1610. Spanish ships had reached Parris Island, South Carolina in 1562, and St. Augustine, Florida in 1565, and established settlements where gardens had been planted. The gardeners in the Spanish settlements, Dunmire added, "had planted almost precisely the same mix of crops" Onate had planted wheat and oats, and had a flour mill by 1601. A poem written by Villagra in 1610 about the settlement at San Gabriel included two verses about the crops. They included wheat, lettuce, cabbage, beans, peas, cumins, carrots, turnips, garlic, onions, artichokes, radish, and cucumbers. Native planting were melons, beans, corn and squash and they also kept, "pleasing herds of turkeys." Grapes were grown. The settlers had transplanted chili seeds and plants from Mexico to New Mexico.

In Spain, pastoral land was shared for common use for pasturing cows and sheep. The same plan was implemented in Mexico in the 1530's, but failed due to conflicts between grazing sheep and cattle. Spanish farmers insisted on private ownership and the *estancias* and haciendas were developed. Wheat and livestock were standard products. Near Santa Fe the farms were modeled on the Spanish *encomiendas*, a land grant of medieval origin. The owner not only held and farmed the land, he also extracted tribute from the Indians for their use of the land. The New Mexico farms and settlements ended abruptly in August, 1680 when, after five years of drought and famine, the Pueblo revolt drove all settlers out to El Paso.

British settlers had established Jamestown, Virginia, in 1607 where they also planted crops, and in 1620 Pilgrims landed at Plymouth, Massachusetts where corn, pumpkins, squash, beans and potatoes were planted. They also planted old world crops of wheat, oats, barley, carrots turnips and peas.

III. Pacific Northwest Period: From 1786 and the arrival of the first explorers to the first farms of the 1830s. Legend suggests that when Francis Drake was on the coast of California in 1579 he gave Indians pigs and some seeds to plant. Several reports of the first probable planting began with seaman John Mackay who was left at Nootka Sound on the west coast of Vancouver Island in July, 1786. Captain Strange reported, "I left with him a large quantity of Garden seeds, & Grain of Various sorts, and before I sailed, a considerable spot of Ground was allotted to him for the Culture of them, & for which purpose he had every necessary implement given him."* Walker, who was also on the expedition, wrote, "'A large assortment of tools was sent along with him, ... A Piece of Ground was also chosen for a Garden and thirteen or fourteen different kinds of seeds... were sown." Fourteen months later when he was provided passage on another ship, he abandoned his goats and garden; or, by another reports, the goats had died, his gun was damaged or destroyed, his writing materials were gone, and he had eaten his garden seeds. He went to India with the ship, but disappeared in Bombay in 1788. Descriptions of him use terms "habits of drinking and natural

incapacity," "very ignorant," "in spite of his limitations," "his natural stupidity," etc. There are no reports of plants sprouting, growing or being harvested.

Some of the most successful early gardening in the region also took place at Nootka Sound. Beginning in June, 1789, Spanish troops and ships maintained a military village at Friendly Cove in Nootka Sound. The garrison of two corporals and eighteen privates, with little military activity, were occupied with construction and with cultivation of the gardens. The first year lettuce, cabbage, turnips and radishes were grown. There was also success with carrots, garlic, onions, parsley and artichokes. In later years, wheat, chickpeas, and corn were planted, but did not mature. Barley, peas and beans produced a limited harvest. In 1792, George Vancouver reported about his stay at Nootka, "...the gardeners were busily employed in putting the gardens in order. The Poultry, consisting of fowls and Turkeys, was in excellent condition and abundance, as was the black cattle and swine."* Three excellent goats were added to the herd by another ship, and, before he left for the Columbia River in September, 1792, Vancouver added hogs and goats. There were some sheep in the herd.

In 1795, at the mouth of the Columbia River, Captain Charles Bishop recorded in the journal of his ship, *Ruby*, "Friday 5th June: ...While we were in the Harbour, We cleared a small Island and Planted: Peas, Beans, Potatoes, and several Peach stones, and Sow'd Reddishes, Mustard, Cresses, and Sallery that we are in hopes on our return from the Northward we Shall have vegetables for our table: the natives brought us a large moose deer and 3 fallow dears which served the whole Crew 9 days." When they returned October 18, 1795, potatoes and a few beans were harvested. Before departing on January 23, 1796, the garden was replanted with Indian corn, radishes, mustard, beans, celery, cabbage, and turnips. On the following voyage Captain Bishop became mentally unstable, the ship was sold, and they never returned. With the changing currents of the Columbia River, the island, named "Tree Island Possession," and the garden, washed away.

There were also some mystery gardens reported in the northwest. Meares wrote of an area on the north coast of British Columbia in 1788, that an area showed signs of cultivation and an area had recently been sown. He suggested that Captain Gray of the Sloop *Washington* had either planted or encouraged the Indians to plant some crop. Captain Douglas of Meares' expedition planted some beans and gave some to Indians to plant. Reporting of the voyage further north to Cooks Inlet in Alaska, Meares found that the only vegetable available was wild celery, and reported that the Russians had "introduced no cultivation whatever, no domestic fowls or animals except dogs." Lewis and Clark's journal reported that in October, 1805 on the lower Columbia River, a piece of land had been gardened. The plot of ground, they wrote, "has greatly the appearance of having at some period been cultivated."

In 1788, Alexander Mackenzie had started a garden at "The Old Establishment" near Fort Vermillion, Alberta. A small spot was cleared and was sown with turnips, carrots and parsnips which all grew and were harvested. The next year cabbages and potatoes were added. The potatoes were neglected and froze. He also wrote that they had a successful kitchen garden at Athabasca in 1787.

In 1811 two more successful gardens were started by determined gardeners. At Stuart Lake, in British Columbia, David Harmon, of the North West Company started a garden at Ft. St. James. He planted potatoes, onions, carrots, beets, barley, and parsnips. A harvest of some sort was made after five years struggling with late frosts, animals and insects. J.J. Astor's Pacific Fur Company settlers who founded the town of Astoria at the mouth of the Columbia were supplied with seeds for a garden. Years later, it was reported that "the soil was rich and well adapted to the culture of all the useful vegetables; ... turnips, potatoes, onions, rye, wheat, melons of various kinds, cucumbers and every species of peas..." Barry reports that the Astoria harvest included turnips, potatoes and cabbage, with some potatoes and corn planted at near-by Tongue Point. Both gardens were continued for some years producing potatoes and a few vegetables.

The Astorians had arrived in March 1811. David Thompson arrived at Astoria in July, 1811, the middle of the gardening season, and remained for a week. There is no mention of a garden in his journal entries about Astoria. In 1808-09 Thompson had planned to supplement his food supply in the Kootenai country by planting gardens at his posts in Canada. He had transported vegetable seeds and planned to plant potatoes. He had asked a friend to send barley, rice, peas and beans for planting. When he was preparing an inventory of their trade goods and supplies in January, 1811, he listed 12 pounds of beads, ribbons and "Garden Seeds" among the supplies. There are no notes about his gardening in his Columbia journals.

J. J. Astor reported on the settlement and provided a comprehensive inventory, made in October 16, 1813, listing the goods at the time it was turned over to the Northwest Company. A number of the items were for use in gardening or agriculture. The inventory was included in a government report by Mr. Prevost, ten years later, in 1823. The listing was very broad, ranging from over a ton of beads, to boats and boat-building tools, to wine glasses. Included were two scythes, spades, large gardening hoes, small gardening hoes, and one iron rake.

Also listed were nine additional hoes, "in use." In the provisions delivered to Astoria, but not produced there were 28 pounds of barley, 20 bushels of potatoes, as well as taro, rice and flour. Farm animals included 15 large hogs, 5 small pigs and 7 goats.

A month later, fur trader and manager, Alexander Henry, began writing of life at Astoria. In his journal, he reported making a detailed inventory of goods, possibly preparing the document used by Mr. Astor. On November 27, 1813, he wrote that all fresh food was gone, and they were on rations of salt meat and Indian corn. In December they sent five pigs to the ship *Raccoon*, which was at anchor. *Raccoon* sailed on December 29 with some of the men on board suffering from scurvy. A pig, slaughtered for the fort, was so disagreeable and foul tasting that it was not palatable. New Years Day dinner included cranberries and wild fruit pie, wild meats and fowl, and potatoes.

Although Henry's reports were always hopeful about livestock and garden plants, repeatedly there was death, disaster and loss. Hens sat on dozens of eggs, but hatched only 3 or 4 or 5 chicks, sometimes none. One hen's brood was all killed by a skunk. One hatch of 5 chicks all died. The turkey cock killed a chicken cock. In May, the chickens were all failing, becoming skinny and dying, and only three were left. A goat had 3 kids, but she killed 2. Another 2 goats died on December 27. Two pigs were accidentally killed on January 2nd. A sow was injured when dropped while being transferred from a ship to a shore boat, the fall causing her to give birth to a large litter in the row boat. Only two of the baby pigs survived. Of those two, one was killed by a raven, the second died a few days later. There were more unusual risks to the piglets. In the journal of his inspection of Astoria/Fort George, Simpson recorded, "...the good people of Fort George have been so averse to the rearing of live Stock and so dainty that they would not Eat their suckling Pigs but by way of keeping down the Stock and for want of more rational pastime actually used to amuse themselves in practicing Pistol Shooting by making War on the poor little Grunters at Twelve paces distance: we shall soon however I expect tum them to better account." Men were killed and injured by Indian arrows, misfiring guns and cannons, and drownings. Ten to fourteen men were temporarily disabled by "the venereal" and in the hospital.

In the Spring of 1814, Henry seemed hopeful about gardening, and in May, he had men cleaning the garden and preparing for planting- possibly with Mr. Astor's spades, hoes and rake. In mid-march, some flowers were in bloom and raspberries were budding. But during the first week of April there was snow. In late April, the garden fence was finished. Potatoes and three kinds of cabbage were planted. The potatoes sprouted, but were eaten by the hogs. Carrots, radishes and onions were planted on May 11. He wrote that one of the cats had four kittens. The stores had sufficient tea and some coffee, but no sugar. A goat provided milk for the coffee. Even some bananas were seen on one of the supply ships. The journal and reports of gardening ended on May 22, 1814: Henry was sailing out to the ship *Isaac Todd* when the boat capsized and he drowned.

Gabriel Franchere was at Astoria during the same period and provided a brief report about the gardening. They had "all kinds of vegetable seeds" which they planted in May. The garden had a beautiful appearance in August, but, except for the radishes, turnips and potatoes, the plants failed to mature. His reports about the potatoes is conflicting: writing in 1854 he stated that they raised an increasing number of potatoes eventually yielding fifty bushels in 1813. However in his report of 1820, he had written that they were mostly destroyed in the ground by the mice, and in the second year, the potatoes didn't mature, "and all came to absolutely nothing."

The men at Astoria found the damp, cold, rapidly changing weather of the little river bank town unsuitable for raising animals or vegetables and, in late 1813, had made a determined search for a more suitable place for gardening. A location near the Willamette River was considered, but found too rocky. Oak Point, where the Winspears had tried to build in 1810, looked good, but flooded annually. They liked Point Vancouver but didn't relocate there because there was little timber available for building. Ten years later, George Simpson, on his first visit to the Columbia, chose the site for Fort Vancouver and had the farm operation and headquarters moved there. Although the fur traders, trappers, sailors, and explorers of the Columbia had had limited success with their attempts to grow gardens, by 1813 they had succeeded with root crops if they were protected from the mice and hogs.

Astor's Pacific Fur Company was taken over by the Northwest Company (also spelled North West Company or North-west Company) in October, 1813, and it, in turn, was taken over by Hudson's Bay Company in 1821. Records of Hudson's Bay Company as early as 1692-93 show that scythes, spades and garden seeds were sent to the site at Hudson's Bay. Carrots, mustard, onions, turnips, lettuce, spinach, beans, cabbage and radish seeds were sent along with the cereals: corn, wheat, barley, oats and peas. A report from the 1730's states that some turnips and "salad" were grown, but the corn didn't grow and the barley and oats didn't ripen.

Commercial Period: 1825-1849

A period dominated by Hudson's Bay Company's forts and their economic, cultural, and agricultural activities as well as the spiritual and agricultural efforts of the Christian missions. Dr. John McLoughlin of Fort Vancouver could provide food and material on credit, employment, seed, and loan oxen for plowing. When a crop was harvested it could be sold to the fort.

In 1820 George Simpson had been appointed to the Board of Governors of Hudson's Bay Company and transferred from London to Toronto. The Governors believed that the fur trade was becoming unprofitable and instructed Simpson to develop a plan to close the fur trade operation and the establishments on the

Columbia. In 1824 he made an inspection tour from Toronto to Astoria to assess the operations. But rather than terminating the trading posts and facilities, he chose to reduce the costs, expand the retail business, improve the productivity and profit and reduce the dependency on exchanging guns, beads, cloth and trinkets for the pelts and furs of small mammals.

The first target of his efficiency and thrift was the cost of providing food. Most rations came by ship from England with some additions such as taro and rice and pigs purchased in the Sandwich Islands, (Hawaii). This means of providing food, Simpson declared was a "prodigious" cost. The "enormous price" of "European Provisions" for the employees on the Columbia was so great that, "all this time they may be said to have been eating Gold; .."

Simpson was clear about the Company changing direction with its business on the Columbia. "On the banks of the Columbia River, however, where the soil and climate are favorable to cultivation we are directing our attention to agriculture on a large scale, and there is every prospect that we shall soon be able to establish important branches of export trade from thence in the articles of wool, tallow, hides, tobacco, and grains of various kinds." He began reorganization by moving trading posts to locations with potential for producing crops and supporting herds of cattle. Forts were located at Point Vancouver, found unsatisfactory by Astor's men ten years earlier, and, he stated, "a farm to any extent may be made there, the pasture is good and innumerable herds of Swine can fatten... Indian Corn and other grain cannot fail of thriving; ..." After first suggesting that Fort Okanogan would be closed, he decided another farm would be located there. Spokane House would be closed and Fort Colville would be built at Kettle Falls, where "Pork, Potatoes and Grain may be provided for consumption of the Post and Voyage so as to render them independent..." He would direct the farm operations from Toronto, several thousand miles away, via an annual letter of instructions carried by express canoe, to the director of Fort Vancouver, Dr. John McLoughlin. McLoughlin would report annually to Simpson and the Governors in London. Simpson and McLoughlin, neither of whom had been farmers, would be assisted by fur traders, trappers, and canoe voyageurs, all who had chosen a life on the rivers and in the forests and mountains, rather than working on a home and farm in eastern North America. They would be assisted by Indian farm hands - although few of the Columbia River Indians had even held a spade or a rake, harnessed a horse or ox team to a plow, and for whom scratching or digging the earth was a cultural and spiritual taboo. In addition Hawaiians would be hired to come to the Columbia Basin to work on the farms and in trapping crews and as sailors. Before Simpson had started back up the Columbia River, he had dedicated the location and beginning of Fort Vancouver, forecast good potato crops at Fort Okanogan, and, as he portaged around Kettle Falls, had specified the location for building Fort Colville, outlined the location of a garden and given instructions for immediately planting potatoes and other crops there.

First year reports were good. McLoughlin wrote in March, 1826, "Our farming is coming on as well as we could expect,." The farm included nearly 60 cattle including bulls and calves, but four pigs had died from eating poisonous camas. Nine hundred barrels of potatoes, over nine bushels of seed peas, and a few beans for seed had been grown. Later that year, November, 1826, Aernilius Simpson, half-cousin to George Simpson, traveling down the Columbia, stopped at Fort Okanogan. He reported, "Notwithstanding the Apparent Sterility of this spot, ... Potatoes of an excellent quality" had been raised. In a garden along side the fort, peas, turnips and cabbage had been grown. Brown reported to Boening that the Hudson's Bay Company at Fort Okanogan, "...did no irrigating...What gardens they had were on sub-irrigated ground along the Okanogan River."

The Fort Vancouver farm, operating from 1825 to 1860, developed three major functions. First, it was to provide sustenance for the staff and employees; second, it became the commercial center for growing and shipping of wheat and dairy products to the Russian community at Sitka, Alaska, a Russian colony. It also became an experimental or demonstration farm, where new, non-native crops were planted and demonstrated to be successful and expanded, or found to be unsuccessful in the soil and climate. The development and production of the Vancouver Farm is documented with detailed production figures in Hussey's manuscript. Though the statistics vary greatly by the person making the reports, it appears that wheat, potatoes, pork, corn, butter, and some cheese were the main products. Even these were affected greatly by recurrent drought and floods. Malaria, referred to as "the fever and ague," small pox, and desertion of workers for the California gold rush reduced the number of farm hands. International politics, squatters or American homesteaders taking over portions of the farm, and devastation by a forest fire all maintained tension over the success or failure of farming.

The acreage and production of the two major crops, wheat and potatoes are reported in Hussey. By some records and reports, the farm stretched for twenty miles along the river and four miles back from the river, and included several islands. It was also described as being around 9,000 acres total with 1,500 acres cultivated. The garden was 600 by 500 feet, or about 7 acres with an additional orchard of 400 - 500 apple trees. Harvests of wheat ranged from 3,000 bushels in 1843, 4,000 in 1844, 4,000 in 1845, and 6,000 in 1847. But there was only 1,500 in 1846 due to drought. Potato harvests ranged from 600 bushels in 1826 to 6,000 bushels in 1846.

Simpson's contract with the Russian-American Company in 1839 provided a market for the produce of the Hudson's Bay Company farms in the region. The agreement called for providing the Russian settlement at Sitka, with 4,000 fanegas of wheat (one fanega is equal to about 1.6 bushels), and 160 hundredweight of flour annually, plus pork, butter and cheese. To supply Sitka and furnish grain for Fort Vancouver, produce

from the other Hudson's Bay farms at Langley, Fort Colville, and Cowlitz was required. In addition, grain was purchased, from settlers in the Willamette Valley. In 1843, McLaughlin planned to purchase 10,000 bushels of wheat from settlers in addition to the 3,000 bushels raised at Ft. Vancouver. Potatoes apparently were for consumption by the residents and employees at Fort Vancouver.

The fields produced traditional cereals and root vegetables, the pastures the conventional livestock. The garden was a source of pride for Dr. McLaughlin who provided tours for his visitors. They in turn often wrote of the flowers, berries and interesting and unusual plants seen in the garden and orchard. Included in various reports were hops, flax, coleseed - a cabbage, and vetch, the latter two used for forage; and apples, peaches, grapes, figs, pears, oranges, lemons, pomegranates and nectarines. In her correspondence, Narcissa Whitman wrote of seeing garden crops of "cucumbers melons beans peas beats cabbage, taumatoes..." Cotton was planted in 1836. Barry reports there were small amounts of hops, hemp and tobacco.

Fresh fruits and vegetables could be found on the menu at McLaughlin's dining table. The farm hands and men that worked at the fort received more basic foods. Bread, potatoes, salmon and peas were rations for the farm orkers, wrote Captain Slacum in 1836. Weekly rations issued to men with families included eight salt salmon and eight gallons of potatoes. Peas and tallow were added in the summer. The ration did not include bread or meat. Families or their slaves hunted for wild meat to add to their menu.

Indians, Europeans and Hawaiians, all worked in the gardens and farm at For Vancouver. McLaughlin's daughter remembered the first gardener being an Indian. For the boys enrolled in the fort school, part of each day was spent working in the garden. Sometimes they worked all day, everyday for weeks in the garden. Indians were hired to help in the gardens and fields during busy periods or when there was a need for labor during harvests, ploughing and planting seasons. When the regular employees were away trapping, or were unable to work due to illness or when they had left for the Californian gold rush more Indians were employed.

Indians developed a fondness for some of the crops. At Cowlitz Farm, a watchman was posted in the pea fields and the potato fields as the crops matured to to keep Indians from taking the fresh vegetables. Indian women were employed to harvest the potatoes, the clover, and timothy hay seeds. Hussey refers to Indians being employed at Colville and Walla Walla and possibly at Vancouver, as livestock herders, field hands and grain millers. McLaughlin reported that, "... our ploughing and harrowing is principally done by Indians" Another observer reported that at Fort Vancouver, "we employed a great many Indians... eight or ten ploughs and as many harrows running with them." There are also descriptions of twenty or thirty ploughs in a field, followed by men sowing seed, followed by a dozen harrows. Over the years the Fort Vancouver farm

operated, there were hundreds of Indians directly participating in the complete farming cycle from ground preparation, planting and weeding to harvest and threshing and milling. Numerous additional tribal members would have observed the process. In 1837 when he was plowing at the mission at Waiilatpu, Marcus Whitman reported that he was using a yoke of oxen borrowed from a Cayuse Indian Chief. These reports indicate that there were many Indians who could harness and drive draft animals, both oxen and horses, as singles and as a team, and that some Indians owned draft animals. There were hundreds of Indians skilled at farming tasks and management by the late 1840's and early 1850's, years before Isaac Ingalls Stevens arrived with treaties and promises of fenced farmlands and ploughs on reservations.

Farming at Hudson's Bay Company Fort Colville was similar to Fort Vancouver, except that there was less import and export due to the distance from the sea. The fort measured 5-6 miles square with 4,500 acres of arable land. The Chief Factor, Archibald McDonald, fancied himself "the Lord of the Manor," according to Chance. The fort was operated similarly, with most of the same crops raised as at Vancouver: wheat, oats, buckwheat, peas and potatoes. Few of the more unique crops such as fruit and berries are reported. A 1837 report shows Fort Colville produced 5,000 bushels of grain, and employed 50 Indians in the harvest. The 1838 inventory shows five tons of wheat flour, and 3500 bushels of wheat in addition to other grains were produced. Fort Colville had the first grist mill in the region, so provided flour for a wide area. In 1853, Spokane Indians were transporting their wheat up to 70 miles, to have it ground as flour. As part of Hudson's Bay Company, the farm was also producing butter and cereals for the Russian trade.

The first missionaries, the Spaldings and Whitmans, went on to Fort Vancouver when they first arrived at the Columbia River. After they settled at Waiilatpu and at Lapwai where they built missions, both sent to Fort Colville for supplies. Henry Spalding wrote in February, 1837, that he had received supplies from Colville including "1 Pack of pork, 2 of pease, 7 of com, and 8 of flour, each weighing 90 pounds." Whitman had received supplies earlier. The supplies that had been brought from Fort Vancouver earlier included a good supply of port, flour and butter. They had also received com and potatoes from Walla Walla.

Whitman, writing to Greene in Boston from "Wiiletpoo," in May, 1837, explained that he had planted 2 acres of peas and 9 acres of com and would plant 2 acres of potatoes. They had butchered and eaten 9 or 10 horses received from Indians. For the mission, he requested plows and hoes --the main farming "utentials" needed. He added that "the number of hoes ought to very great and of a strong make." He had loaned fifteen hoes to a few Indians in March so they could prepare ground and plant com. Henry Spalding had also begun his farm at Lapwai, starting some apple trees and planting pease and potatoes. He planned to sow 100 acres in grain. 30 hoes had been provided to Indians so they could prepare ground for gardens. When missionary Jason Lee was at Whitmans' mission in 1834 he had seen some Indians' gardens, and wrote in his diary,

"Visited the Indian farms and was surprised that they had done so much in the absence of almost every tool necessary to do with. Some had two or three acres, wheat, peas, com, and potatoes." In her letters Narcissa Whitman wrote of com, wheat and potatoes. Boening, quotes Snowden's reports on the Whitmans' and Spaldings' irrigation and planting and interaction with the local Indians, "The soil was fertile and easily brought under cultivation. By the aid of a little irrigation, which was easily provided by a ditch made without difficulty in the loose soil, wonderful crops were produced." Whitman and Spalding had both planted apple seeds in 1837. By 1841 a few Indians had small fields and gardens and were using irrigation similar to Whitman's.

The reports of farming at Waiilatpu and Lapwai are not always consistent. Hoes were reported to be given to Indians and used, but they need more hoes. Another report states they haven't the necessary tools. Meanwhile, Whitman was plowing with oxen. Spalding wrote that he planned to sow 100 acres in grain, yet another writer stated that the 100 acres were sown, "only in the air." The group of missionaries spent over \$3200 for expenses traveling to Oregon Territory, yet they purchased only \$7.17 in grain seeds. In 1838, Narcissa Whitman wrote that "The Indians have planted a good deal of land this spring." In 1840, she wrote, "They (Indians) are becoming quite independent in cultivation and make all their ground look as clean and mellow as a garden. Great numbers of them cultivate." Yet in 1838, she explained, "We are very much in want of a farmer for ourselves and to teach the Indians to cultivate." By 1840, both the missionaries and some of the local Indians were raising hogs, hens, beef, com and potatoes.

By 1848 the Hudson's Bay Company supply parties were no longer traveling on the lower Columbia, but were going to Langley on the Fraser River, via Kamloops, so Colvile was less important and less busy. In addition, the Chief Trader reported the soils around the post were exhausted. In 1846, after it was determined that the U.S./Canadian Boundary was the 49th Parallel, not the Columbia River, Fort Vancouver was rapidly reduced in importance. Hudson's Bay Company headquarters moved to Victoria in 1849, and the fort was completely closed in June, 1860. The missions were closed and missionary activity, except for the Oblates, ceased in 1847 and 1848 after the killings at Whitmans' Waiilatpu Mission. Hudson's Bay Company continued farming in Langley and near Fort Victoria, and maintained a cattle farm on San Juan Island. There was little private farming in British Columbia. Hudson's Bay Company held the land rights through their Royal Charter.

A private farmer was required to purchase a hundred acres and bring in 3 married couples or 5 laborers to work the land, making it difficult for a single family to farm.

Gardens in Yakima Valley, 1847-1900: the Priest, the Indian Chief and the Captain.

By the mid to late 1850's there were three gardens that had been thriving and growing for several years in the Yakima Valley. One established by an Army Lieutenant, one by a Catholic Priest and one by an Indian Chief. By 1859 all had been abandoned, and the lieutenant, the priest and the chief had each gone to Canada. In another year or two, either 1860 or 1861, the first settler and farmer moved into Yakima Valley. Fielden Mortimer Thorp, his wife Margaret and their nine children settled in Moxee, and were soon joined by the Splawn, Henson and Bond families. Though these families were focused on cattle herds with some sheep farming, they raised vegetable gardens for family subsistence. Thorps were reported to have a garden of five or six acres. Cattle farming was successful during the 1860's with cattle being driven to the mines in Canada, Idaho and Montana. When that market failed in 1870, cattle prices dropped sharply, but new markets were found in Seattle and the Puget Sound region. By 1880, conflicts were reported with sheep farmers in the region. The severe winter of 1880 - 1881 with temperatures reported below minus 30 degrees, Fahrenheit, killing major parts of the herds, ended the plans of being a cattle and sheep farming region.

Captain Archer stopped at Fort Vancouver in September, 1856, en route to Fort Simcoe. At Vancouver he had been served a breakfast including blue wing duck, potatoes, raw tomatoes, cantaloupe and peaches. When he reached Fort Simcoe, they had "some very fine cantaloupe and watermelons...had a feast." Military posts met some of the need for food by purchasing and importing grains and salted meat. Captain Archer supplemented the rations with fresh vegetables hoping to prevent scurvy. In March 1857 at Fort Simcoe, he wrote they were starting a garden, and in April, he wrote again that he had "commenced a garden." A dam and irrigation ditch had been constructed in September, 1857. But in June he reported that even though they took great pains to irrigate the crops, they were all eaten by crickets. Instead their supply of fresh vegetables came from the Willamette Valley. In one of his letters of August, 1857 Archer wrote that all other posts "have large flourishing gardens sufficient to supply the soldiers with abundance of every kind of vegetables "

The following season, 1858, Captain Archer wrote in July that he was expecting to harvest 5,000 heads of cabbage and 2,000 bushels of potatoes. His report of April 1, 1859, was that "we are getting along fine with our company gardens, which we persist in making. He probably did not harvest a crop from Fort Simcoe that year. On May 28, 1859, Fort Simcoe was closed as a military post and assigned to the Bureau of Indian Affairs. On the 28th of May, Captain Archer and the soldiers of Company I traveled north toward the Canadian Boundary, where, until 1861, they would be the military escort for the United States and British Boundary Commission surveying the national border. The soldiers were either discharged or sent to the U.S. Civil War actions. After leaving Fort Simcoe, they had stopped on May 29, 1859, near the Ahtanum, at St. Joseph's Mission location, before continuing to their camp at Lake Osoyoos in Canada.

St. Joseph's Mission, operated by Fr. Pandosy, of the Oblate order, was the location of the Columbia Basin's most notorious garden. In 1855, a company of U. S. Army regulars and volunteers had stopped near the mission when pursuing some Indians. Fr. Pandosy had recently left, traveling north with the Indians. The soldiers were foraging in the potato patch for some vegetables for their dinner when they dug up a half keg of gun powder, either hidden there for later use or to prevent it being used by Indians. In retaliation, the soldiers burned the mission. The succinct journal entry of William Charles Painter of November 14, 1855, summarizes the military and food supply outcome: "Went to the mission and burned it. Got turnips and cabbages." The mission garden had crops similar to Kamiakin's garden less than two miles away. Pigs and chickens were raised as well. Fr. Pandosy continued to Ft. Colville. There he met Governor Isaac Stevens in January of 1856. Later, the Governor sent a letter to Pandosy, temporarily forbidding him to return to Ahtanum. Pandosy returned to the mission July 18, 1856. He later traveled to Esquimalt, near Victoria B.C. in 1858, and then on to Okanogan in 1859, where he continued missionary work until his death in 1891.

The site for St. Joseph's Mission on the Ahtanum (or as spelled by the Oblates, Attanum), had been selected by Frs. D'herbomez and Chirouse in April, 1852, and construction had begun in June, 1852. Fr. D'herbomez had soon planted vegetables. The mission was described as being situated on the edge of Chief Kamiakin's vast garden, near his camp. Over the years a variety of crops and livestock were reported at the mission. In 1855, potatoes, horses and cattle were listed as well as wheat, oats, and peas. There were also cabbages, potatoes and "a considerable herd of pigs." The claim for the burned mission included onions, turnips, oats, wheat and "crop in the ground." Livestock included 4 oxen, 18 cows and 18 calves 2 sows, 13 hens and 50 horses. St. Joseph's mission was abandoned by the Oblate order on March 28, 1859. Schoenberg wrote that Fr. J. N. St. Onge took over St. Joseph's Mission on Attanum Creek in September, 1867. There he built a temporary hut for a dwelling, then a 16 by 24 foot log structure for a church and dwelling. The next year he was joined by Brother John Baptist Boulet. In the Spring of 1868 they set out fruit trees at the mission.

West of the Ahtanum mission, Kamiakin, a Yakima tribal leader, maintained his home and garden in the 1850's. The garden is cited as having the first irrigation ditch in the region, dug about 1853, or by other reports, the ditch was begun in 1850 and enlarged in 1853. Fr. Ricard's report of May, 1851, had reported that they had been teaching irrigation and agricultural practices to Indians, a year before the reported beginning of the Ahtanum irrigation ditch. Kamiakin's garden was described as a quarter mile long and up to 250 feet wide, producing corn, wheat, pumpkins, potatoes, squash, melons, and peas, also beans, beets, turnips, carrots and onions. A cornfield was maintained downstream. Kamiakin was injured in a battle with the U.S. Army at Four Lakes, near Spokane, in 1858. He traveled to Kootenay country in Canada, then on to Montana, then, in 1860, back to Palouse country where he lived until 1877.

Archer continued to plant crops for the company. They were marching to the Okanogan Valley where they would be attached to the Northwest Boundary Commission that was surveying the U.S.-- Canadian Boundary. But first, they went to Colville (then called Hamey Depot), where they would spend the winter planting turnips and potatoes for winter use. At Hamey Depot in July, 1860, Archer wrote, "We are beginning to live pretty well again on trout, game and excellent vegetables. . . ! will make about five hundred bushels of potatoes and other vegetables." He added that the settlers at Colville were in the midst of the wheat harvest. A year later Archer was discharged from the U. S. Army and was soon commissioned a Brigadier in the Confederate Army. Captured at Gettysburg, he was held as a prisoner of war for over a year. Although his health deteriorated, he lived until 1874.

Though these three early Yakima Valley gardeners had very different roles in life: soldier, priest, and Indian chief, they knew and visited each other. Fr. Pandosy had been to Fort Simcoe where he probably saw Archer when he dined with the officers, and he often saw Kamiakin, who lived near-by and often brought food to the mission and frequently joined the missionaries for dinner. All three left Yakima Valley about the same time and all three ended up in the southeastern portion of British Columbia in 1859.

Fr. Pandosy is often associated with the Ahtanum mission because of the incident with the gun powder. However, other missionaries of the Oblate order were also active in establishing missions in the Yakima Valley and developing mission gardens. The first mission, St. Rose of Chemna, was begun shortly after the first Oblates arrived at Ft. Walla Walla in late September and early October of 1847. Four of the missionaries crossed the Columbia River with a wagon and two yoke of oxen to locate a mission near the mouth of the Yakima River. Soon the Oblates were confronted with severe winter weather, inadequate preparation and the turmoil of the killings at the Whitmans' Waiilatpu Mission. They had carried some seeds for planting later, but ate the seeds when short of food. The Oblates established several other missions in the Yakima Valley, including St. Joseph of Aleshecas, or St. Joseph of Simcoe. The location of the mission, established in 1848, was near the present town of Sawyer, north of Wapato. Schoenberg reports that the mission grew the first garden crops in the Yakima Valley. Fr. Chirouse saw wheat and potatoes planted there by Indians, in 1849. Fr. Pandosy opened the Manastash Mission, St Mary, or Immaculate Conception in the Kittitas Valley in 1848 and a garden was started there in January, 1849.

When the U.S. Army left Fort Simcoe, it was turned over to the Bureau of Indian Affairs. It was used as a residential school, eventually headed by Father Wilbur after June 2, 1859. Wilbur's 1865 report, quoted by Relander, states " ... they must have raised 10,000 bushels of wheat and com, about 2,000 bushels of oats and 1,500 bushels of peas. Potatoes they raised all they could use." An 1862 map of Fort Simcoe shows an orchard of 2 acres and a garden of 5 acres. These would have been planted before Wilbur's arrival. The map also shows a miller's residence, a "flouring mill" and a saw mill six miles east of the fort.

There are other reports of Indians and early settlers in Yakima Valley who had gardens. Chief Owhi, in the Wenas Valley, was reported to have had a garden and to have sold or traded thirteen bushels of potatoes to the Longmire party traveling through the area in 1853. There is speculation about the other crops and probable irrigation he might have used.

Fielden Mortimer Thorp and his wife, Margaret and nine children settled in Moxee Valley in 1860 or 1861. They were joined by Alfred Henson and his wife, Nancy Bond, and by A. J. and Charles Splawn, also in 1861. Although they were primarily cattle and sheep ranchers, it is probable that they maintained kitchen gardens and grew some sort of crops for family use. Lyman reported that the Thorps had a garden of five or six acres. Thorp moved on to the Kittitas Valley and established the town that bears his name in 1868. Other settlers arrived in the Ellensburg area in 1870 and 1871.

Fr. Pandosy, had established a mission, Immaculate Conception, on the Manastash creek near the Yakima River in 1848. A visitor in January 1849, reported that Brother Celestin Verney, who was sharing the mission with Fr. Pandosy, was planting a garden even though there was still snow on the ground, making him the first (and perhaps overly optimistic) gardener in the Kittitas Valley. The garden did well. In August, 1849, Father Chirouse wrote of seeing "the beautiful garden where kids like parasites destroy the vegetables,..." He added, "we live like princes; some good turnip soups, omelets...some salads, onions, some peas...sometimes pies or bread." Frederick Ludi settled on the Manastash in 1867, then moved to the Ellensburg location in 1868, where he planted the first garden in that part of the valley.

The history of early fruit, grain and vegetable farming in Yakima Valley, written by Kuhler, begins with reports of small plantings beginning in 1866. That year Alfred Henson planted an orchard. The next year, 1867, H. T. Goodwin grew five acres of wheat near Moxee. Goodwin planted an orchard of 150 trees in 1868, but it was washed away by flood water. John Wilson Beck planted an orchard of 59 apple trees and 50 peach trees near Yakima City in 1870. Although these plantings were the beginning of commercial agriculture in the valley, without a flour mill, adequate transportation or local markets, and no irrigation, they could hardly have been a commercial success. E. V. Kuykendall, whose father was assigned to Fort Simcoe from 1872-1882 as a physician for the Indian Agency, reminisced as how, as a young boy, he would gather apples from a tree at the fort. He wrote that he believed the tree was planted between 1860 and 1864, making it the first apple tree in Yakima County. Apple trees were planted at St. Joseph's on the Ahtanum after the mission was rebuilt in 1867.

Kuhler described the farming and agriculture in Yakima during the twenty years from 1880 to 1900, as "on an experimental basis". Reports of the experiments seemed full of optimism and excitement.

Crops that were tried - apparently with some success - included sweet potatoes, sorghum, sugar cane, wine grapes and tobacco. Tobacco reportedly did well, but disappeared from the reports by 1890. The Moxee Farm, begun in 1887, produced tobacco and manufactured cigars until 1890 or 1891. Other trial crops either vanished or nearly vanished by 1900. Oats, barley, alfalfa, grapes and vegetables were tried and found some success. However, tomatoes were not a successful crop. Hops were introduced about 1877, though Lyman reported that Charles Carpenter grew hops on the Ahtanum as early as 1872. Sugar beets were successfully introduced in 1889 and watermelons in 1890. By 1900 there were also successful crops of onions and potatoes.

An April 12th, 1887 article in The Republic, a Yakima newspaper, reprinted an interview with J.M. Adams of the U.S. Land Office, describing the crops of Yakima country. His list included hops, sugar cane, sugar beets, tobacco, peanuts, prunes, beans, barley, and flax. Fruits listed included grapes, peaches, apples, pears and apricots. By that time a new flour mill was operating. Potatoes, melons and all kinds of vegetables were "grown in prodigious quantities," and sold to the coal mining companies and the crews building the great tunnel.

The features that provided for agricultural success were developed during the 1880- 1900 period: irrigation projects were begun, railroad transportation to Puget Sound markets was completed, the local markets increased, and the first cannery and evaporator for drying fruit were completed in 1893. Grains continued as successful crops, but they were sometimes replaced with more valuable crops. Corn/maize continued, but at a reduced amount, as more water was required for that crop. By the turn of the century, the experimental nature of crops and farming was completed, wrote Kuhler, "...the general pattern of agricultural products for the Yakima Valley had been fairly well established by 1900. Fruits, vegetables, hay and hopsthe most important." Cereals were still produced in considerable quantity.

U.S. Census reports provide 1909 production figures for some agricultural crops and products for Yakima County:

Cereals, Hops and Potatoes

Potatoes	1,221,175 bushels
Hops	2,065,342 pounds
Sugar beets	217 tons
Alfalfa	216,321 tons
Rye	1,074 bushels
Barley	78,804 bushels
Wheat	209,509 bushels
Oats	181,653 bushels
Com	63,072 bushels

Tree Fruit

Apples	321,546 bushels
Peaches and Nectarines	7,526 bushels
Pears	56,779 bushels
Cherries	4,565 bushels
Apricots	334 bushels

Dairy and Eggs

Eggs	567,116 dozen
Milk	3,074,736 gallons
Cheese	1,240 pounds
Butter	300,442 pounds
Grapes	745,049 pounds

Production figures for agricultural products compiled by the Yakima Commercial Club for 1917 for Yakima and Benton counties combined are reprinted by Lyman in his 1919 History of Yakima County. He suggests that dividing the Yakima County/Benton County figure would be about 5 V2 1, with Yakima providing the larger portion.

Cereals, Hops and Potatoes, 1917:

Potatoes	2,500 carloads
Hops	158 carloads
Sugar beets, sugar and pulp	491 carloads
Alfalfa	9,353 carloads
Barley	44 carloads
Wheat	546 carloads
Oats	60 carloads

Tree Fruit, 1917:

Apples	8,700 carloads
Peaches	1,750 carloads
Pears	1,950 carloads
Cherries	160 carloads
Apricots	7 carloads
Grapes	10 carloads

Dairy, 1917:

Milk	308 carloads
Cheese	8 carloads
Butter	30 carloads

Significant amounts of onions-200 carloads, or 3,000 tons were shipped. Also 85 carloads or 1,400 tons of turnips, rutabagas, and carrots were shipped. There were 750,000 pounds of honey, but only 100,000 pounds of asparagus shipped. The largest food crops, apples, potatoes, pears and peaches filled over a third of the carloads.

"No factor has played so great a part in our economic development as irrigation," states Boening. She reviews the early ditches of the Spaldings and Whitmans before reporting about small ditches dug by individual farmers between 1869 and 1873, apparently in the Ahtanum Valley, used to irrigate fields of up to 160 acres. In Kittitas County ditches were in use in 1869 and 1873. A communal effort dug the Manastash Canal in 1874, and the nine mile "Tenem" Ditch was dug in 1875. A table reprinted by Kuhler listed canals constructed or surveyed in Yakima County by 1893. Fifteen canals were listed, with 365 miles of canal completed. It is noted that the Ahtanum, Naches, Wenas and Cowlitz valley canals are "small canals," with a total length of 134 miles. By 1861 Thorp had relocated to Kittitas County and was joined there a year later by Charles Splawn. Both men irrigated orchards with ditches. Although discussions of irrigation usually refer to Kamiakin as having the earliest irrigation ditch for his garden on the Ahtanum, Kowrach writes that "In the Yakima country, the Oblates had introduced irrigation to Kamiakin and had grown a successful garden on the Ahtanum." Young refers to correspondence from Fr. Pascal Ricard from 23 May, 1851, "Ricard was proud to note that the Oblates had begun teaching methods of agricultural cultivation and irrigation to the native people in their care." This correspondence was written a year before the priests had selected land for their Ahtanum Mission adjacent to Kamiakin's garden.

Some of the early irrigation began on the Ahtanum, and the early disputes about water allocation and water rights also began on the Ahtanum. The Ahtanum stream formed part of the northern boundary of the Yakima reservation, with white farms on the north and Indian farms on the south. Relander refers to a letter of 1889 that states the white settlers have withdrawn all the water...to irrigate their lands on the north side, leaving the Indian residents destitute of water for their stock and other purposes" In 1905, McWhorter reports, an adjudication allowed the Indian farmers on the south side only one quarter of the stream flow, still leaving their ditches entirely dry.

Wine grapes were a crop that Kuhler suggests were grown with some success between 1880 and 1900, but had entirely or almost entirely vanished from the list of Yakima Valley products by 1900. Neither figures nor production details are reported. A few fragmented reports about wine and grapes on the early Columbia River appear in records, journals and in correspondence. There is no definitive report of grapes beginning at Fort Vancouver, but there are some fairly reliable observations. Hussey's report on the Fort Vancouver Farm provides some notes on the probable source of the grape seeds. When Lt. Aemilius Simpson traveled across North America from Toronto with the Hudson's Bay Company express canoes in 1846, he had reportedly brought apple seeds and grape seeds to Fort Vancouver. He didn't arrive until November of 1826, too late for planting that year, so it is likely they started growing in 1827. Hussey refers to a report by Aemilius Simpson in 1828 or 1829 that he had planted grapes. He also refers to a report that credits McLoughlin, Pambrum and

Lt. Simpson with planting the grapes. Jedediah Smith reported seeing small apple trees and grape vines at Ft. Vancouver in 1828. Grapes were reported growing in the garden by 1832. During her stay at Fort Vancouver in 1836, Narcissa Whitman wrote of the summer house being covered in grape vines. By 1841, it was reported that the grapes had done well, but had been neglected, and in the 1850's, the only vines were those growing over the veranda.

After Hudson's Bay Company left Fort Vancouver in 1860, all structures were burned or torn down by the U.S. Army, probably including the structure providing an area for the grape vines. Grapes were grown at Fort Vancouver, but no wine production was reported. Some modern histories of grape production in Yakima County suggest that grape vines at Union Gap vineyards (in 1872 or 1874) came from "near by" Fort Vancouver, implying that the neglected vines of 1841 Fort Vancouver survived the 1860 burning and land clearing. To reach Vancouver from Yakima, a traveler would go 80 miles south over the Simcoe Mountains to the Columbia River, then another 80 miles down a difficult section of the river.

Lieutenant Charles Wilson with the British Army detachment of the Boundary Commission attended a "great feed" at the American Garrison in 1860 at Fort Colville, where guests were poured, "... any amount of champagne of the vilest description." For the bottles to have reached there, they would have been carried halfway around the world, around Cape Horn, and twice across the equator in the hold of a sailing ship, then carried hundreds of miles on mules. The basic process for making champagne by adding sugar or molasses to the wine had been developed in the 1650's and 1660's, but it wasn't until the 1830's that strong enough glass and bottles were developed to reliably contain the wine. The 1811 inventory of supplies at Fort Astoria suggest that rustic fur traders had planned to serve and drink wine in style; a supply of over 100 wine glasses had been imported for the small party of fur trappers.

U.S. Census reports of 1850, 1860 and 1870 provide a measure of the nascent regional wine industry. Reports of Oregon Territory in 1850 - which at that time included Washington, showed no wine production. In 1860 Oregon State, by then separated from Washington Territory, had produced 2603 gallons of wine. Also in 1860 Washington Territory had produced a total of 179 gallons of wine: 48 gallons in Thurston County and 131 gallons in Clark County. The census of 1870 shows a total production of wine for Washington Territory of 235 gallons: 85 gallons in King County, and 150 gallons in Whatcom County. All wine had been produced in Western Washington.

Several historical sites, books and articles refer to the canal building and wine grape planting of Charles and Joseph Schanno near Union Gap as the first wine grape plantings in the Yakima Valley. They settled there in 1870, and built two canals. The second canal, which they started in 1873, reached their garden in Union Gap/Yakima City in 1875. They reportedly had planted wine grapes there in 1872 or 1874 and irrigated the grapes with water from the ditch. W. D. Lyman, who published in 1919, over 40 years later, had communicated with Marie Catron, daughter of Charles Schanno, about her childhood reminiscence of the canals and crops. She recalled gardens and berry patches and that by 1881 the ditch was used to irrigate

some alfalfa. There is no mention of grapes. In his History of Yakima Valley, Vol I. 1852- 1920, Lyman wrote, "Charles Schanno, the father of Yakima City, had a fine garden and a plantation of blackberries and raspberries in 1872. There is no mention of grapes. Irvine refers to a statement from Catron, published in 1933, about her father planting the first grapes in Yakima Valley. She stated that the cuttings came from Hudson's Bay Company Fort Vancouver. In 1993 Irving was shown the surviving vines of the vineyard planted by Anthony Herke in the Ahtanum Valley in 1871. Some gnarly old vines of the original planting still produced a few grapes. Yakima wine was reported in The Yakima Republic in April 21, 1887, "Yakima wine,, has entered the markets and is said to be much liked for table use and for invalids." The wine was made from raspberries.

Oxen, the ard, two wheeled plows, and the development of agriculture.

"During the fifth to the second millennia, vast changes in food use took place... of special importance was the cultivation and increased consumption of cereals" states Brothwell. Among the changes that provided the increased production and use possible was the increased use of the ox drawn plough. With the plough, (or plow), larger areas of land could be cultivated and ploughed deeper producing more grain. The early oxen drawn plough-type tool, the ard, was first used about 3,500 BCE and developed into the turn plough in the seventh century CE, and later the mould board plough. The ard, pulled by single oxen, is still in use in some areas today. The importance, distribution and duration of the oxherd - the man who cared for the animals when they were not working, the ploughman - who conducted the animals and plough in the fields, and the oxboy - who managed the whip or goad to keep the animals moving is suggested by their repeated appearance in art work over centuries. A sample of the images of the ox team with the crew and two wheeled plow, begins with two images in rock art provided by Fowler. The images, drawn on stone, are from Sweden and from Val Camonica, Italy. He suggests that the ploughs were in use by the second millennium B.C. T.W. Africa provides a photograph of a bronze Etruscan statuette of a ploughman, plough and ox team from Arezza. An Etruscan vase is decorated with an ox plough. Various sources date it from the 6th to 4th century BCE. Another Etruscan image of oxen, plough and ploughman, on terra cotta is held by the Louvre, Paris, and is dated 530 BCE. Applebaum provides a photograph of another bronze statuette of an ox team and plough found in Britain in his chapter on "Roman Britain." A Roman mosaic of an oxen plough is shown by White to illustrate Roman farm equipment. A biblical reference in 1 Kings, 19:19, describes Elisha ploughing with 12 yoke of oxen. Christian documents provide more illustrations of ploughing with oxen:

Seeborn uses an illustration from Caedmon's Paraphrase of Tubal Cain ploughing with an ox team and 2 wheeled plough; also an illustration from the Luttrell Psalter of the 14th century of two yokes of oxen pulling a plough; also from Fitzherbert's Husbandry, of 1525 of an ox team with a yoke of oxen with a two wheeled plough. "Piers Ploughman," a poem written in 1360's or 1380's includes a drawing of the ploughman and ox boy along with a huge wheelless plough pulled by four oxen. Thirsk shows an ox team illustration from Planets of 1465. Salzman reprints an image of a four ox team from an Anglo-Saxon calendar of the middle ages. William the Conqueror surveyed England and found Saxon agriculture, "almost totally geared to the ox" wrote Martin Watts.

Shortly after the Pilgrims arrived in North America in 1620 oxen were imported. In 1623, Edward Winslow went back to England, then returned to North America in 1624 with a Devon bull and three heifers, beginning the first North American ox herd. Oxen were used at Hudson's Bay in 1731.

When the first oxen arrived at the Columbia Basin is unclear. Some reports show that over half the wagons traveling the Oregon trail were pulled by oxen, indicating that thousands of oxen arrived in Oregon Territory. A rapid decline in their use throughout North America occurred about the same time settlement started on the Columbia. There are a number of possible reasons for their disappearance. Being castrated, they couldn't reproduce themselves, so, without some planning, the numbers would diminish, and there was a shortage of cattle in the early communities. When settlers arrived in Oregon in the late fall or early winter there was little time to cut hay for winter fodder for the oxen and horses. There was often a food shortage. By butchering the oxen the need for fodder was eliminated, and food was supplied for the families. Horses for food or transportation could be obtained locally. Oxen use was diminishing throughout the country. Farm equipment was being manufactured by larger corporations, not locally. The corporations could make equipment adapted to oxen, or horses, or provide two models. To reduce the costs of manufacture, they chose to make only horse drawn equipment. If farmers needed oxen equipment they could either have it made, or adapt horse drawn equipment.

The Oregon Trail was in use from the mid 1840's to the late 1860's. Figures for the number of travelers are estimates or rough counts of people or wagons leaving Missouri. The estimates are generally a total of between 350,000 and 500,000 people. Kingston cites a report of an 1843 party traveling to Oregon Territory with a total of 992 people. Two hundred and sixty were men, with 130 women, plus children. Their transportation was 121 wagons, 698 oxen and 296 horses.

When the first party of French speaking Oblate missionaries were preparing to leave Missouri for Oregon Territory they purchased 8 yokes of oxen and wagons for transport. None of the men were familiar with oxen. Bishop Blanchet reported, "None of (the) men know how to drive oxen ... They shout, they beat the poor again and again - nothing moves. They change them about; they place in the lead those who were in the rear ... their success is the same. If they do take a few steps it is to launch out for the sides of the road and win open country .. "

Soon they had purchased 5 more yokes of oxen, and had joined up with a wagon train of over 50 oxdrawn wagons for a party of 172 people. The Oblates lost 3 yoke of oxen along the way, but arrived safely at Fort Walla Walla in late September and early October. When they continued across the Columbia River to establish their first mission in Yakima country, they had purchased two different yokes of oxen and a wagon for their supplies. These were possibly the first oxen in Yakima County. The Mission was Saint Rose of Chemna, two weeks travel up the Columbia, located north of the Yakima River and West of the Columbia River an area known as Satus.

There are scattered reports of oxen use in the Columbia basin. Kingston refers to a report of missionary Jason Lee at the Salem mission having 7 oxen borrowed from Hudson's Bay Company in 1837, and the Coeur d'Alene mission having 8 yoke of oxen in 1853. In 1837, missionary Marcus Whitman at Waiilatpu had plowed using a yoke of oxen belonging to a Cayuse Indian, and another yoke of bulls, apparently borrowed from Hudson's Bay Company. He also had four mules and two horses for draft animals. Wilson, in 1860 was traveling north of Lake Osoyoos, surveying the Boundary, when he encountered a wheat and potato farm annex of the Hudson's Bay Company that had, "a large number of oxen." The animals probably came through Fort Colville. Though Hudson's Bay Company reports annually state the number of cattle, hogs, etc, they didn't regularly report on numbers of oxen. Observations by visitors, and fort correspondence provide some numbers of oxen in use. McLaughlin wrote that in 1826 the fort had only two oxen. They are identified by other reports as "Lion" and "Brandy", the two oxen that routinely pulled the fort's water wagon to and from the river. Ten years later, in 1836-37, Slacum reported the fort had 40 yoke of oxen. In his correspondence of October, 1837, McLoughlin listed 178 oxen and steers, and said that 40 oxen would be butchered. One hundred were required for farm and sawmill work. Henry Spalding and Narcissa Whitman, visiting the fort for lengthy periods in 1836, did not mention any oxen.

An inventory of the Fort made in 1844 lists a total of 194 oxen: 128 at the fort, 22 at Willamette Falls, and 44 at Sauvie Island,. The same year, an inventory lists only one ox yoke at Sauvie Island. Farm equipment at the fort included 2 oak four-wheel ox wagons, 2 two-wheel ox trucks, 1 four-wheel ox truck, 9 ox yokes and bows, and 10 ox chains. One cast iron Ransom ox plow is listed along with 15 cast iron horse plows. An 1847 inventory of buildings shows two ox byres, one 34 by 29 feet, the other, 40 by 25 feet. It is not reported whether the fort bred, raised and trained oxen, or if they traded for mature animals from settlers. Though the reports on the use of oxen by Hudson's Bay Company are limited and fragmented, it appears that at times, nearly 200 oxen were used. At Fort Simcoe, Father Wilbur had three ox teams in use in 1864. They were teams of seven to ten yokes of oxen in each team for a total of between 25 and 30 oxen in use plowing.

In his report on History of Washington State, Bancroft briefly refers to oxen. He indicates that the early attempts at logging on Puget Sound in the early 1850's were unsuccessful as there were no oxen to move the large logs. However, a logger at Dungeness had four yokes of oxen to work at his logging operation about 1851. Photographs made in the region show oxen pulling a freight wagon and working at several logging operations. There are teams of up to seven yokes, or fourteen oxen, pulling loads of logs. A wagon train with 47 people crossed the Cascades to Puget Sound in 1853 with 62 oxen. This was apparently a section of the Longmire wagon train which has been reported in a number of records and stories.

Census documents show that in the US in 1850 there were over 1.7 million oxen; in 1860, 2.2 million, an increase of 32%. In Oregon Territory in 1850 there were 8,114 oxen; in 1860, only 7469. The decrease was partially due to Washington Territory being established. There were 2571 oxen in Washington in the census of 1860. For the two territories there was an increase of nearly 2,000 animals to over 10,000. But the 1870 figures show a dramatic decrease: only 4622 oxen for the State of Oregon and the Territory of Washington, combined. The 1870 report provided the a total for Yakima County: 39 oxen. The numbers of working oxen were not listed in the census of 1890 or the census of 1900, and the records of 1880 were destroyed by fire. Around 1880 there was a dramatic decrease in use of oxen, especially in the Northwest. After ox teams completed hauling the settlers' wagons to Oregon Territory, they weren't replaced with young oxen, but by horses;

There were significant changes occurring during the late 1800's in the source and techniques of agricultural and industrial power. Though horses outnumbered oxen in agricultural use, oxen were being used in logging. But soon steam locomotives were being used in the forests to haul the large timbers. High wire logging, using steam donkey engines could move logs on cables suspended above the ground were coming into use after 1905, so there were less jobs for the oxen. The census of 1900 reviewed the sources of power in agriculture, "...power of the farm at the present time is principally that of the horse and mule, although... the steam engine is used to a limited extent in plowing the land "

Oxen were not just used for the dull labor of pulling the plough. In the early 1900's, reports Stoppard-Rose, three different armies used oxen mounted soldiers for cavalry: Madagascar, Burma, and some of the German Army in Africa. The animals reportedly learned to respond to bugle calls. Watts reprints a painting of a team of eighty-six oxen harnessed in six rows and rigged to pull a windmill that they moved two miles.

In response to a request for information about use of oxen in Yakima Valley, a noted regional historian told of hearing of a conflict between a pilot in an air plane training for air combat in WWI and a farmer plowing with oxen in the Ahtanum Valley. The pilot flew low over the farmer and his ox team that were plowing the field, frightening the animals that ran in fear. After the farmer regained control of the animals and resumed plowing, the pilot returned, again frightened the animals who again stampeded. The farmer, however, was prepared and threw a rock and boasted that he nearly hit the airplane. A fine example of defending a 3,500 year old technology with a rock, when it was being threatened by an aircraft using technology less than ten years old, and equipped to carry a machine gun. The farmer, pilot, oxen and aircraft all continued uninjured, but illustrated the ending of the use of oxen power and the rapid dominance of gasoline power and aircraft. The tale also illustrates that prehistoric agricultural technology and agricultural practices were still used on farms in Yakima Valley in the early 20th century.

Conclusions and observations

The illustrations of farmers in the Luttrell Psalter of the 14th century show a ploughman and an ox boy with an ox team pulling a two wheel plough. Another illustration shows a harrow pulled by an ox team along side a farmhand sowing seed. If these 14th century farmers had miraculously appeared on the grain fields of the Fort Vancouver farm in the 1830's or 1840's they could have replaced the Indian farm workers in their plowing, planting and harrowing tasks. Though they would not have recognized the surrounding landscape or spoken the language, the draft animals, the farm equipment, the seeds of wheat, barley, flax and lentils and the farming techniques of plowing, sowing, harrowing and harvesting were nearly identical to what they had used 500 years earlier. Perhaps some iron tips or steel plowshares had been added. If those same 14th century farmers saw the stone drawings of oxen and 2-wheeled ploughs from 2000 BCE, they also would have recognized the animals, the equipment, the process and the seeds. Possibly there would have been some stone, bone or horn tips added to the wooden ard or plough. The same seeds, draft animals and farm machinery had been in use for nearly 3,000 years. The same crops of lentils, wheat, rye and barley were grown. By 1900 the oxen had been replaced by horses and mules, the wooden farm equipment by steel and iron, the scythes and sickles and the threshing floor replaced by great steam traction engine powered combines.

In the past 100 years, with the introduction of petroleum and increased use of steel, the nature of farming has changed. Steel tractors moving on twelve rubber tired wheels or wide steel tracks can plow more acres than a herd of oxen. Perhaps more importantly, the use of petroleum has shifted the use of farm products. Petroleum based fiber is used to produce fabric and textiles, moving farm production away from the cotton, wool, flax and mulberry trees - for silk worms - used for fabric fibers. Chemical and mineral dyes for fabric eliminated large crops of dyestuffs: the woad, saffron, cochineal, and indigo that had been used for coloring fabric.

Chemical fertilizers have eliminated the need to haul tons and tons of animal feces, with the associated smell and diseases, from barns and city streets to redistribute it on the fields to improve and maintain farm soil. Petroleum, solar, nuclear and hydroelectric power shifted the use of olive oil and flax seed oil from use in lighting to greater use in human nutrition. With the resulting decrease in livestock, more of the cereal crops go to human nutrition rather than for animal feed. The farmer and his family no longer compete with the livestock for the same cereal foods. With abundant glass and plastic containers, gourds are no longer an important crop to be used for containers and water bottles. Groves of cork trees aren't needed for their bark with plastic stoppers and screw caps available. Farms need not maintain a wood lot for timbers for building and wood for heating, nor a reed field for thatch for roof building and repair.

Most of the changes to farming have been incremental, they have been gradual changes that have slowly replaced older farm practices over a generation or longer periods. The exception, it could be argued, was the introduction of the mass produced, gasoline powered tractor in 1917 by the Ford Company. World War I resulted in deaths of 500,000 to 800,000 British mules and horses and the death of nearly 800,000 British service men who would never return to farming or plowing a field. Food shortages were feared in England and Europe. Funding was made available to the Ford Company for a manufacturing facility for building a tractor that could be operated by a woman, with the first 5,000 or 6,000 being shipped to England to help with the food production. With internal combustion power, chemical fertilizer, petroleum fiber and fabric, and steel and iron farm machinery, farming and food production would never be the same.

References

1. Africa, Thomas W. The Immense Majesty: A History of Rome and the Roman Empire. Harlan Davidson, Inc. 1991.
2. Archer, C. I. "Retreat from the North: Spain's Withdrawal from Nootka Sound, 1793-1795". B.C. Studies. No 37, Sp. 1978.
3. Archer, C. I. "The Transient Presence: A Re-Appraisal of Spanish Attitudes Toward the Northwest Coast in the Eighteenth Century." B. C. Studies. No. 18., Summer, 1973.
4. Archer, James G. "Correspondence-1856-1861". Archives of Maryland Historical Society. Baltimore, Maryland. Atlas of Washington Agriculture. Olympia. Washington State Department of Agriculture. 1963.
5. Bancroft, H.H. The Works of Hubert H. Bancroft. A. L. Bancroft & Co. San Francisco. 1882.
6. Barker, Graeme. The Agricultural Revolution in Prehistory. Oxford University Press. 2006 and 2009.
7. Barry, J. Neilson. "Agriculture in the Oregon Country in 1795-1844." Oregon Historical Quarterly. XXX (June, 1929).
8. Baskes, Jeremy. Indians, Merchants and Markets. 1750 1821. Stanford University Press. 2000.
9. Bellwood, Peter. First Farmers. Blackwell Publishing. Oxford. 2005.
10. Boardman, John. Jasper Griffin and Oswyn Murray. Greece and the Hellenistic World. Oxford University Press. 1988.
11. Boening, Rose M. "History of Irrigation in the State of Washington." The Washington Historical Quarterly. Vol. IX. No. 4. (Oct., 1918). p. 259. Master's Thesis, University of Washington.
12. Brown, Peter. The World of Late Antiquity: AD 150 750. Thames and Hudson. 2013.
13. Brothwell, Don. "Diet, Economy and Biosocial Change in Late Prehistoric Europe." In Simpson. 1971.
14. Bumstead, J.M. "Mackay, John." Dictionary of Canadian Biography. University of Toronto. 2017.
15. Candolie, Alfonse de. Origin of Cultivated Plants. Hafner Publishing Co. N.Y. 1959. (reprint of 1886) Chance, David. People of the Falls. Kettle Falls Historical Center. Colville, WA. 1986.
16. Chevalier, Francois. Land and Society in Colonial Mexico. University of California Press, Los Angeles. 1966.
17. Cohen, Mark N. The Food Crisis in Prehistory. Yale University Press. New Haven. 1977.
18. Dyer, C. C. "Gardens and Garden Produce in the Later Middle Ages." in Woolgar.
19. Denman, Tim and Peter White. (eds.) The Emergence of Agriculture. Routledge, Oxon. 2007.
20. Dorset, Elaine C. A Historical and Archaeological Study of the 19th Century Hudson's Bay Company Gardens at Fort Vancouver.
21. Dunmire, William W. Gardens of New Spain. University of Texas Press. Austin. 2004.
22. Epstein, Steven A. An Economic and Social History of Later Medieval Europe. 1000-1500. Cambridge Univ. Press. 2009.
23. Finberg, H.P.R., (ed.) The Agrarian History of England and Wales. Cambridge University Press. Cambridge. 1967. Flower, Barbara and Elisabeth Rosenbaum. The Roman Cookery Book. Peter Nevill Ltd. London. 1958.
24. Fowler, P. J. "Early Prehistoric Agriculture in Western Europe: Some Archaeological Evidence." in Simpson. Fowler, P. J. The Farming of Prehistorical Britain. Cambridge University Press. 1983.
25. Franchere, Gabriel. Hoyt C. Franchere translator. Adventures at Astoria, 1810 1814. Univ. of Oklahoma Press, Norman.
26. Fussell, G.E. "Farming Systems of the Classical Era." Technology and Culture. Vol.8, No. I. Winter 1967.
27. Gates, Charles M. (ed.) Readings in Pacific Northwest History. Seattle. University Bookstore. 1941.

28. Grendon, Felix. "The Anglo-Saxon Charms." Journal of American Folklore. Vol. XXII, No. LXXXIV, April-June 1909.
29. Guie, H. Dean. Bugles In the Valley, Garnett's Fort Simcoe. Oregon Historical Society. Portland. 1977.
Hagan, Ann. Anglo-Saxon Food and Drink. Anglo-Saxon Books. Norfolk. 2006.
30. Harris, David R. and Gordon C. Hillman, (eds.) Foraging and Farming. Unwin Hyman Ltd., London. 1989.
31. Harris, Richard Colebrook. The Seigneurial System in Early Canada. Les Presses de L' Universite Laval. Quebec. 1966.
32. Hartman, Amos W. "The California and Oregon Trail 1849-1860." Oregon Historical Quarterly., Vol. XXV, Mar. 1924.
33. Hawkes, J.G. "The Ecological Background of Plant Domestication." In Ucko, P.J. and G. W. Dimbleby, The Domestication and Exploitation of Plants and Animals. Gerald Duckworth & Co. London. 1969.
34. Hayes, Wilma P. and R. Vernon Hayes. Foods the Indians Gave Us. Ives Washburn Inc. N.Y 1973.
Henry, Alexander. Journal of Alexander Henry 1799-1814. Champlain Society. 1988.
35. Herr, Richard. Rural Change and Roval Finances in Spain at the End of the Old Regime. UofCalif. Press. Berkeley. 1989.
36. Howay, F. W. "The Spanish Settlement at Nootka." The Washington Historical Quarterly. Vol. VIII., No. 3. July, 1917.
Hussey, John A. The Fort Vancouver Farm. (typescript). National Park Service. Vancouver. n.d.
37. Hussey, John A. The History of Fort Vancouver and Its Physical Structures. Washington State Historical Society. 1957.
Irvine, Ronald. The Wine Project: Washington State's Wine Making History. Sketch Publications. Vashon, WA. 1997.
Kennedy, Joseph C. Agriculture of the United States in 1860. U.S. GPO. Washington. 1864.
38. Kowrach, Edward J. Mie. Charles Pandosy, O.M.I., A Missionary of the Northwest. Ye Galleon Press. Fairfield, WA. 1992.
39. Kuhler, Joyce. A History of Agriculture in The Yakima Valley Washington From 1889 To 1900. Thesis, U. of Wash. 1940.
40. Mackenzie, Alexander. Alexander Mackenzie's Voyage to the Pacific Ocean in 1793. Citadel Press. New York.
41. MacNeish, Robert S. The Origins of Agriculture and Settled Life. University of Oklahoma Press. Norman. 1992.
42. Markey, T. L. "The Spread of Agriculture in Europe." in Harris.
43. McLoughlin, John. "The Farm at Fort Vancouver." Washington Historical Quarterly. II (October, 1907).
McWhorter, Lucullus V Crime Against the Yakimas. Republic Print. North Yakima, WA. 1913.
44. Meares, John. Voyages made in the Years 1788 and 1789 From China to the Northwest Coast of America. Da Capo Press, New York, 1967.
45. Merk, Frederick. (ed.). Fur Trade and Empire. George Simpson's Journal. Harvard University Press. London. 1931.
46. Miles, Jo N. "Kamiakin's Impact on Early Washington Territory." Pacific Northwest Quarterly. p. 159. Fall, 2008.
47. Morris, Robert and Gilly Vanderkamp. English Medieval Agriculture 1000-1485. Stuart Press. 2008.
48. Murray, Jacqueline. The First European Agriculture: A Study of the Osteological and Botanical Evidence Until 2000 BC. Edinburgh University Press. 1970.
49. Nelson, Denys. "Yakima Days." Washington Historical Quarterly. Vol. 19, 1928.
50. Ormsby, Margaret A. "The History of Agriculture in British Columbia." Scientific Agriculture. 20. P. 61-72. 1939.
51. Relander, Click. Drummers and Dreamers. Caxton Printer. 1986.

52. Relander, Click. Strangers on the Land. Yakima Indian Nation. Yakima, WA. 1962.
53. Salaman, Redcliffe N. The History and Social Influence of the Potato. Cambridge University Press. 1949.
Salzman, L.F. English Life in the Middle Ages. Oxford University Press. 1926.
54. Sauer, Carl O. Agricultural Origins and Dispersals. American Geographical Society. New York. 1972.
55. Scarre, Chris. The Human Past. Thames and Hudson. London. 2009.
56. Schoenberg, Wilfred P. Paths to the Northwest: A Jesuit History of the Oregon Province. Loyola U. Press. Chicago. 1982.
57. Seeborn, M. E., The Evolution of the English Farm. George Allen & Unwin Ltd. London. 1927.
58. Simpson, A. Aemilius Simpson's Journal. Hakluyt Society.
59. Simpson, D. D. A., (ed.) Economy and Settlement in Neolithic and Early Bronze Age Britain and Europe. Leicester University Press. 1971.
60. Smith, Bruce D. "Seed Plant Domestication in Eastern North America." in Last Hunters-First Farmers. Price, T.
61. Douglas and A. B. Gegauer, (eds.) Santa Fe, N.M. 1995.
62. Stanley, George F. G. Mapping the Frontier: Charles Wilson's Diary of the Survey of the 49th Parallel. 1858-1862. University of Washington Press, Seattle, 1970.
63. Stone. D. J. "The Consumption of Field Crops In Late Medieval England." in Woolgar, C.M. and D. Serjeantson and
64. T. Waldron, (eds.) Food in Medieval England. Oxford University Press. 2006 and 2009.
65. Stoppard-Rose, N. Man's Forgotten Friend: A History of the Ox.
66. Strange, James. James Strange's Journal and Narrative of the Commercial Expedition From Bombay to the North-West Coast of America. Shorey Book Store. Seattle. 1967.
67. Suttles, Wayne. "The Early Diffusion of the Potato Among the Coast Salish." Southwestern Journal of Anthropology. Vol. 7, 1951.
68. "The Yakima Valley." The Republic. North Yakima. April 21, 1887.
69. Thirsk, Joan. "Patterns of Agriculture in 17th Century England." Seventeenth Century New England. Vol 63. Colonial Society of Massachusetts. Boston. 1984.
70. Thirsk, Joan. "The Rural Economy." Our Forgotten Past. Jerome Blum, Ed. Thames and Hudson. New York. 1982.
71. Thompson, David. Columbia Journals. McGill University Press. Montreal. 2007.
72. U.S. Census, Vol. VII. Agriculture 1909 and 1910. Government Printing Office. 1913.
73. Vancouver, George. Voyage of Discovery to the North Pacific Ocean and Round the World. 1790-1795. London. 1798.
74. Walker, Francis. The Statistics of the Wealth and Industry of the United States. U.S. GPO, Washington. 1872.
75. Walker, Alexander. An Account of a Voyage to the North West Coast of America in 1785 1786. Robin Fisher and J.M. Bumsted, eds. Douglas and McIntyre. Vancouver/Toronto. 1982.
76. Watts, Martin. Working Oxen. Shire Publications. 1999.
77. Weiss, Ehud and Daniel Zohary. "The Neolithic Southwest Asian Founder Crops: Their Biology and Archaeobotany." Current Anthropology. Vol 52, No. 4. October 2011.
78. Welch, Jeanne M. Kamiakin's Gardens. National Registry of Historic Places Inventory-Nomination Form. Olympia, Washington. 1976.
79. White, K. D. Farm Equipment of the Roman World.

80. Williams, David and David Peacock. Bread for the People: Archaeology of Mills and Milling. ArchaeoPress. Oxford. 2011.
81. Young, R. W., O.M.I. The Mission of the Missionary Oblates of Mary Immaculate to the Oregon Territory (1847-1860).
82. *Dissertatio ad Doctoratum in Missiologia. Romae, 2000.*
83. Zohary, David. Domestication of Plants in the Old World. Oxford. 1993.
84. Zohary, Daniel. "Domestication of the Southwest Asian Neolithic Crop Assemblage of Cereals, Pulses and Flax." in Denman.