

## Environment, Culture and Diffusion : The Broad Bean in Québec

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Article abstract

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# Environment, Culture, and Diffusion : The Broad Bean in Québec

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## Abstract

An ancient Old World domesticate, broad bean (*Vicia faba*) was carried from Europe to North America early in the seventeenth century. Competition and unfavorable growing conditions marginalized it over most of the United States and Canada. The major exception was the Saguenay—Lac-Saint-Jean region where *gourgane* acquired a horticultural and culinary role. However, its cultivation there is not an archaic survival of old French varieties and usages. This study poses larger questions about the interplay of agro-ecological fit and cultural factors in the intercontinental transfer of crops.

**Key Words :** Broad Bean, *Vicia faba*, Crop introduction, Diffusion, North America, Québec.

## Résumé

**Environnement, culture et diffusion : la gourgane au Québec**

La fève des marais ou gourgane (*Vicia faba*), une plante cultivée depuis la Haute Antiquité en Europe, fit partie de l'inventaire agricole transporté en Amérique du Nord tôt au XVII<sup>e</sup> siècle. Ce légume n'y a pas généralement réussi, faute de climat convenable et d'un intérêt suffisant. À titre d'exception, la gourgane s'est intégrée dans la tradition potagère et le régime alimentaire de la frange périphérique au Québec, en particulier celle de la région du Saguenay—Lac-Saint-Jean. La diffusion de la gourgane n'y signifie pourtant pas une persistance archaïque des variétés et usages français. Si le transfert intercontinental des plantes cultivées dépend d'une adaptation écologique, son approbation dans un système agraire ne sera assurée que par un mélange des facteurs économiques et culturels.

**Mots-clés :** Fève des marais, gourgane, *Vicia faba*, diffusion, introduction des plantes, Amérique du Nord, Québec.

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Broad bean (*Vicia faba*) is an Old World cultigen with a complex history and ecology critical to understanding its comparatively recent New World chapter. In most of North America, broad bean is rarely cultivated or eaten and only dimly appreciated as being a distinct plant species. In Québec, however, it acquired a place in the gardens and kitchens of certain areas. This pattern of acceptance and rejection suggests the sorting process that all intercontinental crop transfers have undergone. The interplay of environmental fit, agrarian niche, and dietary intake provide a case study to reflect on the intricacies of the nature/culture interrelationship as it relates to crop transfers around the world.

A veil of nescience surrounds broad bean which has often been confused with other leguminous seed plants. In neither North American English nor North American French does the morpheme — bean or *fève* — segregate this particular species from others placed in that same category. Thus agricultural censuses have rarely distinguished *Vicia faba* from other beans. In fact most production of this plant in North America is not canvassed at all for it comes largely from non-commercial gardens. To geographically reconstruct such a plant in space and time requires an eclectic openness to a wide range of sources that include agronomic reports, gardening manuals and local histories.

## BROAD BEAN AS A CULTIVATED PLANT

### MORPHOLOGY AND ECOLOGY

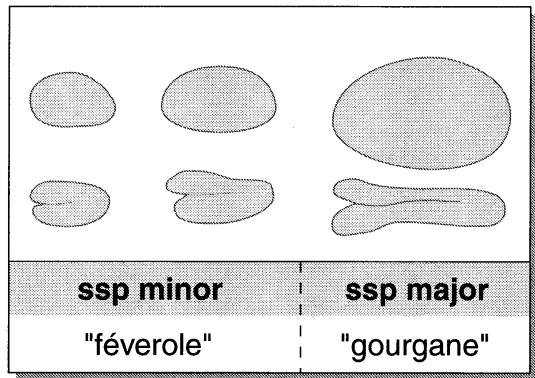
Broad bean has several characteristics that set it apart from other cultivated pulses in the bean family. The plant grows upright from one to two meters tall, with unbranched stems and without tendrils (photo 1). In most varieties the large papilionaceous flowers are white with a bold black blotch on each wing. The fuzzy pods may be short or long and the flat seeds may be large (2,5 cm), medium, or small (0,9 cm) in size (figure 1). Protein content of the seeds is high; fresh or dried, they have a distinct earthy flavor.

To yield well the plant requires a conflux of rather stringent environmental conditions. It needs moisture without interruption, for even brief droughts affect germination and truncate the flowering period. Clay soils that retain water are therefore well-suited to its cultivation. The growing plant is more tolerant of acid conditions than other leguminous crops. *Faba* is a cool-weather crop *par excellence*. Both the germinating seed in the ground and the mature plant can withstand temperatures as low as -4° C, and some varieties can take -10° C Chilly nights (10-15° C) increase yields. Conversely, temperatures above 23° C cause blossoms to prematurely drop off and encourage a number of fungal and viral diseases and insect pests. Broad bean's uncommon requirements owe much to its long history of use as a cultivated plant.

## Photo 1



Figure 1

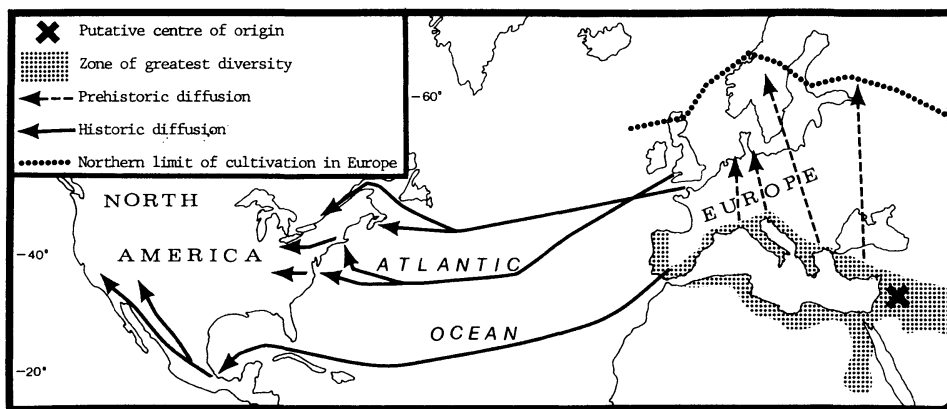


## OLD WORLD ASSOCIATIONS

This crop first appeared east of the Mediterranean Sea at least 8000 years B.P., though which of the wild *Vicia* species found there gave rise to the domesticate is not clear (Kislev, 1985; Cubero, 1984). At a very early time it spread westward through the Mediterranean Basin as a winter crop. During that period of the year abundant rainfall, high humidity and coolish temperatures prevail with harvest occurring as early as March. In Mediterranean tradition, the dried beans have been fried or toasted and ground into a meal or flour. The green seeds and sometimes the pods have also been consumed. Broad bean's long history as an excellent source of protein and vitamins evolved in concert with a paradoxical trade-off involving disease. *Faba* is one of the few cultivated legumes in which cooking does not eliminate toxins. Between 5 to 11 % of the Mediterranean human population have a genetic susceptibility to acute hemolytic anemia caused by the action of glucosides in the bean (Mager *et al.*, 1980). At the same time, however, susceptible people who survive that debilitating condition acquire resistance to malaria.

Between 3000 and 4000 years B.P., *Vicia faba* diffused northward in Europe where it has fit into two different seasonal regimes (figure 2). In northwestern France and southern England it could be planted in the late autumn, coaxed through the relatively mild winters and harvested in the spring (Lemery, 1698). Inland and farther north in Europe, hard winter freezes have restricted its cultivation to spring and summer. Coolish rainy weather from May to September in Germany and Scandinavia roughly parallels conditions from December to April in southern Europe. In whatever climatic zone, its agronomic success was greatest on humid soils rich in organic matter.

Figure 2



In the process of geographic expansion, mutations occurred and selection was made for larger seed size and long-day flowering. Medium-sized beans, common in Normandy and Brittany evolved from the small-seeded types (subsp. *minor*) of the Mediterranean. Large-seeded varieties (subsp. *major*) of *faba* beans emerged during the Middle Ages and were cultivated as a garden crop in Europe (Korber-Gröhne, 1987, pp. 126-127). Large-seeded broad beans compete poorly with weeds; for that reason gardening, which involves the intensive hand weeding of gardening, is more adapted to successful yield than field cultivation. Moreover individual hand sowing places the bean deeply in the soil where the greater moisture content assures better germination than broadcast seeding. In England, the «great beane» referred to in Gerard's (1975) sixteenth-century herbal was grown in gardens everywhere around London. Smaller seeded varieties were grown as field crops, some for human food, others as animal feed. On the eve of the great discoveries, *Vicia faba* in its considerable diversity was the only cultivated bean species in northwestern Europe.

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## BROAD BEAN IN NORTH AMERICA

Broad bean was introduced along with other elements of Old World agricultural subsistence to North America in the seventeenth century. Given its dietary role throughout Europe at the time, British, French, Dutch, German and Spanish settlers all plausibly carried broad bean seeds with them. In New England, the *in situ* possibilities offered by Amerindian agriculture allowed bearers of the introduced European inventory to discard the familiar and still not threaten their survival (Josselyn, 1672). *Vicia faba* did not yield satisfactorily in years of heat waves or droughts (Deane, 1797). The native kidney bean (*Phaseolus vulgaris*) was much less subject to crop failure, yet had good flavor and keeping qualities. Broad bean, though it never totally disappeared in New England, was enough of a poor match to the environment to make it hardly worth the labour, time and space needed to cultivate it. In the Southwest and California, where it had been first brought from Spain via Mexico, the plant had an early start but never became an important crop. Over most of the West, Midwest and South summers were too unremittingly hot and often too dry as well for its successful cultivation. Kidney bean, Lima bean (*Phaseolus lunatus*), cowpea (*Vigna unguiculata*), scarlet runner bean (*Phaseolus coccineus*) and hyacinth bean (*Dolichos lablab*) have been better suited than *Vicia faba* for temperatures above 28° C.

Broad bean was also largely rejected as a food plant in most of what later became Canada. On the Atlantic façade it was one of the plants cultivated early in the seventeenth century from France (Biard, 1897, p. 62). It languished there as it did in New England, without gaining dietary importance. Across the continent on the Pacific Coast, western British Columbia is a close climatic analogue with northwestern Europe, yet broad bean has not been a conspicuous horticultural element there. In the Prairie Provinces, especially in Manitoba, the plant has had an agricultural presence since the 1970s as a protein supplement for livestock.

Compared to Europe where this crop was widely appreciated as a source of food, its North American role has been scanty but not because of lack of introduction. Each new group of European immigrants, wanting to duplicate their Old World crop inventory, tried to grow broad bean (Grece, 1819, p. 119; Burr, 1865). Undependable yield from one year to the next discouraged its cultivation, so that gardening repertoires eventually excluded it. By the early nineteenth century North Americans had largely given up on this plant (Fessenden, 1839; Neill, 1855; Bridgeman, 1867; Bailey, 1907; French, 1907; Hedrick, 1950). Today most seed distributors in the United States and Canada do not include broad bean in their inventories. Except among certain ethnic groups, especially Greek and Italian, gardeners are generally ignorant of it, and few people have savoured it as a vegetable. On a continental scale broad bean has failed to become part of horticulture or diet. At the regional level a divergent pattern emerges in Québec.

## BROAD BEAN IN QUÉBEC

### Historical and linguistic evidence

Broad bean in Québec had more relative success as a crop plant than elsewhere in North America. Time of first arrival in the St. Lawrence Valley is uncertain, for it is not clear that Jacques Cartier actually brought seeds of this plant on his third voyage to the St. Lawrence Valley in 1541 (Rousseau, 1937). Cartier did, however, contrast the broad bean familiar to him in France with the indigenous kidney bean which he also called *fève*. What is clearer is that native peoples adopted no Old World plants Cartier might have brought. Its actual cultivation had to wait until Europeans came as settlers. In 1618 Louis Hébert brought seeds of European crops and planted a proper vegetable garden at Québec that included this Old World bean. Every ship bringing French settlers must have carried dried broad beans as provisions during the journey. This crop was widely known and cultivated in northern and western France from whence most immigrants to New France came. Uneaten seeds left over after arrival could be used as propagules for a colonist's first garden plot.

Broad bean's relative importance in New France is elusive, for different pulses were usually aggregated under the same name of *fève*. In most cases, when used without qualification, *fève* in Québec has meant *Phaseolus vulgaris*, a plant which in France became known as *haricot*. A name still used in France, *fève des marais* («marsh bean»), appertains unambiguously to broad bean when used in the Québec context. Other adjectival qualifiers for the plant created an abundant folk nomenclature at a local or regional level: *fève d'Espagne* («Spanish bean») (Barbeau, 1917); *fève à café* («coffee bean»); *fève brune* («brown bean»); *fève rose* («pink bean»); *fève marron* («chestnut bean»); and *fève des marins* («sailor's bean») (Dulong and Bergeron, 1980, IV, pp. 1416-1417). Also derived from *fève* is *féverole* which now signifies the small-seeded kinds of broad bean used to feed livestock. Still other names for this crop are *orteil de prêtre* («priest's toe»), *nombril jaune* («yellow navel») and *gourgane*. *Gourgane* is now the most common vernacular term in Québec for this plant and its edible seeds. Once used in Normandy dialect as a mariner's term for the dried beans that formed part of ship provisions, it survives as a classic archaism in Québec (Boisvert *et al.*, 1985, pp. 78-79).

In the seventeenth century *feves de marais* were grown in both fields and gardens as a subsistence and commercial crop in the Montréal area (Boucher, 1664; Séguin, 1987, p. 189). In 1749, Pehr Kalm (1753-1761, III, p. 339) found this species of bean planted in kitchen gardens near the city of Québec. As in Europe broad bean was most suited to horticultural settings, not large fields. Québec vegetable gardens included crops originally brought from Europe and the New World maize, kidney beans, and squash. Then as now crops were grown in rows and separate blocks, an European design which was standard throughout North America.

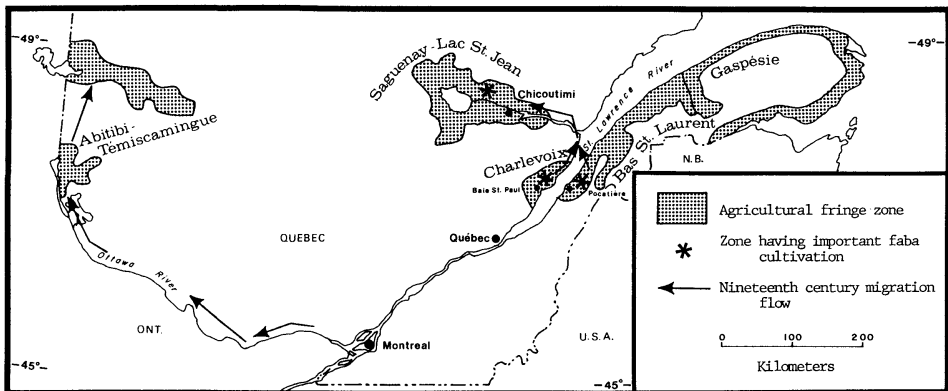
By the late nineteenth century, broad bean had fallen into much the same obscurity in southern Québec as in New England. Many vegetable inventories failed to mention the plant. Gardening manuals gave only passing reference to it

(Provancher, 1874; Langelier, 1890; Rouleau, 1890; Santerre, 1903). One wartime guide for the Québec vegetable grower did not even describe the plant (Billault, 1942). Peas and kidney beans, considered better adapted and better tasting than *gourgane*, were the two pulses of importance. The rapid rise before 1850 of the potato as a food may have pushed *gourgane* into a marginal position, but the occasionally hot summer weather of southern Québec seems also to have discouraged its general cultivation. Yet some market gardeners around urban centers continue to grow it and sell the fresh seeds in Montréal and Québec markets.

### Ambient conditions on the fringe

This plant found a niche on the northern fringes of the agricultural ecumene between 47° and 49° N, latitude in three main regions : Saguenay—Lac Saint-Jean, Charlevoix and the Bas-Saint-Laurent northward from La Pocatière (figure 3). Daily high temperatures in July, the warmest month, are 22-24,5° C; low temperatures for that month are 10, 6-13, 5° C (Environment Canada, 1982). The average number of frost-free days in those northerly reaches varies from 85 to 130 depending on microclimate, with a yearly precipitation that exceeds 850 mm. Occasional rainfall deficiencies during the summer were compensated for the moisture retained in the clay soils.

Figure 3





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Since long daylight increases the rate of flower initiation of varieties that evolved in northern Europe, photoperiod may also play a role (Evans, 1959; Poulain *et al.*, 1989). On June 21, the 16 hours 10 minutes of daylight at 49° N are 33 minutes longer than on the border with New York and Vermont (45° N). Broad bean in the Québec fringe is also favoured by lowered light intensity due to the high degree of cloudiness. By one measure, Hébertville has 184 hours less of bright sunshine than Montréal in the three months of June, July and August (Wilson, 1975). If the ambient conditions are nearly ideal in those latitudes for the growth of *gourgane*, it has not been cultivated everywhere on the northern fringe. Farmers and gardeners in the good clay soils of Abitibi-Témiscamingue did not give much attention to cultivation of this crop. Many settlers who migrated there in the colonization schemes of the early twentieth century came from the Ottawa Valley where broad bean was scarcely known.

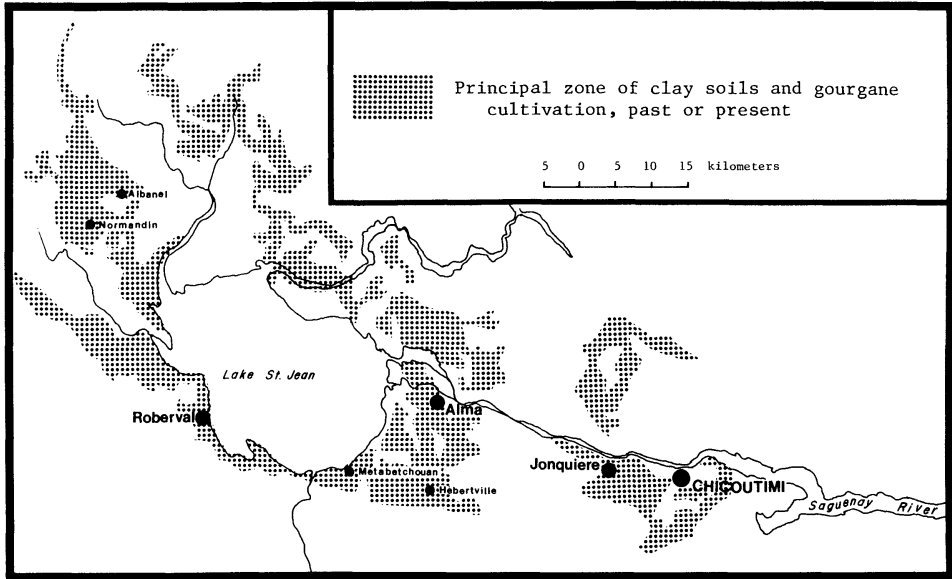
## FABA IN THE SAGUENAY—LAC-SAINT-JEAN

### ORIGINS, SETTLEMENT, AND LAND USE

*Faba's* greatest historic success in North America has been 300 km northwest of Québec City in the Saguenay—Lac-Saint-Jean Basin. Beginning in the 1830s, this agricultural outlier was settled by *charlevoisiens* who arrived with knowledge of how to cope with the short growing season. Their forebearers had worked out an adjustment to the unreliable growing climate near what was then the effective northern limit of agriculture. Beginning in 1849, a second migratory flow occurred to Saguenay—Lac-Saint-Jean with people from Kamouraska and L'Islet counties on the eastern side of the St. Lawrence. Migration of several hundred families from these two primary source areas and a high degree of intermarriage within the region resulted in a narrow human gene pool. Over time a deleterious build-up of recessive genes appeared in the regional population as hereditary disorders (Bouchard, 1988).

Self-sufficiency was an initial preoccupation for settlers involved in wood-cutting as much as farming (Bouchard, 1977). They brought the same hardy crops they grew in the Charlevoix: small grains (wheat, barley, oats, and rye), potato, turnip, cabbage, pea, carrot, onion and *gourgane*. This Old World bean had a solid reputation in the Charlevoix as a crop people could depend on (Gérin, 1938, pp. 13-54; Gauldrée-Boilleau, 1968; Provencher, 1984a, p. 77). Vast areas of clay soils in the region were well suited to the crop (figure 4). Whereas kidney bean was not safely sown until early June, broad bean could be planted in cold ground beginning in early May. Seeds germinate at only 3,5° C so that May freezes left tender plants unscathed. Pods continued to mature for several weeks after the first frosts which normally arrive in the second week of September. Not until temperatures below -5° C took hold in October were the plants killed.

Figure 4



*Gourgane's* high food value and adaptability to the cool climate and soil favoured its cultivation, though it never dominated land use. The mixed grain and livestock economy that emerged in the region shifted in the 1890s to commercial dairying. Although agricultural land has declined more than 30 % since the 1960s, potatoes and blueberries are still important crops on sandy soils around the lake (Gauthier, 1975) The region's sequestration near the northern limit of commercial agriculture did not place it outside the North American mainstream (Bouchard, 1990). The tractor, silos and the Mason canning jar rapidly became part of rural life, and certain foods that originated in the United States, such as canned pork and beans, corn flakes and toasted bread, became part of local diets.

#### CULTIVATION AND USE

Increased competition and permutations in livelihood have not extinguished broad bean's role as a food plant there. New hybrid seeds enable the cultivation of more different kinds of crops in a climate from which they once were excluded. Commercial greenhouses provide fresh vegetables, especially tomatoes, and grocery chains import substantial amounts of produce from the United States. Nevertheless *gourgane* remains a visible and much appreciated food plant in the region. Most production comes from vegetable gardens that a majority of rural households continue to plant although, as elsewhere in North America, self-sufficiency is n° longer a compelling motive. Some gardeners allot more space to *gourgane* than to any other of the half dozen plants they normally grow. Home freezing is now the preferred means of preservation for future use.

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Field cultivation of *gourgane* occupies about 70 ha in the *maraîchage* zones around Hébertville, Métabetchouan, Alma and near Roberval. Truck farms located on clay soils produce it for sale to supermarkets and roadside stands within the region. Urban dwellers in Chicoutimi, Jonquière, Roberval, Alma and other large towns eat broad beans. An attempt in the region to commercially can *gourgane* was economically unsuccessful, which suggests minimal interest in it as a comestible elsewhere in Québec and in Canada.

Unlike France where the seeds and stalks have been fed to pigs and horses, that use has not been traditional anywhere in North America. However, since the 1970s, the small-seeded *féverole* has been grown in the region on a small scale as a substitute for imported soybean cake. Impetus to cultivate field-grown varieties for this purpose has come from recommendations of two agricultural experiment stations at Normandin and La Pocatière (Drapeau, 1993). The broad bean varieties used for human consumption in the region are primarily those introduced directly or indirectly from England in the nineteenth and twentieth centuries. Two antique land races, *Baie-Saint-Paul/Arnaud* and *Côte des Fortin*, were possibly brought from seventeenth-century France; they are little known, rarely cultivated, and near extinction (Provencher, 1984b).

#### GOURGANE AND REGIONAL TRADITION

Broad bean in this region of Québec has been mainly used for the slightly immature green seeds. Eating the pods, grilling the seeds or mashing them into a purée enriched with fat — uses known in France — are not part of Québec folk tradition (Castelot, 1971, p. 187). Nor for that matter are seeds germinated to make sprouts or leaves of the plant eaten as a potherb. Even drying seed has not been common in the region aside from obtaining stocks for the next year's planting. One minor usage, now obsolete, was *café aux gourganes*, a coffee substitute made from seeds dried, finely ground, and dried again with the use of heat. Regional food processing did not include meal or flour. Difficulties of air drying seed of high water content in a cool cloudy climate might explain the emphasis on the fresh bean. Use of tender green seeds was also encouraged by a strong regional culinary preference for their part in making soup.

This emblematic dish involves more ingredients than its name implies (Boisvenue, 1964; Bouchard, 1967; Mongrain-Dontigny, 1988; Normand and Couillard, 1982). Grain is a component; whole barley (often called *barli* rather than *orge*) is preferred, but rice or even pasta is not excluded. Salt pork, ham bone, or beef is often added. Some cooks favour the addition of butter and special herbs, especially savoury. Broad beans are the only indispensable ingredient. They impart their inimitable musty flavour, but they also tint the broth a rich brown, considered to be the appropriate appearance for this dish. Colour is imparted by the hypocotyl which is not removed in the shelling process. But broad beans are not the only vegetable: onion, carrot, cabbage, rutabaga (*chou de Siam*), celery, shallot, potato and/or kidney bean can also be part of *soupe aux gourganes*. The panoply of ingredients make it one manifestation of the classic pepper pot that countless cultures have

devised as fuel and warmth for the body. The *potage aux fèves* of Normandy bears superficial resemblance only in that both dishes include broad beans. Particularly interesting is that the Québec version is very often made with whole barley which betrays a Scottish culinary influence. Tremblay (1976, pp. 15-16) suggests that *soupe aux gourganes* had its specific roots in the staple dish prepared on board seventeenth-century ships.

The broad bean has acquired a regional specificity for its role in traditional cookery (Rousseau, 1967, p. 23). *Soupe aux gourganes* forms the first course of a highly structured meal that moves to *tourtière*, a thick crust filled with small pieces of wild game or pork separated by a layer of potatoes. The meal ends with *tarte aux bleuets*, a pie made with the most abundant fruit of the area (photo 2). Broad bean and blueberry as regional totems extend beyond food or agriculture to become folkloric elements of the *petite patrie*. Extended kinship networks among most of the 300 000 people in Sagamie enhance awareness of their genealogical ties to the nineteenth-century pioneers from the Lower St. Lawrence who cleared the vast forests as *bûcherons* and farmers. Other elements of a geographically defined particularism are pride in hunting and fishing skills, hockey prowess, and certain lexical idiosyncracies in this most monolingual part of francophone Québec. Realization of how *gourgane* evokes history and culture is a prerequisite to understanding why a humble bean could have become a badge of regional identification.

## Photo 2



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Since 1974, broad bean has been the thematic centerpiece at the *Festival de la gourgane* in the town of Albanel, population 1 422, north of lac Saint-Jean. This occasion held on the first weekend of August coincides with the beginning of the broad bean harvest. The original idea for the festival came when a broad bean canning plant was established in Albanel. That enterprise later failed, but the event continued as an annual community celebration. In addition to musical shows and sporting matches, activities involve food sampling, including a range of broad bean soup recipes, and contests to shell seeds from their pods (*gourganéthon*). Events were held in Albanel's community center called *La Gourganière*, before the building was destroyed by fire in 1989.

## CONCLUSION

*Gourgane's* slender, uneven pattern of cultivation and use in North America points to the key importance of two main processes. First, diffusion in two different phases separated by more than 200 years made this crop available from its hearths and also conditioned its acceptance by sorting out its adaptability in the Charlevoix staging area. Secondly, the search for agro-ecological fit fell on the Saguenay—Lac-Saint-Jean region where the cloudy, cool and short summers encouraged farmers to include it in their plots and diets. Satisfactory yields and high protein content of the seeds made it a dependable and nutritious food plant there.

Establishment of *gourgane* in this region does not, however, denote survival of a larger trait complex of archaic traits, in spite of its perceived remoteness. The varieties grown and the ways the plant have been used, do not closely resemble those in France. Cultural continuity is also placed in doubt by the regional absence of favism, a disease known in France. Some incidence of this enzymatic deficiency might be expected, given the history of ardent *gourgane* consumption, regional endogamy and emergence of other hereditary disorders.

The truncated saga of *Vicia faba* in North America leads to broader reflection on agricultural transfer over the last half millenium. Barriers to the kinetic movement of propagules were insignificant compared to those that controlled a plant's adaptation. Contrary to the Lamarckian view of nature, old crops taken to new places did not modify their tolerance limits to fit a different set of growth conditions. Inability to yield annihilated most attempted transfers. Two seventeenth-century cases in point, vinifera grapevines in the city of Québec and orange trees in Jamestown, Virginia, were ultimately screened out by killing freezes. These experiences, multiplied in many locales, indicate the environmental and horticultural state of knowledge at the time and the trial and error that was the only practical procedure to follow in plant introduction. North American became a vast and diverse environmental stage from the seventeenth to the nineteenth centuries on which farmers sought to duplicate the crop inventory of their cultural baggage. Once a crop had passed muster, cultural factors played the key role in establishing its relative importance and kinds of uses.

The post-Columbian carriage of cultigens to other continents is a collection of odysseys, all different and still largely untold. Each crop introduction, whether a success, failure or having an indeterminate status between, has an historical and geographical trajectory all its own. Analysis of many individual transfers would establish an empirical basis for sound generalizations on the intercontinental dissemination of food plants as one of the most significant kinds of diffusion in the history of the world. The foundations for a theory of crop introduction could eventually emerge from this thinking.

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