

Source: Michael Pollan, *The Botany of Desire: A Plant's Eye View of the World* (New York: Random House, 2001), p. 192-194, 198-206, 229-231.

## History of the Potato

*The Andes, 1532.* The patented potatoes I was planting are descended from wild ancestors growing on the Andean altiplano, the potato's "center of diversity." It was here that *Solanum tuberosum* was first domesticated more than seven thousand years ago by ancestors of the Incas. ...

My blue potato is part of the cornucopia of potatoes developed by the Incas along with their ancestors and descendants. In addition to the blue potato, the Incas grew reds, pinks, yellows, and oranges; all manner of skinnies and fatties, smooth-skinneds and russets, short-season spuds and long, drought-tolerant and water-loving, sweet tubers and bitter ones (good for forage), starchy potatoes and others almost buttery in texture—some three thousand different spuds in all. This extravagant flowering of potato diversity owes partly to the Incas' desire for variety, partly to their flair for experimentation, and partly to the intricacy of their agriculture, the most sophisticated in the world at the time of the Spanish conquest. ...



Photo: Farming terraces in Peru.

The Incas figured out how to grow impressive yields of potatoes under the most inauspicious conditions, developing an approach that is still in use in parts of the Andes today. A more or less vertical habitat presents special challenges to both plants and their cultivators, because the microclimate changes dramatically with every change in altitude or orientation to the sun and wind. A potato that thrives on one side of a ridge at one altitude will languish in another plot only a few steps away. No monoculture could succeed under such circumstances, so the Incas developed a method of farming that is monoculture's exact opposite. Instead of betting the farm on a single cultivar, the Andean farmer, then as now, made a great many bets, at least one for every ecological niche. Instead of attempting, as most farmers do, to change the environment to suit a single optimal spud—the Russet Burbank, say—the Incas developed a different spud for every environment. ...

The genetic diversity cultivated by the Incas and their descendants is an extraordinary cultural achievement and a gift of incalculable value to the rest of the world. ... Francisco Pizarro was looking for neither plants nor intellectual property when he conquered the Incas; he had eyes only for gold. None of the conquistadores could have imagined it, but the funny-looking tubers they encountered high in the Andes would prove to be the single most important treasure they would bring back from the New World. ...

*Ireland, 1588.* Like an alien species introduced into an established ecosystem, the potato had trouble finding a foothold when it first arrived in Europe toward the end of the sixteenth century, probably as an afterthought in the hold of a Spanish ship. The problem was not with the European soil or climate, which would prove very much to the potato's liking (in the north anyway), but with the European mind. Even after people recognized that this peculiar new plant could produce more food on less land than any other crop, most of European culture remained inhospitable to the potato. Why? Europeans hadn't eaten tubers before; the potato was a member of the nightshade family (along with the

equally disreputable tomato); potatoes were thought to cause leprosy and immorality; potatoes were mentioned nowhere in the Bible; potatoes came from America, where they were the staple of an uncivilized and conquered race. The justifications given for refusing to eat potatoes were many and diverse, but in the end most of them came down to this: the new plant ... seemed to contain in its being too little of human culture and rather too much unreconstructed nature.

Oh, but what about Ireland? Ireland was the exception that proved the rule—indeed, the exception that largely wrote the rule, since that country's extraordinary relationship to the potato consolidated its dubious identity in the English mind. Ireland embraced the potato very soon after its introduction, a fateful event sometimes credited to Sir Walter Raleigh, sometimes to the shipwreck of a Spanish galleon off the Irish coast in 1588. As it happened, the cultural, political, and biological environment of Ireland could not have better suited the new plant. Cereal grains grow poorly on the island (wheat hardly at all), and, in the seventeenth century, Cromwell's Roundheads seized what little arable land there was for English landowners, forcing the Irish peasantry to eke out a subsistence from soil so rain-soaked and stingy that virtually nothing would grow in it. The potato, miraculously, would manage to extract prodigious amounts of food from the very land the colonial English had given up on. And so, by the end of the seventeenth century, the plant had made a beachhead in the Old World; within two centuries it would overrun northern Europe, in the process substantially remaking its new habitat.

The Irish discovered that a few acres of marginal land could produce enough potatoes to feed a large family and its livestock. The Irish also found they could grow these potatoes with a bare minimum of labor or tools, in something called a "lazy bed." The spuds were simply laid out in a rectangle on the ground; then, with a spade, the farmer would dig a drainage trench on either side of his potato bed, covering the tubers with whatever soil, sod, or peat came out of the trench. No plowed earth, no rows, and certainly no Agricultural Sublime—a damnable defect in English eyes. Potato growing looked nothing like agriculture, provided none of the Apollonian satisfactions of an orderly field of grain, no martial ranks of golden wheat ripening in the sun. Wheat pointed up, to the sun and civilization; the potato pointed down. ...

The Irish were too hungry to worry about agricultural aesthetics. The potato might not have presented a picture of order or control in the field, yet it gave the Irish a welcome measure of control over their lives. Now they could feed themselves off the economic grid ruled by the English and not have to worry so much about the price of bread or the going wage. For the Irish had discovered that a diet of potatoes supplemented with cow's milk was nutritionally complete. In addition to energy in the form of carbohydrates, potatoes supplied considerable amounts of protein and vitamins B and C (the spud would eventually put an end to scurvy in Europe); all that was missing was vitamin A, and that a bit of milk could make up. (So it turns out that mashed potatoes are not only the ultimate comfort food but all a body really needs.) And as easy as they were to grow, potatoes were even easier to prepare: dig, heat—by either boiling them in a pot or simply dropping them into a fire—to eat.

Eventually the potato's undeniable advantages over grain would convert all of northern Europe, but outside Ireland the process was never anything less than a struggle. In Germany, Frederick the Great had to force peasants to plant potatoes; so did Catherine the Great in Russia. Louis XVI took a subtler tack, reasoning that if he could just lend the humble spud a measure of royal prestige, peasants would experiment with it and discover its virtues. So Marie Antoinette took to wearing potato flowers in her hair, and Louis hatched an ingenious promotional scheme. He ordered a field of potatoes planted on the royal grounds and then posted his most elite guard to protect the crop during the day. He sent the guards home at midnight, however, and in due course the local peasants, suddenly convinced of the crop's value, made off in the night with the royal tubers.

In time, all three nations would grow powerful on potatoes, which put an end to malnutrition and periodic famine in northern Europe and allowed the land to support a much larger population than it ever could have supported in grain. Since fewer hands were needed to farm it, the potato also allowed the countryside to feed northern Europe's growing and industrializing cities. Europe's center of political gravity had always been anchored firmly in the hot, sunny south, where wheat grew reliably; without the potato, the balance of European power might never have tilted north.

The last redoubt of antipotato prejudice was in England, and there it was not confined to a hidebound or superstitious peasantry. Well into the nineteenth century, a significant portion of elite opinion in London regarded the potato as nothing more or less than a threat to civilization. Proof? All one had to do was point in the direction of Ireland.

*England, 1794.* The wheat harvest in the British Isles failed in 1794, sending the price of white bread beyond the reach of England's poor. Food riots broke out, and with them a great debate over the potato that would rage, on and off, for half a century. ... Engaging the energies of the country's leading journalists, agronomists, and political economists, the potato debate brought to the surface predictable English anxieties about class conflict and the "Irish problem." But it also

threw into sharp relief people's deepest feelings about their food plants and the ways they root us, for better and worse, in nature. Do we control these plants? Or do they control us?

The debate was kicked off by the potato's advocates, who argued that introducing a second staple would be a boon to England, a way to feed the poor when bread was dear and keep wages—which tended to track the price of bread—from rising. Arthur Young, a respected agronomist, had traveled to Ireland and returned convinced that the potato was “a root of plenty” that could protect England's poor from hunger and give farmers more control over their circumstances at a time when the enclosure movement was undermining their traditional way of life.

The radical journalist William Cobbett also traveled to Ireland, yet he returned with a very different picture of the potato eaters. Whereas Young had seen self-reliance in the Irishman's potato patch, Cobbett saw only abject subsistence and dependence. Cobbett argued that while it was true that the potato fed the Irish, it also impoverished them, by driving up the country's population—from three million to eight million in less than a century—and driving down its wages. The prolific potato allowed young Irishmen to marry earlier and support a larger family; as the labor supply increased, wages fell. The bounty of the potato was its curse.

In his articles, Cobbett depicted “this damned root” as a kind of gravitational force, pulling the Irishman out of civilization and back down into the earth, gradually muddying the distinctions between man and beast, even man and root. This is how he described the potato eater's mud hut: “no windows at all; . . . the floor nothing but the bare earth; no chimney, but a hole at one end . . . surrounded by a few stones.” In Cobbett's grim imager, the Irish had themselves moved underground, joining their tubers in the mud. Once cooked, the potatoes “are taken up and turned into a great dish,” Cobbett wrote. “The family squat round this basket and take out the potatoes with their hands; the pig stands and is helped by some one, and sometimes he eats out of the pot. He goes in and out and about the hole, like one of the family.” The potato had single-handedly unraveled civilization, putting nature back in control of man.

“Bread root” was what the English sometimes called the potato, and the symbolic contrast between the two foods loomed large in the debate, never to the spud's advantage. Catherine Gallagher points out that the English usually depicted the potato as mere food, primitive, unreconstructed, and lacking in any cultural resonance. In time, that lack would itself become precisely the potato's cultural resonance: the potato came to signify the end of food being anything more than food—animal fuel. Bread, on the other hand, was as leavened with meaning as it was with air.

Like the potato, wheat begins in nature, but it is then transformed by culture. While the potato is simply thrown into a pot or fire, wheat must be harvested, threshed, milled, mixed, kneaded, shaped, baked, and then, in a final miracle of transubstantiation, the doughy lump of formless matter rises to become bread. This elaborate process, with its division of labor and suggestion of transcendence, symbolized civilization's mastery of raw nature. A mere food thus became the substance of human and even spiritual communion, for there was also the old identification of bread with the body of Christ. If the lumpish potato was base matter, bread in the Christian mind was its very opposite: antimatter, even spirit.

The political economists also weighed in on the potato debate, and though they framed their arguments in somewhat more scientific terms, their rhetoric too betrays deep anxieties about nature's threat to civilization's control. Malthusian logic started from the premise that people are driven by the desires for food and sex; only the threat of starvation keeps the population from exploding. The danger of the potato, Malthus believed, was that it removed the economic constraints that ordinarily kept the population in check. This is a nutshell was Ireland's problem: “the indolent and turbulent habits of the lower Irish can never be corrected while the potato system enables them to increase so much beyond the regular demand for labour.”

In the same way that the potato exempts the potato eater from the civilizing processes of bread making, it also exempts him from the discipline of the economy. Political economists like Adam Smith and David Ricardo regarded the market as a sensitive mechanism for adjusting the size of the population to the demand for labor, and the price of bread was that mechanism's regulator. When the price of wheat rose, people had to curb both of their animal appetites and so produced fewer babies. The problem with “the potato system” is that, under it, the *Homo economicus* who adjusts his behavior to the algebra of need is replaced by a far less rational actor—*Homo appetites*, as Gallagher calls him. If Economic Man operated under the coolly rational sign of Apollo, Appetite Man was in thrall to earthy, fecund, amoral Dionysus. Since the Irishman grew and ate his own potatoes, and since his potatoes (unlike wheat flour) could not easily be stored or traded, they never became commodities and were therefore, like him, subject to no authority but nature's own.

In the eyes of the political economists, capitalist exchange was a lot like baking, since it represented a way of civilizing anarchic nature—the anarchic nature, that is, of both plants and people. Without the discipline of commodity markets, man is thrown back on his instincts: unlimited food and sex leading inexorably to overpopulation and misery. David Ricardo was convinced that the potato was both the cause and symbol of this regression, this surrender of control to nature. As long as humans need to eat, we can never completely insulate ourselves from the vicissitudes of nature; the

best we can do, Ricardo believed, was to rely on a staple that, like wheat, can be stored against storms and droughts and readily converted into money to buy other foods. The potato offered no such security. By refusing to transcend its own nature and become a commodity, the potato threatened, in Gallagher's words, to "wipe out the progress an advanced economy has made in liberating humankind from dependence on shifty nature."

About this much, at least, history would prove the political economists terribly correct. The control with which the potato appeared to have blessed the Irish would turn out to be a cruel illusion. Dependence on the potato had in fact made the Irish exquisitely vulnerable, not to the vicissitudes of the economy so much as to those of nature. This they would abruptly discover late in the summer of 1845, when *Phytophthora infestans* arrived in Europe, probably on a ship from America. Within weeks the spores of this savage fungus, borne on the wind, overspread the continent, dooming potatoes and potato eaters alike. ...

*Ireland, 1846.* "On the 27<sup>th</sup> of last month [July] I passed from Cork to Dublin, and this doomed plant bloomed in all luxuriance of an abundant harvest." So begins a letter written in the summer of 1846 by a Catholic priest named Father Mathew. "Returning on the 3<sup>rd</sup> [of August] I beheld with sorrow one wide waste of putrefying vegetation. In many places the wretched people were seated on the fences of their decaying gardens, wringing their hands, and wailing bitterly the destruction that had left them foodless."

The arrival of the blight was announced by the stench of rotting potatoes, a stench that became general in Ireland in the summer of 1845, then again in '46 and '48. Its spores carried on the wind, the fungus would appear in a field literally overnight: a black spotting of the leaves followed by a gangrenous stain spreading down the plant's stem; then the blackened tubers would turn to evil-smelling slime. It took but a few days for the fungus to scorch a green field black; even potatoes in storage succumbed.

The potato blight visited all of Europe, but only in Ireland did it produce a catastrophe. Elsewhere, people could turn to other staple foods when a crop failed, but Ireland's poor, subsisting on potatoes and exiled from the cash economy, had no alternative. As is often the case in times of starvation, the problem was not quite so simple as a shortage of food. At the height of the famine, Ireland's docks were heaped with sacks of corn destined for export to England. But the corn was a commodity, determined to follow the money; since the potato eaters had no money to pay for corn, it sailed for a country that did.

The potato famine was the worst catastrophe to befall Europe since the Black Death of 1348. Ireland's population was literally decimated: one in every eight Irishmen—a million people—died of starvation in three years; thousands of others went blind or insane for lack of the vitamins potatoes had supplied. Because the poor laws made anyone who owned more than a quarter acre of land ineligible for aid, millions of Irish were forced to give up their farms in order to eat; uprooted and desperate, the ones with the energy and wherewithal emigrated to America. Within a decade, Ireland's population was halved and the composition of America's population permanently altered.

Contemporary accounts of the potato famine read like visions of Hell: streets piled with corpses no one had the strength to bury, armies of near-naked beggars who'd pawned their clothes for food, abandoned houses, deserted villages. Disease followed on famine: typhus, cholera, and purpura raced unchecked through the weakened population. People ate weeds, ate pets, ate human flesh. "The roads are beset with tattered skeletons," one witness wrote. "God help the people."

The causes of Ireland's calamity were complex and manifold, involving such things as the distribution of land, brutal economic exploitation by the English, and a relief effort by turns heartless and hapless, as well as the usual accidents of climate, geography, and cultural habit. Yet this whole edifice of contingency rested at bottom upon a plant—or, more precisely, upon the relationship between a plant and a people. For it was not the potato so much as potato monoculture that sowed the seeds of Ireland's disaster.

Indeed, Ireland's was surely the biggest experiment in monoculture ever attempted and surely the most convincing proof of its folly. Not only did the agriculture and diet of the Irish come to depend utterly on the potato, but they depended almost completely on one kind of potato: the Lumper. ... The Incas too built a civilization atop the potato, but they cultivated such a polyculture of potatoes that no one fungus could ever have toppled it. In fact, it was to South America that, in the aftermath of the famine, breeders went to look for potatoes that could resist the blight. And there, in a potato called the Garnet Chile, they found it.