

## AN EXTRUSION OF POTATOES



**WALDEN:** Why level downward to our dullest perception always, and praise that as common sense? The commonest sense is the sense of men asleep, which they express by snoring. Sometimes we are inclined to class those who are once-and-a-half witted with the half-witted, because we appreciate only a third part of their wit. Some would find fault with the morning-red, if they ever got up early enough. "They pretend," as I hear, "that the verses of Kabir have four different senses; illusion, spirit, intellect, and the exoteric doctrine of the Vedas;" but in this part of the world it is considered a ground for complaint if a man's writings admit of more than one interpretation. While England endeavors to cure the potato-rot, will not any endeavor to cure the brain-rot, which prevails so much more widely and fatally?

PEOPLE OF  
WALDEN

KABIR



# POTATO

# SOLANUM TUBEROSUM

[potato](#) (Wild)  
 Solanum tuberosum var. guaytecarum (**POTATO**)<sup>1</sup>  
 II.....261

[potato](#) (Wild)  
 Apios americana (**GROUNDNUT**)  
 IV.....491

## THE NIGHTSHADES (SOLANACEAE)

- — [Solanum tuberosum](#)
- — [Tomato Lycopersicon esculentum](#)
- — chili peppers
- — eggplant
- — deadly nightshade
- — [Nicotiana tabacum](#)
- — henbane
- — Jimson weed
- — petunia
- — plus some 2,000 other species grouped into 75 genera

1.This is a variety of the common cultivated [potato](#). See the article by Duncan Porter in [Taxon 31](#) (August 1982), page 504 for identification.

**SOLANUM TUBEROSUM****POTATO****16TH CENTURY****1531**

In the mountains of Perú, Francisco Pizarro “discovered” the Incas cultivating many varieties of an edible tuber, *Solanum tuberosum* (genus *Solanum* of the family *Solanaceae*, the 48-chromosome, tetraploid “[potato](#)”). He sought the permission of the King of Spain to bring back home some of these dormant tubers. This was a poor harvest year for Europe, threatening [famine](#). The monarch would approve.





## POTATO

## SOLANUM TUBEROSUM

1536

Union of England and Wales.

George Browne, appointed Archbishop of Dublin, was given the task of reforming the [Irish](#) Church.

Pedro de Mendóza founded Buenos Aires and sent an expedition to find a route to Peru.

As soon as the Spaniards completed their conquest of Peru, they began to rely on its [potatoes](#) as cheap food for their sailors. The earliest English publication describing potatoes, however, would be Gerard's 1597 *HERBALL*. By 1700 these starchy tubers would be important in Germany, and by 1800, in Russia.

PLANTS

1540

An edition of Suetonius' LIVES OF THE TWELVE CAESARS was prepared in France by Robert Estienne. The types used were those of Claude Garamond, and were here used in the italic (this typeface was to become dominant in France and to assume an important position in the typefaces of the Western world).

HISTORY OF  
THE PRESS

When the Spanish presented a specimen [potato tuber](#) to Pope Paul III, he handed it off to a guy who would introduce this into France as an ornamental.

PLANTS

1550

During the second half of the 16th Century, dormant tubers of the genus *Solanum* of the family *Solanaceae* (the 48-chromosome, tetraploid "[potato](#)") were being introduced into Europe in what the [Encyclopædia Britannica](#) refers to as "a haphazard mixture of varieties." Unpacking that encyclopædic remark and the silences which surround it, what the EB indicates is that the white intrusives were collecting in a happy-go-lucky manner, basically just carrying off from their new colonies whatever happened not to be nailed down, and this utter ignorance and inane negligence would cause problems later at home because, evidently, only a small fraction of the genetic material had been represented in the samples,<sup>2</sup> but, nevertheless, this white neglect—which would have the gravest consequences in the 19th Century—was entirely at the responsibility of the red indigenous farmer of the Peruvian-Bolivian Andes, who obviously lacked wisdom about this plant resource which had been being developed there for more than two millennia.

IRISH POTATO FAMINE

2. *S. indigenum*, for one instance, apparently having been entirely unrepresented among the *S. tuberosum*.



**SOLANUM TUBEROSUM**

**POTATO**

**1565**

John Hawkins introduced [tobacco](#) seeds into England from Florida, but smoking would not spread until dashing Sir Walter Raleigh, who was at this point only eleven years of age, would help it become fashionable in the court in the mid-1570s.

**Chronological observations of America**

**Tobacco first brought into *England* by Sir *John Hawkins*, but it was first brought into use by Sir *Walter Rawleigh* many years after.**

**BY *John Josselyn Gent.***

**From the year of the World**

**to the year of Christ 1673.**

(Although there have been popular reports that John Hawkins may have introduced [potatoes](#) into [Ireland](#) in this year, we don't have an actual confirmation of potatoes in Ireland prior to the year 1586.)

**PLANTS**



POTATO

*SOLANUM TUBEROSUM*

1577

Late in this year, Francis Drake left England with five ships, with the cover story that the little fleet was on a trading expedition to the Nile River.

A

## Chronological TABLE

*Of the most remarkable passages in that part of  
America, known to us by the name of NEW-  
ENGLAND.*

*Anno Dom.*

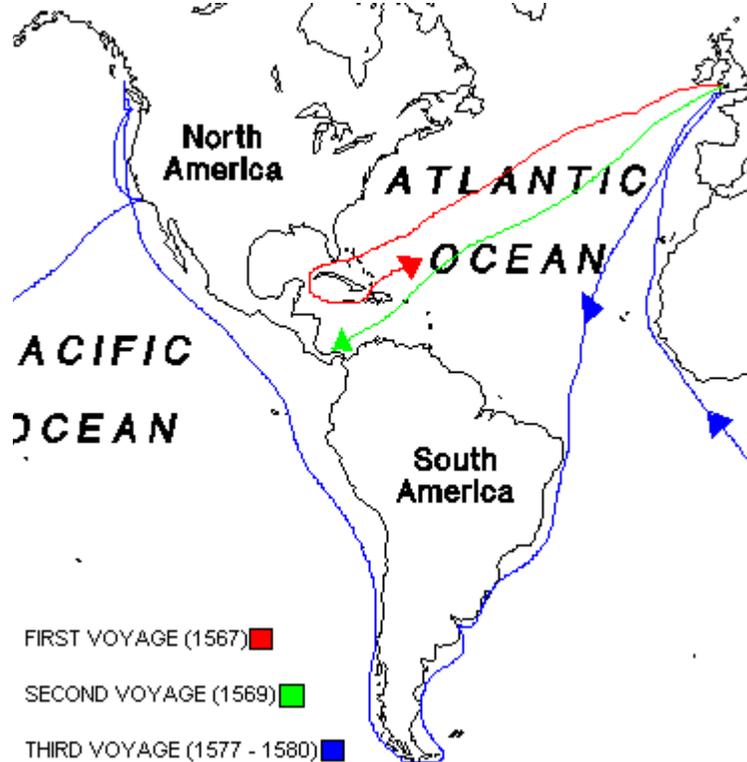
1577. Sir *Francis Drake* began his Voyage about the  
*World.*

When they reached the coast of Africa, to the dismay of some of the accompanying gentlemen and to the alarm of the sailors, their actual destination was revealed to be the Pacific Ocean by way of the Strait of Magellan. He had secret instructions to poach in the Pacific Ocean. He was to go through the Straits of Magellan and attack the Spanish ships and towns on the West Coast of South America. He was to find people there who weren't under the control of Spain and enter into trade agreements with them. He was to see if there wasn't a continent somewhere in the South Pacific. He was look out for a western end to the Northwest Passage through

# SOLANUM TUBEROSUM

# POTATO

North America. From this year into 1580 they would be sailing round the world.



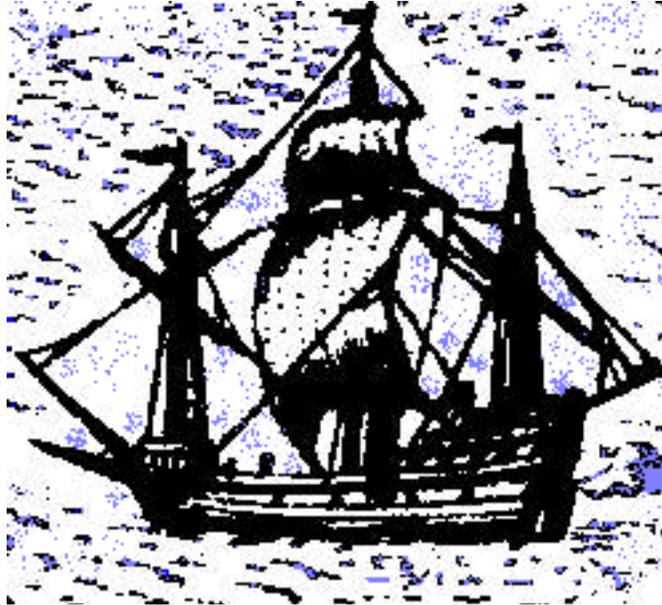
While they were still in the eastern Atlantic, they captured a Portuguese merchant ship and its pilot, and then they crossed the Atlantic, by way of the Cape Verde Islands, until they sighted the coast of Brazil.

While the expedition was running down the coast of South American, they would encounter storms, separations, dissension, and a fatal skirmish with natives. Before leaving the Atlantic, Drake would lighten the expedition by disposing of two unfit ships and by trying and executing one of the English gentleman for mutiny. After rallying the men under his command by means of a remarkable speech, Francis Drake renamed his flagship, the *Pelican*, as the *Golden Hind*. This image, from the Hondius broadside map of circa 1595, is

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# SOLANUM TUBEROSUM

perhaps the *Golden Hind*:



The expedition would come upon a [potato](#) being grown in Chile; however, by this point in all probability potatoes were already being cultivated back in European soil, on the Iberian peninsula.





## Chronological observations of America

*November* the 17th Sir *Francis Drake* began his voyage about the world with five Ships, and 164 men setting sail from *Plimouth*, putting off *Cape de verde*. The beginning of *February*, he saw no Land till the fifth of *April*, being past the line 30 degrees of latitude, and in the 36 degree entered the River *Plates* whence he fell with the streight of *Magellan* the 21 of *August*, which with three of his Ships he passed, having cast off the other two as impediments to him, and the *Marigold* tossed from her General after passage was no more seen. The other commanded by Capt. *Winter* shaken off also by Tempest, returned thorow the Streights and recovered *England*, only the Pellican, whereof himself was Admiral, held on her course to *Chile*, *Coquimbo*, *Cinnama*, *Palma*, *Lima*, upon the west of *America*, where he passed the line 1579 the first day of *March*, and so forth until he came to the latitude 47.

From the year of the World

to the year of Christ 1673.

BY John Josselyn Gent.



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*SOLANUM TUBEROSUM*

## Chronological observations of America

*From the year of the World*

Thinking by those North Seas to have found passage to *England*, but fogs, frosts and cold winds forced him to turn his course South-west from thence, and came to Anchor 38 degrees from the line, where the King of that Countrey presented him his Net-work Crown of many coloured feathers, and therewith resigned his Scepter of Government unto his Dominion, which Countrey Sir *Francis Drake* took possession of in the Queens name, and named it *Nova Albion*, which is thought to be part of the Island of *California*.

*to the year of Christ 1673.*

Sir *Martin Frobisher's* second voyage.

**BY John Josselyn Gent.**

**SOLANUM TUBEROSUM****POTATO****1580**

There are reports that Sir Walter Raleigh was having [potatoes](#) planted on his estates in western [Ireland](#). (But by this point these edible tubers from the New World had already become a kitchen staple in Seville, Spain, and we don't have an actual confirmation of potatoes in Ireland prior to the year 1586.)



**POTATO*****SOLANUM TUBEROSUM***

The colonists of Sir Walter's settlement on Roanoke Island off the coast of what has become North Carolina, not to be outdone, sent samples of the American [ground-nut](#) to Queen Elizabeth I.



(Did the English queen try to eat them? –Thoreau would consider them to taste better boiled than baked.)

**1586**

This was in general a poor harvest year in Europe. [Potatoes](#) may or may not have been introduced to [Ireland](#) at an earlier point in time, but we know for a fact that they were present as of this year.



## SOLANUM TUBEROSUM

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1588

[William Hunnis](#)'s wife died at Ilford. He would no longer be associated with the Company of Grocers of London.

Thomas Hariot, who in later years would be recognized as a preeminent natural philosopher (scientist), had been part of a group sent by Sir [Walter Raleigh](#) to establish the first English colony in the New World. During 1585-1586 on Roanoke Island, while most of his party had fitfully searched for gold while bitching at how there were not "in Virginia any English cities, or fine houses, or their accustomed dainty food, or any soft beds of down or feathers," he had been taking accurate stock of the land and its bounties. It is he who is reputed to have carried back home on Sir [Francis Drake](#)'s ship two strange plants: the [tobacco](#) and the [potato](#). At this point he had returned to London and issued A BRIEF AND TRUE REPORT OF THE NEW FOUND LAND OF VIRGINIA, DIRECTED TO THE INVESTORS, FARMERS, AND WELL-WISHERS OF THE PROJECT OF COLONIZING AND PLANTING THERE:

There is an herb called *uppówoc*, which sows itself. In the West Indies it has several names, according to the different places where it grows and is used, but the Spaniards generally call it tobacco. Its leaves are dried, made into powder, and then smoked by being sucked through clay pipes into the stomach and head. The fumes purge superfluous phlegm and gross humors from the body by opening all the pores and passages. Thus its use not only preserves the body, but if there are any obstructions it breaks them up. By this means the natives keep in excellent health, without many of the grievous diseases which often afflict us in England.

This *uppówoc* is so highly valued by them that they think their gods are delighted with it. Sometimes they make holy fires and cast the powder into them as a sacrifice. If there is a storm on the waters, they throw it up into the air and into the water to pacify their gods. Also, when they set up a new weir for fish, they pour *uppówoc* into it. And if they escape from danger, they also throw the powder up into the air. This is always done with strange gestures and stamping, sometimes dancing, clapping of hands, holding hands up, and staring up into the heavens. During this performance they chatter strange words and utter meaningless noises.

While we were there we used to suck in the smoke as they did, and now that we are back in England we still do so. We have found many rare and wonderful proofs of the *uppówoc*'s virtues, which would themselves require a volume to relate. There is sufficient evidence in the fact that it is used by so many men and women of great calling, as well as by some learned physicians.



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The above was part of a compendium of “commodities” he intended to help maintain interest in Sir [Walter Raleigh](#)’s doomed attempts to make money out of his commercial explorations to the New World. In providing a list pertaining to the “Virginia” coast, this has amounted to the 1st book in English to mention the flora and fauna of any part of what is now the United States. After Hariot’s return to England, he would meet and become buddies with Raleigh and would be his main contact with the outside world during the 13 years of residence in the Tower of London (where, in fact, Raleigh was able to grow his own tobacco as well as set up his own little distillery).<sup>3</sup>

[BOTANIZING](#)



[READ ABOUT VIRGINIA](#)

July 19: After being dispersed by a storm, the Spanish Armada of 132 vessels and 3,165 guns<sup>4</sup> reassembled and entered the English Channel, where it was defeated by the English fleet under Lord Howard of Effingham, Sir Francis Drake, and Sir John Hawkins:

“In that memorable year, when the dark cloud gathered round our coasts, when Europe stood by in fearful suspense to behold what should be the result of that great cast in the game of human politics, what the craft of Rome, the power of Philip, the genius of Farnese, could achieve against the island-queen, with her Drakes and Cecils, –in that agony of the Protestant faith and English name.” – Hallam, CONST. HIST., Volume I, page 220.

3. Sir [Walter Raleigh](#) reportedly would have a [pipe](#) of his home-grown for solace while on his way to have his head surgically excised in 1618. Hariot, on the other hand, would be during that same period suffering terribly from a “cancerous ulcer of the nose,” presumably inoperable and caused one may suspect by tobacco, till his death at the age of 61 in 1621. Life just ain’t fair.

4. (It was evidently not enough to be Armada-ed to the teeth. :-)



**SOLANUM TUBEROSUM**

**POTATO**

### **Chronological observations of America**

*From the year of the World*

The *Spanish Armado* defeated, consisting of 130 ships, wherein were 19290 Souldiers 2080 chained Rowers 2630 great Ordinance, Commanded by *Perezius Guzman Duke of Median Sedonia*, and under him *Johannes Martinus Recaldus* a great Seaman; The Fleet coming in like a half moon, the horns of the front extending one from the other about 7 miles asunder, it was preparing 15 years, and was blackt to make it seem the more terrible.

*to the year of Christ 1673.*

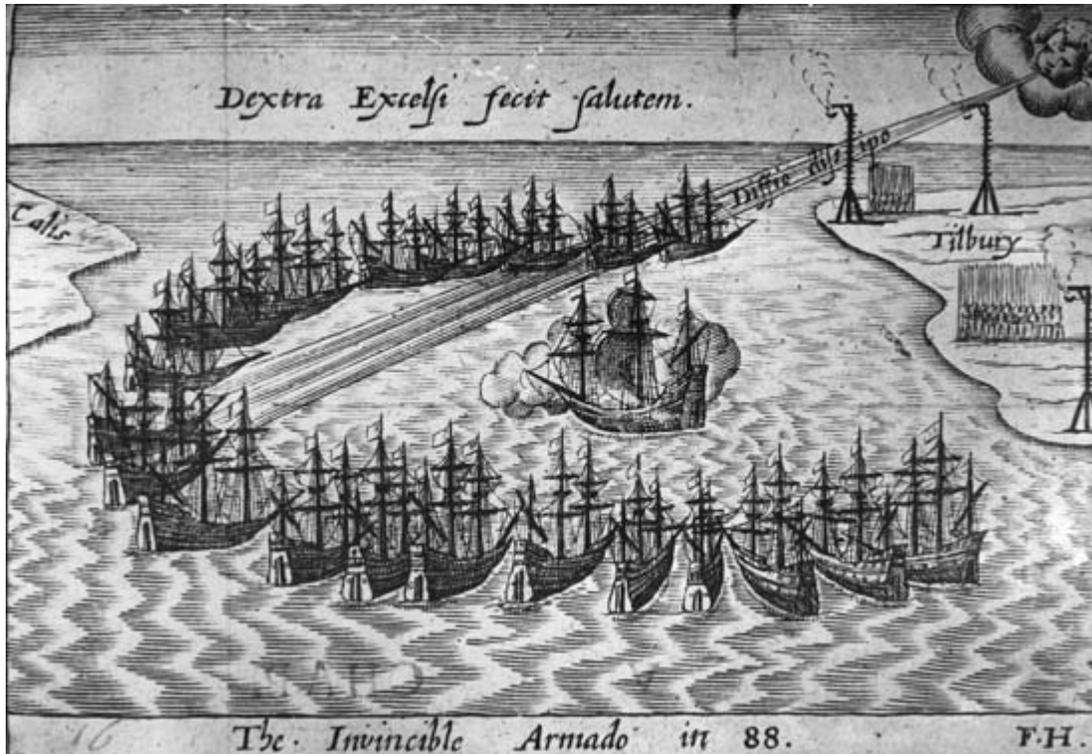
**BY John Josselyn Gent.**

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[Alexander Hume](#)'s poem in heroic couplets on the destruction of the Spanish Armada, dedicated by the author to Lady Culross, "The Triumph of the Lord after the Manner of Men: alluding to the Defait of the Spanish Navie, 1588" (this can be found in Sibbald's CHRONICLE OF SCOTTISH POETRY, VOLUME III and would in 1832 be reprinted for the Bannatyne Club).

## SCOTTISH POETRY III



As an experienced mariner, [Henry Hudson](#) would have probably served aboard an English ship in this battle (unless he was occupied elsewhere).



Some accounts have it that [potatoes](#) were washing up on the shores of western [Ireland](#) after the sinking of these ships of the Spanish Armada — for sure, beginning in this year, they would be being introduced into the Lowlands of Europe by the French herbalist Carolus Clusius, as he had just received two tubers from the Andes Mountains of South America. However, we know that some potatoes had already been present in Ireland, two years prior to the sailing of this Armada.



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"Brilliant generalship in itself is a frightening thing – the very idea that the thought processes of a single brain of a Hannibal or a Scipio can play themselves out in the destruction of thousands of young men in an afternoon."

– Victor Davis Hanson, *CARNAGE AND CULTURE: LANDMARK BATTLES IN THE RISE OF WESTERN POWER* (NY: Doubleday, 2001)





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On the afternoon of the 19th of July, AD. 1588, a group of English captains was collected at the Bowling Green on the Hoe at Plymouth, whose equals have never before or since been brought together, that favorite mustering place of the heroes British navy. There was Sir Francis Drake, the first English circumnavigator of the globe, the terror of every Spanish coast in the old world and the new; there was Sir John Hawkins, the rough veteran of many a daring voyage on the African and American seas, and of many a desperate battle; there was Sir Martin Frobisher, one of the earliest explorers of the arctic seas in search of that North-West Passage which is still the darling object of England's boldest mariners There was the high-admiral of England, Lord Howard of Effingham, prodigal of all things in his country's cause, and who had recently had the noble daring to refuse to dismantle part of the fleet, though the queen had sent him orders to do so, in consequence of an exaggerated report that the enemy had been driven back and shattered by a storm. Lord Howard (whom contemporary writers describe as being of a wise and noble courage, skillful in sea matters, wary and provident, and of great esteem among the sailors) resolved to risk his sovereign's anger, and to keep the ships afloat at his own charge, rather than that England should run the peril of losing their protection.

Another of our Elizabethan sea-kings, Sir Walter Raleigh, was at that time commissioned to raise and equip the land-forces of Cornwall; but, as he was also commander of Plymouth, we may well believe that he must have availed himself of the opportunity of consulting with the lord-admiral and other high officers, which was offered by the English fleet putting into that port; and we may look on Raleigh as one of the group that was assembled at the Bowling Green on the Hoe. Many other brave men and skillful mariners, besides the chiefs whose names have been mentioned, were there, enjoying, with true sailor-like merriment, their temporary relaxation from duty. In the harbor lay the English fleet with which they had just returned from a cruise to Corunna in search of information respecting the real condition and movements of the hostile Armada. Lord Howard had ascertained that our enemies, though tempest-test, were still formidably strong; and fearing that part of their fleet might make for England in his absence, he had hurried back to the Devonshire coast. He resumed his station at Plymouth, and waited there for certain tidings of the Spaniard's approach,

A match at bowls was being played, in which Drake and other high officers of the fleet were engaged, when a small armed vessel was seen running before the wind into Plymouth harbor, with all sails set. Her commander landed in haste, and eagerly sought the place where the English lord-admiral and his captains were standing. His name was Fleming; he was the master of a Scotch privateer; and he told the English officers that he had that morning seen the Spanish Armada off the Cornish coast. At this exciting information the captains began to hurry down to the water, and there was a shouting for the ships' boats; but Drake coolly checked his comrades, and insisted that the match should be played out.



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He said that there was plenty of time both to win the game and beat the Spaniards. The best and bravest, match that ever was scored was resumed accordingly. Drake and his friends aimed their last bowls with the same steady calculating coolness with which they were about to point their guns. The winning cast was made; and then they went on board, and prepared for action, with their hearts as light and their nerves as firm as they had been on the Hoe Bowling Green.

Meanwhile the messengers and signals had been dispatched fast and far through England, to warn each town and village that the enemy had come at last. In every sea-port there was instant making ready by land and by sea; in every shire and every city there was instant mustering of horse and man. In Macaulay's Ballad on the Spanish Armada, the transmission of the tidings of the Armada's approach, and the arming of the English nation, are magnificently described. The progress of the fire-signals is depicted in lines which are worthy of comparison with the renowned passage in the Agamemnon, which describes the transmission of the beacon-light announcing the fall of Troy, from Mount Ida to Argos.

But England's best defense then, as ever, was her fleet; and after warping laboriously out of Plymouth harbor against the wind, the lord-admiral stood westward under easy sail, keeping an anxious look-out for the Armada, the approach of which was soon announced by Cornish fisher-boats, and signals front the Cornish cliffs.

The England of our own days is so strong, and the Spain of our own days is so feeble, that it is not possible, without some reflection and care, to comprehend the full extent of the peril which England then ran from the power and the ambition of Spain, or to appreciate the importance of that crisis in the history of the world. We had then no Indian or Colonial Empire, save the feeble germs of our North American settlements, which Raleigh and Gilbert had recently planted. Scotland was a separate kingdom; and Ireland was then even a greater source of weakness, and a worse nest of rebellion than she has been in after times. Queen Elizabeth had found at her accession an encumbered revenue, a divided people, and an unsuccessful foreign war, in which the last remnant of our possessions in France had been lost, she had also a formidable pretender to her crown. whose interests were favored by all the Roman Catholic powers and even some of her subjects were warped by religious bigotry to deny her title, and to look on her as an heretical usurper. It is true that during the years of her reign which had passed away before the attempted invasion of 1588, she had revived the commercial prosperity, the national spirit, and the national loyalty of England. But her resources, to cope with the colossal power of Philip II., still seemed most scanty; and she had not a single foreign ally, except the Dutch, who were themselves struggling hard, and, as it seemed, hopelessly, to maintain their revolt against Spain.

On the other hand Philip II. was absolute master of an empire so superior to the other states of the world in extent, in resources, and especially in military and naval forces, as to make the project of enlarging that empire into a universal



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monarchy seem a perfectly feasible scheme; and Philip had both the ambition to form that project, and the resolution to devote all his energies, and all his means, to its realization. Since the downfall of the Roman empire no such preponderating power had existed in the world. During the mediaeval centuries the chief European kingdoms were slowly molding themselves out of the feudal chaos. And, though their wars with each other were numerous and desperate, and several of their respective kings figured for a time as mighty conquerors, none of them in those times acquired the consistency and perfect organization which are requisite for a long-sustained career of aggrandizement. After the consolidation of the great kingdoms, they for some time kept each other in mutual check. During the first half of the sixteenth century, the balancing system was successfully practiced by European statesmen. But when Philip II. reigned, France had become so miserably weak through her civil wars, that he had nothing to dread from the rival state, which had so long curbed his father the Emperor Charles V. In Germany, Italy, and Poland, he had either zealous friends and dependents, or weak and divided enemies. Against the Turks he had gained great and glorious successes; and he might look round the continent of Europe without discerning a single antagonist of whom he could stand in awe. Spain, when he acceded to the throne, was at the zenith of her power. The hardihood and spirit which the Arragonese, the Castilians, and the other nations of the peninsula had acquired during centuries of free institutions and successful war against the moors, had not yet become obliterated. Charles V. had, indeed, destroyed the liberties of Spain; but that had been done too recently for its full evil to be felt in Philip's time. A people cannot be debased in a single generation; and the Spaniards under Charles V. and Philip II. proved the truth of the remark, that no nation is ever so formidable to its neighbors for a time, as is a nation, which, after being trained up in self-government, passes suddenly under a despotic ruler. The energy of democratic institutions survives for a few generations, and to it are superadded the decision and certainty, which are the attributes of government, when all its powers are directed by a single mind. It is true that this preter-natural vigor is short-lived: national corruption and debasement gradually follow the loss of the national liberties; but there is an interval before their workings are felt, and in that interval the most ambitious schemes of foreign conquest are often successfully undertaken.

Philip had also the advantage of finding himself at the head of a large standing army in a perfect state of discipline and equipment, in an age when, except some few insignificant corps, standing armies were unknown in Christendom. The renown of the Spanish troops was justly high, and the infantry in particular was considered the best in the world. His fleet, also, was far more numerous, and better appointed, than that of any other European power; and both his soldiers and his sailors had the confidence in themselves and their commanders, which a long career of successful warfare alone can create.

Besides the Spanish crown, Philip succeeded to the kingdom of Naples and Sicily, the duchy of Milan, Franche-Comte, and the



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Netherlands. In Africa he possessed Tunis, Oran, the Cape Verd, and the Canary Islands; and in Asia, the Philippine and Sunda Islands, and a part of the Moluccas. Beyond the Atlantic he was lord of the most splendid portions of the New world which "Columbus found for Castile and Leon." The empires of Peru and Mexico, New Spain, and Chili, with their abundant mines of the precious metals, Hispaniola and Cuba, and many other of the American Islands, were provinces of the sovereign of Spain. Philip had, indeed, experienced the mortification of seeing the inhabitants of the Netherlands revolt against his authority, nor could he succeed in bringing back beneath the Spanish scepter all the possessions which his father had bequeathed to him. But he had reconquered a large number of the towns and districts that originally took up arms against him. Belgium was brought more thoroughly into implicit obedience to Spain than she had been before her insurrection, and it was only Holland and the six other Northern States that still held out against his arms. The contest had also formed a compact and veteran army on Philip's side, which, under his great general, the Prince of Parma, had been trained to act together under all difficulties and all vicissitudes of warfare; and on whose steadiness and loyalty perfect reliance might be placed throughout any enterprise, however difficult and tedious. Alexander Farnese, Prince of Parma, captain-general of the Spanish armies, and governor of the Spanish possessions in the Netherlands, was beyond all comparison the greatest military genius of his age. He was also highly distinguished for political wisdom and sagacity, and for his great administrative talents. He was idolized by his troops, whose affections he knew how to win without relaxing their discipline or diminishing his own authority. Pre-eminently cool and circumspect in his plans, but swift and energetic when the moment arrived for striking a decisive blow, neglecting no risk that caution could provide against, conciliating even the populations of the districts which he attacked, by his scrupulous good faith, his moderation, and his address, Farnese was one of the most formidable generals that ever could be placed at the head of an army designed not only to win battles, but to effect conquests. Happy it, is for England and the world that this island was saved from becoming an arena for the exhibition of his powers. Whatever diminution the Spanish empire might have sustained in the Netherlands, seemed to be more than compensated by the acquisition of Portugal, which Philip had completely conquered in 1580. Not only that ancient kingdom itself, but all the fruits of the maritime enterprises of the Portuguese had fallen into Philip's hands. All the Portuguese colonies in America, Africa, and the East Indies, acknowledged the sovereignty of the King of Spain; who thus not only united the whole Iberian peninsula under his single scepter, but had acquired a transmarine empire, little inferior in wealth and extent to that which he had inherited at his accession. The splendid victory which his fleet, in conjunction with the Papal and Venetian galleys, had gained at Lepanto over the Turks, had deservedly exalted the fame of the Spanish marine throughout Christendom; and when Philip had reigned thirty-five years, the vigor of his empire



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seemed unbroken, and the glory of the Spanish arms had increased, and was increasing throughout the world. One nation only had been his active, his persevering, and his successful foe. England had encouraged his revolted subjects in Flanders against him, and given them the aid in men and money, without which they must soon have been humbled in the dust. English ships had plundered his colonies; had defied his supremacy in the New World, as well as the Old; they had inflicted ignominious defeats on his squadrons; they had captured his cities, and burned his arsenals on the very coasts of Spain. The English had made Philip himself the object of personal insult. He was held up to ridicule in their stage plays and masks, and these scoffs at the man had (as is not unusual in such cases) excited the anger of the absolute king, even more vehemently than the injuries inflicted on his power. Personal as well as political revenge urged him to attack England. Were she once subdued, the Dutch must submit; France could not cope with him, the empire would not oppose him; and universal dominion seemed sure to be the result of the conquest of that malignant island.

There was yet another and a stronger feeling which armed King Philip against England. He was one of the sincerest and sternest bigots of his age. He looked on himself, and was looked on by others, as the appointed champion to extirpate heresy and re-establish the Papal power throughout Europe. A powerful reaction against Protestantism had taken place since the commencement of the second half of the sixteenth century, and Philip believed that he was destined to complete it. The Reform doctrines had been thoroughly rooted out from Italy and Spain. Belgium, which had previously been half Protestant, had been reconquered both in allegiance and creed by Philip, and had become one of the most Catholic countries in the world. Half Germany had been won back to the old faith. In Savoy, in Switzerland, and many other countries, the progress of the counter-Reformation had been rapid and decisive. The Catholic league seemed victorious in France. The Papal Court itself had shaken off the supineness of recent centuries; and, at the head of the Jesuits and the other new ecclesiastical orders, was displaying a vigor and a boldness worthy of the days of Hildebrand or Innocent III.

Throughout continental Europe, the Protestants, discomfited and dismayed, looked to England as their protector and refuge. England was the acknowledged central point of Protestant power and policy; and to conquer England was to stab Protestantism to the very heart. Sixtus V., the then reigning pope, earnestly exhorted Philip to this enterprise. And when the tidings reached Italy and Spain that the Protestant Queen of England had put to death her Catholic prisoner, Mary Queen of Scots, the fury of the Vatican and Escorial knew no bounds.

The Prince of Parma, who was appointed military chief of the expedition, collected on the coasts of Flanders a veteran force that was to play a principal part in the conquest of England. Besides the troops who were in his garrisons, or under his colors, five thousand infantry were sent to him from northern and central Italy, four thousand from the kingdom of Naples, six thousand from Castile, three thousand from Arragon, three



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thousand from Austria and Germany, together with four squadrons of heavy-armed horse; besides which he received forces from the Tranche-Comte and the Walloon country. By his command, the forest of Waes was felled for the purpose of building flat-bottomed boats, which, floating down the rivers and canals to Meinport and Dunkerque, were to carry this large army of chosen troops to the mouth of the Thames, under the escort of the great Spanish fleet. Gun-carriages, fascines, machines used in sieges, together with every material requisite for building bridges, forming camps, and raising fortresses, were to be placed on board the flotillas of the Prince of Parma, who followed up the conquest of the Netherlands, whilst he was making preparations for the invasion of this island. Favored by the dissension's between the insurgents of the United Provinces and Leicester, the Prince of Parma had recovered Deventer, as well as a fort before Zutphen, which the English commanders, Sir William Stanley, the friend of Babington, and Sir Poland York, had surrendered to him, when with their troops, they passed over to the service of Philip II, after the death of Mary Stuart, and he had also made himself master of the Sluys. His intention was to leave to the Count de Mansfeldt sufficient forces to follow up the war with the Dutch, which had now become a secondary object, whilst he himself went at the head of fifty thousand men of the Armada and the flotilla, to accomplish the principal enterprise—that enterprise, which, in the highest degree, affected the interests of the pontifical authority. In a bull, intended to be kept secret until the day of landing, Sixtus V., renewing the anathema fulminated against Elizabeth by Pius V. and Gregory XIII, affected to depose her from our throne. Elizabeth was denounced as a murderous heretic whose destruction was an instant duty. A formal treaty was concluded (in June, 1587), by which the pope bound himself to contribute a million of scudi to the expenses of the war; the money to be paid as soon as the king had actual possession of an English port. Philip, on his part, strained the resources of his vast empire to the utmost. The French Catholic chiefs eagerly cooperated with him. In the sea-ports of the Mediterranean, and along almost the whole coast from Gibraltar to Jutland, the preparations for the great armament were urged forward with all the earnestness of religious zeal, as well as of angry ambition.—“Thus,” says the German historian of the Popes, “thus did the united powers of Italy and Spain, from which such mighty influences had gone forth over the whole world, now rouse themselves for an attack upon England! The king had already compiled, from the archives of Simancas, a statement of the claims which he had to the throne of that country on the extinction of the Stuart line; the most brilliant prospects, especially that of an universal dominion of the seas, were associated in his mind with this enterprise. Everything seemed to conspire to such end; the predominance of Catholicism in Germany, the renewed attack upon the Huguenots in France, the attempt upon Geneva, and the enterprise against England. At the same moment a thoroughly Catholic prince, Sigismund III, ascended the throne of Poland, with the prospect also of future succession to the throne of Sweden. But whenever any principle



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or power, be it what it may, aims at unlimited supremacy in Europe some vigorous resistance to it, having its origin in the deepest springs of human nature, invariably arises. Philip II had had to encounter newly-awakened powers, braced by the vigor of youth, and elevated by a sense of their future destiny. The intrepid corsairs, who had rendered every sea insecure, now clustered round the coasts of their native island. The Protestants in a body,—even the Puritans, although they had been subjected to as severe oppressions as the Catholics, rallied round their queen, who now gave admirable proof of her masculine courage, and her princely talent of winning the affections, and leading the minds, and preserving the allegiance of men.” Ranke should have added that the English Catholics at this crisis proved themselves as loyal to their queen, and true to their country, as were the most vehement anti-Catholic zealots in the island. Some few traitors there were; but, as a body, the Englishmen who held the ancient faith, stood the trial of their patriotism nobly. The lord-admiral himself was a Catholic, and (to adopt the words of Hallam) “then it was that the Catholics in every county repaired to the standard of the lord-lieutenant, imploring that they might not be suspected of bartering the national independence for their religion itself.” The Spaniard found no partisans in the country which he assailed, nor did England, self-wounded,

“Lie at the proud foot of her enemy.”

For some time the destination of the enormous armament of Philip was not publicly announced. Only Philip himself, the Pope Sixtus, the Duke of Guise, and Philip’s favorite minister, Mendoza, at first knew its real object. Rumors were sedulously spread that it was designed to proceed to the Indies to realize vast projects of distant conquest. Sometimes hints were dropped by Philip’s ambassadors in foreign courts, that his master had resolved on a decisive effort to crush his rebels in the Low Countries. But Elizabeth and her statesmen could not view the gathering of such a storm without feeling the probability of its bursting on their own shores. As early as the spring of 1587, Elizabeth sent Sir Francis Drake to cruise off the Tagus. Drake sailed into the Bay of Cadiz and the Lisbon Roads, and burnt much shipping and military stores, causing thereby an important delay in the progress of the Spanish preparations. Drake called this “Singeing the King of Spain’s beard.” Elizabeth also increased her succors of troops to the Netherlanders, to prevent the Prince of Parma from overwhelming them, and from thence being at full leisure to employ his army against her dominions. Each party at this time thought it politic to try to amuse its adversary by pretending to treat for peace, and negotiations were opened at Ostend in the beginning of 1588, which were prolonged during the first six months of that year. Nothing real was effected, and probably nothing real had been intended to be effected by them. But, in the meantime, each party had been engaged in important communications with the chief powers in France, in which Elizabeth seemed at first to have secured a great advantage, but in which Philip ultimately prevailed. “Henry III. of France was alarmed at the negotiations that were



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going on at Ostend; and he especially dreaded any accommodation between Spain and England, in consequence of which Philip II. might be enabled to subdue the United Provinces, and make himself master of France. In order, therefore, to dissuade Elizabeth from any arrangement, he offered to support her, in case she were attacked by the Spaniards, with twice the number of troops, which he was bound by the treaty of 1514 to send to her assistance. He, had a long conference with her ambassador, Stafford, upon this subject, and told him that the Pope and the Catholic king had entered into a league against the queen, his mistress, and had invited himself and the Venetians to join them, but they had refused to do so. 'If the Queen of England,' he added, 'concludes a peace with the Catholic king, that peace will not last three months, because the Catholic king will aid the League with all his forces to overthrow her, and you may imagine what fate is reserved for your mistress after that.' On the other hand, in order most effectually to frustrate this negotiation, he proposed to Philip II. to form a still closer union between the two crowns of France and Spain: and, at the same time, he secretly dispatched a confidential envoy to Constantinople, to warn the Sultan, that if he did not again declare war against the Catholic King, that monarch, who already possessed the Netherlands, Portugal, Spain, the Indies, and nearly all Italy, would soon make himself master of England, and would then turn the forces of all Europe against the Turks." But Philip had an ally in France, who was far more powerful than the French king. This was the Duke of Guise, the chief of the League, and the idol of the fanatic partisans of the Romish faith. Philip prevailed on Guise openly to take up arms against Henry III. (who was reviled by the Leaguers as a traitor to the true Church, and a secret friend to the Huguenots); and thus prevent the French king from interfering in favor of Queen Elizabeth. "With this object, the commander, Juan Iniguez Moreo, was dispatched by him in the early part of April to the Duke of Guise at Soissons. He met with complete success. He offered the Duke of Guise, as soon as he took the field against Henry III., three hundred thousand crowns, six thousand infantry, and twelve hundred pikemen, on behalf of the king his master, who would, in addition, withdraw his ambassador from the court of France, and accredit an envoy to the Catholic party. A treaty was concluded on these conditions, and the Duke of Guise entered Paris, where he was expected by the Leaguers, and whence he expelled Henry III. on the 12th of May, by the insurrection of the barricades. A fortnight after this insurrection, which reduced Henry III. to impotence, and, to use the language of the Prince of Parma, did not even 'permit him to assist the Queen of England with his tears, as he needed them all to weep over his own misfortunes,' the Spanish fleet left the Tagus and sailed towards the British isles."'

Meanwhile in England, from the sovereign on the throne to the peasant in the cottage, all hearts and hands made ready to meet the imminent deadly peril. Circular letters from the queen were sent round to the lord-lieutenants of the several counties requiring them "to call together the best sort of gentlemen under their lieutenancy, and to declare unto them these great



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preparations and arrogant threatenings, now burst forth in action upon the seas, wherein every man's particular state, in the highest degree, could be touched in respect of country, liberty, wives, children, lands, lives, and (which was specially to be regarded) the profession of the: true and sincere religion of Christ: and to lay before them the infinite and unspeakable miseries that would fall out upon any such change, which miseries were evidently seen by the fruits of that hard and cruel government holden in countries not far distant. We do look," said the queen, "that the most part of them should have, upon this instant extraordinary occasion, a larger proportion of furniture, both for horsemen and footmen, but especially horsemen, than hath been certified; thereby to be in their best strength against any attempt, or to be employed about our own person, or otherwise. Hereunto as we doubt not but by your good endeavors they will be the rather conformable, so also we assure ourselves, that Almighty God will so bless these their loyal hearts borne towards us, their loving sovereign, and their natural country, that all the attempts of any enemy whatsoever shall be made void and frustrate, to their confusion, your comfort, and to God's high glory."

Letters of a similar kind were also sent by the council to each of the nobility, and to the great cities. The primate called on the clergy for their contributions; and by every class of the community the appeal was responded to with liberal zeal, that offered more even than the queen required. The boasting threats of the Spaniards had roused the spirit of the nation; and the whole people "were thoroughly irritated to stir up their whole forces for their defense against such prognosticated conquests; so that, in a very short time, all the whole realm, and every corner, were furnished with armed men, on horseback and on foot; and these continually trained, exercised, and put into bands, in warlike manner, as in no age ever was before in this realm. There was no sparing of money to provide horse, armor, weapons, powder, and all necessaries; no, nor want of provision of pioneers, carriages, and victuals, in every county of the realm, without exception, to attend upon the armies. And to this general furniture every man voluntarily offered, very many their services personally without wages, others money for armor and weapons, and to wage soldiers: a matter strange, and never the like heard of in this realm or elsewhere. And this general reason moved all men to large contributions, that when a conquest was to be withstood wherein all should be lost, it was no time to spare a portion."

Our lion-hearted queen showed herself worthy of such a people. A camp was formed at Tilbury; and there Elizabeth rode through the ranks, encouraging her captains and her soldiers by her presence and her words. One of the speeches which she addressed to them during this crisis has been preserved; and, though often quoted, it must not be omitted here.

"My loving people," she said, "we have been persuaded by some that are careful of our safety, to take heed how we commit ourselves to armed multitudes for fear of treachery: but I assure you I do not desire to live to distrust my faithful and loving people. Let tyrants fear! I have always so behaved



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myself, that, under God, I have placed my chiefest strength and safe-guard in the loyal hearts and good will of my subjects; and, therefore, I am come amongst you, as you see, at this time, not for my recreation or disport, but being resolved, in the midst and heat of the battle, to live or die amongst you all, to lay down for my God, for my kingdom, and for my people, my honor and my blood, even in the dust. I know I have the body but of a weak and feeble woman, but I have the heart and stomach of a king, and of a King of England too; and think it foul scorn that Parma, or Spain, or any prince of Europe, should dare to invade the borders of my realm; to which, rather than any dishonor shall glow by me, I myself will take up arms, I myself will be your general, judge, and rewarder of every one of your virtues in the field. I know already for your forwardness you have deserved rewards and crowns; and we do assure you, on the word of a prince, they shall be duly paid you. In the meantime, my lieutenant-general shall be in my stead, than whom never prince commanded a more noble or worthy subject, not doubting but by your obedience to my general, by your concord in the camp, and your valor in the field, we shall shortly have a famous victory over those enemies of my God, of my kingdom, and of my people."

We have minute proofs of the skill with which the government of Elizabeth made its preparations; for the documents still exist which were drawn up at that time by the ministers and military men who were consulted by Elizabeth respecting the defense of the country. Among those summoned to the advice of their queen at this crisis, were Sir Walter Raleigh, Lord Grey, Sir Francis Knolles, Sir Thomas Leighton, Sir John Norris, Sir Richard Grenville, Sir Richard Bingham, and Sir Roger Williams; and the biographer of Sir Walter Raleigh observes that "These councilors were chosen by the queen, as being not only men bred to arms, and some of them, as Grey, Norris, Bingham, and Grenville, of high military talents, but of grave experience in affairs of state, and in the civil government of provinces, - qualities by no means unimportant, when the debate referred not merely to the leading of an army or the plait of a campaign, but to the organization of a militia, and the communication with the magistrates for arming the peasantry, and encouraging them to a resolute and simultaneous resistance. From some private papers of Lord Burleigh, it appears that Sir Walter took a principal share in these deliberations; and the abstract of their proceedings, a document still preserved, is supposed to have been drawn up by him. They first prepared a list of places where it was likely the Spanish army might attempt a descent, as well as of those which lay most exposed to the force under the Duke of Parma. They next considered the speediest and most effectual means of defense, whether by fortification or the muster of a military array; and, lastly, deliberated on the course to be taken for fighting the enemy if he should land."

Some of Elizabeth's advisers recommended that the whole care and resources of the government should be devoted to the equipment of the armies, and that the enemy, when he attempted to land, should be welcomed with a battle on the shore. But the wiser counsels of Raleigh and others prevailed, who urged the



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importance of fitting out a fleet, that should encounter the Spaniards at sea, and, if possible, prevent them from approaching the land at all. In Raleigh's great work on the "History of the World," he takes occasion, when discussing some of the events of the first Punic war, to give his reasonings on the proper policy of England when menaced with invasion. Without doubt, we have there the substance of the advice which he gave to Elizabeth's council; and the remarks of such a man on such a subject, have a general and enduring interest, beyond the immediate peril which called them forth. Raleigh says:- "Surely I hold that the best way is to keep our enemies from treading upon our ground: wherein if we fail, then must we seek to make him wish that he had stayed at his own home. In such a case if it should happen, our judgments are to weigh many particular circumstances, that belongs not unto this discourse. But making the question general, the positive, Whether England, without the help of her fleet, be able to debar an enemy from landing; I hold that it is unable so to do; and therefore I think it most dangerous to make the adventure. For the encouragement of a first victory to an enemy, and the discouragement of being beaten, to the invaded, may draw after it a most perilous consequence.

"Great difference I know there is, and a diverse consideration to be had, between such a country as France is, strengthened with many fortified places; and this of ours, where our ramparts are but the bodies of men. But I say that an army to be transported over sea, and to be landed again in an enemy's country, and the place left to the choice of the invader, cannot be resisted on the coast of England, without a fleet to impeach it; no, nor on the coast of France, or any other country; except every creek, port, or sandy bay, had a powerful army, in each of them, to make opposition. For let the supposition be granted that Kent is able to furnish twelve thousand foot, and that those twelve thousand be layed in the three best landing places within that country, to wit, three thousand at Margat, three thousand at the Nesse, and six thousand at Foulkstone, that is, somewhat equally distant from them both; as also that two of these troops (unless some other order be thought more fit) be directed to strengthen the third, when they shall see the enemies' fleet to head towards it: I say, that notwithstanding this provision if the enemy, setting sail from the Isle of Wight in the first watch of the night, and towing their long boats at their sterns, shall arrive by dawn of day at the Nesse, and thrust their army on shore there, it will be hard for those three thousand that are at Margat (twenty-and-four long miles from thence), to come time enough to reinforce their fellows at the Nesse. Nay, how shall they at Foulkstone be able to do it, who are nearer by more than half the way? Seeing that the enemy, at his first arrival, will either make his entrance by force, with three or four shot of great artillery, and quickly put the first three thousand that are entrenched at the Nesse to run, or else give them so much to do that they shall be glad to send for help to Foulkstone, and perhaps to Margat, whereby those places will be left bare. Now let us suppose that all the twelve thousand Kentish soldiers arrive at the Nesse, ere the enemy can be ready to disembarque



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his army, so that he will find it unsafe to land in the face of so many prepared to withstand him, yet must we believe that he will play the best of his own game (having liberty to go which way he list), and under covert of the night, set sail towards the east, where what shall hinder him to take ground either at Margat, the Downes, or elsewhere, before they, at the Nesse, can be well aware of his departure? Certainly there is nothing more easy than to do it. Yea, the like may be said of Weymouth, Purbeck, Poole, and of all landing-places on the south west. For there is no man ignorant, that ships, without putting themselves out of breath, will easily outrun the soldiers that coast them. 'Les armees ne; volent poinf en poste;'— 'Armies neither fly, nor run post,' saith a marshal of France. And I know it to be true, that a fleet of ships may be seen at sunset, and after it at the Lizard, yet by the next morning they may recover Portland, whereas an army of foot shall not be able to march it in six days. Again, when those troops lodged on the sea-shores, shall be forced to run from place to place in vain, after a fleet of ships, they will at length sit down in the midway, and leave all at adventure. But say it were otherwise, that the invading enemy will offer to land in some such place, where there shall be an army of ours ready to receive him; yet it cannot be doubted, but that when the choice of all our trained bands, and the choice of our commanders and captains, shall be drawn together (as they were at Tilbury in the year 1588) to attend the person of the prince, and for the defense of the city of London; they that remain to guard the coast can be of no such force as to encounter an army like unto that wherewith it was intended that the Prince of Parma should have landed in England.

"For end of this digression, I hope that this question shall never come to trial; his majesty's many moveable forts will forbid the experience. And although the English will no less disdain that any nation under heaven can do, to be beaten, upon their own ground, or elsewhere, by a foreign enemy; yet to entertain those that shall assail us with their own beef in their bellies, find before they eat of our English capons, I take it to be the wisest way; to do which his majesty, after God, will employ his good ships on the sea, and not trust in any entrenchment upon the shore."

The introduction of steam as a propelling power at sea, has added tenfold weight to these arguments of Raleigh. On the other hand, a well constructed system of railways, especially of coast-lines, aided by the operation of the electric telegraph, would give facilities for concentrating a defensive army to oppose an enemy on landing and for moving troops from place to place in observation of the movements of the hostile fleet, such as would have astonished Sir Walter even more than the sight of vessels passing rapidly to and fro without the aid of wind or tide. The observation of the French Marshall whom he quotes, is now no longer correct. Armies can be made to pass from place to place almost with the speed of wings, and far more rapidly than any post-traveling that was known in the Elizabethan or any other age. Still, the presence of a sufficient armed force at the right spot, at the right time. can never be made a matter of certainty; and even after the changes that have taken place, no one can



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doubt but that the policy of Raleigh is that which England should ever seek to follow in defensive war. At the time of the Armada, that policy certainly saved the country, if not from conquest, at, least from deplorable calamities. If indeed the enemy had landed, we may be sure that he would have been heroically opposed. But history shows us so many examples of the superiority of veteran troops over new levies, however numerous and brave, that without disparaging our countrymen's soldierly merits, we may well be thankful that no trial of them was made on English land. Especially must we feel this, when we contrast the high military genius of the Prince of Parma, who would have headed the Spaniards, with the imbecility of the Earl of Leicester, to whom the deplorable spirit of favoritism, which formed the greatest blemish in Elizabeth's character, had then committed the chief command of the English armies.

The ships of the royal navy at this time amounted to no more than thirty-six; but the most serviceable merchant vessels were collected from all the ports of the country; and the citizens of London, Bristol, and the other great seats of commerce, showed as liberal a zeal in equipping and manning vessels as the nobility and gentry displayed in mustering forces by land. The seafaring population of the coast, of every rank and station, was animated by the same ready spirit; and the whole number of seamen who came forward to man the English fleet was 17,472. The number of the ships that were collected was 191; and the total amount of their tonnage 31,985. There was one ship in the fleet (the Triumph) of 1100 tons, one of 1000, one of 900, two of 800 each, three of 600, five of 500, five of 400, six of 300, six of 250, twenty of 200, and the residue of inferior burden. Application was made to the Dutch for assistance; and, as Stowe expresses it, "The Hollanders came roundly in, with threescore sail, brave ships of war, fierce and full of spleen, not so much for England's aid, as in just occasion for their own defense; these men foreseeing the greatness of the danger that might ensue, if the Spaniards should chance to win the day and get the mastery over them; in due regard whereof their manly courage was inferior to none."

We have more minute information of the numbers and equipment of the hostile forces than we have of our own. In the first volume of Hakluyt's VOYAGES, dedicated to Lord Effingham, who commanded against the Armada, there is given (from the contemporary foreign writer, Meteran) a more complete and detailed catalogue than has perhaps ever appeared of a similar armament.

"A very large and particular description of this navie was put in print and published by the Spaniards; wherein was set downe the number, names, and burthens of the shippes, the number of mariners and soldiers throughout the whole fleete; likewise the quantitie of their ordinance, of their armour, of bullets, of match, of gun-poulder, of victuals, and of all their navall furniture, was in the saide description particularized. Unto all these were added the names of the governours, captaines, noblemen, and gentlemen voluntaries, of whom there was so great a multitude, that scarce was there any family of accompt, or any one principall man



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throughout all Spaine, that had not a brother, sonne, or kinsman in that fleete; who all of them were in good hope to purchase unto themselves in that navie (as they termed it) invincible, endless glory and renown, and to possess themselves of great seignories and riches in England, and in the Low Countreys. But because the said description was translated and published out of Spanish into divers other languages, we will here only make an abridgement or brief rehearsal thereof.

"Portugal furnished and set fourth under the conduct of the Duke of Medina Sidonia, generall of the fleete, ten galeons, two zabraes, 1300 mariners, 3300 souldiers, 300 great pieces, with all requisite furniture.

"Biscay, under the conduct of John Martines de Ricalde, admiral of the whole fleete, set forth tenne galeons, four pataches, 700 mariners, 2000 souldiers, 260 great pieces, &c.

"Guipusco, under the conduct of Michael de Orquendo, tenne galeons, four pataches, 700 mariners, 2000 souldiers, 310 great pieces.

"Italy with the Levant islands, under Martine de Vertendona, ten galeons, 800 mariners, 2000 souldiers, 310 great pieces, &c.

"Castile, under Diego Flores de Valdez, fourteen galeons, two pataches, 1700 mariners, 2400 souldiers, and 280 great pieces, &c.

"Andaluzia, under the conduct of Petro de Valdez ten galeons, one patache, 800 mariners, 2400 souldiers, 280 great pieces, &c.

"Item, under the conduct of John Lopes de Medina, twenty-three great Flemish hulkes, with 700 mariners, 3200 souldiers, and 400 great pieces.

"Item, under Hugo de Moncada, foure galliasses, containing 1200 gally-slaves, 460 mariners, 870 souldiers, 200 great pieces, &c.

"Item, under Diego de Mandrana, foure gallies of Portugall, with 888 gally-slaves, 360 mariners, twenty great pieces, and other requisite furniture.

"Item, under Anthonie de Mendoza, twenty-two pataches and zabraes, with 574 mariners, 488 souldiers, and 193 great pieces.

"Besides the ships aforementioned, there were twenty caravels rowed with oares, being appointed to perform necessary services under the greater ships, insomuch that all the ships appertayning to this navie amounted unto the summe of 150, eche one being sufficiently provided of furniture and victuals.

"The number of mariners in the saide Aeete were above 8000, of slaves 2088 of souldiers 20,000 (besides noblemen and gentlemen voluntaries), of great cast



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pieces 2600. The foresaid ships were of an huge and incredible capacitie and receipt: for the whole fleete was large enough to containe the burthen of 60,000 tunnes.

"The galeons were 64 in number, being of an huge bignesse, and very flatly built, being of marvellous force also, and so high, that they resembled great castles, most fit to defend themselves and to withstand any assault, but in giving any other ships the encounter farr inferiour unto the English and Dutch ships, which can with great dexteritie weild and turne themselves at all assayes. The upperworke of the said galeons was of thicknesse and strength sufficient to bear off musketshot. The lower worke and the timbers thereof were out of measure strong, being framed of planks and ribs foure or five foote in thicknesse, insomuch that no bullets could pierce them, but such as were discharged hard at hand; which afterward proved true, for a great number of bullets were found to sticke fast within the masse substance of those thicke planks. Great and well pitched cables were twined about the masts of their shippes, to strengthen them against the battery of shot. "The galliasses were of such bignesse, that they contained within them chambers, chapels, turrets, pulpits, and other commodities of great houses. The galliasses were rowed with great oares, there being in eche one of them 300 slaves for the same purpose, and were able to do great service with the force of their ordinance. All these, together with the residue aforenamed, were furnished and beautified with trumpets streamers, banners, warlike ensignes, and other such like ornaments.

"Their pieces of brazen ordinance were 1600, and of yron 1000.

"The bullets thereto belonging were 120 thousand.

"Item of gun-poulder, 5600 quintals. Of matche, 1200 quintals. Of muskets and kaleivers, 7000. Of haleberts and partisans, 10,000.

"Moreover they had great store of canons, doublecanons, culverings and field-pieces for land services.

"Likewise they were provided of all instruments necessary on land to conveigh and transport their furniture from place to place; as namely of carts, wheeles, wagons, &c. Also they had spades, mattocks, and baskets, to set pioners to worke. They had in like sort great store of mules and horses, and whatsoever else was requisite for a land-armie. They were so well stored of biscuit, that for the space of halfe a yeere, they might allow eche person in the whole fleete halfe a quintall every month; whereof the whole summe amounteth unto an hundreth thousand quintals.

"Likewise of wine they had 147 thousand pipes,



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sufficient also for halfe a yeeres expedition. Of bacon, 6500 quintals. Of cheese, three thousand quintals. Besides fish, rise, beanes, pease, oile, vinegar, &c. "Moreover they had 12,000 pipes of fresh water, and all other necessary provision, as, namely, candles, lanternes, lampes, sailes, hempe, oxe-hides, and lead to stop holes that should be made with the battery of gunshot. To be short, they brought all things expedient, either for a fleete by sea, or for an armie by land.

"This navie (as Diego Pimentelli afterward confessed) was esteemed by the king himselfe to containe 32,000 persons, and to cost him every day 30 thousand ducates.

"There were in the said navie five terzaes of Spaniards (which terzaes the Frenchmen call regiments), under the command of five governours, termed by the Spaniards masters of the field, and amongst the rest there were many olde and expert souldiers chosen out of the garisons of Sicilie, Naples, and Tercea. Their captaines or colonels were Diego Pimentelli, Don Francisco de Toledo, Don Alonco de Lucon, Don Nicolas de Isla, Don Augustin de Mexia; who had each of them thirty-two companies under their conduct. Besides the which companies, there were many bands also of Castilians and Portugals, every one of which had their peculiar governours, captains, officers, colours, and weapons."

While this huge armada was making ready in the southern ports of the Spanish dominions, the Prince of Parma, with almost incredible toil and skill, collected a squadron of war-ships at Dunkirk, and his flotilla of other ships and of flat-bottomed boats for the transport to England of the picked troops, which were designed to be the main instruments in subduing England. Thousands of workmen were employed, night and day, in the construction of these vessels, in the ports of Flanders and Brabant. One hundred of the kind called hendes, built at Antwerp, Bruges, and Ghent, and laden with provision and ammunition, together with sixty flat-bottomed boats, each capable of carrying thirty horses, were brought, by means of canals and fosses, dug expressly for the purpose, to Nieupoort and Dunkirk. One hundred smaller vessels were equipped at the former place, and thirty-two at Dunkirk, provided with twenty thousand empty barrels, and with materials for making pontoons, for stopping up the harbors, and raising forts and entrenchment's. The army which these vessels were designed to convey to England amounted to thirty thousand strong, besides a body of four thousand cavalry, stationed at Courtrai, composed chiefly of the ablest veterans of Europe; invigorated by rest, (the siege of Sluys having been the only enterprise in which they were employed during the last campaign,) and excited by the hopes of plunder and the expectation of certain conquest. And "to this great enterprise and imaginary conquest, divers princes and noblemen came from divers countries; out of Spain came the Duke of Pestrana, who was said to be the son of Ruy Gomez de Silva, but was held to be the king's bastard; the Marquis of



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Bourgou, one of the Archduke Ferdinand's sons, by Philippina Welserine; Don Vespasian Gonzaga, of the house of Mantua, a great soldier, who had been viceroy in Spain; Giovanni de Medici, Bastard of Florence Amedo, Bastard of Savoy, with many such like, besides others of meaner quality."

Philip had been advised by the deserter, Sir William Stanley, not to attack England in the first instance, but first to effect a landing and secure a strong position in Ireland; his admiral, Santa Cruz, had recommended him to make sure, in the first instance, of some large harbor on the coast of Holland or Zealand, where the Armada, having entered the channel, might find shelter in case of storm, and whence it could sail without difficulty for England; but Philip rejected both these counsels, and directed that England itself should be made the immediate object of attack; and on the 20th of May the Armada left the Tagus, in the pomp and pride of supposed invincibility, and amidst the shouts of thousands, who believed that England was already conquered. But steering to the northward, and before it was clear of the coast of Spain, the Armada was assailed by a violent storm, and driven back with considerable damage to the ports of Biscay and Galicia. It had, however, sustained its heaviest loss before it left. the Tagus, in the death of the veteran admiral Santa Cruz, who had been destined to guide it against England.

This experienced sailor, notwithstanding his diligence and success, had been unable to keep pace with the impatient ardor of his master. Philip II. had reproached him with his dilatoriness, and had said with ungrateful harshness, "You make an ill return for all my kindness to you." These words cut the veteran's heart, and proved fatal to Santa Cruz. Overwhelmed with fatigue and grief, he sickened and died. Philip II. had replaced him by Aionzo Perez de Gusman, Duke of Ededina Sidonia, one of the most powerful of the Spanish grandees, but wholly unqualified to command such an expedition. He had, however, as his lieutenants, two seamen of proved skill and bravery, Juan de Martinerr. Recalde of Biscay, and Miguel Orquendo of Guipuzcoa. The report of the storm which had beaten back the Armada reached England with much exaggeration, and it was supposed by some of the queen's counselors that the invasion would now be deferred to another year. But Lord Howard of Effingham, the lord high-admiral of the English fleet, judged more wisely that the danger was not yet passed, and, as already mentioned, had the moral courage to refuse to, dismantle his principal ships, though he received orders to that effect. But it was not Howard's design to keep the English fleet in costly inaction, and to wait patiently in our own harbors, till the Spaniards had recruited their strength, and sailed forth again to attack us. The English seamen of that age (like their successors) loved to strike better than to parry, though, when emergency required, they could be patient and cautious in their bravery. It was resolved to proceed to Spain, to learn the enemy's real condition, and to deal him any blow for which there might be opportunity. In this bold policy we may well believe him to have been eagerly seconded by those who commanded under him. Howard and Drake sailed accordingly to Corunna, hoping to



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surprise and attack some part of the Armada in that harbor; but when near the coast of Spain, the north wind, which had blown up to this time, veered suddenly to the south; and fearing that the Spaniards might put to sea and pass him unobserved, Howard returned to the entrance of the channel, where he cruised for some time on the, look out for the enemy. In part of a letter written by him at this period, he speaks of the difficulty of guarding so large a breadth of sea,—a difficulty that ought not to be forgotten when modern schemes of defense against hostile fleets from the south are discussed. "I myself," he wrote, "do lie in the midst of the Channel, with the greatest force; Sir Francis Drake hath twenty ships, and four or five pinnaces, which lie towards Ushant; and Mr. Hawkins, with as many more, lieth towards Scilly, Thus we are fain to do, or else with this wind they might pass us by, and we never the wiser. -The Sleeve is another manner of thing than it was taken for: we find it by experience and daily observation to be 100 miles over: a large room for me to look unto!" But after sometime further reports that the Spaniards were inactive in their harbour, where they were suffering severely from sickness, caused Howard also to relax in his vigilance; and he returned to Plymouth with the greater part of his fleet.

On the 12th of July, the Armada having completely refitted, sailed again for the Channel, and reached it without obstruction or observation by the English.

The design of the Spaniards was, that the Armada should give them, at least for a time, the command of the sea, and that it should join the squadron which Parma had collected, off Calais. Then, escorted by an overpowering naval force, Parma and his army were to embark in their flotilla, and cross the sea to England, where they were to be landed, together with the troops which the Armada brought from the ports of Spain. The scheme was not dissimilar to one formed against England a little more than two centuries afterwards.

As Napoleon, in 1805, waited with his army and flotilla at Boulogne, looking for Villeneuve to drive away the English cruisers, and secure him a passage across the Channel, so Parma, in 1558, waited for Medina Sidonia to drive away the Dutch and English squadrons that watched his flotilla, and to enable his veterans to cross the sea to the land that they were to conquer. Thanks to Providence, in each case England's enemy waited in vain!

Although the numbers of sail which the queen's government, and the patriotic zeal of volunteers, had collected for the defense of England, exceeded the number of sail in the Spanish fleet, the English ships were, collectively, far inferior in size to their adversaries; their aggregate tonnage being less by half than that of the enemy. In the number of guns, and weight of metal, the disproportion was still greater. The English admiral was also obliged to subdivide his force; and Lord Henry Seymour, with forty of the best Dutch and English ships was employed in blockading the hostile ports in Flanders, and in preventing the Prince of Parma from coming out of Dunkirk.

The orders of King Philip to the Duke de Medina. Sidonia were, that he should, on entering the channel, keep near the French



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coast, and, if attacked by the English ships, avoid an action, and steer on to Calais roads, where the Prince of Parma's squadron was to join him. The hope of surprising and destroying the English fleet in Plymouth, led the Spanish admiral to deviate from these orders, and to stand across to the English shore; but, on findings that Lord Howard was coming out to meet him, he resumed the original plan, and determined to bend his way steadily towards Calais and Dunkirk, and to keep merely on the defensive against such squadrons of the English as might come up with him.

It was on Saturday, the 20th of July, that Lord Effingham came in sight of his formidable adversaries. The Armada was drawn up in form of a crescent, which from horn to horn measured some seven miles. There was a south-west wind; and before it the vast vessels sailed slowly on. The English let them pass by; and then, following in the rear, commenced an attack on them. A running fight now took place, in which some of the best ships of the Spaniards were captured; many more received heavy damage; while the English vessels, which took care not to close with their huge antagonists, but availed themselves of their superior celerity in tacking and maneuvering, suffered little comparative loss. Each day added not only to the spirit, but to the number of Effingham's force. Raleigh, Oxford, Cumberland, and Sheffield joined him; and "the gentlemen of England hired ships from all parts at their own charge, and with one accord came flocking thither as to a set field, where glory was to be attained, and faithful service performed unto their prince and their country." Raleigh justly praises the English admiral for his skillful tactics. He says, "Certainly, he that will happily perform a fight at sea, must be skillful in making choice of vessels to fight in; he must believe that there is more belonging to a good man-of-war, upon the waters, than great daring; and must know that there is a great deal of difference between fighting loose, or at large and grappling. The guns of a slow ship pierce as well, and make as great holes as those in a swift. To clap ships together, without consideration, belongs rather to a madman than to a man of war; for by such an ignorant bravery was Peter Strossie lost at the Azores, when he fought against the Marquis of Santa Cruza. In like sort had the Lord Charles Howard, Admiral of England, been lost in the year 1588, if he had not been better advised, than a great many malignant fools were, that found fault with his demeanor. The Spaniards had an army aboard then, and he had none: they had more ships than he had, and of higher building and charging; so that, had he entangled himself with those great and powerful vessels, he had greatly endangered this kingdom of England. For, twenty men upon the defenses are equal to a hundred that board and enter; whereas then, contrariwise, the Spaniards had a hundred, for twenty of ours, to defend themselves withall. But our admiral knew his advantage, and held it: which, had he not done, he had not been worthy to have held his head."

The Spanish admiral also showed great judgment and firmness in following the line of conduct that had been traced out for him; and on the 27th of July he brought his fleet unbroken, though sorely distressed, to anchor in Calais roads. But the King of



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Spain had calculated ill the number and the activity of the English and Dutch fleets; as the old historian expresses it, "It seemeth that the Duke of Parma and the Spaniards grounded upon a vain and presumptuous expectation, that all the ships of England and of the Low Countreys would at the first sight of the Spanish and Dunkerke navie have betaken themselves to flight, yeelding them sea-room, and endeavouring only to defend themselves their havens, and sea-coasts from invasion. Wherefore their intent and purpose was, that the Duke of Parma, in his small and flat-bottomed ships should, as it were, under the shadow and wings of the Spanish fleet, convey over all his troupes, armour, and warlike provisions, and with their forces so united, should invade England; or, while the English fleet were busied in fight against the Spanish, should enter upon any part of the coast which he thought to be most convenient. Which invasion (as the captives afterwards confessed) the Duke of Parma thought first to have attempted by the river of Thames; upon the banks whereof, having at the first arrival landed twenty or thirty thousand of his principal souldiers, he supposed that he might easily have won the city of London; both because his small ships should have followed and assisted his land-forces, and also for that the city itself was but meanly fortified and easy to overcome, by reason of the citizens' delicacy and discontinuance from the wares, who, with continual and constant labor, might be vanquished, if they yielded not at the first assault.

But the English and Dutch found ships and mariners enough to keep the Armada itself in check, and at the same time to block up Parma's flotilla. The greater part of Seymour's squadron left its cruising-ground off Dunkirk to join the English admiral off Calais; but the Dutch manned about five-and-thirty sail of good ships, with a strong force of soldiers on board, all well seasoned to the sea-service, and with these they blockaded the Flemish ports that were in Parma's power. Still it was resolved by the Spanish admiral and the prince to endeavor to effect a junction, which the English seamen were equally resolute to prevent: and bolder measures on our side now became necessary. The Armada lay off Calais, with its largest ships ranged outside, "like strong castles fearing no assault; the lesser placed in the middle ward." The English admiral could not, attack them in their position without great disadvantage, but on the night of the 20th he sent eight fire-ships among them, with almost equal effect to that of the fire-ships which the Greeks so often employed against the Turkish fleets in their late war of independence. The Spaniards cut their cables and put to sea in confusion. One of the largest galleasses ran foul of another vessel and was stranded. The rest of the fleet was scattered about on the Flemish coast, and when the morning broke, it was with difficulty and delay that they obeyed their admiral's signal to range themselves round him near Gravelines. Now was the golden opportunity for the English to assail them, and prevent them from ever letting loose Parma's flotilla against England; and nobly was that opportunity used. Drake and Fenner were the first English captains who attacked the unwieldy leviathans: then came Fenton, Southwell, Burton, Cross, Raynor,



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and then the lord admiral, with Lord Thomas Howard and Lord Sheffield. The Spaniards only thought of forming and keeping close together, and were driven by the English past Dunkirk, and far away from the Prince of Parma, who in watching their defeat from the coast, must, us: Drake expressed it, have chafed like a bear robbed of her whelps. This was indeed the last and the decisive battle between the two fleets. It is perhaps, best described in the very words of the contemporary writer as we may read them in Hakluyt.

"Upon the 29th of July in the morning, the Spanish fleet after the forsaid tumult, having arranged themselves againe into order, were, within sight. of Greveling, most bravely and furiously encountered by the English; where they once again got the wind of the Spaniards; who suffered themselves to be deprived of the commodity of the place in Caleis road, and of the advantage of the wind neer unto Dunkerk, rather than they would change their array or separate their forces now conjoynd and united together, standing only upon their defence.

"And howbeit there were many excellent and warlike ships in the English fleet, yet scarce were there 22 or 23 among them all, which matched 90 of the Spanish ships in the bigness, or could conveniently assault them. Wherefore the English ships using their prerogative. f nimble steerage, whereby they could turn and wield themselves with the wind which way they listed, came often times very near upon the Spaniards, and charged them so sore, that non and then they were but a pike's length asunder: and so continually giving them one broadside after another, they discharged all their shot both great and small upon them, spending one whole day from morning till night in that violent kind of conflict, untill such time as powder and bullets failed them. In regard of which want they thought it convenient not to pursue the Spaniards any longer, because they had many great vantages of the English, namely, for the extraordinary bigness of their ships, and also for that they were so neerley conjoynd, and kept together in so good array, that they could by no meanes be fought withall one to one. The English thought, therefore that they had right well acquitted themselves, in chasing the Spaniards first from Caleis, and then from Dunkerk, and by that meanes to have hindered them from joyning with the Duke of Parma his forces, and getting the wind of them, to have driven them from their own coasts.

"The Spaniards that day sustained great loss and damage, having many of their shippes shot thorow and thorow, and they discharged likewise great store of ordinance against the English; who, indeed, sustained some hindrance, but not comparable to the Spaniard's loss: for they lost not any one ship or person of account, for very diligent inquisition being made, the English men all that time wherein the Spanish navy sayled upon their seas, are not found to have wanted aboue one hundred of



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their people: albeit Sir Francis Drake's ship was pierced with shot aboue forty times, and his very cabben was twice shot thorow, and about the conclusion of the fight, the bed of a certaine gentleman lying weary thereupon, was taken quite from under him with the force of a bullet. Likewise, as the Earle of Northumberland and Sir Charles Blunt were at dinner upon a time, the bullet of a demy-culverin brake thorow the midst of their cabben, touched their feet, and strooke downe two of the standers by, with many such accidents befalling the English shippes, -which it were tedious to rehearse."

It reflects little credit on the English government that the English fleet was so deficiently supplied with ammunition, as to be unable to complete the destruction of the invaders. But enough was done to ensure it. Many of the largest Spanish ships were sunk or captured in the action of this day. And at length the Spanish admiral, despairing of success, fled northward with a southerly wind, in the hope of rounding Scotland, and so returning to Spain without a farther encounter with the English fleet. Lord Effingham left a squadron to continue the blockade of the Prince of Parma's armament; but that wise general soon withdrew his troops to more promising fields of action. Meanwhile the lord admiral himself, and Drake chased the vincible Armada, as it was now termed, for some distance northward; and then, when it seemed to bend away from the Scotch coast towards Norway, it was thought best, in the words of Drake, "to leave them to those boisterous and uncouth northern seas. The sufferings and losses which the unhappy Spaniards sustained in their flight round Scotland and Ireland, are well known. Of their whole Armada only fifty-three shattered vessels brought back their beaten and wasted crews to the Spanish coast which they had quitted in such pageantry and pride.

Some passages from the writings of those who took part in the struggle, have been already quoted; and the most spirited description of the defeat of the Armada which ever was penned, may perhaps be taken from the letter which our brave vice-admiral Drake wrote in answer to some mendacious stories by which the Spaniards strove to hide their shame. Thus does he describe the scenes in which he played so important a part:

"They were not ashamed to publish, in sundry languages in print, great victories in words, which they pretended to have obtained against this realm, and spread the same in a most false sort over all parts of France, Italy, and elsewhere; when, shortly afterwards, it was happily manifested in very deed to all nations, how their navy, which they termed invincible, consisting of one hundred and forty sail of ships, not only of their own kingdom, but strengthened with the greatest argosies, Portugal carracks, Florentines, and large hulks of other countries, were by thirty of her majesty's own ships of war, and a few of our own merchants, by the wise, valiant, and advantageous conduct of the Lord Charles Howard, high-admiral of England, beaten and shuffled together even from the Lizard in Cornwall, first to Portland, when they shamefully left Don Pedro de Valdez with his mighty ship; from Portland to Calais,



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where they lost Hugh de Moncado, with the galleys of which he was captain; and from Calais, driven with squibs from their anchors, were chased out of the sight of England, round about Scotland and Ireland. Where, for the sympathy of their religion, hoping to find succor and assistance, a great part of them were crushed against the rocks, and those others that landed, being very many in number, were, notwithstanding, broken, slain, and taken; and so sent from village to village, coupled in halters, to be shipped into England, where her majesty, of her princely and invincible disposition, disdaining to put them to death, and scorning either to retain or to entertain them, they were all sent back again to their countries, to witness and recount the worthy achievement of their invincible and dreadful navy. Of which the number of soldiers, the fearful burthen of their ships, the commanders' names of every squadron, with all others, their magazines of provision were put in print, as an army and navy irresistible and disdaining prevention: with all which their great and terrible ostentation, they did not in all their sailing round about England so much as sink or take one ship, bark, pinnace, or cock boat of ours, or even burn so much as one sheep-cote on this land."



"A victory described in detail is indistinguishable from a defeat."

— Jean-Paul Sartre



(This war between Spain and England would continue until 1603. :-)

SOLANUM TUBEROSUM

POTATO

1591

The potato *Solanum tuberosum* as depicted in this year by Gaspard Bauhin:





## POTATO

## SOLANUM TUBEROSUM

1596

L. Shih Chen published *PEN TS'AO KANG MU*, the most well-known and praised of Chinese herbals.

This was a poor harvest year in Europe. Caspar Bauhin published a short notice on the [potato](#) *Solanum tuberosum*.

PLANTS

This was the 2d of the three so-called “dear years” of England, during which not only meat but even dairy products were in such low supply that they commanded such a price as to be entirely out of the reach of the poor.<sup>5</sup> In these years wheat flour would often need to be augmented by grinding and boiling the root of the cuckoopint, *Arum maculatum*, until even wheat would become too dear for regular consumption by the poor and the many would shift their menus in the direction of “Horsse corne, beanes, peason, otes, tare and lintels.”<sup>6</sup>

IRELAND

5. A. Appleby, [FAMINE](#) IN TUDOR AND STUART ENGLAND (Stanford CA: Stanford UP, 1978), page 5.

6. J.C. Drummond and A. Wilbraham, *THE ENGLISHMAN'S FOOD: A HISTORY OF FIVE CENTURIES OF ENGLISH DIET* (London: Jonathan Cape, 1958), page 88.

**SOLANUM TUBEROSUM****POTATO****17TH CENTURY****1645**

Ground-nut cultivation was attempted again in Europe. Again, the endeavor would fail. The reason seems to have been that these tubers require 2 to 3 years to mature, whereas the potato requires but one growing season.

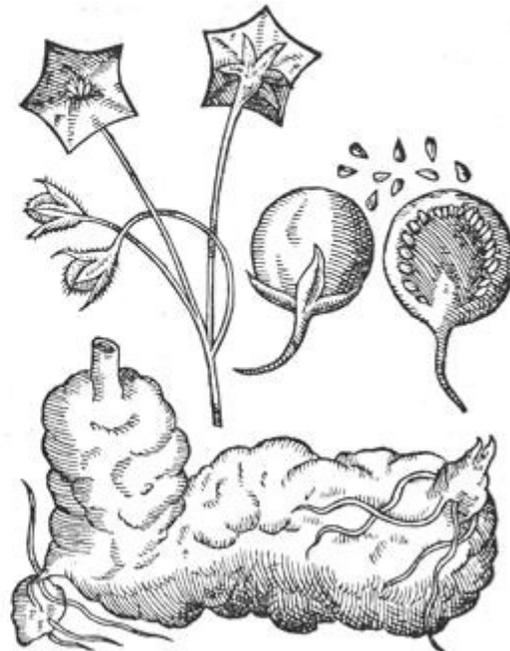


POTATO

*SOLANUM TUBEROSUM*

1663

The Royal Society recommended the planting of [potatoes](#) to provide food for the peasantry in the event of a [famine](#).



**SOLANUM TUBEROSUM****POTATO****1670**

The Royal Society had had its reasons for recommending, in 1663, the planting of potatoes. Their idea had been, disaster relief: a greater percentage of the laboring force would survive the next period of **famine**. Certain of the advantages of the **potato** began also to be noted at this point by the **Irish**: growing underground, it was less readily noted and taxed by the English; the plant would grow on marginal land such as on bogs and on rocky hillsides; the fact that it would not store for long periods meant that it functioned better as a local subsistence crop than as a marketable commodity; the bulk of the tuber would make it inconvenient for these overlords to transport it long distances to their cash markets. The plant seemed to offer something to everyone.

**IRISH POTATO FAMINE**

## POTATO

## SOLANUM TUBEROSUM

1699

By the end of the 17th Century, the few [potato](#) plants fetched from the Andes had created a major [Irish](#) crop.<sup>7</sup>



18TH CENTURY

1718

Some [Irish](#) Presbyterian immigrants brought [potato](#) seed stock with them to [Boston](#).

7. By 1845, approximately  $\frac{1}{3}$ d of the tillable land in Ireland would be devoted to this crop and approximately  $\frac{2}{5}$ ths of the population would be relying upon this tuber, along with skim milk or buttermilk, as their main source for calories and vitamins and minerals and protein. This was not only because potatoes could be grown on marginal land, such as on bogs and on rocky hillsides, but also because, growing underground, the crop was less liable to seizure by the English overlords and tax collectors than, say, an above-ground crop such as wheat or Indian maize, and because the bulk of the potato and the fact that it could not be stored for long periods meant that it functioned better as a local subsistence crop than as a marketable commodity. These righteous overlords were therefore referring to it as “the lazy crop.” The spud was seen to be overly compatible with two things which these notables considered as the notable crimes of the “potato people” — their indolence and their incessant begetting of children.

IRISH POTATO FAMINE



**SOLANUM TUBEROSUM**

**POTATO**

**1719**

Spring: The first settlers of Derry, New Hampshire arrived, led by Reverend MacGregor of Londonderry, [Ireland](#). They called their settlement not Derry but Nutfield, New Hampshire. They immediately planted the potato seedstock they had brought with them — these were the 1st [potatoes](#) to be planted in the soil of what would become the United States of America, and the 1st potatoes to be planted in the New World by white intrusives rather than by indigenous red Americans.

POTATO

SOLANUM TUBEROSUM

1739

In this year about 500,000 people would die in [Ireland](#) due to a widespread failure of the [potato](#) crop. Per the memoirs of [Benjamin Franklin](#), the itinerant preacher George Whitefield came from [Ireland](#) to Philadelphia:



FAMINE



## SOLANUM TUBEROSUM

## POTATO

*In 1739 arrived among us from Ireland the Reverend Mr. Whitefield, who had made himself remarkable there as an itinerant preacher. He was at first permitted to preach in some of our churches; but the clergy, taking a dislike to him, soon refus'd him their pulpits, and he was oblig'd to preach in the fields. The multitudes of all sects and denominations that attended his sermons were enormous, and it was matter of speculation to me, who was one of the number, to observe the extraordinary influence of his oratory on his hearers, and bow much they admir'd and respected him, notwithstanding his common abuse of them, by assuring them that they were naturally half beasts and half devils. It was wonderful to see the change soon made in the manners of our inhabitants. From being thoughtless or indifferent about religion, it seem'd as if all the world were growing religious, so that one could not walk thro' the town in an evening without hearing psalms sung in different families of every street.*

*And it being found inconvenient to assemble in the open air, subject to its inclemencies, the building of a house to meet in was no sooner propos'd, and persons appointed to receive contributions, but sufficient sums were soon receiv'd to procure the ground and erect the building, which was one hundred feet long and seventy broad, about the size of Westminster Hall; and the work was carried on with such spirit as to be finished in a much shorter time than could have been expected. Both house and ground were vested in trustees, expressly for the use of any preacher of any religious persuasion who might desire to say something to the people at Philadelphia; the design in building not being to accommodate any particular sect, but the inhabitants in general; so that even if the Mufti of Constantinople were to send a missionary to preach Mohammedanism to us, he would find a pulpit at his service.*

*Mr. Whitefield, in leaving us, went preaching all the way thro' the colonies to Georgia. The settlement of that province had lately been begun, but, instead of being made with hardy, industrious husbandmen, accustomed to labor, the only people fit for such an enterprise, it was with families of broken shop-keepers and other insolvent debtors, many of indolent and idle habits, taken out of the jails, who, being set down in the woods, unqualified for clearing land, and unable to endure the hardships of a new settlement, perished in numbers, leaving many helpless children unprovided for. The sight of their miserable situation inspir'd the benevolent heart of Mr. Whitefield with the idea of building an Orphan House there, in which they might be supported and educated. Returning northward, he preach'd up this charity, and made large collections, for his eloquence had a wonderful power over the hearts and purses of his hearers, of which I myself was an instance.*

*I did not disapprove of the design, but, as Georgia was then destitute of materials and workmen, and it was proposed to send them from Philadelphia at a great expense, I thought it would have been better to have built the house here, and brought the children to it. This I advis'd; but he was resolute in his first project, rejected my counsel, and I therefore refus'd to contribute. I happened soon after to attend one of his sermons, in the course of which I perceived he intended to finish with a collection, and I silently resolved he should get nothing from me, I had in my pocket a handful of copper money, three or four silver dollars, and five pistoles in gold. As he proceeded I began to soften, and concluded to give the coppers. Another stroke of his oratory made me asham'd of that, and determin'd me to give the silver; and he finish'd so admirably, that I empty'd my pocket wholly into the collector's dish, gold and all. At this sermon there was also one of our club, who, being of my sentiments respecting the building in Georgia, and suspecting a collection might be intended, had, by precaution, emptied his pockets before he came from home. Towards the conclusion of the discourse, however, he felt a strong desire to give, and apply'd to a neighbour, who stood near him, to borrow some money for the purpose. The application was unfortunately [made] to perhaps the only man in the company who had the firmness not to be affected by the preacher. His answer was, "At any other time, Friend Hopkinson, I would lend to thee freely; but not now, for thee seems to be out of thy right senses."*



*Some of Mr. Whitefield's enemies affected to suppose that he would apply these collections to his own private emolument; but I who was intimately acquainted with him (being employed in printing his Sermons and Journals, etc.), never had the least suspicion of his integrity, but am to this day decidedly of opinion that he was in all his conduct a perfectly honest man, and methinks my testimony in his favour ought to have the more weight, as we had no religious connection. He us'd, indeed, sometimes to pray for my conversion, but never had the satisfaction of believing that his prayers were heard. Ours was a mere civil friendship, sincere on both sides, and lasted to his death.*

*The following instance will show something of the terms on which we stood. Upon one of his arrivals from England at Boston, he wrote to me that he should come soon to Philadelphia, but knew not where he could lodge when there, as he understood his old friend and host, Mr. Benezet, was removed to Germantown. My answer was, "You know my house; if you can make shift with its scanty accommodations, you will be most heartily welcome." He reply'd, that if I made that kind offer for Christ's sake, I should not miss of a reward. And I returned, "Don't let me be mistaken; it was not for Christ's sake, but for your sake." One of our common acquaintance jocosely remark'd, that, knowing it to be the custom of the saints, when they received any favour, to shift the burden of the obligation from off their own shoulders, and place it in heaven, I had contriv'd to fix it on earth.*

*The last time I saw Mr. Whitefield was in London, when he consulted me about his Orphan House concern, and his purpose of appropriating it to the establishment of a college.*

*He had a loud and clear voice, and articulated his words and sentences so perfectly, that he might be heard and understood at a great distance, especially as his auditories, however numerous, observ'd the most exact silence. He preach'd one evening from the top of the Court-house steps, which are in the middle of Market-street, and on the west side of Second-street, which crosses it at right angles. Both streets were fill'd with his hearers to a considerable distance. Being among the hindmost in Market-street, I had the curiosity to learn how far he could be heard, by retiring backwards down the street towards the river; and I found his voice distinct till I came near Front-street, when some noise in that street obscur'd it. Imagining then a semi-circle, of which my distance should be the radius, and that it were fill'd with auditors, to each of whom I allow'd two square feet, I computed that he might well be heard by more than thirty thousand. This reconcil'd me to the newspaper accounts of his having preach'd to twenty-five thousand people in the fields, and to the antient histories of generals haranguing whole armies, of which I had sometimes doubted. By hearing him often, I came to distinguish easily between sermons newly compos'd, and those which he had often preach'd in the course of his travels. His delivery of the latter was so improv'd by frequent repetitions that every accent, every emphasis, every modulation of voice, was so perfectly well turn'd and well plac'd, that, without being interested in the subject, one could not help being pleas'd with the discourse; a pleasure of much the same kind with that receiv'd from an excellent piece of musick. This is an advantage itinerant preachers have over those who are stationary, as the latter can not well improve their delivery of a sermon by so many rehearsals.*

*His writing and printing from time to time gave great advantage to his enemies; unguarded expressions, and even erroneous opinions, delivered in preaching, might have been afterwards explain'd or qualify'd by supposing others that might have accompani'd them, or they might have been deny'd; but litera scripta monet. Critics attack'd his writings violently, and with so much appearance of reason as to diminish the number of his votaries and prevent their encrease; so that I am of opinion if he had never written any thing, he would have left behind him a much more numerous and important sect, and his reputation might in that case have been still growing, even after his death, as there being nothing of his writing on which to found a censure and give him a lower character, his proselytes would be left at liberty to feign for him as great a variety of excellence as their enthusiastic admiration might wish him to have possessed.*



*...I turn'd my thoughts again to the affair of establishing an academy. The first step I took was to associate in the design a number of active friends, of whom the Junto furnished a good part; the next was to write and publish a pamphlet, entitled Proposals Relating to the Education of Youth in Pennsylvania. This I distributed among the principal inhabitants gratis; and as soon as I could suppose their minds a little prepared by the perusal of it, I set on foot a subscription for opening and supporting an academy; it was to be paid in quotas yearly for five years; by so dividing it, I judg'd the subscription might be larger, and I believe it was so, amounting to no less, if I remember right, than five thousand pounds.*

*In the introduction to these proposals, I stated their publication, not as an act of mine, but of some publick-spirited gentlemen, avoiding as much as I could, according to my usual rule, the presenting myself to the publick as the author of any scheme for their benefit.*

*The subscribers, to carry the project into immediate execution, chose out of their number twenty-four trustees, and appointed Mr. Francis, then attorney-general, and myself to draw up constitutions for the government of the academy; which being done and signed, a house was hired, masters engag'd, and the schools opened, I think, in the same year, 1749.*

*The scholars increasing fast, the house was soon found too small, and we were looking out for a piece of ground, properly situated, with intention to build, when Providence threw into our way a large house ready built, which, with a few alterations, might well serve our purpose. This was the building before mentioned, erected by the hearers of Mr. Whitefield, and was obtained for us in the following manner.*

*It is to be noted that the contributions to this building being made by people of different sects, care was taken in the nomination of trustees, in whom the building and ground was to be vested, that a predominancy should not be given to any sect, lest in time that predominancy might be a means of appropriating the whole to the use of such sect, contrary to the original intention. It was therefore that one of each sect was appointed, viz., one Church-of-England man, one Presbyterian, one Baptist, one Moravian, etc., those, in case of vacancy by death, were to fill it by election from among the contributors. The Moravian happen'd not to please his colleagues, and on his death they resolved to have no other of that sect. The difficulty then was, how to avoid having two of some other sect, by means of the new choice.*

*Several persons were named, and for that reason not agreed to. At length one mention'd me, with the observation that I was merely an honest man, and of no sect at all, which prevail'd with them to chuse me. The enthusiasm which existed when the house was built had long since abated, and its trustees had not been able to procure fresh contributions for paying the ground-rent, and discharging some other debts the building had occasion'd, which embarrass'd them greatly. Being now a member of both setts of trustees, that for the building and that for the Academy, I had a good opportunity of negotiating with both, and brought them finally to an agreement, by which the trustees for the building were to cede it to those of the academy, the latter undertaking to discharge the debt, to keep for ever open in the building a large hall for occasional preachers, according to the original intention, and maintain a free-school for the instruction of poor children. Writings were accordingly drawn, and on paying the debts the trustees of the academy were put in possession of the premises; and by dividing the great and lofty hall into stories, and different rooms above and below for the several schools, and purchasing some additional ground, the whole was soon made fit for our purpose, and the scholars remov'd into the building. The care and trouble of agreeing with the workmen, purchasing materials, and superintending the work, fell upon me; and I went thro' it the more cheerfully, as it did not then interfere with my private business, having the year before taken a very able, industrious, and honest partner, Mr. David Hall, with whose character I was well acquainted, as he had work'd for me four years. He took off my hands all care of the printing-office, paying me punctually my share of the profits. This partnership continued eighteen years, successfully for us both.*



## POTATO

## SOLANUM TUBEROSUM

*The trustees of the academy, after a while, were incorporated by a charter from the governor; their funds were increas'd by contributions in Britain and grants of land from the proprietaries, to which the Assembly has since made considerable addition; and thus was established the present University of Philadelphia. I have been continued one of its trustees from the beginning, now near forty years, and have had the very great pleasure of seeing a number of the youth who have receiv'd their education in it, distinguish'd by their improv'd abilities, serviceable in public stations and ornaments to their country. ...another projector, the Rev. Gilbert Tennent, came to me with a request that I would assist him in procuring a subscription for erecting a new meeting-house. It was to be for the use of a congregation he had gathered among the Presbyterians, who were originally disciples of Mr. Whitefield. Unwilling to make myself disagreeable to my fellow-citizens by too frequently soliciting their contributions, I absolutely refus'd. He then desired I would furnish him with a list of the names of persons I knew by experience to be generous and public-spirited. I thought it would be unbecoming in me, after their kind compliance with my solicitations, to mark them out to be worried by other beggars, and therefore refus'd also to give such a list. He then desir'd I would at least give him my advice. "That I will readily do," said I; "and, in the first place, I advise you to apply to all those whom you know will give something; next, to those whom you are uncertain whether they will give any thing or not, and show them the list of those who have given; and, lastly, do not neglect those who you are sure will give nothing, for in some of them you may be mistaken." He laugh'd and thank'd me, and said he would take my advice. He did so, for he ask'd of everybody, and he obtained a much larger sum than he expected, with which he erected the capacious and very elegant meeting-house that stands in Arch-street.*

1740

Fall: This was a poor harvest year all over Europe. For the 2d year in a row, the [potato](#) crop failed in [Ireland](#). There was meanwhile [famine](#) in Russia and France, with the people reduced to eating the roots of grass. There was a prison riot in Paris in protest of a cut in the bread ration, and in the putting down of this riot 50 prisoners were killed. Proportionate to the population levels of that era, it is possible that this famine was in Ireland even worse than what has become known to us as the "Great Famine," of 1845-1852. Nearly 400,000 [Irish Catholics](#) were dying — which would have been approximately one out of every five. Some parents were blinding their children in order to make them more suitable objects for charity, it being considerably more difficult to ignore, and to allow to slowly starve, psychologically, a blind child than a sighted child.

The famine in northern [Ireland](#) was instituting a 3d wave of emigration from Ulster, one made up of one quarter of the population. These Scotch-Irish settlers began moving into the western part of Pennsylvania, Virginia, and [North Carolina](#).

1741

Fall: For the 3d year in a row, the [potato](#) crop failed in [Ireland](#).

FAMINE



## SOLANUM TUBEROSUM

## POTATO

1742

Fall: An adequate [potato](#) crop was obtained in [Ireland](#) for the 1st time since the crop of 1738. There had been no general [famine](#) because the peasantry had not yet become totally dependent on this one crop.

1770

In this year there were enough potatoes being grown in England, that a few were beginning to appear on the public market. The [potato](#) was still, however, a quite unfamiliar foodstuff, and in this year, when Frederick the Great's response to a [famine](#) at Kolberg was to send a wagonload of potatoes, the starving peasants would not know what to do with them and would let them rot.

PLANTS

1772

July 31: [Thomas Jefferson](#) tasted [potatoes](#) grown by his [slaves](#).

1779

Opposing Austrian and Prussian armies came to a stalemate in Bohemia when both armies consumed the local [potato](#) stores to depletion. The resulting lack of food combined with cold weather forced a retreat of both sides. Today this War of Bavarian Succession is still sometimes called "The Potato War."

1784

Carl Peter Thunberg had been allowed to travel from the foreign trader's concession on an artificial island in the bay of [Nagasaki](#) to Edo ([Tokyo](#)), and the result was his *FLORA JAPONICA*.

In [Japan](#), some 300,000 had died of starvation and associated disease, and corpses were being consumed (the Irish [potato](#) crop failed and there was famine in [Ireland](#) as well).



SOLANUM TUBEROSUM

POTATO

In France, the gardens of the Tuileries were being used as a potato field. Consumption of more than a pound of meat per person per week had been made a national capital crime.

1799

By the end of the 18th Century, the few potato plants fetched from the Andes had created not only a major Irish dependency upon one crop, but a major dependency in the western regions of England, and a major dependency in the regions of Central Europe which would become Germany. The months of June, July, and August were becoming known as “the meal months,” during which folks needed to eat “stirabout” instead of the usual potatoes and buttermilk because the old stores of potatoes had been exhausted while the new crop was not yet ready to be dug from the ground.<sup>8</sup>

FAMINE

19TH CENTURY

1800



In this and the following year, there would be another severe food crisis in Ireland. The “meal months” during which the old stores of potatoes had become exhausted while the new crop was not yet ready to be dug from the ground would be extended far beyond the usual June, July, and August.<sup>9</sup>

FAMINE

1806



Napoléon Bonaparte offered 100,000 francs to anyone who could create sugar from a native plant — Russian chemist K.S. Kirchhof would later notice that all you really need to do is mash a bowl of potatoes and then, instead of buttermilk and salt, pour in a few pennies worth of readily available sulfuric acid.

SWEETS WITHOUT SLAVERY

8. Potatoes are generally not fully mature in Ireland until October.  
9. Potatoes are generally not fully mature in Ireland until October.



## POTATO

## SOLANUM TUBEROSUM

1816

 August: After a rainy summer, the [potato](#) crop in [Ireland](#) failed. (West Ireland potato famines: 1739, 1816, 1821, 1822, 1831, 1835, 1836, mid-1840s.) In this and the following three years, there would be another severe food crisis in Ireland. The “meal months” during which the old stores of potatoes had become exhausted while the new crop was not yet ready to be dug from the ground would be extended far beyond the usual June, July, and August.<sup>10</sup>

FAMINE

1817

 After attending private schools in [Ireland](#), [Thomas Davis](#) immigrated to the United States and settled in [Providence, Rhode Island](#). He would engage in the manufacture of jewelry.

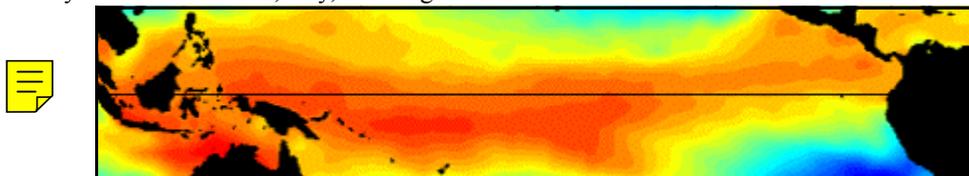
10. [Potatoes](#) are generally not fully mature in [Ireland](#) until October.

## Largest Scale Global Weather Oscillations around 1817

	Southern Oscillation	South Pacific current reversal
1814	strong	warm El Niño strong
1815	absent	cold La Niña
1816	absent	cold La Niña
1817	moderate +	warm El Niño moderate +
1818	absent	cold La Niña
1819	moderate +	warm El Niño moderate +
1820	absent	cold La Niña
1821	moderate	warm El Niño moderate
1822	absent	cold La Niña
1823	absent	cold La Niña

The southern ocean / atmosphere “seesaw” links to periodic Indonesian east monsoon droughts, Australian droughts, deficient Indian summer monsoons, and deficient Ethiopian monsoon rainfall causing weak annual Nile floods. This data is presented from Tables 6.2-6.3 of Quinn, William H. “A study of Southern Oscillation-related climatic activity for AD 622-1900 incorporating Nile River flood data,” pages 119-49 in Diaz, Henry F. and Vera Markgraf, eds. EL NIÑO: HISTORICAL AND PALEOCLIMATIC ASPECTS OF THE SOUTHERN OSCILLATION. Cambridge: Cambridge UP, 1992.

The weather in [India](#) this year would be even worse than the extremely heavy rains and flooding of the year 1815, and the food situation there worsened radically. In the Western world, the food crisis in [Ireland](#) also worsened radically during this year. The “meal months” during which the old stores of [potatoes](#) had become exhausted while the new crop was not yet ready to be dug from the ground on that island would be extended far beyond the usual June, July, and August.<sup>11</sup>



FAMINE

There would be a population migration during the traveling season of this year, but this migration, known as “[Ohio](#) fever,” was due rather to the failed crops of the previous growing season during the cold summer of 1816, rather than to the weather during this summer of 1817.

11. [Potatoes](#) are generally not fully mature in Ireland until October.



## POTATO

## SOLANUM TUBEROSUM

1818

➡ The food crisis in [Ireland](#) continued in all its severity. The “meal months” during which the old stores of [potatoes](#) had become exhausted while the new crop was not yet ready to be dug from the ground would be extended far beyond the usual June, July, and August.<sup>12</sup>

FAMINE

1819

➡ The food crisis in [Ireland](#) was continuing in all its severity. The “meal months” during which the old stores of [potatoes](#) had become exhausted while the new crop was not yet ready to be dug from the ground would be extended far beyond the usual June, July, and August.<sup>13</sup>

IRISH POTATO FAMINE

1820

➡ [Zachariah Allen](#) began, on a worn-out plot of 40 acres in [Smithfield, Rhode Island](#) which he was unable to lease any longer even as pasture, an experiment in silviculture that now seems to us to have been the first such attempt in New England and perhaps in the entire United States (this woodlot has become part of the present-day Lincoln Woods State Park). He planted trees and began a 67-year period of keeping careful track of expenses. The cost of planting these trees was \$45 and the plot had been appraised to have a value of \$600.

At about this time, the American potato and eggplant members of the nightshade family (*Solanacea*) already having gained a widespread acceptance, the [tomato](#) (*Lycopersicon esculentum*) member of that family was also beginning to gain acceptability in the USA as a food for civilized people. In [Newport, Rhode Island](#) Michel Felice Corne again attempted to grow the tomato in his garden – and this time, unlike in his Salem MA garden in 1802, the plant would grow very well and produce a succulent harvest. Soon his neighbors would be planting tomatoes as well! During this decade, several cookbooks would be including tomatoes in recipes. William Cobbett, your ordinary journalist with a penchant for fighting lost battles, having lost the bones of Tom Paine (!), decided to warn against the influence of the [potato](#). Nobody, of course, paid the slightest attention, not because he had lost his hero’s bones, nor because over-reliance on a single staple crop can’t be an exceedingly risky business proposition — but because you’ve got to join them you simply can’t fight them.

FAMINE

THOMAS PAINE

### THE NIGHTSHADES (SOLANACEAE)

- — [Solanum tuberosum](#)
- — [Tomato Lycopersicon esculentum](#)
- — chili peppers

12. [Potatoes](#) are generally not fully mature in [Ireland](#) until October.

13. [Potatoes](#) are generally not fully mature in [Ireland](#) until October.



## SOLANUM TUBEROSUM

## POTATO

- — eggplant
- — deadly nightshade
- — [Nicotiana tabacum](#)
- — henbane
- — Jimson weed
- — petunia
- — plus some 2,000 other species grouped into 75 genera



August 7, Monday: [Potatoes](#) were 1st planted in the Hawaiian Islands.

[Marie Anne Elisa Bonaparte](#), a sister of [Napoléon Bonaparte](#), died at the age of 43.

[Ellen Kilshaw Fuller](#) was born to Margaret Crane Fuller and Timothy Fuller.

In the United States of America, this was the 4th national Census Day. Exceedingly few were living alone. In Shrewsbury, Massachusetts, for instance, the census turned up only two such individuals: a solitary Mary Garfield, a spinster who spun for her neighbors but did not get along well with her kin and who was being referred to as “old Moll Garfield the [witch](#),” and a solitary Jonas Stone, an “insane person” who rejected all attempts at help and was in the process of being coerced by town authorities.

[HERMITS](#)

## POTATO

## SOLANUM TUBEROSUM

1821



When the [potato](#) crop again failed in Ireland as it had in 1800-1801 and in 1816-1819, the nature of [Irish](#) emigration began to change drastically. Previously the immigrants to America had come from families of Protestants in the North who could afford the transatlantic fare. Suddenly the British government was organizing mass emigration from the South in order to avert [famine](#) in the counties of Mayo, Clare, Kerry, and Cork. Some 50,000 would starve or die of starvation-related diseases from Donegal to Youghal (the years of the West Ireland potato famines: 1739, 1816, 1821, 1822, 1831, 1835, 1836, mid-1840s). The goal of the Colonial Office was to provide 2,000 “assisted places” per year. At first the poor Irish Catholics assumed that the grim ships were “transportation”, taking their friends and relatives to what would amount to penal servitude in Australia — which, given the climate of British opinion in regard to the Irish as would be witnessed for instance soon in the early published attitudes of Thomas Carlyle, would not in those times one would have to acknowledge have been an altogether unrealistic suspicion.





## SOLANUM TUBEROSUM

## POTATO

According to Simon Heffer's MORAL DESPERADO: A LIFE OF THOMAS CARLYLE (London: Weidenfeld and Nicolson, 1995), page 42:

In the ten years between the 1811  and 1821  censuses the population of Britain rose by 17%, from 12,000,000 to 14,000,000. Wages, which had risen steadily in real terms since the start of the Napoleonic Wars, were now beginning a downward progress that would not be stopped until after the repeal of the Corn Laws in 1846 – three years after [Thomas Carlyle](#) had railed against the economic and social conditions in England in PAST AND PRESENT. The political establishment was unsteady, the King mad, his son the Prince Regent dissolute and disliked. High stamp duties, of 4d on a newspaper, limited the circulation of opinions hostile to the Tory government or Lord Liverpool. A rash of prosecutions for seditious libel, and for the defamation of the King and his ministers, also occurred in 1817,  as another means of encouraging conformity. A fall in demand immediately after the war led to a great rise in unemployment, exacerbated by the reduction in manpower of the army and navy. Sporadic rioting, and disturbances even among the middle classes, fed the Tory establishment's fear

Soon, however, letters would begin to arrive from the new continent, explaining that in fact they had not been taken around the world to Australia, that there were not very many [anti-Catholic](#) riots or lynchings going on in America, or at least not at that moment, that it was relatively easy to slip across the border from the United States of America to freedom in Canada, that it was relatively easy and risk-free for white people to walk away from the indenture systems then in effect in the USA and assume new identities, etc.

### Population Trends

	England / Wales	Ireland
1821	12,000,000	6,800,000
1831	13,900,000	7,770,000
1841	15,920,000	8,180,000
1845	about 16,700,000	about 8,300,000 (the year of the blight, to be followed by famine and then by fever and emigration)
1851	17,930,000	6,550,000
1861	20,070,000	5,800,000
1871	31,629,299	5,410,000
1881	35,026,108	5,170,000



## POTATO

## SOLANUM TUBEROSUM

1822



July 12: The food crisis in [Ireland](#) was continuing, although this [famine](#) was not turning out to be so severe as the ones of 1800/1801 and of 1816/1819. In Dublin, “Orangemen” (supporters of English rule) were as usual peaceably decorating the statue of their King William on College Green when the [Catholic](#) population began to riot against them.

POTATO

The Sydney, Australia [Gazette](#) posted an alert that Thomas Brooks off the transport *Grenada*, John Heyburn off the transport *Minerva*, and John Creardon off the transport *Lord Sidmouth* were unaccountably absent from their posts of obligation and presumably at large among the public using false documents.

Gullah Jack and others were [hanged](#) in Charleston, South Carolina for having assisted Denmark Vesey in his ill-fated conspiracy to create a servile insurrection (the total of those hanged was rising to 34).

It had come to be reward-yourself time. The economist David Ricardo, accompanied by his wife, two younger daughters, a couple of maidservants and a courier, departed from London on a 5-month broadening “Grand Tour of the Continent.” They would pass through Calais and Brussels into Holland, stay at the Hague and Amsterdam, journey up the Rhine River to Bâle and tour Switzerland, cross from Geneva into Italy for excursions to the Mer de Glace and the Great St Bernard, and go over the Simplon pass to the Italian Lakes, Milan, Venice, and Florence. On their return they would pass through Pisa, Genoa, and Turin on their way to Paris. The trip would be memorialized and it is clear that a good time had been had by all.



## SOLANUM TUBEROSUM

## POTATO

**WALDEN:** If I wished a boy to know something about the arts and sciences, for instance, I would not pursue the common course, which is merely to send him into the neighborhood of some professor, where any thing is professed and practised but the art of life; -to survey the world through a telescope or a microscope, and never with his natural eye; to study chemistry, and not learn how his bread is made, or mechanics, and not learn how it is earned; to discover new satellites to Neptune, and not detect the motes in his eyes, or to what vagabond he is a satellite himself; or to be devoured by the monsters that swarm all around him, while contemplating the monsters in a drop of vinegar. Which would have advanced the most at the end of a month, -the boy who had made his own jack-knife from the ore which he had dug and smelted, reading as much as would be necessary for this, -or the boy who had attended the lectures on metallurgy at the Institute in the mean while, and had received a Rodgers' penknife from his father? Which would be most likely to cut his fingers? -To my astonishment I was informed on leaving college that I had studied navigation! -why, if I had taken one turn down the harbor I should have known more about it. Even the **poor** student studies and is taught only **political** economy, while that economy of living which is synonymous with philosophy is not even sincerely professed in our colleges. The consequence is, that while he is reading Adam Smith, Ricardo, and Say, he runs his father in debt irretrievably.

PEOPLE OF  
WALDEN

ADAM SMITH

DAVID RICARDO

JEAN-BAPTISTE SAY

1830



There was another food crisis in **Ireland**. The “meal months” during which the old stores of **potatoes** had become exhausted while the new crop was not yet ready to be dug from the ground would be extended beyond the usual June, July, and August.<sup>14</sup>

FAMINE

14. **Potatoes** are generally not fully mature in **Ireland** until October.



# POTATO

# SOLANUM TUBEROSUM

**1831**

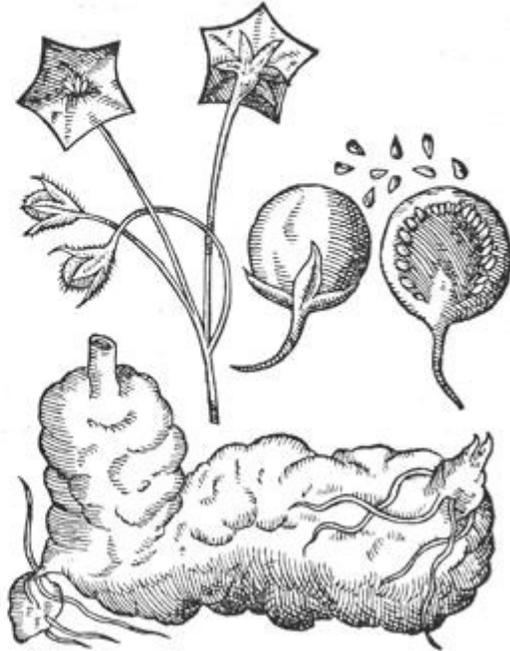
 The potato crisis continued in Ireland, but this famine was not turning out to be so severe as the ones of 1800-1801 and of 1816-1819.

### Population Trends

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**SOLANUM TUBEROSUM**

**POTATO**



## POTATO

## SOLANUM TUBEROSUM

1834

The [tomato](#), *Solanum lycopersicon*, and the [potato](#), *Solanum tuberosum*, are so close genetically that, rather than merely being in the same family, actually they may be in the same genus. Some species of *Lycopersicon* can in fact hybridize with some species related to the white potato. In this year it is reported that a tomato stem was successfully grafted onto a potato root: a plant grew, from which both some smallish potatoes and some smallish tomatoes were harvested. Might this have been the fatal experiment which allowed a crossover of the organism which causes the Irish Potato Blight, from the tomato as a host species to the potato as a host species — resulting in the Great Irish Famine?



(The answer to this question is of course as yet not known, but what must be pointed out at the present juncture is, this is a question which to date we have simply never allowed ourselves to pose! It is unthinkable that the [Irish Potato Famine](#) possibly was something which our incautiousness had brought upon us.)

### THE NIGHTSHADES (SOLANACEAE)

- — [Solanum](#) *tuberosum*
- — [Tomato](#) *Lycopersicon esculentum*
- — chili peppers
- — eggplant
- — deadly nightshade
- — [Nicotiana](#) *tabacum*
- — henbane
- — Jimson weed
- — petunia
- — plus some 2,000 other species grouped into 75 genera



## SOLANUM TUBEROSUM

## POTATO

1838

[Henry Root Colman](#) made his initial annual report of agricultural conditions and resources in Massachusetts.

[WALDEN](#): Fellow-travellers as they rattled by compared it aloud with the fields which they had passed, so that I came to know how I stood in the agricultural world. This was one field not in Mr. Colman's report. And, by the way, who estimates the value of the crop which Nature yields in the still wilder fields unimproved by man? The crop of *English* hay is carefully weighed, the moisture calculated, the silicates and the potash; but in all dells and pond holes in the woods and pastures and swamps grows a rich and various crop only unreaped by man. Mine was, as it were, the connecting link between wild and cultivated fields; as some states are civilized, and others half-civilized, and others savage or barbarous, so my field was, though not in a bad sense, a half-cultivated field. They were beans cheerfully returning to their wild and primitive state that I cultivated, and my hoe played the *Ranz des Vaches* for them.

PEOPLE OF  
WALDEN

HENRY ROOT COLMAN

THE BEANFIELD

According to this report, by this point fully 85% of Massachusetts had been devoted to farming and livestock. Few farmers owned more than six cows and few owned any horses at all. Oxen, fed in stalls, were usually turned over to drovers in the spring when they were 3 to 5 years old to be driven to the markets at Brighton. Trying to keep the animals from losing more than 100 pounds each, the drovers would pasture them in fields of grass that would be paid for as they made their journey toward Boston. Where there were sheep, they were owned more often in upland towns. The major crops were grasses, corn, oats, rye, wheat, broom corn (which had been introduced *circa* 1815), [hops](#), barley, buckwheat, teasle, peppermint, and [potatoes](#).

1839

 August 30, Friday: In the evening the Thoreau brothers loaded their *MUSKETAQUID*, which they had provided with wheels in order to be able to roll it around falls, with [potatoes](#) and melons from a patch they had cultivated, and a few utensils, at the door of the family home half a mile from the river.

JOHN THOREAU, JR.

HENRY THOREAU

POTATO

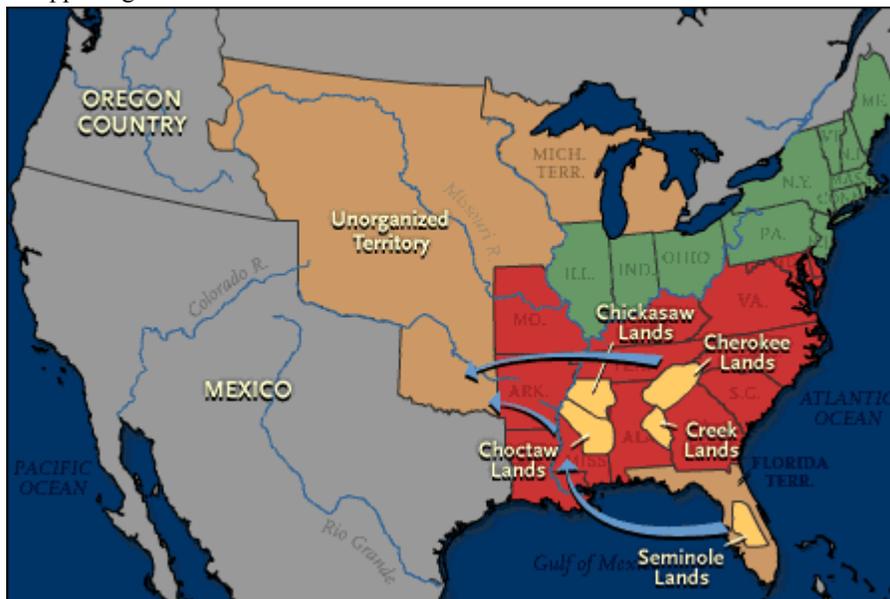
SOLANUM TUBEROSUM

August 31, Saturday: “Fall of 1839 up Merrimack to White Mountains.” As Lucy Maddox has unsympathetically pointed out in her REMOVALS: NINETEENTH-CENTURY AMERICAN LITERATURE AND THE POLITICS OF INDIAN AFFAIRS, “The journey that is recorded in WEEK took place in 1839, the year after the Trail of Tears (although Thoreau did not publish his book until ten years later).



JOHN THOREAU, JR.

Thoreau knew where the real Indians were and what was happening to them, and he looked for ways to justify what was happening.



He also sought out some of the Indians remaining in the East; he just didn't like them much when he found them.”<sup>15</sup> Well, it does appear that this adventure of the brothers was in fact [Henry Thoreau](#)'s first overnight outing after a number of years of he and his brother playing Indian, and that despite many day excursions it was his first night in a tent: “I shall not soon forget my first night in a tent –how the distant barking of dogs for so many still hours revealed to me the riches of the night.– Who would not be a dog and bay the moon? —

15. NY: Oxford UP, 1991, pages 176-7.

»16



Ross/Adams commentary  
 Cruickshank commentary

TIMELINE OF A WEEK



We note that at this point in time there was no “[Old North Bridge](#)” whatever, only the abutments of that historic structure still being available for view on the banks of the river:

**A WEEK:** We were soon floating past the first regular battle-ground of the Revolution, resting on our oars between the still visible abutments of that “North Bridge,” over which in April, 1775, rolled the first faint tide of that war, which ceased not, till, as we read on the stone on our right, it “gave peace to these United States.” As a Concord poet has sung:—

“By the rude bridge that arched the flood,  
 Their flag to April’s breeze unfurled,  
 Here once the embattled farmers stood,  
 And fired the shot heard round the world.

“The foe long since in silence slept;  
 Alike the conqueror silent sleeps;  
 And Time the ruined bridge has swept  
 Down the dark stream which seaward creeps.”

**A WEEK:** (August 31, Saturday, 1839) At length, when we had made about seven miles, as far as Billerica, we moored our boat on the west side of a little rising ground which in the spring forms an island in the river. Here we found huckleberries still hanging upon the bushes, where they seemed to have slowly ripened for our especial use. Bread and sugar, and cocoa boiled in river water, made our repast, and as we had drank in the fluvial prospect all day, so now we took a draft of the water with our evening meal to propitiate the river gods, and whet our vision for the sights it was to behold.

COCOA

16. At about this same time, Waldo Emerson was setting off with George Bradford on a sightseeing tour of the White Mountains, and Emerson was shipping off a bushel of [potatoes](#) for his brother William on Staten Island.



## POTATO

## SOLANUM TUBEROSUM

**A WEEK:** Late in the afternoon we passed a man on the shore fishing with a long birch pole, its silvery bark left on, and a dog at his side, rowing so near as to agitate his cork with our oars, and drive away luck for a season; and when we had rowed a mile as straight as an arrow, with our faces turned towards him, and the bubbles in our wake still visible on the tranquil surface, there stood the fisher still with his dog, like statues under the other side of the heavens, the only objects to relieve the eye in the extended meadow; and there would he stand abiding his luck, till he took his way home through the fields at evening with his fish. Thus, by one bait or another, Nature allures inhabitants into all her recesses. This man was the last of our townsmen whom we saw, and we silently through him bade adieu to our friends.



DOG



**A WEEK:** For the most part, there was no recognition of human life in the night, no human breathing was heard, only the breathing of the wind. As we sat up, kept awake by the novelty of our situation, we heard at intervals foxes stepping about over the dead leaves, and brushing the dewy grass close to our tent, and once a musquash fumbling among the potatoes and melons in our boat, but when we hastened to the shore we could detect only a ripple in the water ruffling the disk of a star. At intervals we were serenaded by the song of a dreaming sparrow or the throttled cry of an owl, but after each sound which near at hand broke the stillness of the night, each crackling of the twigs, or rustling among the leaves, there was a sudden pause, and deeper and more conscious silence, as if the intruder were aware that no life was rightfully abroad at that hour. There was a fire in Lowell, as we judged, this night, and we saw the horizon blazing, and heard the distant alarm-bells, as it were a faint tinkling music borne to these woods. But the most constant and memorable sound of a summer's night, which we did not fail to hear every night afterward, though at no time so incessantly and so favorably as now, was the barking of the house-dogs, from the loudest and hoarsest bark to the faintest aerial palpitation under the eaves of heaven, from the patient but anxious mastiff to the timid and wakeful terrier, at first loud and rapid, then faint and slow, to be imitated only in a whisper; wow-wow-wow-wow – wo – wo – w – w. Even in a retired and uninhabited district like this, it was a sufficiency of sound for the ear of night, and more impressive than any music. I have heard the voice of a hound, just before daylight, while the stars were shining, from over the woods and river, far in the horizon, when it sounded as sweet and melodious as an instrument. The hounding of a dog pursuing a fox or other animal in the horizon, may have first suggested the notes of the hunting-horn to alternate with and relieve the lungs of the dog. This natural bugle long resounded in the woods of the ancient world before the horn was invented. The very dogs that sullenly bay the moon from farm-yards in these nights excite more heroism in our breasts than all the civil exhortations or war sermons of the age. "I would rather be a dog, and bay the moon," than many a Roman that I know. The night is equally indebted to the clarion of the cock, with wakeful hope, from the very setting of the sun, prematurely ushering in the dawn. All these sounds, the crowing of cocks, the baying of dogs, and the hum of insects at noon, are the evidence of nature's health or **sound** state. Such is the never-failing beauty and accuracy of language, the most perfect art in the world; the chisel of a thousand years retouches it.

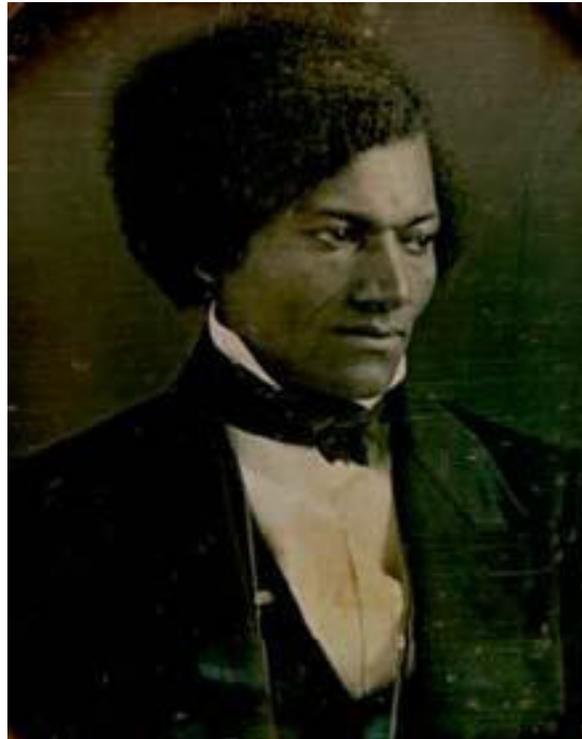
DOG

POTATO

SOLANUM TUBEROSUM

September 3, Tuesday: The 1st anniversary of Frederick Douglass’s freedom, which we may well elect to celebrate in lieu of **an unknown slave birthday**.

*“It has been a source of great annoyance to me, never to have a birthday.”*



September 3: Tuesday We passed a boat before sunrise, and though we could not distinguish it for the fog, the few dull sounds we heard, carried with them a sense of weight and irresistible motion which was impressive. *{Four-fifths page blank}*

If ever our idea of a friends is realised it will be in some broad and generous natural person — as frank as the daylight — in whose presence our behavior will be as simple and unconstrained, as the wanderer amid the recesses of the hills.

The language of excitement is picturesque merely — but not so with enthusiasm You must be calm before you can utter oracles— What was the excitement of the Delphic priestess compared with the calm wisdom of Socrates! God is calm

Enthusiasm is a supernatural serenity. *{Two-fifths page blank}*

Rivers are the natural highways of all nations, not only levelling and removing obstacles from the path of the traveller — quenching his thirst — and bearing him on their bosom, but conducting him through the most interesting scenery of a country most rich in natural phenomena, through the most populous portions of the globe where the animal and vegetable kingdoms attain the greatest perfection. *{Three-fifths page blank}*

We passed a man on the shore fishing with a long birch pole and a dog at his side — standing like caryatides under the cope of heaven— We passed so near as to agitate his float with our oars, and drive luck away for an indefinite term — but when we had rowed a mile as straight as an arrow with our faces toward him, he still stood with the proverbial patience of a fisherman the only object to relieve the eye in the extended meadow — under the other side of heaven — and there would stand abiding his luck — till he took his way home at evening with his fish — — He and his dog! (it was a superior contemplative dog) may they fare well. I trust we shall meet again. He was no chimera or vision to me.

When we had passed the bridge we saw men haying far off in the meadows, their heads moving like the herds grass. In the distance the wind seemed to bend all alike.<sup>17</sup>

**SOLANUM TUBEROSUM**

**POTATO**



Plum Island, at the mouth of this river [The Merrimack] to whose formation, perhaps, these very banks have sent their contribution, is a similar desert of drifting sand, of various colors, blown into graceful curves by the wind. It is a mere sand-bar exposed, stretching nine miles parallel to the coast, and, exclusive of the marsh on the inside, rarely more than half a mile wide. There are but half a dozen houses on it, and it is almost without a tree, or a sod, or any green thing with which a country-man is familiar. The thin vegetation stands half buried in sand as in drifting snow. The only shrub, the beach plum, which gives the island its name, grows but a few feet high; but this is so abundant that parties of a hundred at once come from the mainland and down the Merrimack, in September, pitch their tents, and gather the plums, which are good to eat raw and to preserve. The graceful and delicate beach pea, too, grows abundantly amid the sand, and several strange moss-like and succulent plants. The island for its whole length is scalloped into low hills, not more than twenty feet high, by the wind, and, excepting a faint trail on the edge of the marsh, is as trackless as Sahara. There are dreary bluffs of sand and valleys plowed by the wind, where you might expect to discover the bones of a caravan. Schooners come from Boston to load with the sand for masons' uses, and in a few hours the wind obliterates all traces of their work. Yet you have only to dig a foot or two anywhere to come to fresh water; and you are surprised to learn that woodchucks abound here, and foxes are found, though you see not where they can burrow or hide themselves. I have walked down the whole length of its broad beach at low tide, at which time alone you can find a firm ground to walk on, and probably Massachusetts does not furnish a more grand and dreary walk. On the seaside there are only a distant sail and a few coots to break the grand monotony. A solitary stake stuck up, or a sharper sand-hill than usual, is remarkable as a landmark for miles; while for music you hear only the ceaseless sound of the surf, and the dreary peep of the beach-birds.

BEACH PLUM  
PLUM ISLAND

17. The poet W.H. Auden has in 1962 brought forward a snippet from this day's entry as:

**THE VIKING BOOK OF APHORISMS, A PERSONAL SELECTION  
BY W.H. AUDEN...**

Pg	Topic	Aphorism Selected by Auden out of Thoreau
67	<b>The Talker</b>	The language of excitement is picturesque merely — but not so with enthusiasm You must be calm before you can utter oracles.



## POTATO

## SOLANUM TUBEROSUM

Near Litchfield, Thoreau saw an extensive desert area where sand had blown into dunes ten and twelve feet high. This recalled to his mind Plum Island, which he had visited in the past, for he thought some of this desert sand might well be borne down the Merrimack to its mouth not far from Newburyport, and there form part of that island so well known to the birding clan. Of course, Thoreau did not come nearer to Plum Island on this river trip than the junction of the Concord and Merrimack, some thirty miles away. But Thoreau's description of Plum Island is especially interesting to bird watchers. In his GUIDE TO BIRD FINDING, Dr. Olin Sewall Pettingill, Jr., calls this one of the most famous ornithological areas of the eastern United States. Birds traveling north or south along the Atlantic coast funnel over this area, and multitudes drop down to rest and feed there. A trip to this island is particularly rewarding during the peak of shorebird migration in spring and fall. The half-dozen houses of Thoreau's day have multiplied many times over. Nevertheless, ripe beach plums may still be picked there in September. Untracked sand, particularly in winter or after storms, may still be found. The fact that Thoreau mentioned only a few beach birds running on the sand and some coots (scoters) riding the waves behind the surf reveals clearly that his interest in birds was dormant when he visited Plum Island. C. Russell Mason, then Executive Director of the Massachusetts Audubon Society, after an early September visit to Plum Island with Dr. Roger Tory Peterson, wrote, "Every shore-bird in the book can be found on Plum Island, and as for gulls, if rare species appear on the north-east coast, they will almost surely be spotted at Plum Island." Plum Island is one of the most important areas covered by the Newburyport Christmas Bird Count. This Count is made at a time when weather is severe and one would expect bird life in that bleak area to be at a low ebb. Yet on the 1962 Count when winds blew off the ocean and the temperature scarcely rose into the thirties, when snow covered the ground and all the ponds were frozen, eighty-eight species and about twenty-eight thousand individual birds were seen. -Cruickshank, Helen Gere. THOREAU ON BIRDS (New York: McGraw-Hill Book Company, 1964)

## SOLANUM TUBEROSUM

## POTATO



September 3: Tuesday The banks of the Merrimack are steep and clayey for the most part and trickling with water — and where a spring oozes out a few feet above the level of the river, the boatmen cut a trough out of a slab with their axes and place it so as to receive the water, and fill their jugs conveniently. Bursting out from under the root of a pine or a rock, sometimes this purer and cooler water is collected into a little basin close to the edge of and level with the river — a fountain head of the Merrimack.—

so near along life's stream lie the fountains of innocence and youth — making fertile the margin of its turbid stream. Let the voyageur replenish his vessel at these uncontaminated sources.— Some youthful spring perchance still empties with tinkling music into the oldest river, even when it is falling into the sea. I imagine that its music is distinguished by the river gods from the general lapse of the stream and falls sweeter upon their ears in proportion as it is nearer the sea.

As thus the evaporations of the river feed these unsuspected springs which filter through its banks so our aspirations fall back again in springs upon the margin of our life's stream to refresh and purify it.

The routine of these boatmen's lives suggests to me how indifferent all employments are, and how any may be infinitely noble and poetic in the eyes of men, if pursued with sufficient buoyancy and freedom. For the most part they carry down wood and bring back stores for the country, piling the wood so as to leave a little shelter in one part where they may sleep, or retire from the rain if they choose.

I can hardly imagine a more healthy employment, or more favorable to contemplation, or the observation of nature.— In no weather subject to great exposure — as the lumberers of Maine — and in summer inhaling the healthfullest breezes. But slightly encumbered with clothing — frequently with the head and feet bare.

From morning till night the boatman walks backwards and forwards on the side of his boat, now stooping with his shoulder to the pole, then drawing it back slowly to set it again — meanwhile moving steadily and majestically forward through an endless valley, amid an ever changing scenery, — now distinguishing his course for a mile or two — and now finding himself shut in by a sudden turn of the river, in a small woodland lake.

All the phenomena which surround him are simple and grand— The graceful majestic motion of his craft, must communicate something of the same to his character. So will he over forward to his objects on land. There is something impressive and stately in this motion which he assists. He feels the slow irresistible motion under him with pride as if it were the impetus of his own energy.

At noon his horn is heard echoing from shore to shore to give notice of his approach — to the farmer's wife with whom he is to take his dinner — frequently in such retired scenes that only muskrats and king fisher's seem to hear.



Tuesday sep 3d About noon we passed the village of Merrimac where some carpenters were at work mending a scow on the shore. The strokes of their mallets echoed from shore to shore and up and down the river, and their tools gleamed in the sun a quarter of a mile from us, which made boat building seem as ancient and honorable as agriculture, and we realized how there might be a naval as well as pastoral life— We thought of a traveller building his boat on the banks of the stream under the heavens— As we glided past at a distance these out-door workmen seemed to have added some dignity to their labor by its publicness — it seemed a part of the industry of nature like the work of hornets and mud wasps

The whole history of commerce was made plain in this scow turned bottom upward on the shore. Thus men begin to go down upon the sea in ships. There was Iolchos and the launching of the Argo. ———

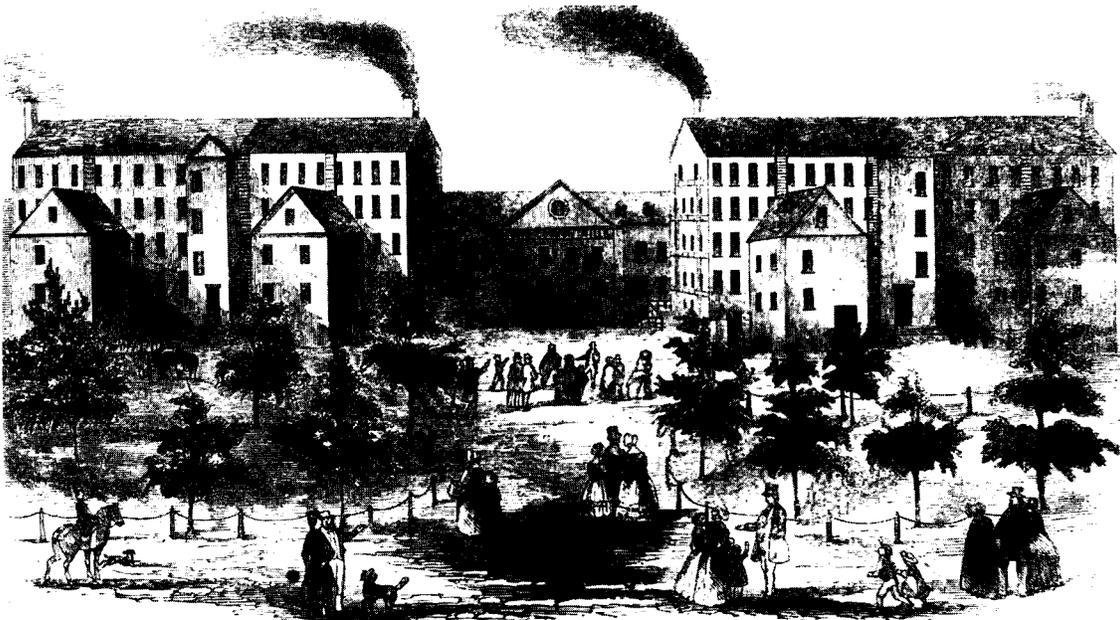
The waves slowly beat  
 Just to keep the noon sweet  
 And no sound is floated oer  
 Save the mallet on shore  
 Which echoing on high  
 Seems a caulking the sky

We passed some shag-bark trees on the opposite shore skirting the waters edge. The first I had ever seen On the sandy shore of the Merrimack opposite to Tyngsboro, we first discovered the blue bell— A pleasant sight it must be to the Scotchman in Lowell mills.

## POTATO

## SOLANUM TUBEROSUM

The moon now rises to her absolute rule,  
 And the husbandman and hunter  
 Acknowledge her for their mistress.  
 Asters and golden reign in the fields  
 And the life everlasting withers not.  
 The fields are reaped and shorn of their pride  
 But an inward verdure still crowns them  
 The thistle scatters its down on the pool  
 And yellow leaves clothe the vine—  
 And nought disturbs the serious life of men.  
 But behind the sheaves and under the sod  
 There lurks a ripe fruit which  
     the reapers have not gathered  
 The true harvest of the year  
 Which it bears forever.  
 With fondness annually watering and maturing it.  
 But man never severs the stalk  
 Which bears this palatable fruit.



## Mills of Lowell

The hardest material obeys the same law with the most fluid. Trees are but rivers of sap and woody fibre flowing from the atmosphere and emptying in to the earth by their trunks — as their roots flow upward to the surface. And in the heavens there are rivers of stars and milky ways— There are rivers of rock on the surface and rivers of ore in the bowels of the earth.

From this point the river runs perfectly straight for a mile or more to Carlisle bridge — which consists of 20 piers — and in the distance its surface looks like a cobweb gleaming in the sun. *{Two-fifths page blank}*

In the morning the whole river and adjacent country was covered by a dense fog — through which the smoke of our fire curled up like a subtler mist. But before we had rowed many rods the fog dispersed as by magic and only a slight steam curled up from the surface of the water.—

We reached the falls in Billerica before noon, where we left the river for the canal, which runs six miles through the woods to the Merrimack at Middlesex. As we did not care to loitre in this part of our voyage while one ran along the tow path drawing the boat by a cord, the other kept it off from the shore with a pole, so that we accomplished the whole distance in little more than an hour.

There is some abruptness and want of harmony in this scenery since the canal is not of equal date with the forests and meadows it runs through.

You miss the conciliatory influence of time on land and water.

In the lapse of ages no doubt nature will recover and idemnify herself. Gradually fit shrubs and flowers will be planted along the borders Already the king-fisher sits on a pine over the water, and the dace and pickerel swim



## SOLANUM TUBEROSUM

## POTATO

below. All works pass directly out of the hands of the architect. and though he has bungled she will perfect them at last.

Her own fish-hawks hover over our fish-ponds  
were pleased to find that our boat would float in M. water

By noon we were fairly launched upon the bosom of the merrimack — having passed through the locks at Middlesex — and felt as if we were on the ocean stream itself.

Beaver river comes in a little lower down draining the meadows of Pelham, Windham, and Londonderry, the Irish settlers of which latter town were the first to introduce the potatoe into N.E. *{One-fourth page blank}*

Two men called out from the steep and wooded banks to be taken as far as Nashua but we were too deeply laden— As we glided away from them with even sweeps while the fates scattered oil in our course — as the sun was sinking behind the willows of the distant shore, — we could see them far off over the water — running along the shore and climbing over the rocks and fallen trees like ants till they reached a spot where a broad stream poured its placid tribute into the Merrimack— When a mile distant we could see them preparing to ford the stream— But whether they got safely through or went round by the source, we never learned.

Thus nature puts the busiest merchant to pilgrim's shifts. She soon drives us to staff and scrip and scallop shell. The Mississippi the Nile the Ganges can their personality be denied? have they not a personal history in the annals of the world— These journeying atoms from the andes and ural and mountains of the moon — by villas — villages — and mists — with the moccasined tread of an Indian warrior. Their sources not yet drained. The mountains of the moon send their tribute to the pasha as they did to Pharoah without fail. though he most collect the rest of his revenue at the point of the bayonnette

Consider the phenomena of morn — or eve — and you will say that Nature has perfected herself by an eternity of practice— Evening stealing over the fields— The stars come to bathe in retired waters The shadows of the trees creeping farther and farther into the meadows. And a myriad phenomena beside.

Occasionally a canal boat with its large white sail glided around a promontory a quarter of a mile before us and changed the scene in an instant— Occasionally attaching ourselves to its side we would float back in company awhile — interchanging a word with the voyageurs and obtaining a draught of cooler water from their stores. Occasionally we had to muster all our energy to get round a point where the river broke rippling over rocks and the maples trailed their branches in the stream.

The rain had pattered all night And now the whole country wept, the drops falling in the river, and on the alder, and in the pastures, but instead of any bow in the heavens there was the trill of the tree sparrow all the morning. The cheery faith of this little bird atoned for the silence of the whole woodland quire.

### MIDDLESEX CANAL



Tuesday—

At intervals when there was a suitable reach in the river — we caught sight of the Goffstown mountain — the Indian Un-can-nu-nuc rising before us, on the left of the river— “The far blue mountain.” *{One-fourth page blank}*

We soon after saw the Piscataquoag emptying in on our left — and heard the falls of Amoskieg above.

It was here according to tradition that the sachem Wonolanset resided, and when at war with the mohawks his tribe are said to have concealed their provisions in the cavities of the rocks in the upper part of the falls

The descent is 54 feet in half a mile.

The manchester manufacturing company have constructed a canal here — through which we passed.

Above the falls the river spreads out into a lake — stretching up toward Hooksett— We could see several canal boats at intervals of a mile or more standing up to Hooksett with a light breeze. With their broad sails set they moved slowly up the stream in the sluggish and fitful breeze — as if impelled by some mysterious counter current — like Antediluvian birds. A grand motion so slow and steady. For the most part they were returning empty, or at most with a few passengers aboard. As we rowed near to one which was just getting under way, the steers man offered to take us in tow — but when we came along side we found that he intended to take us on board, as otherwise we should retard his own voyage too much — but as we were too heavy to be lifted aboard — we left him and proceeded up the stream a half a mile to the shade of some maples to spend our noon

In the course of half an hour several boats passed up the river at intervals of half a mile — and among them came the boat we have mentioned, keeping the middle of the stream and when within speaking distance the steers man called out if we would come along side now he would take us in tow. But not heeding their taunts we made no haste to give chase until our preparations were made — by which time they were a quarter of a mile ahead. Then with our own sails set — and plying our four oars, we were soon along side of them — and we glided close under their side, we quietly promised if they would throw us a rope that we would take them in tow. And then we gradually overhauled each boat in succession until we had the river to ourselves again.

No man was ever party to a secure and settled friendship — it is no more a constant phenomenon than meteors and lightning— It is a war of positions of silent tactics.

With a fair wind and the current in our favor we commenced our return voyage, sitting at ease in our boat and



## POTATO

## SOLANUM TUBEROSUM

conversing, or in silence watching, for the last sign of each reach in the river, as a bend concealed it from view. The lumbermen who were throwing down wood from the top of the high bank, 30 or 40 feet above the water, that it might be sent down the river — paused in their work to watch our retreating sail. *{One-fifth page blank}*  
In summer I live out of doors and have only impulses and feelings which are all for action— And must wait for the quiet & stillness and longer nights of Autumn and Winter, before any thought will subside.

---

I mark the summer's swift decline  
The springing sward its grave clothes weaves  
Oh could I catch the sounds remote  
Could I but tell to human ear  
The strains which on the breezes float  
And sing the requiem of the dying year.

None of the feathered race have yet realized my conception of the woodland depths. I had fancied that their plumage would assume stronger and more dazzling colors, like the brighter tints of evening, in proportion as I advanced farther into the darkness and solitude of the forest. The red election, brought from their depth, did in some degree answer my expectation — gleaming like a coal of fire amid the pines.  
In Autumn what may be termed the dry colors preponderate in Summer the moist. The Asters and golden rod are the livery which nature wears at present. The golden rod alone seem to express all the ripeness of the autumn, and sheds its mellow lustre on the fields as if the now declining summer sun had bequeathed its hues to it. Asters everywhere spot the fields like so many fallen stars.

Thoreau shot a Passenger Pigeon, one of a large flock near the mouth of the Souhegan River, and broiled it for supper. Scientists are not sure why these birds, once fantastically abundant, became extinct. Some attribute it to excessive slaughter on the breeding grounds and throughout the year. Some believe the destruction of the beech and oak forests was largely responsible. Some believe that the numbers having been severely reduced by overshooting, the species was no longer able to reproduce. Thoreau's concern about the dead pigeon was philosophical. Did he have a right to kill such a beautiful bird? Having killed it, he decided it should be eaten and not wasted.? Though Thoreau seldom saw a dead bird in the woods or fields, had he visited a nesting place of colonial birds, or walked along the drift of an ocean beach, he would have seen many dead birds. Probably the majority of song birds are finally caught and eaten by other creatures. Most of those that do die of disease or age, being quite small, are eaten by insects, mice, or even snakes, for the latter have been seen eating birds killed on highways. Certainly birds are never translated, as some of the Old Testament prophets were said to have been, being taken directly from earth to heaven without dying. -Cruickshank, Helen Gere. THOREAU ON BIRDS (New York: McGraw-Hill Book Company, 1964)



[Tuesday of WEEK. American Passenger Pigeons *Ectopistes migratorius* near the mouth of the Souhegan River.] During the heat of the day, we rested on a large island a mile above the mouth of this river, pastured by a herd of cattle, with steep banks and scattered elms and oaks, and a sufficient channel for canal-boats on each side. When we made a fire to boil some rice for our dinner, the flames spreading amid the dry



## SOLANUM TUBEROSUM

## POTATO

grass, and the smoke curling silently upward and casting grotesque shadows on the ground, seemed phenomena of the noon, and we fancied that we progressed up the stream without effort, and as naturally as the wind and tide went down, not outraging the calm days by unworthy bustle or impatience. The woods on the neighboring shore were alive with pigeons, which were moving south, looking for mast, but now, like ourselves, spending their noon in the shade. We could hear the slight, wiry, winnowing sound of their wings as they changed their roosts from time to time, and their gentle and tremulous cooing. They sojourned with us during the noon-tide, greater travellers far than we. You may frequently discover a single pair sitting upon the lower branches of the white pine in the depths of the woods, at this hour of the day, so silent and solitary, and with such a hermit-like appearance, as if they had never strayed beyond its skirts, while the acorn which was gathered in the forests of Maine is still undigested in their crops. We obtained one of these handsome birds, which lingered too long upon its perch, and plucked and broiled it here with some other game, to be carried along for our supper; for, beside provisions which we carried with us, we depended mainly on the river and forest for our supply. It is true, it did not seem to be putting this bird to its right use to pluck off its feathers, and extract its entrails, and broil its carcass on the coals; but we heroically persevered, nevertheless, waiting for further information. The same regard for Nature which excited our sympathy for her creatures nerved our hands to carry through what we had begun. For we would be honorable to the party we deserted; we would fulfill fate, and so at length, perhaps, detect the secret innocence of these incessant tragedies which Heaven allows.

Nature herself has not provided the most graceful end for her creatures. What becomes of all these birds that people the air and forest for our solacement? The sparrows seem always *chipper*, never infirm. We do not see their bodies lie about. Yet there is a tragedy at the end of each one of their lives. They must perish miserably, not one of them is translated. True, "not a sparrow falleth to the ground without our Heavenly Father's knowledge," but they do fall, nevertheless.

That night the Thoreau brothers camped "In [the township of] Bedford, on the west bank [of the Merrimack River], opposite a large rock, above Coos Falls." Did they, due to rainy weather, completely miss the northern lights display of that night? The next morning, as they shoved off, they would see a **Green-backed Heron** *Butorides striatus*.

Ross/Adams  
commentary

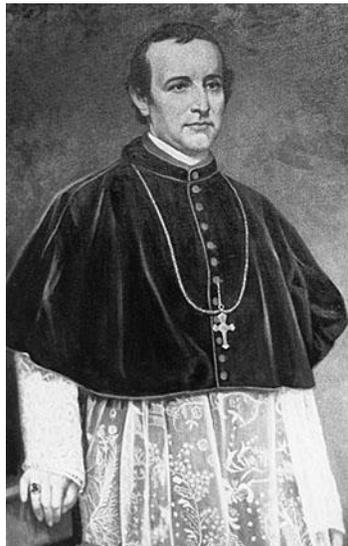
TIMELINE OF A WEEK

POTATO

SOLANUM TUBEROSUM

1840

In Ireland, the Repeal Association was founded by Daniel O’Connell. Archbishop John Joseph Hughes of the Roman Catholic church in New-York (who would, like most Catholics of the northern states, strongly support the war to preserve the Union, while vigorously opposing the abolition of human slavery) pointed out to O’Connell that while he had many friends in America, “you have some who are much displeased with certain of your public remarks.”



When the Irish patriotic leader inquired what he had said that had so seriously offended the Irish of America, the archbishop advised him that “they think you are too severe upon ... slavery.” O’Connell’s response was characteristic of the man: “It would be strange indeed if I should not be the friend of the slave throughout the world — I who was born a slave myself.” Later the American archbishop commented that he had found such a response unpersuasive.<sup>18</sup>



“It is simply crazy that there should ever have come into being a world with such a sin in it, in which a man is set apart because of his color – the superficial fact about a human being. Who could want such a world? For an American fighting for his love of country, that the last hope of earth should from its beginning have swallowed slavery, is an irony so withering, a justice so intimate in its rebuke of pride, as to measure only with God.”



– Stanley Cavell, MUST WE MEAN WHAT WE SAY? 1976, page 141

18. Obviously, the good archbishop should have been persuaded, since O’Connell’s attitude that while any person of color remained unfree, the Irish would not be free, was an attitude which flows directly out of the religious injunction “What ye do unto the least of these my brethren, ye do unto Me” — a religious injunction which supposedly ought to be considered unobjectionable by any and all of the archbishops of the True Church.



## SOLANUM TUBEROSUM

## POTATO

Although by the period of the 1840s the [Irish](#) growers had developed some 200 commercial varieties of the [potato](#) plant, these cultivars were undergoing a rapid degradation perhaps because potato viruses were evolving to adapt to local conditions almost as rapidly as the potatoes themselves. By the time of the appearance of the late blight, most of the peasants in the areas that would be hit the hardest were growing only what they called the “lumper,” one single cultivar which, although contemned by both humans and livestock for its “watery” taste, was proving to be the most productive amid the rocks and in the general wetness of the west of Ireland. Potatoes were making up like 60% of the entire national food intake. Even the bogs were being planted, by the technique known as the “lazy bed,”<sup>19</sup> in order to obtain adequate nutrition, which had resulted in the derogatory epithet “Bogtrotter” being applied to designate a poor Irish potato farmer. The stage was thus set for an infestation which would be rapid, virtually total, and devastating. In Ireland even today, mass graves are turning up, the most probable death estimate for these dark years indicating an average of 30 corpses per square mile of land surface.

During the years of this decade, Holyoke would be becoming the site for a planned industrial city and work would be beginning on the plan, the dam, and the [canal](#). [Irish](#) laborers would begin to arrive, in great numbers.

19. On land so wet that a grain crop might “lodge,” that is, lie flat upon the ground, one may expect to produce six tons of potatoes per acre by the use of such “lazy beds,” the seed potatoes being laid out in rows upon the surface of the ground along with manure and seaweed, and then covered over with soil dug from drainage trenches between these rows.

POTATO

SOLANUM TUBEROSUM

1841

October: [Rhode Island](#) was in turmoil. During this month a People’s Constitutional Convention met and drafted a People’s Constitution to replace the old royal colonial charter which was still in effect. There were a lot of millworkers, mostly centered around a place called Blackstone Valley or [Pawtucket](#) that you can still see without even needing to get off the freeway as you drive through [Providence](#). Almost 60% of Rhode Islanders –strike that, almost 60% of the **adult male** population of Rhode Island– were being denied the opportunity to



vote by the dominant Law-and-Order party there –a party made up to a significant degree of landowners who

**READ EDWARD FIELD TEXT**

had inherited fortunes made in the slave trade– because they did not hold at least \$134.<sup>00</sup> in property and/or were not the eldest son of a Rhode Islander who held at least \$134.<sup>00</sup> in property. However, the workers who were fighting for universal (adult male) suffrage were also, generally, racists fighting to deny such suffrage to adult free black males. This made for an interesting politics. For instance, the Law-and-Order party of [Rhode Island](#) cut a deal with the large black population of [Providence](#) because “they would rather have the Negroes vote than the damned [Irish](#).” (The Irish were a threat simply because, since they had been forced to flee the [potatoes](#) and the [famines](#) of Ireland, they had become susceptible to pressures to labor longer hours for lower pay.)





# SOLANUM TUBEROSUM

# POTATO

Outside agitators who were in favor of equal suffrage for all adult males, outside agitators such as [Abby Kelley](#), stood accused in the newspapers of trying to “convert people to [transcendentalism](#).” [Frederick Douglass](#) later wrote of Kelley that “Her young and simple Quaker beauty, combined with her wonderful earnestness, her large knowledge and great logical power bore down all opposition, wherever she spoke, though she was pelted with foul eggs and no less foul words from the noisy mobs which attended us.”

The Law and Order party lost the election, but it was an illegal election anyway and the Law and Order party had a promise from President John Tyler of federal troops if necessary, so they put a thousand-dollar reward on the head of the winner of the election, [Thomas Wilson Dorr](#), and when they arrested him they tried him for treason and sentenced him to life in prison.<sup>20</sup>

### Population Trends

	England / Wales	Ireland
1821	12,000,000	6,800,000
1831	13,900,000	7,770,000
1841	15,920,000	8,180,000
1845	about 16,700,000	about 8,300,000 (the year of the blight, to be followed by famine and then by fever and emigration)
1851	17,930,000	6,550,000
1861	20,070,000	5,800,000
1871	31,629,299	5,410,000
1881	35,026,108	5,170,000

20. It's not that bad, wouldn't you know: the Law and Order people pardoned this candidate as soon as they were firmly in control of [Rhode Island](#) again, and so actually he only spent a couple of years of his life in prison as a traitor to his country for the crime of being the political candidate who had been the best vote-getter in an election that was declared to be unauthorized.

## POTATO

## SOLANUM TUBEROSUM

1842

The current regulations for emigration, as specified by the British parliament, were that each emigrant passenger was to be provided with at least 10 square feet of deck area, which space was to be not exposed but between decks. For provisions, each emigrant was to be issued 7 pounds of bread, biscuits, flour, oatmeal, or rice, or the equivalent in [potatoes](#), per week. The regulations specifically instructed that this ration for emigrants was to be provided in uncooked form only. One can only imagine how wildly happy the arrival scene must have been:



THE TRAFFIC IN MAN-BODY

1843

In [Ireland](#), Daniel O'Connell was staging Monster Meetings (he would be imprisoned on account of his patriotism).

The black smut of the late blight fungus was observed on potato leaves near Philadelphia. For a long time we had presumed that this must have originated in the central highlands of Mexico, in the vicinity of the Toluca Valley where it has always afflicted a number of Mexican plants of the same genus and where even today it is quite impossible to grow potatoes. (We now know, based on genetic markers, that it is more likely to have originated in Peru.) It is probable that this fungus had made its way to Europe from the New World by way of a plant collector, perhaps one like the Poinsett who would bring back the poinsettia from the war against Mexico, a collector who lived in the northeastern United States. At this time the government of the province

## SOLANUM TUBEROSUM

## POTATO

of West Flanders began to import fresh varieties of potatoes from both North and South America, and to make field trials of these novel cultivars. These field trials would continue during the growing seasons of 1844 and 1845, up to the point at which all such crops were being destroyed by the “late blight” fungus which had been introduced from the Americas.



Human selection of [potato](#) and [tomato](#) cultivars for lessened bitterness may have resulted in greater vulnerability to [infection](#) by *Phytophthora*. Native potatoes and wild tomatoes possess much higher levels of the phytoalexin alkaloid and tend to be much more resistant to infection. However, among the infection organisms, *Phytophthora* in particular seems to have evolved a way in which to slip past the poisonous potato and tomato steroidal alkaloids which are effective in protecting these plants against many other varieties of microorganisms. We should beware of the scare stories which have it that Europeans were simply being foolish in the 16th Century, when they resisted the introduction of potatoes and tomatoes to their diet — as the potatoes then and the tomatoes then may have been substantially more bitter and substantially more poisonous and allergenic than the potatoes and tomatoes being grown nowadays. One of our attempts to breed a less vulnerable potato, the Lenape, has had to be withdrawn from the market because it proved to be far too toxic to humans. There is a substantial correlation between the very serious *spina bifida* and *anencephaly* birth defects and years in which potato blight has been widespread in the British Isles. Were potatoes to be introduced today as a new and novel food crop, they would have to be subjected to a long and careful period of evaluation by our Food and Drug Administration. After a year in which people have been reduced to eating deteriorated potatoes, there is ordinarily a year in which significant numbers of human infants are stillborn or born deformed. The suspicion is that this is caused by an accumulation of the chemical *solanidine* in the mother’s liver, and its liberation and transfer to her fetus during the 3d or 4th week of gestation while the fetus’s neural tube is closing. The concentrations of this dangerous alkaloid are highest in the spring after winter storage of the potato crop, and highest in the vicinity of the potato’s eyes while it is sprouting. It has been noticed that stored potatoes which have been infected by *Phytophthora infestans* begin to sprout earlier in the spring than uninfected potatoes. After a blight year, in the late spring just at the point at which the food need is highest and the last of the old stored potatoes are about to be replaced by the first of the new potatoes, the risk of generating deformed babies reaches its peak.

### THE NIGHTSHADES (SOLANACEAE)

- — [Solanum tuberosum](#)
- — [Tomato Lycopersicon esculentum](#)
- — chili peppers
- — eggplant
- — deadly nightshade
- — [Nicotiana tabacum](#)
- — henbane
- — Jimson weed
- — petunia
- — plus some 2,000 other species grouped into 75 genera



## POTATO

## SOLANUM TUBEROSUM

**Therefore it is strongly recommended that girls, and women who are not yet out of their reproductive years, should never nowadays (except of course under conditions of absolute starvation) consume potatoes from which they have had to rub off the sprouts with their hands (as a Thoreau uncle was described, in Walden, as having done):**

**WALDEN:** Breed's hut was standing only a dozen years ago, though it had long been unoccupied. It was about the size of mine. It was set on fire by mischievous boys, one Election night, if I do not mistake. I lived on the edge of the village then, and had just lost myself over Davenant's Gondibert, that winter that I labored with a lethargy, -which, by the way, I never knew whether to regard as a family complaint, having an uncle who goes to sleep shaving himself, and is obliged to sprout potatoes in a cellar Sundays, in order to keep awake and keep the Sabbath, or as the consequence of my attempt to read Chalmers' collection of English poetry without skipping. It fairly overcame my Nervii. I had just sunk my head on this when the bells rung fire, and in hot haste the engines rolled that way, led by a straggling troop of men and boys, and I among the foremost, for I had leaped the brook. We thought it was far south over the woods, -we who had run to fires before, - barn, shop, or dwelling-house, or all together. "It's Baker's barn," cried one. "It is the Codman Place," affirmed another. And then fresh sparks went up above the wood, as if the roof fell in, and we all shouted "Concord to the rescue!" Wagons shot past with furious speed and crushing loads, bearing, perchance, among the rest, the agent of the Insurance Company, who was bound to go however far; and ever and anon the engine bell tinkled behind, more slow and sure, and rearmost of all, as it was afterward whispered, came they who set the fire and gave the alarm. Thus we kept on like true idealists, rejecting the evidence of our senses, until at a turn in the road we heard crackling and actually felt the heat of the fire from over the wall, and realized, alas! that we were there. The very nearness of the fire but cooled our ardor. At first we thought to throw a frog-pond on to it; but concluded to let it burn, it was so far gone and so worthless. So we stood round our engine, jostled one another, expressed our sentiments through speaking trumpets, or in lower tone referred to the great conflagrations which the world has witness, including Bascom's shop, and, between ourselves we thought that, were we there in season with our "tub", and a full frog-pond by, we could turn that threatened last and universal one into another flood. We finally retreated without doing any mischief, -returned to sleep and Gondibert. But as for Gondibert, I would except that passage in the preface about wit being the soul's powder, -"but most of mankind are strangers to wit, as Indians are to powder."



FIRE

PEOPLE OF  
WALDEN

INSURANCE

ALEXANDER CHALMERS

BASCOM & COLE



## SOLANUM TUBEROSUM

## POTATO

These toxic compounds are not removed by boiling, and in fact seem to be concentrated by the process of frying in oil. Also, therefore, they should never ingest such foods as “fish and chips” and “french fries,” for such commercially prepared potatoes may have been purchased for bulk processing because they were cheap, low-grade “old crop” potatoes which had begun to sprout: their sprouts would be automatically knocked off by peeling machinery. Tests using golden hamsters suggest that infant deformation may be minimized by ensuring that every woman or girl who might become pregnant receives constant elevated levels of vitamin C — perhaps because the C vitamin has a tendency to clear these toxic accumulations of solanidine from the liver.<sup>21</sup>

21. For more on this challenging topic, consult J.H. Renwick’s “Our Ascorbate Defense Against the *Solanaceae*,” pages 567-76 in D’Arcy, William G. (ed.), *SOLANACEAE: BIOLOGY AND SYSTEMATICS* (NY: Columbia UP, 1986).

## POTATO

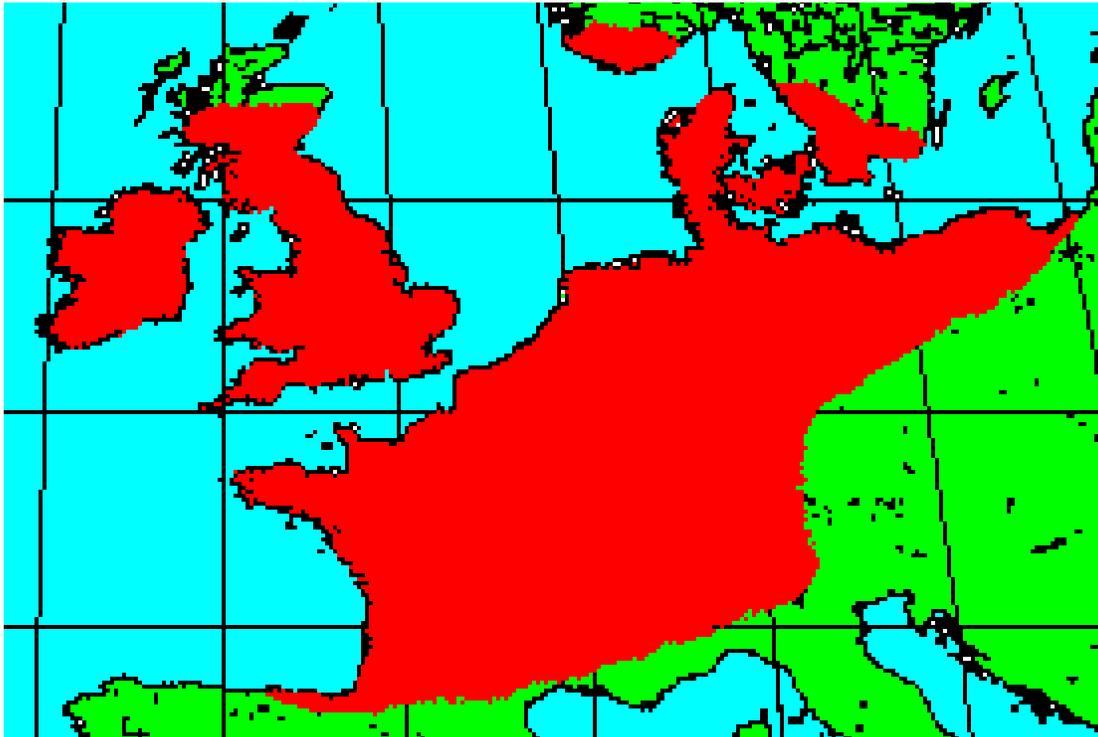
## SOLANUM TUBEROSUM

1845

From this year into 1850, in the [Irish Potato Famine](#), the problem presented to the English overlords of [Ireland](#) by the intransigent native Irish [Catholics](#) would be being in part resolved, unfortunately by means of starvation, by means of disease, and by means of mass emigration, with the assistance of a “late blight” of



*Phytophthora infestans* which would be causing apparently sound and meaty white [potato](#) tubers to suddenly disintegrate into black slime just as they were becoming ready to harvest. A million of these Irish people who were in the way of the English would die and eight million more of these Irish people who were in the way would be forced from their homeland.





## SOLANUM TUBEROSUM

## POTATO

We know that, largely because of this famine, in 1845 a domestic servant could be hired for \$1.<sup>25</sup> per week in New England, because [Sophia Peabody Hawthorne](#) was able to retain a woman for this wage. (Her sister Mary was able to rent a house in Hingham MA for \$75.<sup>00</sup> annually.

### Population Trends

	England / Wales	Ireland
1821	12,000,000	6,800,000
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During a period in which the population of virtually every other country in Europe was Dublin, the population of Ireland would lose 3.1 million people. This was a trauma with which it was most difficult to deal. For instance, we all know that Australia was settled largely by “British criminals” who had been “transported” during this period, but few of us are aware that a very significant percentage of these “British criminals” actually were mere Irish men and women who had become concerned, and who had thus made themselves politically suspect. A special prayer was promulgated and was being read in all the churches of the Anglican communion, to entreat the Almighty God to spare the Irish people from the ravages of the famine. The term “[Potato](#)” not being grand enough for an occasion of speaking directly to Almighty God, for verbiage for herbage this recitation substituted the euphemism “Succulent Tuber.”

April 29, Tuesday: [John Leonard Knapp](#) died near Bristol, England. He would be buried at St. Helen, Alveston. Five volumes of unpublished drawings of British fungi are in the Natural History Museum. His herbaria is at Edinburgh and at the Bristol City Museum and Art Gallery. Some of his letters are in the Smith correspondence at the Linnaean Society. There is a wax bust by Parker at Kew and a portrait in the Hunt Library. Three manuscript notebooks toward a possible revised edition of JOURNAL OF A NATURALIST and other papers are in the Buckinghamshire Record Office.

[Saunders' News-Letter](#) for County Armagh, [Ireland](#) reported that after a warning had been passed to John O'Brien, Esq., of Hogan's-pass in County Armagh, or some of his workmen, not to attempt to till certain fields near Rallyvillane about a mile from Nenagh, on Thursday night last a number of ploughs that had been brought there were destroyed by persons unknown. The [Monaghan Standard](#) of County Monaghan, Ireland reported that a few nights since, a gang of ruffians, calling themselves Molly Maguire's chickens, went to the house of Abraham Sloan, a farmer near Scotstown in County Monaghan, and having broken the door, their leader, who called himself Captain Steelribs, ordered his “chickens” to drag the man of the house out of bed. This man was put upon his knees with a cocked pistol at to his breast, and presented with “a Romish Catechism.” He swore



## POTATO

## SOLANUM TUBEROSUM

an oath that he would on the following morning give up possession of a farm that he held in dispute. “After threatening the most dreadful vengeance in the event of a non-compliance with this mandate, and after firing some shots about the premises, the miscreants decamped, by word of command, in military array.” The Enniskillen Correspondent for the Armagh Guardian reported that Mr. Arthur Leonard of Callowhill has been again served with a threatening notice by the “Molly Maguires,” and that there had been another murder, on Wednesday night last, the victim being a man named Ferguson who resided at Drumkeerin in County Leitrim. “While employed in his own house at some domestic business, he was shot at, and melancholy to relate it proved fatal. The cause assigned for this bloody deed is that the unfortunate man had a small plot of land let to some tenants, and was about taking it from them to occupy it himself. The ‘Molly Maguires’ it is said are the party accused of the murder.” This correspondent noted that since Thursday evening last there had been some refreshing showers which were tending greatly to improve the early-set potatoes: “The healthy appearance of the crops in the neighbourhood promise an abundant harvest.” Nevertheless, he wrote, the annual tide of emigration to America had just commenced in this county, and every week large numbers of the peasantry of our country were passing through Enniskillen on their way to the ports of Donegal, Derry, Sligo, &c. “The majority of those emigrating are Protestants.”

FAMINE

In the Huron Reflector of Norwalk, Ohio the term “top notch” was deployed apparently for the first recorded time, as a description for items of the highest quality. The citation offers no clue as to the manner in which this usage had originated:

J. WHYLER Has just arrived from the Great Emporium, with a Tremendous Cargo of Spring and Summer Goods, which he is now unloading at his Old Stand in Norwalk – consisting of the choicest selections he ever made – the top notch of Fashions and Patterns – and an extensive variety of DRY GOODS, to suit his Old Customers and every other person who will give him a call.



## SOLANUM TUBEROSUM

## POTATO

June 24, Tuesday: Early in the month, out in Walden Woods, [Henry Thoreau](#) had planted *Phaseolus vulgaris* var. *humilis* common small navy pea bush white beans<sup>22</sup> for a cash crop, plus some peas and corn and [potatoes](#) for himself.



The problem begins with the transcendentalists, who believed that the American landscape was sacred – nature, Emerson held, was the symbol of Spirit. Once you have come to regard the landscape as a moral or spiritual space, altering it in any way – even gardening it – becomes problematic. This is what Thoreau discovered very soon after he planted his bean field at Walden. He was actually racked with guilt about pulling weeds, of all things....

– “Afterword” by Michael Pollan  
on page 262 of a coffee-table book  
KEEPING EDEN: A HISTORY OF GARDENING  
IN AMERICA, put out in 1992 by the  
Massachusetts Horticultural Society

### WALDEN

### THE BEANFIELD

It seems strange to hear someone allege that Thoreau “was actually racked with guilt about pulling weeds,” when a more careful analysis of the text and its context would indicate that Thoreau not only pulled weeds, but also, he experimented with eating such weeds as the purslane he had hoed from his corn rows, and then,

22. These are beans that ripen prior to harvest and are threshed dry from the pods. Only the ripe seeds reach market. Four main types are grown as follows: (1) the Pea or Navy which Henry was growing; (2) Medium type, which includes Pinto, Great Northern, Sutter, Pink Bayo, and Small Red or Mexican Red; (3) Kidney; and (4) Marrow. Seeds vary in size from about 1/3-inch long in Thoreau’s pea or navy bean to 3/4-inch in the Kidney. All these plants are of bush type. They are usually cut or pulled when most pods are ripe, and then vines and pods are allowed to dry before threshing. This is a bean thought to have originated in Central America from southern Mexico to Guatemala and Honduras. Evidence of the common bean has been found in two widely separated places. Large seeded common beans were found at Callejon de Hualylas in Peru, and small seeded common beans were found in the Tehuacan Valley in Mexico, with both finds carbon-dating as earlier than 5,000 BCE. This crop is associated with the maize and squash culture which predominated in pre-Columbian tropical America. In our post-Columbian era this bean has come to be grown in all areas of the world.

However, that’s only the literal bean, not the metaphorical or literary bean, and once upon a time in Europe, there had been a form of commercial counting in use very much like the abacus of the East, in which beans were used. In those days to “know how many beans make up five” was to be commercially numerate. --Sort of like today knowing how to count one’s change. It might be suggested therefore that Thoreau’s determination to know beans was a play upon this archaic usage in which not knowing one’s beans amounted to innumeracy, and in addition a play upon the common accusation “You don’t know beans about xxxxx!” It might also be suggested that this is scatological humor similar to Shakespeare’s — the following is from his “Comedy of Errors”:

A man may break a word with you sir; and words are but wind;  
Ay, and break it in your face, so he break it not behind.



## POTATO

## SOLANUM TUBEROSUM

of all things, he wrote favorably about them after eating them:

**WALDEN:** I learned from my two years' experience that it would cost incredibly little trouble to obtain one's necessary food, even in this latitude; that a man may use as simple a diet as the animals, and yet retain health and strength. I have made a satisfactory dinner, satisfactory on several accounts, simply off a dish of purslane (*Portulaca oleracea*) which I gathered in my cornfield, boiled, and salted. I give the Latin on account of the savoriness of the trivial name. And pray what more can a reasonable man desire, in peaceful times, in ordinary noons, than a sufficient number of ears of green sweet-corn boiled, with the addition of salt? Even the little variety which I used was a yielding to the demands of appetite, and not of health. Yet men have come to such a pass that they frequently starve, not for want of necessaries, but for want of luxuries; and I know a good woman who thinks that her son lost his life because he took to drinking water only.

PEOPLE OF  
WALDEN

REUBEN KELSEY?

# SOLANUM TUBEROSUM

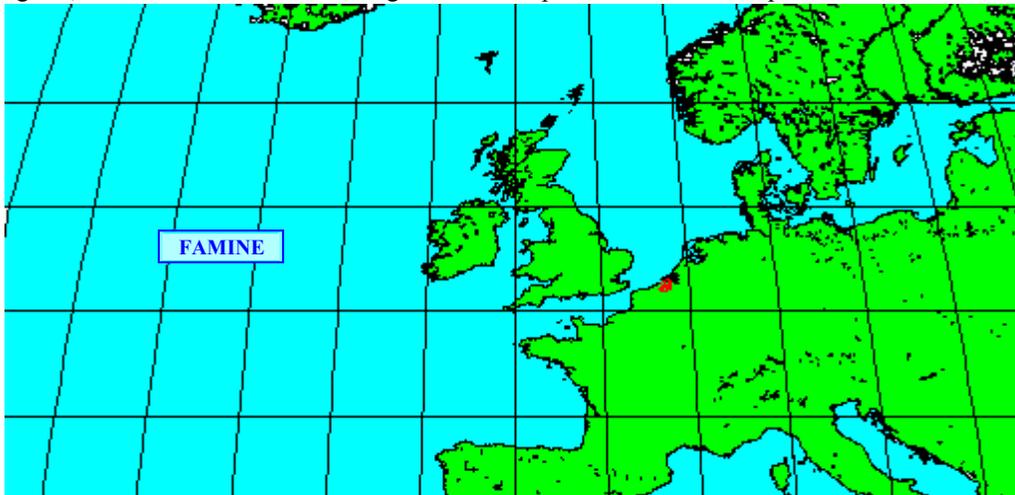
# POTATO

It takes a rather poor reader to miss this sort of reference!



Incidentally, since purslane is a late germinator in New England’s cool soils, the leaves beginning to appear only in July, we know that Thoreau would not have been making this experiment with using the plant as a vegetable until his rows of Indian maize were already well on their way, in July or August of 1845.

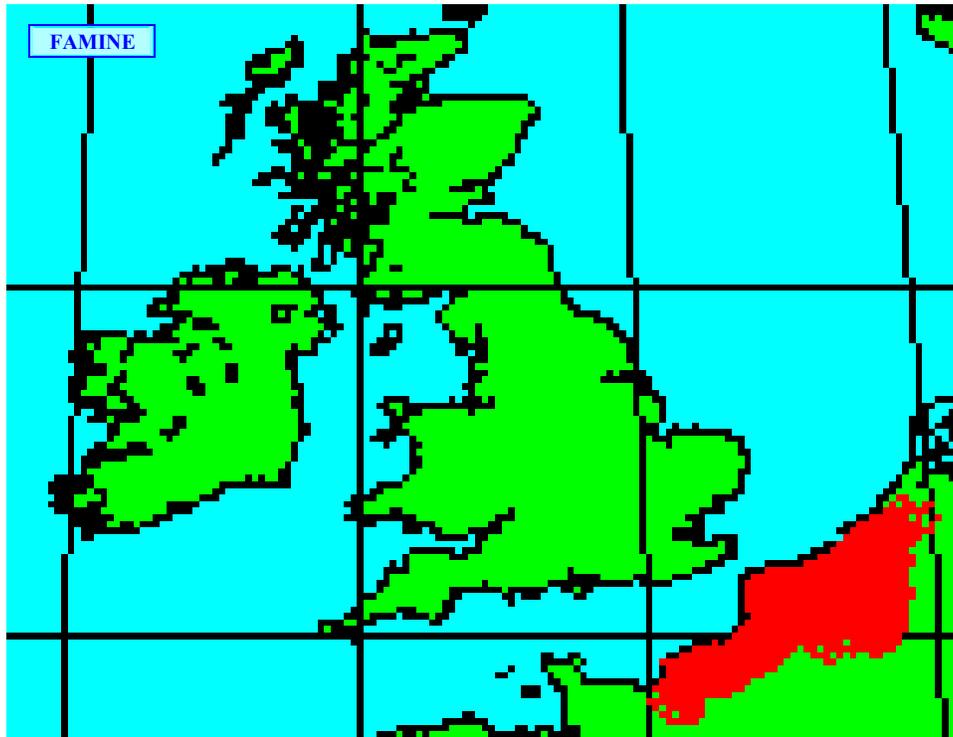
However this all may be, the late blight fungus that infected [potato](#) plants had by this point spread throughout northeastern North America. The discolored outside of the tuber indicated that when cut open, it would be seen to be full of a dark, corky rot. Potato crops were being destroyed — but then, neither Thoreau in particular nor America in general was solely relying upon the potato plant for human nutrition. In the Courtrai region of Belgium, the black smut of the late blight was seen upon the leaves of the plants.



# POTATO

# SOLANUM TUBEROSUM

Mid-July: In northern Europe, there would be more than three weeks this month of “one continued gloom, the sun scarcely ever visible during the time, with a succession of most chilling rains and some fog” — ideal weather for the development and dispersion of a potato blight, each fungal lesion of which can disperse 300,000 spores every five days. The late blight was endemic in the potato fields of Flanders, and in border areas of the Netherlands and of France.



**SOLANUM TUBEROSUM****POTATO**

Tubers were being destroyed while still the size of marbles.



August: The American [potato](#) blight *Phytophthora infestans* appeared on the Isle of Wight and in the vicinity of Kent. Reports began to come in of this soot's appearance elsewhere as well, in Scotland, and in Belgium, and in Holland.

FAMINE

August 23, Saturday: In England, John Lindley reported that "A fatal malady has broken out amongst the [potato](#) crop. On all sides we hear of the destruction."

FAMINE

There had since Wednesday been showers and thunderstorms from Maine to New-York, breaking what had been in eastern Massachusetts a severe drought. The lightning strikes on this day in the vicinity of Littleton, ten miles to the northwest of Walden Pond, both in the morning storm and in the afternoon storm, were particularly devastating, initiating several woodlot fires and several structure fires (such as the Tremont Hotel), stunning cattle in the fields, killing a couple of people, etc. On this afternoon [Henry Thoreau](#) got caught in a rainshower and thunderstorm, as he would report in [WALDEN: OR, LIFE IN THE WOODS](#), and sought refuge in the isolated shanty of a local [Irish](#) immigrant family. The infant of the family would be described in [WALDEN](#) as still "cone-headed" by recent passage through the birth canal, and that girl baby had been born in May of this year.<sup>23</sup>

23. Note that "cone-headed," an accurate medical description of a neonate condition, is not an epithet of derision.



## POTATO

## SOLANUM TUBEROSUM

**WALDEN:** I set out one afternoon to go a-fishing to Fair-Haven, through the woods, to eke out my scanty fare of vegetables. My way led through Pleasant Meadow, an adjunct of the Baker Farm, that retreat of which a poet has since sung, beginning,-

“Thy entry is a pleasant field,  
Which some mossy fruit trees yield  
Partly to a ruddy brook,  
By gliding musquash undertook,  
And mercurial trout,  
Darting about.”

I thought of living there before I went to Walden. I “hooked” the apples, leaped the brook, and scared the musquash and the trout. It was one of those afternoons which seem indefinitely long before one, in which many events may happen, a large portion of our natural life, though it was already half spent when I started. By the way there came up a shower, which compelled me to stand half an hour under a pine, piling boughs over my head, and wearing my handkerchief for a shed; and when at length I had made one cast over the pickerel-weed, standing up to my middle in water I found myself suddenly in the shadow of a cloud, and the thunder began to rumble with such emphasis that I could do no more than listen to it. The gods must be proud, thought I, with such forked flashes to rout a poor unarmed fisherman.



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## SOLANUM TUBEROSUM

## POTATO

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Toward evening — as the world waxes darker I am permitted to see the woodchuck stealing across my path,  
and tempted to seize and devour it. The wildest most desolate scenes are strangely familiar to me

Why not live a hard and emphatic life? not to be avoided –full of adventures and work! Learn much –in it.  
travel much though it be only in these woods I some-times walk across a field with unexpected expansion and  
long-missed content –as if there were a field worthy of me. The usual daily boundaries of life are dispersed and  
I see in what field I stand.

When on my way this after noon shall I go down this long hill in the rain to fish in the pond “I ask myself”– and  
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are really free. Stay till late in the night –be unwise and daring– See many men far and near –in their fields and  
cottages before the sun set –though as if many more were to be seen– And yet much rencontre shall be so  
satisfactory and simple that no other shall seem possible Do not repose every night as villagers do– The noble  
life is continuous and unintermitting At least, live with a longer radius– Men come home at night only for the  
next field or street –where their house hold echoes haunt –and their life pines and is sickly because it breathes  
its own breath. Their shadows morning & evening reach farther than their daily steps. But come home from far  
–from ventures & perils –from enterprise and discovery –& crusading –with faith and experience and character.  
Do not rest much. Dismiss prudence –fear –conformity – Remember only –what is promised. Make the day light  
you and the night hold a candle –though you be falling from heaven to earth –“from morn to dewy eve a  
summer’s day.”

for Vulcan’s fall occupied a day but our highest aspirations and performances fill but the interstices of time.

Are we not reminded in our better moments that we have been needlessly husbanding somewhat –perchance –  
our little God-derived capital –or title to capital guarding it by methods we know? but the most diffuse  
prodigality a better wisdom teaches –that we *hold* nothing –we are not what we were–

By usurers craft –by Jewish methods –we strive to retain and increase the divinity in us –when the greater part  
of divinity is out of us.

Most men have forgotten that it was ever morning– But a few serene memories –healthy & wakeful natures  
there are who assure us that the Sun rose clear, heralded by the singing of birds

### MEMNON

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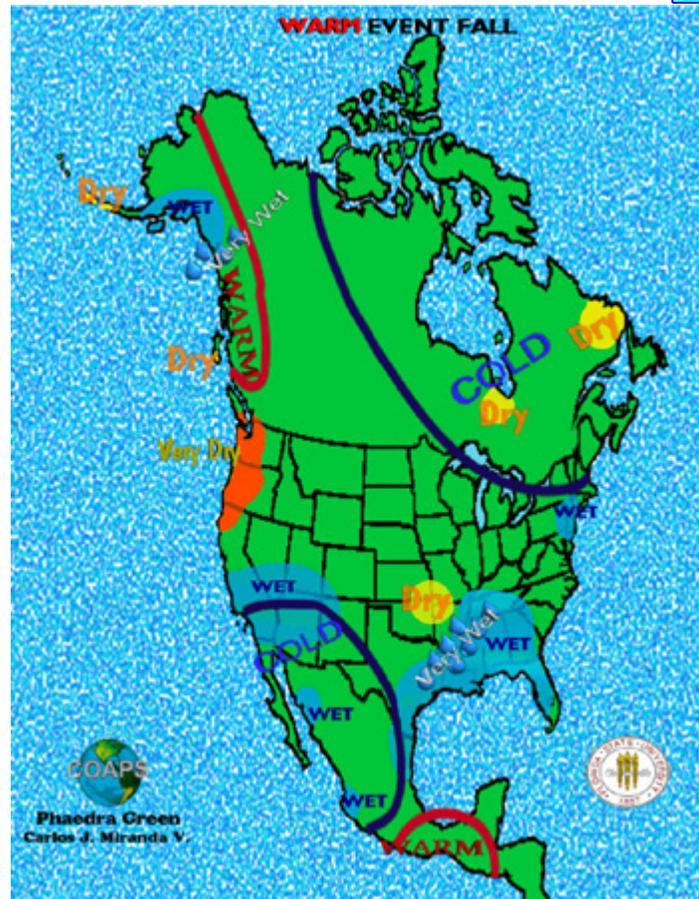
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POTATO

SOLANUM TUBEROSUM

The rays which streamed through the crevices will be forgotten when the shadow is wholly removed.

TIMELINE OF WALDEN



➡ Beginning of September: At the end of the usual “meal months” during which the old stores of potatoes had become exhausted while the new crop was not yet ready to be dug from the ground, the months of June, July, and August, the American potato blight *Phytophthora infestans* was reported as having spread to Ireland, but the plants were lush and green despite the summer having been unusually wet and cool, and an exceptionally abundant October crop was being anticipated.<sup>24</sup>

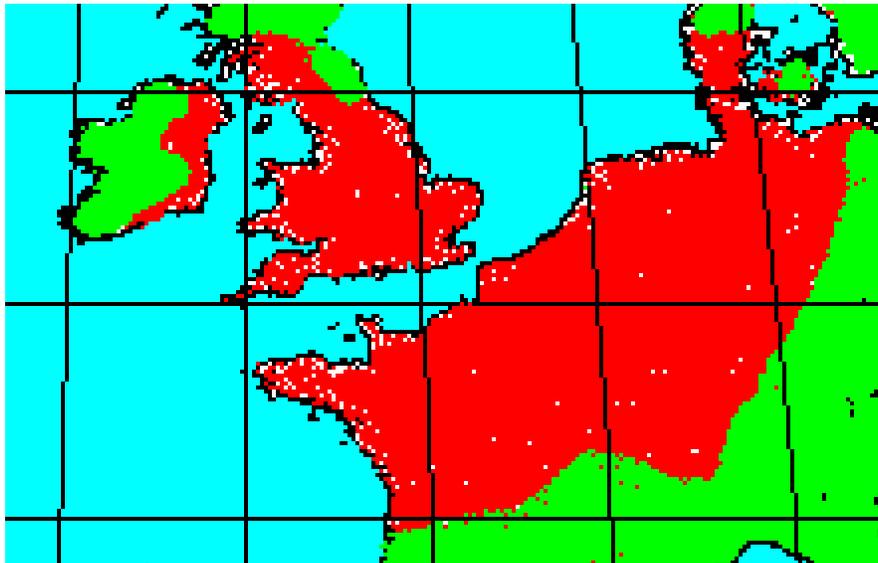
FAMINE

24. Potatoes are generally not fully mature in Ireland until October.

**SOLANUM TUBEROSUM**

**POTATO**

September 16, Tuesday: Official confirmation of widespread blight in Irish potato patches across the entire eastern portion of the island.



Evidently the October crop was not about to be so abundant as had been anticipated:

**Acreage in Potatoes**

<b>Year</b>	<b>Acres</b>
<b>1845</b>	<b>&gt;2,000,000</b>
<b>1846</b>	<b>&gt;1,000,000</b>
<b>1847</b>	<b>300,000</b>
<b>1848</b>	<b>700,000</b>

Prior to this year the average daily intake of an Irish adult during a winter would have consisted of 10-12 pounds of potatoes, with buttermilk. We didn't know then precisely how many people would starve to death or, weakened by starvation, succumb to diarrhea and fever or to cholera in Ireland during the 1845-1851 period, and we still don't know now, but we do know that the first great die-off had occurred during the winter of 1846-1847. A table prepared after the fact by Census Commissioners, presented here, in all probability under-estimates the mortality because of the manner in which they collected data: for a family all of whose members succumbed zero deaths would be tabulated. Of the total number of deaths, which would be between 500,000 and 1,500,000, the percentage of that total which would occur in each year probably worked out to



## POTATO

## SOLANUM TUBEROSUM

something like this:

### Mortality, expressed as %ages of the 1841 Population

Year	%
1842	5.1%
1843	5.2%
1844	5.6%
1845	6.4%
1846	9.1%
1847	18.5%
1848	15.4%
1849	17.9%
1850	12.2%

The figures shown for 1849 are the result of a [cholera](#) epidemic in Connacht, Leinster, and Munster, as well as of the general starvation.

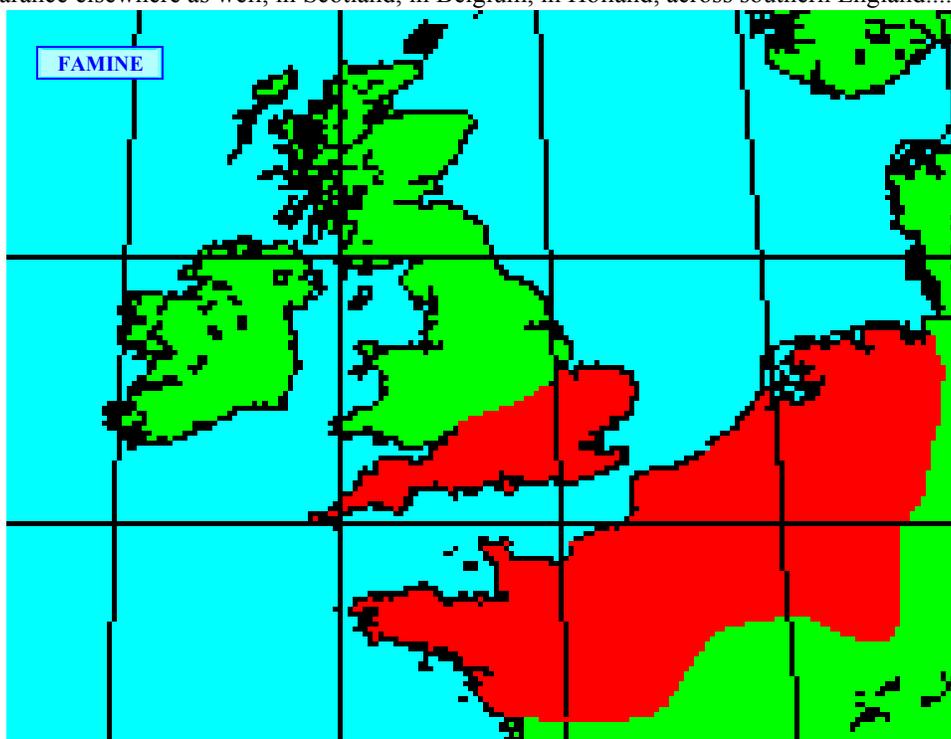
**SOLANUM TUBEROSUM**

**POTATO**

Mid-August: The American [potato](#) blight *Phytophthora infestans* appeared on the Isle of Wight and in the Channel



Islands and in the vicinity of Kent and in the vicinity of Paris. Reports began to come in of this soot's appearance elsewhere as well, in Scotland, in Belgium, in Holland, across southern England...



August 23, Saturday: In England, John Lindley reported that “A fatal malady has broken out amongst the [potato](#) crop. On all sides we hear of the destruction.”

**FAMINE**

There had since Wednesday been showers and thunderstorms from Maine to New-York, breaking what had been in eastern Massachusetts a severe drought. The lightning strikes on this day in the vicinity of Littleton, ten miles to the northwest of Walden Pond, both in the morning storm and in the afternoon storm, were particularly devastating, initiating several woodlot fires and several structure fires (such as the Tremont Hotel), stunning cattle in the fields, killing a couple of people, etc. On this afternoon [Henry Thoreau](#) got caught in a rainshower and thunderstorm, as he would report in [WALDEN: OR, LIFE IN THE WOODS](#), and sought refuge in the isolated shanty of a local [Irish](#) immigrant family. The infant of the family would be described in [WALDEN](#) as still “cone-headed” by recent passage through the birth canal, and that girl baby had been born in May of this year.<sup>25</sup>

25. Note that “cone-headed,” an accurate medical description of a neonate condition, is not an epithet of derision.



## POTATO

## SOLANUM TUBEROSUM

**WALDEN:** I set out one afternoon to go a-fishing to Fair-Haven, through the woods, to eke out my scanty fare of vegetables. My way led through Pleasant Meadow, an adjunct of the Baker Farm, that retreat of which a poet has since sung, beginning,-

“Thy entry is a pleasant field,  
Which some mossy fruit trees yield  
Partly to a ruddy brook,  
By gliding musquash undertook,  
And mercurial trout,  
Darting about.”

I thought of living there before I went to Walden. I “hooked” the apples, leaped the brook, and scared the musquash and the trout. It was one of those afternoons which seem indefinitely long before one, in which many events may happen, a large portion of our natural life, though it was already half spent when I started. By the way there came up a shower, which compelled me to stand half an hour under a pine, piling boughs over my head, and wearing my handkerchief for a shed; and when at length I had made one cast over the pickerel-weed, standing up to my middle in water I found myself suddenly in the shadow of a cloud, and the thunder began to rumble with such emphasis that I could do no more than listen to it. The gods must be proud, thought I, with such forked flashes to rout a poor unarmed fisherman.



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Thinking to live by some derivative old country mode in this primitive new country e.g. to catch perch –with



## SOLANUM TUBEROSUM

## POTATO

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I find an instinct in me conducting to a mystic spiritual life –and also another –to a primitive savage life–  
Toward evening — as the world waxes darker I am permitted to see the woodchuck stealing across my path,  
and tempted to seize and devour it. The wildest most desolate scenes are strangely familiar to me

Why not live a hard and emphatic life? not to be avoided –full of adventures and work! Learn much –in it.  
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next field or street –where their house hold echoes haunt –and their life pines and is sickly because it breathes  
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–from ventures & perils –from enterprise and discovery –& crusading –with faith and experience and character.  
Do not rest much. Dismiss prudence –fear –conformity – Remember only –what is promised. Make the day light  
you and the night hold a candle –though you be falling from heaven to earth –“from morn to dewy eve a  
summer’s day.”

for Vulcan’s fall occupied a day but our highest aspirations and performances fill but the interstices of time.

Are we not reminded in our better moments that we have been needlessly husbanding somewhat –perchance –  
our little God-derived capital –or title to capital guarding it by methods we know? but the most diffuse  
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By usurers craft –by Jewish methods –we strive to retain and increase the divinity in us –when the greater part  
of divinity is out of us.

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### MEMNON

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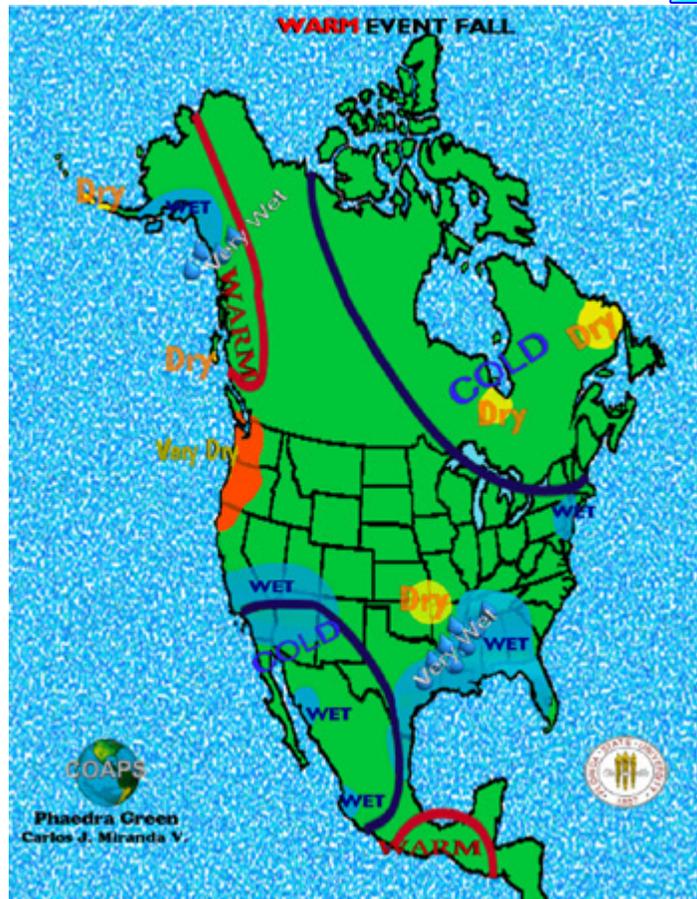
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TIMELINE OF WALDEN



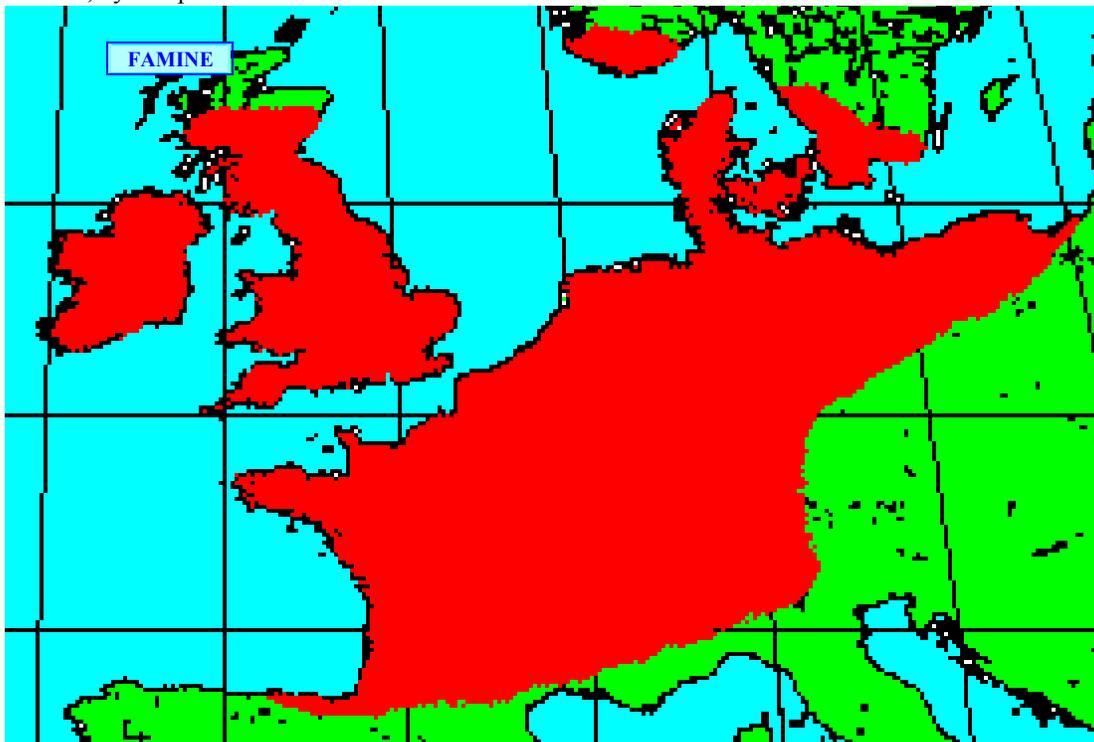
Mid-September: In England, John Lindley asked dramatically “[W]here will **Ireland** be, in the event of a universal potato rot?”

FAMINE

**SOLANUM TUBEROSUM**

**POTATO**

Mid-October: The full magnitude of the year's potato disaster, and the repercussions which inevitably were going to follow, by this point had become all too evident:



POTATO

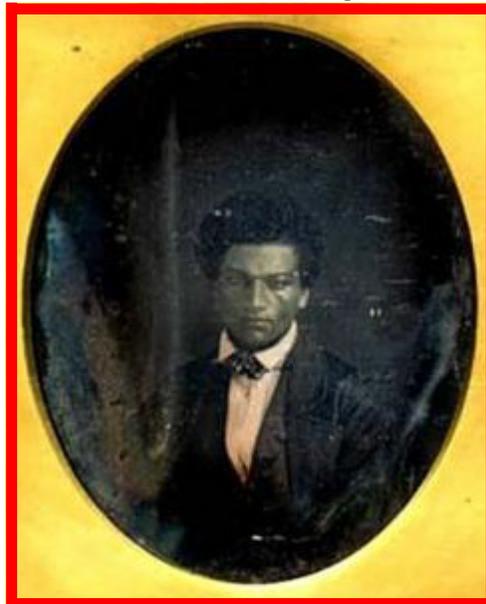
SOLANUM TUBEROSUM

November: In the Scientific American magazine there appeared a note that “The accounts of the general failure of the potato crops by the rot, especially in Ireland, are of a very serious and alarming character.”

William Lloyd Garrison returned from England to the United States. In Ireland, Frederick Douglass traveled from Cork to Limerick, along the way noting the condition of the Irish rural poor due to rotting potato crops. Although he reported back to Garrison that

*I see much here to remind me of my former condition and I confess I should be ashamed to lift my voice against American slavery, but that I know the cause of humanity is one the world over.*

he did not mix this issue that his audiences did not want to hear about into his anti-slavery talks. English sales of his NARRATIVE meanwhile reached 500 copies.<sup>26</sup>



**N**ARRATIVE of the LIFE of FREDERICK DOUGLAS, an AMERICAN SLAVE, now in Great Britain, written by himself, Price 2s. 6d. Published and Sold by Webb & Chapman, Great Brunswick Street, Dublin. Previous to F. D.'s departure from America, in 9th Month, 1845, 4,500 copies of this Narrative had been sold. An Edition of 2000, printed in Dublin, since his arrival, is nearly exhausted; and another Edition, with some few corrections, is in the press. The total number of Copies of the Narrative which have been Published, amounts, therefore, to 8,500.

26. I do not know the date on which this occurred, but it would have needed to have occurred before Garrison embarked in November 1845 to return to America. From William Lovett's THE LIFE AND STRUGGLES OF WILLIAM LOVETT, IN HIS PURSUIT OF BREAD, KNOWLEDGE, AND FREEDOM (London: Trubner, 1876, page 321) we learn that on a particular evening in London, evidently at a private party in a home, not only did Henry Vincent perform "The Marseillaise," but also William Lloyd Garrison presented "several anti-slavery pieces," the "grave" Henry C. Wright "sang an old Indian war song," and Frederick Douglass, "who had a fine voice, sang a number of negro melodies."



## SOLANUM TUBEROSUM

## POTATO

1846

A pamphlet appeared in [Boston](#) summarizing the munificence and beneficence of the 1,496 men in the commonwealth who were worth at least \$50,000, each.

### BOSTON'S FIRST MEN

Strict rules were utilized for the determination of benevolence. Since [Queen Victoria](#) had given \$900,000 for relief in the [Irish Potato Famine](#) out of her vast fortune, the size of which was approximately known — by computation a Boston laborer receiving an average wage would have needed to donate \$0.<sup>80</sup> in order “to be precisely as benevolent as Her Majesty.” Similarly, the editors knew of a Boston man with an annual income of \$20.<sup>00</sup> who annually gave \$0.<sup>50</sup> to charity. It was on the basis of this sort of “widow’s mite” high standard that only 375 of the 1,496 were being declared to be “more or less Benevolent”:

Amount of property owned	\$244,780,000
Number worth over one million dollars	18
Number worth just one million dollars	8
Number worth three fourths of a million dollars	10
Number worth half a million dollars	45
Number worth quarter of a million dollars	147
Number who began poor, or nearly so	705
Number who rec'd all, or the greater part, by inheritance or marriage	282
Number of rich Farmers	90
Number of rich Manufacturers (Cotton, Woolen, &c.)	53
Number of rich Merchants (and Various Traders)	463
Number of rich Lawyers (including Judges)	75
Number of rich Physicians	31
Number of rich Clergymen	12
Number of rich Brokers (including some speculators)	46
Number of rich Publishers	11
Number of rich Editors	4
Number of rich Shoe makers (and Dealers)	50
Number of rich Tailors (and Clothes-Dealers)	10
Number of rich Carpenters (and Ship-Builders)	15
Number of rich Masons	9

POTATO

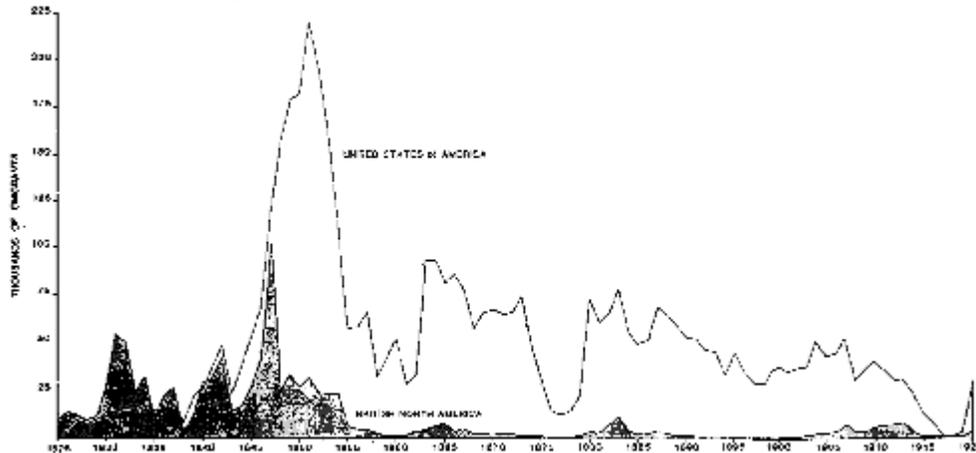
SOLANUM TUBEROSUM

Number of rich Butchers (and Provision-Dealers)	13
Number of rich Distillers	14
Number ascertained to be more or less Benevolent	375
Number of rich Old Bachelors	68

While this benevolence was going on in [Boston](#) in the New World, in [Ireland](#) the apparently sound and meaty white tubers of the new [potato](#) crop, upon which so very much depended, suddenly again disintegrated into stinking black slime — just as they had in the previous harvest season. This episode of the “late blight” of *Phytophthora infestans* was merely as bad as before but the population was already in an emaciated condition.



Therefore a visit which had been planned for Queen Victoria would obviously need to be postponed. Of over 100,000 malnourished, [cholera](#)-ridden [Irish](#), off-loaded from the converted cargo holds of sailing ships into Canadian quarantine stations, one-third died within this year. Next to a wharf at Montréal, in a pit, 6,000 bodies were dumped and the cause of death was set down simply as “ship fever.” Spectators on the banks of the St. Lawrence noticed that, as survivors of the trans-Atlantic voyage were being barged upriver toward the Canadian interior, they appeared too weak to return the waves of children on shore.



We don't know precisely how many people have starved to death or, weakened by starvation, succumbed to diarrhea and fever or to [cholera](#) in [Ireland](#) during the ensuing period, but we do know that the first great die-off would occur during the winter of 1846-1847. A table prepared after the fact by Census Commissioners, presented here, in all probability under-estimates the mortality because of the manner in which they collected data: for a family all of whose members succumbed zero deaths would be tabulated. Of the total number of deaths, which would be between 500,000 and 1,500,000, the percentage of that total which would occur in each

**SOLANUM TUBEROSUM**

**POTATO**

year probably worked out to something like this:

**Mortality, expressed as %ages of the 1841 Population**

Year	%
1842	5.1%
1843	5.2%
1844	5.6%
1845	6.4%
1846	9.1%
1847	18.5%
1848	15.4%
1849	17.9%
1850	12.2%

Prior to 1845 the average intake of an [Irish](#) adult during a winter had consisted of ten to twelve pounds of potatoes, with buttermilk, daily. In the oncoming winter it would consist of one pound of Indian meal **or** one bowl of soup with one slice of bread — and to prove oneself worthy to receive such sustenance one would need to be doing daily hard labor.

In this year a painting was made of [Albert Edward, Prince of Wales](#). The 5-year-old appears well enough nourished.



A Mrs. Thynne brought some of the corals of Torquay to London “for the purpose of study and the entertainment of friends.” Each day, this lady’s housemaid<sup>27</sup> would need to spend thirty to forty-five minutes

27. Possibly, but of course not necessarily, an [Irish](#) woman.

POTATO

SOLANUM TUBEROSUM

pouring the six gallons of salt water of the aquarium backward and forward before an open window, in order to keep it fresh. The “aquarium craze,” something that Brits would be referring to as “sea-gardening,” had fairly begun.

On a related note (?), the “Boston Museum” was constructed on Tremont Street in [Boston](#).<sup>28</sup> Many edifices of this type were in this period becoming economically possible, due in part to the wealth being generated by the sea trade and in part to of the eagerness of these [Irish](#) unfortunates to part with their labor for ridiculously low wages. —Hey, it’s an ill wind that blows **nobody** any good!

At this point John Mitchel and other Young Irelanders who had come to disdain the doctrine of “moral force” broke with Daniel O’Connell and founded the Irish Confederation, devoted to an agenda of the doing of harm so that good might result. —Hey, let’s give terrorism a chance!



[Thomas Carlyle](#) would be doing his part, from this year into 1851, by making a study of the situation in Ireland in order to inform curious Englishmen what they ought to make of it.

July: There were scattered reports of a reappearance of the blight in [Ireland](#), including some counties such as Wicklow which had been free of the soot on the leaves in the preceding [potato](#) season.



FAMINE

August 7: “The [potatoes](#) all about [Kingstown](#) are rotting.”

RHODE ISLAND

In one area between Dublin and Cork in [Ireland](#), travelers could smell the rotting [potatoes](#) even from the public highway.

IRISH POTATO FAMINE

28. This structure is not to be confused with the “Boston Museum of Natural History” which was constructed in 1863 in the newly filled Back Bay and which eventually became the Museum of Science. This structure wasn’t a museum at all, it was a 1,200-seat auditorium at which plays were regularly performed. It was termed a “museum” in order to reassure blue-blooded [Boston](#) clients who might have been reluctant to visit anything so vulgar as a “theater.”

SOLANUM TUBEROSUM

POTATO

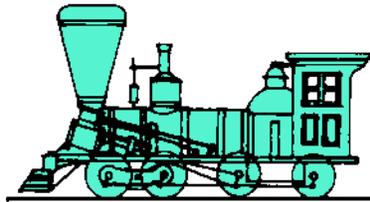
Mid-August: The new crop of potatoes was anticipated to be able to provide its first nourishment, and succor the Irish for the localized and variegated appearance of the blight in their previous year’s crop. However, the “soot” was in this year everywhere apparent on the strong green leaves of the plant.

IRISH POTATO FAMINE



August 31, Monday-September 10: Henry Thoreau went on his 1st trip to the Maine wilderness, with his cousin-by-marriage George Augustus Thatcher. If the locomotive that pulled Thoreau’s train out of the railroad station in Boston that day was one of the newest ones manufactured by the company of Mathias W. Baldwin in Philadelphia in 1846, this may have been what it looked like:

HISTORY OF RR



Or, this may have been what it looked like, since we know Baldwin’s company had begun to manufacture such a model for the Madison & Indianapolis Railroad:

(Would it be wrong to suggest, Thoreau was being haunted by what that old Indian had said to him on the dock in Oldtown in 1838? → )

POTATO

SOLANUM TUBEROSUM

The cousin adventurers went by rail via Boston to Portland and then by night steamship to Bangor, by stagecoach to Mattawamkeag, by batteau up the Penobscot River into North Twin Lake and to Sowadahunk



deadwater, climbed Mount Ktaadn, and then Thoreau returned by ship. His notes of the climb at that point were no more than: “climb tree — torrent — camping ground — leave party — go up torrent — fir trees — lakes — rocks — camp — green fish — fire at night — wind up ravine.” He then wrote, but decided not to domesticate, a seven-page account of Agiocochook. (Instead, he expanded the Saddleback episode eventually for use in [A WEEK ON THE CONCORD AND MERRIMACK RIVERS.](#))



TIMELINE OF THE MAINE WOODS

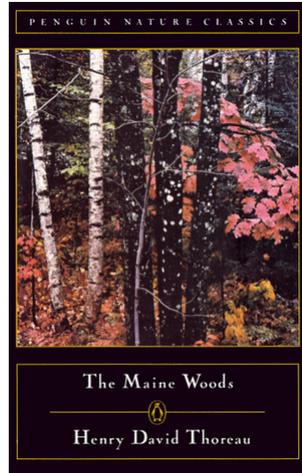


Aug 31st 1846 Concord to Boston— Rail road Station —tall man —sailors short of money —cars to Portland Passenger to Umbagog. Sea shore —Salem tunnel no water hay cocks —Portsmouth North Berwick

**SOLANUM TUBEROSUM**

**POTATO**

–Saco –Portland –Capt’s office –White head light –sailor –owls head Thomaston –Camden –Belfast –Bangor–



(The map prepared by Tom Funk which shows the route of this journey, and the one Thoreau would make in 1857, can be viewed on the following screens.)

In the “[KTAADN](#)” essay that would be based primarily on this trip, Thoreau would comment that a local farmer who seemed by inference to have been attempting also to grow tomatoes had even in that remote area been infected by the potato rot though he had used seed of his own raising!

I think he said that he was the first to bring a plough and a cow so far; and he might have added the last, with only two exceptions. The potato-rot had found him out here, too, the previous year, and got half or two thirds of his crop, though the seed was of his own raising. Oats, grass, and [potatoes](#) were his staples; but he raised, also, a few carrots and turnips, and “a little corn for the hens,” for this was all that he dared risk, for fear that it would not ripen. Melons, squashes, sweet-corn, beans, [tomatoes](#), and many other vegetables, could not be ripened there.

**FAMINE**

Since the late blight caused by *Phytophthora infestans* affects both [potato](#) and [tomato](#) plants, it would be possible that the source of this isolated farm’s potato rot occurring in potatoes grown from local seed would have been that the farmer had brought in tomato seedlings containing the fungus.<sup>29</sup>

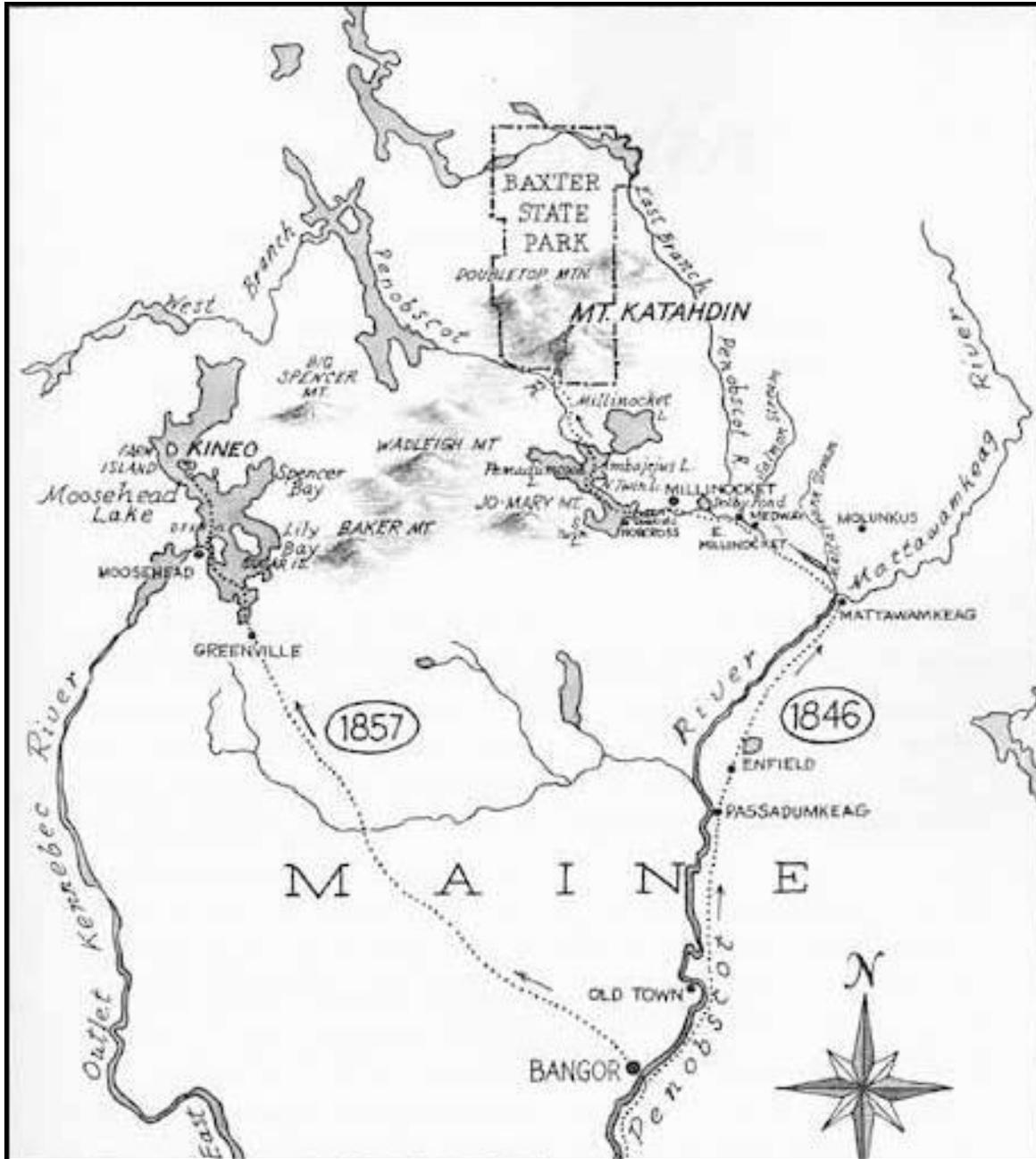
**IRISH POTATO FAMINE**

**Irish Acreage in Potatoes**

Year	Acres
1845	>2,000,000
1846	>1,000,000
1847	300,000
1848	700,000

POTATO

SOLANUM TUBEROSUM



29. The Irish potato famines of the mid-19th century were caused by a late blight disease which occurs in humid regions with temperature ranges of between 40 and 80 degrees Fahrenheit; hot, dry weather checks its spread. The *Phytophthora* fungus survives in stored tubers, in dump piles, in field plants, and in greenhouse tomatoes. The sporangia are airborne to nearby plants, in which infection may occur within a few hours. At temperatures below 59 degrees Fahrenheit the sporangia germinate by producing zoospores that encyst and later form a germ tube. Above that temperature most sporangia produce a germ tube directly. Foliage blighting and a new crop of sporangia are produced within four to six days after infection. The cycle is repeated as long as cool, moist weather prevails. Potato or tomato vines that are infected may rot within two weeks. The disease destroyed more than half of the tomato crop in the eastern United States in 1946, leading to the establishment of a blight-forecasting service in 1947. When plants have become infected, lesions (round or irregularly shaped areas that range in color from dark green to purplish black and resemble frost injury) appear on leaves, petioles, and stems. A whitish growth of spore-producing structures may appear at the margin of the lesions on the underleaf surfaces. Potato tubers develop rot up to 0.6 inch deep. Secondary fungi and bacteria (*Erwinia*) often invade potato tubers and produce rotting that results in great losses during storage, transit, and marketing.

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POTATO





POTATO

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## HERE THEN IS MY NEW THEORY

Various scholars have alleged that in the [Irish Potato Famine](#), we have a case of genocide. Dr. Edward Brennan, Ireland's ambassador to Canada, has noted: "The Great Famine was Ireland's holocaust (which) condemned the Irish to be the first boat people of modern Europe."

Weary men, what reap ye? Golden corn for the Stranger.  
What sow ye? Human corpses that await the Avenger.  
Fainting forms, all hunger stricken, what see you in the offing?  
Stately ships to bear our food away amid the stranger's scoffing.  
There's a proud array of soldiers, what do they round your door?  
They guard our masters' granaries from the hands of the poor.  
Pale mothers, wherefore weeping? Would to God that we were dead.  
Our children swoon before us, and we cannot give them bread!  
We are wretches, famished, scorned, human tools to build your pride,  
But God will yet take vengeance for the souls for whom Christ died.  
Now is your hour of pleasure, bask ye in the world's caress;  
But our whitening bones against ye will arise as witnesses,  
>From the cabins and the ditches, in their charred, uncoffined masses,  
For the Angel of the Trumpet will know them as he passes.  
A ghastly spectral army before God we'll stand  
And arraign ye as our murderers, O spoilers of our land!

The Irish labor leader James Connolly alleged that "The English administration of Ireland during the 'famine' was a colossal crime against the human race." The allegation has repeatedly been made by Irish patriots that their nation did not starve for want of potatoes, but because still-available foodstuffs, 30 to 40 shiploads per day, were being removed while this removal process was being guarded by 200,000 British soldiers organized as what amounted to Food Removal Regiments. Be that as it may, apologists for British conduct during this period of food scarcity would do well to ponder the characterization of British colonialism in Ireland by William Makepiece Thackeray:

It is a frightful document against ourselves ... one of the most melancholy stories in the whole world of insolence, rapine, brutal, endless slaughter and persecution on the part of the English master ... no crime ever invented by eastern or western barbarians, no torture or Roman persecution or Spanish Inquisition, no tyranny of Nero or Alva but can be matched in the history of England in Ireland.

In 1861 in THE LAST CONQUEST OF IRELAND, John Mitchel wrote:

The Almighty indeed sent the potato blight but the English created the famine.

Mitchel further observed that:

... a million and half men, women and children were carefully, prudently and peacefully slain by the English government. They died of hunger in the midst of abundance which their own hands created. There was no famine. There can be no famine in a country overflowing with food.



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A London Times editorial of September 30, 1845, warned: “In England the two main meals of a working man’s day now consists of potatoes.” Grossly over-populated relative to its food supply, England’s overdependence on imported foodstuffs was similar to Ireland’s overdependence on the potato. In 1844 the European potato crop failed, causing food prices to rise, before in 1845 the blight hit the offshore potato crop. England was itself facing famine unless it could import vast amounts of alternative food but didn’t grab Irish food merely to save itself. It took this food in part in order to decimate the population of Ireland. Queen Victoria’s economist, Nassau Senior, would express a fear that the plan would “kill only one million Irish, and that will scarcely be enough to do much good.” Treasury Chief Charles Trevelyan refused entry to an American food ship and, when an eyewitness urged a stop, responded, “We must not complain of what we really want to obtain.” Thomas Carlyle exulted: “Ireland is like a half-starved rat that crosses the path of an elephant. What must the elephant do? Squelch it, by heavens, squelch it.” “TOTAL ANNIHILATION,” offered a London Times headline of September 2, 1846; and in 1848 an editorialist exulted that “A Celt will soon be as rare on the banks of the Shannon as a red man on the banks of Manhattan.”

Here, however, we have a new theory as to how the blight microorganism which caused the [Irish Potato Famine](#) originally made its way to [Ireland](#), and this new theory does not allege English purposefulness and therefore does not allege English genocide. It merely ascribes something to the English which we all know to be, anyway, utterly characteristic of them: unconsciousness.

We know that epidemiologically, the microorganism came from Mexico or Peru to the Eastern seaboard of the United States to the Low Countries to England and Ireland. That’s a given, extrapolated from the years in which the microorganism began to destroy [potato](#) crops in these various areas.

This is evidence that it seems unlikely, will ever be challengeable.

We believe we know, on the basis of the movement of infected potatoes, how the microorganism made its way from Mexico or Peru to the Eastern seaboard of the United States. We believe we know, likewise, on the basis of the movement of infected potatoes, how the microorganism made its way from the Eastern seaboard of the United States to the Low Countries of Europe. That historical research has been done. What we don’t have much evidence for, what to this point we have never bothered to research, is specifically how the blight microorganism then made its way across the English and Irish channels, to infect crops on these islands north of Europe.

The only existing theory is that the microorganism was wafted across these bodies of water on the cool winds. That is, the culprit was a cool season.

Nobody’s fault.

The only thing that this theory has had going for it, is that it has been the only theory in existence. This must have been what happened, we say, because there’s no other available explanation. The blight was blown by the wind. Nobody’s fault.

What has recently been noticed, however, is that the potato plant and the [tomato](#) plant, both *Solanaceas*, are both carriers of the microorganism. The microorganism blights potatoes but has no noticeable impact on tomatoes. Nevertheless, it is at least as easy for this particular microorganism to be carried from place to place, by the human transportation of tomatoes and of tomato plants, as it is for it to be carried from place to place, by the human transportation of potatoes and of potato plants. In fact, it is more likely that during the time period in question we would have indulged in the transportation of the blight microorganism by our relocation of healthy-seeming tomato materials, than that we would have indulged in the transportation of noticeably infected and inferior potato materials.

We have seen a situation in which there was an isolated potato farm in the backwoods of Maine, that for years during the potato blight was free of the microorganism. Then the farmer went to town and got some tomato plants and took them home in his wagon! The next year his potatoes turned to mush and he wondered why. (We know of this because Henry David Thoreau made a note of it in his journal of his trip to Maine, preparatory for his writing the series of articles we know as THE MAINE WOODS.)

During the period in question the potato was bulk food for the most vulnerable classes but the tomato was in an entirely different category of alimentation. The potato provided calories, vitamins, and minerals for the needy. The tomato was, however, a mere specialty food, a *salet* item relatively lacking in calories and in vitamins (yes, tomatoes are **low** in vitamins), a comestible for the delight of the well-to-do and easily bored. Roughly, that social distinction between the needy and the bored correlates, in the context of Ireland, with the gross social distinction



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we think of as — the Irish versus the English.

If some well-to-do, easily bored English resident of Ireland had imported tomato plants to be grown in his or her garden on his or her estate in Ireland, either from the Eastern seaboard of the United States or from the Low Countries of Europe, during the period in question, that could have been an alternative vector for the transmission of the microorganism across the channels of water that isolate England and Ireland.

Therefore we now have two competing theories, not one unchallenged theory, for how the blight microorganism made its way to Ireland. The original theory, that the microorganism was wafted to Ireland on the cool winds of an unusual season, nobody's fault—a theory that has never had any real evidence to support it, a theory that has stood unchallenged because it has been the only theory available—no longer stands alone and unchallenged.

We badly need to do historical research into the movement of tomatoes and of tomato plants during the period in question. **Did** some English resident of Ireland import tomatoes or tomato plants into Ireland just prior to the Irish Potato Famine? **Was** the Irish Potato Famine induced among the poor Irish, unbenownst, merely in order to grace the tables of the English with a novelty *salet* item?

I myself take no position in this matter, other than to insist that further historical inquiry is now indicated. I make no accusation that, if tomato material was indeed the vector for the intrusion of this blight, and if English residents of Ireland brought this tomato material, that they did this **on purpose to destroy the improvident Irish** who, they were commenting at that time, were such a bother to them. (In such a case, the totality of the comment which I might personally make would be: “**How convenient it can be when we happen inadvertently to strike two birds with the same stone!**”)

August 7: “The [potatoes](#) all about [Kingstown](#) are rotting.”

[RHODE ISLAND](#)

In one area between Dublin and Cork in [Ireland](#), travelers could smell the rotting [potatoes](#) even from the public highway.

[IRISH POTATO FAMINE](#)

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Early October: With the [potato](#) harvesting season underway in [Ireland](#), Lord Lieutenant Lord Bessborough confessed to the Prime Minister of England

*"I verily believe that by Christmas there will not be a sound potato in the country."*



[Margaret Fuller](#) was visiting [Thomas Carlyle](#). During her stay in London she commented, evidently not at all anent the potatoes of Ireland, "I accept the universe." Carlyle made light of the comment, clearly not at all anent the potatoes of Ireland of the scarcity of which he would emphatically have approved — for it was considered bad form in the 19th Century for a **mere woman** to accept the universe, it was as distressing as the idea of a cheerleader taking on the football team since it was the masculine role to embrace, the feminine to

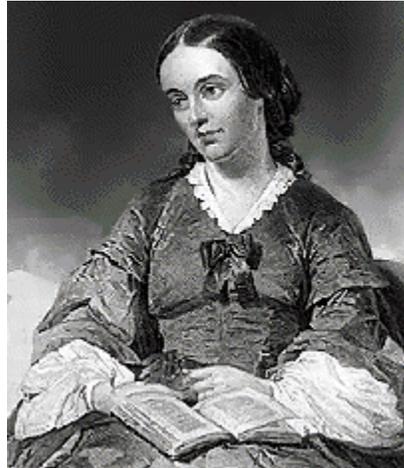
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FEMINISM

renounce.<sup>30</sup>

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Fuller would come away from her encounter with this illuminated one with an understandable reaction: “the worst of hearing Carlyle is that you cannot interrupt him.” During her visit, the harangue which she had attempted to interrupt had been one in which [Carlyle](#) was carrying on about his pet idea that “if people would not behave well,” we ought simply to “put collars round their necks. Find a hero, and let them be his slaves.”<sup>31</sup>

Public Works Enrollment

October 1846	114,000
January 1847	570,000
March 1847	750,000

30. Carlyle seems to have overlooked, however, that Fuller was merely negating the thesis of Ivan in THE BROTHERS KARAMAZOV, “I do not accept the world.” Of course, it was unmanly for [Fyodor Mikhailovich Dostoevski](#) to have announced this through a male character, as unmanly as it would have been for him to have failed to have embraced a lady in distress, since it was the 19th Century gentleman’s role to seize every opportunity. We may also note that when, in Philadelphia PA in 1852 at the first Women’s Rights Convention, [Sarah Moore Grimké](#) proposed Fuller’s “Give me truth; cheat me by no illusion” as the motto of the movement,  she was proposing a motto very similar to this “I accept the universe” sentiment. Those who have incautiously repeated Carlyle’s defensive mutter seem to have neglected to notice that it is a very serious matter, in Christendom, for us to criticize an attitude of acceptance. And in particular we who are influenced by the life of Thoreau should be wary of criticizing an *amor fati*.

31. Compare this with the beloved “conservative” radio commentator Paul Harvey’s pet idea in our own time in our own nation, that what we ought to do with our criminals is get them off their asses and out of our prison systems by simply chaining them behind our garbage trucks.

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**POTATO**

**1847**

Fall: In [Ireland](#), the prospects for an 1847 [potato](#) harvest had appeared good, despite the continuing presence of some “soot” on the leaves.



However, the number of acres not planted, and the continuing presence of the blight, would mean a rather small dig that October.

**FAMINE**

**Acreage in Potatoes**

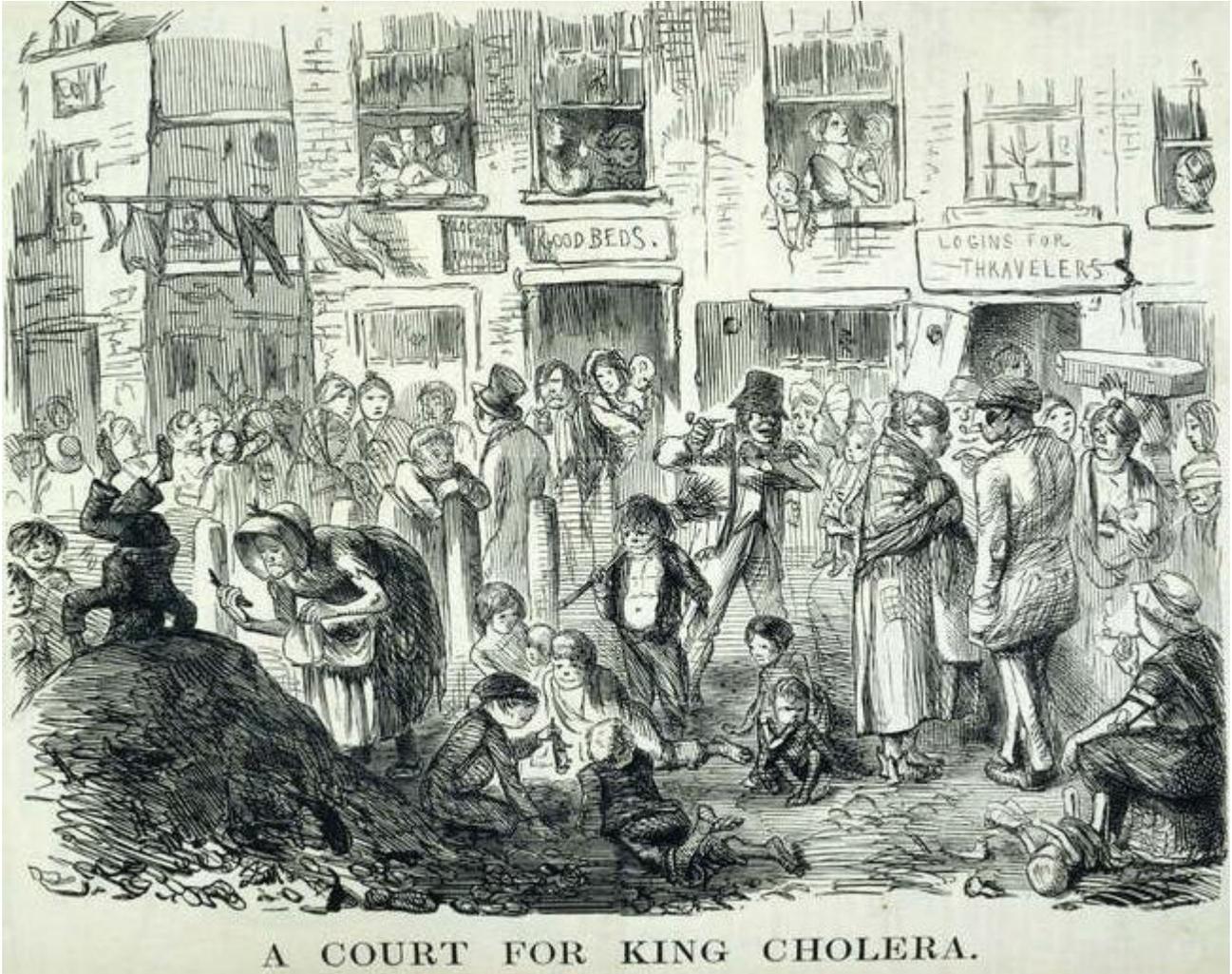
<b>Year</b>	<b>Acres</b>
1845	>2,000,000
1846	>1,000,000
<b>1847</b>	<b>300,000</b>
1848	700,000

At this point the Relief Commissioners began to predict that neither home potatoes nor the wages needed to procure other sustenance were going to be available during the coming winter. Later on, –although we don’t know precisely how many people starved to death or, weakened by starvation, succumbed to diarrhea and fever or to [cholera](#) in [Ireland](#) during the period– we would be able to calculate that the first great die-off had occurred during the winter of 1846-1847. A table prepared after the fact by the Census Commissioners, presented here, in all probability under-estimates the mortality because of the manner in which they collected data: for a family

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all of whose members succumbed zero deaths would be tabulated.





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Of the total number of deaths, which would be between 500,000 and 1,500,000, the percentage of that total which would occur in each year probably worked out to something like this:

### Mortality, expressed as %ages of the 1841 Population

Year	%
1842	5.1%
1843	5.2%
1844	5.6%
1845	6.4%
1846	9.1%
1847	18.5%
1848	15.4%
1849	17.9%
1850	12.2%

The figures shown for 1849 are the result of a [cholera](#) epidemic in Connacht, Leinster, and Munster, as well as of the general starvation.



One of the most important and highly regarded charitable organizations was the Society of Friends, or Quakers. They first became involved in the Irish Famine relief in November 1846, when some Dublin-based members of the Society decided to establish a Central Relief Committee. The Quakers had a long tradition of philanthropic activity and were well regarded for their avoidance of proselytism. Although the Quakers were numerically small in Ireland, their numbers did include a relatively high proportion of successful businessmen. They also had the support of co-religionists throughout the world. Initially, the role of the Central Relief Committee was to be mainly advisory, as they believed that it was important for accurate information to be provided by disinterested experts. They intended that any assistance which they gave was to be merely supplementary to other relief. However, in the early months of 1847, the relief provided by the Society of Friends often proved crucial in keeping people alive, as other systems of relief failed in this basic purpose. This was particularly so during the vacuum in relief provision following the closure of public works in some areas.

At the end of November 1846, two Englishmen, James H. Tuke and William Forster, with the assistance of local Quakers, commenced a tour of the most distressed parts of Ireland. During the course of this journey, they visited counties Roscommon, Leitrim, Fermanagh, Donegal, Sligo, Mayo, Galway, Longford and Cavan. The Quakers admitted that their extensive experience in working with distressed people in England had not prepared them for what they saw in Ireland. They reported to the Central Relief Committee



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that they were appalled by the scenes which they witnessed and had never encountered such suffering before. Tuke was driven to record: "the scenes of poverty and wretchedness are almost beyond belief ... notwithstanding all my experience derived from my years service in the Poor Law Commission, three of which were spent in Yorkshire and Lancashire during the extremity of distress there."

A number of Quakers criticised the relief policies of the government, holding them to be inadequate and misjudged. As the Quakers who were touring the west of Ireland quickly realised, the distress was often most severe in the areas where the administrative machinery for the distribution of relief was most limited. They believed that absentee or irresponsible landlords were to a large extent responsible for this. Consequently, although the Quakers identified the most severe distress as existing in the province of Connacht, the amount of relief which they provided was restricted because of the absence of an interested middle and landlord class in some places through which to channel this assistance. Joseph Bewley, the Secretary of the Society of Friends, realised that government policies meant that the relief taxes were heaviest in the districts which were least able to afford them. He judged these policies to be short-sighted and incapable of bringing any long-term benefit to the people of Ireland. During his visit to Co. Donegal, Tuke was delayed for weeks by heavy snowstorms. He realised the implications that this had for people who were employed on the public works: bad weather reduced the amount of money which could be earned. Also, the effort to remain warm and dry -- through the wearing of warm clothes or the lighting of a small fire-- proved an additional drain on the limited resources of the people. Those who attempted to continue working during the bad weather invariably increased their propensity to fall ill. Apart from the relief provisions, Tuke was also critical of the social structures within Ireland. He regarded the abject poverty and wretchedness of the small farmers and cottiers as not being surpassed even in the "most barbarous nations." Tuke saved his most severe criticisms for the role played by absentee landlords, particularly those who, although they owned large estates, had not "subscribed one farthing" to help alleviate the suffering of their tenants.

The main form of relief provided by the Quakers in 1848 was the distribution of seed, primarily on behalf of the government. The Relief Commissioners had a supply of seed but the government would not permit them to become involved in the direct sale of it. Instead they requested the Quakers to distribute it in the most impoverished districts in Ireland. The Quakers agreed, as they felt that this would be of permanent benefit to the country. In total, they distributed nearly 200,000 lbs of seed which was estimated to result in the cultivation of approximately 800 acres of green crops. The vast majority of the seeds were turnip, although carrot, parsnip and cabbage seeds were also distributed....

The Society of Friends had undertaken to import supplies of food mostly from America into Ireland in 1847. Even before it arrived, it was obvious to Tuke and Forster that in many areas



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more extensive and immediate assistance was required than that envisaged by their colleagues in Dublin. In each of the areas which they visited, Tuke and Forster distributed both food and cash. Although the Quakers had intended that their provisions should be sold at cost price, they realised that if they adhered to this, it would still be beyond the means of the most distressed people. Increasingly, the relief provided by the Quakers in the field was given gratuitously even though in doing so they offended both the central committee in Dublin and the Treasury. As far as possible, the Quakers worked through the local relief committees or local gentry or clergy. Money was not to be provided directly to the destitute people. The money which they provided was frequently used for the establishment of a soup kitchen, the purchase of seed, or the provision of local employment. In Dunfanaghy, for example, money was given to the local minister for the purchase of boilers for a soup kitchen and the purchase of materials for the local women to knit Guernsey shirts.

Apart from food and cash, the Quakers donated clothes and bedding. They also imported boilers for soup kitchens, being one of the first organizations to favour the use of soup kitchens as a means of providing large-scale relief. This was approved by the government, which disliked giving either money or uncooked food. The government, who regarded the involvement of the Quakers as very valuable, paid the freight and warehouse charges of all goods imported by the Quakers and waived all port duties. Most of the food was imported directly into the area where it was to be distributed. It included Indian meal, flour, rice, biscuits, peas, Scotch barley, American beef and tapioca. During 1846 and 1847, the Quakers provided approximately £200,000 for the relief of distress in Ireland, which was spent almost exclusively in the west of the country. The following statistics which refer to Co. Donegal provide an insight into the assistance afforded by the Quakers:

### Quaker Relief in Co. Donegal

Estimated number of grants:	266
Number of boilers:	19
Quantity of food, in tons:	400
Value of food and boilers:	£6,659 0s 0d
Amount of money grants:	£1,429 5s 9d
<b>Total Value</b>	<b>£8,088 5s 9d</b>

During the summer of 1847, as the Temporary Relief Act was implemented, the Quakers began to wind down their operations with a view to ending them totally when the extended Poor Law became operative in the autumn. Instead, they decided only to provide relief which would contribute to developing the industries and resources of the country. However, in the winter of 1847-8, the government asked them if they would consider again becoming involved in the provision of relief, particularly



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in the re-establishment of soup kitchens. The Quakers were reluctant to do so. As one official explained, providing this form of relief would be similar to "giving the criminal a long day." They believed that it was better if they used their energies to contribute to the long-term improvement of Ireland and leave the provision of immediate relief to the government. In 1849, Trevelyan, at the request of the government, offered the Quakers £100 if they would provide direct relief as they had previously done, but again they refused.

October: The [Irish potato](#) harvest was generally healthy and, in many counties, the blight made no appearance at all. However, due to the [famine](#) die-off, in the hardest hit districts it had simply been impossible to plant or cultivate any significant crops, which meant that the yield was low, food prices remained high, and those in low-paying jobs were entirely unable to feed themselves:

### Acreage in Potatoes

Year	Acres
1845	>2,000,000
1846	>1,000,000
1847	300,000
1848	700,000



## SPROUTING POTATOES AND BIRTH DEFECTS

I have been studying the [Irish potato](#) famine of the 1840s, and as part of my background for this investigation I have consulted a technical treatise on the general family of plants which includes the potato, D'Arcy, William G. (ed.), SOLANACEAE: BIOLOGY AND SYSTEMATICS (NY: Columbia UP). This technical treatise was published in 1986, all of a decade ago, and yet it is the most recent book-length treatment which I have been able to locate. I have picked up some really quite startling observations from this tome, about dangers in a potato diet, which I would like to check out with someone on this list. I have seen the potato famine in Ireland linked to monoculture and to class and national antagonisms, and I have seen it linked to various epidemics which followed the starvation. I have not, however, seen it linked to birth defects in the manner depicted in this technical treatise. Here are some of the factoids which I have picked up in this reading, in their technical complexity:

- European selection of potato and tomato cultivars for lessened bitterness during the 16th-19th Centuries may have resulted in greater vulnerability to infection by the *Phytophthora infestans* microorganism (the “late blight” or “murrain” of the famine era). Native potatoes and wild tomatoes possess much higher levels of bitter phytoalexin alkaloid and tend to be much more resistant to infection. However, among the infection organisms, *Phytophthora* in particular seems to have evolved a way in which to slip past the poisonous potato and tomato steroidal alkaloids which are otherwise effective in protecting these plants against many other varieties of microorganisms. Therefore we should be somewhat skeptical of the popular stories which have it that certain parochial Europeans were simply being foolish in the 16th Century, when they resisted the introduction of potatoes and tomatoes to their diet – as potatoes then and tomatoes then may have been substantially more bitter and substantially more hyperallergenic than the potatoes and tomatoes we enjoy nowadays. One of our attempts to breed a less vulnerable potato, the “Lenape,” has had to be withdrawn from the market because it proved to be far too toxic to humans.
- There has been a substantial correlation between the very serious *spina bifida* and *anencephaly* birth defects in the British Isles in this century, and years in which potato blight has been a problem. In fact, were the potato to be introduced today as a new and novel food crop, the source points out, it would need to be subjected to a long and careful period of evaluation by our Food and Drug Administration before being approved for general use as a dietary supplement.
- After a year in which people have been reduced to eating deteriorated potatoes, the charts show that there is ordinarily a year in which significant numbers of human infants are stillborn, or born deformed. The suspicion is that this is caused by an accumulation of solanidine in the mother's liver, and the liberation and transfer of this chemical to her fetus during the 3rd or 4th week of gestation while the fetus's neural tube is in the process of closing.
- The concentrations of this dangerous alkaloid, solanidine, are highest in the spring after winter storage of the potato crop, and highest in the vicinity of the potato's eyes while it is sprouting. It seems to function in the potato as a natural insecticide to protect the young leaves. It has been noticed that stored potatoes which have been infected by the late blight *Phytophthora infestans* microorganism begin to sprout earlier in the spring than uninfected potatoes. After a blight year, in the late spring just at the point at which the food need of poor farm people is highest and the last of the old stored potatoes are about to be replaced by the first of the tiny new potatoes, the risk of generating deformed babies reaches its peak.
- Therefore in this literature it is strongly recommended that girls, and women who are not yet out of their reproductive years, should never nowadays (except I suppose of course again under conditions of absolute starvation) consume old potatoes from which they have had to rub off the sprouts with their hands.
- Such toxic alkaloid compounds are not removed by boiling, and in fact seem to be concentrated by a cooking process involving oil and high heat. Also, therefore, females should never ingest such preprepared foods as “fish and chips,” the source recommends, for such commercially prepared



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potatoes may have been purchased by a corporation for bulk processing because they were cheap, low-grade “old crop” potatoes which had begun to sprout: their sprouts would be automatically knocked off by the peeling machinery! (As an American rather than a Brit, I wonder whether this source’s recommendation against any consumption of fish and chips by those human females who might without their knowledge be in an early stage of pregnancy might not also extend to our own ubiquitous “burger and fries.”)

- Tests using golden hamsters suggest that infant deformation may be minimized by ensuring that every woman or girl who might become pregnant receives constant elevated levels of vitamin C – perhaps because the C vitamin has a tendency to clear these toxic accumulations of solanidine from the liver. REFERENCE: J.H. Renwick’s “Our Ascorbate Defense Against the Solanaceae,” pages 567-76 in D’Arcy, William G. (ed.), SOLANACEAE: BIOLOGY AND SYSTEMATICS (NY: Columbia UP, 1986).

So, has anyone ever seen literature in which the potato famine of the 1840s in Ireland, in addition to being linked to the epidemics which followed among the weakened and impoverished, was also linked to a spasm of birth defects?

Note that we are dealing here with both nutritional deficiency and chemical poisoning. It may be that potatoes are deficient in choline, or at least that has been suggested. The deficiency of Indian corn, maize, in the amino lysine is well known. And it is known that the standard diet of Ireland in the years before the famine was ten to twelve pounds of potatoes per day per person, eaten often with buttermilk and not supplemented by a whole lot of other foodstuffs – one simply wouldn’t be able to consume ten to twelve pounds of potatoes per day if one were eating in addition any quantities of any other foodstuff. Nutritional insufficiencies operate in quite a different manner from chemical poisons. One is an insufficiency of a chemical, the other an excess of a chemical. Fetuses generally feed first, that is, in cases of nutritional insufficiency it is generally the pregnant woman who is impacted before her fetus. This *spina bifida* and *anencephaly* however, by way of contrast, being the result of a specific toxin which has a specific effect on a specific vulnerable new tissue growth, that is to say, the initial closure of the new neural tube, is one which shows up in the stillborn or live birth by an apparently healthy mother.

1848

Spring: The prospects for an [Irish potato](#) harvest appeared good.  
It ain’t over, of course, ’till it’s over, but — is it over?



Friendship has this peculiarity that it can never be talked about. It is never established –as an understood relation– Friends are never committed.

What it would say can never be expressed. All words are gossip– what has speech to do with it.

When a man approaches his friend who is thus transfigured to him, even his own hoarse salutation sounds prosaic and ridiculous and makes him least happy in *his* presence.

–It is an exercise of the purest imagination and the rarest faith– I will be so related to thee– I will spend truth on thee– the friend responds through his nature and life and treats *his* friend with the same divine civility–

There is friendship –but without confession –in silence as divine –

If the other is dull or engrossed by the things of the world and does not respond to this lofty salute –or from a lower platform –hears imperfectly– That friendship is by necessity a profound secret which can never be revealed– It is a tragedy that cannot be told. None ever knows what was meant.

There is no need that a man should confess his love of nature –and no more his love of man.– In any case what *sentence* is it indispensable should be framed and uttered Why a few sounds.

True love does not quarrel for slight reasons –such mistakes as mutual friends can explain away –but alas only for adequate & fatal & everlasting reasons, which can never be set aside.

That person is transfigured is God in the human form –henceforth– The lover asks no return but that the



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## POTATO

beloved will religiously accept & wear and not disgrace this apotheosis Whatever virtue or greatness we can conceive we ascribe to that one –of that at least his nature is capable –though he may {leaves missing}

Yet a fault may appear greater than it is in many ways.

I have never seen a person –who could bear criticism –who could not be flattered who would not bribe his judge.– Who would bear that truth should be loved always better than themselves —

Mythology is ancient history or biography The oldest history still memorable becomes a mythus– It is the fruit which history at last bears– The fable so far from being false contains only the essential parts of the history–

What is today a diffuse biography –was anciently before printing was discovered – –a short & pithy tradition a century was equal to a thousand years. To day you have the story told at length with all its accompaniments In mythology you have the essential & memorable parts alone –the you & I the here & there the now & then being omitted– In how few words for instance the Greeks would have told the story of Abelard & Heloise instead of a volume They would have made a mythus of it among the fables of their gods and demigods or mortals –and then have stuck up their names to shine in some corner of the firmament– And who knows what Greeks may come again at last to mythologize their Love.– and our own deeds.

How many Vols folio make the life and labors of Prometheus have filled if perchance it fell in days of cheap printing!– What shape at length will assume the fable of Columbus –to be confounded at last with that of Jason –& the expedition of the Argonauts –and future Homers quoted as authority. And Franklin there may be a line for him in the future Classical dictionary recording what that demigod did.– & referring him to some new genealogy –

I see already the naked fables scattered up & down the history of modern –Europe– A small volume of mythology preparing in the press of time– The hero tell –with his bow –Shakspeare –the new Apollo — Cromwell –napoleon.

The most comprehensive the most pithy & significant book is the mythology

Few phenomena give me more delight in the spring of the year than to observe the forms which thawing clay and sand assume on flowing down the sides of a deep cut on the rail road through which I walk.

The clay especially assumes an infinite variety of forms–

There lie the sand and clay all winter on this shelving surface an inert mass but when the spring sun comes to thaw the ice which binds them they begin to flow down the bank like lava –

These little streams & ripples of lava like clay over flow & interlace one another like some mythological vegetation –like the forms which I seem to have seen imitated in bronze– What affects me is the presence of the law –between the inert mass and the luxuriant vegetation what interval is there? Here is an artist at work – as it were not at work but –a-playing designing – – It begins to flow & immediately it takes the forms of vines –or of the feet & claws of animals –or of the human brain or lungs or bowels– Now it is bluish clay now clay mixed with reddish sand –now pure iron sand –and sand and clay of every degree of fineness and every shade of color– The whole bank for a quarter of a mile on both sides is sometimes overlaid with a mass of plump & sappy verdure of this kind– I am startled probably because it grows so fast –it is produced in one spring day. The lobe of these leaves –perchance of all leaves –is a thick –now loitering drop like the ball of the finger larger or smaller so perchance the fingers & toes flow to their extent from the thawing mass of the body –& then are congealed for a night.

–Whither may the sun of new spring lead them on– These roots of ours– In the mornings these resting streams start again and branch & branch again into a myriad others– Here it is coarse red sand & even pebbles –there fine adhesive clay–

–And where the flowing mass reaches the drain at the foot of the bank on either side it spreads out flatter in to sands like those formed at the mouths of rivers –the separate streams losing their semicircular form-and gradually growing more and more flat –and running together as it is more moist till they form an almost flat sand –variously & beautifully shaded –& in which you can still trace the forms of vegetation till at length in the water itself they become the ripple marks on the bottom

The lobes are the fingers of the leaf as many lobes as it has in so many directions it inclines to flow –more genial heat or other influences in its springs might have caused it flow farther.

–So it seemed as if this one hill side contained an epitome of all the operations in nature.

So the stream is but a leaf What is the river with all its branches –but a leaf divested of its pulp – – but its pulp is intervening earth –forests & fields & town & cities– What is the river but a tree an oak or pine –& its leaves perchance are ponds & lakes & meadows innumerable as the springs which feed it.

I perceive that there is the same power that made me my brain my lungs my bowels my fingers & toes working in other clay this very day– I am in the studio of an artist.

This cut is about a quarter of a mile long –& 30 or 40 feet deep –and in several places clay occurs which rises to within a dozen feet of the surface.– Where there is sand only the slope is great & uniform –but the clay being more adhesive inclines to stand out longer from the sand as in boulders –which are continually washing & coming down.

Flowing down it of course runs together and forms masses and conglomerations but if flowed upward it would dispersed itself more –& grow more freely –& unimpeded

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In the next 9 miles which completed the extent of the voyage for this day We rowed across several small lakes –poled up numerous rapids & thoroughfares, and carried over 4 portages– I will give the names and distances for the benefit of future tourists

1st after leaving Ambejisjis lake –a a quarter of a mile of rapids to the Portage or carry of 90 rods around Ambejisjis Falls. ——

Then a mile & a half through Passamagamet lake, which is narrow & river like to the falls of the same name – Ambejisjis stream coming in on the right ——

Then 2 miles through Katepskonegan lake.– to the carry of 90 rods around Katepskonegan Falls –which name signifies “carrying place” –Passamagamet stream coming in on the left ——

Then 3 miles through Pockwockomus lake –a slight expansion of the river to the carry of 40 rods around the falls of the same name Katepskonegan stream coming in on the left ——

The 3/4 of a mile through Aboljacarmegus lake, similar to the last to the portage of 40 rods around the fall of the same name ——

Then 1/2 mile of rapid water to the Sowadnehunk dead water & the Aboljacknagesic stream.

This is generally the order of names as you ascend the river &c v 81

July: Farmers along the west coast of Ireland were beginning to notice blight on the leaves of their potato crop.



IRISH POTATO FAMINE

War wounded Thomas Mayne Reid, Jr. sailed back from Mexico to New-York with what remained of the 1st New York Volunteer Infantry Regiment.

WAR ON MEXICO



# SOLANUM TUBEROSUM

# POTATO

August: The plan of the English government, to dispense with all relief efforts for those starving in [Ireland](#) as of August 15th, needed to be postponed when the blight was again discovered on the leaves of the [potato](#) plants.



IRISH POTATO FAMINE

The blight was already as pervasive as it had been in August  of 1846.

## Acreage in Potatoes

Year	Acres
1845	>2,000,000
1846	>1,000,000
1847	300,000
1848	700,000

"Until Ireland can be famished, it cannot be subdued."  
— Edmund Spenser



1849

The [negrero](#) *Casco*, sailing without papers, was boarded and searched by a British cruiser and found to be transporting 420 [slaves](#) (SENATE EXECUTIVE DOCUMENT, 31st Congress, 1st session XIV Number 66, page 13).

To the current regulations for emigration, the British parliament added at this time that the berthing together of single men and women was forbidden. The food ration was increased from the 7 pounds per week specified in 1842, by adding onto that quantity of bread, biscuits, flour, oatmeal, or rice, or the equivalent in [potatoes](#), a twice-weekly provision of oatmeal, of tea, of rice, of sugar and of molasses. Still, no vegetables were provided, and still, passengers had to bring along much of their food for the journey. Rather than requiring merely that each vessel carrying more than 100 emigrants have aboard a surgeon, each vessel carrying more than 50 emigrants would in the future have either to carry a surgeon, or provide for each passenger 14 rather than 10 square feet of deck area.

### THE TRAFFIC IN MAN-BODY

W.E. Burghardt Du Bois: A somewhat more sincere and determined effort to enforce the slave-trade laws now followed; and yet it is a significant fact that not until Lincoln's administration did a slave-trader suffer death for violating the laws of the United States. The participation of Americans in the trade



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continued, declining somewhat between 1825 and 1830, and then reviving, until it reached its highest activity between 1840 and 1860. The development of a vast internal slave-trade, and the consequent rise in the South of vested interests strongly opposed to slave smuggling, led to a falling off in the illicit introduction of Negroes after 1825, until the fifties; nevertheless, smuggling never entirely ceased, and large numbers were thus added to the plantations of the Gulf States.

Monroe had various constitutional scruples as to the execution of the Act of 1819;<sup>32</sup> but, as Congress took no action, he at last put a fair interpretation on his powers, and appointed Samuel Bacon as an agent in Africa to form a settlement for recaptured Africans. Gradually the agency thus formed became merged with that of the Colonization Society on Cape Mesurado; and from this union Liberia was finally evolved.<sup>33</sup>

Meantime, during the years 1818 to 1820, the activity of the slave-traders was prodigious. General James Tallmadge declared in the House, February 15, 1819: "Our laws are already highly penal against their introduction, and yet, it is a well known fact, that about fourteen thousand slaves have been brought into our country this last year."<sup>34</sup> In the same year Middleton of South Carolina and Wright of Virginia estimated illicit introduction at 13,000 and 15,000 respectively.<sup>35</sup> Judge Story, in charging a jury, took occasion to say: "We have but too many proofs from unquestionable sources, that it [the slave-trade] is still carried on with all the implacable rapacity of former times. Avarice has grown more subtle in its evasions, and watches and seizes its prey with an appetite quickened rather than suppressed by its guilty vigils. American citizens are steeped to their very mouths (I can hardly use too bold a figure) in this stream of iniquity."<sup>36</sup> The following year, 1820, brought some significant statements from various members of Congress. Said Smith of South Carolina: "Pharaoh was, for his temerity, drowned in the Red Sea, in pursuing them [the Israelites] contrary to God's express will; but our Northern friends have not been afraid even of that, in their zeal to furnish the Southern States with Africans. They are better seamen than Pharaoh, and calculate by that means to elude the vigilance of Heaven; which they seem to disregard, if they can but elude the violated laws of their country."<sup>37</sup> As late as May he saw little hope of suppressing the traffic.<sup>38</sup> Sergeant of Pennsylvania declared: "It is notorious that, in spite of the utmost vigilance that can be employed, African negroes are clandestinely brought in and sold as slaves."<sup>39</sup> Plumer of New Hampshire stated that "of the unhappy beings, thus in violation of all laws transported to our shores, and thrown by force into

32. Attorney-General Wirt advised him, October, 1819, that no part of the appropriation could be used to purchase land in Africa or tools for the Negroes, or as salary for the agent: *OPINIONS OF ATTORNEYS-GENERAL*, I. 314-7. Monroe laid the case before Congress in a special message Dec. 20, 1819 (*HOUSE JOURNAL*, 16th Congress 1st session, page 57); but no action was taken there.

33. Cf. Kendall's Report, August, 1830: *SENATE DOCUMENT*, 21st Congress 2d session, I. No. 1, pages 211-8; also see below, Chapter X.

34. Speech in the House of Representatives, Feb. 15, 1819, page 18; published in Boston, 1849.

35. Jay, *INQUIRY INTO AMERICAN COLONIZATION* (1838), page 59, note.

36. Quoted in *Friends' FACTS AND OBSERVATIONS ON THE SLAVE TRADE* (ed. 1841), pages 7-8.

37. *ANNALS OF CONGRESS*, 16th Congress 1st session, pages 270-1.

38. *ANNALS OF CONGRESS*, 16th Congress 1st session, page 698.

39. *ANNALS OF CONGRESS*, 16th Congress 1st session, page 1207.



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the mass of our black population, scarcely one in a hundred is ever detected by the officers of the General Government, in a part of the country, where, if we are to believe the statement of Governor Rabun, 'an officer who would perform his duty, by attempting to enforce the law [against the slave trade] is, by many, considered as an officious meddler, and treated with derision and contempt;' ... I have been told by a gentleman, who has attended particularly to this subject, that ten thousand slaves were in one year smuggled into the United States; and that, even for the last year, we must count the number not by hundreds, but by thousands."<sup>40</sup> In 1821 a committee of Congress characterized prevailing methods as those "of the grossest fraud that could be practised to deceive the officers of government."<sup>41</sup> Another committee, in 1822, after a careful examination of the subject, declare that they "find it impossible to measure with precision the effect produced upon the American branch of the slave trade by the laws above mentioned, and the seizures under them. They are unable to state, whether those American merchants, the American capital and seamen which heretofore aided in this traffic, have abandoned it altogether, or have sought shelter under the flags of other nations." They then state the suspicious circumstance that, with the disappearance of the American flag from the traffic, "the trade, notwithstanding, increases annually, under the flags of other nations." They complain of the spasmodic efforts of the executive. They say that the first United States cruiser arrived on the African coast in March, 1820, and remained a "few weeks;" that since then four others had in two years made five visits in all; but "since the middle of last November, the commencement of the healthy season on that coast, no vessel has been, nor, as your committee is informed, is, under orders for that service."<sup>42</sup> The United States African agent, Ayres, reported in 1823: "I was informed by an American officer who had been on the coast in 1820, that he had boarded 20 American vessels in one morning, lying in the port of Gallinas, and fitted for the reception of slaves. It is a lamentable fact, that most of the harbours, between the Senegal and the line, were visited by an equal number of American vessels, and for the sole purpose of carrying away slaves. Although for some years the coast had been occasionally visited by our cruisers, their short stay and seldom appearance had made but slight impression on those traders, rendered hardy by repetition of crime, and avaricious by excessive gain. They were enabled by a regular system to gain intelligence of any cruiser being on the coast."<sup>43</sup> Even such spasmodic efforts bore abundant fruit, and indicated what vigorous measures might have accomplished. Between May, 1818, and November, 1821, nearly six hundred Africans were recaptured and eleven American slavers taken.<sup>44</sup> Such measures gradually changed the character of the trade, and opened the

40. ANNALS OF CONGRESS, 16th Congress 1st session, page 1433.

41. Referring particularly to the case of the slaver "Plattsburg." Cf. HOUSE REPORTS, 17th Congress 1st session, II. No. 92, page 10.

42. HOUSE REPORTS, 17th Congress 1st session, II. No. 92, page 2. The President had in his message spoken in exhilarating tones of the success of the government in suppressing the trade. The House Committee appointed in pursuance of this passage made the above report. Their conclusions are confirmed by British reports: PARLIAMENTARY PAPERS, 1822, Vol. XXII., SLAVE TRADE, Further Papers, III. page 44. So, too, in 1823, Ashmun, the African agent, reports that thousands of slaves are being abducted.

43. Ayres to the Secretary of the Navy, Feb. 24, 1823; reprinted in FRIENDS' VIEW OF THE AFRICAN SLAVE-TRADE (1824), page 31.



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international phase of the question. American slavers cleared for foreign ports, there took a foreign flag and papers, and then sailed boldly past American cruisers, although their real character was often well known. More stringent clearance laws and consular instructions might have greatly reduced this practice; but nothing was ever done, and gradually the laws became in large measure powerless to deal with the bulk of the illicit trade. In 1820, September 16, a British officer, in his official report, declares that, in spite of United States laws, "American vessels, American subjects, and American capital, are unquestionably engaged in the trade, though under other colours and in disguise."<sup>45</sup> The United States ship "Cyane" at one time reported ten captures within a few days, adding: "Although they are evidently owned by Americans, they are so completely covered by Spanish papers that it is impossible to condemn them."<sup>46</sup> The governor of Sierra Leone reported the rivers Nunez and Pongas full of renegade European and American slave-traders;<sup>47</sup> the trade was said to be carried on "to an extent that almost staggers belief."<sup>48</sup> Down to 1824 or 1825, reports from all quarters prove this activity in slave-trading.

The execution of the laws within the country exhibits grave defects and even criminal negligence. Attorney-General Wirt finds it necessary to assure collectors, in 1819, that "it is against public policy to dispense with prosecutions for violation of the law to prohibit the Slave trade."<sup>49</sup> One district attorney writes: "It appears to be almost impossible to enforce the laws of the United States against offenders after the negroes have been landed in the state."<sup>50</sup> Again, it is asserted that "when vessels engaged in the slave trade have been detained by the American cruisers, and sent into the slave-holding states, there appears at once a difficulty in securing the freedom to these captives which the laws of the United States have decreed for them."<sup>51</sup> In some cases, one man would smuggle in the Africans and hide them in the woods; then his partner would "rob" him, and so all trace be lost.<sup>52</sup> Perhaps 350 Africans were officially reported as brought in contrary to law from 1818 to 1820: the absurdity of this figure is apparent.<sup>53</sup> A circular letter to the marshals, in 1821, brought reports of only a few well-known cases, like that of the "General Ramirez;" the marshal of Louisiana had "no information."<sup>54</sup>

There appears to be little positive evidence of a large illicit

44. HOUSE REPORTS, 17th Congress 1st session, II. No. 92, pages 5-6. The slavers were the "Ramirez," "Endymion," "Esperanza," "Plattsburg," "Science," "Alexander," "Eugene," "Mathilde," "Daphne," "Eliza," and "La Pensée." In these 573 Africans were taken. The naval officers were greatly handicapped by the size of the ships, etc. (cf. FRIENDS' VIEW OF THE AFRICAN SLAVE-TRADE (1824), pages 33-41). They nevertheless acted with great zeal.

45. PARLIAMENTARY PAPERS, 1821, Vol. XXIII., SLAVE TRADE, Further Papers, A, page 76. The names and description of a dozen or more American slavers are given: PARLIAMENTARY PAPERS, 1821, Vol. XXIII., SLAVE TRADE, Further Papers, A, pages 18-21.

46. HOUSE REPORTS, 17th Congress 1st session, II. No. 92, pages 15-20.

47. HOUSE DOCUMENT, 18th Congress 1st session, VI. No. 119, page 13.

48. PARLIAMENTARY PAPERS, 1823, Vol. XVIII., SLAVE TRADE, Further Papers, A, pages 10-11.

49. OPINIONS OF ATTORNEYS-GENERAL, V. 717.

50. R.W. Habersham to the Secretary of the Navy, August, 1821; reprinted in FRIENDS' VIEW OF THE AFRICAN SLAVE-TRADE (1824), page 47.

51. FRIENDS' VIEW OF THE AFRICAN SLAVE-TRADE (1824), page 42.

52. FRIENDS' VIEW OF THE AFRICAN SLAVE-TRADE (1824), page 43.

53. Cf. above, pages 126-7.

54. FRIENDS' VIEW OF THE AFRICAN SLAVE-TRADE (1824), page 42.



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importation into the country for a decade after 1825. It is hardly possible, however, considering the activity in the trade, that slaves were not largely imported. Indeed, when we note how the laws were continually broken in other respects, absence of evidence of petty smuggling becomes presumptive evidence that collusive or tacit understanding of officers and citizens allowed the trade to some extent.<sup>55</sup> Finally, it must be noted that during all this time scarcely a man suffered for participating in the trade, beyond the loss of the Africans and, more rarely, of his ship. Red-handed slavers, caught in the act and convicted, were too often, like La Coste of South Carolina, the subjects of executive clemency.<sup>56</sup> In certain cases there were those who even had the effrontery to ask Congress to cancel their own laws. For instance, in 1819 a Venezuelan privateer, secretly fitted out and manned by Americans in Baltimore, succeeded in capturing several American, Portuguese, and Spanish slavers, and appropriating the slaves; being finally wrecked herself, she transferred her crew and slaves to one of her prizes, the "Antelope," which was eventually captured by a United States cruiser and the 280 Africans sent to Georgia. After much litigation, the United States Supreme Court ordered those captured from Spaniards to be surrendered, and the others to be returned to Africa. By some mysterious process, only 139 Africans now remained, 100 of whom were sent to Africa. The Spanish claimants of the remaining thirty-nine sold them to a certain Mr. Wilde, who gave bond to transport them out of the country. Finally, in December, 1827, there came an innocent petition to Congress to *cancel this bond*.<sup>57</sup> A bill to that effect passed and was approved, May 2, 1828,<sup>58</sup> and in consequence these

55. A few accounts of captures here and there would make the matter less suspicious; these, however, do not occur. How large this suspected illicit traffic was, it is of course impossible to say; there is no reason why it may not have reached many hundreds per year.

56. Cf. editorial in *Niles's Register*, XXII. 114. Cf. also the following instances of pardons: —

PRESIDENT JEFFERSON: March 1, 1808, Phillip M. Topham, convicted for "carrying on an illegal slave-trade" (pardoned twice). PARDONS AND REMISSIONS, I. 146, 148-9.

PRESIDENT MADISON: July 29, 1809, fifteen vessels arrived at New Orleans from Cuba, with 666 white persons and 683 negroes. Every penalty incurred under the Act of 1807 was remitted. (Note: "Several other pardons of this nature were granted.") PARDONS AND REMISSIONS, I. 179.

Nov. 8, 1809, John Hopkins and Lewis Le Roy, convicted for importing a slave. PARDONS AND REMISSIONS, I. 184-5.

Feb. 12, 1810, William Sewall, convicted for importing slaves. PARDONS AND REMISSIONS, I. 194, 235, 240.

May 5, 1812, William Babbit, convicted for importing slaves. PARDONS AND REMISSIONS, I. 248.

PRESIDENT MONROE: June 11, 1822, Thomas Shields, convicted for bringing slaves into New Orleans. PARDONS AND REMISSIONS, IV. 15.

Aug. 24, 1822, J.F. Smith, sentenced to five years' imprisonment and \$3000 fine; served twenty-five months and was then pardoned. PARDONS AND REMISSIONS, IV. 22.

July 23, 1823, certain parties liable to penalties for introducing slaves into Alabama. PARDONS AND REMISSIONS, IV. 63.

Aug. 15, 1823, owners of schooner "Mary," convicted of importing slaves. PARDONS AND REMISSIONS, IV. 66.

PRESIDENT J.Q. ADAMS: March 4, 1826, Robert Perry; his ship was forfeited for slave-trading. PARDONS AND REMISSIONS, IV. 140.

Jan. 17, 1827, Jesse Perry; forfeited ship, and was convicted for introducing slaves. PARDONS AND REMISSIONS, IV. 158.

Feb. 13, 1827, Zenas Winston; incurred penalties for slave-trading. PARDONS AND REMISSIONS, IV. 161. The four following cases are similar to that of Winston: —

Feb. 24, 1827, John Tucker and William Morbon. PARDONS AND REMISSIONS, IV. 162.

March 25, 1828, Joseph Badger. PARDONS AND REMISSIONS, IV. 192.

Feb. 19, 1829, L.R. Wallace. PARDONS AND REMISSIONS, IV. 215.

PRESIDENT JACKSON: Five cases. PARDONS AND REMISSIONS, IV. 225, 270, 301, 393, 440.

The above cases were taken from manuscript copies of the Washington records, made by Mr. W.C. Endicott, Jr., and kindly loaned me.

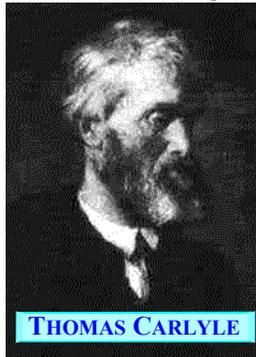
57. See SENATE JOURNAL, 20th Congress 1st session, pages 60, 66, 340, 341, 343, 348, 352, 355; HOUSE JOURNAL, 20th Congress 1st session, pages 59, 76, 123, 134, 156, 169, 173, 279, 634, 641, 646, 647, 688, 692.

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Africans remained as slaves in Georgia. On the whole, it is plain that, although in the period from 1807 to 1820 Congress laid down broad lines of legislation sufficient, save in some details, to suppress the African slave trade to America, yet the execution of these laws was criminally lax. Moreover, by the facility with which slavers could disguise their identity, it was possible for them to escape even a vigorous enforcement of our laws. This situation could properly be met only by energetic and sincere international co-operation....<sup>59</sup>

Spring: [Waldo Emerson](#) had recommended Indian cornmeal to [Thomas Carlyle](#) as a substitute for the scarce and low-quality [potato](#) of this period, and had provided the Carlyles with an American recipe that removed some of the bitterness of this mash, which many farmers were refusing to feed even to their livestock.<sup>60</sup>



Carlyle was so impressed by the idea that a servant might be fed for as little as a penny per day that he wrote a short piece on this intending to put it in the [Times](#) of London. As it would turn out, he wouldn't be able to get it published there — but would be able to get such ruminations published in [Fraser's Magazine](#).

IRISH POTATO FAMINE

1850

September 6, Thursday: In [South Kingstown, Rhode Island](#), "The [potato](#) rot is making great havoc here."

IRISH POTATO FAMINE

58. STATUTES AT LARGE, VI. 376.

59. Among interesting minor proceedings in this period were two Senate bills to register slaves so as to prevent illegal importation. They were both dropped in the House; a House proposition to the same effect also came to nothing: SENATE JOURNAL, 15th Congress 1st session, pages 147, 152, 157, 165, 170, 188, 201, 203, 232, 237; 15th Congress 2d session, pages 63, 74, 77, 202, 207, 285, 291, 297; HOUSE JOURNAL, 15th Congress 1st session, page 332; 15th Congress 2d session, pages 303, 305, 316; 16th Congress 1st session, page 150. Another proposition was contained in the Meigs resolution presented to the House, Feb. 5, 1820, which proposed to devote the public lands to the suppression of the slave-trade. This was ruled out of order. It was presented again and laid on the table in 1821: HOUSE JOURNAL, 16th Congress 1st session, pages 196, 200, 227; 16th Congress 2d session, page 238.

60. [Emerson](#) and [Carlyle](#) were mistaken. A diet of Indian [maize](#) produces scurvy as this grain is not only deficient in the essential amino protein known as lysine but also deficient in Vitamin C. The ultimate effects of such a regimen are that one's gums bleed and teeth fall out, while one's limbs are covered with black sores. A death from scurvy is often hastened by gangrene — and this would be inevitable even were one able to force down enough cooked cracked corn mush to prevent any loss of weight! Had these gents themselves been obliged to subsist for any length of time upon the sort of cheapo regimen they supposed good enough for servants, they would of course have been obliged to become considerably more thoughtful.

SOLANUM TUBEROSUM

POTATO



Sept. 6: What a generation this is! It carries some brains in its hat with a couple of spare cigars on top of them— It carries a heart in its breast and a lozenge in its waistcoat pocket  
 John Garfield brought me this morning (Sep. 6th) a Young Great Heron Ardea Herodias which he shot this morning on a pine tree on the North branch— It measured 4 ft 9 inches from bill to toe—& 6 ft in alar extent—and belongs to a different race from myself and Mr Frost. I am glad to recognize him for an American citizen.  
 In the twilight when you can only see the outlines of the trees in the horizon—the Elm tops indicate where the houses are. I have looked afar over fields and even over distant woods and seen the conspicuous graceful sheaflike top (head) of an elm which shadowed some farm-house. From the N W? part of Sudbury you can see an elm on the Boston road—on the hill top in the horizon in Wayland 5 or 6? miles distant. The elm is a tree which can be distinguished farther off perhaps than any other. The wheel wright still makes his hubs of it—his spokes of white oak his felleys of yellow oak which does not crack on the corners.— In England 'tis said they use the ash for felleys.

1851

In [Boston](#), one Bernard McGiniskin was hired as a policeman, then fired, then re-hired, and then re-fired.<sup>61</sup>

As an after-impact of the great [potato](#) famine, there was widespread blindness in [Ireland](#). The population of the island had fallen from 8,175,124 as of 1841 to 6,552, 385 (whereas without the [Irish Potato Famine](#) and the accompanying epidemic and emigration the population of that island could have been expected at this point to have been something greater than 9,000,000).

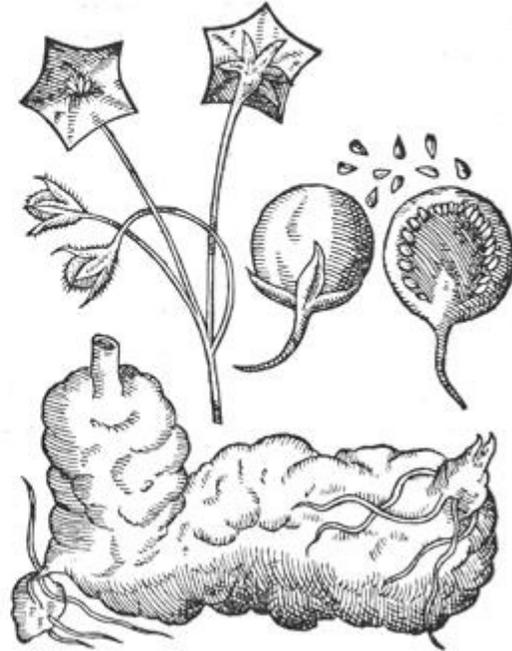
Population Trends

	England / Wales	Ireland
1821	12,000,000	6,800,000
1831	13,900,000	7,770,000
1841	15,920,000	8,180,000
1845	about 16,700,000	about 8,300,000 (the year of the blight, to be followed by famine and then by fever and emigration)
1851	17,930,000	6,550,000
1861	20,070,000	5,800,000
1871	31,629,299	5,410,000
1881	35,026,108	5,170,000

61. He was the initial [Irishman](#), you see, on the force. This was just scandalous — it was like supposing one could fit a fox into a uniform and entrust to it the safety of one's chickens. Bostonians [*sic*, this means white non-Irish males] talked about it, in their barber shops they were saying it was as cunning as hiring a nigger boy [*sic*, these are 19th-Century white American men talking to 19th-Century white American men] to tend a garden full of watermelons. What is going to come of all this insane **liberalism**?

POTATO

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**SOLANUM TUBEROSUM**

**POTATO**

Accurate estimates of this sort of thing are of course rather hard to come by, but order-of-magnitude it is now being estimated that like a million people had starved to death. Reviewing these figures, however, the Census Commissioners of the time pronounced them “on the whole, satisfactory,” pointing out that lower population levels meant “the general advancement of the country.” The relatives who had emigrated to the USA were evidently unable to take such a sanguinary attitude, as they were providing continuously increasing assistance for the people they had left behind:

**Low Estimates for Total Remittances to Ireland**

Year	Pounds
1848	£460,000
1849	£540,000
1850	£957,000
1851	£990,000

Because of the fact that:

It is useless to disguise the truth that any great improvement in the social system of Ireland must be founded upon an extensive change in the present state of agrarian occupation, and that this change necessarily implies a long, continued and systematic ejection of small holders and of squatting cottiers.

the trend among the “improving” absentee landlords of the island had become to hire gangs of thugs who would evict small tenants and tear the roofs from their cottages to make certain they could not come back:

**Families Evicted**

Year	Families
1847	6,026
1848	9,657
1849	16,686
1850	19,949
1851	13,197



What precisely was it, which had produced such a tragedy, or, such a travesty, as this famine and epidemic? Is an event of this magnitude to be understood as having been purely and simply an ecological disaster, a Malthusian inevitability, or must this be considered as having been primarily a piece of political opportunism, a Newt Gingrichian malignancy on the body politic, an opportunity to kick an entire people while they were down? Christine Kinealy has offered a refined analysis<sup>62</sup> involving some mixture of these possibilities:

62. Kinealy, Christine. THIS GREAT CALAMITY: THE IRISH FAMINE 1845-52. Dublin: Gill & Macmillan, 1994



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The onset of the Famine was unexpected although partial crop failures and food shortages were not unusual. In 1845, therefore, the [potato](#) blight, regardless of the lack of understanding of either its origins or an antidote, was not regarded with undue alarm. Although approximately 50 per cent of the main subsistence crop failed in 1845-6, the consequence of the resultant shortages was not [famine](#), nor did emigration or mortality increase substantially. The role played by the government, local landlords, clerics, and various relief officials was significant in achieving this outcome. The second, more widespread, blight of 1846 marked the real beginning of the Famine. Ominously, the impact of the shortages was apparent in the period immediately following the harvest. Inevitably also, the people undergoing a second year of shortages were far less resilient than they had been twelve months earlier. The government responded to this potentially more serious situation by reducing its involvement in the import of food into the country and by making relief more difficult to obtain.

The distress that followed the 1847 harvest was caused by a small crop and economic dislocation rather than the widespread appearance of blight. The government again changed its relief policy in an attempt to force local resources to support the starving poor within their district. The government professed a belief that this policy was necessary to ensure that a burden which it chose to regard as essentially local should not be forced upon the national finances. This policy underpinned the actions of the government for the remainder of the Famine. The relief of [famine](#) was regarded essentially as a local responsibility rather than a national one, let alone an imperial obligation. The special relationship between the constituent parts of the United Kingdom forged by the Act of Union appeared not to extend to periods of shortage and famine.

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If the blight is judged to be an unforeseen ecological disaster, beyond the control of man, which struck [Ireland](#) at a particularly vulnerable time, it was especially important that the intervention of man (as represented by [Irish](#) merchants, landlords, and the policy makers within the British government among others) should compensate for the failings of nature. It was the failure of these key groups to meet the challenge and implement effective action which transformed the blight into a [famine](#).

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The contribution of outside charitable bodies was mostly confined to the early years of the Famine. By 1847, most of these sources had dried up or, as in the case of the [Quakers](#), they had decided to use their remaining funds to concentrate on long-term improvements rather than immediate relief. Significantly, the Quakers' men on the ground who toured the west of [Ireland](#) in the winter of 1846-7 were critical both of absentee landlords and of the policies pursued by the British government alike.

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For landlords also, who were able to ride the storm of diminished



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rentals and heavy taxation, the Famine ultimately brought both social and financial benefits. As Lord George Hill, a “reforming” landlord who had attempted without success to consolidate his estates prior to 1845, admitted:

The [Irish](#) people have profited much by the Famine, the lesson was severe; but so rooted were they in old prejudices and old ways, that no teacher could have induced them to make the changes which this Visitation of Divine Providence has brought about, both in their habits of life and in their mode of agriculture.

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In conclusion, therefore, the response of the British government to the Famine was inadequate in terms of humanitarian criteria and, increasingly after 1847, systematically and deliberately so. The localised shortages that followed the blight of 1845 were adequately dealt with but, as the shortages became more widespread, the government retrenched. With the short-lived exception of the soup kitchens, access to relief –or even more importantly, access to food– became more restricted. That the response illustrated a view of [Ireland](#) and its people as distant and marginal is hard to deny. What, perhaps, is more surprising is that a group of officials and their non-elected advisors were able to dominate government policy to such a great extent. This relatively small group of people, taking advantage of a passive establishment, and public opinion which was opposed to further financial aid for Ireland, were able to manipulate a theory of free enterprise, thus allowing a massive social injustice to be perpetrated within a part of the United Kingdom. There was no shortage of resources to avoid the tragedy of a [famine](#). Within Ireland itself, there were substantial resources of food which, had the political will existed, could have been diverted, even as a short-term measure, to supply a starving people. Instead, the government pursued the objective of economic, social, and agrarian reform as a long-term aim, although the price paid for this ultimately elusive goal was privation, disease, emigration, mortality and an enduring legacy of disenchantment.

End of this quoting. What I am wondering is whether anyone can offer insight into the Quaker disengagement cited by the author as having taken place in 1848. Was that a case of what nowadays we term “burnout”? In particular, where Friends spoke of their prior effort as having been equivalent to “giving the criminal a long day,” what was the significance of the deployment of such an idiom? Were the Friends at that point, in despair, becoming political “Newt Gingrichians”? What **was** it precisely, in that period, to “give the criminal a long day”?

1852

October: The [Irish potato](#) harvest this year was virtually free of the late blight. England had disbursed a grand sum total of less than 1/2 of 1% of **one** year’s annual Gross National Product in relief to sustain the Irish during this entire panicky [Irish Potato Famine](#) period of like eight years, and had begrudged even that level of assistance.<sup>63</sup>



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1855

To the current regulations for emigration, the British parliament at this point added that meat, [potatoes](#), and peas were to be included in ship rations, that meals were to be issued daily, and that these were to be cooked meals, ready to consume — this marked the earliest point at which an emigrant could be assured that his or her transportation included all necessary food.

1859

The ten-line burweed beetle *Leptinotarsa* had transitioned from feeding only upon the intrusive Mexican burweed to feeding only upon garden [potato](#) plants. How about that?<sup>64</sup>

63. Which is to say, making a comparison with the past, that over a period of eight years they had been willing to spend to fight this famine only 10% of what they had felt required to spend **every** year in order to neutralize the armies of Napoleon. Or, looking at this thing compared to England's glorious future, the Treasury had with the greatest of reluctance disbursed only £8,000,000 for all the Irish, when in a few years it would be disbursing over £69,000,000 in order to fund a pointless and disastrous military foray into the Crimea.

64. A piece of its second pair of chromosomes had shifted. Whether this is what had enabled the abrupt change in diet is anybody's guess. (NOTE: this has nothing whatever to do with the [Irish Potato Famine](#) of 1845-1852. It is a completely different problem of a completely separate era.)

**SOLANUM TUBEROSUM****POTATO****1861**

In this year Anton de Bary of Freiburg discovered the growth patterns of the *Phytophthora infestans*, establishing it as the microorganism causing the [potato](#) “late blight” syndrome.

**1872**

The ten-line burweed beetle *Leptinotarsa* that had learned to eat [potatoes](#) in your garden had become a general infestation along America’s northeastern coast. Where food is multiplied, says a good book, they are multiplied that feed upon it. We have a record of a train that was in this year stopped on its tracks by loss of traction, due to a swarm of these beetles.<sup>65</sup>

65. This has nothing whatever to do with the [Irish Potato Famine](#) of 1845-1852. It is a completely different problem of a completely separate era.



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1877

Harvest: In [Ireland](#), failure of the [potato](#) crop. Would there be another [famine](#)?

1880

March: The USS *Constellation* was carrying relief supplies to victims of yet another [famine](#) in [Ireland](#), until June. To modify the vessel for this mission, her armament and some ballast had been removed, and carpenters at the New York Navy Yard had built bins on the orlop deck in which were stowed over 2,500 barrels of [potatoes](#) and flour.

Continuation of serial publication of [Fyodor Mikhailovich Dostoevski](#)'s THE BROTHERS KARAMAZOV in [The Russian Herald](#): Continuation of Book IX. (Dmitry is taken away.)

April 20, Tuesday: The USS *Constellation* arrived off Queenstown, to offload its cargo of [potatoes](#) and flour onto lighters, for relief of the [Irish famine](#). The vessel would take on ballast for the return trip, and after return, would be re-fitted for its training mission, and depart on its annual midshipman cruise.

In Central Asia, a symphonic poem by Alyeksandr Borodin composed for the silver jubilee of Tsar Alyeksandr II, was performed for the initial time, in Kononov Hall, St. Petersburg, conducted by Nikolai Rimsky-Korsakov. Also premiered were the closing scene from Modest Musorgsky's opera *Khovanshchina*, along with the premiere of Musorgsky's Mephistopheles' Song of the Flea for solo voice and piano to words of [Goethe](#) (tr. Strugovshchikov).

20TH CENTURY

1937

In Germany, Mohler found [M. tuberculosis](#) to be alive and virulent in butter that had been in cold storage for six months.

“*Éire*” constitution enacted in the [Irish](#) Free State, infamous Articles 2 and 3 included....

In this timeframe the [potato](#) variety “Virgil” was being introduced with great fanfare, as a “blightproof” cultivar — no more potato [famines](#) because the potato breeders (!) had obtained one R-gene from *Solanum demissum*. This was going to be the biggest thing since beer was put in cans! Well, events would reveal that the iron laws of epidemiology are not so readily to be overcome — the new potato would succumb to newly evolved varieties of the pathogen *Phytophthora infestans*, once again demonstrating the validity of the BIBLE's commonsense observation that as food is increased, so is increased they that eat of it.



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1966

April 1, Friday: Flan O'Brien's last and perhaps greatest work was left unfinished at his death on April Fool's Day of this year. In this comic masterpiece, the protagonist blames everything that is wrong in Ireland upon the [potato](#) plant, including putative [Irish](#) personality characteristics such as baseness, grovelingness, and backwardness. A wealthy American widow of Irish extraction, in SLATTERY'S SAGO SAGO, is allowed to essay to convert the island into a paradise by the plantation of vast plantations of the sago palm. Not only will this introduced species feed the multitudes, she offers, it is going to soften the climate. We will have monkeys and exotic birds frolicking in the treetops. Freed from the downward growth of the tuber, the Irish are going to grow straight and true. The manuscript reminds me of a German who opined after the end of the Second World War, that the only problem with the *Führerprinzip* had been that we had selected a crazy man as our *Führer* — let's do it again, he implied, but this time we need to get it right by selecting a sane guy to be our *Führer*.

1975

The Provisional Irish Republican Army staged a bomb campaign in Great Britain. De Valera died. Merlyn Rees became Secretary of State for Northern [Ireland](#). A new Northern [Ireland](#) convention was proposed.

An integrated pest management program named BLITECAST, running on mainframe computers at the University of Maine, began to attempt to forecast whether weather conditions were likely to be such as to cause the [late potato blight](#) to become a problem in the current potato-growing season. This was intended to assist farmers in deciding whether to complete the traditional routine series of six serial weekly applications of expensive and dangerous fungicides (farmers could hope to increase profits through reducing spraying; for instance if a farmer growing 50 hectares of potato crop would be able with confidence to skip three of his six sprayings, he would have his potato cash crop worth \$144,000 while putting an additional \$2,850 in foregone costs directly into his pocket as profit, the only question being how he was going to be able to fall sleep until this crop was safely harvested and sold).

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The virus section of the US Army’s Center for Biological Warfare Research at Fort Detrick, Maryland was renamed as “The Fredrick Cancer Research Facilities” to suggest falsely to American voters that this facility was engaged in research into saving the lives of people by developing a cure for cancer rather than in research into how to kill people by causing them to develop cancer. For extra-deep “cover,” this bio-war facility was placed under the supervision of the National Cancer Institute — an agency not normally associated in the public mind with the taking of human life. It would be at that facility that a special virus cancer program would be initiated by the US Navy, purportedly to develop new sorts of virus that would cause cancer. It would also be there that retrovirologists would isolate HTLV (Human T-cell Leukemia Virus), a virus for which we have no present immunity.



1994

June 8, Sunday: About a century and a half too late to help the sufferers of the [Irish Potato Famine](#), researchers at Purdue University discovered that a gene found in another member of the nightshade family (*Solanaceae*), *Nicotiana tabacum*, could be transferred to *Solanum tuberosum* to help them resist the sort of blight which caused the catastrophe of the mid-19th Century. Well, gee, **too bad** we didn’t figure this out as of 1845! The tobacco gene in question codes for osmotin, a molecule produced by many plants when under stress. These scientists not only found a way to implant this gene within the [potato](#) genetic materials, but also had been able to transfer it multiple times so as to multiply the production of that protein molecule. These large amounts of osmotin would enable genetically altered potatoes to resist late blight infections for an additional day or two (this blight organism being still endemic around the world), which, the researchers alleged, might well be all that is required to have a significant impact upon world nutrition — better living through genetic chemistry. Reassuringly, their press release indicated that although the health impact of starvation upon humans is **not unknown** (emphasis added), osmotin as a naturally occurring chemical has no **known** (emphasis added) health impact upon humans.



THE NIGHTSHADES (SOLANACEAE)

- — [Solanum tuberosum](#)
- — [Tomato Lycopersicon esculentum](#)
- — chili peppers



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- — eggplant
- — deadly nightshade
- — [Nicotiana tabacum](#)
- — henbane
- — Jimson weed
- — petunia
- — plus some 2,000 other species grouped into 75 genera

During this year the government of Ireland established a committee to fund events and works commemorating the Famine's 150th anniversary. In a recently republished "Transactions of the Society of Friends during the Famine in Ireland" the [Irish](#) Government minister in charge of the National Commemoration of 150th Anniversary of the Great Famine had this to offer:

On behalf of the Government, I wish to tender our thanks to the Society of Friends for their effort -past and present- in constructing a dignified Christian society in Ireland. We greatly value and cherish your presence here and we acknowledge with heartfelt gratitude your enormous contribution during the famine.... I note too how modern the Quakers were in their attitudes to poverty – seeing it as a structural problem, rather than blaming the poor for their own poverty. Such enlightened attitudes powered the moral imperative to feed the hungry and clothe the naked which constitutes the Quakers glowing achievement in those bitter years.

21ST CENTURY

2000

According to [Diversity Journal](#), the [potato](#) was in trouble again due to new strains of *Phytophthora infestans*, strains that had leaked out of the Toluca Valley of Mexico in 1976 in shipments of potatoes.

2001

Nicholas Wade reported in the [New York Times](#) about the history of [potato](#) cultivation:

### Testing Links Potato Famine to an Origin in the Andes

A delicate piece of detective work in the collections of the Royal Botanic Gardens at Kew has started to cast light on the origins of the blight that caused the Irish potato famines a century and a half ago.

Analysis of DNA from stricken potato leaves has confirmed that the pathogen was a fungus known as *Phytophthora infestans*, but suggests that it did not originate in the Toluca Valley of



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Mexico, a hot spot of different strains of the blight that has been proposed as the most likely source. Instead, researchers theorize, it may have arisen in the ancestral home of the potato in the Andean highlands of South America.

The Irish potato famines lasted from 1845 to 1860, during which about a million of Ireland's 8 million people starved to death and 1.5 million emigrated, mostly to the United States.

Diseased leaves deposited at the time in botanical collections have been analyzed by Dr. Jean B. Ristaino, a plant pathologist at North Carolina State University in Raleigh.

She and colleagues report in the current issue of Nature that they were able to extract DNA from samples collected in Ireland, Britain and France between 1845 and 1847. In the right conditions, DNA can survive for many years after the death of the living cells that make it.

The samples lack the genetic signature of a widespread strain of the fungus, US-1, which has been assumed from its worldwide distribution to have descended from the 19th-century blight that struck Ireland and much of Europe. The US-1 strain is thought to have originated in Mexico because that is where the known diversity of blight strains is highest.

Because the potato famine samples differ from the US-1 strain, Dr. Ristaino and her colleagues suggest that it is likely to have come from the Andean highlands. It is a well known phenomenon in biology for a pathogen and its host to evolve together.

A South American source was proposed by several people who studied the blight in the 19th century, including Charles Darwin.

He had collected potato tubers from Chile in 1835 during the voyage of the Beagle that led him to propose his theory of evolution by natural selection. Darwin was very concerned about the blight, Dr. Ristaino said, and gave Irish potato breeders £100 of his own money to support efforts to develop resistant strains.

He also hoped that the tubers from Chile might be naturally resistant to the blight and asked his cousin, William Darwin Fox, to grow them. But they all succumbed to the blight, which was endemic in England as well as [Ireland](#), Dr. Ristaino said.

There were many hints available at the time pointing to South America as a possible source of the blight, she said: European potato crops had been wiped out earlier in the century by a different disease, caused by a fungus called Fusarium, and were replaced with varieties from Peru.

There was also a vigorous trade in bat guano fertilizer between Peru and Ireland, and that material could have transported the blight.

Dr. Ristaino said more strains of the blight needed to be sampled worldwide to help pinpoint the origin of the one she had found in the herbarium samples.

"There's a real treasure trove of materials over there," she said, referring to the Kew herbarium collections outside London.

"There are many other pathogens hidden away on the shelves. You can capture a whole window into past epidemics."

In a commentary in Nature, Dr. Nicholas P. Money, a botanist at



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Miami University in Oxford, Ohio, described Dr. Ristaino's analysis as "a remarkable piece of molecular detective work." Dr. Stephen B. Goodwin, one of the biologists who discovered that the US-1 strain of blight now dominates the globe, said his theory of its being the cause of the Irish potato famine now seemed incorrect.

"Too bad it wasn't true," he said, "but that's the way it goes sometime. It was a great hypothesis."

Dr. Goodwin, a Department of Agriculture plant pathologist who teaches at Purdue University, said that the potato family had two centers of diversity, one in Mexico and one in Peru, but that the blight itself is far more diverse in the Mexican center and is likely to have evolved there.



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"It's all now you see. Yesterday won't be over until tomorrow and tomorrow began ten thousand years ago."

- Remark by character "Garin Stevens"  
in William Faulkner's INTRUDER IN THE DUST



Prepared: August 30, 2013

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# ARRGH AUTOMATED RESEARCH REPORT

## GENERATION HOTLINE



This stuff presumably looks to you as if it were generated by a human. Such is not the case. Instead, upon someone's request we have pulled it out of the hat of a pirate that has grown out of the shoulder of our pet parrot "Laura" (depicted above). What these chronological lists are: they are research reports compiled by ARRGH algorithms out of a database of data modules which we term the Kouroo Contexture. This is data mining. To respond to such a request for information, we merely push a button.



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Commonly, the first output of the program has obvious deficiencies and so we need to go back into the data modules stored in the contexture and do a minor amount of tweaking, and then we need to punch that button again and do a recompile of the chronology – but there is nothing here that remotely resembles the ordinary “writerly” process which you know and love. As the contents of this originating contexture improve, and as the programming improves, and as funding becomes available (to date no funding whatever has been needed in the creation of this facility, the entire operation being run out of pocket change) we expect a diminished need to do such tweaking and recompiling, and we fully expect to achieve a simulation of a generous and untiring robotic research librarian. Onward and upward in this brave new world.

First come first serve. There is no charge.  
Place your requests with <Kouroo@kouroo.info>.  
Arrgh.



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