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Diet, politics and disaster: The Great Irish Famine

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In the 6 years from 1845 to 1851 the Irish Famine caused approximately 1.2 million deaths, and 0.315 million averted births (O'Boyle & O Gráda, 1986) from a population of 8.5 million. Also, between 1846 and 1855 about 2.1 million people emigrated, with a further 3 million emigrating in the subsequent 50 years (O Gráda, 1994). It was not the most devastating of famines; those which occurred in China 1957–62, in Bengal in 1943 and in the Ukraine in the 1930s eclipse it in terms of mortality.

However, as a proportion of the population who either died or who were forced to escape from its effects, the Irish famine was remarkable for the fact that the population of Ireland as a whole never recovered in number, remaining to this day at half the pre-famine level. Apart from the death toll, the land clearances and emigration contributed to the demise of a significant part of Irish culture, particularly its language. Social historians have described the psychological aspects of Famine memory, the mindset formed by the experience of famine: the forced evictions, Poor Law dependence, relief works, emigration and the general decomposition of society brought on by famine (Morash, 1995). Unquantifiable aspects of chronic malnutrition include what the historian Joseph Lee calls the Life-Boat ethic, a system of triage that places additional strain on families: who gets the most food, the father, the mother, the children? Who will emigrate and who will remain? In many parts of Ireland there were five consecutive years of this hand-to-mouth existence. A glimpse of this strain on families is provided by reports of fathers being accompanied by their families on the food queues for fear they might abscond with the rations; descriptions of the starvation-induced apathy of mothers towards their children. Such indefinable factors are outside the realm of consideration when we set about the business of nutritional assessment in famine.

IRISH ECONOMIC LIFE AND THE POTATO CULTURE

'The greatest evil with which we have to contend is not the physical evil of the famine, but the moral evil of the selfish, perverse and turbulent character of the people'

Charles Trevelyan, Assistant Secretary to the Treasury (Woodham-Smith, 1962)

Many commentators agree that it was the fragile shape of the Irish economy more than anything else that exposed the people so disastrously to a crop disease that had comparatively slight effect on neighbouring countries in Europe. The factor which made the biggest difference economically was that these countries had a higher rate of development

and, unlike Ireland, had participated in the Industrial Revolution. Ireland's poor economic status rendered it incapable of withstanding the shock administered by the potato blight. Taking a modern example, Mokyr (1985) cites the ability of Western economies to withstand the rise in energy prices in the 1970s as a reflection of the robustness of their economies. While German and Swiss economies were exposed in the same degree to rising oil prices as the Portuguese or Turkish economies, the results were very different.

To understand Ireland's poor rate of development compared with the rest of Europe at the time, we need some picture of the political and economic landscape of Ireland. At the time of the Famine most of the land and property was owned by landlords whose descendants had been beneficiaries of successive settlements by English royalty and parliament: Elizabethan, Cromwellian and Williamite. The Penal Laws of 1695 codified the suppression of Catholics who constituted three-quarters of the population. Although not strictly enforced, the Penal Laws at the very least created a culture of distrust and enmity between two traditions. The case could be made, however, that irreparable damage was done to the delicate basis of the Irish economy principally by the policy of land confiscation from the indigenous owners, replacing them with a class of soldier-adventurers lucky enough to be on the winning side after the Williamite Wars.

One must distinguish, though, between British policy before and after 1782, when the Penal Laws were relaxed. From this time onwards Catholics participated more in business and the professions. The principal industry, agriculture, benefited greatly from the expansion of the Empire and particularly from the French Wars at the turn of the century as the demand grew for Irish grain, beef, pork, butter and livestock.

The basic elements that sustained life for the majority of Irish people in the mid-nineteenth century, the potato and turf, although cheap to produce, were not tradeable commodities. This was because the crop could not be stored for periods exceeding 1 year, so that there were no buffer stocks. Moreover, because of its bulk, transportation costs were very high. The only way to convert potato into a store as a hedge against future crop failure was by feeding it to pigs. For those on the lower rungs of the economic ladder the only cash transaction of the year was the sale of the pig, which together with working as an agricultural labourer for his landlord, helped to pay the rent on the plot of land.

Since trade in the main food commodity, the potato, was very low, commercialization as a whole was, therefore, also at a low level. Large areas of Irish life, geographically as well as socially, ran on a cashless economy. To understand the precarious nature of this economy one can compare a self-sufficient farmer to a farmer who deals at the market place. The economic standing of the self-sufficient farmer will depend purely on factors which affect his agricultural output, the most obviously devastating in this case being blight. For the commercial farmer, on the other hand, who sells most of his crop, this dependence is no longer true. When output falls due to harvest failure, agricultural prices rise, offsetting partially or completely the fall in income due to harvest failure. In addition, savings made in previous good years provide a buffer in difficult years. The risks of starvation, therefore, in case of harvest failure are smaller for the commercial than for the self-sufficient farmer.

That Ireland remained very much a peasant society while the rest of Europe was developing industrially may be explained by one important factor. Most of the wealth and political power rested with the 8000 or so landlords from whom the great majority of the population, predominantly rural, rented their houses and land (Campbell, 1994). The abolition of the Irish Parliament in 1800 and Ireland's official integration into Great Britain removed whatever trade barriers there had been. The previously-protected cottage industries of spinning and weaving were wiped out by industrially-produced imports from

England. In addition, following the end of the French Wars in 1814 agricultural prices collapsed causing many producers to fall into rent arrears, resulting in eviction from their holdings. Those losing their livelihoods as a result could either emigrate or become a part of a feudal land system sustained by landlordism and condoned by the government.

With the passing of the Act of Union landlords resided at their country estates less and less, using the rental income to support political careers or fashionable living in England. They let their estates at low rent to wealthy farmers known as middlemen who made vast profits by subletting at increased rent to numerous under-tenants. The very poor held land in one of two ways. The 'cottier' was a farm labourer who rented a small portion of land annually from his employer. The cottier paid rent by working a fixed number of days on the employer's farm. A more prevalent system in Connaught was the 'conacre' system where a casual or seasonal labourer made an annual arrangement to occupy a portion of manured ground to grow one year's crop of potatoes. This labouring class would rent the use of about one acre of land from a middleman paying five times the price the middleman would have paid the landlord. The existence of land division and sub-tenantry in this way constituted a mainstay of what stood for economic life in Ireland. Bourke (1993) has provided us with a tabular description of pre-famine Irish society with some indication of the relative potato dependence of the various groups (Table 1).

It is an oversimplification to contrast a small group of grasping landlords, English and Protestant, with a great mass of exploited tenantry, Irish and Catholic. As Bourke (1993) has pointed out, 'many landlords, as well as their middlemen, were efficient, innovative and generous to their tenants, particularly in stressful times. To lay the blame solely on political and sectarian lines ignores the fact that most of the bailiffs, agents, gombeen men and usurers who battered on the potato system were Irish and Catholic'. Daniel O'Connell, for instance, was charging his Kerry tenants over £1500 for Trinity College land for which he paid the College less than £900.

It is easy to see why the potato was viewed as a blessing, a nutritional miracle, and why growing potatoes compared with other crops held such an attraction (see Table 2). Several independent reports have calculated that during the period of the year when potatoes were

Table 1. *Potato consumption by different groups in Ireland, 1841* (after Bourke, 1993)

	No. (million)	% total	Potato consumption (lb/d during 10.5 months/year)
Agricultural			
Cottiers: Total	3.283	40.16	12
Ulster	1.407	17.21	8
Farmers: < 50 acres	0.601	7.36	6
> 50 acres	0.246	3.01	3
Graziers, landagents, etc.	0.026	0.32	3
Sub-total	5.563	68.07	-
Non-agricultural			
Clothing workers	0.742	9.08	6
Building, furniture trade	0.553	6.77	4
Miscellaneous workers	0.402	4.92	4
Professional, merchants	0.447	5.47	1
Paupers	0.019	0.23	6
Unclassified	0.448	5.48	6
Sub-total	2.611	31.93	-
Total	8.172		

Table 2. *Daily nutrient intake of adult Irish male (pre-famine)**
(Based on consumption of 6.350 kg potatoes, 1 litre buttermilk)

Macronutrients	g/d	% Total energy (23.7 MJ/d)
Protein	122.90	9.02
Fat	11.35	1.87
Carbohydrate	1300.00	90.00
Micronutrients	Amount (mg)	% Reference nutrient intake
Thiamin	5.48	548
Riboflavin	3.70	285
Niacin	51.80	323
Vitamin C	581.5	1453
Vitamin B ₆	11.93	852
Vitamin B ₁₂ (µg)	1.0	66
Folate (µg)	725	362.5
Vitamin E	Trace	
Vitamin D	Trace	
Vitamin A	Trace	
Fe	19.25	192
Na	750	46
K	22455	641
Ca	1454	200

*Nutrient analysis based on Bassham & Fletcher (1985).

available Irish agricultural labourers consumed up to 6.350 kg potatoes daily (Bourke, 1993) along with some buttermilk when available.

As well as having a high nutritional value potatoes were also a high-yielding crop compared with grain crops, highlighting how suitable the culture of potato dependence was in upholding the exploitative pre-famine land system. The sustenance provided by this one staple food source encouraged repeated sub-division of land and created an overpopulation of ill-paid, ill-treated, but grateful labour. The potato could be grown on land where no other crop could survive. From population maps of the period (Vaughan, 1989) it is possible almost to track the pre-famine movements of this huge underclass of landless peasantry, living in cabins which afforded little more than a secure shelter from the elements, reclaiming mountain and bogland through the 'lazybed' system of potato cultivation.

There is much evidence to show, however, that in spite of their being disadvantaged in most other ways, the Irish in the main were healthy and strong. The most commonly used index of long-term nutritional well-being is height. Height measurements in Irish recruits to the British Army in the early half of the nineteenth century have been used by O Gráda (1994) to show that as far as diet was concerned, at least, the Irish (whose diet was largely composed of potatoes) were better off than their English counterparts.

THE ANNUAL CYCLE OF EMPLOYMENT AND OF DISTRESS

An important factor in the lives of Irish labourers and small farmers was the fluctuation during the year in the demand for agricultural labour with peak labour demand often coinciding with food shortages. To meet the rent and survive, members of a labouring family would have been obliged to meet the physical demands of this cycle of agricultural

work. Contemporary accounts convey a sense of how extraordinarily labour-intensive pre-Famine Irish agriculture was. For instance, lime and seaweed for fertiliser were often carried for great distances, and the high-yielding lazybed system of growing potatoes relied on laborious cultivation methods. Such a working regimen would have required a high level of physical fitness, i.e. good nutritional status, and freedom from disease and injury. In this context dietary energy is likely to have been the most limiting factor. This does not imply, as modern World Health Organization research has shown (Pacey & Payne, 1985), that vitamin and other deficiencies did not occur, or were of minor consequence. Rather the avoidance of energy constraints is likely to have been a necessary even if not always a sufficient condition for avoiding malnutrition.

The yearly burden of agricultural work consisted, on the one hand, of that which went to pay the rent to the landlord, that is, the sowing and harvesting of grain crops and the more expensive, commercial varieties of potatoes, and on the other, that which the family grew for themselves. Malnutrition was most likely to occur during the summer months because the peak labour demand for the grain harvest is unlikely to have been met by sufficient food to balance expenditure at that period. What was referred to as the 'potato gap', or the interval between the old and new crops of potatoes, often lasted from mid-May to September or later, until the new crop of Lumper potatoes could be lifted. A poor harvest of potatoes had a knock-on effect the following year, chiefly because of the scarcity of seed potatoes. Sickness or injury to either the labourer or his wife, particularly during the intensive harvesting periods spelt disaster, labour being the direct method of payment for personal land usage. As Bourke (1993) has pointed out, the amplitude and intensity of the mid-summer wave of distress varied from year-to-year, but it was a regular feature of the Irish social scene for the 30 years preceding the famine.

Reinforcing the precarious nature of this existence are the well-characterized changing energy requirements of a typical family living at subsistence. The seasonal changes in food supply overlie the longer-term cyclical nature of a family's demographic expansion as children are born and grow up. During the first year or two of marriage, both parents contribute to extra-household labour, so the economic dependency is low. Things may become more difficult as the number of children increases. Young children require relatively large amounts of dietary energy. (A 1-year-old child is one-fifth the weight of an adult, but her/his energy intake will be about half the adult level.) To add to the economic strain of that household, nursing children under 2 years of age removes the woman, at least partially, from outside economic activity. It becomes necessary then to increase food supply without any reliable source of additional labour. A family which copes with one or two dependent children might thus start to have difficulty when later ones arrive. In studies in India, Gopalan (Pacey & Payne, 1985) found evidence that the fourth and subsequent children were twice as likely to be malnourished as those born earlier. Families with elderly people who do not work are likely to experience even more difficulty. Later, as the children take on more work, the economic burden eases.

One outstanding feature of the famine was the comparatively high excess mortality incurred by young children (O Gráda, 1993). In looking at the reasons why children in subsistence societies are more vulnerable than their elders it is meaningless to argue about whether low food intake or infection plays the larger part; a web of other contributory causes may include environmental conditions and pressures arising from the mother's workload. The period when children's health is most in danger starts at about 3 months, when breast-feeding stops, and lasts until they can feed themselves, perhaps when about 3 years old. The introduction of food supplements poses severe risks for the health of the child subsequently. Because of the need for the mother to supplement the man's work in

the fields, batches of food prepared in advance must have been prone to contamination. Similarly, food might have been improperly cooked because of similar pressures arising from extra-household workload or because of the obvious problem of damp turf. The potato diet was often supplemented with buttermilk, one likely source of weaning food, procured most certainly from a local commercial creamery. Passing through several transactions before reaching the subsistence household, the possibility of contamination must have been high. The result would have been diarrhoea, and children aged less than 6 months would have been especially vulnerable. Whatever the adequacy of the potato for those in good health, a bulky and coarse food like the potato was scarcely optimum for the ailing or weaning child.

A society living on a varied diet derived from a variety of resources is in a better position to withstand exogenous shocks such as potato blight. It can retrench in times of dearth. Such a society has room to fall. But when people have no alternative to very basic resources of food, they can fall no further. They are placed on the verge of existence. Their wages, being regulated by the price of potatoes, will not buy them other foodstuffs; and whenever, therefore, the supply of potatoes fails, it is next to impossible for them to avoid famine. This then, was the precarious scenario for the majority of Irish peasants when the potato blight struck Ireland in the summer of 1845.

THE FAMINE YEARS

Potato blight is caused by a fungus *Phytophthora infestans*, which was probably introduced to Europe from North America in cargoes of guano in early 1845. The blight hit most of western Europe severely and was first apparent in Ireland in August 1845, when almost half the potato crop was destroyed (Kissane, 1995).

The British Prime Minister Robert Peel, seeing that failure of the potato crop was likely to result in famine, ordered maize to be purchased from the USA. Although the amount imported was not enough to replace the lost potato crop, the initial effect of the availability of this maize (or Indian Corn) was to dampen the inevitable rise in food prices. Where available, the problem with this alternative foodstuff was that many had little experience of cooking anything other than potatoes. The hard shell made it difficult to grind, neither ovens nor utensils were available and instructions were printed in English. The result was that it caused severe stomach problems, leading it to be called 'Peel's brimstone'.

To enable people to buy the maize the government provided loans for public works. However, only a small percentage of the destitute derived any benefit from the well-intentioned work schemes up to the summer of 1846, much of the relief funds being ill-spent on enhancing local amenities and to repay political favours rather than to alleviate distress. With the inadequacies of the works relief scheme, prices began to soar and people could not even afford the cheap relief maize. By the early summer of 1846 the use of the term 'famine' became commonplace in the newspapers.

A combination of political and natural events then combined to fasten Ireland in the grip of deep famine. In June 1846, mainly because of the furore in England caused by his repeal of the Corn Laws, Peel was replaced by Lord John Russell and a cabinet that was motivated strongly by the philosophy of *laissez faire* and minimal government intervention in economic affairs. Maize continued to be imported along with other grains but, by and large, it was sold at prevailing prices as the government was unwilling to undercut the dealers and so interfere with normal trade. In July 1846 the blight reappeared and destroyed three-quarters of the potato crop.

In response, the government undertook to provide employment through more public works schemes to enable people to buy food. The cost of this, however, was to be borne by the local ratepayers, that is, the greatest burden fell upon those least able to pay. When local rate income was inadequate, those areas comparatively better off were obliged to help. Rate-payers in Ulster complained of subsidizing the poorer areas of Connaught, when, quite rightly, the burden should have been spread throughout the United Kingdom; Mayo and Clare, for example, since the Act of Union, being similar constitutionally to Warwickshire or Kent. The public relief scheme mainly took the form of making or repairing roads and for many it was the only means of earning enough to stay alive. Women and children were eventually also allowed onto these hard-labour schemes, enduring the attendant misery of long journeys to and from the works during a particularly long and severe winter.

The precarious existence, which I described earlier, eked out by over three million people up to 1845 was now crumbling fast. Laurence Geary, in his Thomas Davis Lecture (Portéir, 1995) described succinctly the tragic social interchange that begets the mass starvation–infectious disease cycle.

‘There was a complete disintegration of the social norms, the only reality being the desperate search for sustenance. Hygiene was neglected, clothing and bedding were pawned or left unchanged for months on end, and displaced families, who had abandoned their holdings, or been evicted, congregated together in vacant cabins throughout the country. The sick and dying clamoured for admission to the workhouses, while the jails were filled to overflowing. Dirt, neglect and gross overcrowding generated fever, which was diffused in a variety of ways, by vagrancy, by the intermingling of the infected, the convalescent and the healthy at soup shops, food depots and public works. Even those who were barely able to crawl out of their makeshift beds were compelled by the direst necessity to report for work on the roads, where they occupied themselves in industrious idleness and in infecting their susceptible workmates.’

At their peak in March 1847, over 700 000 people were employed, if that is the correct description, on public relief schemes; in vain as it turned out, since the wage they earned was often not enough to keep up with the rising price of grain.

Exports of food from Ireland went unrestricted. While imports far exceeded exports for the period of the famine as a whole, there was an acute shortage of food in late 1846 and early 1847. Food riots broke out and the rate of crime doubled during the famine period, although these were mainly crimes against property and included poaching, siphoning blood from cattle for direct consumption, burglary, attacks on food shops and armed robbery.

Meanwhile, overwhelming numbers were flooding onto the relief works, administration was breaking down, and costs were escalating. The alarming increase in mortality from starvation, fever and other diseases prompted the government in February 1847 to set up a system of soup kitchens on foot of a loan which was to be repaid from local rates. The destitute got soup free; those earning wages insufficient for their needs were allowed to purchase it. By July, up to three million people were receiving soup daily, the scheme saved many lives and was by far the most effective of all methods adopted by the government to deal with starvation and disease.

In retrospect, however, it merely marked a hiatus in the soaring mortality rate as economic and political events in Britain again intervened to the detriment of the Irish poor. A combination of a financial crisis in October 1847 together with a general election saw

Russell retain power as British Prime Minister, but now even more beholden to a circle of monetarist politicians led by the Chancellor of the Exchequer, Charles Wood. Encouraged by the fact that the 1847 potato harvest was unscathed by blight, although only one-quarter of the usual acreage was planted, Sir Charles Trevelyn, Assistant Secretary to the Treasury but effectively the man in charge in Ireland, declared the famine to be at an end and proceeded to oversee the almost total withdrawal of British financial responsibility for famine relief. From then until the famine petered out around 1851 responsibility for relief was transferred to an expanded Poor Law system whereby local rate-payers bore the total burden for the operation of indoor (i.e. workhouse) and outdoor relief for the locality.

Faced with overwhelming numbers now being thrown onto the poor law system, whose physical manifestation was the hated workhouse, local landlords were given every incentive, therefore, to clear their land of small tenant landholders who were in rent arrears in order to decrease their rate obligations. Land clearances were also greatly facilitated by the infamous 'quarter acre' clause, whereby those holding one-quarter of an acre or more were ineligible for public relief.

'... the tenants must be taught by the strong arm of the law that they had no power to oppose or resist... it was the landlord's undoubted, indefeasible and most sacred right to deal with his property as he list...'

Lord Brougham, on the eviction of seventy-six families from Baltinglass village, March 1846 (Woodham-Smith, 1962)

As soon as the occupier left for the workhouse, agents of the landlord quickly rendered the cottier-dwelling uninhabitable by pulling down the roof. Faced with overcrowded workhouses and two successive severe winters, countless thousands, old and young, had no option but to settle by the side of roads, in woods and in bogs, where they died in their countless thousands.

'Several car and coach drivers have assured me that they rarely drive anywhere without seeing dead bodies strewn along the roadside, and that in the dark they have even gone over them.'

J. H. Tuke (Morash, 1995)

Usually, the victims of famine endure malnutrition and disease. As the case of the Irish famine shows, many of the victims were afflicted with the additional trauma of eviction from their homes and subsequent homelessness. In the Irish case, it was not a coincidental circumstance, but rather an integral and inevitable feature of the dynamic set in motion by repeated failure of the potato crop. Nevertheless, the systematic process of eviction was supported in law and, by default, by the government and parliament of the day. The government took no action of any consequence to stop or regulate evictions, nor to feel an obligation of care for the dispossessed, other than to direct them to most certain danger in overcrowded workhouses.

To ease their rate obligation even further, landlords took to offering tenants their passage to Canada and the United States, an offer which many accepted readily, overcoming their reticence and fears of voyaging across the Atlantic, sometimes in the depth of winter, in unregulated ships many of which were unsuitable for passenger transport. Between 1845 and 1855 a total of 2.1 million Irish had emigrated either by assisted or unassisted passage, mainly to North America.

Much of the disastrous course of the subsequent famine period was dictated by this policy of withholding funding for famine relief and instead placing the relief burden locally.

ASPECTS OF EXCESS FAMINE MORTALITY

An examination of some aspects of the excess mortality due to the famine gives a clearer picture of the extent of the disaster. First, there appeared to be no difference in excess mortality between men and women (O Gráda, 1994). However, the young and the old suffered disproportionately. Second, data on workhouse deaths indicate the marked seasonal nature of death during the famine, with peaks occurring in wintertime, particularly during the severe winters of 1846–7 and 1848–9 (O Gráda, 1993). Significant also was that the death rates in 1850 and 1851 were equal to that of 1847–8, indicating the protracted nature of the Famine. Third, O Gráda (1994) showed that comparatively few deaths occurred from literal starvation, most being related to infectious diseases such as typhus, dysentery, smallpox and the cholera epidemic of 1848. A feature of these data is again the prolonged nature of the famine, particularly in western counties. Mokyr's (1985) calculation of annual rates of excess mortality on a county basis showed that western counties fared worst of all, with rates of approximately 50 per thousand annually, whereas eastern counties suffered only one-fifth that rate.

AVERTED BIRTHS AND LONGEVITY OF SURVIVORS

The calculated number of averted births (O'Boyle & O Gráda, 1986) during the famine would have been expected given the degree of reported deprivation at the time. The long-term consequences for people born in abject poverty have been addressed comprehensively by Barker (1992). Barker's (1992) Programming Hypothesis embodies the idea that certain serious adult diseases, including coronary heart disease, stroke and diabetes originate in impaired development during fetal life and infancy. Evidence for the theory includes the high prevalence of these diseases in geographical areas where infant mortality had been high (infant mortality being, of course, a proxy for an impoverished environment and poor maternal nutrition). If the theory holds for conditions in early twentieth-century England how does it fare for mid-nineteenth century Ireland ravaged by famine and disease, when infant mortality must have been very high indeed? A test of the programming hypothesis would have required the examination of death certificates at the turn of the century, comparing the incidence of serious disease in regions where famine infant mortality was highest with the incidence in less-affected regions. Even had such data been available, the accuracy of death certification would have been poor.

An alternative approach was to look at longevity among survivors born during the Famine as a crude semi-quantitative proxy measure of life-threatening disease incidence. Median-age-of-death graphs were constructed (Mausner & Kramer, 1985) from the official decennial census data for Ireland from 1851 to 1901.

For purposes of comparison with those born and who survived the Famine years of 1846–51, I selected those born in the succeeding 5-year period, 1851–6, within the same county. This restrictive comparison in time and place was essential (a) because of Mokyr's (1985) data showing the great county variability of excess mortality, and (b) because of the regional and age-sensitive nature of emigration during, and particularly after, the Famine. Median-age-of-death graphs were constructed for twelve counties and for each of the four provinces (see Table 3). The data may only be used for intra-county comparisons and have

Table 3. 'Longevity' (years) of Irish Famine survival children compared with post-famine children for twelve counties and the four provinces*

Cohort	Famine	Post-famine
Wexford	32	36.5
Carlow	30.5	28.2
Louth	42.5	37.5
L'Derry	38	30
Kildare	37.5	35
Down	30.5	26
Leitrim	28	24.5
Mayo	30.5	24.3
Sligo	29	24.8
Roscommon	27.1	24.5
Galway	28.1	25.7
Cavan	28.8	25.5
Ulster	33.5	34
Munster	30	25.5
Leinster	32.5	27.5
Connaught	27.5	24.2

*Values from median-age-to-death graphs constructed (Mausner & Kramer, 1985) from official decennial census data for Ireland from 1851 to 1901.

no absolute value, chiefly because of the emigration factor. Eastern counties, for instance, have greater 'longevity' values than western counties, probably reflecting greater rates of emigration than in the latter. What the data demonstrate clearly though, is a markedly greater longevity associated with famine than with post-famine child survivors, in all but one of the counties examined, Wexford, as well as the province of Ulster.

The result is the opposite of what one might have expected if the Programming Hypothesis were true and longevity was an accurate reflection of later disease incidence. So, what was the explanation? Perhaps those born during the famine, in an environment of malnutrition and disease, survived it to become fitter and longer-living than those born afterwards? Do the data reflect the effects of immunity conferred naturally by the infectious disease epidemics of the period? A more likely explanation lies in looking at the experience of the Dutch Famine that occurred exactly 100 years later, and particularly on famine-related changes in the pattern of fertility.

Towards the end of World War II the German Occupation Forces in Holland cut off the food supplies coming into the country in retaliation for a strike by Dutch railway workers. As a result, a large part of The Netherlands suffered a severe famine for 9 months from September 1944 to May 1945. The Dutch Famine cannot be compared with the Irish Famine either in terms of duration, severity or the long-term social disruption that ensued. Nearly all the excess mortality was ascribed to literal starvation whereas Irish deaths were in the main fever-related.

A common finding in nutrition which was reinforced by the Dutch experience was that fertility varied closely with energy intake at the time of conception in the peri-famine period. Fertility rates among human subjects depend first on the proportion of fecundable women in the population, second on their opportunities for mating; but most importantly, on social mores expressed in individual decisions about birth control and family size. A large, indeterminate factor contributing to infecundity, in the Irish case at least, must have been the preoccupation with the scramble for food and survival, and fear of death. Reproduction, under these circumstances, would be expected to be of low priority.

In the extreme famine situation, the physiological preconditions assume greater importance in fertility. Data collected during two world wars from concentration camps and blockaded cities demonstrate that starvation caused amenorrhoea, anovular menstrual cycles, reduced ovarian function (to menopausal levels) and loss of libido. The male contribution to fecundity may also be affected by low sperm counts, impotence, as well as loss of libido. Stein *et al.* (1975) who studied the Dutch Famine, combined this relationship between fertility and nutrition with the idea that social class is a determinant of nutrition through its influence on dietary habits and access to food. Indeed, what they showed was that social class was a powerful predictor of changes in fertility during the famine. Infertility was by no means confined to families in the lower social classes. All classes suffered a sharp decline in births, but the decline was steepest among the lower classes. Therefore, the median-age-of-death data for the Irish Famine survivors suggests a famine-related reversal of the normal course of events whereby a greater proportion of births was attributable to the higher social classes, the subsequent survival and greater longevity of this class being again related to better access to food, money, housing, and education. This phenomenon, as portrayed by the data, occurred neither in Wexford, possibly because of all counties Wexford was least affected by the Famine; nor in the province of Ulster as a whole, possibly because of greater industrialization as well as the fact that oatmeal was an important part of the diet there. As with the Dutch post-famine experience, fertility rates rebounded after the famine, particularly in those counties most affected (O Gráda, 1993).

FAMINE AND FOOD ENTITLEMENTS

*'The law stands between food availability and food entitlement.
Starvation deaths can reflect legality with a vengeance.'*

Amartya Sen (1981)

It might seem obvious that famine stems from shortfalls in the supply of food. However, a generalized food shortage is not a necessary condition of mass starvation. Arguing from modern famine experience Amartya Sen (1981) contended that mass starvation arises not from food shortage but from people's inability to purchase what food is available. Food entitlements as he calls it, refers to those resources which determine a household's command over food. In Ireland of the 1840s entitlements derived mainly either from direct food production or from the hire of one's labour. As we have seen, direct food production was out of the question due to the potato blight, and the hire of one's labour when work was available was generally in vain because wages failed to meet the rise in food prices. Those without food lacked the funds to buy it, and the authorities lacked the will to transfer the food to them through political means, relying instead on market forces.

The argument based on food entitlements, of course, assumes that food, although hoarded for speculative purposes, was available in a sufficient amount. But was it? O Gráda (1993) has calculated that it would have required about three million acres of grain annually to make up the shortfall in production of potatoes. Acreage to this extent was never grown in Ireland, so to the extent that Sen (1981) has described it, famine in Ireland was not a case of lack of entitlements, there simply was not enough food to go around.

But would a prohibition of food leaving the country have helped? The question of exportation of food at the height of the famine is one particularly surrounded by myth and misunderstanding. The myth has been readily exposed by O Gráda (1994) who showed that Ireland became a substantial net importer of grain during the famine. The misunderstanding arises from the idea that it was the authorities who were exporting

food. It was, of course, private businesses, among whom there were undoubtedly Catholic farmers and merchants seeking the best price for their produce abroad. To have placed an embargo on the exportation of food, which some have suggested would have saved many lives, would merely have curtailed production in the following seasons, unless the food were purchased by the government at a market price, for redistribution. Nevertheless, the lack of generosity displayed by Irish landlords and farmers, together with the rest of the United Kingdom, guaranteed the disastrous outcome.

However, one test of the applicability of Sen's (1981) thesis to the Irish Famine is that if starvation is the outcome purely of an entitlement shift, then losses and gains among sectors of society must even out. However, few benefited from the Famine, neither the landlords (many of whom were bankrupted as highlighted by the Encumbered Estates Act of 1848), nor the landless or near landless (many of whom perished or emigrated). Larger landholdings which resulted from land clearances and forced evictions had little effect on overall prosperity when weighed against the overwhelming loss of half the population to death and emigration. Amongst those who gained, however, must be counted the countries that accepted the emigrants: Great Britain, Canada, Australia, but most of all the United States, which gained 'ready-made' adults without the usual expense of educating and looking after the welfare of young dependants. Children impose an expense on a country, and at least some of the prosperity associated with these emerging countries in the late nineteenth- and early twentieth-centuries must be interpreted in this light.

Neither the modern Ireland nor Great Britain, however, can look back and say that any benefit accrued from the famine experience. Britain, on the one hand, benefited from the ready availability of Irish immigrant labour, particularly for the construction industry, health and education sectors. Antipathy towards Britain, on the other hand, derived in some degree at least from the Famine experience, cost Britain dearly during the subsequent century and beyond, the most obvious example being the denial of the active support of the Irish Free State Government during the Second World War.

In the initial phase of the famine the prompt response of the British Prime Minister Robert Peel, as well as aid provided by charities such as the British Association, was appreciated by many in Ireland, including the influential nationalist newspaper, *The Nation*. This was in stark contrast to the callous attitude of the subsequent government of Lord John Russell, guided as it was by a philosophical mixture of Providentialism and market-driven economics. It is not unreasonable to suggest that if anything like the famine had occurred in the 'mainland' part of the United Kingdom the government would have easily overcome its theoretical scruples, and come to the rescue of the starving. The £9 million given towards relief, mostly in the form of loans, was in stark contrast to that devoted to other projects during that period; including £20 million to compensate slave plantation owners in the West Indies following emancipation, and £70 million to fund an ill-advised adventure in the Crimea.

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