

now taking place throughout the world in spite of increasing urbanization. In cities in technically developed rich countries, malnutrition in infants and young children has been largely eliminated.

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### Food in nineteenth century England: nutrition in the first urban society

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#### *Introduction*

When the English philosopher, Thomas Hobbes, described man's existence in the state of nature as 'solitary, poore, nasty, brutish, and short' (Hobbes, 1651) it seemed almost a description of the England of his own times. A pre-industrial society, like that of seventeenth and eighteenth century England, had very limited possibilities of economic production. Essentially it was tied to the level of agricultural output and reflected fluctuations in population growth, in prices, in foreign trade and levels of income. Also, while there was a lack of systematic understanding of the physical environment, there could be little marked advance in technology. Consequently, in such a society food production necessarily occupied a large part of the labour force and, although income levels were low, much of what was earned was spent not in investment in new techniques, but in spasmodic high living or in wars or in religious monuments—to the economist the parish churches and cathedrals of England represent the non-productive fixed capital of a past age.

#### *Industrialization and urbanization*

Although the traditional society's control over its resources was limited, the nutritionist has to recognize that its population survived and succeeded in reproducing itself, however irregular work and income might have been or whatever mishaps befell the harvest. What is more, there was a marked growth in population during the second half of the eighteenth century. In England in 1801 there were some 50% more people than in the mid-eighteenth century: estimates for 1750 suggest the population was about  $6.5 \times 10^6$  persons, and  $9.1 \times 10^6$  in 1801. Whatever the reasons for this growth, it appears to be part of a European-wide movement (Cipolla, 1965). Table 1 shows population growth in Britain during the nineteenth century. Between 1801 and 1911, the decennial rate of increase was always in excess of 10%. By

Table 1. *Population growth in Great Britain, 1781-1931*

(Millions of people)

Year	Total	Percentage increase	Ireland
1781	8.900	—	4.100
1791	9.700	9.0	4.800
1801	10.686	10.2	5.216
1811	12.147	13.7	5.956
1821	14.206	16.9	6.802
1831	16.368	15.2	7.767
1841	18.551	13.4	8.200
1851	20.879	12.5	6.514
1861	23.189	11.1	5.788
1871	26.158	12.7	5.398
1881	29.789	13.9	5.146
1891	33.122	11.2	4.680
1901	37.093	12.0	4.446
1911	40.918	10.3	4.381
1921	42.814	4.6	4.354
1931	44.831	4.7	4.176

From Deane &amp; Cole (1967). Irish figures include Eire for 1921 and 1931.

contrast, Ireland shared in the population expansion until, in the absence of industrial progress, the 'potato famine' acted as a check to growth in the way common among pre-industrial societies. In Britain, however, the process of self-sustaining economic growth characteristic of an industrializing country was coeval with population growth. Table 2 illustrates the growth of the non-agricultural sector of the economy, and shows clearly the importance of the second quarter of the nineteenth century in establishing this trend.

Table 2. *Index of industrial production in the United Kingdom (1913=100)*

Year	Index	Year	Index
1801	5.35	1871	46.1
1811	7.03	1881	54.6
1821	8.47	1891	65.8
1831	12.8	1901	75.8
1841	18.1	1911	89.6
1851	24.3		
1861	33.6		

From Mitchell &amp; Deane (1962) and Hoffman (1955).

Table 3. *The growth of urban areas: internal migration in England, 1841-1911*

(Thousands of people)

Decade	London	Other towns	Colliery districts	Rural areas
1841-1851	+274	+386	+82	-443
1851-1861	+244	+272	+103	-743
1861-1871	+262	+271	+91	-683
1871-1881	+307	+297	+84	-837
1881-1891	+169	-31	+90	-845
1891-1901	+226	+294	+85	-660
1901-1911	-232	-89	+114	-295

From Deane &amp; Cole (1967); see also Cairncross (1953).

The increase in urban population is shown in Table 3. The introduction of civil registration after 1837 allows us to record the great movement into the towns during the 1840's. Thus, by the middle of the century urban and rural population were equal in proportion and, by 1901, three-quarters of the people were town dwellers. After 1870, the degree of urban density was already sufficient for individual towns to lose their identity in an urban sprawl, and Table 4 shows the extent to which present-day conurbations were already present in the nineteenth century.

Table 4. *The development of conurbations, 1871-1911*

Area	(Millions of people)				
	1871	1881	1891	1901	1911
Greater London	3.9	4.8	5.6	6.6	7.3
South-east Lancashire	1.4	1.7	1.9	2.1	2.3
West Midlands	1.0	1.1	1.3	1.5	1.6
West Yorkshire	1.1	1.3	1.4	1.5	1.6
Merseyside	0.7	0.8	0.9	1.0	1.2
Tyneside	0.3	0.4	0.6	0.7	0.8
Clydeside	—	—	—	1.3	1.5

From Mitchell & Deane (1962).

#### *Economic factors affecting food habits*

From the end of the Napoleonic wars to the First World War, then, was a period of the growth of wealth, of industry, and of trade. But such growth in the economy does not automatically relate to a rise in the standard of living. At a time when the industrial revolution had achieved for Britain the position of being the foremost political and industrial power in the world, there was great poverty in the country. The incomes distribution policy determined the standard of living for the mass of the people. In the nineteenth century, incomes were very unequally distributed. For most of the century the so-called 'iron law of wages' based on the writings of the economist, David Ricardo, prevailed upon employers. Put simply, this held that the cost of subsistence determined wages, and therefore the difference in value between the amount produced by labour and the amount paid out in wages was profit. Hence it was the attempt to pay wages as low as possible which led to the existence in the nineteenth century of large groups of the population at subsistence level. Not only was this economic in consideration, but early in the century low wages appear to have been important as a form of social control. A popular book of the day (Townsend, 1786) approved hunger as providing 'not only a peaceable, silent, unremitting pressure, but as the most natural motive to industry and labour, it calls forth the most powerful exertions'. Even at the end of the nineteenth century an American observer noted that British employers thought their workers' requirements were strictly limited and based their wage bargaining on the view 'that the workingman does not need more than so many shillings a week' (Saul, 1960).

The first economic factor affecting dietary patterns, therefore, was that consumer demand was a function of low incomes, and low purchasing power limited the amount of food eaten. The effect of this was clearly seen in the 1840's where among the lower ranges of income, to quote a contemporary observer, 'we find the animal

food reduced to a small piece of bacon cut up with the potatoes; lower still, even this disappears, and there remain only bread, cheese, porridge, and potatoes, until on the lowest round of the ladder, among the Irish, potatoes form the sole food' (Engels, 1892). Secondly, and similar in effect, irregular employment—either seasonal or associated with trade cycles or even the changing structure of the industry—caused low purchasing power. The cotton spinner's life, wrote Carlyle, 'now in plethoric prosperity, anon extenuated into inanition and "short time", is of the nature of gambling; they live by it like gamblers, now in luxurious superfluity, now in starvation' (Carlyle, 1840). This uncertainty generated 'black mutinous discontent' among the working classes. Engels wrote in agreement: 'far more demoralising than his poverty in its influence upon the English working-man is the insecurity of his position, the necessity of living upon wages from hand to mouth, that in short which makes a proletarian of him' (Engels, 1892).

Thirdly, social conditions of life during the period of industrialization affected food habits by restricting demand for food. This was apparent where women's employment was of major importance to industry. It was particularly marked in textile areas, with the result that a working wife had little time to spend in meal preparation. In extreme cases, it even involved a reversal of roles within the family: 'In many cases the family is not wholly dissolved by the employment of the wife, but turned upside down. The wife supports the family, the husband sits at home, tends the children, sweeps the room and cooks. This case happens very frequently; in Manchester alone many hundred such men could be cited, condemned to domestic occupations' (Engels, 1892). In addition, where dense areas of factory housing had developed, it was difficult for previous food habits based on the conditions of a rural society to survive. Most urban areas ceased to bake bread at home in the nineteenth century, and only traces of home brewing remained when Edward Smith made his investigations into diet in 1863. Housing in the new urban areas seldom had adequate facilities for baking even if fuel was available cheaply, and much cookery was reduced to the limits of a frying pan and kettle. Even if these factors had not been sufficient, the nineteenth century Briton restricted his choice of food by prejudices and preferences about which we today know little: but it seems clear that attitudes of distrust towards fruit, vegetables, and milk remained strong until the very end of the nineteenth century (Cheadle, 1902; Pavy, 1875; Holt, 1902).

To the economic and social historian, the period after 1825 is important as one in which the framework of modern industrial society was established and the decline of the previously predominant rural society came about. But to the nutritionist, it is important as a situation in which more and more people in the population became dependent on fewer and fewer people engaged in agriculture. The rapid growth of urban areas naturally threw a heavy strain on the existing supply system. The nineteenth century opened in a period during which food riots were a notable expression of discontent and, during the first half of the century, evidence of poor-quality food and widespread adulteration amply illustrates the near-breakdown in food supplies which occurred. Though prices of agricultural produce began to decline after the Napoleonic wars, the supply of food continued to depend on a high-cost transport

system until the railways were developed. Perishability of animal foods meant that much was only available in dried or cured forms, so that grain products by virtue of their durability formed the basis of the diet. Table 5 shows Salaman's wheat and potato availability indices for the nineteenth century (Salaman, 1949). *Per capita* supplies of wheat declined from 1795 until the 1850's, with the lowest point in 1846, of 0.75 lb/d. As a result, the potato became increasingly important in the diet. In the early nineteenth century it was undoubtedly regarded as a poor substitute for bread; it was known as the 'root of misery' and William Cobbett, who thought the right diet for Englishmen to be bread and beer, castigated it as 'the root of extreme unktion'. According to Salaman's figures, consumption of potatoes remained fairly

Table 5. *The supply of wheat and potatoes, 1775-1914*  
(Daily consumption in lb per head)

Year	Wheat*	Potatoes
1775	1.3	0.25
1795	1.36	0.40
1814	1.05	0.47
1838	0.90	0.62
1851	0.85	0.67
1866	1.03	0.80
1871	1.05	0.90
1881	1.05	0.64
1891	1.04	0.65
1901	1.03	0.58
1911	1.01	0.60
1914		0.53

From Salaman (1949).

Salaman calculated the wheat supply for the United Kingdom, but deflated population figures to allow for lower wheat consumption in Scotland and Ireland. Potato supply was calculated for England and Wales only.

\*Average figures for the decade in which each year falls (except 1775 which is an individual value for that year).

high until the end of the nineteenth century. Salaman's view on this is interesting: he pointed out that only when the general rise in wages which had begun in the 1860's was sufficient for the labourer to buy four quartern loaves a day did the demand for potatoes begin to fall off and that, for the agricultural labourer at least, this point was not reached until the early twentieth century (Salaman, 1949).

Even if this was rather an *ad hoc* method of assessing the situation, it fits what is known of the circumstances. Although grain imports began to mount through the 1860's and 1870's and livestock traffic reached a peak in the 1880's, the real benefits of the improvements in international transport and the expansion of overseas agriculture were not reached until the 1890's. By that time refrigeration techniques had reached a sufficiently advanced stage for large imports of butter and meat to reach Britain. In effect, preservation techniques and the development of food technology were relevant factors in the supply situation only at the very end of the century.

*Some evidence of food consumption*

The effect of changes in supply and demand on consumption of food cannot be assessed with any accuracy in the absence of adequate information. Rather than attempt to construct a series of *per capita* estimates of food consumption based on statistics of trade and output, it is, perhaps, more interesting to compare the results of analysing evidence obtained from family budgets. The weekly *per capita* consumption of food is shown in Table 6. The figures for 1841 are taken from William Neild's survey of families in Manchester and Dukinfield (McKenzie, 1962) and for 1863 from Edward Smith's large-scale survey of families of low-paid workers (Oddy & Yudkin, 1969). The remaining columns are averages based on a number of surveys carried out between 1887-1901, and 1902-1913, and include the remarkable studies of Booth & Rowntree. The analysis of these diets was based on a process of computer-assisted dietary analysis designed by Mr D. S. Miller and Miss Pamela Mumford, Department of Nutrition, Queen Elizabeth College.

Table 6. *Weekly food consumption, 1841-1913, from family budget evidence*

Food	1841	1863	1887-1901	1902-1913
Bread (lb)	5.4	5.4	6.5	6.7
Potatoes (lb)	5.2	2.4	1.6	2.9
Milk (pints)	1.6	0.75	1.4	1.7
Sugar (lb)	0.4	0.5	0.9	1.0
Meat (lb)	1.0	0.8	1.4	1.3
Fats (lb)	0.4	0.3	0.5	0.48

Although these columns should not be closely compared as they are in no sense to be regarded as statistical samples, certain generalizations may be made about the diets of the working classes during the process of urbanization in England.

Bread and potatoes were the staple foods in working class households, while the intake of meat, fats and milk was low. Some increase in milk consumption may have taken place between the 1880's and 1914 (Cohen, 1936) as improved transport of milk to towns developed, though consumption in Britain probably lagged behind that of other highly developed economies. Sugar is the one food which one must assume was consumed in ever-increasing quantities throughout the century.

The daily nutrient intake provided by these diets is shown in Table 7. This indicates that throughout the century carbohydrates were the main source of calories and that protein and fat intakes were low. The total calorific value of these diets is barely adequate by present standards, and positively inadequate when taking into

Table 7. *Daily nutrient intake, 1841-1913, from family budget evidence*

	1841	1863	1887-1901	1902-1913
Energy value (kcal)	2300	2188	2077	2431
Protein (g)	65	55	58	67
Fat (g)		53	57	73
Carbohydrate (g)		370	330	380
Iron (mg)	15	12.5	10.0	12.2
Calcium (g)		0.36	0.3	0.47

account the less sedentary nature of nineteenth century life and work. Iron intake was similar to present-day levels, while calcium intake was very much lower.

Finally, Table 8 shows urban and rural diets in the middle and at the end of the nineteenth century. Smith's 'indoor' category in 1863 included both workers in a completely urban environment, and some in industrialized villages whose way of life was certainly that of urban workers.

Table 8. *Comparison between urban and rural food consumption from family budget evidence*

Foods:	1863		1902-13	
	Indoor	Rural	Urban	Rural
Bread (lb/week)	5.4	6.9	6.7	5.7
Potatoes (lb/week)	2.4	4.4	2.9	4.4
Milk (pints/week)	0.75	1.6	1.7	2.0
Sugar (lb/week)	0.5	0.4	0.9	0.8
Meat (lb/week)	0.8	0.9	1.3	0.8
Fats (lb/week)	0.3	0.3	0.5	0.3
Nutrients:				
Energy value (kcal/d)	2190	2760	2431	2172
Protein (g/d)	55	70	67	56
Fat (g/d)	53	54	73	53
Carbohydrate (g/d)	370	460	380	370
Iron (mg/d)	12.5	15.9	12.2	11.0
Calcium (g/d)	0.36	0.48	0.47	0.41

With the exception of sugar, rural families in the 1860's ate more of all the main foods than urban families and, as a result, apart from fat, their nutrient intake was significantly higher than that of urban families. By the early twentieth century the situation was reversed. Some improvement in urban food supplies of meat, milk and butter is reflected by increases in these foods in the urban diets, but rural workers had not benefited in the same way. Their wages had not risen as had those of urban workers, and this is shown by a lower consumption of bread and other sources of carbohydrates in the diet. As a result, the energy value of the rural diets may well have been lower by the end of the century than it had been in the 1860's.

### Conclusion

Many facets of life were affected during the period of transition from a predominantly rural to an industrial and urban society. A deterioration in the diet of the working classes seems probable in the early nineteenth century and although food supplies in general improved as the century progressed, the nutritional status of the working class showed comparatively little change.

Carbohydrate foods, such as bread and potatoes, supplied two-thirds or more of the calories, and consumption of meat, fat and milk remained low. Fruit, vegetables and eggs contributed little to the diet, which was therefore unavoidably monotonous. From the emphasis placed by Victorians on Sunday dinner, it may be assumed that most of the meat and any vegetables were eaten at that meal, with the result that

during the week, in Booth's words: 'a good deal of bread is eaten and tea drunk especially by the women and children'.

Without detailed knowledge of distribution of food within the family or of work-loads in industry, the adequacy of the diet is difficult to assess. However, the concern exhibited in the late nineteenth century for social problems involving the standard of living requires some comment.

The improvement in wages, the reduction in hours of work in those industries in which labour was well-organized, and the fall in the price of foodstuffs from the 1880's, all point to an improvement in the standard of living. On the other hand, there is some evidence of greater intensity of work per hour being introduced (Merttens, 1893-4), and of the health of urban populations being still unsatisfactory, despite marked changes in public health administration. It must be remembered that infant mortality rates were still as high in 1900 as they were when civil registration began in 1837, while tuberculosis, rickets, dental caries and anaemia were all endemic diseases in urban areas of Britain at the outbreak of war in 1914.

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#### The growth and nature of urban areas in developing countries

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In thinking how to make a start on these global terms of reference I recalled some observations of Pierre Bertaux (1968) at Washington in 1967: 'whom and what do we mean by man? . . . normally the "Western white civilised male adult"—who is, in fact,