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BOOK REVIEWS

FLOUD, RODERICK, ROBERT W. FOGEL, BERNARD HARRIS [a.o.]. The Changing Body. Health, Nutrition, and Human Development in the Western World since 1700. [New Approaches to Economic and Social History.] National Bureau of Economic Research; Cambridge University Press, Cambridge [etc.] 2011. xxvi, 431 pp. $90.00. (Paper: $32.99.); doi:10.1017/S0020859011000575

The main thesis of this book, inspired by the concept of technophysio evolution, is that "the health and nutritional status of one generation contributes, through mothers, and through infant and childhood experience, to the strength, health, and longevity of the next generation, which enables members of that next generation to work harder and longer and to create the resources which can then be used to assist the next generations to prosper".

Why is the nutritional status of mothers so important? It is because poorly nourished mothers are at greater risk of giving birth to babies of very low birth weight, who in turn are at increased risk of poor health and earlier mortality in later life. Floud *et al.* rely heavily here on the well-known hypothesis of Barker, which asserts that adverse factors encountered during foetal life affect prenatal growth and cause greater susceptibility to major diseases in adult life. In the first chapter Floud *et al.* also emphasize that there is increasing evidence that nutritional status is related to work capacity and physical productivity. In my view, the whole first chapter would have been more convincing had the authors presented a systematic overview of the evidence concerning the Barker hypothesis as well as the nutrition productivity link, instead of scattering references to relevant literature over several chapters.

Chapter 2 describes a number of tools for evaluating the nutritional status of past populations as well as tools for reconstructing the historical relationship between biological and economic factors from what are patchy data sources. Use of food balance sheets is a better method for assessing trends in nutritional intake in past populations than is information about food intake in institutions or surveys of household or individual private consumption. Household consumption studies usually focus on lower-class diets, while information about food intake in institutions often does not provide data about age and sex.

Two cases are presented to show how one can calculate the size distribution of calories in a population: one relates to calorific consumption in France in 1785, and the other to Britain at the end of the eighteenth century. Crucial to reconstructing the distribution of calories is the assumption of a lognormal distribution of calories and the choice of a particular coefficient of variation, or Gini ratio. By using different Gini ratios, varying from 0.11 (an egalitarian distribution of calories) to 0.22 (a non-egalitarian distribution), and given an average daily availability of 2,413 kcal per adult male equivalent, an average male body height of 163 cm, and an average body mass index of 19 kg/m^2, they conclude that in late eighteenth-century France a Gini ratio of 0.17 was the most likely distribution, implying that the bottom 5 per cent of the population were subject to starvation. That estimate is consistent with what is known about mortality rates in the period.

In chapter 3 Floud *et al.* apply some of the tools discussed in chapter 2 to issues under debate by economic and social historians interested in long-term trends in indicators

of human welfare, and seek to evaluate the impact of improved nutrition on labour productivity. One of these issues relates to the efficiency of food production in eighteenth-century France. According to Toutain, calorific availability in 1705 was 1,918 kcal per adult male equivalent, or 20 per cent less than in 1785. However, Le Roy Ladurie has argued that calorific availability in 1705 was 2,165 kcal per adult male equivalent, or about 10 per cent less than in 1785. Floud *et al.* ask themselves which of the two is the more likely estimate, and to answer their question they have made various assumptions: a coefficient of variation of 0.3 of the distribution of calories, as well as a lognormal distribution of the body mass index of the French population. If Toutain is right, the bottom five deciles of the population would have had insufficient food energy even for body maintenance. Floud *et al.* conclude that that is clearly impossible.

In their second case, Floud *et al.* claim that as much as 30 per cent of Britain's economic growth rate might be attributable to improvements in gross nutrition, i.e. more calories. Consequently they recommend incorporating gross nutrition in standard economic growth models. It is odd that instead of gross nutrition the authors did not consider including capacity for physical work in a growth model, since physical work capacity captures the influence of both under-nutrition as well as over-nutrition. Obesity reduces work capacity because it tends to cause decline in endurance, reduced muscle strength, and, through that, a limited capacity to hold fixed postures for prolonged periods.

In chapter 4 Floud *et al.* examine the history of British health from 1700–2000, including height, weight, and morbidity and their determinants, along with mortality, all within the framework provided by the earlier chapters. Part of chapter 4 consists of a summary of the discussion on height data presented by Floud, Wachter, and Annabel Gregory in their book, *Height, Health and History: Nutritional Status in the United Kingdom, 1750–1980* (Cambridge, 1990). Data is also presented on long-term (1840–1979) changes in the average adult body mass index (weight/height^2). It would have been more instructive to learn about the percentage of adults with a BMI lower than 18.5 kg/m^2, the cut-off value for underweight used by the World Health Organization, although an interesting part of the chapter is the reconstruction of per capita calorific availability from 1700 to 1914 based on food balance sheets. The authors conclude, unlike John Komlos, for example, that the second half of the eighteenth century was not dominated by a "Malthusian crisis", since per capita calorific availability did not decline, but actually increased owing to the growing importance of imported foods: from 2,237 kcal/day in 1750 to 2,439 in 1800. That increase partially explains why life expectancy and average height rose between 1750 and 1820 and reinforces the link between nutrition and mortality. Floud *et al.* show too that public health measures, especially to improve the quality of water supply, contributed to the decline in mortality in the late nineteenth and twentieth centuries.

Chapter 5 is an extension of chapter 4, in that it examines long-term changes in health and mortality in continental Europe. The section on height and mortality development is a useful summary of what has been published in the past few decades. The authors go on to show that the changes in real wages in a number of European cities in the nineteenth century are broadly consistent with changes in height. The effects on public health of urbanization in the nineteenth century varied among European countries. In the majority of western European countries urbanization took place in the second part of the nineteenth century and coincided with public health measures. In England and Wales, however, urbanization increased in the first half of the nineteenth century, while public health measures gained significance only in the late nineteenth century.

As far as the impact of health improvement (1841–1960) on per capita GDP growth (1881–2000) is concerned, Floud *et al.* conclude that health improvement in western Europe explains between 12 per cent (The Netherlands) and 49 per cent (England and Wales) of per capita GDP growth. They fail to notice that their result is somewhat surprising given the dramatic height increase of Dutch boys (and girls!) since the 1840s: Dutch males and females are now the world's tallest people, whereas Dutch boys in the 1840s were smaller than their English peers.

Chapter 6 discusses the American experience of technophysio evolution and compares it with British and continental European experiences. Floud *et al.* underline the advantageous ecological environment of colonial America, with its abundant farmland and lower risk of infectious diseases. Americans were better nourished, healthier, and taller than European populations at the beginning of the nineteenth century. Americans consumed about 2,950 kcal daily in 1800. Adult heights of native-born Americans then decreased from 1830 onwards until the 1880s, while per capita calorific availability decreased to 2,585 kcal daily in 1850, but went on to recover from the 1870s onwards. According to Floud *et al.*, that was caused by the rapid growth of immigration and population relative to domestic food production. A worsening epidemiological environment too, caused by increasing urbanization and reflected in high levels of infant mortality, contributed to the decline in average height. Just as in European countries, American height increased during the twentieth century and BMI rose to reach its optimum for males in the 1970s at 25.58 kg/m^2 with respect to minimal morbidity and economic productivity. The recent obesity epidemic, reflected by male BMIs well above 27 kg/m^2 (ages over thirty), are a threat to health and economic productivity alike.

In their final chapter Floud *et al.* conclude "that technophysio evolution has benefited, and will continue to benefit the human condition and that further significant gains in height, infant mortality, and life expectancy are likely to be possible". Such gains would relate not only to developing countries but also to Europe and the US. Meanwhile they play down the increasing prevalence of obesity by saying that it still affects just a small proportion (fewer than 10 per cent) of the population of most developed countries. However, the most recent figures from the World Health Organization's Global Database on Body Mass Index indicate a median prevalence of 16 per cent worldwide. Taking into account the global financial, economic, and political crises as well, I think the conclusion of Floud *et al.* is over-optimistic.

Nevertheless, the book as a whole is a must-read for anyone interested in the insights that anthropometric history has produced in recent decades.

Hans de Beer

Bohstedt, John. The Politics of Provisions. Food Riots, Moral Economy, and Market Transition in England, c.1550–1850. Ashgate, Farnham [etc.] 2010. Maps. 312 pp. £65.00; doi:10.1017/S0020859011000587

I have long admired the work of John Bohstedt, and this book, itself partly a retrospective of his own contribution to the field, does not disappoint. The book sets out to explore the nature of food supply and the different, sequential and co-terminus, socio-political phases within which issues of supply were inscribed over the best part of three centuries from the