Introduction

Making and selling food is a precarious and complex business. Markets for food are constantly in flux. Farmers and fishers strive in vain for uniformity of production as they confront seasonality and shifting weather patterns. Consumers transform their diets rapidly in the face of news reports on health benefits or risks. Moreover, markets for food are invested with layers of cultural significance: notions of authenticity vie with fears of risk; concerns about health trigger dietary restrictions; and factors of gender, class, and ethnic identity determine the desirability and content of meals. These concerns and thousands of others only tangentially related to commercial value accompany every forkful.[1]

Given the complexity involved in producing and marketing even the most mundane foodstuffs, historical studies of food, business, and technology are of necessity diverse. At least three specific historiographical themes stand out, however, as particularly productive areas of inquiry and debate over the past twenty years. First, the food business has long been a central area of technological innovation, often cross-fertilizing with other sectors of capitalist enterprise far removed from farm fields or dinner tables. Second, histories of food and technology often provide deep insights into the environmental impacts and economic geography of rural–urban relations. Third, food has always been intensely politicized, meaning that its production, marketing, and consumption have historically functioned at the center of government interactions with private enterprise.

First, technological innovation has attracted considerable attention from historians of food industries. Historians of agriculture, for example,

[1] Studies examining the intersection of culture and the business of producing and consuming food include: Warren Belasco and Philip Scranton, eds., *Food Nations: Selling Taste in Consumer Societies* (New York, 2002); Jean Louis Flandrin, Massimo Montanari, and Albert Sonnenfeld, eds., *Food: A Culinary History from Antiquity to the Present*, trans. Clarissa Botsford (New York, 1999); Sidney Mintz, *Sweetness and Power: The Place of Sugar in Modern History* (New York, 1985); John Burnett, *Plenty and Want: A Social History of Food in England from 1815 to the Present Day*, 3d ed. (London, 1989); Jeffrey Pilcher, *Que Vivan Los Tamales! Food and the Making of Mexican Identity* (Albuquerque, 1998); Harvey Levenstein, *Revolution at the Table: The Transformation of the American Diet* (New York, 1988); Hasia R. Diner, *Hungering for America: Italian, Irish, and Jewish Foodways in the Age of Migration* (Cambridge, Mass., 2001); Donna R. Gabaccia, *We Are What We Eat: Ethnic Food and the Making of Americans* (Cambridge, Mass., 1998); Katherine J. Parkin, *Food Is Love: Food Advertising and Gender Roles in Modern America* (Philadelphia, 2006); Warren J. Belasco, *Appetite for Change: How the Counterculture Took on the Food Industry*, 2nd ed. (Ithaca, 2007).

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have explored in great detail how individual inventors, corporate research and development teams, and state research agencies developed technologies to boost food and fiber output.[2] Business enterprises geared toward mechanizing agricultural practices have developed new technologies, networks of knowledge, and business strategies that feed into other industrial sectors. The role of Cyrus McCormick's reaper in the rise of mass production and distribution is a case in point.[3] Such studies of primary food production forcefully demonstrate that the history of industrialization cannot be confined to the urban manufacturing core.

Recent histories of innovation move further downstream in the food economy, reflecting the shift of economic resources and rewards from farm to factory over the course of the past two centuries. In capitalist economies in which relatively small proportions of the population engage in producing food, the business of processing, preserving, packaging, and marketing foodstuffs attracts larger investments of capital and generally results in steadier returns than primary production on farms or at sea. In their pioneering study on agribusiness, Harvard Business School professors John H. Davis and Ray A. Goldberg determined that, in 1954, food processors accounted for 62 percent of all value added by economic activity within the broadly defined U.S. food sector, whereas farmers contributed only 21 percent (a near reversal of the ratio that existed in 1910).[4] Beginning in the mid- to late nineteenth century, food processors, including meatpackers, canners, bakers, milk bottlers, condiment producers, and brewers developed technologies and business strategies for mass producing and distributing foodstuffs on national and global markets. Economies of scale and scope characterized several of these industries, as exemplified in the rise of the five largest meatpackers in the urban Midwest, which contributed to changes in indus-

[2] Deborah Fitzgerald, "Beyond Tractors: The History of Technology in American Agriculture," *Technology and Culture* 32 (Jan. 1991): 114–26; Wayne D. Rasmussen, "The Impact of Technological Change on American Agriculture, 1862–1962," *Journal of Economic History* 22 (Dec. 1962): 578–91; Deborah K. Fitzgerald, *Every Farm a Factory: The Industrial Ideal in American Agriculture* (New Haven, 2003); R. Douglas Hurt, *Agricultural Technology in the Twentieth Century* (Manhattan, Kans., 1991); Vaclav Smil, *Enriching the Earth: Fritz Haber, Carl Bosch, and the Transformation of World Food Production* (Cambridge, Mass., 2001); Christopher Henke, *Cultivating Science, Harvesting Power: Science and Industrial Agriculture in California* (Cambridge, Mass., 2008); J. L. Anderson, *Industrializing the Corn Belt: Agriculture, Technology, and Environment, 1945–1972* (De Kalb, 2008); Alan L. Olmstead and Paul W. Rhode, *Creating Abundance: Biological Innovation and American Agricultural Development* (New York, 2008).

[3] David A. Hounshell, *From the American System to Mass Production, 1800–1932: The Development of Manufacturing Technology in the United States* (Baltimore, 1984). Although he did not elaborate the point, Alfred Chandler noted the importance of agricultural inputs industries in the rise of modern mass marketing; see *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, Mass., 1977).

[4] John H. Davis and Ray A. Goldberg, *A Concept of Agribusiness* (Boston, 1957), 14.

trial labor relations, the expansion of national transportation networks, and the rise of mass consumer culture through the first half of the twentieth century.[5] Food historian Harvey Levenstein has labeled the decades of the 1950s and 1960s the "golden age of food processing," pointing to the rapid proliferation of branded convenience foods, such as Cheez Whiz and Swanson's TV dinners, during those decades, but the technological transformation of the modern diet was well underway decades before the fish stick made its incursion into the American stomach.[6] Most such transformations in the modern diet entailed technological innovations further downstream, particularly in the transportation, refrigeration, retailing, and home storage and preparation of food. The modern food chain, as scholars have recently explored in detail, is utterly dependent upon seemingly mundane, yet world-changing, technologies, such as manufactured ice, refrigerated trucks, supermarket display cases, telescoping shopping charts, home freezers, and microwaves.[7]

Beyond innovation, technological change in the food industries also lends itself to a broad discussion of the geography and ecology of urban–rural relations. Environmental historians have been particularly attentive to the ways in which colonization, urbanization, and industrialization transformed human relations with the land and sea through new

[5] Mary Yeager, *Competition and Regulation: The Development of Oligopoly in the Meat Packing Industry* (Greenwich, Conn., 1981); Margaret Walsh, *The Rise of the Midwestern Meat Packing Industry* (Lexington, Ky., 1982); Roger Horowitz, *Negro and White, Unite and Fight! A Social History of Industrial Unionism in Meatpacking, 1930–90* (Urbana, 1997); Roger Horowitz, *Putting Meat on the American Table: Taste, Technology, Transformation* (Baltimore, 2005); Wilson J. Warren, *Tied to the Great Packing Machine: The Midwest and Meatpacking* (Iowa City, 2007); Simon Naylor, "Spacing the Can: Empire, Modernity, and the Globalisation of Food," *Environment and Planning A* 32 (2000): 1625–39; Gabriella M. Petrick, *Industrializing Taste: Food Processing and the Transformation of the American Diet, 1900–1965* (Baltimore, forthcoming); E. Melanie DuPuis, *Nature's Perfect Food: How Milk Became America's Drink* (New York, 2002); Susan Strasser, *Satisfaction Guaranteed: The Making of the American Mass Market* (New York, 1989); Nancy F. Koehn, "Henry Heinz and Brand Creation in the Late Nineteenth Century: Making Markets for Processed Food," *Business History Review* 73 (Autumn 1999): 349–93; Geoffrey Jones and Nicholas J. Morgan, eds., *Adding Value: Brands and Marketing in Food and Drink* (London, 1994).

[6] Harvey A. Levenstein, *Paradox of Plenty: A Social History of Eating in Modern America* (New York, 1993). On the fish stick, see: Paul R. Josephson, "The Ocean's Hot Dog: The Development of the Fish Stick," *Technology and Culture* 49 (Jan. 2008): 41–61.

[7] Warren J. Belasco and Roger Horowitz, eds., *Food Chains: From Farmyard to Shopping Cart* (Philadelphia, 2009); Shane Hamilton, *Trucking Country: The Road to America's Wal-Mart Economy* (Princeton, 2008); Erik van der Vleuten, "Feeding the Peoples of Europe: Transport Infrastructures and the Building of Transnational Cooling Chains in the Early Cold War, 1947–1960," in *Untangling Infrastructures and Europe: Mediations, Events, Scales*, ed. Alexander Badenoch (London, forthcoming); Shelley Nickles, "Preserving Women: Refrigerator Design as Social Process in the 1930s," *Technology and Culture* 43 (Oct. 2002): 693–727; Ruth Schwartz Cowan, *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave* (New York, 1983).

modes of farming, hunting, fishing, and food processing.[8] Food studies have become a cottage industry within social-science disciplines attuned to rural-urban relations, as economic and cultural geographers, ethnographers, and rural sociologists have produced a raft of articles, monographs, and edited volumes over the past two decades, exploring everything from the contested origins of rice in the colonial American South to the contemporary business of selling "fresh" food.[9] One of the attractions of food for geographers and geographically inclined historians and sociologists is the opportunity it gives them to study the intersection of political economy with the natural environment. Food production, to a greater degree than other industrial enterprises, is inherently tied to place, beholden to weather and climate and soil type, and subject to seasonal fluctuations. Mapping the dynamics of capital and labor flows in the food economy, particularly on a global scale, has led to rich theoretical treatises on the nature (literally) of modern capitalism.[10] Theoretically inclined scholars are not the only writers who have studied food chains in order to shine a light on the "creative destruction" at work in modern capitalism. The banal fact that most people are physi-

[8] Donald Worster, "Transformations of the Earth: Toward an Agroecological Perspective in History," *Journal of American History* 76 (Mar 1990): 1087–1106; William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York, 1991); James McCann, *Maize and Grace: Africa's Encounter with a New World Crop, 1500–2000* (Cambridge, Mass., 2005); John M. MacKenzie, *The Empire of Nature: Hunting, Conservation, and British Imperialism* (Manchester, U.K., 1988); Timothy Silver, *A New Face on the Countryside: Indians, Colonists, and Slaves in South Atlantic Forests, 1500–1800* (Cambridge, U.K., 1990); Karl Jacoby, *Crimes against Nature: Squatters, Poachers, Thieves, and the Hidden History of American Conservation* (Berkeley, 2001); Arthur F. McEvoy, *The Fisherman's Problem: Ecology and Law in the California Fisheries, 1850–1980* (Cambridge, U.K., 1986); Joseph E. Taylor III, *Making Salmon: An Environmental History of the Northwest Fisheries Crisis* (Seattle, 1999); Paul R. Josephson, *Industrialized Nature: Brute Force Technology and the Transformation of the Natural World* (Washington, D.C., 2002); Maurizio Gangemi, *Pesca e patrimonio industriale: tecniche, strutture e organizzazione (Sicilia, Puglia, Malta e Dalmazia tra XIX e XX secolo)* (Bari, Italy, 2007).

[9] Judith Ann Carney, *Black Rice: The African Origins of Rice Cultivation in the Americas* (Cambridge, Mass., 2001); Susanne Freidberg, *Fresh: A Perishable History* (Cambridge, Mass., 2009). For a longer introduction to much of this literature, see Shane Hamilton, "Analyzing Commodity Chains: Linkages or Restraints?" in *Food Chains: From Farmyard to Shopping Cart*, ed. Warren J. Belasco and Roger Horowitz (Philadelphia, 2009), 16–27.

[10] Brian Page and Richard Walker, "From Settlement to Fordism: The Agro-Industrial Revolution in the American Midwest," *Economic Geography* 67 (1991): 281–315; Richard Walker, *The Conquest of Bread: One Hundred Fifty Years of Agribusiness in California* (New York, 2004); David Goodman and Michael Watts, eds., *Globalising Food: Agrarian Questions and Global Restructuring* (London, 1997); Susan Mann, *Agrarian Capitalism in Theory and Practice* (Chapel Hill, 1990); Philip McMichael, ed., *The Global Restructuring of Agro-Food Systems* (Ithaca, 1994); David Burch and Geoffrey Lawrence, eds., *Supermarkets and Agri-food Supply Chains: Transformations in the Production and Consumption of Foods* (London, 2007); Harriet Friedmann, "The Political Economy of Food: A Global Crisis," *New Left Review* 197 (1993): 29–57; Susanne Freidberg, *French Beans and Food Scares: Culture and Commerce in an Anxious Age* (New York, 2004); Julie Guthman, *Agrarian Dreams: The Paradox of Organic Farming in California* (Berkeley, 2004).

cally far removed from their food sources has recently made it possible for journalists and popular writers to achieve extraordinary book sales by exploiting consumers' concerns over the "dark side" of their meals' origins.[11]

The popularity of these modern-day muckraking tomes highlights the politicized nature of food, a third productive historiographical strand in studies of food, technology, and business. The thick layers of cultural meaning and social relations always embedded in the sale or use of food has meant that principles of moral economy and political economy have clashed with regularity and occasionally with force.[12] Food riots were a regular feature of urban life until the early twentieth century, and have broken out periodically in recent years in response to spiking global food prices, but consumers and food producers in advanced industrial economies have, by and large, turned to regulatory governance since the nineteenth century to police the boundaries of fairness, trust, and purity in their food economies. Despite a longstanding focus by historians on the creation of pure food and drug laws in the United States during the Progressive Era, the site of regulatory governance has not always been the nation-state. Prior to the twentieth century, most such regulatory action occurred at a local or regional level, while the twentieth and twenty-first centuries witnessed corporations (often multinationals) or trade organizations taking a more assertive role in assuring food safety, promising environmental quality, or determining the "fair price" of a given commodity or foodstuff.[13] Much work remains to be done in this realm, but the scholarship to date has produced

[11] Michael Pollan, *The Omnivore's Dilemma: A Natural History of Four Meals* (New York, 2006); Eric Schlosser, *Fast Food Nation: The Dark Side of the All-American Meal* (Boston, 2001); Ann Vileisis, *Kitchen Literacy: How We Lost Knowledge of Where Food Comes From and Why We Need to Get It Back* (Washington, 2008); Steve Striffler, *Chicken: The Dangerous Transformation of America's Favorite Food* (New Haven, 2005).

[12] E. P. Thompson, "The Moral Economy of the English Crowd in the Eighteenth Century," *Past and Present* 50 (Feb. 1971): 76–136; James C. Scott, *The Moral Economy of the Peasant: Rebellion and Subsistence in Southeast Asia* (New Haven, 1976); Dana Frank, "Housewives, Socialists, and the Politics of Food: The 1917 New York Cost-of-Living Protests," *Feminist Studies* 11 (Summer 1985): 255–85; Tracey A. Deutsch, "Untangling Alliances: Social Tensions Surrounding Independent Grocery Stores and the Rise of Mass Retailing," in *Food Nations: Selling Taste in Consumer Societies*, ed. Warren J. Belasco and Philip Scranton (New York, 2002), 156–74.

[13] Vera Hierholzer, "Searching for the Best Standard: Different Strategies of Food Regulation during German Industrialization," *Food & History* 5, no. 2 (2007): 295–318; Christine Meisner Rosen, "The Role of Pollution Regulation and Litigation in the Development of the U.S. Meatpacking Industry, 1865–1880," *Enterprise & Society* 8 (June 2007): 297–347; Jeffrey Pilcher, *The Sausage Rebellion: Public Health, Private Enterprise, and Meat in Mexico City, 1890–1917* (Albuquerque, 2006); Marion Nestle, *Food Politics: How the Food Industry Influences Nutrition and Health* (Berkeley, 2002); Marion Nestle, *Safe Food: Bacteria, Biotechnology, and Bioterrorism* (Berkeley, 2003); Alessandro Bonanno et al., *From Columbus to ConAgra: The Globalization of Agriculture and Food* (Lawrence, Kans., 1994).

important insights into the ways that food has been caught in webs of contestation among private enterprises, organized consumers and producers, and governmental and private regulators.

The essays in this volume of *Business History Review* all explicitly deal with one or more of these three historiographical themes. Edward Beatty and Knut Sogner, though studying widely different arenas of innovation, nonetheless reveal the ways in which technologies for harvesting and distributing foods have emerged from contingent and complex interactions, rather than tracing an arc predetermined by the "logic" of managerial capitalism. Uwe Spiekermann's case studies of two new food products introduced in twentieth-century Germany examine the flip side of innovation—that is, failure—highlighting a hidden irony in the modern food economy: namely, the vast majority of "new" food products are either minor transformations of familiar products or are so devoid of cultural value for would-be consumers that they fail to capture long-term market share. Mansel G. Blackford's essay considers the interplay of environment and business enterprise in a world of finite fish stocks, demonstrating that nature can hold the power to dictate the transformation of capital, rather than always serving as the object of degradation, subjugation, or commodification. Finally, Andrew Godley and Bridget Williams address the issue of regulation and food safety in a politicized market, making the important point that food enterprises often seek to self-regulate food quality, not only to avoid government intervention but also to cultivate relations of trust with consumers. Taken as a whole, furthermore, the essays' international perspectives enrich a field that is inherently global in scope.[14] It is with great pleasure, then, that I introduce this special volume of *Business History Review* on the complex intersections of food, technological, and business history.

Shane Hamilton
University of Georgia

[14] Recent general works on the business and technology of food production and consumption in non-U.S. contexts include: Paul Freedman, *Out of the East: Spices and the Medieval Imagination* (New Haven, 2008); Peter J. Atkins, Peter Lummel, and Derek J. Oddy, eds., *Food and the City in Europe since 1800* (Aldershot, U.K., 2007); Uwe Spiekermann, *Künstliche Kost: Die Genese der modernen Ernährung in der Wissens- und Konsumgesellschaft Deutschland 1880–2000* (Göttingen, forthcoming); Alain Drouard and Jean-Pierre Williot, *Histoire des Innovations Alimentaires: XIXe et Xxe Siècles* (Paris, 2007); Antonio Di Vittorio and Carlos Barciela López, eds., *Las industrias agroalimentarias en Italia y España durante los siglos 19 y 20* (Alicante, Spain, 2003); Francesco Chiapparino and Renato Covino, *Consumi e industria alimentare in Italia dall'Unità a oggi: lineamenti per una storia* (Perugia, Italy, 2002).

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