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# Across the Great Divide: Agriculture and Industrial Geography\*

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**Abstract:** Research within industrial geography has illuminated the relationship between the restructuring of manufacturing and the reshaping of urban space. Industrial geographers have paid little attention, however, to the dramatic social and economic changes occurring throughout rural America. I contend that evident sectoral and urban biases mask an underlying issue: a persistent conceptual schism between agriculture and industry, in which agriculture is comparatively undertheorized as an arena of capitalist development. As a result, a significant part of the story of economic restructuring—the transformation of farming and the creation of new forms of rural development—remains largely unexamined. This paper sets out to bridge the gap separating industry from agriculture and thereby begins to recover this lost side of industrial restructuring. I argue that the incorporation of agriculture into industrial geography involves much more than a simple mapping of industrial theory onto farm terrain; it requires an exploration of the distinctive process of industrialization surrounding farm production. A careful treatment of agricultural development allows farming to be reclaimed from the conceptual backwater, while also providing an opportunity to scrutinize industrial theory from a forgotten perspective. Drawing on recent political economic research in geography and allied fields, I focus on three themes that emerge from the study of agriculture and discuss the lessons they impart to industrial geography: (1) the importance of sectoral difference to regional development, (2) the multiplicity of industrialization paths, and (3) the importance of locality. Each theme is illustrated using examples drawn from the Midwest.

**Key words:** rural development and restructuring, agro-industrialization, meat packing, Midwest.

The rural Midwest occupies a special place in the American imagination. It is our quintessential pastoral setting, a verdant land of rolling corn fields, distant silos, and family farmsteads where people work hard and care for their neighbors. Such rural imagery is familiar to each of us. It is invoked on a daily basis in the service of everything from product advertising to politics. Rurality has come to connote stability and worthy simplicity; it has become our collective past, the rootstock allowing us to withstand relent-

less winds of change blowing through the modern urban world.

The reality of rural life, however, stands in marked contrast to the idyllic landscape projected by popular culture. Change, not stability, is everywhere in evidence. The midwestern countryside was once densely settled; now the ubiquity of abandoned farmhouses bears witness to agricultural industrialization, farm consolidation, and rural population decline. Other signs of transition abound. Instead of muddy outdoor hog pens—an icon of diversified family farming—livestock are bred, birthed, and fattened indoors in confinement facilities. Many of the grain elevators that still mark the rural skyline have closed, and all of the local livestock sale barns stand empty, victims of pervasive

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changes in the marketing of farm products. Once vibrant farm-support towns are withering away: their storefronts are boarded over; many have lost their schools and physicians; poverty is on the rise. And while most rural towns struggle with population loss and economic decline, a few are faced with rapid rural industrialization and a host of associated "boom town" problems, including overwhelming immigration, social conflict, and overstressed local services.

Such dramatic social and economic transformations are occurring throughout rural America. Yet rural areas receive little attention from economic geography. In particular, the fact that new industrial geography—long obsessed with the restructuring of manufacturing—has virtually ignored rural restructuring is surprising, given that a focus on territorial development is a hallmark of this literature. In contrast to traditional concerns with allocative market functions or corporate hierarchies, the new industrial geography emphasizes the propulsive force of capitalist production as the prime determinant in the trajectory of industries and the fate of regions (Harvey 1982; Massey 1984; Scott and Storper 1986; Storper and Walker 1989). In this view, spatial and sectoral development are bound together in a process of economic expansion through which new sites emerge and grow in association with the rising or renewed industries of their time. Industries do not simply locate in regions and cities in response to exogenously given characteristics; rather, they create and re-create these places at the same time as they industrialize by reinvesting capital, expanding commodity output, improving production methods, multiplying the division of labor, and competing vigorously.

This approach is rarely applied to rural restructuring in the United States because the sectors that traditionally played strong roles in rural areas—resource-based industries, particularly agriculture—are neglected. Instead, research in the new industrial geography concen-

trates on a limited list of industries, headed by automobiles, electronics, steel, machining, and textiles. Perhaps this is to be expected, given the dominance of the flexible specialization and Regulation schools of thought, with their shared focus on epochal shifts. Attention to the "second industrial divide" tilts work either toward the study of prototypical Fordist industries or the study of industries exhibiting post-Fordist characteristics, particularly new forms of flexible production and organization. In turn, because of this sectoral orientation, research on the emergence of new spatial forms of development concentrates mostly on cities, specifically the tightly clustered urban-industrial districts of California, Europe, and Japan.

Following FitzSimmons (1986), my contention is that sectoral and urban biases evident within the new industrial geography mask an underlying issue: a powerful and persistent conceptual schism between agriculture and industry within geography and allied disciplines, in which agriculture is comparatively undertheorized as an arena of capitalist development. Indeed, agriculture serves as a mere backdrop to most analyses of U.S. industrialization. Apparent in the work of Clark (1929), transformed into orthodoxy by Rostow (1961), and locked into place by Regulation theory (Aglietta 1979), the idea that American industrialization was everywhere led by heavy industries permeates the literature. In this sense, new industrial geographers share with their classical counterparts an inability to recognize the binding together of agriculture and industry in the process of economic development. While this hiatus has recently been addressed in the historical literature,<sup>1</sup> it still colors research on contemporary economic change. As a result, a significant

<sup>1</sup> For a range of new perspectives on the historical relationship between industry and agriculture, see Walsh (1981), Post (1982), Pudup (1987), Cronon (1991), Page and Walker (1991), and Earle (1992).

part of the contemporary economic restructuring story—agricultural transformation and the creation of new forms of rural development—remains largely unexamined.

In this paper, I set out to bridge the gap separating industry from agriculture and thereby to begin to recover the lost side of industrial restructuring. I start by critically examining recent attempts to extend Regulation theory into the agricultural realm; this unidirectional application of industrial theory all but obliterates the distinctive character and history of agricultural development. The remaining sections make the case for recursive rather than unidirectional movements across the divide. The study of agricultural development has something to offer industrial geographers beyond a better understanding of rural changes. Incorporating agriculture into industrial geography is more than simply mapping industrial theory directly onto rural terrain; it involves an exploration of the peculiar process of capitalist development surrounding the farm. Indeed, a careful treatment of farming, guided by recent work on the political economy of agriculture, can provide a valuable perspective from which to examine our theories of industrial restructuring. Drawing mostly on the case of U.S. agriculture, three key themes are identified: the importance of sectoral difference to regional development, the multiplicity of industrialization paths, and the importance of locality. Each point, taken up in turn, is illustrated using examples drawn from the Midwest.

### Crossing the Divide

The agriculture-industry divide has a long history. When the study of modern society was divided among emergent academic disciplines in the late nineteenth century, farming and rural society in general were perceived as residual social and economic activities operating under dictates distinct from

those governing industrial capitalism (Newby 1982). A lasting dualism came into being.<sup>2</sup>

This strict dichotomy has been broken recently by agricultural research in both geography and sociology that sees farming not as a precapitalist vestige but as a distinct branch of industry guided by the overarching principles of capitalist production. The initial concern of this literature was the classical "agrarian question" applied to the modern family farm, an effort that focused on the transitional or persistent nature of noncapitalist social relations in American farming. For years, debates on this agrarian mode of production dominated the field, but over time a chorus of voices acknowledged key limitations to this thinking. In particular, critics decried overattention to social forms of production on the farm and a corresponding failure to adequately conceptualize ways in which agricultural production is bound up with wider processes of economic development and capital accumulation (e.g., Buttel 1982; Goodman and Redclift 1985; Marsden et al. 1986). As this critique gained ground, researchers focused on the forces shaping agriculture from beyond the farm, resulting in a reformulation of the field's theoretical agenda.<sup>3</sup>

In their insightful summary of these developments, McMichael and Buttel (1990, 99) identify the central theme of this new agenda as "the application of a comparative-historical approach in the

<sup>2</sup> The study of agriculture in isolation from the dynamics of industrial society has characterized research in both geography and sociology. Agricultural geography largely eschewed the issue of farm production, focusing instead on regional classification, farm structure, and the diffusion of innovations (Symons 1967; Pacione 1986). Meanwhile, rural sociology virtually abandoned the study of agriculture in favor of descriptive research on rural communities (cf. Friedland 1982).

<sup>3</sup> For recent summaries of the history of the field, see Mann (1990), McMichael and Buttel (1990), and Buttel, Larson, and Gillespie (1990).

broadest sense in re-thinking the sectoral status of agriculture." They highlight two analytic strategies within the literature leading in this direction: first, strategies that reconceive agriculture as a historical sector formed and reformed by state policy; and second, strategies that reconceive agriculture as a historical sector in a dynamic and fluid relationship with industry. Attempts to reposition agriculture within an industrial context have required the exploration of theoretical sources outside the field. As part of this effort many have turned to the industrial restructuring literature. In particular, the application of Regulation theory (Aglietta 1979; Lipietz 1987; Boyer 1990) to the study of agriculture is increasingly popular, leading to the development of what may be called "Fordist agriculture" approaches.

The extension of this theory into the agricultural realm takes two main forms. One group systematically adopts the central concepts and periodizations of Regulation theory, using this framework as the primary lens through which to interpret the development of U.S. farming (Kenney et al. 1989, 1991; Kim and Curry 1993). It focuses on the ways in which broad societal shifts in the relationship between production and consumption shaped the technological and organizational character of agriculture. A second Regulation-inspired approach turns to the broad institutional environment of agriculture, focusing on the ways in which state-regulated "food regimes" govern the structure of food production and consumption and thereby shape the process of agricultural transformation (Friedmann 1993; Friedmann and McMichael 1989). Thus, although research within industrial studies shows little interest in exploring a connection with agriculture, theories originally developed to analyze industrial capitalism are being used to construct a link from the other side of the divide.<sup>4</sup>

<sup>4</sup> Others do not explicitly adopt Regulation theory but nevertheless use its framework as

But the issue that must be addressed is whether or not Regulation theory is a viable conceptual bridge linking farming to manufacturing. I argue that it is not. Regulation theory has been adopted uncritically, seemingly without awareness of the widespread critique of Fordist and post-Fordist frameworks in the analysis of industrial change.<sup>5</sup> Several problems with the Regulation framework render it singularly unsuited to an analysis of capitalist development surrounding agriculture.<sup>6</sup> Chief among these is an oversimplified and clearly inaccurate interpretation of American economic history that hinges on the emergence of mass production (cf. Brenner and Glick 1991). As a result, the historical relationship between agriculture and industry is misconstrued within the Fordist agriculture model. The integration of farmers into the industrial economy as consumers of mass-produced goods and producers of agricultural inputs to industry is mistakenly ascribed to the rise of Fordism, whereas this dynamic propelled nineteenth-century industrialization. Similarly, the development of the complex of industries that manufactured farm inputs and processed farm output is mistaken as a derivative of Fordist mass production, whereas these industries were critical contributors to a technical lineage leading directly to Ford (Page and Walker 1991).

A second problem with Regulation theory is a reductionist tendency to collapse all industrial development into one of two opposites: Fordism or post-Fordism (cf. Pollert 1988; Sayer 1989).<sup>7</sup>

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an accepted backdrop to stories of agricultural and rural change (e.g., Marsden 1992; Goodman and Redclift 1990).

<sup>5</sup> For critiques of the Fordist and post-Fordist literature see Gertler (1988), Williams et al. (1987), Sayer (1989), and Walker (1995).

<sup>6</sup> For an extended critique of the use of Regulation theory in the analysis of agricultural development, see Goodman and Watts (1994) and Page and Walker (1996).

<sup>7</sup> In this framework Fordist industry is characterized by high-volume mass produc-

But the notion that agriculture was ever really Fordist is questionable, at best. As Goodman and Watts (1994) point out, farming simply does not fit this typology in terms of production technology, labor process, firm organization, or competitive structure. The practice of overlaying the outlines of a post-Fordist transition onto agriculture is also of limited value. Forcing farming into either mold only obscures its complexity and diversity.

A third problem with Regulation theory is that, because of a limited understanding of industrial dynamics, it overemphasizes institutional coherence within a mode of regulation in the explanation of capitalist development (cf. Walker 1995). Fordist agriculture approaches repeat this tendency, according Fordist institutions the central role in the process of agricultural restructuring. Regulation-inspired approaches make a vital contribution by directing attention to the ways in which the state mediates capitalist development in farming. Yet, left aside in the useful discussions of successive global regulatory "regimes" is any detailed analysis of industrial change in agriculture. Instead, a single technical-organizational model (postwar "productivist" U.S. farming) is superimposed upon the agricultural sector, belying the variety of directions taken by agriculture worldwide (cf. Goodman and Watts 1994). Likewise, the global-scale analysis of the social regulation of agriculture overlooks lasting differences in agricultural policy among nations, regions, and farm commodity sectors (Dupuis 1993; Moran et al. 1994).

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tion, dedicated machinery, standardized products, poor responsiveness to changes in demand, Taylorist work practices, market-mediated buyer-supplier relations, and the vertical integration of production within global firms. Post-Fordist industry is characterized by batch production, flexible machinery, differentiated products, quick responsiveness to market shifts, flexible post-Taylorist and skill-enhancing work practices, subcontracting networks rooted in nonmarket relations, and the vertical disintegration of firms in localized industrial districts.

Efforts to extend Regulation theory in this way represent less of a synthesis of the agricultural and industrial literatures than a subsumption of the former into the latter. Ironically, in the haste to cross the divide that separates farming from manufacturing, the distinctive technological, organizational, and institutional character of agriculture is lost. The remainder of this essay examines the ways in which agriculture differs from other sectors of industry and explores the analytic importance of this difference for industrial geographers.

### Agro-Industrialization

The first theme that emerges from the agricultural studies literature concerns the role of nature in shaping the unique character of industrial development in food and fiber production. Unlike most branches of industry, farming presents constraints to industrialization in the form of natural processes that act to limit the productivity of labor and restrict capital investment. Biology's role in plant and animal growth is key; there are no industrial substitutes for soil or sunlight, and the biological conversion of energy in plant development and animal gestation cannot easily be accelerated or standardized, as in manufacturing (Goodman, Sorj, and Wilkinson 1987). Biological time's dominance over these processes has other critical implications. Because production time exceeds labor time in farming labor cannot be applied constantly to production, thereby limiting surplus extraction, while the seasonality of production slows the circulation of capital (Mann and Dickinson 1978; FitzSimmons 1986; Mann 1990). In addition to natural processes, the land-based character of farm production poses several constraints to industrialization. In crop farming, unlike a factory, capital cannot be applied to the labor process at a single site where production is expanded or intensified. Instead, increased production requires a spatial extension (conversely, decreased production requires a spatial contraction).

But because land is a fixed and limited resource, and because land markets are colored by localized social conditions, farmers cannot easily or quickly adjust their investment in land (Marsden et al. 1986).

Because of barriers to the social and technical rationalization of the farm labor process, noncapitalist social relations of production (Marx's "petty commodity production") dominated U.S. agriculture during the nineteenth century and persist today. These family-labor farms survive and at times prosper because of their flexibility in the face of natural constraints.<sup>8</sup> Yet, while it is important to affirm the viability of household producers versus capitalist producers on the farm, it is equally important to address the effects of the division of labor in allowing capitalist domination of the overall food- and fiber-producing system. Despite barriers, industrialists behave just as they would in any other branch of industry, continually attempting to revolutionize productive methods in order to extract surplus value from the labor process. Indeed, unflagging effort to reduce the importance of nature in production is the driving force behind agricultural industrialization. This process moves forward slowly, but over time natural constraints have been gradually eroded as technological and organizational innovations have been introduced.

Agro-industrialization advances along two broad fronts, capturing agricultural production itself in a pincer-like grip between suppliers of farm inputs and processors and marketers of farm output. On the one hand, specific aspects of the

farm labor process are gradually assimilated into factory-based industry, where they are rationalized, mechanized, and intensified beyond anything possible on the farm. Goodman, Sorj, and Wilkinson (1987) describe this process as one in which elements of agricultural production are "appropriated" by manufacturers, transformed into discrete branches of industry, and then reincorporated back into farm production as purchased inputs. On the other hand, commodity traders and manufacturers progressively act to reduce farm products to more simple and controlled industrial inputs in an effort leading eventually to the replacement of agricultural goods with industrially produced inputs. Capitalist production thus gradually encroaches on agriculture from above and below within the division of labor via the "appropriationist" and "substitutionist" strategies of agro-industrial firms (Goodman, Sorj, and Wilkinson 1987; Goodman 1991).<sup>9</sup> As this happens, the extent of industrial activities linked to agriculture expands greatly, and industri-

<sup>9</sup> The encroachment on agriculture by industrial firms occurs in the context of state involvement. Regulation-inspired interpretations of agriculture capture the vital importance of postwar state policy in shaping agriculture via the stimulation of mass food consumption as well as a package of productivity policies aimed at increasing yield and output (Kenney et al. 1989; Friedmann 1993). Yet, because of an adherence to the overall Regulation framework, these institutional developments are necessarily viewed as a fundamental break from the past, and thus appreciation for the continuity of state involvement is missed. It is impossible to separate discussion of agricultural development in the nineteenth century from state policy toward land division and acquisition, settlement, Native American removal, transportation development, or the creation of a system of agricultural education and research. These institutional developments underwrote the entire process of midwestern agro-industrialization and established a correspondence between mass production and mass consumption by the middle of the nineteenth century.

<sup>8</sup> As Friedmann (1978) argues, family-labor farms traditionally have had several advantages over capitalist farms: they are able to adapt to uneven labor demands because noncommodity relations prevail in production; they need only simple reproduction, not expanded reproduction through profit; and they are able to adjust consumption to subsistence levels during times of market downturn.

alists and merchants increase their effective control (directly or indirectly) over on-farm labor.

For industrial geographers, the first point that emerges from this analysis of agriculture is the importance of paying attention to ways in which sectoral difference shapes processes of regional development. In agriculture, industrialization is fundamentally conditioned by the natural basis of production, as well as by the social relations that often follow closely in the wake of natural difference, resulting in distinctive processes of economic and spatial growth. By glossing over the specific character of development in agriculture, economic geographers and others overlook the dynamic relationship between farming and manufacturing and miss the fact that this interaction can act as a powerful force in regional development. Traditionally, agriculture has been viewed either as a netherworld beyond real industry or as an active brake on wider capitalist growth. But, in reality, whole regions have grown on the basis of the expansion of the division of labor surrounding agricultural production; moreover, this dynamic continues to shape patterns of regional growth and decline today.

The case of the Midwest provides an example. Here, the foundation of nineteenth-century regional development was laid via the interaction of a vibrant farm sector with rising manufactures. Midwestern farmers were highly commercialized owing to their integration into the wider economy via the process of land acquisition during the early and mid-1800s (Gates 1962; Swierenga 1968). Independent farmers were eager to expand family income and landholdings, making them close cousins in outlook and behavior to true capitalist producers. At the same time, they were compelled to be improvers by the logic of the market: rising productivity and total output created strong downward pressure on prices, thereby propelling them further into the market (and into debt) to secure better equipment and breeding stock. Farmers sold their produce as quickly as possible;

they invested in necessary farm inputs, such as plows, tools, lumber, and breeding stock; and they purchased necessary household goods, such as processed foods, pots, stoves, and furniture (Post 1982; Page and Walker 1991).

In this way, the family-labor farm acted as the hub of a rapidly expanding division of labor surrounding resource extraction—enabling, rather than impeding, capitalist development in agriculture. With the Chicago Board of Trade came standardized markets for agricultural commodities and a flowering of trade in agricultural goods. Meanwhile, the articulation of the railroad network, the creation of centralized stockyards, and the development of a grain storage system rationalized the movement of goods from countryside to city (Cronon 1991). Fueled by this outpouring of farm produce, industrialization proceeded rapidly in the processing sectors, aided by a raft of innovations, including roller mills, mechanized slaughtering, pasteurization, and ice-refrigeration (Page and Walker 1991). Farm success and expansion created new markets for a great range of manufactured goods, from tools and machines to fertilizers and household wares (Walsh 1981; Pudup 1987). In turn, the rapid growth of these manufacturing sectors created a proliferating network of backward and forward industrial linkages throughout the region. Agro-industrialization thus generated a distinctive pattern of territorial development. From the beginning of settlement, rural agrarian production was enmeshed with the urban industrialization process occurring at a distance in factories and workshops. Here, capitalist and noncapitalist production activities were bound together in a relationship of mutually supportive development across wider production systems that ultimately led to the flowering of mass production and the success of the Midwest on a global stage.

Agro-industrialization continued to be a primary force shaping both the urban and rural Midwest through the twentieth century. Farm-input manufacturers in-



creased their role in both crop and animal production through a series of biological, chemical, and mechanical innovations, including hybrid seeds, nitrogenous fertilizers, insecticides, herbicides, specialized farm machinery, livestock antibiotics, and feedlot and confinement systems. As farmers adopted these technological packages, total output and productivity skyrocketed and primary agriculture became ever more dependent on industrially produced inputs. Food manufacturers and retailers also greatly increased their role in the agro-food system in a variety of ways: through the replacement of staple products by an ever-expanding array of branded, high value-added processed foods from the concentrated, capital-intensive processing industries; through the combination of food wholesaling and retailing within increasingly large-scale supermarket firms; and through the growth of corporate fast food restaurant chains based upon a dramatic rise in out-of-home food consumption in the postwar era. On both the input and output sides, current biotechnological advances offer new methods of manipulating natural processes and create new investment opportunities for agro-business firms (Busch et al. 1991; Goodman, Sorj, and Wilkinson 1987).

As a result, farmers are caught in a persistent cost-price squeeze associated with the workings of the technological treadmill, leading to widespread farm consolidation and a decline in rural population (Chocrane 1979). Highly productive farming practices are also associated with severe environmental consequences, including surface water pollution, groundwater depletion, and chemical exposure (Lowe, Marsden, and Whatmore 1990). In addition, many key urban farm-related industries (e.g., farm implements, meat packing) have been restructured in this process, resulting in rationalization, job loss, and relocation, while other industrial sectors (e.g., seed production, insecticide manufacture, artificial sweeteners) have expanded. In this way, the shifting character of agro-industrial linkages continues to be

a central element in the process of regional development.

### **Divergent Paths of Development**

The second theme arising from the agricultural studies literature concerns the internal richness and diversity of the agricultural sector. While processes of appropriation and substitution establish the broad outline of capitalist development in agriculture, it is important to recognize their partial and contingent character. Many of the key biological processes involved in plant and animal production remain impervious to technical advance, and thus the ability of industrial capital to subsume farm production remains limited. These processes of appropriation and substitution also vary tremendously across both time and space, a pattern of unevenness that derives from the commodity-specific structure of the sector. In essence, the production of a given animal or plant and the transformation of that biological product into a food or fiber commodity presents a unique set of constraints to be overcome by capital. For this reason, industrial transformation in agriculture centers on specific farm products as capital encroaches from adjacent industrial sectors within commodity-based divisions of labor, resulting in the development of specialized commodity chains that link farmers to upstream suppliers of inputs and to downstream processors, marketers, and consumers of food and fiber. The pace and form of agro-industrialization, however, varies markedly among such chains of production and consumption, each of which has its own distinctive trajectory of development.

Sources of divergence among commodity chains are many. The first is the social organization of farm production, characterized by a complex coexistence of capitalist and household production. In particular, household producers vary greatly in terms of gender relations and intergenerational relations within the household, connection to external labor

markets, farming practices, and strategic behavior. This diversity derives in part from the character of specific agricultural products. On the farm, crops differ from one another in many key respects. Each plant or animal species has its own biological rhythm of reproduction, growth, and development, and each yields a farm product with a unique configuration of traits, such as size, shape, weight, durability, or perishability. In turn, each crop exerts its own requirements upon agricultural practice and thereby puts an unmistakable stamp on the direction of technological change, the farm labor process, and farm enterprise organization (Friedland, Barton, and Thomas 1981; Friedland 1984).<sup>10</sup>

A second source of divergence lies in the broader pattern of linkages in which the farm enterprise is enmeshed. Each commodity chain contains a particular grouping of industrial sectors engaged in farm supply, processing, and marketing. In turn, each of these industries has its own internal character; they differ from one another in terms of the product (e.g., machinery, chemical inputs, food processing), manufacturing process, labor relations, markets, competitive conditions, and so forth. Here, natural difference again plays a significant role. The pecu-

liarities of each crop establish the fundamental context (or problematic) of industry's incursion into the agricultural realm and thereby influence technological development, labor process, and sectoral organization. Given such variation, each commodity chain exhibits a distinctive set of relationships linking farmers to input or output industries, processors to distributors or retailers, retailers to consumers.

Commodity chains differ also in the power relations operating within the chain. Agro-industrial development is a contentious encroachment upon nature, fueled by fierce competition between broad appropriationist and substitutionist strategies, between firms within the same sector of industrial activity, and between firms linked vertically within a given commodity chain. Traditionally, agro-industrial firms have pursued a strategy aimed at dominating a particular stage of production, whether machinery inputs, chemical inputs, or processing. More recently, new strategies have emerged as larger firms attempt to integrate various stages of production upstream and downstream of agriculture (Marsden and Little 1990).

A third source of divergence among commodity chains is state policy. Though situated in a common national political milieu, agricultural policy in the United States varies by region and by commodity. Overall, the state permeates agricultural production, shaping land use patterns, crop choices, production practices, and technological trajectories, although the type and level of involvement varies according to crop and location. State policy also affects the operation of specific agro-industrial sectors via trade policy, environmental regulation, antitrust enforcement, and so on. Each commodity chain, then, is characterized by a distinct constellation of social, technical, organizational, and institutional relationships, and each is associated with a unique geographic pattern—a spatial division of labor. This in no way implies any sort of natural determinism, however. Nature matters to where agricultural production

<sup>10</sup> It would be wrong to characterize household-based farming as a residual form of production passively awaiting the eventual reach of capital, however. Farmers actively shape (and sometimes resist) the incursion of industrial capital through their choices about household organization, labor sourcing, technique, suppliers, and marketers and in so doing create a mosaic of social forms of production both within and across commodity chains (Mooney 1983; Whatmore 1991; Moran et al. 1994). In this sense, agro-industrialization may be viewed not as a top-down imposition of new farm practices but as a process in which farmers negotiate change with adjacent industrial sectors in an environment characterized by constant shifts in the relationship between nature and production (Roberts and Emel 1992).

is located, but locational constraints can be overcome to some degree through the transformation of nature via irrigation, plant and animal breeding, or improvements in production facilities. In this sense, the geographies of commodity chains are not static; instead, they are constantly expanding and reconfiguring themselves in response to competition, market shifts, and persistent technical and social change.

Thus, there is no single form of industrialization in agriculture, despite a general trend toward the expansion of the division of labor and the increasing dominance of large firms. Rather, capitalist development surrounding the farm moves forward at different rates and in a multiplicity of directions, giving rise to a remarkably heterogeneous agricultural landscape composed of commodity chains in which agriculture and industry are fundamentally united in historically constructed spatial divisions of labor.

For industrial geographers, an understanding of agriculture's internal structure leads to a second point: the need to broaden our vision to include a wider array of possible paths of industrialization. The case of agriculture forces us to notice that industrialization is highly differentiated. Individual commodity chains, as well as the specific industrial sectors they contain, exhibit distinctive paths of development based on crucial differences in material base, labor, technology, and organization. Of course, sectoral studies was an early theme in the new industrial geography (e.g., Massey 1984; Storper and Walker 1984), but it has been overshadowed in the search for overarching visions of capitalist history. The existence of a large and disputed body of research on agrarian capitalism should make clear how difficult it can be to grasp the complexity of any one sector of the economy, yet industrial geographers too often take specific sectors to be variations on a basic theme.

Another example drawn from the realm of midwestern agriculture—the meat packing industry—illustrates the

importance of uncovering the sources of divergent sectoral development. Meat packing simply does not fit within the confines of a Fordist/post-Fordist historical framework, in which mass production emerged in 1913, flowered at midcentury, and then stagnated by the 1970s to be replaced by a new industrial paradigm. This lack of fit derives from the fact that both the Regulation School's theory of Fordism and the model of flexible specialization have truncated concepts of technical and organizational progress in industry that primarily encompass the problematics of assembly and machining (Aglietta 1979; Leborgne and Lipietz 1990; Sabel 1989). Neither is of much use when studying meat packing. Take, for example, the evolution of industrial technique and labor process. At first glance, there might appear to be a good match with Fordist practices. Meat packing is characterized by high-volume production of standardized goods in large-scale plants, special-purpose machinery incorporated into a continuous flow (dis)assembly line, and division of labor based upon Taylorist methods of scientific management. Yet rationalized work sequencing along a mechanized disassembly line was first employed by Cincinnati packers in the 1830s, and improvements and modifications to this system soon followed in Chicago and elsewhere (Gidieon 1948). These developments had nothing to do with Fordism *per se*: Taylor was building on a tradition of work rationalization and detail division of labor going back to the eighteenth century, and mechanization had been applied to factory production from the first industrial revolution (Marx [1867] 1906; Rosenberg 1972). Indeed, Ford's accomplishments in the automation of work flow and the dedication of specialized machinery borrowed from antecedent developments in meat packing. What differentiated Ford from earlier manufacturers was the addition of key innovations on top of this base, particularly the perfection of interchangeable parts and the elimination of "fitting" (Hounshell

1984), practices that had little relevance to disassembly.

Meat packers had an entirely different set of problems. Attempts to extend and intensify commodity production were inextricably bound to the fact that the industry's material input was a biological entity produced by land-based agricultural enterprises and that its chief output was perishable animal flesh. The industry's early innovations concerned these very basic issues: Chicago's Union Stockyards originated as a response to problems associated with the uncoordinated and seasonal flow of livestock inputs into the city from geographically dispersed small-scale farmers tied to the natural rhythms of animal gestation, birth, and development (Cronon 1991); while refrigerated manufacturing, transportation, and storage addressed the need to overcome seasonal limits to production and distribution imposed by product perishability (Yeager 1981). In turn, the ability to acquire inputs, engage in production, and market output throughout the year allowed Chicago's packers to invest in large, integrated slaughtering and packing facilities and to improve the labor process of mass production. Here, the chief obstacle confronting firms was the irregularity and tenacity of biological architecture. Mechanical systems that moved the carcass through the plant were improved and other aspects of disassembly were mechanized (e.g., scalding and de-hairing), but the arduous and exacting work of killing an animal and separating muscle from bone, tendon, and viscera could only be accomplished through the coordinated action of the human eye, arm, and hand in concert with a sharp knife (Clemen 1923). Deskilling was a response to a dependence on human labor dictated by biological constraints to mechanization.

Contemporary technology and labor process dynamics in meat packing remain tied to this agro-industrial problematic. The development of new meat products and the creation of new methods for packaging, freezing, and canning meat represent both a continuation of efforts to

solve problems of circulation associated with perishability and a simultaneous attempt to differentiate the form and composition of animal flesh in order to expand sales of branded, high value-added commodities. The introduction of boxed beef and pork production has increased the shelf life of fresh meat by several weeks.<sup>11</sup> All of this has involved significant changes in labor process: the machine-driven disassembly line has been extended beyond the overhead rail via the introduction of waist-high conveyors; many processing activities (e.g., bacon and sausage manufacture) have been completely mechanized; and human labor in slaughtering has been augmented by mechanical stunners, skinners, knives, and saws.

New manufacturing practices, however, are no more post-Fordist than earlier practices were Fordist. Boxed meat production has introduced greater flexibility in terms of fresh meat marketing, while meat packers have become more attuned to market niches (promoting an array of low-fat products to health-conscious consumers, for example), but there is no sign that the industry is moving toward batch

<sup>11</sup> Boxed beef production is an extension of mechanized disassembly within the plant in which the beef carcass is broken down into primal and subprimal cuts of meat that are then vacuum sealed and loaded into boxes. The new techniques of boning, wrapping, and packaging were incorporated into huge and efficient state-of-the-art slaughtering/processing plants that yielded significant economies of size based, in part, on improved by-product recovery and sales. Boxed beef could also be shipped directly to the retail store, where the final retail cuts were performed. Thus, boxed beef production revolutionized the distribution system by eliminating the need for a separate "fabrication" stage in between the packinghouse and the retail store. It also revolutionized retail butchering by effectively transferring the work of thousands of skilled, union butchers from the fabrication warehouse to the packinghouse, where the tasks were deskilled and performed by low-wage, non-union laborers (Burns 1982).

production or any evidence of increased flexibility in machinery or product mix. To the contrary, current innovations are part of a continuous quest for standardized mass production going back 160 years. Nor are new flexible work practices to be found. Despite recent innovations, meat packing remains a labor-intensive business due to the nature of the raw material, and it remains a low-margin business because of the nature of the product (it is a "commodity" industry characterized by low profit levels per unit of product sold). Given these limitations, it is not surprising that meat packers are preoccupied with efforts to boost labor productivity and lower labor costs, goals accomplished by extending and intensifying Taylorist work practices while simultaneously attacking the position of organized labor. Clearly, these changes reflect a deepening of labor exploitation rather than an enhancement of skills or the incorporation of workers' knowledge and creativity into the production process.<sup>12</sup>

Meat packing also does not match Fordist or post-Fordist prototypes with respect to industrial organization or the character of interfirm competition. Here again, its distinctive path has been shaped by an agricultural integument. Organizational and competitive changes in meat packing have always been tied to the uneven dynamics of industrialization occurring within the broader meat producing system—that is, the set of linked activities from feed grain and livestock production through livestock marketing, meat packing, distribution, retailing, and consumption. For example, by the mid-

1890s—some 20 years before the putative inauguration of mass production at Highland Park—meat packing was characterized by vertical integration and was dominated by just a few giant firms. The big packers' economic power was based not only in mass-production plants, but also in investment in national systems of stockyards, rail cars, and warehouses. Control over the facilities of animal procurement and meat sales allowed them to dominate economic relations with adjacent stages of the pork and beef commodity chains where capitalist development lagged: packers dictated the terms and conditions of livestock marketing to small-scale and widely scattered household livestock producers and prescribed meat marketing practices to small-scale, neighborhood retailers.

Later, during the immediate postwar period of "high Fordism," when oligopolies in many key U.S. industries were consolidated, exactly the opposite occurred in meat packing: new firms entered the industry, the concentrated organizational structure was broken apart, and vertical integration was abandoned. The established packers lost their once insurmountable competitive position in beef packing because of shifts in power within the commodity chain. Downstream, food retailing was transformed through the combination of wholesaling and retailing within large-scale grocery firms. These firms bypassed the meat packers' warehouses and developed their own meat distribution systems that purchased directly from the slaughtering plant. In addition, retailers replaced the existing system of packer-defined grades of fresh beef with new buying practices based on United States Department of Agriculture (USDA) grades, while encouraging competitive bidding among packing firms. Together, these changes removed barriers to entry into beef packing associated with the Big Four's traditional control over distribution and retail methods (Aududdell and Cain 1981). Upstream, the industrialization of cattle feeding brought with it radical shifts in

<sup>12</sup> Certain aspects of work in meat packing undeniably become more flexible as firms have extended their power over the terms and conditions of work: management has gained authority on the shop floor and can more easily move workers from one job assignment to another; and the packing firms have also gained flexibility in terms of work scheduling, allowing them to better adapt to the uncertainties of livestock supply.

both the social organization and geography of cattle production as large-scale specialized feedlots emerged in the Great Plains.<sup>13</sup> The rapid expansion of fed-cattle production undercut packer dominance over livestock markets (Butz and Baker 1960). As a result, new specialized fed-cattle slaughtering firms emerged during the 1950s and early 1960s and were able to compete effectively.<sup>14</sup>

Yet meat packing did not continue down a path toward vertical disintegration and the dominance of small firms; instead, it experienced a renewal of industrial concentration based in large measure on fur-

<sup>13</sup> This process of expansion was fundamentally tied into broader trends. On the one hand, beef consumption, particularly of high-quality grain-fed beef, had been rising steadily since the end of the war, due to generally rising incomes and the aggressive sales efforts of supermarkets. On the other hand, feed grain agriculture was being transformed through the appropriation of farming by the oil, chemical, machinery, and seed industries in the form of integrated input-intensive practices. Together with an institutional framework aimed at disseminating technological advances, expanding output, and developing new markets, these changes led to unparalleled increases in total output and yield of feed grains (Perelman 1977; Goodman and Redclift 1990; Friedmann 1993). In turn, cheap feed grains combined with industrial advances in cattle feeding, hog raising, and dairying to keep the price of meat and dairy products low, thereby fueling further increases in consumption.

<sup>14</sup> In essence, the new beef packing firms aggressively inserted themselves into an emerging fed-beef chain between feedlots and the supermarkets by locating in rural areas near the source of livestock supply. As this happened, long-distance, rail-based stockyard marketing gave way to local truck-based auction and direct marketing. Faced with outdated livestock procurement and meat marketing practices, aging facilities, increasing competition, and the growing power of labor, the established packers made big changes. By 1965, they had closed most of their multispecies urban plants and replaced them with specialized beef and pork plants located in livestock-producing areas.

ther shifts in the division of labor brought on by boxed beef production. Boxed beef was an organizational as well as technical/labor process innovation that reoriented marketing channels by allowing meat packers to reclaim control over the terms, conditions, and locations of meat wholesaling from supermarket chains. During the 1970s, the firms that initiated these changes expanded capacity, powered their product into the market, and put devastating pressure on competing firms.<sup>15</sup> In the 1980s, boxed beef producers reestablished dominance in livestock procurement, expanded into pork packing, and strengthened their position in beef; by 1994, the four largest firms accounted for 82 percent of the nation's steer and heifer slaughter, compared to 36 percent in 1980 (USDA 1996).

Vertical integration is also on the rise. Much of the industry is now housed within diversified agro-food corporations (e.g., Cargill and ConAgra) that are involved in nearly every stage of meat production, including grain shipping, livestock feed manufacture, livestock production, meat packing, and processed food production. Casting this as Fordism reborn, however, only obscures the workings of a persistent agro-industrial imperative. Large firms are pursuing strategies that join formerly separate aspects of meat production together in coordinated efforts to intensify each stage of the beef and pork commodity chains while more effectively integrating overall systems of production and circulation in time and space. In this process, meat packing is being subsumed within increasingly unified

<sup>15</sup> The competitive advantage of boxed beef firms was not limited to the combination of high-productivity manufacturing methods with new marketing practices, however. Added to this mix was the fact that these firms operated outside of the industry's master agreement labor contracts using mostly non-union labor. This combination proved lethal for the older meat packing firms, who eventually abandoned beef packing altogether—but only after several years of massive adjustments for labor and communities (Perry and Kegley 1989).

meat industries (pork, beef) that compete with each other as well as with poultry. Agro-industrial integration is occurring not only through direct ownership along Fordist lines, but also through more flexible forms of articulation such as forward contracting and production contract networks. Agro-food industries of this sort also encompass many decidedly non-Fordist production types (e.g., family farming, contract growing) as well as a range of firms that do not easily fit the pattern of a Fordist enterprise (e.g., feedlots, integrators, veterinarians, and other service providers) (cf. Goodman and Watts 1994).

### The Politics of Place

A third theme of the agricultural studies literature concerns the importance of locality in shaping the direction of sectoral change. Increasingly, researchers recognize that patterns of uneven development in agriculture are not solely the outcome of industrial dynamics, but are produced through the complex articulation of these processes with a diverse set of places. Marsden et al. (1986), writing on British agriculture, establish a strong conceptual link between general political economic forces and concrete historical cases. By concentrating on the role of human agency in creating localized differences in farming practices, on-farm social relations, land tenure patterns, agro-industrial linkages, labor markets, and state policy, their analysis highlights the geographic specificity of capital's penetration into the farm sector. Embedded local conditions have important effects upon agriculture, often serving as powerful barriers to industrial transformation.

More recent work in the field continues to explore the ways in which endogenous and exogenous forces interact and shape each other in the place-specific process of agricultural and rural transformation. For example, Moran et al. (1994) argue for the need to recognize the efficacy of farmer political movements in the construction of regional and national agricultural policy in

both France and New Zealand. In similar fashion, Roberts (1994) demonstrates that the differential fortunes of High Plains family farmers is more a product of political struggle over water rights than the outcome of a universal agro-industrial logic.<sup>16</sup> Others take this focus on the politically mediated character of agro-industrial development even further. Using the central concepts of the network analysis of Callon and Latour, Marsden et al. (1993) and Murdoch (1994) characterize rural localities as particular constellations of cultural, social, economic, and political relationships. In turn, each constellation is one moment in broader networks of social relations through which actors are tied together at various spatial scales—"meeting places" where sets of social relations intersect. The key dynamic within these networks is the exercise of power as social actors formulate interests and pursue particular courses of action in competition with others. According to this model, localities are interactively constructed as actors forge associations, acquire "resources" (the means of power), and impose their interests on others. As such actions are taken, localized configurations of power are made and remade, layering one on top of the other over time. In this actor-based, bottom-up approach, new divisions of labor in agriculture are not superimposed upon the rural landscape; to the contrary, they emerge through the complex workings of power within social networks at the local scale and between the local and nonlocal scales.

For industrial geographers, the point

<sup>16</sup> In many rural places (particularly in Britain), this political contest has been extended far beyond the traditional realm of farming in response to the encroachment of other land uses. As a result, housing developers, recreation developers, planners, and non-farm professional residents are increasingly influential in shaping local change (Lowe, Marsden, and Whatmore 1993; Marsden et al. 1993).

that emerges is a familiar one: geography matters. Localities are not static remnants of past rounds of investment and social activity; they are distinctive congeries of social practices that actively shape industrial development. This can be vigorously contested as localities are formed and transformed through processes of industrialization that tear apart existing social relations and precipitate struggles over their reconstitution. In this case, the experience of agriculture reaffirms a long-standing research theme in industrial geography. After all, interest in locality was in large measure sparked by Massey's (1984) pioneering analysis of the ways in which contemporary economic restructuring is shaped by the accumulated sediments of regional and local history, and geographers have continued to advance localities research (e.g., Cox and Mair 1991). But, again, the new industrial geography has been perhaps too quick to move beyond this early message on its way to questions concerning epochal changes to and from Fordism, Toyotaism, and the like. Industrial geographers, of course, continue to wrestle with this issue, but not in isolation. Work in agricultural and rural studies has taken up the locality issue, providing new insights and rekindling an interest in the thorny relationship between structure and action.

The role of place-specific social relations in shaping agricultural development may be illustrated using the example of midwestern hog production. After 1970, the rapid diffusion of capital-intensive confinement techniques led to dramatic reductions in the number of farms raising hogs and a concomitant increase in the average size of hog farms.<sup>17</sup> Because new production practices emerged from within the ranks of traditional corn belt family-labor farms, hog farming has been charac-

terized by strong continuity in the social organization of production despite increasing levels of concentration. Hog farming is dominated by midsized producers who sell their animals in open markets (although great variety exists in terms of both the size of farms and levels of technology); it is conducted through "farrow-to-finish" operations that are joined to grain production on diversified farms; and it is housed within farm enterprises that use mostly family labor (Van Arsdall and Nelson 1984).

Today, midwestern hog farming is experiencing significant change. Hogs are increasingly produced under contract by farmers who own neither the hogs nor the necessary inputs to produce them; instead, the hogs are owned by contracting firms that supply genetically standardized young pigs and manufactured feed to a network of farmers ("growers") who fatten the animals for a fee. Veterinary and technical services are supplied by the contracting firm, while grower production practices and facilities are carefully specified and monitored. Growers are responsible for financing facilities and pay for all operating costs. Marketing of the fattened hogs is handled by contracting firms. In some cases, hog sales are transacted via forward contracting arrangements with meat packers, but in other cases the contractor is itself a meat packing firm, so that the transaction is internalized within a single business entity. Thus, in a striking break from the past, contractual relationships are steadily replacing market exchanges as nominally independent growers are brought under the control of agro-industrial firms that orchestrate relationships within the commodity chain.

Contract growers are not wage laborers directly employed by agro-industrial firms. Nevertheless, the kind of hog produced, how it is produced, and when it is produced are under the control of the contractor. This form of production represents a successful strategy of appropriation through which firms "saturate" the farm labor process without actually taking control at the point of production, gain

<sup>17</sup> The number of hog farms in Iowa declined by 53 percent between 1970 and 1985, while the average size of the remaining farms nearly doubled (Futrell and Dhuyvetter 1986).



flexibility to quickly increase or decrease production, and minimize the risk associated with investment in facilities (Watts 1990). The portrayal of the contract as an agreement entered into freely by both parties masks these relations of control (Clapp 1988). Hog contracting began in the South, but in the past decade the practice has spread into the Midwest, where it is expanding more rapidly than in any other part of the country (Rhodes 1990; Rhodes and Grimes 1992). Behind the expansion of contract production lies an undeniable competitive force: integrated producers surpass traditional midwestern producers in terms of both physical productivity (e.g., the number of pigs weaned per litter, the average age at which pigs are weaned, loss to disease, growth rates) and labor productivity, as well as in uniformity and quality of output (Kliebenstein 1988).

In Iowa, the heart of traditional hog production, a new era is being ushered in as two very different production systems collide. This is no automatic transition; attempts to establish a new division of labor in hog production are being channeled through a dense web of existing social relations that are themselves constantly in flux. In this process, changes unfold through innumerable acts of social negotiation and contest occurring at a variety of scales. While a full discussion of this process cannot be undertaken in the context of this essay, a brief consideration of key arenas of transformation can shed light on the complexity and uncertainty of the routes through which change takes place.

One arena of transformation is on the farm. Contract production gained a foothold in Iowa during the farm crisis of the early 1980s (Marbery 1993c). Large-scale southern contracting firms entered Iowa hog farming at that time, but the rise of contracting was in no way a simple invasion from afar. These firms were joined by regional agro-business cooperatives like Farmland Industries and Land O'Lakes as well as by local feed companies and independent hog farmers who could not finish all of the young pigs that they produced

(Rummens, Kliebenstein, and Rhodes 1991). Contracting firms discovered that their chief obstacle was a strong sense of independence among family-labor hog farmers, who were reluctant to sign on, difficult to supervise, and unlikely to continue with the contracting arrangement (Nelson 1990). Contractors thus compete not only against each other for new grower recruits, but also against the region's strong agrarian ideology. Some contractors target growers with no previous experience in hog farming, but most Iowa contract growers were at one time independent farmers who switched to contract production because they lacked the financial resources to remain independent (Rummens, Kliebenstein, and Rhodes 1991).

Contracting both exploits and exacerbates existing lines of differentiation within the Iowa farm community. Although Iowa farmers are bound together by a remarkably strong collective identity, there is little unanimity in their response to the rise of contract hog production. Iowa producers see that vertical integration will restrict their available market options. Yet, as a body, they are torn between wanting to protect independent hog production and not wanting to place limits on economic enterprise. This issue has become a central point of dispute within farm organizations, whose members range from farmer-contractors to growers to adamant anticontracting activists. For these organizations, the result is the emergence of sharp internal divisions, a fragmented political voice, and an uncertain future direction. Ultimately, this discourse is about more than policy. It is a contest of representation revolving around the question of which groups will define the meaning of "independent" production. The central issue is whether or not contract growers can be accommodated within the prevailing agrarian ideology. If they can, a significant barrier to vertical integration will be removed.<sup>18</sup>

<sup>18</sup> Take, for example, a brochure produced by the contracting firm Swine Graphics

A second arena of transformation is the network of relationships linking farmers to their input suppliers. Farmers are not the only actors within the established commodity chain with contradictory impulses toward contract production. Some local feed companies have integrated forward into contracting in order to expand their market, but other local material and service suppliers stand to lose business given that integrating firms favor a pattern of centralized, nonlocal acquisition. This problem also extends to the system of informational inputs. Many larger contracting firms are internalizing this function by doing their own proprietary research on genetics, nutrition, and health (Lawrence 1992). The role of land grant universities and agricultural extension services as providers of research and technical advice could be usurped if independent farmers are replaced by contract growers. In Iowa, state-sponsored economists actively shape the process of agricultural restructuring by working to provide independent producers with the means to compete with the southern-style system (e.g., Kliebenstein 1988; Hilburn et al. 1988). Yet the future of such efforts is unclear because of a wider discourse on agricultural policy that could lead to cutbacks in public funds.

A third arena of transformation, then, is the state. At the local level, the battle to limit vertical integration emerged in the form of farmer-community coalitions that successfully stopped the development of large-scale farrowing units and large-scale farrow-to-finish facilities using county nuisance ordinances as well as private lawsuits. A coalition of livestock business interests (including the Iowa Farm Bureau) countered these efforts by supporting state legislation that would establish "agricultural enterprise zones" designed

to exempt large-scale hog facilities from nuisance suits (Roos 1993). This legislation failed, as have other efforts to repeal the state's existing ban on packer ownership of livestock and involvement in contracting.

Political resistance to contracting, at both the local and state levels, exerts a profound influence on the geography of the hog-pork commodity chain.<sup>19</sup> Some contracting firms have responded by establishing their large-scale farrowing facilities and grower networks just outside Iowa, where they still have access to low grain prices and an established meat packing industry. Other contracting firms have pursued a strategy of intraregional specialization wherein pigs are farrowed in areas with little developed resistance to corporate livestock production but are then shipped back to Iowa for finishing and slaughter. In another strategy, a new group of integrated hog production/meat packing firms are avoiding Iowa altogether and developing their operations in other parts of the greater Midwest. For example, Tyson (an agro-industrial giant with roots in integrated poultry production) recently established a pork packing plant in Missouri that draws on company-operated hog contracting networks in Missouri, Oklahoma, and Arkansas (Marbery 1993a), while Seaboard, another integrated poultry producer, purchased a pork packing plant in Oklahoma and will slaughter hogs raised through its contracting system there.<sup>20</sup>

<sup>19</sup> Kansas has a law that prohibits meat packers from owning hogs, while Nebraska, South Dakota, and Missouri have "corporate farming" laws that restrict nonfarm ownership of farm enterprises.

<sup>20</sup> In addition to the mid-South, Indiana has emerged as an important center for integrated hog production. In 1993, Premium Standard Farms, a hog contracting firm that was established in Iowa but later fled south, integrated forward into meat through the purchase of a plant in Indiana that slaughters contract hogs raised there and in Missouri (Marbery 1993b). Also, IPC, a joint venture of

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Enterprises, in which one of the growers working with the company states: "This relationship allows me to be my own boss and is the reason I feed for them" (Swine Graphics 1993).

A fourth arena of transformation concerns the meat packing industry and its relationship to hog farmers. It is not at all clear how the nation's dominant pork packing firms (IBP, ConAgra, Cargill) will respond to the development of hog contracting in the Midwest or to the emergence of new integrated competition in meat packing. These firms have enormous investments in Iowa hog slaughtering and have established reliable networks of independent producers. In fact, through the agency of direct marketing, meat packers have been able to push farmers to produce more lean and uniform hogs, which, in turn, has stimulated a commitment to modern input-intensive practices leading to an increase in the size of hog farms. Still, meat packers are playing both sides in Iowa; both ConAgra and Cargill have eagerly purchased the output of emergent contracting networks because these producers are able to provide packing firms with high-quality, high-volume inputs (Burgett 1990). It is also likely that the established pork packers will try to match companies like Tyson and become fully integrated themselves, either by attempting to remove restrictions on packer-owned livestock in Iowa, or by relocating—a move that would bring incredible political pressure to bear in the Hawkeye state. Although neither ConAgra nor Cargill is directly integrated backward into hog production

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Central Soya (a subsidiary of the Italian firm Ferruzzi) and Mitsubishi of Japan, has recently constructed a pork packing plant in Indiana that slaughters hogs either raised through a company-owned contracting network or purchased from the nearby contracting network of Continental Grain, one of the nation's largest cattle feeders. Built to European Community standards, this plant processes hogs into primal, subprimal, and retail cuts of meat which are then vacuum sealed into branded packages using modified-atmosphere technology to further extend shelf life. These meat products are then distributed to markets in Japan and other Pacific Rim nations, as well as to markets in the United States, Canada, Mexico, and, soon, Europe (Morris 1992).

in the central Midwest, they are well positioned to do so. Both firms have considerable experience with integrated production in the poultry industry. Moreover, Cargill already engages in contract hog production in Arkansas (Marbery 1988). Meanwhile, IBP may be missing the competitive boat in livestock procurement. It has no experience in the poultry industry and does not engage in contract pork production, but it recently purchased a plant near a cluster of integrated producers in Indiana.

Overall, hog production in Iowa remains extremely unsettled. Production contracting has introduced new relationships throughout the hog-pork commodity chain, setting into motion a dynamic and contested process of restructuring occurring between and within various arenas of transformation. How all of this unfolds is an open process with no predictable outcome.

## Conclusion

In this essay I have argued for the integration of agriculture into contemporary economic geography. A lasting agriculture-industry divide blinds us to the workings of agricultural industrialization and diverts our attention from rural restructuring. Crossing this divide on the horse of Fordism, however, only makes matters worse by trampling the actual history and character of agricultural development. In contrast, an examination of the distinctive process of capitalist development surrounding the farm provides an opportunity to reclaim agriculture from the conceptual backwater and to scrutinize industrial theory from a forgotten perspective.

While the story of midwestern agro-industrialization must be told and understood in its own right, it also has important lessons to impart to industrial studies. First, it is essential that we drop the idea that agriculture is a primitive mode of accumulation that leads only so far down the road to capitalist development and no farther, and that real

industrialization is something that happens afterward. This is the foundation of all simplistic stages-of-growth schemes, from Rostow to Aglietta. The case of the Midwest demonstrates that it is not manufacturing alone that drives regional development, thereby cautioning economic geographers against the adoption of reductionist theories of regional formation and restructuring. Indeed, the midwestern experience illustrates the ways in which regions emerge and grow on the basis of distinctive social, economic, political, and environmental arrangements. Furthermore, comparative studies of agriculture—take the case of regional divergence among the U.S. South, Midwest, and Far West, for example—highlight the fact that there are many roads to capitalist development and many regional and national capitalisms that share certain social and economic characteristics but differ significantly with respect to resource base, technical conditions, class relations, race and caste hierarchies, and a panoply of political and cultural features.

Second, it is important that we pay more attention to social relations, technical differences, and divisions of labor across all sectors of industry. In meat packing there has been no industrial divide, no break in industrial paradigms; rather, the continuity of development that does exist can only be understood with reference to an agro-industrial problematic that has defined the dynamics of technology, labor process, organization, competition, and location in the industry. Nor is meat packing alone in its lack of fit with contemporary Fordist and post-Fordist frameworks. Overall, the food- and fiber-producing system exhibits a mix of social relations of production, an incredible breadth of technological development, and a wide range of forms of industrial organization. Such variation, deriving from differences among commodity chains rooted in the natural circumstances of plant and animal growth, suggests a remarkable openness in the evolution of production systems under capitalism. This is not to argue that

generalization is impossible, but to point out that it must be based on abstractions from variegated concrete instances, rather than imposed on a flattened landscape by overgeneralization from one or two sectors' specific histories and geographies.

Finally, it is vital that we probe the historical processes through which industries and places are mutually constructed. It is not that industrial studies have ignored geographic specificity; yet local difference is too often taken to be the direct expression of universal processes without sufficient attention to the ways in which class relations, technical advance, business culture, political dynamics, and the like emerge from local circumstances. As evidence of a failure to seriously pursue historical analyses, one need look no further than the eager grasping for an errant schematic history that has swept through the field. Geographers would do well to question the thin histories drawn by the Regulation and flexible specialization schools and instead follow the cue of agricultural studies by turning attention to a careful consideration of the deeply embedded sources of local difference.

Research on agriculture can inform industrial studies in many ways, and the converse is equally true. It is time to bridge the divide and develop an ongoing dialogue between the two fields.

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