Dissertations

DRAINING THE WET PRAIRIE OF EAST CENTRAL ILLINOIS

Roger A. Winsor
Appalachian State University

Today a pattern of artificial drainage underlies the agricultural landscape of east central Illinois. The area studied is the most intensively drained area in the state. Though the 16 counties of the Grand Prairie constitute about 20 percent of Illinois's total land area, they contain 52 percent of the state's drained land [1].

East central Illinois was a region of numerous swamps and poorly drained lakes with interspersed areas of seasonally dry upland. There were discrepancies between where the wet prairies were thought to be and where they actually were. Several major wet areas were much more "visible" to observers and attracted undue attention. The early maps and descriptions greatly overgeneralized, stereotyping as wet, counties which had large wet features. Many of these early sources were written for land promotional purposes and thus depreciated the minor wet features. Some areas of wet prairie were only periodically wet, requiring that one travel through them in the spring to note the wetness. As plagiarism was common, a misrepresentation once established was adopted by others.

Wet areas were seen by all as impediments to travelers and settlers because of their wetness and the presence of malaria. In fact, the area was one which repelled people. Travel across miry sloughs and poorly marked roads was difficult and maps were unreliable. Malaria was endemic in the wet lands of east central Illinois. Indeed, settlers often were preoccupied with malaria as the prime characteristic to be associated with the wet lands.

The wet prairie was a tall grass prairie interrupted by sloughs or ponds which were the home for thousands of migratory geese and ducks. From these habitats the waterfowl foraged widely consuming a large portion of the farmers' corn crops. Some set-

tlers were perceptive enough to realize that the wet prairies would one day become the most valuable land for cultivation. Accordingly, to reduce crop losses farmers were forced to devise special methods of wet prairie cultivation, planting the higher ridges and knolls, keeping the low wet land in permanent pasture, or planting water-tolerant buckwheat.

Although the belief that the wet prairies could be drained probably was widespread, it was not until the wet years of the late 1850s that such opinions began to appear in print. Thereafter periods of excessive wetness increased interest in drainage. Sucessive wet years in the late 1860s and late 1870s ruined many farmers of the area. Fields were flooded, hindering planting and cultivation; sometimes crops were drowned, drastically curtailing yields. This stimulated many farmers actively to consider artificial drainage as a way to remove the hazard of water-logged and ponded fields.

The residents began to consider drainage as a way to reduce crop losses in wet years, to increase crop yields, to advance the cropping season, and to increase the amount of land under cultivation. Many farmers reported having their crop yields on drained land increased between 10 and 100 percent. Land drainage was also shown to provide a 25 to 100 percent rate of return on the owner's drainage investment. The drained land commanded a substantially higher market price than undrained land. Some people had a purely speculative interest in land drainage.

A few observers were opposed to drainage, viewing it as the cause of droughts. Some farmers believed that the value of land was simply too low to warrant expensive investments in drainage. For most, the greatest hindrance to drainage was its cost, made exorbitant by the problems of securing tile from considerable distances. As tile factories were constructed locally, the drainage costs decreased primarily because of competition.

The passage of the two 1879 drainage laws were instrumental in accelerating drainage adoption. Prior to this time Illinois adhered to the principle of natural drainage, which held that owners of lower property had to receive runoff which flowed naturally from higher ground. Natural drainage also prevented cutting through drainage divides and the construction of outlet ditches to the main water channel. This often made the cultivation of low areas impossible. The passage of this legislation enabled farmers to drain their land adequately on a large scale by giving to the drainage districts the right of eminent domain. The drainage laws enabled a majority of the landowners to force unwilling landowners into a drainage district for the common good. The law also permitted the drainage district to assess owners for the derived benefits and to issue low-interest-bearing bonds to pay for the work.

Institutions such as the Illinois Department of Agriculture, the Illinois State Agricultural Society, the University of Illi-

nois, agricultural journals, and the railroads were influential in promoting drainage adoption by conducting drainage experiment and drainage equipment contests, publishing pamphlets on drainag and making rate concessions on drain tile. Institutions rather than technology were the more important element in promoting drainage adoption. Drainage technology -- including mechanical equipment and drainage guides -- were available from the mid-1850s, but it was 20 years later that drainage became widely adopted, with institutions playing a prominent role in fostering its acceptance. There was a temporal sequence in the use of drainage forms, including mole drains, open ditches, tiling, and dredged channels. The first forms were the least permanent and expensive, and experimentation usually preceded large investment

The landlords of moderate to substantial means led the drainage movement; these innovators, better informed on technological innovations, were opinion leaders. The early drainage adopters were wealthier, owned larger units, had more exposure to channels of mass media and interpersonal communication, and had more contact with change agents. While all innovators operated larger-sized units, not all large landlords were innovators

Several early adopters brought European drainage experience and techniques with them. Unlike local innovators, they did not have to go through the experimental stages of draining small plo employing the least expensive and and least permanent types of drainage. These transplanted Europeans immediately employed the large ditching plows and constructed open ditches instead of experimenting with board drains and mole ditches.

Residents of the study area began draining their lands as early as the 1850s with one innovator noted as early as the 1830 Most farmers waited until the late 1870s or early 1880s to adopt drainage, when a number of local tile factories became operational and after residents formed drainage districts.

Two indexes of diffusion were examined, the building of tile factories in Illinois and the adoption of tile drainage in east central Illinois. There were broad similarities between these two patterns, with Macon County an innovation center in both instances. Logan County was an innovation center with regard to tile adoption as it was located between Macon and Tazewell Counties, the two leading centers of tile factories. Tile drainage adoption tended to "radiate" outward from Macon and Logan Counties with counties at the farthest distances adopting last. Ford, Iroquois, and Kankakee Counties lagged in both the construction of tile factories and the adoption of tile drainage as dredged outlet ditches needed to be excavated before tile drainage was practical. These three counties moved ahead only after the dredging began in the late 1880s and 1890s. Tile drainage adoption moved rapidly in some counties because relatively few tiles were required per acre and farmers in other counties adopted more slowly because of the cost of the most

extensive tile networks. The era of most rapid tile adoption in the study area was 1884 through 1886.

The examination of the diffusion of drainage suggests that it resulted not from distance decay and the function of interaction over distance, but from other factors, particularly the dredging problems and the lack of tile factories. The idea diffused universally, but it could be adopted only where certain prior arrangements or certain kinds of infrastructure were provided.

A descriptive summary model of the drainage experience illustrates that the adoption of tile drainage coincided in time and place with a number of other contemporaneous events: the rise of local tile factories, the wet years of the 1870s, the reduction of railroad freight rates on drain tile, and the passage of Illinois's 1879 drainage laws. Tile factories were in operation in the study area from the mid-1860s, but not many farmers adopted tile drainage because of the high freight rates on tile and because outlets were difficult to obtain. The years 1875 through 1878 were extremely wet and resulted in destroyed crops and diminished yields. This stimulated the usage of more tile as farmers sought to ensure against future crop losses. With increased demand tile factories were constructed, leading ultimately to increased competition and lower prices. The several railroads in the study area also suffered from the wet years of the late 1870s as crop shipments decreased. They reduced freight rates on drain tile in the late 1870s, further encouraging farmers to adopt tile. These events helped to stimulate the business of tile factories and spread the adoption of tile drainage among farmers. The farmers, agricultural organizations, and tile makers worked together for the passage of the drainage laws of 1879, which removed the last major obstacle to widespread tile adoption by granting drainage districts the right of eminent domain so that outlets could be obtained for drainage networks. This was the most important stimulus to drainage. Relatively few farmers adopted tile prior to the passage of the 1879 laws, choosing to wait until they could be assured of proper outlets for their drainage systems. The increased number of tile factories through the study area by the mid-1880s promoted increased competition, which led to reduced tile prices and further stimulated the adoption of tile, a process slowed only by drought conditions in certain years.

The drainage of the wet prairie of east central Illinois produced a modified landscape. Ditches, tile lines, and drainage channels drained ponds, removed sloughs, reduced both aquatic flora and fauna, and decreased the incidence of mosquitoes. Land which hitherto was in permanent pasture or lay unused was brought into crop production. The profitability and security of agriculture was increased, since drainage raised crop yields, advanced the cropping season, and decreased the hazard of crop losses due to flooding.

NOTES

*This paper is based on my "Artificial Drainage in East Central Illinois, 1820-1920," Ph.D. diss., University of Illinois at Urbana-Champaign, 1975. Financial support for this study was provided by the H. B. Earhart Foundation.

1. The study area includes Champaign, Christian, Coles, DeWitt, Douglas, Edgar, Ford, Iroquois, Kankakee, Livingston, Logan, McLean, Macon, Moultrie, Piatt, and Vermilion Counties.

REFERENCE

1. US Bureau of the Census, *US Census of Agriculture, 1959*, Vol. 4, *Drainage of Agricultural Lands* (Washington: United States Government Printing Office, 1961), pp. 129-37.

THE GROWTH OF A REFINING REGION

Joe Pratt
The Johns Hopkins University

My dissertation is a regional study of 20th century industrialization. The region examined is the geographical and historical center of Gulf Coast refining, an approximately 100-mile-long corridor from the Houston area to the Beaumont-Port Arthur, Texas area. After the discivery of oil at Spindletop near Beaumont in 1901, the sustained growth of petroleum refining and related industries greatly affected most phases of this region's evolution. In analyzing the lines of influence which reached out from this oil-related industrial core and shaped development on the Texas Gulf Coast, I concentrate on four general areas where the growth of refining introduced significant changes -- the industrial mix, the labor market, the political system, and the environment. My focus on a small geographical area allows me to take an approach broad enough to include such closely related changes, all of which are encompassed by the general theme of rapid growth and its impact.

Within the modern Gulf Coast economy, growth was very closely tied to the growth of the largest oil companies. Robert Averitt's *The Dual Economy* [1] and Edith Penrose's *The Theory of the Growth of the Firm* [2] provide a useful overview of microeconomic growth. Borrowing from them, I stress the implications for the refining

region of the emergence of a dual economy. Since large refineries operated by national and international oil companies generated the primary impetus for economic development, their microeconomic needs shaped important aspects of the growth process.

A brief comparison of the regional economy before and after Spindletop suggests the transformation which came with petroleum. Before the discovery of oil at Spindletop, a regional transportation revolution based on new railroad networks and improved shipping prepared the area for the expansion of the cotton, timber, and rice industries. These concerns grew steadily in the late 19th century but oil brought a new economic era. It attracted a vast migration of capital, labor, and managerial talents from existing eastern oil fields; it tied the region's fate to that of an oil industry which was to assume a crucial function in an automotive society. Two companies chartered in response to the opportunities presented by Spindletop, Gulf and Texaco, were regional leaders in the construction of large, permanent refineries. Others followed and the refining complex grew steadily, spreading across the entire Texas-Louisiana Gulf Coast. By World War II, this area contained over 30 percent of the nation's total petroleum refining capacity. As a favored location for the large refineries of integrated oil companies selling in national markets, the Gulf Coast assumed an important role in the modern national economy. The nature and magnitude of this role were the prime factors influencing the course of regional development.

The most pronounced effect of the growth of refining was its alteration of the industrial mix of the region. The construction, supply, and maintenance of large refineries stimulated the creation and expansion of secondary industries. Initially, the refineries had to supply many of the goods and services required by expansion in a new region, but strong backward linkages encouraged the growth of independent supply firms. Many expanded into national markets and diversified their products; many made Houston an administrative headquarters while establishing plants elsewhere in the region. The refineries generated even stronger forward linkages, especially to the sulphur, natural gas, and petrochemical industries. Reenforcing and encompassing such backward and forward linkages were what are perhaps best labeled "vertical integration effects." The large, expensive refineries were the fixed hub around which revolved much of the producing, transporting, and marketing activities of their owners. As the once regional oil companies grew into giant vertically integrated concerns, the internal logic of their historical evolution dictated the location of numerous, diverse company functions near their major refineries. The sustained growth of regional refining thus encouraged the continued expansion of petroleum production and transportation facilities in and around the region. It also helped attract to the Houston area the administrative offices and the research and development centers of numerous large oil companies. This growing

oil-related complex greatly influenced the evolution of the region's transportation system and its financial system. It was, all in all, an excellent conductor of rapid, sustained economic growth.

The most important permanent economic tie between the oil companies and the region was the labor force required to build and operate the refineries. While attracting new workers from surrounding areas and from a pool of skilled petroleum specialists within the national economy, the center firms introduced several significant changes in the regional labor market. They brought a new level of skills and compensation; they created the conditions which gave rise to strong, independent industrial unions; they accelerated the pace of technological change, thereby altering the composition of the work force. In important respects, the evolution of refinery unions was similar to the course taken by companies which supplied materials, not labor, to the large refineries. The increasing independence of labor organizations climaxed in the 1940s with the formation of CIO unions, the growth of existing AFL organizations, and the transformation of company unions into autonomous nonaffiliated workers' groups. The creation in 1955 of the AFL-CIO's Oil, Chemical, and Atomic Workers International Union meant that most of the region's refinery workers were represented by a nationally based organization with a diversified membership.

The rise of independent labor unions had a significant political effect, since the oil workers' unions served as a partial counterweight to the local political power of the large oil companies, at least on issues which did not threaten the continued prosperity of refining; but before and after the CIO's creation, the large size and critical economic function of the companies which owned the major refineries made them very powerful in local, state, and national politics. At all levels antitrust laws and rhetoric, when heard against the background of the dissolution of Standard Oil in 1911, threatened the companies with political uncertainties. In response to such attacks and in pursuit of control over a chaotic and potentially harmful political environment, the large companies, with the benefit of their long-range planning horizons, sought to identify, pursue, and attain their political interests. Their early, sustained experience in politics and their large size and well-developed political resources enabled them to fend off sporadic attacks on "big oil" by various diverse and less organized interest groups.

This "traditional" political power took on special importance within the region and the nation when the society began to seek solutions to the problems arising from the environmental impact of petroleum refining and petrochemical production. Throughout the century, the large refiners used increasing amounts of the region's land, water, and energy resources while producing ever greater supplies of both refined goods and waste products. Along

with the large refining capacity which resulted from the region's role as a national refining center came an unequal share of the nation's refinery-related pollution. The large oil companies first systematically attacked refining pollution and waste problems in the 1920s, primarily in the pursuit of increased efficiency. Neither public nor political pressures strengthened these early attempts at pollution control. Conversely, public demand for more and better refined products combined with a societal faith in sustained growth through rapid technological change encouraged the neglect of such externalities. In the 1950s and 1960s, political demands for solutions were often not accompanied by a modification of this faith in rapid growth. In this period, earlier company efforts to ameliorate the environmental impact of refining were intensified by a variety of legal sanctions.

The large refineries and related industries were obviously not the only source of pollution. Nor did they exert the only influence on the region's economic or political systems. My analysis of the linkages between the refining complex and the development of the upper Texas Gulf Coast does not constitute a comprehensive economic history of the area. Instead, I am striving to isolate important aspects of the broad impact of its dominant industry. My description of the consequences of the growth of refining demonstrates its crucial role in regional development. My discussion of the changing position and power of the owners of the large refineries within the national and international petroleum industry places the evolution of this specific region into the broader context of national growth.

REFERENCES

1. Robert Averitt, *The Dual Economy* (New York: Norton, 1968).
2. Edith Penrose, *The Theory of the Growth of the Firm* (New York: Wiley, 1959).

BUSINESS RESPONSES TO KEYNESIAN ECONOMICS, 1929-64

Robert Collins
North Carolina State University

The purpose of this dissertation was to examine the responses of three major business organizations -- the Chamber of Commerce

of the United States, the Committee for Economic Development, and the National Association of Manufacturers -- to the enlargement of the federal government's economic role over the period 1929-64. The study makes three basic points: (1) that there was during this time a revolution in national economic policy, a change characterized by the ascendance of Keynesian analytic techniques and policy prescriptions; (2) that the definition of what constituted Keynesian economic policy changed during this period; and (3) that the actions of organized business were a crucial factor in the shaping and molding of the new definition which had become dominant by the 1960s.

Regarding the first of these conclusions, it must be noted that America's Keynesian revolution was not an overnight transformation. Franklin Roosevelt was hardly an immediate convert to the preachments of John Maynard Keynes. Though the New Deal engaged in deficit spending early on, it is clear that this course was a pragmatic response to the public distress resulting from the Depression. Such spending was aimed at relieving suffering rather than at generating economic recovery. It was informed not by economic theory but rather by practical humanitarian and political concerns.

The administration's rationale for spending changed subtly but significantly in the wake of the "Roosevelt recession" of 1937-38. FDR's decision in April 1938, to revert to massive -- in the context of the times -- infusions of government spending to shore up the economy represented the President's first acceptance of fiscal policy as a legitimate tool for economic stabilization. Never again would America's national leadership approach government expenditure as solely a charitable exercise.

The institutional foundation for a continuous Keynesian role was laid with the passage of the Employment Act of 1946. This legislation declared it "the policy and responsibility of the Federal Government to use all practicable means... to promote maximum employment, production, and purchasing power" and created the Council of Economic Advisers and the Joint Committee on the Economic Report to carry out the mandate. A further step was the Republican acceptance of the government's new role. The performance of the Eisenhower administration during the recessions of 1954 and 1958 gave proof that the lessons of Keynesian economics had been internalized, at least to the degree that no administration was likely to attempt to combat recession by belt-tightening and raising taxes to prevent a deficit. If this represented acceptance of the passive side of the New Economics, the use by Presidents Kennedy and Johnson of discretionary fiscal policy to *prevent* a recession and to reinvigorate a sluggish economy -- the famous tax cut of 1964 -- was a culmination of the Keynesian revolution. By 1965, the dean of America's conservative economists, Milton Friedman, was quoted by *Time* as proclaiming, "We are all Keynesians now."

Several weeks after this quote appeared, Friedman wrote to the editors of *Time* pointing out that he had also said, "and nobody is any longer a Keynesian." The paradox involved, apparently adjudged by *Time* to be too puzzling for its readers, leads to my second major point. The Chicago economist was correct, for the definition of Keynesianism had indeed changed significantly over the years. The Keynesianism of the New Deal was rooted in the mature economy thesis advanced by Alvin Hansen and others. This stagnationist formulation of Keynesian doctrine influenced Lauchlin Currie, Henry Wallace, the planners of the National Resources Planning Board, and to some degree FDR himself. It argued that the United States had reached economic maturity: population increase had slowed dramatically, and territorial expansion was now a thing of the past. Technological innovation had produced no great industrial boom since the automobile, and it was doubtful that this factor could be counted on to act with regularity. The result was economic stagnation and the cure was government investment to take up that slack which was now a natural condition of the system. Ideally, such a program of investment would entail continuously high federal spending -- and deficits -- for education, social welfare, public works, regional development, public health and hygiene, and urban renewal.

It was, however, a much different brand of the New Economics which came to dominate the public policy dialog in the 1950s and 1960s. This more conservative Keynesianism stressed fiscal automaticity rather than discretionary economic management, valued increases in private spending (that is, tax reduction) over increases in public spending, and omitted the earlier stagnationist interest in the redistribution of income and the reallocation of resources. New emphasis was placed on monetary policy as a tool of macroeconomic management.

It is the third and perhaps most significant finding of this study that organized business played a crucial role in this process of redefinition. The first step came with the political defeat of the stagnationist formulation during the struggle over full employment legislation in 1945-46. The Chamber of Commerce of the United States played an important part in this struggle by accepting a minimal federal role in the management of the economy and by providing alternative drafts which stripped the original Full Employment Bill of its stagnationist trappings. These drafts served as the basis for the relatively conservative legislation which finally emerged as the Employment Act of 1946.

Having ensured that the new federal government role would *not* be that envisioned by the stagnationists, it remained for business to present a positive alternative. This was provided by another business group, the Committee for Economic Development. The CED's version of Keynesian public policy comprised four major elements: (1) a prescription for fiscal policy featuring stable tax rates set to yield a surplus in the cash-consolidated budget

at a level of national income consistent with high employment; (2) the reservation of further deliberate antirecession or anti-inflation budgetary policy for serious and unusual circumstances; (3) emphasis on tax changes rather than expenditure changes when strong discretionary measures were indeed required; and (4) stress on a flexible monetary policy to be administered by a fully independent Federal Reserve System. It was a combination as thoroughly colored by conservative values as the earlier stagnationist version had been by liberal, reformist ideals.

The CED worked to implement its conservative Keynesianism in several important ways. It helped develop and publicize several key economic concepts (for example, the automatic stabilizer concept and the idea of the full employment budget) which shaped the parameters of the continuing debate over federal fiscal policy. The organization's most fecund idea man, Beardsley Ruml, was a leader in the movement to apply the pay-as-you-go withholding principle to the federal income tax -- reform which made possible a shift in emphasis from the expenditure to the revenue side of the budget. A further influence on public policy was the influx of CED members into federal service. CED alumnus Thomas B. McCabe, for example, played a major role in implementing the flexible monetary policy proposed by the committee; as chairman of the Board of Governors of the Federal Reserve System, he was a leading figure in the Fed's successful attempt to liberate itself from the domination of the Treasury Department. When the two versions of Keynesianism collided once again during the Kennedy years, the chamber, the NAM, and the CED united in support of tax reduction rather than increased public spending or the customary balanced-budget approach. It was the business community which led a wavering JFK to its own version of the New Economics, a brand of conservative Keynesianism ultimately embodied in the Revenue Act of 1964.

The study thus concludes that over the period 1929-64 organized business exhibited impressive flexibility in successfully accommodating to the Keynesian revolution. The success of the CED in particular calls into question our conventional emphasis on peak business associations such as the chamber and the NAM. The CED was a new and distinctive type of lobbying group. While carefully maintaining a small, cohesive membership, the committee emphasized expertise and research rather than propaganda of the more obvious customary sort. It was an effective organizational adaptation to the development during the New Deal years of a governmental style characterized by bureaucratic institutions and administrative values, an increased reliance upon expert knowledge, and a planning ethos.

My findings further demonstrate the necessity of breaking down the historian's customary compartmentalization of the New Deal era. The long-run view is required; we must trace the changes of the Depression decade through time and see how executive and

legislative decisions were actually administered. It is only from this perspective that we can fully understand the dynamics of the fiscal revolution set in motion during the 1930s.

A SON OF ANTAEUS: JAMES J. HILL AND AGRICULTURAL DEVELOPMENT OF THE NORTHWEST

Howard Dickman
University of Michigan

The historical function of American railroads was not limited to forging a national market or to solving the critical managerial and administrative problems faced by emerging big businesses in the late 19th century. A number of published and unpublished studies[1] have established that railroads in all regions of the country assisted directly both the extensive growth and the intensive development of the agricultural sector of the economy. At first, especially in the West, railroads recruited immigrants and other settlers to their undeveloped territory; but many went on to promote crop rotation and diversified farming systems; to introduce new, marketable crops; to distribute educational information to farmers about improved production methods, implements, and technologies; to carry on extension services even before the county agent system came into being; to help farmers market their crops; and even to sponsor scientific research. The rationale for their efforts was to capture the benefits, directly in the form of increased freight, and indirectly by fostering prosperous and stable farming communities in their territory. Agricultural products were often a crucial component of these railroads' income, and by helping their clients to adapt to changing market conditions, they furthered both their interests. It is sometimes assumed that in the absence of public support, agricultural extension, education, and research would not be carried on in the private sector, because the benefits could not be captured by those who paid the costs. This thesis should be reevaluated in light of the historical contributions of the railroads, not to mention those yet to be determined of the milling, banking, agricultural implement, and fertilizer industries.

Using the James J. Hill papers and the Great Northern Railway Company archives I have undertaken to present, explain, and assess James J. Hill's impact on the agricultural history of the Great Northern territory in light of his expressed views on the comple-

mentarity of interest between farmer and railroad, and on the need to expand agricultural output and improve its productivity in order to ensure an adequate domestic food supply for American society. Hill's performance was not unique, nor was he the first railroader to engage in agricultural improvement work. He was, however, a leader; his programs did influence others in the private and public sectors, and they had an unmistakable impact on the agricultural modernization of his region. I can offer here only a few examples from my research to illustrate these conclusions.

Minnesota and North Dakota were, and still are, primarily grain-growing regions. Nevertheless, from the early 1880s Hill promoted a shift from the one-crop system to diversified farming, primarily through the raising of livestock for home consumption, and for sale in the growing urban markets in the Midwest and East. Railroad revenues were heavily dependent on grain in those years. Wheat, for instance, accounted for nearly half the entire freight revenues of the old St. Paul, Minneapolis, and Manitoba Railway in the 1880s. However, this dependence was unfavorable for the railroads and for the farmer. A poor harvest could, and did, reduce railroad earnings immediately and drastically; a poor harvest or even a good harvest accompanied by a decline of grain prices could, and did, wipe out farmers completely. Diversification provided an additional source of income, a cushion against hard times However, one obstacle to the spread of livestock farming was the cost of obtaining good breeding sires. These were necessary to improve herd quality, and thus to upgrade the marketability of the meat and dairy product. Hill thought of an ingenious device to circumvent this problem. He spent tens of thousands of dollars to import hundreds of pedigreed bulls from proven European herds, and he then distributed them free to farmers along the line of the railroad. The proviso was that the recipient had to allow the neighbors in his county to service their cows to the new bull. Hill's cooperative herd sire program was the first of its kind in the country, and it was an important event in the transition to grain and stock farming in the newer regions of Minnesota and North Dakota. Later on, his idea was copied and expanded on by other railroads, farmer cooperatives, and even colleges of agriculture. It presaged the modern and vastly more efficient technique to accomplish the same end, artificial insemination.

Hill did not limit his interest in diversification to the livestock industry. He had the Great Northern invest financially in the early irrigation enterprises of the Wenatchee River Valley in the state of Washington. At the same time, he lent the construction firms the use of his railroad engineers, and had his immigration agents scout out experienced fruit farmers willing to relocate to this new area. The result of this program was the growth of an apple industry which within a few decades became second in importance only to small grains among agricultural commodities shipped over the railroad. The Wenatchee-Okanogan

district is to this day one of the most important commercial apple-growing regions in the nation, although, ironically, the freight business has now been captured by trucks. In the northern Great Plains region, Hill's agricultural agents assisted diversification by introducing beet sugar to the irrigable river valleys and getting beet sugar factories to locate on their line, and by helping build up a market for certified seed potatoes grown there in the southern states.

Hill also worked to expand agricultural output by increasing the land devoted to farming. His first venture into resource policy concerned the drainage of vast stretches of swampy, overflowed land in the fertile Red River Valley of northern Minnesota and North Dakota. He had the railroad dig a number of ditches and canals early in the 1880s, but property rights conflicts forced him to abandon this direct approach. Nevertheless, he was a key figure in the development of a modern drainage system for the state. He paid most of the cost of the initial topographical surveys of both sides of the valley, surveys necessary to determine the extent and feasibility of drainage. Then he assisted various local and county organizations in a six-year effort to obtain new general drainage legislation. In order to get the law passed, at the eleventh hour, Hill even committed the Great Northern to paying one-fourth of the annual legislative appropriations for an initial test period! In time, under a system which grew out of the one Hill sponsored, Minnesota has become one of the top five states in the nation in total land area drained.

Hill was convinced that the tillage practices of Plains farmers were depleting the soil of its fertility, to the peril of the nation's future. He believed that soil-conserving methods improved agricultural productivity, were easy to adopt, and were profitable to the individual farmer. To prove that this was so, he undertook a soil-testing and cooperative demonstration program in 1912 which was the largest of its kind in the nation. The railroad hired soil chemists to analyze samples it obtained from farms in all the counties which it served in Minnesota and North Dakota. In turn, railroad agricultural agents (often college professors who left their academic posts for railroad service) assisted farmers in purchasing and using better inputs: fertilizers, pure seed, and improved tillage practices. Hill's program was soon copied by other railroads in the nation, and in his own state it helped precipitate a statewide soil-testing and analysis program conducted by the Minnesota Experiment Station.[2]

Finally, one of Hill's far-reaching contributions to 20th century American agriculture was the role he played in the passage of the Newlands Reclamation Act of 1902. Early in 1899 Hill got together a number of transcontinental railroads, and together they organized and financed the National Irrigation Association. By means of a vast and expensive publicity campaign, this organization became the single most important interest group, outside of

Congress and the Geological Survey, responsible for drumming up support for a federally funded irrigation program. The head of the organization, George H. Maxwell, even had a hand in drafting the final form of the law. Hill's railroad, like the other western systems, became a staunch supporter of multipurpose reclamation projects. It is very likely that they were second in importance only to project settlers themselves as an interest group seeking further appropriations for these enterprises.[3]

There were, of course, other contributions which Hill made and his railroad carried on for decades after his death. In later years, however, the Great Northern often acted in cooperation with other groups to carry out development programs. For instance, a consortium of private businesses, the Crop Quality Council, began in 1922 to help coordinate and assist in the campaign against cereal rust through the eradication of the carrier, the common barberry bush; to this day this organization sponsors much valuable research in plant pathology and genetics to keep one step ahead of new races of rust. In other areas, such as agricultural credit, the railroads in cooperation with bankers did much to fulfill the intermediate credit needs of grain and stock farmers in the Plains in the 1920s. However, in recent decades the patter has been a steady growth in public support for agricultural R & D, and a relative decline in private expenditure. *Just* recently, however, in this time of pinched public budgets many policymakers have urged that applied research especially and by implication other activities be shifted back to the private sector where, it is hoped, it can be performed by those with a direct stake in the outcome. My study of James J. Hill's career, together with those done on other railroads and businesses provides ample historical precedent for this idea.[4]

NOTES

1. The first was Paul Wallace Gates [1]. Two other major published works in this area are [5 and 3]. More recently, C. Clyde Jones [4] and Roy V. Scott [6] have continued to explore the subject. Scott's book contains the best exposition on the agricultural development work performed by nontransportation companies.

2. Soil surveys were well in use by 1912. Nevertheless, Hill's program was the first of its type in Minnesota.

3. The importance of the National Irrigation Association to the passage of the Newlands Reclamation Act is discussed in [2], which, however, did not discover the "railroad connection."

4. Discussing the "...shift toward more applied research in recent years, partly because of budget measures and partly to make the research effort both more visible and more accountable" in the public sector, the author of the chapter, "Food and Agriculture," in the 1975 *Economic Report of the President* intimates that "In fact, however, publicly supported research might better

concentrate on basic research, leaving applied research to the private sector." (p. 179)

REFERENCES

1. Paul Wallace Gates, *The Illinois Central and Its Colonization Work* (Cambridge: Harvard University Press, 1934).

2. Samuel P. Hayes, *Conservation and the Gospel of Efficiency* (New York: Atheneum Press, 1974).

3. James B. Hedges, *Building the Canadian West: The Land and Colonization Policies of the Canadian Pacific Railway* (New York: Macmillan, 1939).

4. C. Clyde Jones, "The Agricultural Development Program of the Chicago, Burlington, and Quincy Railroad," Ph.D. diss., Northwestern University, 1954.

5. Richard C. Overton, *Burlington West: A Colonization History of the Burlington Railroad* (Cambridge: Harvard University Press, 1941).

6. Roy V. Scott, *The Reluctant Farmer: The Rise of Agricultural Extension to 1914* (Urbana: University of Illinois Press, 1971).

ENTREPRENEURIAL HISTORIANS AND HISTORY: AN EXPLORATION IN THE ORGANIZATION OF INTELLECT

Steven A. Sass
The Johns Hopkins University

Entrepreneurial history was the central research program of the Committee for Research in Economic History (CREH) when that organization was the most important financier of research in the discipline, from 1941 to 1950. In 1941 the Rockefeller Foundation organized the committee and awarded it $250,000. The funds were to be spent within a period which ultimately became nine years. The committee's purpose was to overcome a crisis in the profession.

The specific incidents which brought on the crisis were the retirement of Dean Edwin F. Gay, the leader of economic history, the outbreak of war in Europe, and the beginnings of an industrial history society.

Until 1936, the year of his retirement, Edwin Gay was the leader of economic history in America. He guided research, cert-

ified the worth of contributions and practitioners, and maintained contacts with other disciplines and with the nonacademic world. He was very influential in the Rockefeller Foundation and controlled much of its financial support for economic history. In addition, he was a leading member of both the National Bureau of Economic Research and the Council on Foreign Relations, a crucial organization for the formulation of American foreign policy. His retirement thus created a large vacuum. The Rockefeller Foundation and the State Department, as well as economic historians, found Gay's counsel of first importance. The CREH was established as a surrogate. Its function was to give the discipline leadership and organization, to maintain contact between scholars and policymakers, and to produce economic historians such as Gay.

The second factor in the crisis was the outbreak of World War II. Before the war the American discipline was dependent on European journals and theories. The only American journal, the *Journal of Economic and Business History,* existed for only four years. American scholarship had been able to generate a solid stream of monographs, but European economic historians supplied most of the interpretive literature. With the outbreak of hostilities Americans felt compelled to assume these professional tasks. In 1940 the Economic History Association was formed and began publishing the *Journal of Economic History.* Many of its organizers also participated in the CREH and in its effort to give substantive direction to research in economic history.

The final cause of the crisis was the threatened organization of an industrial history association. Such an association would convert an essential part of economic history into an autonomous, or at least a semiautonomous, discipline. In the past decade another essential part of economic history, business history, had broken away. By 1940 business history had its own authority structure, professional association, journal, body of sources, problems and model studies. Furthermore, two other specialties, agricultural history and labor history, had been functioning largely independently of economic history for many years. An industrial history society threatened to reduce economic history to a federation of specialties. The CREH sought to reverse this fragmentation.

The roots of the fragmentation, however, were to be found in the basic research program of the discipline. As its subject matter, economic history had taken the development of economic institutions and activities. It was felt that these phenomena were products of mind. In Kantian fashion, economic historians held that such subject matter could not be explained by a deductive axiomatic schema; such universal concepts were out of place in social scholarship. Instead, economic historians tried to produce empirical generalizations which would illuminate the inner logic of their research objects. The scholar would find the patterns which existed in the sources. With the accumulation of such stud-

ies, ever larger patterns should emerge. This, however, did not occur. What happened was the clustering of economic historians by bodies of sources and empirical referents. No larger economic historical generalizations were forthcoming.

The new agents of the discipline, the CREH, developed entrepreneurial history to check this fragmentation and promote the development of a broader understanding of economic history. Entrepreneurial history was the committee's device to organize the discipline's diversity and division of labor. Entrepreneurs, or businessmen, were isolated as the chief research object because they were seen as the main source of economic change, the central figure in economic history. It was hoped that entrepreneurial history could thus provide a common focus for all specialties in economic history. During the life of entrepreneurial history, projects were thus developed in labor-management relations, aristocratic entrepreneurship, the farmer as entrepreneur, the engineer as entrepreneur, and so on.

In order to make such diverse forms of entrepreneurship comparable, entrepreneurial history abandoned the inductive methodology and sought to develop a general conceptual framework. Common aspects of entrepreneurial situations were to be isolated and explored. This, of course, challenged the Kantian position that mind and concrete social institutions were unique and had to be understood as wholes.

Although these elements of the entrepreneurial history program were clearly outlined in 1941, the CREH had a hard time putting its program into effect. In part this was due to the general retardation of research during World War II. Yet even after 1945 there were difficulties in finding a suitable conceptual scheme and in inducing the discipline to engage in entrepreneurial research.

Until 1948 the CREH promoted entrepreneurial history chiefly by granting funds to projects submitted by members of the discipline. Most such proposals were for conventional research. The committee also organized a series of conferences in 1946-47 which were designed to bring the discipline and entrepreneurial history together. This also failed to reorient older patterns of thought and to establish a theoretical and monographic literature for entrepreneurial history. Finally, in 1948, the chairman of the committee, Arthur H. Cole, organized the Research Center for Entrepreneurial History at Harvard using funds from the CREH and the Rockfeller Foundation.

It was at the center that entrepreneurial histories were finally written and a conceptual scheme developed. Here a level of concentration was achieved which allowed the reorientation of the discipline around a common research program. The most important collective conceptual scheme at the research center was Parsonian sociology, a universalistic framework which analyzed value, roles, and sanctions. It was a system which in large part grew out of economic historical work. Both Parsons and his major influence, Max Weber, essentially began their careers as economic

historians. Their points of departure were capitalism and rationality, central concerns of economic historical interpretation.

Although many valuable contributions grew out of entrepreneurial history, it failed to dominate the discipline for very long. In the second half of the 1950s the "new economic history" became ascendant. Part of the decline of entrepreneurial history was due to its own weakness. Its ties to sociology were weak; after 1951 it lacked the resources to draw graduate students; entrepreneurial research was still foreign to traditional economic historians and was pursued only sporadically outside the research center. Within the center, experimentation and exploration were encouraged, diffusing the impact of entrepreneurial research.

On the other hand, the new economic history represented a ver powerful movement. It grew up in economics departments, the customary home of economic history; tortuous interdisciplinary ties were thus avoided. Furthermore, the sociological research of entrepreneurial historians was viewed with increasing scorn by other members of these economic departments. To them, the future of economics lay with the new science of econometrics. These theoretically based quantitative methods made it easier to verify arguments and for scholars to cooperate and build on each other's work. The new economic history was the historical application of econometrics.

The final, and perhaps decisive advantage of the new economic history was its greater apparent social utility. Analytically based quantitative science became the nexus of communication in the new technocratic mode of policy formulation. Thus the contributions of the new economic history flowed more readily into the decision-making process. Entrepreneurial history also tried to address policy issues. Its contributions, however, were poorly adapted to the new mode of communication. Thus leading young scholars and philanthropic foundations flocked to the new economic history.