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Henry Ford and Field and Factory: An Analysis of the Ford Sponsored Village Industries - Experiment in Michigan, 1918-1941

John Robert Mullin

Between 1916 and 1941, Henry Ford embarked on an effort to decentralize the production facilities of the ford Motor Company. One component of this effort was an experiment in which he located seventeen small factories, called Village Industries, in rural areas throughout southeastern Michigan. These factories were designed to utilize water power in the production of sub-assembly parts for Ford's main assembly plants and were intended to provide jobs for rural residents. Ford endeavored to develop a sense of "field and factory" in these plants by training rural workers in the latest technological advances, allowing them release time to farm their fields, and paying them "city" wages. The Ford experiment is important for, despite a significant body of literature calling for the decentralization of industry during this period, there were few efforts that were comprehensively implemented, few which included rural areas, and even fewer that were totally financed by the private sector.

The Village Industries Idea

Henry Ford, beginning in 1918, saw that most major American industries were moving toward national and international markets. He anticipated that there would be fewer companies in each sector of industry than in the past and that these companies would be larger and organized along the lines of vertical trusts. He also foresaw increased competition among the survivors. This meant that industry would have to be extremely cost conscious and would have to move closer to markets, away from areas of high land prices, and to areas of expanding labor pools. With these thoughts in mind, he began a series of maneuvers to decentralize Ford Motor Company activities away from Dearborn and Detroit, Michigan. His plan called for the development of assembly plants in six regions across the nation, three medium size manufacturing plants located in the Detroit Metropolitan Area, four lumber mills in northern Michigan, and seventeen small manufacturing plants located on the outer edge of the Detroit metropolitan area. These last were labeled "Village Industries" by Ford and were to be located primarily in rural areas and small villages in Michigan.[1]

Throughout this decentralization effort, Ford followed a philosophy of relative economic pragmatism that was, on the whole, similar to that of other leading industrialists. His main assembly plants were located in urban areas where labor and supplies were readily available. His sub-assembly manufacturing plants near Detroit were close enough to the Highland and Rouge Plants for vertical integration to occur. His lumber mills were located in forest lands that were both plentiful and relatively close to the Ford centers of production.

It is the Village Industries component of Ford's decentralization efforts that separated him from other leading industrialists of the period. Beginning in 1916, Ford had become increasingly concerned over the polarization between rural life and agricultural production on one side, and urban life and industrial production on the other.[2] He also noted that both rural and urban workers had extensive periods of underproductivity.[3] After pondering this problem, he determined that there was no legitimate economic or social reason for this polarization and that efforts should be

undertaken to unite rural communities with the technology and industrial production that was commonly found in cities.[4]

Guiding principles

Ford's idea was tested in 1918 and became part of an informal program in 1921. He never established a formal series of published principles that were to guide the development of the Village Industries. However, from his writings and those of his spokesmen, it is possible to construct a set of principles that were critical to their development. These are noted below.

First, and most basic, Ford wanted to create an environment in which technology, modern production, and agriculture could coexist.[5] Thus, the Village Industries factories had to be located in areas where farm land was plentiful. This meant that both suburban and urbanizing areas were to be excluded. It did not mean, however, that his workers had to own their own land. Rather, it meant only that there had to be sufficient land available for them to farm if they so desired.

Second, each factory would have to make maximum use of nearby rivers for energy purposes. Henry Ford was concerned about the high cost of energy and intrigued about methods of harnessing water power for his factories. He saw the dams that powered the nineteenth century mills of America as having great replication in the twentieth century. In fact, at the start of the Village Industries Program, Ford insisted that all plants rely solely on hydropower for their energy needs.[6]

Third, the factories had to be located close enough to the main assembly plants to ensure that their products could be transported cheaply and efficiently. Thus, the Village Industries factories had to be located within easy commuting distance of the Rouge and Highland Park Plants and the products of the factories had to be small and light enough to be shipped efficiently. Sub-assembly items such as valves, horns, regulators, switches, taps, and gauges fit this requirement.[7]

Fourth, the first jobs in the new industries were to be made available to unemployed residents of the rural areas.[8] Ford was concerned about adding new residents to these communities without contributing to the employment needs of the current residents. At the same time, fully realizing that the Ford Motor Company paid "top wages", he did not want to "steal" workers from well functioning plants and businesses. Thus by focusing on unemployed residents, he felt that the factories would not be disruptive to the existing micro-economic climates.

Finally, the Village Industries factories were to be an integral part of the Ford Motor Company's production system. They were to build sub-assemblies that were to be used in Ford products and that met efficiency, cost control, quality control, and time control standards.

Over time, these principles were modified as local conditions and Ford Motor Company priorities changed. However, the basic intent of the principles was at least initially applied in each of the Village Industries projects.

The Experiments

Ford first experimented with his concept in the village of Nankin Mills in 1918.[9] The company purchased an old gristmill located on the Rouge River, rehabilitated the mill building, and revitalized the dam to generate the power needed to run the plant. The interior of the old mill was totally gutted and turned into a modern factory. The plant employed twelve men (who worked small farms during off work or down times) on each of two shifts.[10] These workers manufactured screws, which were easily transported to the Highland Park Plant, approximately twelve miles away. The Rouge River at this point was little more than an intermittent stream. Thus, the Ford Motor Company had to rebuild the dam and provide a new headrace, sluiceway, water catchment area, and power generating equipment.

The Nankin Mills equipment, while not actually part of the Village Industries Program, set the tone for the decentralized village factories that followed.[11] For example, Ford had a strong desire to locate his factories in abandoned or underutilized old mill sites.[12] In many instances he actually revitalized the old mills, while in others he simply utilized the site and revitalized the dams nearby. Also, most of his plants were located adjacent to streams where hydropower could be used. The resultant lakes created by these ponds were landscaped and made available for recreation purposes. Finally, the majority of employees were rural residents who worked their own farms or garden plots (often provided by Ford) after working hours.

Ford never developed a formal plan. David Lewis, Professor of Business History at the University of Michigan, in correspondence with the author, stated that such a decision would have been highly uncharacteristic of Mr. Ford's style of management.[13] In fact, he often acted impulsively in deciding where the plants should be located. Anne O'Hare McCormick, writing in the *New York Times Magazine*, summarized Ford's decision making as follows:

> He sees the world sadly out of plumb, and because he moves by instinct he is trying to work out not by formulation but on the ground what he calls a sample of a better scheme. He began on the farm and he knows something real is to be found there.[14]

There is little historical documentation to indicate what factors Ford examined before he selected his sites. However, in response to a woman requesting that he consider building a small factory on the Walkill River, near Walden, New York, he wrote that the following information was important: a description of the site; the speed, width, depth, and ownership of the stream; the distance from the site to major railroads, highways, cities, and towns; and finally, the cost of purchase.[15]

Between 1918 and 1936, Village Industries were built on the Rouge, Raisin, and Huron Rivers. In the early years (1918-1925), emphasis was placed on sites near the Rouge River. In addition to Nankin Mills, plants were placed at Northville (1921), Phoenix (1922), Plymouth (1923), and Waterford (1925). The Northville plant represented the first project of what came to be called the Village Industries Program. All of these plants used hydropower to some degree, while three were built on the sites of old mills.[16]

Unlike the Rouge River factories, the first two plants developed on the Huron River were quite large. The sites were in Flat Rock and Ypsilanti. Built in the early

1930s, they reflect hybrid characteristics, combining traits of the huge Rouge Plant complex and the newer village sites. By 1935, each plant housed hundreds of workers and relied heavily on water power taken from the powerful Rawsonville Dam located well away from the factory sites. Yet, Flat Rock was a village of 1,231 people in 1935. In addition, over 4,000 acres of Ford-owned farm land were close by the Ypsilanti site.[17] Ironically, Ford Motor Company officials themselves could not decide whether or not these were truly Village Industries.[18]

After 1935, Henry Ford moved more vigorously in implementing his Village Industries concept across Michigan. Another plant on the Rouge River was built at Newburg (1936). On the Raisin River, plants were located at Tecumseh (1935), Dundee (1937), Brooklyn (1937), Sharon Hollow (1939), and Manchester (1941).[19] These plants were small, employing eighty men at most, and were located in villages with populations of two thousand people or less. Sharon Hollow, for example, had a population of twenty-five people in 1939.[20]

The plant at Tecumseh deserves particular mention for it represented a major bridge between agriculture and technology. Ford saw the soybean as a wonder crop. He financed extensive scientific research efforts to make the crop useful both as a food and as a basic component in manufacturing (i.e., Ford used soybeans in the manufacturing of plastic parts for his automobiles). To this end, he built several plants that were designed to collect, clean, and process soybeans. The Hayden Mill at Tecumseh represented his first effort.

Finally, plants were built on the Huron River at Milford (1938-1939) and Willow Run (1940-1941), and on the Saline River at Saline (1938) and Milan (1938).[21] The two plants on the Saline, like the Tecumseh plant, were built for soybean processing. The Milford plant illustrates the degree to which Ford followed his "local hire" policy. All but three of the three hundred employees lived within five minutes of the plant. Further, the Milan factory employed 10 percent of the community's two thousand residents.[22]

It is clear that the principles developed by Ford were, on the whole, implemented. Almost all the factories were located in small villages or towns; were located close to rivers and used hydropower for part of their energy; created sub-assembly components to be shipped to larger plants; and at least initially, employed a large number of farmers who lived within the vicinity of the village where the plant was located. Perhaps the largest separation between principle and reality occurred when several of the factories became quite large and out of scale with their surroundings. The Northville (300 employees), Ypsilanti (738 employees), Milford (350 employees), and Flat Rock (500 employees) factories all had large facilities that did not fit the initial concept.[23] The Michigan sites were considered as simply the beginning of a major Village Industries decentralization effort. The *New York Tribune* reported that the concept was intended to be exported to England and other countries.[24] An article in the *American Machinist* (April 27, 1937) stated that the Ford Motor Company was planning fifty additional sites in Michigan alone.[25]

In 1938, Ford executive Ernest G. Liebold developed a list of 212 potential Village Industries sites across the country.[26] Further, it appeared that wherever Henry Ford visited, there were rumors that a new Village Industry would be developed. An editorial in the *Elyria (Ohio) Telegram* summarized Ford's impact as follows:

> Let Ford visit any place and immediately a story flashed over the wires that he is visiting that locality looking over sites … For the past few years there have been more communities in the country which were supposed to be under the watchful eye of Henry Ford to upbuild and advance their interests than could comfortably be counted on both hands several times.[27]

This idea was also reported with some exaggeration in a page one article in the *New York Times*: "Henry Ford plans to build a factory on every water power site he can obtain in Michigan".[28] Ford was highly interested in being able to purchase potential sites across the state without having to deal with speculation minded or recalcitrant site owners. He petitioned the Michigan State Legislature to pass a bill that would allow him, working through the State of Michigan Public Utilities Commission, to expropriate up to 25 percent of the land adjacent to dam sites for his factories. It was passed.[29]

Impacts

Community Impacts

The impact of the plants on the local communities was generally positive. Certainly the most beneficial feature of the factories built in the 1930s was that the Ford Motor Company was expanding its Village Industries and creating new jobs in the midst of the Depression. These jobs were in many instances the only non-farming employment opportunities in the smaller communities. For example, in Dundee, Ford rehabilitated a mill that was the last of a nineteenth century complex of eleven industries. The impact on the village of Brooklyn was perhaps the most positive. The Ford Motor Company hired eighty villagers for its new factory in 1939 at the minimum wage of $6.00 per day. This contributed substantially to a decrease of families on the village welfare roles from 75 percent to less than 5 percent.[30] As W.J. Cameron wrote: "In more than one instance during the Depression Years the establishment of a little Ford industry has been the economic salvation of the town".[31]

Ford attracted several types of people to the plants. The first group was the locally unemployed. To them, the coming of the Village Industry was a virtual economic life saver. The second group was made up of underemployed farmers. With many lean years occurring in the 1920s and 1930s, the opportunity to continue farming had great appeal. The *Christian Science Monitor* noted the appeal as being "country life at city pay".[32] The final group consisted of urban residents who wanted to "return to the land". Ford, while somewhat supportive of their intentions, wanted to attract local workers first. Thus, he made it more difficult for the exurbanites by requiring them to establish residency before becoming eligible for employment.[33]

The plants, on the whole, were designed to fit within the context of the villages without inducing large-scale change. There was no intention of creating an economic boom, developing a loud statement that a new life was at hand, or introducing a new work ethic to the residents. Henry Ford also made it clear that he was not building model villages, utopian schemes, or paternalistic company towns.[34] There were no comprehensive attempts to gain political control of the villages, to build company housing for the workers, to provide company stores, or to encourage rural electrification or water systems, and there was no effort to organize farmers to cooperatively buy supplies or sell produce. When a village obtained a new facility as a result of the location of the factory, it was largely due to the fact, with few exceptions, that the Ford Motor

Company needed the facility for its production or image. Henry Ford was quite clear about his perceptions of improving the local quality of life at the expense of his company: "Social benefits are merely the by-product of efficient business management".[35]

As well, great care was taken such that village – company relations would not become strained. For example, Ford Motor Company officials realized that the siting of their plants had the potential to raise the cost of local land, goods, and wages. The merchants of Northville were particularly concerned with this issue. Indeed, their concern in retrospect, appears to be highly justifiable. The arrival of an automobile plant, regardless of how small, expanded markets and created new jobs for local suppliers and merchants. Predictably, cheap farm labor would be attracted to the plants thus creating a labor problem on the farms, while property values and property tax payments would be increased. Ford attempted to address this issue by stating that he would hire the unemployed first so that local employers would not lose their workers. Also, he adopted a policy that stipulated that no villager would be hired unless he had six months residency in the community. This tended to decrease the flow of new residents to the villages and to slow down the rate of increase in property values. Over time both policies were relaxed. In addition, he developed a program of decentralized purchasing that allowed local merchants to gain a share of the Ford Motor Company business. Fortune Magazine reported that in 1933, the Ford Motor Company was purchasing supplies from 5,300 sources.[36] This figure represented an increase of approximately 3,000 sources in three years.[37] Data on direct purchases from rural areas or the Village Industries communities is scarce. However, in 1935, fifteen rural suppliers with 302 employees sold one million dollars in goods to the company.[38] In sum, to quote Henry Ford himself, "We have never put a plant anywhere without increasing the purchasing power of the community nor without increasing our own sales in the community".[39]

The Ford Motor Company provided many services to the towns and villages in which it located, although almost always with its own interests in mind. For example, in Nankin Mills the company furnished free electricity and water. At Flat Rock, the company built a bridge for the Detroit, Toledo, and Irontown Railroad (owned by Ford) and a road for the public. The company also paid most of the cost of a one-million gallon capacity reservoir (used by the Ford factory). In Milford, Ford undertook a "beautification program" that included the removal of unsightly homes and a junkyard (near the Ford factory). In several instances Ford directed that local landmarks be restored. For example, the Nankin Mill (Nankin Mills), the Dubuar Mill (Northville), the Schuyler Mill (Saline), and the Hayden Mill (Tecumseh) were all either abandoned, dilapidated, or decayed prior to Ford's arrival. Ford restored and modernized the structures such that they again became symbols of community pride. In other instances he built modern plants that were in careful harmony with the environment. Such was the case with the Bauhaus-influenced low-slung structure which replaced the old mill at Northville (1937) and the Art Deco-influenced structure at Milford. In both cases, the siting of such structures in these "backwater" areas, particularly during the Depression, resulted in a significant uplifting of community spirit.

The second key feature was that Ford developed schools in most of the Village Industries communities. These were normally one-room schools where students from grades one through twelve were taught a strong curriculum of practical knowledge. Ford, known for his famous phrase "history is bunk" did not see much merit in learning merely

for the sake of learning. He urged that the curriculum emphasize vocational knowledge, leadership training, and technology.[40]

Ford's views of the interface between village and factory can best be summed up by a question put to him by Drew Pearson in 1924: "Do you intend to build any model towns in conjunction with your village factories …?" Ford's response: "No, I am against that sort of thing. I believe that if people want to get things done they can do them themselves. Cooperate with them, but don't hamper them."[41]

The Impact on the Ford Motor Company

During the War Years (1941-1945), three additional factories were built at Hayden Mills, Cherry Hill, and Clarkston. The Hayden Mills Project was particularly unique in that it was sparked by Ford's interest in the Dynamic Kernals Project – a religiously inspired method of growing and reaping wheat in a "record breaking" manner.[42] It was to be Ford's last unique venture with the Village Industries.

Several reasons may be offered for the ending of the effort, including Ford's age (he was eighty years old when he participated in the last Village Industries Project), the fact that a new management team had taken over the Ford Motor Company in 1946, and that the Village Industries Program was never an official activity of the Ford Motor Company operations staff.[43] Indeed, the program was often referred to as one of Henry Ford's hobbies.[44] This last point can be clearly understood when one realizes that both the archives of the Ford Motor Company (one of the most complete corporate record centers in the United States) and the Henry Ford Museum in Dearborn have virtually no primary material on the Village Industries.[45] They were truly a personal project of Mr. Ford's.

There were also problems concerning the productivity of the industries. Henry Ford stated that it was critical that his Village Industries use maximum water power and that the workers be given maximum release time to work in the fields. These two policies often did not coincide with the needs of the larger Ford company production system. Two key factors bear this out. First, it is a dictum of industry that production needs determine spatial requirements. Ford, in the case of the Village Industries, took the opposite view; that the size of the plant and the energy capacity of the river determined the product to be developed. If the dam on a site could only generate fifteen horsepower, then that would determine how many people would work at the site and what could be produced at that plant. In fact, Ford regularly employed a standard equating one unit of horsepower with one worker.[46] Second, production needs and available water power did not always coincide. Ford maintained that this was not a problem because, when water power was not available, his workers could work at their farms.[47] Unfortunately, low water did not always coincide with the growing season. Perhaps more important, low water power meant that production schedules could not be met. Over time, many of the sites with low water problems were allowed to use supplemental power generators.[48] Also, the number of farmers released for field work declined over time.[49]

Thus, it is clear that the sites were not developed purely for production reasons. In fact, with Ford's insistence that water be the primary power source, one could state that the plants were built as a message that the Village Industries concept could work, and only secondly as a key element of the Ford Company's production system.

Whether the Village Industries program ever made a profit for the Ford Motor Company is not clear. In fact, it is impossible to obtain any data on the cost effectiveness of the program because records dealing with the efficiency of the program were not kept. To quote Nevins and Hill: "Nobody had any financial authority over the Village Industries which Ford operated for personal satisfaction. We can only guess at their gains and losses."[50] Henry Ford did keep partial records on production output and production costs (which were regularly released to the press) but no efforts were made to assess the relative economic cost and benefits of developing decentralized Village Industries as opposed to housing the operations in larger plants. David Lewis stated that Ford did not even count what he spent on the factories.[51]

The Impact beyond the Communities and the Ford Motor Company

The Ford concept was not replicated by any other large scale business in the United States. However, officials from the governments of Germany, France, and even the United States were influenced by the concept. In Germany's East Prussia, a land-rich but underpopulated section of that nation, the government saw the concept as a means of attracting industry and people to the area. The factory was to serve as the focal point of the village, with housing in close proximity and lands for farming purposes on the fringe. The governor of East Prussia, Gauleiter Erich Koch, was a strong advocate of industrial decentralization and saw much merit in the Nazi Settlements Office's plan to de urbanize the nation.[52]

In France, Le Temps of Paris published an article stating that Marshal Petain had noted Ford's plans and was proposing to scatter small industrial sites throughout France as a means of minimizing the impact of possible enemy artillery and bombing attacks.[53]

Finally, Harry Hopkins, Director of the Federal Emergency Relief Administration, saw the Ford approach as an effective measure to relieve the unemployment problems of urban poor. Hopkins went so far as to state that "It would be a good thing for America if large cities disappeared and their industries were scattered in a thousand small communities".[54] Also, Rexford Tugwell, Director of Roosevelt's Resettlement Administration, praised Ford's concept in general stating that it represented "Henry Ford at his best".[55] The Ford approach was at least partially integrated into the new village program of Franklin Roosevelt's Farm Security Administration (FSA). For example, in 1936, the FSA developed the Village of Jersey Homesteads (now called Roosevelt). It included 1200 acres of woodland, 200 homes, a garment factory, and a 600 acre farm. The FSA rented the units primarily to New York City based garment workers who were expected to work nine months in the factory and three months in the field.[56] Unfortunately, the idea did not work, for there was little commitment to the farming enterprise and, as soon as the economy improved, workers went back year round to the factory. Other similar efforts of the federal government to mate field and factory met similar fates.[57]

Ford as Communitarian Theorist

What prompted the development of Ford's Village Industries idea cannot be accurately determined. However, business historian David Lewis maintains that Ford's

good friend Thomas Edison probably provided a great deal of encouragement.[58] Historian Reynold Wik has written that Ford may have been influenced by the architect Edgar Chambless who wrote a polemic calling for the decentralization of cities and the creation of linear communities along major highways in the country.[59] Chambless described his concept as a "linear city through the country". His text, full of anti-urban rhetoric, suggests that cheaper land in the country would attract the firms, that urbanites would gain from a sense of nature, and that the evils of urban life would be eliminated.[60] The similarity between Ford's views and those of Chambless will be noted below. However, as with Edison, a direct tie cannot be ascertained.

Ford and the City

It is clear that Henry Ford's motives were at least partially based upon a strong distaste for the city. At some times this feeling was expressed in purely economic terms while at others it simply reflected a feeling that such places were unfit habitats for American citizens. Concerning his sense of economic pragmatism, Ford regularly pointed out that the city was too costly a place to undertake business. It was a place of high land cost, inefficient infrastructural systems, radical worker behavior, and a lack of commitment to one's home and workplace.[61] All of Ford's points were at least partially accurate, yet the argument that Ford put forth was not strong enough to cause him to reject the city as a place for production. In fact, while Ford was building his Village Industries, he was also expanding his urban plants. For example, his Rouge Plant located in Detroit housed, at maximum, over 103,000 workers. By the end of the 1920s, the Rouge Plant was the largest factory in the world.[62] Thus, in an economic sense, while Ford saw much that was wrong with the city, he did not reject it as a place for his operations. This point was often reinforced by Ford company writers who regularly commented that Ford's goal in decentralizing his factories was simply to improve efficiency.[63] They also pointed out that this could be accomplished through a synergistic relationship between the decentralized rural factories and the centrally located urban plants. Finally, Ford made the point that the city plants made possible the opportunity to create the Village Industries.

Concerning Ford's personal views of the city as a place to live, his opinions were often expressed far less rationally than in his economic argument. His writings and those of his surrogates regularly portrayed the city as being transitory, soulless, artificial, pestiferous, and parasitic.[64] At times, his writings and those of his spokesmen even called for the abandonment of the city and the creation of new forms of community (i.e., "We shall solve the city problem by leaving the city").[65] Drew Pearson, following an interview with Henry Ford, summarized Ford's views without regard for accuracy, as follows: The big city is doomed. In the America of the future, there will be no New Yorks or Chicagos or other mammoth collections of skyscrapers and teeming tenements in which millions of people are cooped within a few square miles of territory. Instead, the country will be traversed by chains of small towns clustering around individual factories and inhabited by people who will divide their time between factory and farm. This is the vision of the future which was pointed out by Henry Ford.[66]

At the same time, Ford also held strong pro-agricultural values. Ford Motor Company publications regularly described the worker in the Village Industries as being

"strong, committed, dedicated, and family-oriented". He (never she) was portrayed as being "one with the soil". Indeed, even patriotism and nationalism come into play: "With one foot in agriculture, America is safe".[67] Nevins and Hill quote Ford's personal view on agriculture as follows: "I am a farmer …. I want to see every acre of the earth's surface covered with little farms, with happy, contented people living on them".[68] *Literary Digest*, commenting upon Ford's desire to modernize the farm and decongest the city, wrote: "Henry Ford wants Cowless Milk and Crowdless Cities".[69] Ford's anti-urbanism can be interpreted as simply expressing a long-held belief that the city was an un-American institution – a theme that has remained relatively constant among American intellectuals from the time of Hamilton and Jefferson through the Ecotopians of the 1970s.[70] His anti-urbanism was mainly expressed through diatribes written on the pages of the Dearborn Independent, a newspaper owned by the Ford Motor Company and with a weekly circulation of 250,000 readers. The Whites, in their book The Intellectual Versus the City, noted that the anti-urban writings of Ford and his surrogates had a distinctly Emersonian ring: "The city … lacks a soul; it is artificial; it is not a community; it should be abandoned for the country; it is absolutely dependent on the country; it is doomed to extinction …."[71] It is also interesting to note that the Whites, upon concluding their thoughts about Ford, stated the following:

> The fact that so many intellectual figures who occupy our national pantheon said more in opposition, to city life than they said in praise of it is responsible for the fact that today's city planner in America finds no powerful intellectual tradition of love for the city to which he can appeal.[72]

Which of the above-noted ideological beliefs held primacy? Was Ford's ideology more from a personal sense of anti-urbanism, a love of country life, or economic pragmatism? On one hand, Ford argued that all of his decisions concerning the development of the Village Industries were based on the need to improve the production cycle. As spokesman Cameron noted: ". . . utilization concerns held primacy over humanitarian issues".[73] Yet production was regularly subordinated to such seasonal conditions as low water, farming operations, the size of local factories, and the availability of local labor. These four factors regularly interfered with the synergistic relationship between the Village Industries and the large plants. Indeed, as long as Ford maintained that these factors were important, the Village Industries could never become efficient, integrated centers of production. Similarly, one cannot state that anti-urbanism alone was the key motivating factor because Ford saw the need to maintain the city as a center of production. Indeed, the city, as previously mentioned, made the constellation of Village Industries possible.

It appears that the most critical feature was his strong desire to promote rural, agrarian life in the context of a modern, technological society. The theme of rural life as being optimal is a constant in his writing. He also noted that rural life needed to be enhanced and his Village Industries, in one sense, could show how this enhancement could occur. Descriptions such as "family-oriented, loyal, back-to-nature, home owners, disciplined, hardworking and patriotic" were regularly applied to his village workers (and never to those working in the urban plants).

In sum, his beliefs were more of a mosaic of loosely connected and sometimes contradictory ideas than a "cast in stone", dogmatic set of ideological principles.

The Question of Territory

Henry Ford's program was very much concerned with the future of the small, rural, agrarian town. More specifically, the flow of jobs and people to the city, the lack of intellectual activity in rural areas, and the failure of rural areas to provide steady jobs for rural residents were issues of concern. He felt that by strengthening the small town, the entire region and the nation could benefit. For this reason he took several key actions.

First, he endeavored to strengthen the symbolic meanings of the rural village. His factories were not meant to dramatically change the character of the communities in which they were located but to provide work alternatives, to maximize production opportunities for local residents, and to fit into the existing aesthetic character. One can best understand his quest to create a territorial relationship by examining the design of his structures. Not one of the revitalized mills or new structures was designed to dominate or announce change. Rather they represented commitment and dedication to the old values upon which the villages were originally founded.

Next, Ford endeavored to interact positively with the local political leadership. While never with the direct intention of contributing to the commonwealth, Ford plants were often built in such a way as to provide recreational resources, schools, dams, electrical power, and water resources for the local populace. These were not always free to the villagers but they were always a bargain. Ford was attempting to show that his company was not merely located in the community but, rather, was indeed part of the community. It was accurately perceived by Ford that new values, new people, and new buildings would result in the transformation of the village. To prevent this, great care was taken to insure that the political structure remained as it was prior to the development of the Ford factory.

Perhaps most important, his effort was part of an attempt to create economic spaces. Continued reliance on agriculture alone in these areas would result, he thought, in little more than increasing the flow of people from rural areas to the city and exacerbating existing cultural differences. By introducing new jobs, new technological challenges, and the opportunity for better education, Ford felt that these villages could culturally and economically reassert themselves. The key element in this regard was, again, to create a balanced community where economic choice would lead to increased technological understanding and where the tie between village and city would decrease the sense of rural isolation.

Ford, Technology, and Escapism

Ford saw that the hope for rural areas rested in the residents gaining a sense of modernism and accepting the use of technology as a means to stimulate cultural, social, and economic fulfillment. At no time was he, like the German anti-urbanists of the same period, calling for a retreat from modern society to medieval values and community forms.[74] Instead, his ideas related to the need to accept technological change.[75] At times, Ford was portrayed as putting too much trust in technology and scientific determinism. Aldous Huxley, in his rejection of the tendency of contemporary society of the 1930s to rely on scientific determinism, uses Ford as his arch-villain.[76] Further, as architectural historian Peter Batchelor writes: "Who . . . could ask for a more potent symbol of man's

supremacy over the inexorable forces of history and culture than Henry Ford and his legions of Model T's".[77]

Nor were Ford's ideas escapist. He did not see the need for the creation of communities that were self-sufficient and independent from the regions in which they were located.[78] The emphasis in his writings was that the city, suburbs, rural villages, and hinterland were all part of one system.[79] This system, to function efficiently and equitably, had to distribute wages, intellect, technique, and culture on a more even basis throughout the region. Ford's program, ideally, was designed to contribute to this end.

His ideas were quite opposite those of the Garden City advocates, who were arguing for new communities that were separatist, self-sustaining, cooperative-oriented, and located on the urban fringe. There were three key differences. First, Ford rejected the idea that new communities were necessary.[80] New communities, he felt, lacked the soul, commitment to place, and sense of tradition that could be found in existing villages. In effect, the building of new communities would result in a "back to the land" philosophy in which urban values would be transferred to rural areas. There would be no strengthening of rural society as a result of this approach. Second, new communities would not be contributing directly to either the production system or the economic base located in existing communities. Instead, they would be adding new systems and competing for similar markets. Finally, Ford objected to the government manipulation that would have to occur in order to make these communities work. To make decentralization work, it had to be accepted by the people who were the recipients of the new factories – not a higher authority. In sum, he felt that the intrusion of new work opportunities, new technological advances, expanded intellectual challenges, and an increase in wages into existing communities would negate the need to start anew.

Ford and Friends

Elements of Ford's ideological perspectives can be found in the pastoral thoughts of Longfellow, the anti-urbanism of Emerson, and the utopian perspective of Chambless. His belief that technology could lead to an improvement in society places Ford in agreement with the writings of the sociologists Cooley and Giddings, the philosopher Dewey, and the industrialist Carnegie. As well, his Village Industries were compared with the New Harmony, Brook Farm, and Oneida experiments.[81] Perhaps most uniquely, there was, in the case of the Tecumseh factory, even a flirtation with a literal interpretation of the Bible.[82]

Yet Ford's ideas on decentralization and the need to maintain and enhance rural life most clearly match the communitarian thoughts of Peter Kropotkin, author of Fields, Factories and Workshops.[83] Kropotkin, a Russian-born anarchist, was concerned with the collapse of rural culture. To prevent this, he advocated the creation of regions in which loosely connected communes would be developed. These communes would have both agricultural and industrial work opportunities and would utilize modern technology to the fullest extent. Kropotkin emphasized the need to integrate agricultural and industrial labor, the need to prevent a dehumanizing labor environment by providing work alternatives, and the need to de-isolate rural areas from our cities through the use of technology, communication, and group intelligence.

While Ford and Kropotkin did not agree on the proper form of government or the economic basis of society, their ideas on village industries closely matched. Indeed, Lewis Mumford linked Kropotkin's thoughts and Ford's actions when he wrote: . . . although a great part of mechanical industry is burdened with overproductivity – which it recovers from by periodic shut-downs at the expense of the workers – it waited the suggestion of Peter Kropotkin, and the technical innovations of Henry Ford, actually to hold out the prospect of an environment in which industrial idleness might be bridged over by a certain sustaining minimum of agricultural labor.[84]

Fortunately, Kropotkin's writings have influenced communitarian theorists including Geddes, Howard, and Mumford. Unfortunately, Ford's ideas have been largely forgotten or ignored.

A Legacy?

The Village Industries idea did not have a direct sustained influence upon city or regional planning or upon the Ford Motor Company. In fact, beyond the writings of members of the Regional Planning Association of America (i.e., Mumford and Chase) and the Whites, the world of planning theorists and practitioners did not even take note of the Ford accomplishment.[85] The Ford Motor Company began closing the Village Industries shortly after Henry Ford stepped down from the presidency of the company in 1945. At that time, the company began to introduce strict cost accountability procedures and found that most of the factories were not operating in an optimal benefit/cost position. Five were still in operation in the mid-1950s, three in the mid-1960s, and only Northville remains today.[86]

Yet the idea has theoretical importance to both historians and planning theorists primarily due to two facts. First, it was actually implemented. Examples of implemented, large scale, comprehensive efforts at decentralization during this period, in contrast to proposed attempts, are few. Examples of privately financed efforts are even fewer. Second, using the work place as a fulcrum to reduce the cultural, technological, and economic differences between field and factory represented a unique method for stimulating a stronger sense of regionalism.

The concept has as much, if not more, relevance today than in the 1920s and 1930s. Urban and suburban sprawl continue and agricultural lands are being increasingly subjected to development pressures while Americans are more desirous than ever of living in small towns. Industry continues to decentralize to the sunbelt and the far West but, even then, rarely to the smaller towns. It is only the incubator industries that seem to locate in villages. This small, self-started, but underfinanced group of risk takers provide a large share of American jobs and yet are virtually unnoticed.[87]

It is rare when one of the top multinationals or America's *Fortune* "five hundred" firms decides to build in rural areas. It is even more unusual when scaled down, integral production components are placed in small towns. What is most surprising is that, while Ford chose to develop hydropower and to build small scale plants in an age of energy abundance, so few firms, in an age of skyrocketing power costs, choose to ignore the use of this source for their power. Rural areas and small towns, with their desired quality of life and often cheap energy sources, can have much to offer American industry. Indeed, while Ford's experience hasn't taught us much to date, perhaps it will tomorrow.

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[1] There was never an official list of Village Industries. Some authors and historians make reference to sites in Ohio, Minnesota, and New York. These sites, while exhibiting characteristics of Village Industries, were not as intimately associated with Henry Ford himself as those in Michigan and therefore have been left out of this article. Also, sites were developed after 1941. These are noted later in the paper. These sites represented the last group of Henry Ford's experiment and, in terms of innovation, added little to the experience. For this reason, they are underplayed in this article. For a summary of the total Ford decentralization program see the report entitled *One Foot in Industry and One Foot in the Soil* written by A. Hurford Crosman of the American Friends Service Committee and Mr. Gerry of the French Rural Reconstruction Agency following a five day visit to Ford plants in July 1945. It is in the Ford Archives, Dearborn, Michigan.

[2] Very little is known concerning what actually stimulated Henry Ford in developing the Village Industries idea in 1916. Nevins and Hill wrote that the Village Industries "embodied a dream that he had cherished before World War One". See Allen Nevins and Frank E. Hill, *Ford: Decline and Rebirth* (New York: Charles Scribner's Sons, 1962), p. 72. W.J. Cameron wrote that: "The idea originally came to Mr. Ford in his frequent drives through the country, as he passed the places where the early settlers established their mills run by water power. He has a very high respect for the ability of those settlers to pick the right spot." See W.J. Cameron, "Decentralization of Industry", a speech given at the semiannual meeting of the American Society of Mechanical Engineers, Detroit, May 17-21, 1937. Reprinted in *Mechanical Engineering* 59, 7 (July 1937): 483-487.

[3] This concern was expressed in an interview to *New York Tribune* reporter Wilbur Forest five years after Ford began to implement his idea. See Wilbur Forest, "The Secret of an Interview with Henry Ford: Lucky Reporter Had Appearance of a Mechanic", *New York Tribune* (February 20, 1921), Part 8, p. 1.

[4] The earliest analytical explanation of Ford's idea came in 1924. See Paul V. Kellogg, "The Play of a Big Man with a Little River", Survey Graphic 52, 1. (April 1, 1924): 14.

[5] Harold N. Denny, "Times Good, Not Bad, Says Ford; Sees the Dawn of a Bright Future", *New York Times* (February 1, 1933): 1-3. This article provides an excellent summary of Ford's perceptions of the role of the machine in the future.

[6] There is an interesting story involving a decision by Clarence Avery, Director of the Village Industries Program in the early years, to provide back-up power generators for one of the plants when water supply was insufficient. Avery determined that a Lincoln engine was needed. Ford, upon hearing of Avery's directive, became highly agitated and ordered the generator part of the engine to be sent to Avery's house and left overnight. Nevins and Hill quote Ford's response as follows: "We built these plants to run on water power …. When I want any other kind of power in I'll let you know how to do it." See Nevins and Hill, *Ford: Decline and Rebirth*, p. 228.

[7] For a list of the products see "Village Industries By Little Rivers," *Ford News* 16, 4 (April 1936): 70.

[8] Paul Kellogg, "The Play of a Big Man", p. 17.

[9] "Small Ford Plants on River Rouge Become Efficient Production Units", *Ford News* 5, 5 (May 1925): 3.

[10] Ford Motor Company, *Data on River Plants* (May 2, 1935), a Xerox copy found in the Ford Archives, Dearborn, Michigan.

[11] Cameron, "Decentralization of Industry", p. 485.

[12] Among these were the Nankin Mills, Dubuar Mill, Schuyler Mill, and Hayden Mill.

[13] Letter from David Lewis to John R. Mullin, August 10, 1981.

[14] Anne O'Hare McCormick, "Ford Seeks a New Balance for Industry", *New York Times Magazine* (May 1929): 4. Also see Anne Jardin, *The First Henry Ford: A Study in Personality and Business Leadership* (Cambridge: The MIT Press, 1970).

[15] "Invites Ford to Walkill: Walden Woman Suggests that He View Water Power Chances", *New York Times* (February 12, 1922): 21.
[16] See "Little Plants in the Country", *Ford News* 16, 7 (July 1936): 127-128, 137; "Small Ford Plants on the River Rouge Become Efficient Production Units", *Ford News* 5, 5 (May 1925): 3; and Arthur Van Vlissingen, "The Big Idea Behind Those Small Plants of Ford's" *Factory Management and Maintenance* 96, 4: (April 1938): 46-50.
[17] "At Ypsilanti", *Ford News* 17, 4 (April 1937): 66-68, 76.
[18] See W.J. Cameron, "Decentralization of Industry", A speech given at the semiannual meeting of The American Society of Mechanical Engineers, Detroit, May 17-21, 1937. Reprinted in *Mechanical Engineering* 59, 7 (July 1937): 484. Also see W.J. Cameron's speech before the Seventh International Management Congress, New York, September 19, 1938, as summarized in the *New York Times* in an article entitled, "Ford Aide Tells Rural Plant Gains" (August 21, 1938), Section 3, p. 7.
[19] "Industry in the Country", *Ford News* 28, 4 (April 1938): 81-83.
[20] "Sharon Hollow", *Ford News* 19, 8 (August 1939): 185, 187.
[21] "A New Farm Market", *Ford News* 18, 9 (September 1938): 195-196; "Milford: Another Village Industry", *Ford News* 19, 9 (September 1939): 204, 213; and "Milan: Another Village Industry", *Ford News* 19, 3 (March 1939): 53-54, 69.
[22] Milford Historical Society, "Milford Carburetor Factory", a typed report from the files of the Milford Historical Society sent by Marjorie J. Bournes to John R. Mullin (May 1, 1980), p. 1. Also see letter from Andrea Rumps, Milan Town Librarian, to John R. Mullin (April 17, 1980), p. 1.
[23] Ford Motor Company, *Data on River Plants*, p. 1.
[24] Wilbur Forest, "The Secret of an Interview with Henry Ford", p. 1.
[25] Burnham Finney, "Ford Decentralization", *American Machinest* 81 (April 21, 1937): 320.
[26] Nevins and Hill, *Ford: Decline and Rebirth*, p. 73.
[27] As quoted in David Lewis, *The Public Image of Henry Ford: An American Folk Hero* (Detroit: Wayne State University Press, 1976), p. 163.
[28] "Ford Plans a $100,000,000 Power Project to Give Farmers Winter Work at City Wages." *New York Times* (April 27, 1923): 1.
[29] "Lets Ford Get Power Sites", *New York Times* (May 5, 1923): 2.
[30] "Brooklyn: Another Village Industry", *Ford News* 19, 12 (December 1939): 273, 275.
[31] "Ford Aide Tells of Rural Plants", *New York Times* (August 21, 1938), Section 7, p. 1.
[32] Ralph W. Cessna, "Down by the Old Mill Stream", *Christian Science Monitor* 32, 52 (December 30, 1939): 8.
[33] Cameron, "Decentralization of Industry", p. 486; Kellogg, "The Play of a Big Man", p. 17.
[34] Drew Pearson, "Henry Ford says Farmer Workmen will build Automobile of the Future", *Automative Industries* (August 28, 1924), a typed copy found in the Ford Archives, p. 7. Also see "Henry Ford Dooms Our Great Cities", *Literary Digest* 83, 7 (November 15, 1924): p. 13. Ford did build model communities for his lumber production needs; see James Korwin, "Developer's Plan to Resurrect 'Ghost Town'", *Detroit News* (August 26, 1979): 2B. Also see "Ford Plans Ideal Community in Georgia: Auto Plant Hands will Share in Farm Work", *New York Times* (February 24, 1937): 3.
[35] Vlissingen, "The Big Idea Behind Those Small Plants", p. 50.
[36] "Mr. Ford Doesn't Care", *Fortune Magazine* 8, 12 (December 1933): 65.
[37] Ford strongly advocated the decentralization of purchasing. By 1930, he reported that more than 2,300 suppliers served the Ford Motor Company. He also was quoted as saying: "There ought to be 50,000 plants making parts for Ford cars". See "Ford Explains Policy of Letting out Work", *New York Times* (March 24, 1930): 2. Also see Harold N. Denny, "Small Unit Plants Ford's Final Goal", *New York Times* (February 5, 1933): 1, 22.
[38] R.H. McCarroll, "Increasing the Uses of Agricultural Products in Industry", a speech delivered before the Farmer's National Grain Dealers Association of Illinois, as reprinted in *Ford News* 16, 4 (April 1936): 65-66, 75.
[39] Nevins and Hill, *Ford: Decline and Rebirth*, p. 229.
[40] David Lewis, *The Public Image of Henry Ford: An American Folk Hero and His Company* (Detroit: Wayne State University Press 1976), p. 281.
[41] Drew Pearson, "Farmer-Workmen Will Build Automobile of the Future", *Automotive Industries* (August 28, 1924), a reprint found in the Ford Archives, Dearborn, Michigan, p. 7.

[42] His role in the Dynamic Kernals Project is described in "glorious detail" by one of the participants in the experiment in a religious publication written by Raymond J. Jeffreys, *God is My Landlord* (Tecumseh, Michigan: Dynamics Kernal Foundation, Ind., 1967). See Chapter 4: "Henry Ford Becomes Interested", pp. 15-21. Also see "Henry Ford Cuts Biblical Wheat", *Life* 17, 4 (July 24 1944): 30-31.
[43] "Mr. Ford Doesn't Care", *Fortune Magazine* 8, 12 (December 1933): 65. Also see "Ford Promotes His Hobby to Unite Field and Factory", *Business Week* (September 1931): 23.
[44] "Mr. Ford Doesn't Care", *Fortune Magazine* p. 65.
[45] Letter from David R. Crippen, Ford Archivist, to John R. Mullin (May 1, 1980), p. 1. Author's Note: The major source of data that is available on the factories themselves is the *Ford News*, a monthly publication of the Ford Motor Company during this period. It served primarily as a public relations document. It regularly described "happy, prosperous, and dedicated" Ford workers with no reference to, among other problems, unions, wage-cuts, worker strife, or hard times. Therefore, as a scholarly resource, it must be regarded with great skepticism. However, the articles often included basic data on the factories (i.e., twelve workers on two shifts). This type of data was used in this article and, as much as possible, cross-checked against other sources. Source material from the Ford Motor Company Archives of a non-public relations character was also used. Henry Ford had a strong positive relationship with the press throughout most of his life. Indeed, concerning the Village Industries, only the Kellog article (see note 4), of the 150 sources examined, comes close to being critical. In sum, given the overwhelmingly positive written response to Ford's idea, objectivity is an extremely difficult task!
[46] "Sharon Hollow", *Ford News* 19, 8 (August 1939): 187.
[47] Drew Pearson, "Henry Ford Says", pp. 3-5.
[48] Data on power generation can be examined in a chart found in "Village Industries by Little Rivers", *Ford News* 16, 4 (April 1936): 70.
[49] For example, workers in the Plymouth, Waterford, and Northville plants averaged more than 250 days of work per year in 1934. This certainly doesn't show much release time. *Data on River Plants* (May 2, 1935), Dearborn: The Ford Archives. Also, there appeared to be a correlation between higher wages and the willingness to farm. Vlissinger noted, for example, that workers could not afford to farm when they were earning $10.00 per day. See Arthur Van Vlissingen, "The Big Idea Behind Those Small Plants", p. 48.
[50] Nevins and Hill, *Ford: Decline and Rebirth*, p. 73.
[51] David Lewis, *Public Image*, p. 163.
[52] "Reich Would Cut City Populations", *New York Times* (January 7, 1934): 2E. Also see John Robert Mullin, "The Impact of National Socialist Policies Upon Local City Planning in Pre-war Germany", *Journal of the American Planning Association* 47, 1 (January 1981): 37.
[53] As quoted in Lewis, *Public Image*, p. 163.
[54] As quoted in Lewis, *Public Image*, p. 163.
[55] Rexford Gut Tugwell, "Henry Ford in this World", *The Saturday Review of Literature* 3, 2 (August 7, 1926): 19.
[56] For a description of one settler's perspective of the Jersey Homestead experience see "In Homage", *New Yorker* 38 (September 29, 1962): 31-33.
[57] For a comparative summary of the Ford and FSA experiences, see the Crosman-Gerry Report, Ford Archives, pp. 13-15. Many of the problems associated with the FSA settlement concepts are highlighted in David Myhra, "Rexford Guy Tugwell: Initiator of America's Greenbelt New Towns, 1935-1936", *Journal of the American Institute of Planners*, 40, 3 (May 1974): 176-188.
[58] Lewis, *Public Image*, p. 162.
[59] Reynold Millard Wik, "Henry Ford's Science and Technology for Rural America", *Technology and Culture* (Summer 1962): 247-258.
[60] Edgar Chambless, *Roadtown* (New York: Roadtown Press, 1910), pp. 38-39.
[61] Pearson, "Henry Ford Says", p. 1.
[62] Lewis, *Public Image*, p. 161. Also see Fay Leone Faurote, "How Ford Plans His Layout of Grounds, Buildings and Plant", *Factory and Industrial Management* (June 1928): 1196-1199.
[63] Cameron, "Decentralization", pp. 484-485.
[64] Morton and Lucia White, *The Intellectual Versus the City*. (New York: Mentor Books, 1964), p. 201. Also see Roger Burlingame, *Henry Ford: A Great Life in Brief* (New York: Knopf, 1955), pp. 11-13, 103-106.

[65] This comment, amongst other anti-urban statements, can be found in *Ford Ideals: Being A Selection from "Mr. Ford's Page" in the Dearborn Independent* (Dearborn: Dearborn Publishing Company, 1922). See, for example, "The Modern City – A Pestiferous Growth", pp. 154-158; and "The Exodus from the Cities", pp. 425-428.
[66] Pearson, "Henry Ford Says", p. 1.
[67] Nevins and Hill, *Ford: Decline and Rebirth*, p. 74.
[68] Nevins and Hill, *Ford: Decline and Rebirth*, p. 226.
[69] "Henry Ford Wants Cowless Milk and Crowdless Cities", *Literary Digest* 68, 9 (February 26, 1921): 38-42.
[70] See White, *The Intellectual Versus the City;* and Ernest Callenbach, *Ecotopia* (Berkeley: Banyon Tree Books, 1975), pp. 24-34.
[71] White, *The Intellectual Versus the City*, p. 201.
[72] White, The Intellectual Versus the City, p. 202.
[73] W.J. Cameron, "Decentralization of Industry", p. 485. Also see Manfredo Tafuri, *Architecture and Utopia* (Cambridge: The MIT Press, 1978), p. 67.
[74] For an analysis of German anti-urbanism see Fritz Stern, *The Politics of Cultural Despair: A Study in the Rise of the Germanic Ideology* (Berkeley: University of California Press, 1961).
[75] Nevins and Hill, *Ford: Decline and Rebirth*, p. 229; Pearson, "Henry Ford Says", p. 7; and Kellogg, "The Play of a Big Man", pp. 14-15.
[76] Alduous Huxley, *Brave New World* (London: Chatto and Windus, 1932).
[77] Peter Batchelor, "The Origin of the Garden City Concept of Urban Form", *Journal of the Society of Architectural Historians* 28, 3, (October 1969): 184-200.
[78] Pearson, "Henry Ford Says", p. 2.
[79] Cameron, "Decentralization", p. 485.
[80] Ford even fought efforts to create a model new town for workers at his Willow Run Bomber Plant during World War II. See Keith Sword, *The Legend of Henry Ford* (Toronto: Reinhart, 1948), p. 429.
[81] Jean B. Quandt, *From the Small Town to the Great Community* (New Brunswick: Rutgers University Press, 1970), p. 66; William B. Haswseltime, "Four American Traditions, "The journal of Southern History 27, 1 (February 1961): 3-32; and Nevins and Hill *Ford: Decline and Rebirth*, p. 227.
[82] Letter from Deborah Harris, Tecumseh Public Librarian, to John R. Mullin (March 31, 1980), p. 1.
[83] Peter Kropotkin, Fields, *Factories and Workshops* (London: George Allen and Unwin, 1974).
[84] Lewis Mumford, "The Fourth Migration", *Survey Graphic* 54, 3 (May 1, 1925): 131.
[85] For Chase's comments see Stuart Chase, "Coals to Newcastle", *Survey Graphic* 54, 3 (May 1, 1925): 146.
[86] As this article is being written (April 1982) the Northville factory is temporarily closed.
[87] Incubator industries are commonly defined as manufacturing firms with less than twenty employees and that are less than ten years old.