IN dealing with the comparative growth of cities, Maurice Yeates and Barry Garner, two urban geographers, have suggested that one should think of cities "as being in competition with each other to attract functions." But in order to be useful, the concept of interurban competition requires two conditions: 1) the specification of a "region," since this competition is a form of spatial competition; and 2) the choice of a set of cities or settlements in that region which initially have roughly similar sizes and functions in order to perform a reasonable analysis.

Generally, cities can utilize a variety of weapons in their competition. There are "natural" advantages of site and situation, with site advantages referring to the settlement itself and situation advantages referring to the immediate environs. For example, settlements located at key points along transportation routes possess a key site advantage. Settlements located near a key raw material source possess a key situation advantage. The situation advantages appear to be more important, since many cities have not grown from their original sites, but have grown according to the influence their situation has exerted on their ability to perform the functions associated with cities. Beyond the natural advantages of site and situation, there are "human" advantages such as a skilled labor force, entrepreneurial talent, or a favorable political and social climate. Initially, before the city actually appears, these advantages fit best into the situation category. Once the city has developed, these advantages take on a site aspect as well.

In exploring the growth of cities in the United States in the 19th
One factor looms as very crucial: despite the types of natural or human advantages, whether site or situation, a settlement possessed, urbanization was very closely linked to changes in the transportation system. In the days before the railroad, access to a key water or land route, such as a turnpike, was critical. The largest cities in the United States during the "land and water" era were seaports like Philadelphia or Boston. Larger towns in the interior, such as Lancaster, were located near or at key points of interior land and water routes. (In Lancaster's case, of course, those routes were the Susquehanna River and the Philadelphia-Pittsburgh Turnpike.)

The railroad altered the urbanization pattern created by the land and water system. The influence was particularly significant for those small centers which were just emerging on the basis of activities generated by a land and water system. If the railroad paralleled an already existing land or water route, those settlements continued to benefit. But those settlements which missed the railroad or which received the railroad much later found their development retarded, while settlements which had lacked land and water routes now developed because of the railroad.

In dealing with a long period of time, there is one other factor to consider in explaining the comparative growth of cities and that is the success of the city's basic activities. In the 19th Century the most critical basic activities were manufacturing and commerce. Success or failure in these activities, of course, depended on a number of factors, including entrepreneurial capabilities, the success of the industry's market, the effectiveness of transportation, etc. The larger cities tended to have successful entrepreneurs, growing industries (the more rapid the growth the better) and transportation systems (i.e. the railroad) that provided effective access to both input and output markets.

Thus, in dealing with the question of urban competition, the following must be taken into the account: 1) The "initial" advantages of the cities or settlements to be studied. These advantages include both natural and human elements. 2) Significant changes in the transportation system or perhaps some other fundamental change such as the development of a new technique or industry especially with regards to energy. Of more importance here, however, is the effectiveness of the transport system in tapping raw material sources and in reaching customers. 3) The success or failure of the basic activities of the cities as they develop. This paper compares the development of Reading, Lancaster and Allentown, during the period of 1850-1910, the period of most rapid industrial development for these cities.
Allentown, Lancaster and Reading can serve as a case study in urban competition. They meet the two specifications presented in the first paragraph. First, they are part of a “region,” a region that can best be called “The Pennsylvania Dutch Country,” referring to the predominance of Germanic immigrants in the historical tradition of these cities. But there are some key characteristics these cities have shown that further enhance their qualifications as a region. Each of these cities has been influenced considerably by Philadelphia and its activities and each has been served by Philadelphia-based transport media. The cities sprang from colonial economies which stressed a diversified agriculture and iron manufacturing. Each of the cities initially developed a set of activities associated with their role as county seats. Thus, each city will begin in 1850 with roughly similar functions and sizes. At this point, it will be necessary to explore the development of each city before 1850 in order to identify those key initial advantages.

The earliest of the three cities to develop and perhaps the most developed urban center of the three by 1850 was Lancaster. Located at a rest point along a major Indian thoroughfare running East-West across Pennsylvania and 65 miles west of Philadelphia, Lancaster was situated in one of the most fertile belts of agricultural land in Pennsylvania. The settlement became the seat of Lancaster County, then one of the state’s largest counties, in 1730. The attractiveness of the farmland plus some iron ore and limestone deposits produced a county with a thriving agriculture and an active iron industry. Lancaster, because of its site and situation grew quickly. In fact throughout the 18th and early 19th centuries Lancaster was Pennsylvania’s second largest city. Because of its thriving county, Lancaster quickly developed an active commercial sector to market the produce and iron products of the rural populace. The site of Lancaster, close to the Susquehanna and along a major road to the west, developed industries aimed at servicing the travelers who would stop in the town. There were hotels and taverns, and since many travelers were westbound settlers the town became a leading manufacturer of guns and wagons. Thus Lancaster developed on the basis of some excellent natural and human advantages.

Despite this level of development the growing city faced one serious constraint—its transport system. Lancaster’s major thoroughfare, the Philadelphia-Pittsburgh Turnpike (after 1792) carried, of course, wagon traffic. Wagons were slow, easily hampered by adverse weather given the dirt roads and quite expensive. However, Lancaster was only 15 miles from an even more effective transport medium—the Susquehanna River. The Susquehanna afforded access to Baltimore to the
South; in fact, it was easier to reach Baltimore than Philadelphia. The river could also serve as a thoroughfare to the interior of Pennsylvania to the north and west. The control of the river and the potential wealth of Lancaster and its environs brought Lancaster into the rivalry of Philadelphia and Baltimore for trade supremacy in the Susquehanna Valley.\(^{11}\)

The transportation improvements which affected Lancaster before 1850 were in fact products of the rivalry of the larger cities. Baltimore made the first move in proposing a railroad to be built from the city to York Haven on the Susquehanna across from Middletown (1828), a move which Lancaster and its neighbors along the Susquehanna favored. But fears of Baltimore dominating the Susquehanna trade prevented this project from entering the state.\(^{12}\) Meanwhile, Philadelphia interests countered with their own proposal. Philadelphia's first link to the Susquehanna by water, a canal system which consisted of the Schuylkill Navigation Canal from Philadelphia to Reading and the Union Canal from Reading to Middletown was deemed inadequate for the type of commerce Philadelphia envisioned, due to the narrow width of the Union Canal. Thus in 1828 a railroad between Philadelphia and Columbia along the Susquehanna was proposed and the line was placed into operation in 1834.\(^{13}\) The line ran through Lancaster. Thus, Lancaster became the first of the three cities to receive the railroad. During the 1840s, Lancaster's transport system became totally railroad. The Philadelphia and Columbia Railroad, originally part of the State works, a canal/rail system, became part of the trunk line of the Pennsylvania Railroad, with direct access to Philadelphia, Pittsburgh and eventually points west. By 1850 Lancaster also enjoyed access to Baltimore, although it took three separate rail lines to do it.\(^{14}\)

According to F. S. Klein these improvements, developed over some 20 years, did not fundamentally alter the economic structure of Lancaster, nor did they cause Lancaster to explode. Of course, Lancaster was not the major objective of these improvements; the Susquehanna Valley and the River were. But one noticeable effect of the improved transportation was expansion of Lancaster's agricultural marketing efforts. The livestock pens which developed along the railroad quickly became some of the largest in the country.\(^{15}\)

Thus by 1850 Lancaster had made great strides towards becoming an industrial city. Its site and situation had developed an active commercial sector and an industrial base emphasizing local produce and iron products. Both iron and agri-based industries could fuel a major industrial development scheme. Lancaster's accessibility to two major
cities—Baltimore and Philadelphia—was enhanced by the railroad. Certainly Lancaster had all the prerequisites to continue to be Pennsylvania’s number three city (Pittsburgh had jumped to number two by this time.)

Reading lies 56 miles NW of Philadelphia along the Schuylkill River, and like Lancaster, Reading’s site had also served as a key Indian rest stop. The settlement became the county seat of Berks in 1752. Like Lancaster, Reading’s environs supported a diversified agriculture and iron manufacturing. However in comparison Reading’s environs supported more iron manufacturing relative to agriculture. In fact the Reading area was regarded as one of the leading iron manufacturing areas in the American colonies, and the industry was a major supplier of armaments to the Continental Army during the Revolution. Reading’s situation differed from Lancaster in other respects. Because of Reading’s closer proximity to the Blue Mountains (only 20 miles to the north) Reading also became a center for hides and hats. Before the advent of the railroad hats were in fact the largest industry within Reading itself, and Reading was regarded as a major producer of hide hats. Reading’s situation in terms of commercial activity also differed from Lancaster’s. Reading’s commerce came up river rather than by turnpike. The apparent diversity of products coming from Reading’s environs necessitated the development of a larger and more diversified commercial sector. In its initial phase of development at least, Reading’s situation in terms of potential development appeared more diversified, and its location along a navigable waterway proved significant. Yet on the other hand Reading, unlike Lancaster did not develop a strong manufacturing sector initially, but did develop a stronger commercial sector.

Reading’s transportation improvements, like Lancaster’s reflected the rivalry between Philadelphia and Baltimore, at least initially. In the early years of the 19th Century a group of merchants from Philadelphia and Reading spearheaded a campaign to improve the navigability of the Schuylkill between the two points by means of a canal. Earlier attempts at such a project had failed. At the same time, the attempts of both Baltimore and New York to build canals westward also prompted the need for Philadelphia to do likewise. The result was the incorporation of two canal companies. The Union Canal Company, formed in 1811, would construct a canal from Reading to Middletown on the Susquehanna, thus ensuring an outlet to Pennsylvania’s interior. The Schuylkill Navigation Company would improve the Schuylkill between Reading and Philadelphia. Thus, Reading would serve as the midpoint of the proposed system.
However, construction delays, the War of 1812, and opposition of all sorts held up construction of the system for nearly a decade. In the meantime the discovery of anthracite coal in southern Schuylkill County prompted the Schuylkill Navigation Company to extend its work to Port Carbon, some 50 miles north of Reading and in the heart of the newly found anthracite fields. In 1828 the Union-Schuylkill System was placed into operation, and for 14 years was the major transport route for the town of Reading.

The canal improved Reading's accessibility to Philadelphia. The benefits of the coal trade, the major activity supported by the canal, were minimal since most of the coal was destined for Philadelphia. The Union Canal's problems, as discussed earlier, limited the Union's traffic to coal and produce of the area's farms, much of it bound for Philadelphia. However, because of the increased traffic brought by the canals, and because freight of the Union Canal had to be transferred at Reading to the Schuylkill Canal boats (and vice-versa), Reading greatly expanded its warehousing and commercial activities along the waterfront. The hotel and tavern industry expanded to service canal personnel and passengers, and many men came to Reading to work on the canals particularly in canal boat and canal bed maintenance. The ultimate benefits of the canals were a rapid increase in population but even more important an accumulation of capital which was used to attract manufacturers to Reading.

Between 1838 and 1844 the trunk line of the Reading Railroad, running from Philadelphia to Pottsville was placed into operation. Like the canal the railroad's mainstay was coal. But with the railroad came the appearance of railroad car and repair shops within Reading. These large facilities employing up to 600 men initially sparked the rapid development of the machine industry in the 1840s. The town of 4000 in 1830, with an active commerce but no industry to speak of, had become a "one-industry" town of 12,000 by 1850. The commercial and banking sector built by the canal traffic had given the town a firm foundation, a site advantage it could exploit. Its location near iron and coal deposits could attract iron and related industries. The railroad shops were a large enterprise in a high-growth industry and could further industrial development. Finally, the transportation system provided easy access to Philadelphia and through the railroad even better access to other points could be possible. Reading, like Lancaster, was on the verge of its industrial revolution.

Allentown, the youngest of the three cities and the least developed in 1850, was founded in 1762 and became the seat of Lehigh County. As
with the other cities, Allentown's environs boasted a diversified agriculture and iron production. Located along the Lehigh River, which originates in the mountains to the northwest and flows to the Delaware at the site of Easton, Allentown was favorably situated with respect to the major markets of the East. Like Lancaster, Allentown lay within striking distance of two major cities, Philadelphia and New York being the two for Allentown (70 miles NNW of Philadelphia and 80 mi. W of New York).

Unlike the other two cities, Allentown experienced very little development before 1820. Essentially Allentown provided the necessary mercantile, financial and legal services expected of a county seat. The limitation placed on Allentown's development was human, rather than physical in nature. The town, in fact the environs had been settled primarily by a pious German sect known as the Moravians. Their ethic precluded participation in non-pastoral activities. Consequently, industrial and service activities were supplied by non-Moravian Germans and the English, a minority in the area. As long as agriculture was profitable, and it was generally, the town remained agriculturally-based.

However, Allentown and its environs faced a formidable physical constraint to development. The Lehigh River was non-navigable at points, making access to Philadelphia and to New York possible only by land. Once again, urban rivalry produced a transport innovation. Both Philadelphia and New York were interested in tapping the produce and coal of the Lehigh Valley. Lehigh Valley coal served as a secondary source for both cities, since the Schuylkill deposits were more convenient for Philadelphia and the Lackawanna Valley was closer to New York. But the desire to tap the Lehigh Valley trade did produce the Lehigh Valley Canal which enabled goods to be shipped to Philadelphia via the Delaware River, and to New York via the Delaware and Hudson Canal.

The Lehigh Canal was very successful in improving transport between communities along its route. But because the Lehigh Valley was considered a secondary source by both Philadelphia and New York, trade bound for the major cities was not great enough to cause rapid expansion of economic activity in Allentown as had occurred in Reading and Lancaster. However, the canal facilitated local trade to the extent that local industries flourished—iron to the north of Allentown near the coal fields, dairy farming in the rural areas, slate mining to the west of Allentown and within Allentown numerous artisans, the largest employers being butchers and a clothing manufacturer. By 1850 the
Lehigh Valley Railroad, paralleling the canal, had also been placed into operation. Rail access to Philadelphia and New York was quickly realized.\textsuperscript{26}

Like Reading and Lancaster, Allentown had favorable situation advantages. It was near the coal fields and its agriculture was active. Allentown was accessible to both Philadelphia and New York and of the three cities perhaps had the best location with respect to accessibility to major eastern markets. At its site, Allentown had developed a fine mercantile and financial community, but unlike the other two cities Allentown had not proven to be a site for large-scale manufacturing activities. But all the elements for industrialization were in place by 1850.

The best indicators on economic development that exist for the 19th century come from the Census of Manufacturing. Using the manuscript and aggregate data from the period 1850-1910, a capsule of the development paths taken by each city is now presented.

Population growth is the most basic indicator of urban development. Table I reveals that each city enjoyed a continual increase in population during the 1850-1910 period, but each city also displayed its own peculiar pattern. Allentown's growth appeared especially striking. Allentown's growth rate, roughly calculated, was 4\% per annum, above the national growth rate of 3.5\% per annum for the same period. Reading's rate was second at about 3.0\% and Lancaster's last at 2.5\%. However, those rates must also be placed into the perspective of the relative sizes of the cities. Allentown began the period only $\frac{1}{4}$ the size of Reading and $\frac{1}{3}$ the size of Lancaster, yet by 1910 Allentown was larger than Lancaster and more than $\frac{1}{2}$ the size of Reading. Reading, however, remained larger than the combined populations of the two other cities. In terms of absolute increases between 1850 and 1910 Reading added 80,328, while Allentown added 48,210 and Lancaster only 34,858.

If we accept the hypothesis that a direct correlation exists between population and industrial growth, we could hypothesize that Reading would emerge with a substantially larger industrial sector than either Lancaster or Allentown, and that Reading's industrial growth trends appeared to be steady and moderate. Allentown's development, considered on this basis, would have been rapid and perhaps a bit accelerated. What was a small town in 1850 had become an industrial city of significant size in 1910. Lancaster however, experienced a slow rate of growth during this period, lagging well behind both Reading and Allentown in terms of development. Population growth is a key indicator of the "human" factor of development, particularly in terms of
potential employment. But at this point, examining population growth can only suggest development trends.  

In Table II, the number of manufacturing establishments as reported in the Census returns is presented. Allentown’s proliferation of manufacturing establishments after 1850 paralleled its population growth pattern, indicative of a rapid industrial development path. However, its number was still less than Lancaster’s in 1910, though the gap had narrowed considerably. Allentown’s best period of growth appeared during 1870–1890. Lancaster began the period with the greatest number of manufacturing establishments, remaining in the lead until 1910. Again, Lancaster experienced its greatest period of growth during 1870–90. But both Lancaster and Allentown were victims of the 1910 Census revision. In an effort to more clearly depict the extent of large-scale industrial development in the United States, the Census Bureau beginning with the 1910 returns excluded what it called “local” industries, small enterprises that did not utilize “modern” industrial methods and any enterprises not considered “manufacturing,” especially the building trades. Thus, changes from 1880–1910 do in fact provide some indication of the extent of heavy industrial development, and both Allentown and Lancaster lost heavily in the Census purge. Reading, however, didn’t lose in the purge. Like Allentown, Reading’s manufacturing sector grew steadily after 1850, and like the others 1870–1890 was the period of most rapid growth. But Reading had a net gain in establishments despite the Census revision, and emerged considerably ahead of both Lancaster and Allentown. Thus we could hypothesize that not only was Reading a larger city than the other two, but it possessed a manufacturing sector more highly developed than the others.

Table III indicates the accumulation of manufacturing plant and equipment in the three cities. These figures reinforce the trends presented in the first two tables. Reading (on the strength of the railroad shops) and Lancaster as expected had high capital values in 1850. Allentown, being relatively underdeveloped had an expectedly low value. By 1910 the picture had changed significantly. In absolute terms Reading had surged far ahead of the others, its total being nearly twice that of Allentown’s. Both Reading and Allentown displayed a steady growth path in this indicator, whereas Lancaster showed a declining growth path. Economic historians have associated economic growth in the 19th Century with capital accumulation. Thus, Table III provides further evidence for the steady industrialization of Reading and Allentown and the relative retardation in Lancaster’s development. As the
other two tables indicated, Allentown's development was especially rapid, its capital value overtaking Lancaster's by 1890.

Table IV presents figures for manufacturing employment, with the percent of each city's "population" engaged in manufacturing presented in parentheses as a crude measure of industrial concentration. In 1850 Lancaster displayed a relatively high concentration of industrial activity and in fact manufacturing in Lancaster employed more people than the combined total of Reading and Allentown. By 1890 the concentration ratios were nearly equivalent for each of the cities; thus the employment figures roughly paralleled the ratio of populations for the three cities. In 1910, total employment in Reading was greater than the combined total of Lancaster and Allentown. Reading's concentration, now the greatest of the three, had increased steadily during the study period. Allentown's employment also grew steadily, but its concentration ratio increased slowly after 1890. This could mean one of two things: a) Allentown's economy grew relatively faster in services and/or b) Allentown's manufacturing growth tended to emphasize capital-intensive rather than labor-intensive industries. Lancaster's concentration ratio peaked in 1890 and by 1910 was the smallest of the three. Even more important Lancaster's total manufacturing employment experienced a net decline between 1900 and 1910. Apparently, "modern" industrial activity was not as well developed in Lancaster as in Reading or Allentown. The employment figures confirm the rather devastating effect the Census revision had on Lancaster's manufacturing data.

Table V shows the growth in aggregate product value added (producer's price minus factor costs). There seems to be a direct relationship between the size of the industrial sector, as measured by capital value and employment, and the value of output. In 1850 Reading and Lancaster were predictably grouped together, far ahead of Allentown. But the table shows the rapid growth of Allentown. In fact, Allentown overtook Lancaster in 1900 and by 1910 its product value was only half that of Reading's. Lancaster experienced a slower growth and lost product value was a result of the Census revision. Reading experienced a steady growth in this indicator and had the largest absolute increase, about $50 million.

In summarizing the data presented in the tables, the following statements can be made.

1) Reading and Lancaster experienced an industrial "boom" before 1850 (1830-50 to be exact), while Allentown began its industrialization after 1850.

2) Allentown experienced the most rapid industrial growth. Read-
ing’s growth was steady and the greatest in terms of absolute increase. Lancaster’s growth rate diminished and in fact its industrial sector experienced a net decline between 1900 and 1910.

3) Reading clearly emerged as the largest city of the three.

Aggregate trends such as the ones presented can reveal trends but cannot provide a satisfactory explanation for these trends. For such explanations we must delve a little deeper into the history of these cities between 1850 and 1910.

The indicators testify to the rapid growth of Allentown after 1850. What factors led in this transformation? If we also consider the presence of Bethlehem, Allentown’s twin city, Allentown was located in Pennsylvania’s third major industrial area by 1910.

The transformation occurred because of certain site and situation advantages in Allentown which did not become significant until the 1850s. But it was the conscious decision of outside entrepreneurs to bring their skills and their capital to Allentown that brought about the transformation. Without such an influx of capital and talent, the locational advantages of Allentown would never have been exploited as fully as they were.

The infusion of capital and skills occurred in two waves, each associated with a particular type of industry. The first and most critical wave occurred just before 1850 and lasted until 1880. The wave was associated with the iron industry. Up until this time the iron industry had located close to the sources of ore and wood (later anthracite) along the Blue Mountain ridge to the north and west of Allentown. It was not until 1845 that the borough of Allentown sought to attract iron manufactories to the community. The growing market for iron and the profitable returns for iron producers provided a clear economic incentive for the town’s campaign. The success of the Lehigh Crane Iron Company, established some five years earlier at nearby Catasaqua demonstrated the feasibility of iron production at Allentown.

In a steady procession, rolling mills and iron products companies appeared in a town whose largest industrial employer was a clothier. The Allentown Iron Works appeared in 1846; the Allentown Rolling-Mill in 1855; the Lehigh Rolling Mill in 1861; the Roberts Iron Company in 1862; the Lehigh Iron Company in 1867 and several foundries and specialty-product mills also appeared. Only the Lehigh Iron Company was distinguished in its predominantly local ownership. In the other companies stockholders from Philadelphia, New York and
surrounding communities such as Pottsville and Mauch Chunk predominated.\textsuperscript{36}

While iron was a significant industry in Allentown, the local economy also exhibited diversification. Major enterprises could be counted in clothing, leather products, carpets, cigars and pharmaceuticals. In addition, the growing iron activity around Allentown provided further expansion of the town’s mercantile and financial activities. The construction of the Lehigh Valley Railroad during the 1850s brought Allentown in closer contact with the Philadelphia and New York markets. Both cities wished to cultivate the growing activities in and around Allentown, as already noted by their investments in local iron manufactories.\textsuperscript{37}

The second wave of capital and talent into Allentown had benefits that went far beyond the appearance of iron in the area, at least for Allentown itself. The concentration of iron activity at nearby locations limited Allentown’s development in this field. The 1890 Census revealed six industries with product values over $250,000: iron and steel, boots and shoes, carpentry, foundry/machine, furniture and silk. Of these, only silk had not been in existence before 1880. Yet by 1890 silk, with only 3 enterprises, employed the most people (946), paid out the most wages ($292,495) and had the greatest product value ($1,694,342) of any industry in the city. (Iron and steel ranked second.)

Silk appeared in the city of Allentown thanks to the Phoenix Manufacturing Co. of Paterson, NJ and the Board of Trade of Allentown. In 1880 the Phoenix Co. had advertised for an “eastern site” for a silk mill, then an “infant” industry, but one which had captured interest due to its exotic flavor. The Phoenix Co. was invited to come to Allentown. Impressed with the location, the Phoenix Co. stated that if the local populace could raise the capital for the land and plant, they could be the proud part-owners of a silk mill. The response was more than adequate. In 1881 the mill was opened and 500 young people were employed. Within that decade two other mills were erected. Once the success of one enterprise was established, others followed in the hopes of reaping similar success.\textsuperscript{38}

By 1910 Allentown had become the 9th leading industrial city in Pennsylvania. Five of its industries boasted product values over 1 million dollars. Silk, now 15 enterprises strong, was the largest industry in all categories, employing nearly 4000 workers and boasting a product value of over $7 million dollars. Iron and steel was a more distant second
now, employing less than 2000 workers and having a product value of nearly $5 million. Boots and shoes, foundry and machines and tobacco, an old industry in Allentown but becoming significant after 1900, rounded out the list. That Allentown’s size seems limited is no surprise. Its twin, Bethlehem (especially South Bethlehem), though considerably smaller, was ranked 7th in Pennsylvania industry on the strength of Bethlehem Steel. In fact a very effective “twin city” development had occurred in Bethlehem. Allentown became noted mainly for silk and also for mercantile and financial activities. Allentown and Bethlehem complemented each other, and though they were in separate counties, they worked for their common good. (Yet each city maintained its own identity.)

Allentown’s initial advantages were not adverse to industrial activity and were in fact enhanced by improvements in transportation. But it took the capital and talent of two outside groups, the first associated with the iron industry and the second with silk, to initiate and nurture Allentown’s transformation to an industrial city. The local populace, however, was enthusiastic and progressive with regards to the city’s development. The factors of entrepreneurship from the outside, two leading industries (iron/steel and silk) and access to two major urban markets, Philadelphia and New York appear to have been the major factors behind the rapid growth of Allentown.

The impact of the railroad on Lancaster’s development was felt in the 1840s. Up until that time Lancaster’s industry could best be classified as one based on the household enterprise, consisting of a skilled craftsman with several assistants. Lancaster had amassed nearly 200 of these types of enterprises by 1840, with bricklayers, carpenters, tailors, printers, butchers and ironsmiths being the most numerous. In the 1840s Lancaster experienced a boom of sorts. Population increased 50% during that decade (8417 to 12,369). In the 1850 Census manuscript returns, the most notable entry was a cotton textile mill employing 390 persons, mainly women. Three iron foundries employed about 100 men. The agriculture of the county was profitable and was supporting a growing agricultural machine industry. By 1850 it appeared that Lancaster was in the midst of its urban industrial transformation.

The success of Lancaster’s agricultural hinterland was critical, for as long as it was profitable, Lancaster would need to maintain a certain level of agricultural based industries, including machinery and food processing. In the 1850–60 decade the output of Lancaster county’s tobacco growers increased five-fold from 387,000 tons in 1850 to nearly 2 million tons in 1860. Lancaster led the counties of Pennsylvania in the
output of several agricultural items. By 1860 total capital invested in agriculture (farms, livestock and machinery) totalled $58,000,000, compared to only $6,000,000 in industry county-wide. In 1870 the Census returns revealed that Lancaster had become the leading agricultural county in the state.41

The 1870 Census manufacturing returns reveal the extent to which the county's profitable agriculture influenced industrial development in the city. Textiles continued to dominate Lancaster's industry, employing 1242 and accounting for nearly 50% of the city's industrial output. No other industry even approached this total. Lancaster continued to stress agricultural based industries—farm implements, brewing, and leather. Lancaster had also added two cigar makers, cashing in on the tobacco crop but on a very small scale. (Only 48 were employed in these enterprises). The bulk of Lancaster's industrial sector, although diversified, consisted of the traditional artisan shops.

In the 1870–1910 period Lancaster's population grew at 2.5% per annum, at least 1% below the national average.42 By 1900 Lancaster county had emerged as the leading agricultural county in the nation.43 Between 1870 and 1890 little change had occurred in Lancaster's industrial structure, with the notable exception of tobacco. This industry, which employed less than 50 people in 1870 and had a product value of less than $100,000, now employed 2117 and produced over $3 million in output, making it the largest industry in the city. Textiles, now number two, experienced little change in its indicators. Cork, an industry which had appeared in Lancaster around 1860, also assumed major status by 1890.44 The aggregate indicators clearly demonstrate how far Lancaster now lagged behind Reading, a city which Lancaster had once surpassed in terms of industry. Yet Lancaster had over 150 more enterprises than did Reading. (See Tables I–V). A look at the 1880 returns reveals part of the answer. Of the ten major industries listed in the 1880 returns only three experienced an increase in the number of enterprises in 1890—printing, tobacco and machinery. There was a noticeable decrease in employment in the traditional industries of textiles, carriages and leather. Gainers and losers balanced out. Even more important, large-scale development did not seem to take hold in Lancaster. Lancaster had dropped from 5th to 8th among industrial cities in Pennsylvania by 1890. Lancaster’s industrial drive had stagnated.

The 1890–1910 period added a variety of building supply industries to the list of major industries in Lancaster, as well as umbrellas and canes, which quickly assumed second place behind tobacco. Textiles and
### Table 1
Population Growth 1850, 1870, 1890, 1910

<table>
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<th>1850</th>
<th>1870</th>
<th>1890</th>
<th>1910</th>
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<tbody>
<tr>
<td>Allentown</td>
<td>3,703</td>
<td>13,884</td>
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<tr>
<td>Lancaster</td>
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<td>20,233</td>
<td>32,011</td>
<td>47,227</td>
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<tr>
<td>Reading</td>
<td>15,743</td>
<td>33,930</td>
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<td>96,071</td>
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</table>

Source: U.S. Census

### Table 2
Number of Manufacturing Establishments: 1850, 1870, 1890, 1910

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<tr>
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<th>1850</th>
<th>1870</th>
<th>1890</th>
<th>1910</th>
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<td>Allentown</td>
<td>49</td>
<td>98</td>
<td>382</td>
<td>274</td>
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<tr>
<td>Lancaster</td>
<td>222</td>
<td>278</td>
<td>599</td>
<td>306</td>
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<tr>
<td>Reading</td>
<td>149</td>
<td>217</td>
<td>435</td>
<td>482</td>
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a—1910 returns exclude neighborhood, hand and building establishments.  

### Table 3
Aggregate Capital* Invested in Manufactures: 1850, 1890, 1900, 1910 (in thousand $)

<table>
<thead>
<tr>
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<th>1890</th>
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<td>Allentown</td>
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<td>14,083</td>
<td>27,975</td>
<td>41,053</td>
</tr>
</tbody>
</table>

a—Measure includes plant, equipment and operating funds.  
b—See Table 13, Note a.  
Source: See Table 13.

### Table 4
Manufacturing Employment 1850, 1890, 1900, 1910a  
(% of population in parentheses)

<table>
<thead>
<tr>
<th></th>
<th>1850</th>
<th>1890</th>
<th>1900</th>
<th>1910</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allentown</td>
<td>209 (5.6)</td>
<td>5,833 (23.1)</td>
<td>8,447 (23.9)</td>
<td>12,628 (24.3)</td>
</tr>
<tr>
<td>Lancaster</td>
<td>1,657 (13.4)</td>
<td>8,179 (25.6)</td>
<td>9,349 (21.5)</td>
<td>8,981 (19.0)</td>
</tr>
<tr>
<td>Reading</td>
<td>1,094 (6.9)</td>
<td>12,966 (22.1)</td>
<td>20,238 (25.6)</td>
<td>26,407 (27.5)</td>
</tr>
</tbody>
</table>

a—Measured as average number of employees per year  
b—See Table 13, Note a.  
Source: See Table 13.
cork "disappeared" from the list; machines, clothing and printing lost employment. By 1910 Lancaster was ranked 15th in Pennsylvania in industrial output and only umbrellas and canes and tobacco were "million-dollar" industries. The other industries in Lancaster all suffered as a result of the 1910 Census revision (see tables). What was a leading industrial city in Pennsylvania in 1850 was one in a state of retreat and stagnation in 1910. Industry was still diversified; it still emphasized its agricultural base but it lacked the large scale that now characterized much of Pennsylvania's industry. It was no wonder that a group of local businessmen had begun the Lancaster Development Corporation to bring large-scale industry into the city.45

Local histories did not delve into the reasons behind Lancaster's relative decline. Cork, an up and coming industry, had appeared on the 1910 Census as a "miscellaneous" industry. No reason for this sudden demotion can be discerned, but it appears that the 1890-1910 period was tumultuous for the industry. Economic instability combined with labor unrest had brought decline to Lancaster's cork establishments and one firm had disappeared. The remaining firms were purchased by Armstrong Cork in 1895. Cork would not recover in Lancaster until after 1910. But the reason behind the loss of textiles and perhaps the failure of heavy industry to develop in Lancaster had more to do with the situation of Lancaster than with any peculiarities of the industries themselves.

As an industrial site, Lancaster had proven its viability early on in its development. Its activities were diversified and its artisans successful. It appeared all was going smoothly until the 1860s; then signs of trouble began to appear. Large-scale industries such as iron and machinery found more favorable locations. Reading, Lebanon and Harrisburg, all to the north of Lancaster and closer to the anthracite fields, developed large scale iron, steel and machine industries. Yet Lancaster could

<table>
<thead>
<tr>
<th></th>
<th>1850</th>
<th>1890</th>
<th>1900</th>
<th>1910a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allentown</td>
<td>208.38</td>
<td>8,877</td>
<td>16,948</td>
<td>26,263</td>
</tr>
<tr>
<td>Lancaster</td>
<td>1,220.03</td>
<td>11,362</td>
<td>16,370</td>
<td>15,979</td>
</tr>
<tr>
<td>Reading</td>
<td>1,105.19</td>
<td>20,855</td>
<td>36,902</td>
<td>51,135</td>
</tr>
</tbody>
</table>

a—See Table 13, Note a.

Source: See Table 13.
compensate for this site disadvantage by drawing on its booming agricultural hinterland for industrial growth, and it did. As an industrial site Lancaster possessed all the prerequisites. There does not appear to have been any resistance from the artisans to large-scale industry in the city; in fact Lancaster openly encouraged such development. The answer lies ironically in the success of the county’s agriculture and in the lack of effective intracounty transport links. As agriculture became more prosperous, the ability of Lancaster to attract rural labor to expand its labor force diminished. Both Allentown and Reading were able to draw upon labor from “washed up” iron communities such as Mauch Chunk or Birdsboro or from marginal farming areas. But Lancaster lacked marginal farming areas and its iron communities, located near Harrisburg or Lebanon, sent labor to those sites where iron production was now booming. Because Lancaster lacked viable intracounty transport links county residents found it difficult to travel to Lancaster for services or even to find supplementary or off-season employment. Thus, rural centers such as Ephrata, Lititz, New Holland, etc. developed to serve the needs of the local populace. With a labor force more accessible at those sites, local entrepreneurs in the textile, food processing and machine industries moved out of Lancaster and developed their facilities there. Consequently, large-scale industries perhaps destined for Lancaster never materialized, leaving Lancaster with an only slightly developed industrial sector. In Lancaster’s case its transportation and its situation played major roles in stunting its industrial growth in the nineteenth century.

Before the appearance of the railroad shops, the town of Reading had managed to attract two industrial enterprises—the Seyfert & McManus nail factory, which was to become known as Reading Tube and Nail, and the D. H. Dotterer steam engine company, at whose site the railroad works would be initially located. (Reading Tube and Nail would become Reading’s second largest employer behind the railroad shops, a distinction it would hold for three decades.) Whether other industry would have appeared in Reading in the absence of the railroad shops is open to speculation. But there seems little doubt that the car shops, lured by the availability of the Dotterer shop, had a salubrious impact on the town of Reading. The shops employed an average of 650 men in its early years and was one of the largest enterprises of its type in the nation. The shops attracted men from the hinterland and beyond to be trained as machinists or engineers. But even more important, the shops acted as a “magnet” attracting
entrepreneurs to set up shop in Reading. If the site of Reading was good enough for the railroad, it was good enough for just about anything. Thus, between 1838 and 1850 eighty new industrial enterprises located in Reading. Population increased about 50% in this period and a building boom which would not be duplicated until after the Civil War ensued.\footnote{51}

It was in the aftermath of this initial boom that Reading entered the study period. Growth between 1850 and 1870 was decidedly unbalanced, hinging on the strength of the railroad and its shops and related industries, including hardware and other machine/foundry enterprises. This is not to say that Reading lacked other industries. The 1870 Census manuscript returns list enterprises in some 30 industrial categories, but the influence of the machine industry is easily seen. However, even this unbalanced growth, occurring with a heavy industry, was sufficient to propel Reading into first place among the smaller industrial cities in Pennsylvania in 1870.

After 1870 the city of Reading, as Allentown, began a process of diversification. Before this time Reading had tried to expand its “colonial” industries such as hats, liquors and leather goods, but had little success due mainly to competition from Philadelphia-based enterprises.\footnote{52} A flourishing textile industry had all but disappeared in the panic of 1873.\footnote{53} But the 1880 Census returns listed hats, liquors and leather goods as having product values of over $250,000, an amount sufficient to classify these industries as “major.” By 1910, the city of Reading listed 10 industries with product values over $1,000,000, surging far ahead of Allentown, with five such industries and Lancaster with two. The list of these industries should testify to the diversity of Reading’s industry: clothing, confectionery, foundry/machine, hats, hosiery/knit, iron and steel, malt liquors, railroad works, tobacco products and woolens.\footnote{54}

In analyzing the development of Reading’s economy, it does not seem correct to pose the question: Why did Reading become so large? First of all Allentown had started the period a much smaller place and it had made an impressive “catch up” by 1910. In fact Allentown would overtake Reading in terms of industrial activity after WW II. The factors behind the retardation in Lancaster’s development have already been discussed. A more correct approach in Reading’s case would consider that Reading’s growth was steady and even more important was based on a degree of intensity and diversification of industrial activity unmatched by the other cities and in fact, by no other smaller city in Pennsylvania. The question to pose therefore is why did Reading
become so diversified, and on the basis of the answer to this question we can understand the factors behind Reading's successful development.

Reading certainly had all the desirable attributes for industrial cities. The Reading Railroad System provided an excellent artery for the transport of commodities. Reading was centrally located in southeastern Pennsylvania and it was close to sources of anthracite, iron ore and other raw materials. The labor force was generally skilled and there was an active and progressive elite of entrepreneurs, merchants and bankers willing to develop the city's economy. The hinterland was active agriculturally. Perhaps the only extraordinary aspect of Reading's economy was the railroad shops, yet despite their size it should be erroneous to conclude that the Reading of 1910 existed because of the railroad shops.  

Reading's diversification and, consequently its development succeeded because of the lack of any real obstacles to development. Economists do not have any clear-cut reasons regarding the success of a particular enterprise or an industry at a particular location. It is perhaps easier to identify sources of failures and to simply conclude the successful industries and hence the cities lacked these obstacles.

Taking the perspective of obstacles, the following observations can be made. Berks County agriculture was reasonably productive, but it did not dominate the local economy to the degree it did in Lancaster. The rural population around Reading was fairly mobile; in fact many of Reading's local business leaders in the period of diversification came from rural families of the area. Reading would not feel compelled to devote the bulk of its resources to servicing its agriculture, nor would the rural population prove so immobile that industry would have to move to the population in the degree it did in Lancaster. At least with respect to its neighbors, Reading lacked any significant barriers to growth, and it is the lack of these barriers that looms more significant than any advantages Reading may have possessed.

Allentown, Reading and Lancaster were cities which sprang from similar environments, yet their development paths were unique, molded by each city's site and situation advantages, and by whatever obstacles they faced. This paper explored the development of these three cities during the period of rapid industrialization, 1850–1910, and hopefully demonstrated how advantages and the lack of advantages influenced the development of these urban centers. Lancaster was the most developed of the three cities by 1850, yet it entered the twentieth century with the least developed modern industrial sector. Its agricultural hinterland, the most prosperous in the nation, prevented Lancaster from successfully
developing large-scale industry at its site. Industry tended to disperse to smaller towns around Lancaster in order to more easily attract the rural labor force. Allentown entered the period as the least developed center, but one with an active hinterland industrially. A progressive group of entrepreneurs brought heavy industry to Allentown and by 1910 Allentown was a rapidly growing city with an industrial sector which was diversified as well as large-scale. Allentown was able to exploit its site advantages of market accessibility and land availability and its situation of being in the midst of one of the nation's centers of iron and steel manufacturing. Reading entered the study period as a town growing on the basis of the railroad shops and the machine industry. Reading's site had proven its feasibility as a site for large-scale industry. Its favorable location, good transportation and other advantages enabled Reading to develop rapidly, amassing an impressive and diversified group of large-scale industries by 1910.

NOTES


2. The concept of a "region" is relatively abstract. For the study of urban growth, the region can be best defined as a "subunit of national space." (John Friedmann and Clyde Weaver, *Territory and Function: The Evolution of Regional Planning.* (Los Angeles, 1979), 31.


7. Lebanon is an example of a town which received the railroad later than its neighbors. The Lebanon Valley Railroad did not reach Lebanon until 1857, some 15 to 20 years after towns such as Reading, Lancaster or Harrisburg. (Spiro G. Patton, Urban-Industrial Development of Five Pennsylvania Cities, 1850-1910, paper presented to the Urban History Conference, 1979).


13. ibid. 110.
23. ibid. 52-53.
25. Folsom, op. cit.
30. Obviously not every worker in each city resided in that city, but it is safe to assume that the higher the percentage the greater the concentration of industrial activity at that location.
31. The figures presented here are in terms of “current” prices. Fortunately, the inflation rate over this period was minimal making the figures a fairly accurate measure of the growth in value added.
32. As such, I agree with the analysis presented by Folsom, op. cit.
35. 1850 U.S. Census of Manufactures, Manuscript Returns.
ADVANTAGE AND INDUSTRIALIZATION

38. Mathews and Hungerford, History . . . 162–63; and Roberts, History of Lehigh County, Vol. I., 1059. This phenomenon is called "agglomeration by specialization."


40. Frederic Shriver Klein, Lancaster . . . p. 9; Binder, Coal Age Empire . . . 68–69.

41. F. S. Klein, Lancaster, 20–22; 58.

42. Easterlin, op. cit. fn. 27.


44. Fred J. Daum, "The Cork Industry as Lancaster Knows It," paper read before the Lancaster County Historical Society, 54 (1950) 121–64.

45. William Shand and Dean Keller, "Twentieth Century Industrial Development of Lancaster," Journal of the Lancaster County Historical Society, 69 (1965) 155–56. However, the fruits for an industrial revival had been set just before the end of this decade with the appearance of Armstrong Cork and several other large industrial establishments whose impacts were not significant in the 1910 returns.


47. F. S. Klein, op. cit.

48. Of course immigrants could make up the difference. In any event, industrial opportunities certainly do not seem so lucrative if you are a farmer in the most prosperous agricultural county in the nation!

49. F. S. Klein, op. cit. 121.

50. Albright, Two Centuries . . . 186; Binder, Coal Age Empire . . . 124.


52. Hellstrom, op. cit. Schwenk, op. cit.

53. Patton, Some Impacts . . . 68.


55. This theme is explored in Patton, op. cit.


57. Cyrus T. Fox, ed. Reading and Berks County Pennsylvania: A History. (New York, 1925). Volumes II and III of this work contain the biographies of Reading's leading citizens and their local origins are very much in evidence. See also Patton, Some Impacts . . . 61–66 for an analysis of this local flavor of Reading's elite with respect to the railroad.


59. Allentown's pattern is a standard of urban economic development, see Yeates and Garner, The North American City, pp. 144–56.