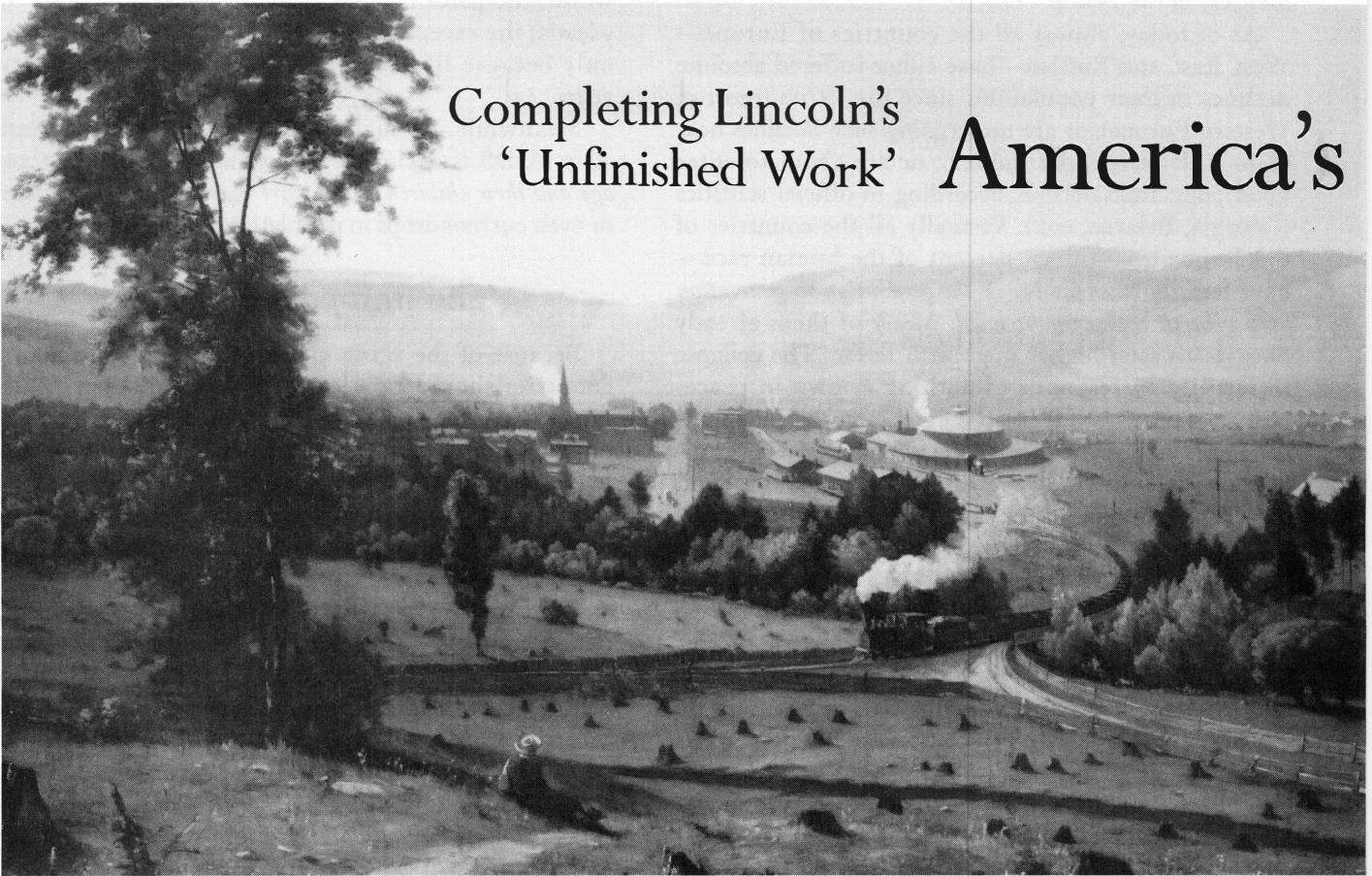


Completing Lincoln's 'Unfinished Work' America's

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One hundred and thirty years ago, come this November 19, Abraham Lincoln stepped forward on the battleground at Gettysburg to deliver that speech which still echoes around the world. To many it is known by heart, and kept there. “The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living rather to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us—that from these honored dead we take increased devotion—that we here highly resolve that these dead shall not have died in vain—that this nation, under God, shall have a new birth of freedom—and that government, of the people, by the people, for the people, shall not perish from the earth.”

Gettysburg was the turning point in the war to preserve the Union. Where did this nation stand at this moment of its new birth? What was the “unfinished work” of which Lincoln spoke? The answer is neither well-known today, nor found in history books. Poised to

take over the world, on behalf of the ideas for which, not one, but three wars had been fought on these shores, by successor generations in that brief span of eighty years. Ideas, which—also not taught in schools, nor found in the history books—are the direct outcome of the greatest flowering of creativity in human history, the European Golden Renaissance.

Lincoln's America had become the world's pre-eminent military power, to be emulated by military strategists and planners around the world. This, thanks to the skills of Generals Grant and Sherman and still others on land, and also by sea. It had become, in terms of potential, the world's pre-eminent economic power, and so-called “American methods,” the model for any country on the path of development. Its alliance with Czar Alexander Romanov, and the international support for the Union's cause against King Cotton and his chattel slaves, was potentially decisive. In the months following that November speech, the world was in our grasp. And then, by the spring of 1865, Lincoln was dead at the hands of the assassin. The world, in a real sense, has not been the same since.



Contribution to the Golden Renaissance

by Christopher White

George Inness, "The Lackawanna Valley," 1855 (detail).

What does all this have to do with the subject of population and the Renaissance? The answer is, absolutely everything.

The pre-eminent potential of the United States would not have been achieved without the pre-eminence of the ideas on which it was created. Specifically, the proposition that all men are created equal, endowed by their Creator with certain inalienable rights. Those propositions, whether the Founding Fathers talked about it or not, flow from the guiding conceptions which organized Europe into the Renaissance. Conceptions associated with Christianity's *filioque* principle: man in the living image of God. A Christian conception, not in the dress of the priest or theologian, but planted in the idea and institutions of representative self-government which took root here and spread from the Massachusetts Bay Colony.

The conception which is still summarily expressed in the Constitution's Preamble: "in order to form a more perfect union . . . and secure the blessings of liberty to ourselves *and our posterity*, we do ordain and establish this Constitution."

What other nation acted to secure the rights of generations to come in its founding law? Rights to seek perfection for their unborn. Anyone who has seen the Florentine orphanage designed by Brunelleschi, known as the

Hospital of the Innocents—a palace fit for the most splendid of kings—or Raphael's series of Madonnas, each with its chubby, all too human, baby boy, knows that here we have the conception which is at the core of everything the European Renaissance stood for. And, that it is concerned with nothing other than perfecting the moral condition of mankind, that he might thereby continuously improve the apparent conditions of his own existence, in accord with the Creator's fundamental law.

This is the unfinished work of which Lincoln spoke.

It is the work which is reflected in the graph shown in Figure 1, which presents estimated values of world population growth. We are concerned with two features of this growth, namely, changes which make their appearance in fifteenth-century Renaissance Europe, and again around the 1780's, the time of the American Revolution and Germany's Weimar Classic. As we shall see, what those changes reflect is that the political experiment brought forth on these shores, from Europe, had found a way to increase the production of useful wealth so as to sustain increasing rates of population growth. The means, improvements in the productivity of labor—what Hamilton called the substitution of "artificial labor" for human or animal muscle power. The method was the application of the Renaissance principle of the primacy of human creativity.

The case to be presented is not one you will find taught any longer in schools. Not these days, when not only is actual history suppressed, but laws are changed to outlaw teaching of such documents as the Declaration of Independence and the Constitution.

What are the changes referred to? First, in the world population chart (SEE Figure 1), note that if our species took one thousand years to increase from about 250 million souls, world-wide, the same as the U.S. population of today, to 500 million, it took only another three hundred or so years to increase to one billion, and another two hundred to increase to around four billion. Someone is going to say, “ah, hah! Fallacy of *post hoc, ergo propter hoc*: just because it happened *after*, doesn’t mean it happened *because of*”!

Leave that for the moment. Figure 2 more or less appears to show that the effect of the increasing rate of advance was general, and not specific: all parts of the world appear to have benefitted proportionately.

Figure 3 clarifies that, however. We can see two general forms among the data: first, a cyclical pattern, ups and downs, relative to the increase of world population as a whole, which can then be contrasted with a second, differing pattern which prevailed in Europe from the fifteen century until the beginning of this present one, and is reflected in the growth patterns of the the U.S., and the category marked “other” (which includes Ibero-America, that other offspring of Europe’s Renaissance).

What we are seeing, on the scale of human history, is the superiority of Golden Renaissance-based political

culture, and the verification of the political form of the *filiouque*, that “all men are created equal,” since the lives of all members of each successor generation have been transformed by creativity at work. Thus was the pattern of imperial cycles of growth and decay potentially broken for all mankind for all time. If the quality of ideas which permit one nation to secure its future growth by creating wealth at a rate adequate to that, are demonstrated through their power to transform people and the world, then no nation ought to be deprived of those same ideas. This, again, is mankind’s unfinished work.

The giants of the Renaissance placed the creative potentials of the human mind, the image of the Creator, at the center. The founders of this Republic, institutionalized such conceptions in the form of their notion of “citizens’ self-government,” together with its corollary, free labor, against empire and its slaves.

It is these ideas, not the so-called industrial revolution, machine age, and so forth, not the daily practice which becomes custom, attenuates, and degenerates into its opposite, mere words in the service of egoism and chauvinism, which account for the changes.

Man, individual man, mastering through science the ideas which permit him to change the way his species exists, and out of those changes realize the potential for

change again. Man as creative intellect, not beast of repetitive labor, contributing during his individual lifetime, to improving the lifetimes of generations to come, and thereby validating all those who went before. Such is true liberty, the labor of the free, not the disgusting hedonism that masquerades as freedom today.

The Development of America

Let us now show, using some examples from U.S. history, how the ideas which set such a priceless value on the life of the individual human being, in the individual’s potential contribution to the uplifting of all mankind, do

The graphs accompanying this article are adapted from a slide show entitled “Two Hundred Years of U.S. Economic History,” which is available from EIR News Service, Inc. for \$35. To order, call John Hoefle at (703)777-9451.

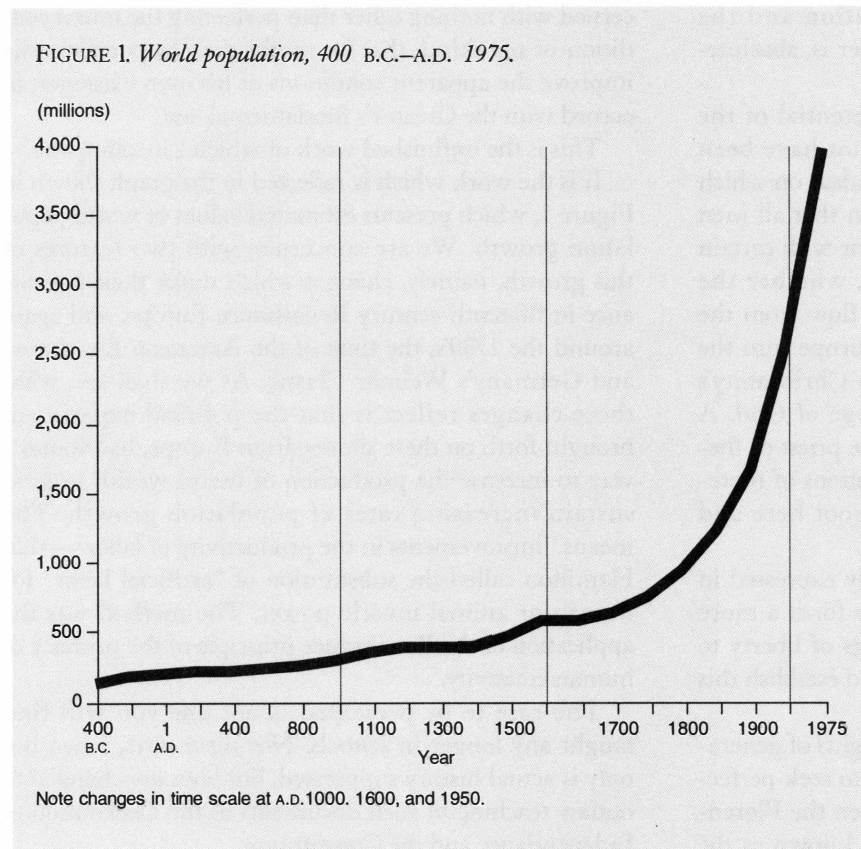


FIGURE 2. *World population, 400 B.C.—A.D. 1975.*

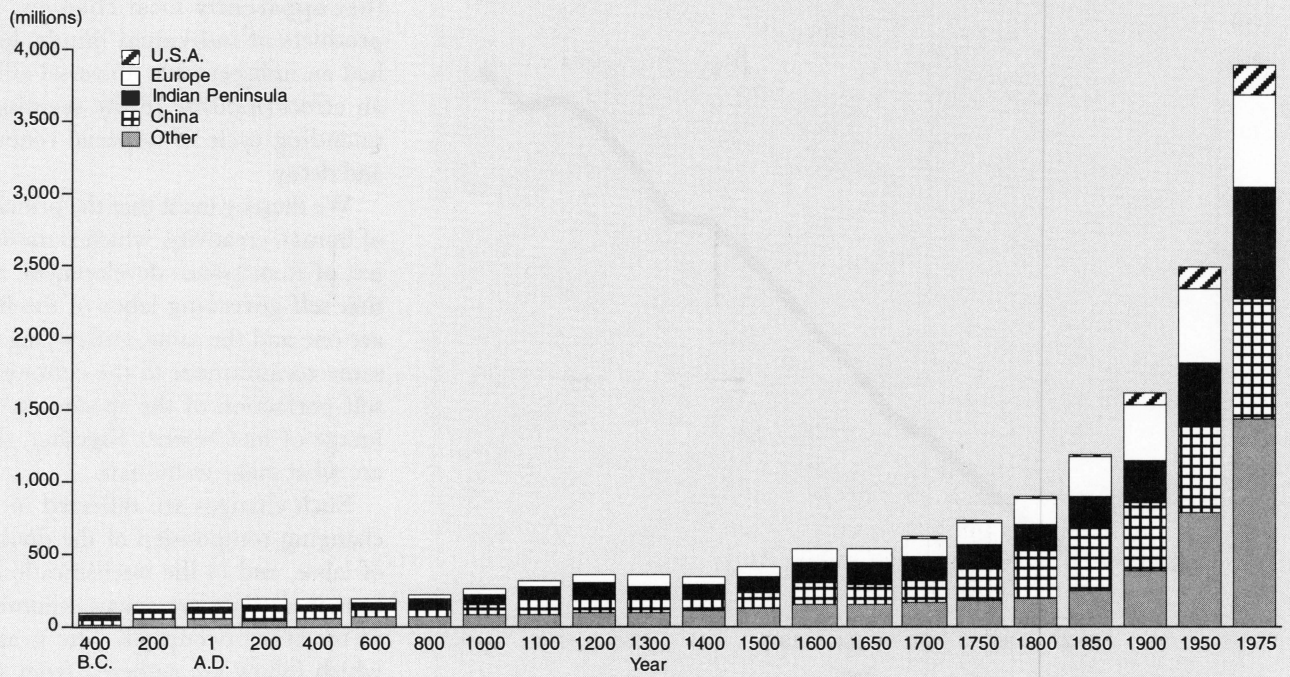
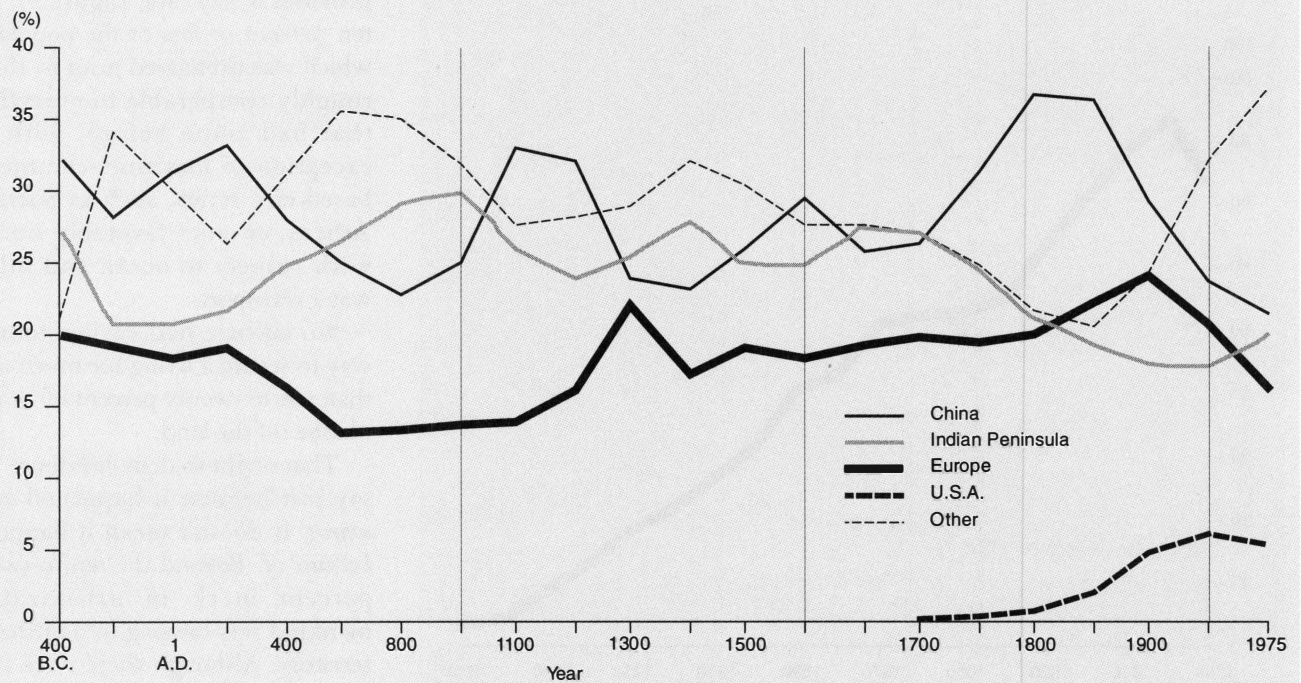


FIGURE 3. *Regions as a percentage of world population, 400 B.C.—A.D. 1975.*



Note changes in time scale at A.D. 1000, 1600, and 1950.

FIGURE 4. *Urban population as a percentage of total U.S. population, 1790–1990.*

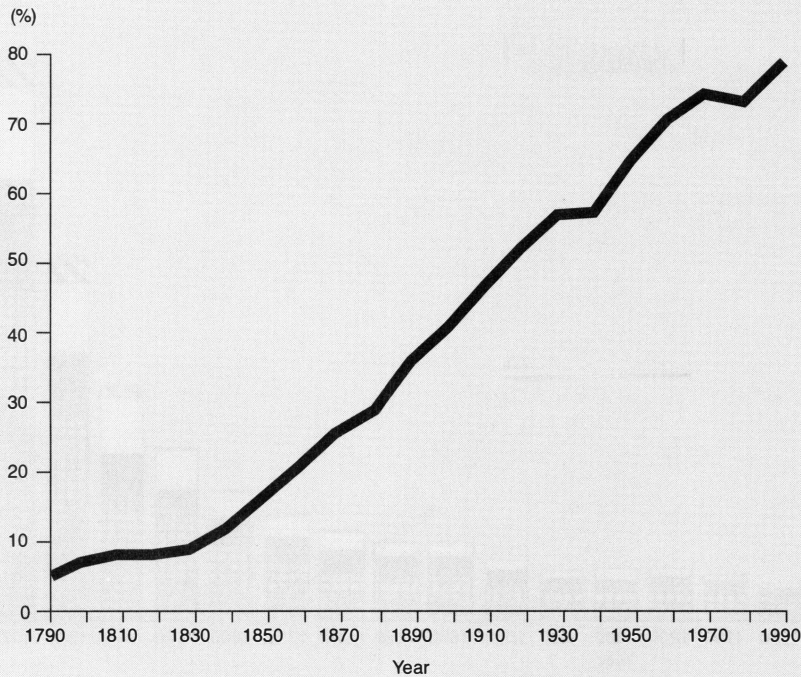
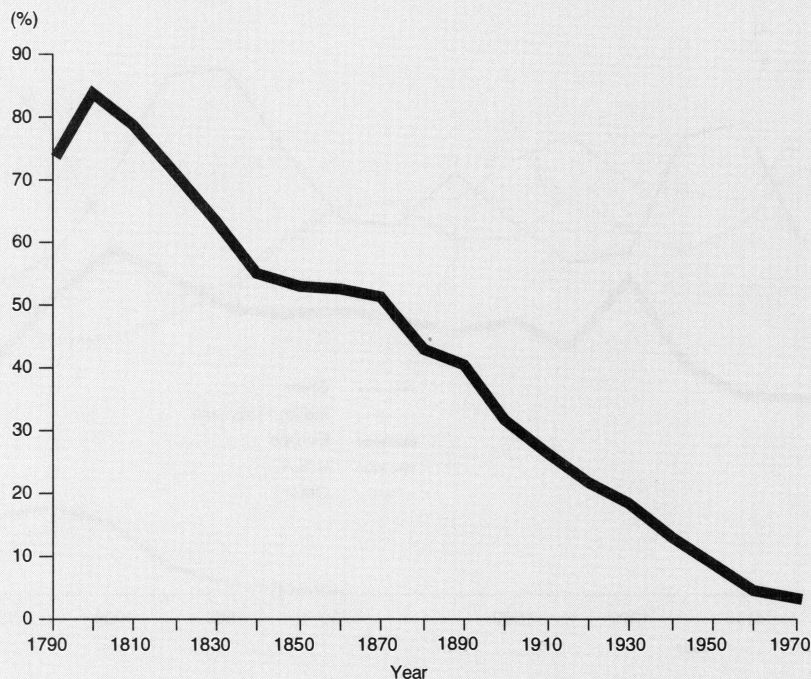


FIGURE 5. *Agricultural labor as a percentage of total U.S. labor force, 1800–1970.*



indeed result in the changes which make improved continued human existence possible, universally, such that apparently local changes, the products of individual minds, have had an indispensable universal effect, an effect opposite to the seemingly unending cycle of imperial renewal and decay.

We thereby insist that the principle of human creativity, which is the subject of Renaissance development, and that self-governing labor of the free, are one and the same, embodying the same commitment to the continuing self-perfection of the species, in the image of its Creator. Together, they are what make us human.

Such changes are reflected in the changing composition of the division of labor, and in the intensification of human activity *per* square kilometer of territory occupied. The graphs which follow are gathered from successive editions of the U.S. Census of Population and Census of Manufactures, since the first such Census was conducted in 1791.

The growth of urban population provides a key (SEE Figure 4). The ten percent or less of the population which was urbanized prior to 1850 is roughly comparable to everything that had come before, with the exception of maritime-commerce-based city states, such as Socrates' Athens, or cities favorably situated with respect to ocean and inland water transport.

No culture had earlier found a way to secure a living for much more than ten to twenty percent of its population off the land.

That ought to demolish those who say just because it happened *afterwards*, it doesn't mean it happened *because of*. Beyond the ten to twenty percent mark in urbanization, mankind was moving into uncharted territory. Although there were those who, like Columbus, knew where they were going.

Furthermore, if no previous culture had found a way to support more than ten to twenty percent of its population living away from the land, neither had any society found a way to ensure that wealth could be created sufficient to guarantee its own future growth. For example, to increase the productivity of agriculture, and thereby food production, faster than the rate of population growth, to make a more rapid growth of population possible.

How to support a growing urban population as a percentage of a growing total population? Only through improving agricultural productivity, through reducing that portion of the total labor force required to produce food for itself and everyone else. (SEE Figure 5) Compare Figures 4 and 5: it is not until agricultural employment reaches fifty percent and lower that urban population begins to take off. The increase from about fifteen to thirty percent urbanized is accomplished with fifty percent of the labor force still working the land. The growth of the city population above thirty percent is accompanied by an equally rapid decline in agricultural employment.

It has been, over two hundred years, a roughly hundred-fold increase in the productive power of agricultural labor, relative to everything that had gone before. But these were only humans: if they could do it, why shouldn't everyone else? And they had nothing, compared to the means we now dispose of. But they did use their minds.

Concomitantly, we find a thirty-five-fold reduction in the land area required to support each household (SEE Figure 6). Mark again how the reductions parallel the increase in urbanized population, and the reduction in agricultural labor. (The initial increase, for the curious, is the effect of the Louisiana Purchase.)

This is not the same as crop area

FIGURE 6. U.S. land area per household, 1800–1990.

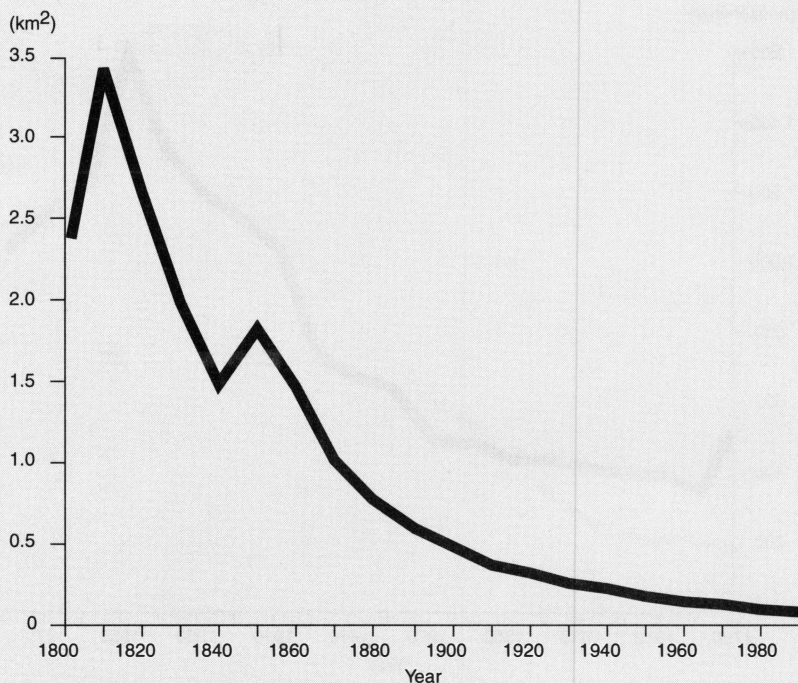


FIGURE 7. U.S. crop land per household, 1800–1990.

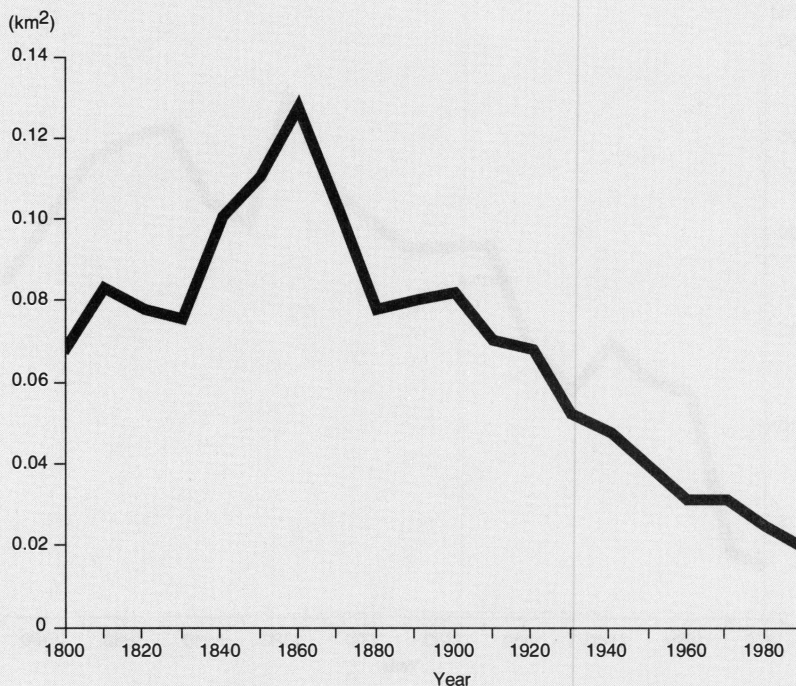


FIGURE 8. U.S. urban households per urban area, 1790–1980.

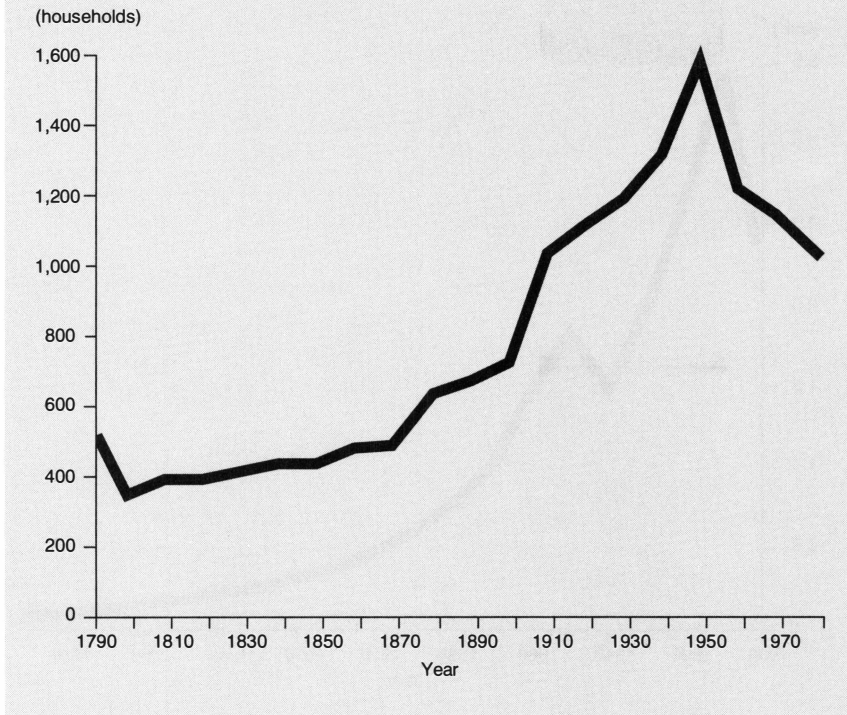
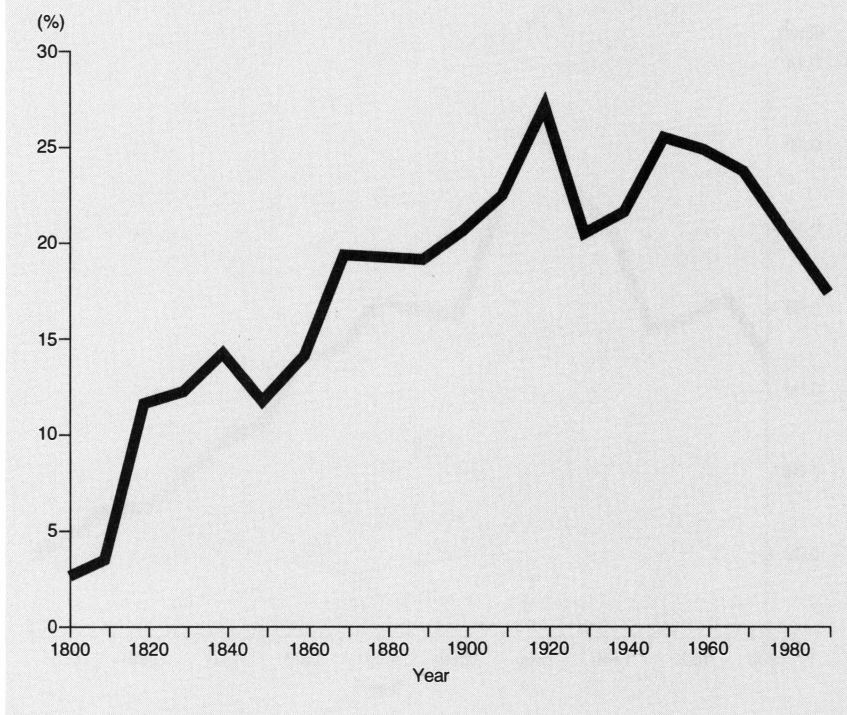


FIGURE 9. Manufacturing labor force as a percentage of total U.S. labor force, 1800–1990.



employed, which first increases, nearly doubles, as the wilderness is brought into cultivation to provide the necessities of life for more people, and then declines, as agricultural productivity increases outpace population growth (SEE Figure 7). As the growth of urban population is related to the increasing productive power of farm workers, so is the increasing intensity of activity in urban areas related to the decline in land required *per* household. This is reflected in Figure 8, urban households *per* unit urban area.

But now neither farm labor, nor any other kind of labor, can any longer be equated with the dumb repetitive behavior of the ox. With pride did Judge Jesse Buell write in the *Farmer's Companion* of 1839, “a farm may now be worked with half the expense of labor that it was wont to be worked with forty years ago, and may be better worked withal.” The 1860 Census documented another further fifty percent reduction in labor costs through the introduction of machinery, and showed how improvements in each farm operation contributed to the whole. For example, throughout human history, the grain harvest had been brought in with scythe and rake. One man cuts one acre *per* day, that's how it was. It is shown on the tomb paintings of Pharaonic Egypt; it is still in use. In 1851, a U.S. design won the reaper competition at the London World's Fair. It harvested one acre in 22 minutes, against 66 minutes for a British design, and 72 for an Algerian one. By 1880, three to four men working in the Dakotas could produce, process, and transport enough flour to feed a thousand people for a year.

The benefits of city life ought to be obvious. Freed from the land, man's potential to improve his life is vastly improved. The head of the Census Bureau before the war for the Union put it this way: “The proportion

between the rural and town population of a country is an important fact in its interior economy and condition. It determines, in a great degree its capacity for manufactures, the extent of its commerce and the amount of its wealth. The growth of cities commonly marks the progress of intelligence and the arts, measures the sum of social enjoyment, and always implies increased mental activity, which is sometimes healthy and useful, sometimes distempered and pernicious.”

Freed from the harsh necessity of agricultural labor, man can take up other pursuits in the path of improvement. Figures 9 and 10 indicate the growth of employment in manufacturing as a percentage of the labor force, and show the growth of principal categories of economic activity in terms of numbers of workers *per* household.

These changes reflect an ordered process of application of the powers of the human mind to transform the conditions of man’s existence in an equally ordered way. Advances in scientific knowledge, and the technological applications made possible by advances in science provide the ordering principle.

The succession in this case—from water and animal power, to the heat-powered steam engine, and then the mastering of the power of electricity, to augment through brain power the muscle power of human labor—was the transmission belt by which the ideas of the Renaissance

were conveyed, through the work of the institutions of citizen’s self-government, into increasing the potential of all mankind to advance in the same kind of way, if not precisely the same way.

These days we tend to look at this as a function of the growth of energy throughput, or more exactly, of the use of *heat*, since this is what they are looking at (SEE Figure 11). This, because of the idiotic conservers of energy, who insist that resources, human activity and so on, are all finite, limited in the same way these graphs are limited by their *x* and *y* axes. They ignore creativity’s ordering of the kind of change which *changes the axes* of such graphs.

So we see the succession of heat sources employed. From wood fuel, through anthracite and bituminous coal, into the age of oil and electricity. Not such a dramatic increase, more or less a doubling, as we saw the increase in agricultural productivity to have been, or the decline in land required *per* household, is it? But it doesn’t tell the story, this measure of *heat*, because by improving technology, we get more out of less (SEE Figure 12, “Horsepower,” which is a measure of the work output of the fuel consumed as heat). As we saw, within each fuel mode consumption remains pretty flat. But we get more work out of each unit of fuel employed: from around ten pounds of coal *per* horsepower of output in the aftermath of the Civil War, to around five pounds at the turn of the

FIGURE 10. U.S. workers per household by major division, 1800–1990.

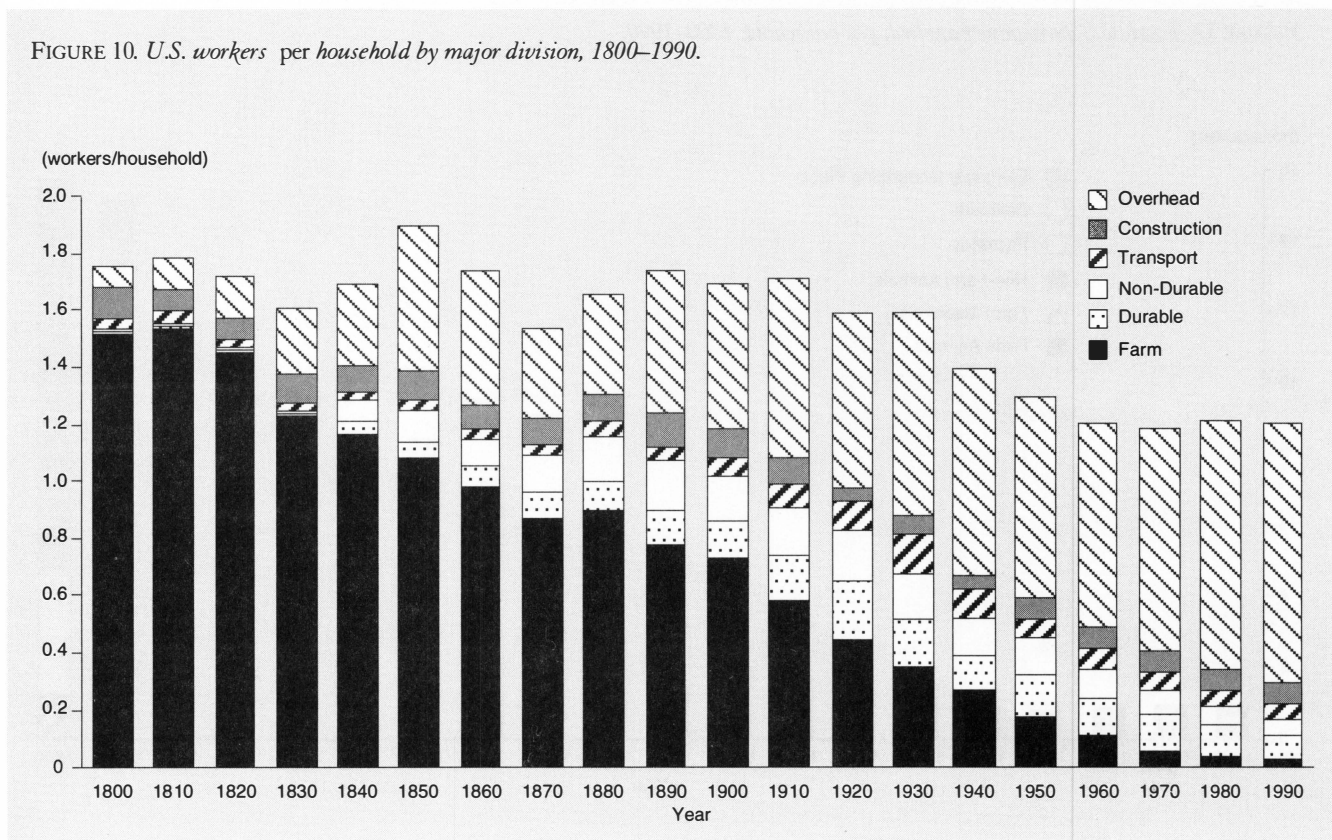


FIGURE 11. U.S. energy sources in trillion BTU per household, 1800–1990.

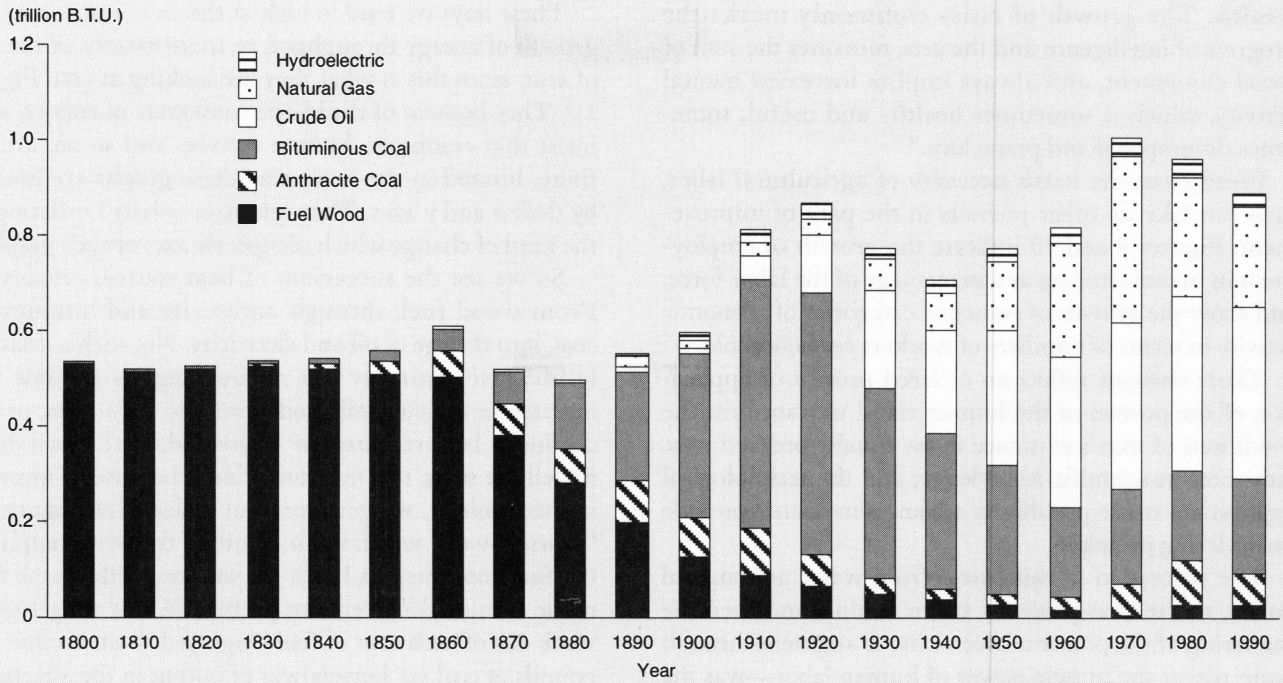
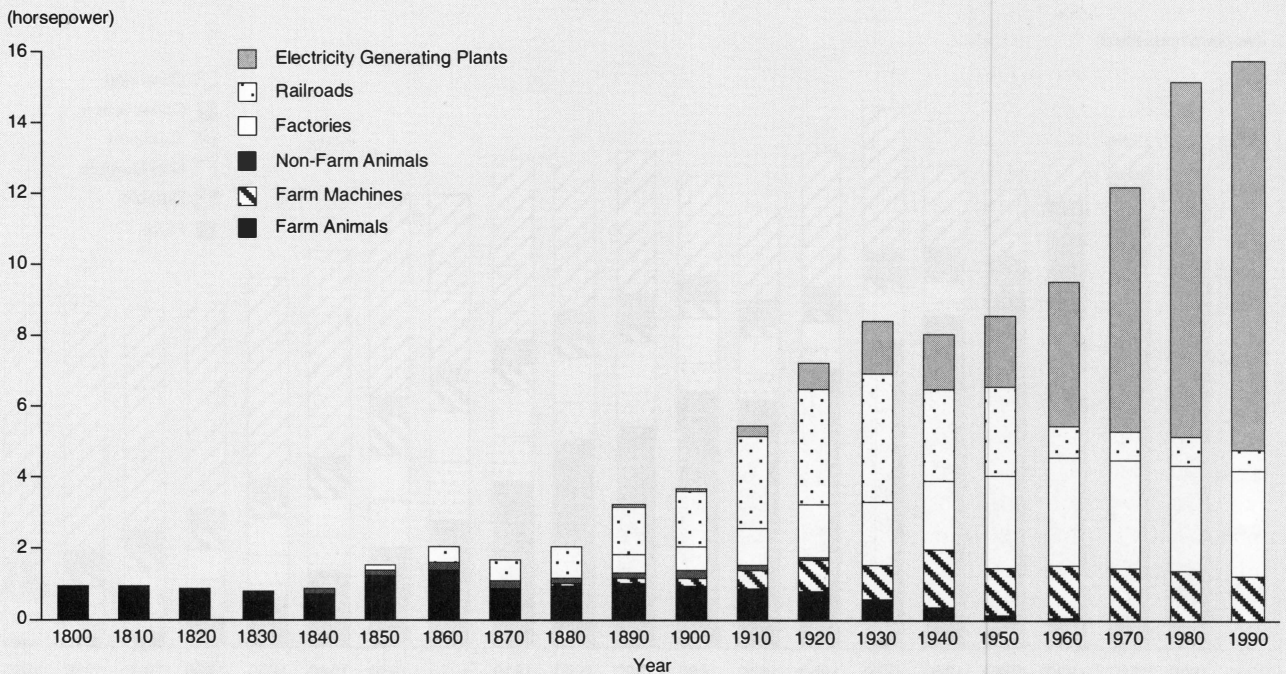


FIGURE 12. Total U.S. horsepower applied, per household, 1800–1990.



century, down to less than a pound before World War II.

Or, according to nineteenth-century engineers, a more than fifty-fold increase in the power output of the engine over the course of the century, combined with a more than four-fold improvement in its efficiency in burning fuel, combine here to produce a two-hundred-fold improvement in power output *per* unit fuel consumed. This is twice the improvement in agricultural productivity over this same period.

How does the development of artificial labor, machine power, fit into changing the relationship between countryside and city so profoundly? The answer used to be obvious, but isn't anymore, because we are dominated by insane ideas about cost. Nowadays we say, "It costs too much. We can't do it." But the answer lies in *infrastructure*, the development of basic economic infrastructure—in particular, the infrastructure of transportation.

Suppose a farmer is limited to animal and muscle power to grow and harvest his crops and move them to market, and suppose a city is limited to walking as a mode of transport.

In the one case, beyond a certain distance, the cost of carriage to market will price the farmer's goods out of consumption, no matter how well he produces. In the other, a city will not be able to expand in size much beyond a radius that can be walked in a given time, say for purposes of getting to and from work.

Thus, for example, at the time of the American Revolution, it was cheaper to transport goods 3,000 miles across the Atlantic ocean to Philadelphia, than it was to move them by wagon to Philadelphia from Lancaster, Pennsylvania. Robert Fulton expressed the arguments in a letter to Albert Gallatin, telling him that flour could be moved by water at one-tenth the cost it could be by road, and that at prevailing transport costs it could not be moved further than 150 miles. With the beginning ratios we have seen, an area of about 240 square kilometers, devoted to cropland only and without access to water, would be required to provide for about 2,400 farm families, and six hundred city households. Increasing the number of city dwellers much beyond that would sooner or later result in a food shortage in the city, no matter whether or not farmers

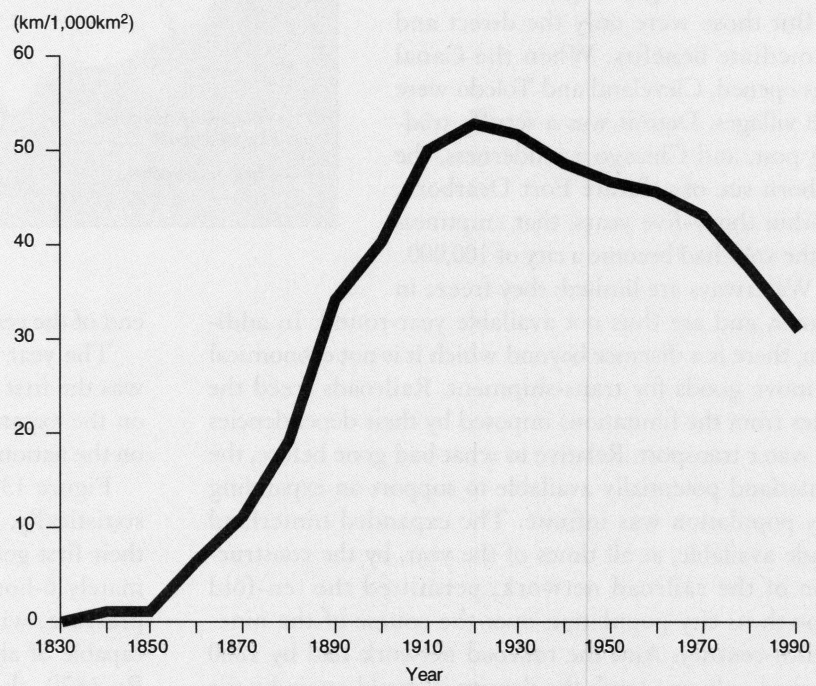
were growing food, because of the relationship between transport costs and area occupied.

The development of transportation infrastructure and the application of machine power to transportation infrastructure is what made the difference. Its importance is attested to by Benjamin Franklin's involvement with the projecting and planning of a highway system, by Washington's plans for a national canal system, and by Lincoln's involvement with the development of railroads, in Illinois with the Illinois Central, and of course, with the construction of the transcontinentals.

Already in 1786 and 1787, Oliver Evans—a Philadelphia engineer who invented the high-pressure, non-condensing steam engine, thus making the railroads possible (his type of engine powered Stephenson's Rocket), who built Philadelphia's first steam engine factory (immediately replicating the process in Pittsburgh, Cincinnati and Louisville), and who succeeded in applying steam power to the solution of Philadelphia's water-supply problems—had petitioned the Pennsylvania Legislature to sponsor development work on what would become the steam-powered railroad. But we went the route of road and water/canal, before we went to railroads. Maps I-IV show some features of this.

De Witt Clinton's Erie Canal was decisive. Built between 1817 and 1825, the Canal was intended to open

FIGURE 13. U.S. railroad track length per total land area, in $\text{km}/1,000\text{km}^2$, 1830–1990.



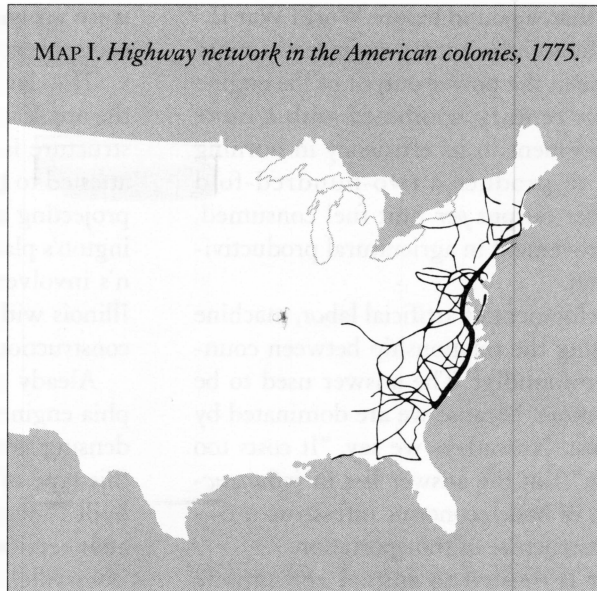
up 8,000 square miles across the Appalachians to agriculture, with Sandusky, Ohio as the distribution center, and to prevent Union farmers from becoming enthralled to a northern outlet for their goods, under the British in Montreal, and to a southern one, down the Mississippi in New Orleans. Under the latter, Northern farmers were supposed to be suppliers of bacon and grits to the ever-expanding slave system of the South. The Canal changed all that, by creating an outlet for expanded farm produce in the urban centers of the East.

Prior to the Canal's construction, it cost \$100 and took twenty days to move one ton of goods the 425 miles between Buffalo and New York City. Once in New York, the goods were priced at three times and more the price of local produce. After the Canal was finished, freight costs fell to \$15-25 *per ton*, and the time of the transit was reduced to eight days. In the years before the Civil War, the rate for goods from Ohio fell to one-tenth the pre-Canal rates. Farm production in Ohio doubled in value, without increasing costs to the consumer in the East. Within fifteen years the volume of goods coming from Ohio exceeded that originating in New York.

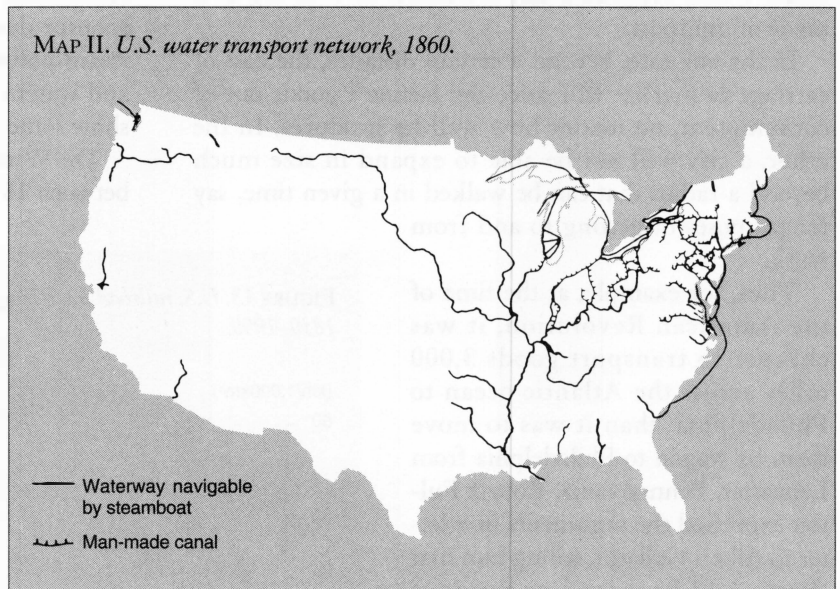
But those were only the direct and immediate benefits. When the Canal was opened, Cleveland and Toledo were still villages, Detroit was a scruffy trading post, and Chicago a wilderness, the unborn site of a future Fort Dearborn. Within thirty-five years, that emptiness in the void had become a city of 100,000.

Waterways are limited: they freeze in winter, and are thus not available year-round. In addition, there is a distance beyond which it is not economical to move goods for trans-shipment. Railroads freed the cities from the limitations imposed by their dependencies on water transport. Relative to what had gone before, the hinterland potentially available to support an expanding city population was infinite. The expanded hinterland made available, at all times of the year, by the construction of the railroad network, permitted the ten-fold growth in city population over the course of the nineteenth century. And the railroad network had by 1860 reached only one-tenth the density it would attain by the

MAP I. *Highway network in the American colonies, 1775.*



MAP II. *U.S. water transport network, 1860.*

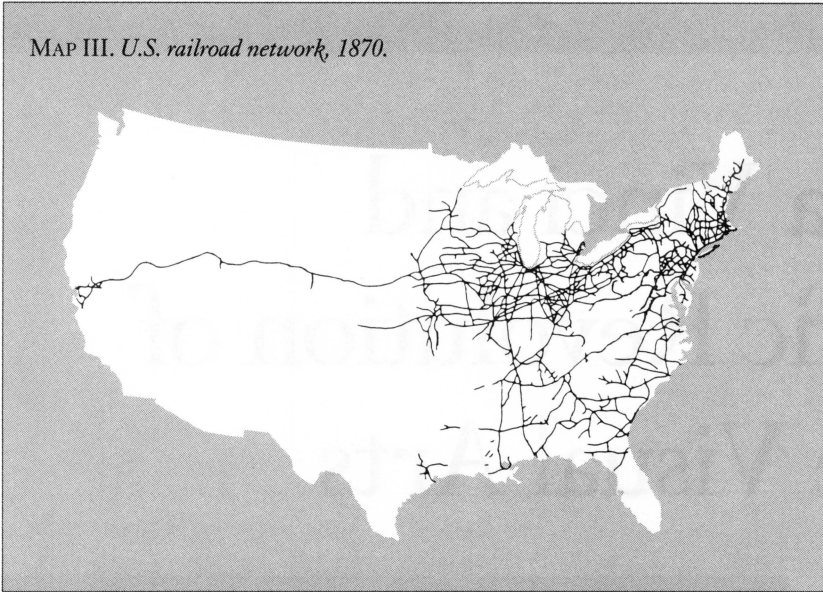


end of the century (SEE Figure 13).

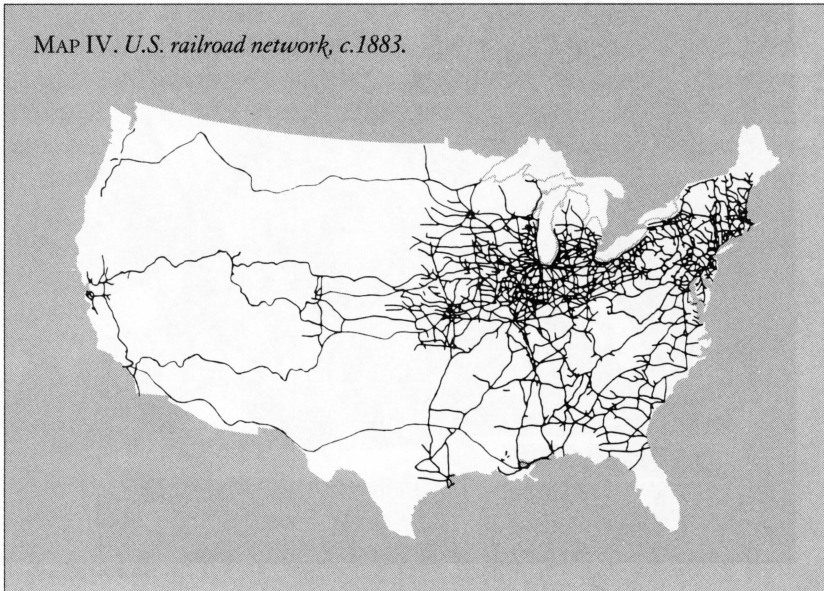
The year 1860, when Lincoln was elected President, was the first year in which the volume of freight carried on the expanding railroad system, exceeded that carried on the nation's waterways, man-made or otherwise.

Figure 13 shows the growth of the railroad network statistically, and Maps I-IV show it geographically. In their first generation, the railroad engines were approximately 6-horsepower affairs, operating at 50-psi steam pressure, with an axle weight of about 1-ton *per axle*, capable of about 1,000 ton-miles *per hour*, gross weight. By 1870, the coal burning standard American-class

MAP III. U.S. railroad network, 1870.



MAP IV. U.S. railroad network, c.1883.



engine produced 500 horsepower, with an axle weight of 20 tons. Ton-miles *per* hour were increased a hundred-fold and more. The railroads provided the logistical depth, and mobility, for Union forces during the War.

In the cities, the considerations applied are not so different. Improved transportation was equally vital, even if the distance scales are totally different.

Four phases stand out, prior to the twentieth century adoption of the automobile: The “walking” city; the city of the horse-drawn omnibus; the city of the rail-based, horse-drawn street car; and the city of the electric street car. In speed, the horse-drawn omnibus, pioneered by

Leibniz collaborator Blaise Pascal in seventeenth-century Paris, was comparable to foot. The horse-drawn street car, running on iron rails, doubled the number of passengers that could be moved *per* team of horses, and increased the speed of travel from about four to about six miles *per* hour. Potential area covered, and thus potential city size, and population, increases as the square of the radius.

So the population of New York City, where horse-drawn street car service began operations in 1832, increased eight-fold to reach one million by 1860.

The electric street car, introduced by Frank Sprague in Richmond, Virginia in 1885, quadrupled the enlarged area that could be served in the same period of time. It was what permitted the growth of population living in cities of over 10,000, from eleven million to forty-five million between 1880 and 1920.

And now look at the world today. Where does the unfinished work of Gettysburg stand? Yes, the technological means have increased vastly again beyond what we have discussed. Now we need nuclear scientists and engineers, not electrical engineers or boiler makers. But more than two-thirds of the world’s population still live with over fifty percent of their labor force deployed in agriculture. Billions of people live in economies where urban population remains below thirty percent, and where cities have been rendered uninhabitable to human beings.

And we in the United States today, are seriously discussing handing the work of two hundred years, and indirectly many more, back to Mother Nature, and her consort, the Father of All Rivers, as the President’s Mississippi-flood panel proposes. By the standards of November 19, 1863, we must surely, as a people, be judged insane; even, perhaps, traitors to the principles which made us what we were. The time has come to prove that is not so, to take up the solemn resolve of Gettysburg field, and to resume what Lincoln called “the unfinished work” of organizing victory for Renaissance principles for all mankind.