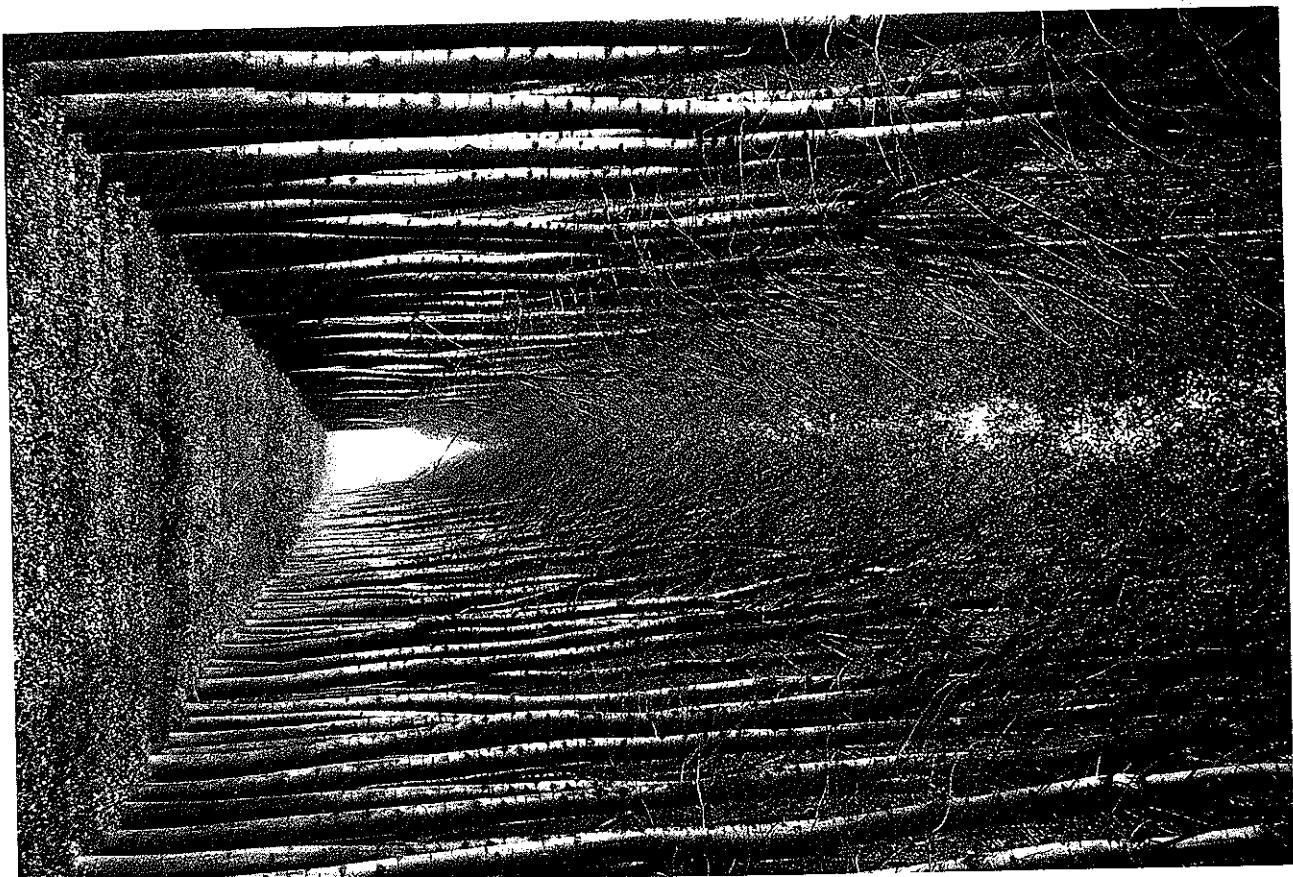
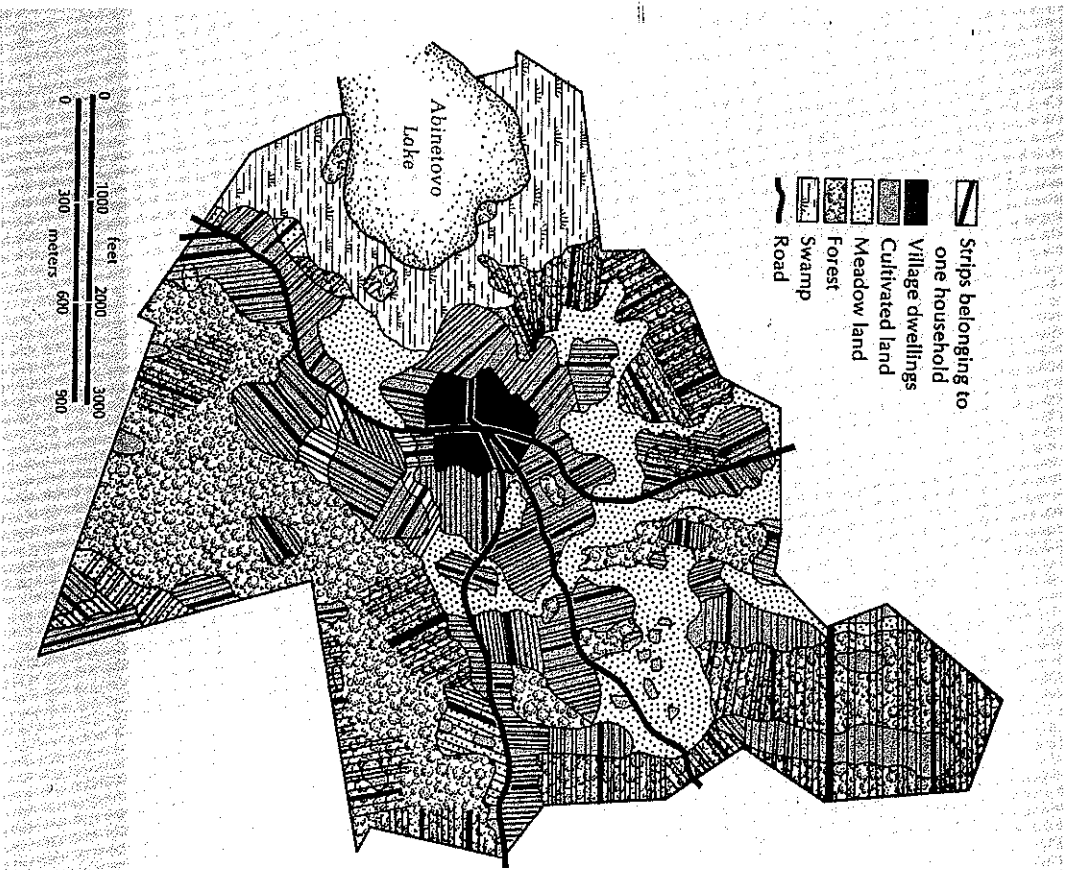




1. Mixed temperate forest, part managed, part natural regeneration

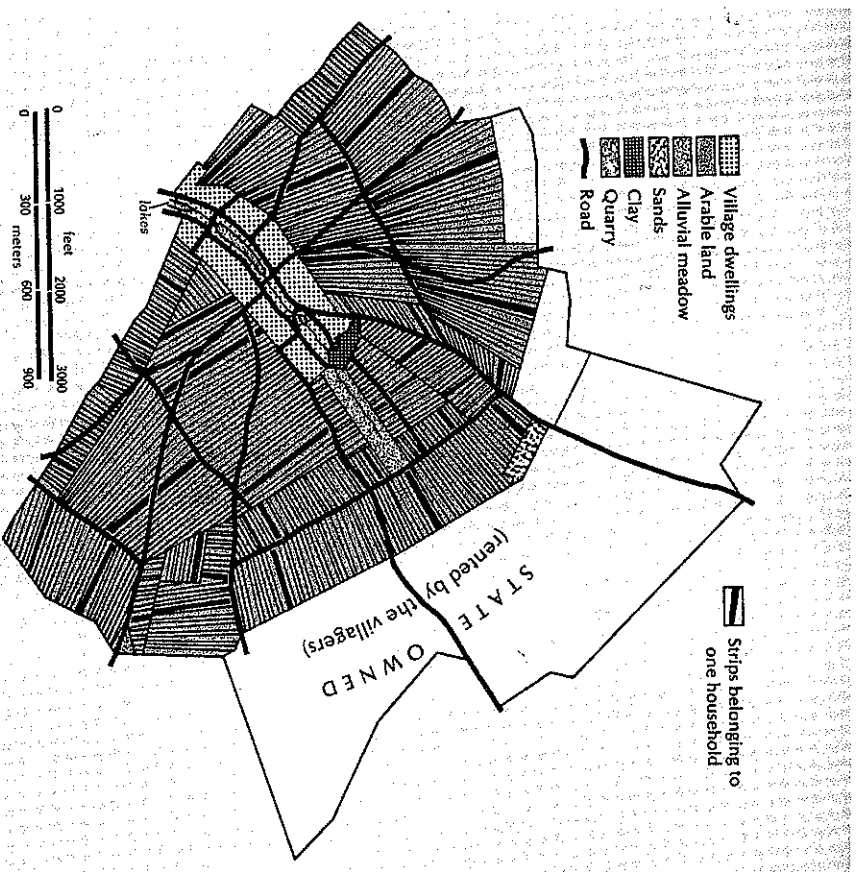


2. One aisle of a managed poplar forest in Tuscany



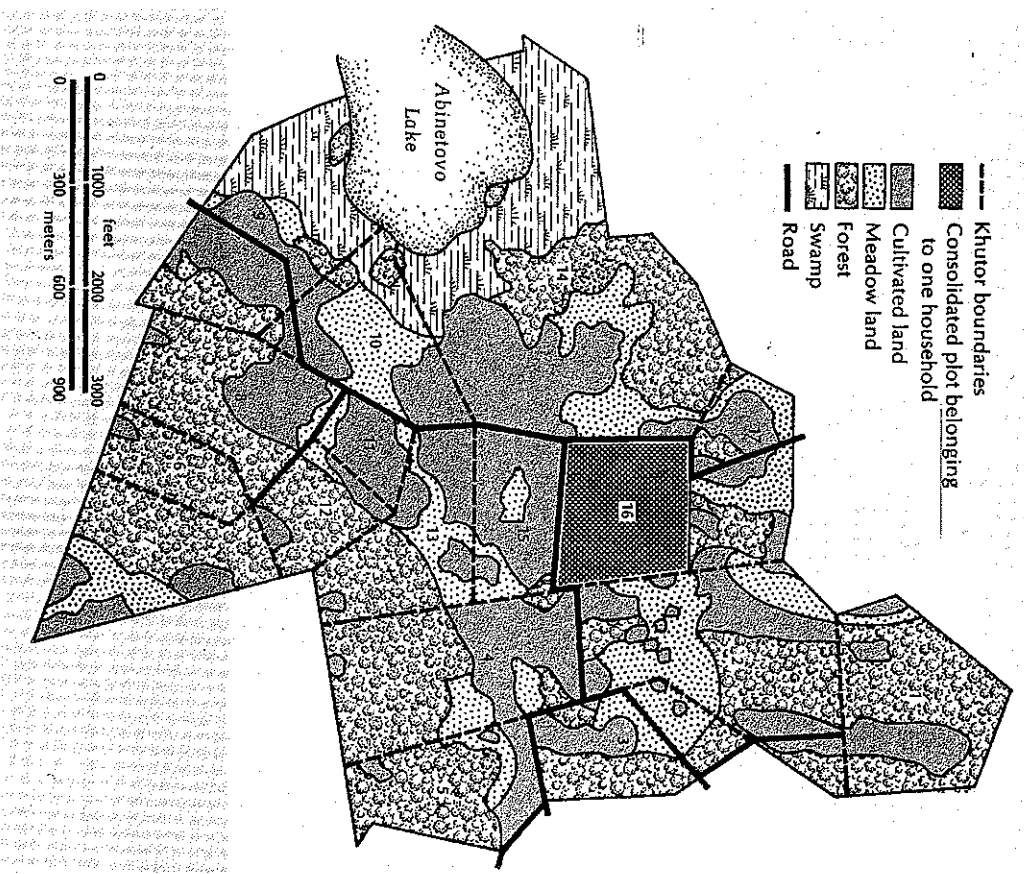
3. Novoselok village before the Stolypin Reform

were generally straight and parallel so that a readjustment could be made by moving small stakes along just one side of a field, without having to think of areal dimensions. Where the other end of the field was not parallel, the stakes could be shifted to compensate for the fact that the strip lay toward the narrower or wider end of the field. Irregular fields were divided, not according to area, but according to yield. To the eye—and certainly to those involved in cadastral mapping—the pattern seemed convoluted and irrational. But to those familiar with it, it was simple enough and worked admirably for their purposes.



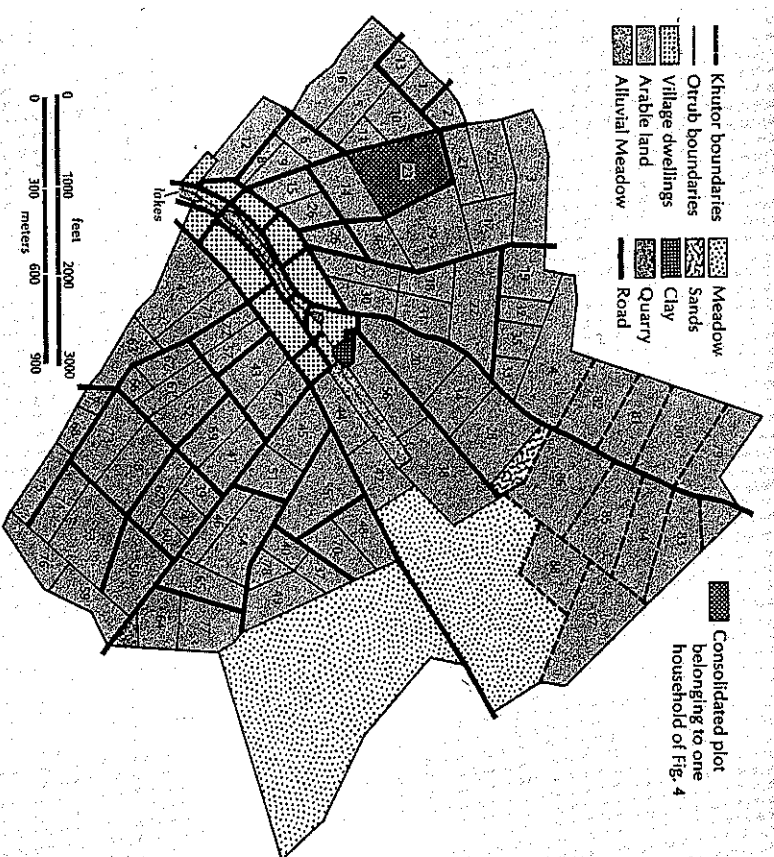
4. Khoynitsa village before the Stolypin Reform

The dream of state officials and agrarian reformers, at least since emancipation, was to transform the open-field system into a series of consolidated, independent farmsteads on what they took to be the western European model. They were driven by the desire to break the hold of the community over the individual household and to move from collective taxation of the whole community to a tax on individual landholders. As in France, fiscal goals were very much connected to reigning ideas of agricultural progress. Under Count Sergei Witte and Petr Stolypin, as George Yaney notes, plans for reform shared a common vision of how things were and how they needed to be: "First tableau: poor peasants, crowded together in villages, suffering from hunger, running into each other with their plows on their tiny strips. Second tableau: agriculture specialist agent leads a few progressive



5. Novoselok village after the Stolypin Reform

peasants off to new lands, leaving those remaining more room. Third tableau: departing peasants, freed from restraints of strips, set up khutor [integral farmsteads with dwellings] on new fields and adapt latest methods. Those who remain, freed of village and family restraints, plunge into a demand economy—all are richer, more productive, the cities get fed, and the peasants are not proletarianized.⁷⁶ It was abundantly clear that the prejudicial attitude toward interstripping was based as much on the autonomy of the Russian village, its illegibility to outsiders, and prevailing dogma about scientific agriculture as it was

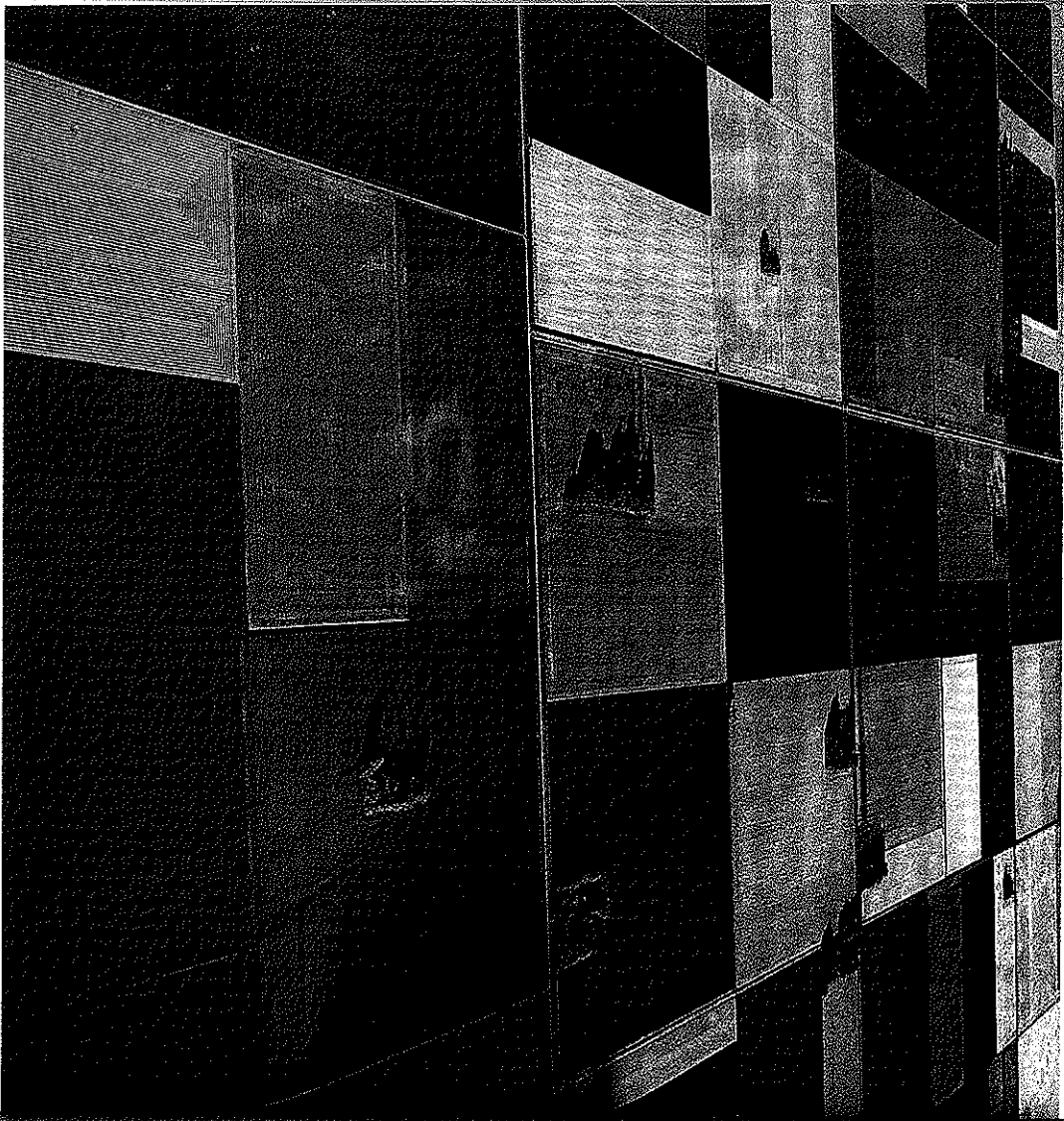


6. Khotynitsa village after the Stolypin Reform

on hard evidence.⁷⁷ The state officials and agrarian reformers reasoned that, once given a consolidated, private plot, the peasant would suddenly want to get rich and would organize his household into an efficient workforce and take up scientific agriculture. The Stolypin Reform therefore went forward, and cadastral order was brought to both villages in the wake of the reform (figures 5 and 6).

In Novoselok village, seventeen independent farmsteads (*khutor*) were created in a way that aimed to give each household a share of meadow, arable, and forest. In Khotynitsa village, ten khutor were created as well as seventy-eight farms (*orub*), whose owners continued to dwell in the village center. As a cadastral matter, the new farms were mappable, easily legible from above and outside, and, since each was owned by an identifiable person, assessable.

Taken alone, the maps shown in figures 5 and 6 are misleading. Such model villages suggest efficient cadastral teams working their way diligently through the countryside and turning open-field chaos into tidy lit-



7. The survey landscape, Castleton, North Dakota

an eye trained by Enlightenment rationalism, imagined dividing the United States west of the Ohio River into "hundreds"—squares measuring ten miles by ten miles—and requiring settlers to take the parcels of land as so designated.

The geometrical clarity of Jefferson's proposal was not merely an aesthetic choice; he claimed that irregular lots facilitated fraud. To reinforce his case, he cited the experience of Massachusetts, where actual landholdings were 10 percent to 100 percent greater than what had

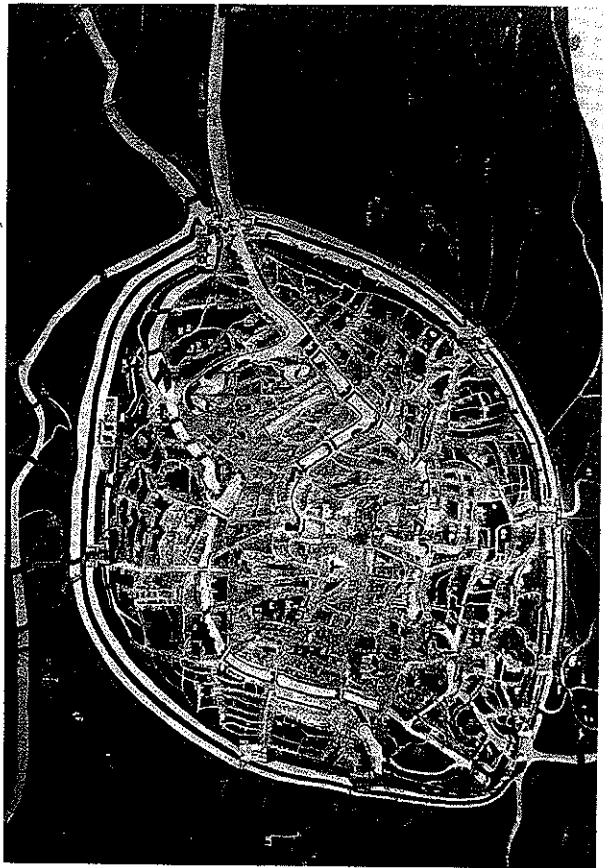
been granted by deed.¹⁰⁰ Not only did the regularity of the grid create legibility for the taxing authority, but it was a convenient and cheap way to package land and market it in homogeneous units. The grid facilitated the commoditization of land as much as the calculation of taxes and boundaries. Administratively, it was also disarmingly simple. Land could be registered and titled from a distance by someone who possessed virtually no local knowledge.¹⁰¹ Once it was in place, the scheme had some of the impersonal, mechanical logic of the foresters' table. But in practice, land titling in Jefferson's plan (which was modified by Congress to provide for rectangular lots and townships that were thirty-six square miles) did not always follow the prescribed pattern.

The Torrens system of land titling, developed in Australia and New Zealand in the 1860s, provided a lithographed, presurveyed grid representing allotments that were registered to settlers on a first-come first-served basis. It was the quickest and most economical means yet devised to sell land, and it was later adopted in many British colonies. The more homogeneous and rigid the geometric grid, however, the more likely it was to run afoul of the natural features of the nonconforming landscape. The possibilities for surprises was nicely captured in this satirical verse from New Zealand.

Now the road through Michael's section
though it looked well on the map
For the use it was intended
wasn't really worth a rap
And at night was not unlikely
to occasion some mishap.

It was nicely planned on paper
and was ruled without remorse
Over cliffs, and spurs and gullies
with a straight and even course
Which precluded locomotion
on part of man or horse.¹⁰²

The cadastral survey was but one technique in the growing armory of the utilitarian modern state.¹⁰³ Where the premodern state was content with a level of intelligence sufficient to allow it to keep order, extract taxes, and raise armies, the modern state increasingly aspired to "take in charge" the physical and human resources of the nation and make them more productive. These more positive ends of statecraft required much greater knowledge of the society. And an inventory of land, people, incomes, occupations, resources, and deviance was the logical place to begin. "The need for the increasingly bureaucratic state to organize itself and control its resources gave an impulse to the collectio-



8. Bruges circa 1500, from a painting in the Town Hall, Bruges

ties.¹ It functioned spatially in much the same way a difficult or unintelligible dialect would function linguistically. As a semipermeable membrane, it facilitated communication within the city while remaining stubbornly unfamiliar to those who had not grown up speaking this special geographic dialect.

Historically, the relative illegibility to outsiders of some urban neighborhoods (or of their rural analogues, such as hills, marshes, and forests) has provided a vital margin of political safety from control by outside elites. A simple way of determining whether this margin exists is to ask if an outsider would have needed a local guide (a native tracker) in order to find her way successfully. If the answer is yes, then the community or terrain in question enjoys at least a small measure of insulation from outside intrusion. Coupled with patterns of local solidarity, this insulation has proven politically valuable in such disparate contexts as eighteenth- and early nineteenth-century urban riots over bread prices in Europe, the Front de Libération Nationale's tenacious resistance to the French in the Casbah of Algiers,² and the politics of the bazaar that helped to bring down the Shah of Iran. Illegibility, then, has been and remains a reliable resource for political autonomy.³

Stopping short of redesigning cities in order to make them more legible (a subject that we shall soon explore), state authorities endeavor

ored to map complex, old cities in a way that would facilitate policing and control. Most of the major cities of France were thus the subject of careful military mapping (*reconnaissances militaires*), particularly after the Revolution. When urban revolts occurred, the authorities wanted to be able to move quickly to the precise locations that would enable them to contain or suppress the rebellions effectively.⁴

States and city planners have striven, as one might expect, to overcome this spatial unintelligibility and to make urban geography transparently legible from without. Their attitude toward what they regarded as the higgledy-piggledy profusion of unplanned cities was not unlike the attitude of foresters to the natural profusion of the unplanned forest. The origin of grids or geometrically regular settlements may lie in straightforward military logic. A square, ordered, formulaic military camp on the order of the Roman *castra* has many advantages. Soldiers can easily learn the techniques of building it; the commander the troops knows exactly in which disposition his subalterns and various troops lie; and any Roman messenger or officer who arrives at the camp will know where to find the officer he seeks. On a more speculative note, a far-flung, polyglot empire may find it symbolically useful to have its camps and towns laid out according to formula as a statement of its order and authority. Other things being equal, the city laid out according to a simple, repetitive logic will be easiest to administer and police.

Whatever the political and administrative conveniences of a geometric cityscape, the Enlightenment fostered a strong aesthetic that looked with enthusiasm on straight lines and visible order. No one expressed the prejudice more clearly than Descartes: "These ancient cities that were once mere *straggling* villages and have become in the course of time great cities are commonly quite *poorly laid out* compared to those *well-ordered towns* that an *engineer lays out on a vacant plane* as it suits his fancy. And although, upon considering one-by-one the buildings in the former class of towns, one finds as much art as more than one finds in the latter class of towns, still, upon seeing how the buildings are arranged—*here a large one, there a small one*—*and how they make the streets crooked and uneven*, one will say that it *chance more than the will of some men using their reason that has arranged them thus*."⁵

Descartes's vision conjures up the urban equivalent of the scientific forest: streets laid out in straight lines intersecting at right angles, buildings of uniform design and size, the whole built according to single, overarching plan.

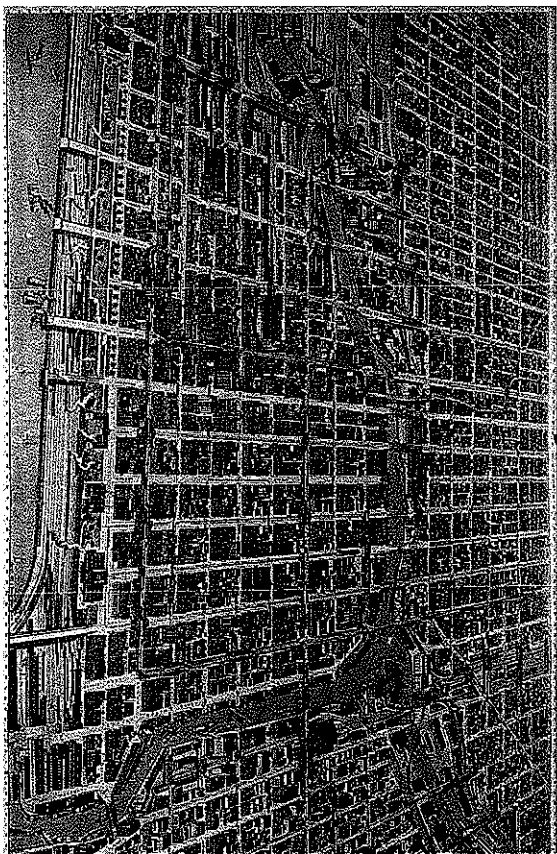
The elective affinity between a strong state and a uniformly laid out

city is obvious. Lewis Mumford, the historian of urban form, locates the modern European origin of this symbiosis in the open, legible baroque style of the Italian city-state. He claims, in terms that Descartes would have found congenial, "It was one of the triumphs of the baroque mind to organize space, to make it continuous, reduce it to measure and order."⁶ More to the point, the baroque redesigning of medieval cities—with its grand edifices, vistas, squares, and attention to uniformity, proportion, and perspective—was intended to reflect the grandeur and awesome power of the prince. Aesthetic considerations frequently won out over the existing social structure and the mundane functioning of the city. "Long before the invention of bulldozers," Mumford adds, "the Italian military engineer developed, through his professional specialization in destruction, a bulldozing habit of mind: one that sought to clear the ground of encumbrances, so as to make a clear beginning on its own inflexible mathematical lines."⁷

The visual power of the baroque city was underwritten by scrupulous attention to the military security of the prince from internal as well as external enemies. Thus both Alberti and Palladio thought of main thoroughfares as military roads (*viae militares*). Such roads had to be straight, and, in Palladio's view, "the ways will be more convenient if they are made everywhere equal: that is to say that there will be *no part in them where armies may not easily march*."⁸

There are, of course, many cities approximating Descartes's model. For obvious reasons, most have been planned from the ground up as new, often utopian cities.⁹ Where they have not been built by imperial decrees, they have been designed by their founding fathers to accommodate more repetitive and uniform squares for future settlement.¹⁰ A bird's-eye view of central Chicago in the late nineteenth century (William Penn's Philadelphia or New Haven would do equally well) serves as an example of the grid city (figure 9).

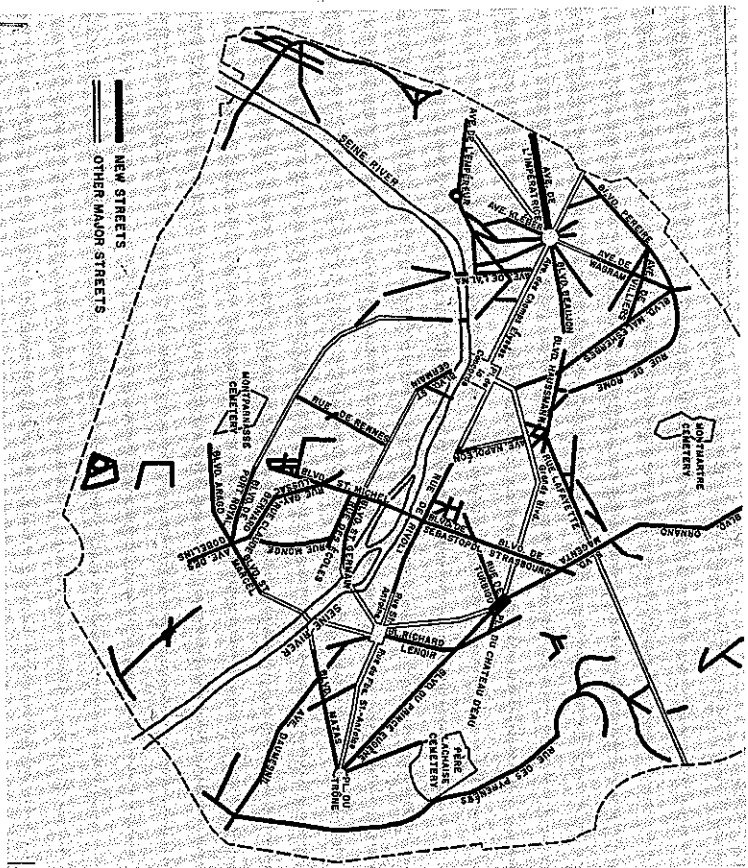
From an administrator's vantage point, the ground plan of Chicago is nearly utopian. It offers a quick appreciation of the ensemble, since the entirety is made up of straight lines, right angles, and repetitions.¹¹ Even the rivers seem scarcely to interrupt the city's relentless symmetry. For an outsider—or a policeman—finding an address is a comparatively simple matter; no local guides are required. The knowledge of local citizens is not especially privileged vis-à-vis that of outsiders. If, as is the case in upper Manhattan, the cross streets are consecutively numbered and are intersected by longer avenues, also consecutively numbered, the plan acquires even greater transparency.¹² The aboveground order of a grid city facilitates its underground order in the layout of water pipes, storm drains, sewers, electric cables, natural



9. Map of downtown Chicago, circa 1893

gas lines, and subways—an order no less important to the administrators of a city. Delivering mail, collecting taxes, conducting a census, moving supplies and people in and out of the city, putting down a riot, or insurrection, digging for pipes and sewer lines, finding a felon, conscript (providing he is at the address given), and planning public transportation, water supply, and trash removal are all made vastly simpler by the logic of the grid.

Three aspects of this geometric order in human settlement bear emphasis: The first is that the order in question is most evident, not at street level, but rather from above and from outside. Like a marcher in a parade or like a single riveter in a long assembly line, a pedestrian in the middle of this grid cannot instantly perceive the larger design of the city. The symmetry is either grasped from a representation—it is in fact what one would expect if one gave a schoolchild a ruler and a blank piece of paper—or from the vantage point of a helicopter hovering far above the ground: in short, a God's-eye view, or the view of an absolute ruler. This spatial fact is perhaps inherent in the process of urban or architectural planning itself, a process that involves miniaturization and scale models upon which patron and planner gaze down, exactly as if they were in a helicopter.¹³ There is, after all, no other way of visually imagining what a large-scale construction project will look like when it is completed except by a miniaturization of the



10. Map of Paris, 1870, showing the principal new streets built between 1850 and 1870

boulevards, which were widened and straightened.¹⁷ But the retrofit, seen merely as a new street map, greatly underestimates the transformation. For all the demolition and construction required, for all the new legibility added to the street plan, the new pattern bore strong traces of an accommodation with "old-growth" Paris. The outer boulevards, for example, follow the line of the older customs (*octroi*) wall of 1787. But Haussmann's scheme was far more than a traffic reform. The new legibility of the boulevards was accompanied by changes that revolutionized daily life: new aqueducts, a much more effective sewage system, new rail lines and terminals, centralized markets (Les Halles), gas lines and lighting, and new parks and public squares.¹⁸ The new Paris created by Louis Napoleon became, by the turn of the century, a widely admired public works miracle and shrine for would-be planners from abroad.

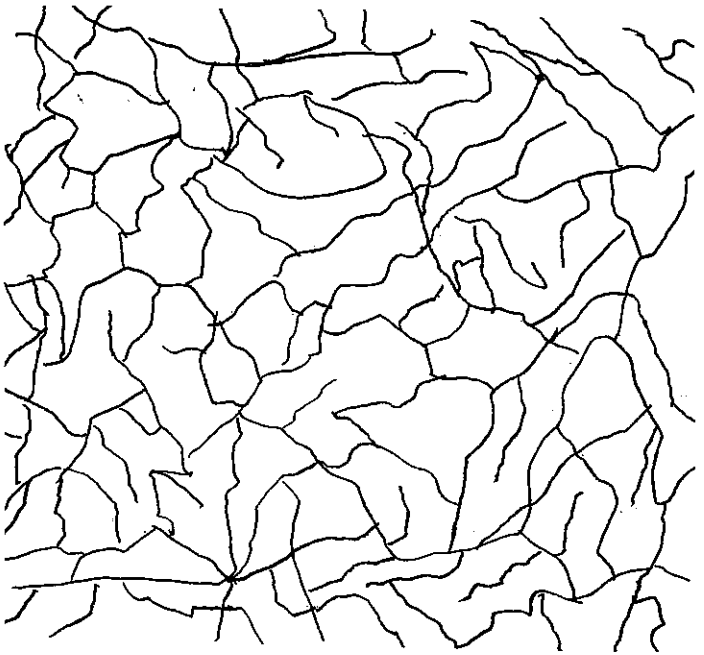
At the center of Louis Napoleon's and Haussmann's plans for Paris lay the military security of the state. The redesigned city was, above

all, to be made safe against popular insurrections. As Haussmann wrote, "The order of this Queen-city is one of the main pre-conditions of general [public] security."¹⁹ Barricades had gone up nine times in the twenty-five years before 1851. Louis Napoleon and Haussmann had seen the revolutions of 1830 and 1848; more recently, the June Days and resistance to Louis Napoleon's coup represented the largest insurrection of the century. Louis Napoleon, as a returned exile, was well aware of how tenuous his hold on power might prove.

The geography of insurrection, however, was not evenly distributed across Paris. Resistance was concentrated in densely packed, working-class *quartiers*, which, like Bruges, had complex, illegible street plans.²⁰ The 1860 annexation of the "inner suburbs" (located between the customs wall and the outer fortifications and containing 240,000 residents) was explicitly designed to gain mastery over a *ceinture sauvage* that had thus far escaped police control. Haussmann described this area as a "dense belt of suburbs, given over to twenty different administrations, built at random, covered by an inextricable network of narrow and tortuous public ways, alleys, and dead-ends, where a nomadic population without any real ties to the land [property] and without any effective surveillance, grows at a prodigious speed."²¹ Within Paris itself, there were such revolutionary *foyers* as the Marais and especially the Faubourg Saint-Antoine, both of which had been determined centers of resistance to Louis Napoleon's coup d'état.

The military control of these insurrectionary spaces—spaces that had not yet been well mapped—was integral to Haussmann's plan.²² A series of new avenues between the inner boulevards and the customs wall was designed to facilitate movement between the barracks on the outskirts of the city and the subversive districts. As Haussmann saw it, his new roads would ensure multiple, direct rail and road links between each district of the city and the military units responsible for order there.²³ Thus, for example, new boulevards in northeastern Paris allowed troops to rush from the Courbevoie barracks to the Bastille and then to subdue the turbulent Faubourg Saint-Antoine.²⁴ Many of the new rail lines and stations were located with similar strategic goals in mind. Where possible, insurrectionary quarters were demolished or broken up by new roads, public spaces, and commercial development. Explaining the need for a loan of 50 million francs to begin the work, Léon Faucher emphasized state security needs: "The interests of public order, no less than those of salubrity, demand that a wide swath be cut as soon as possible across this district of barricades."²⁵

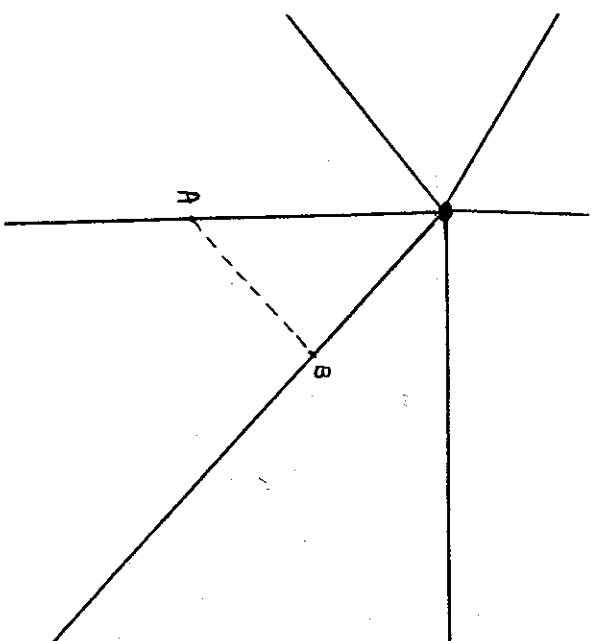
The reconstruction of Paris was also a necessary public-health mea-



11. Paths created by use and topography

along valleys, by watercourses, and around defiles and also the location of important resources and ritual sites. Weber captures the wealth of human activities that animate these movements across the landscape: "They served professional pursuits, like the special trails followed by glassmakers, carriers or sellers of salt, potters, or those that led to forges, mines, quarries, and hemp fields, or those along which flax, hemp, linen, and yarn were taken to market. There were pilgrimage routes and procession trails."⁶⁸

If we can imagine, for the sake of argument, a place where physical resources are evenly distributed and there are no great physical barriers to movement (such as mountains or swamps), then a map of paths in use might form a network resembling a dense concentration of capillaries (figure 11). The tracings would, of course, never be entirely random. Market towns based on location and resources would constitute small hubs, as would religious shrines, quarries, mines, and other important sites.⁶⁹ In the French case as well, the network of roads would have long reflected the centralizing ambitions of local lords and the nation's monarchs. The point of this illustrative idealization, however, is to depict a landscape of communication routes that is only



12. Centralized traffic hub

lightly marked by state centralization. It would resemble in many ways the cityscape of late fourteenth-century Bruges, shown earlier.

Beginning with Colbert, the state-building modernizers of France were bent on superimposing on this pattern a carefully planned grid of administrative centralization.⁷⁰ Their scheme, never entirely realized, was to align highways, canals, and ultimately rail lines to radiate from Paris like the spokes of a wheel (figure 12). The similarity between this grid and the *tre-aire* of the well-managed state foresaw conceived by Colbert was not accidental. They were both devised to maximize access and to facilitate central control. And the kind of simplification involved was, again, entirely relative to location. For official at the hub, it was now much easier to go to A or to B along new routes. The layout was designed "to serve the government and cities and lacking a network of supporting thoroughfares had little to do with popular habit or need. Administrative highways, a historical precedent called them, [were] made for troops to march on and for revenues to reach the treasury."⁷¹ For anyone wanting to travel or to trade goods between A and B, however, things were not so simple. Just as documents had to "pass through" the official legal language, so too much of the commercial traffic had to pass through the capital.

The driving intellectual force behind this *esprit géométrique* vision and has remained, the renowned engineers of the Corps des Ponts

sonal income taxes). The interventions it does experience will typically be mediated by local trackers who know the society from inside and who are likely to interpose their own particular interests. Without this mediation—and often with it—state action is likely to be inept, greatly overshooting or undershooting its objective.

An illegible society, then, is a hindrance to any effective intervention by the state, whether the purpose of that intervention is plunder or public welfare. As long as the state's interest is largely confined to grabbing a few tons of grain and rounding up a few conscripts, the state's ignorance may not be fatal. When, however, the state's objective requires changing the daily habits (hygiene or health practices) or work performance (quality labor or machine maintenance) of its citizens, such ignorance can well be disabling. A thoroughly legible society eliminates local monopolies of information and creates a kind of national transparency through the uniformity of codes, identities, statistics, regulations, and measures. At the same time it is likely to create new positional advantages for those at the apex who have the knowledge and access to easily decipher the new state-created format.

The discriminating interventions that a legible society makes possible can, of course, be deadly as well. A sobering instance is wordlessly recalled by a map produced by the City Office of Statistics of Amsterdam, then under Nazi occupation, in May 1941 (figure 13).⁷⁶ Along with lists of residents, the map was the synoptic representation that guided the rounding up of the city's Jewish population, sixty-five thousand of whom were eventually deported.

The map is titled "The Distribution of Jews in the Municipality." Each dot represents ten Jews, a scheme that makes the heavily Jewish districts readily apparent. The map was compiled from information obtained not only through the order for people of Jewish extraction to register themselves but also through the population registry ("exceptionally comprehensive in the Netherlands")⁷⁷ and the business registry. If one reflects briefly on the kind of detailed information on names, addresses, and ethnic backgrounds (determined perhaps by names in the population registry or by declaration) and the cartographic exactitude required to produce this statistical representation, the contribution of legibility to state capacity is evident. The Nazi authorities, of course, supplied the murderous purpose behind the exercise, but the legibility provided by the Dutch authorities supplied the means to its efficient implementation.⁷⁸ That legibility, I should emphasize, merely amplifies the capacity of the state for discriminating interventions—a capacity that in principle could as easily have been deployed to feed the Jews as to deport them.



13. Map produced by the City Office of Statistics of Amsterdam and entitled "The Distribution of Jews in the Municipality (May 1941)"

Legibility implies a viewer whose place is central and whose vision is synoptic. State simplifications of the kind we have examined are designed to provide authorities with a schematic view of their society, a view not afforded to those without authority. Rather like U.S. highway patrolmen wearing mirrored sunglasses, the authorities enjoy a quasi-monopolistic picture of selected aspects of the whole society. This privileged vantage point is typical of all institutional settings where command and control of complex human activities is paramount. The monastery, the barracks, the factory floor, and the administrative bureaucracy (private or public) exercise many statelike functions and often mimic its information structure as well.