State Simplifications: Nature, Space and People

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Introduction

Certain forms of knowledge and control require a narrowing of vision. The great advantage of such tunnel vision is that it brings into very sharp focus certain limited aspects of an otherwise far more complex and unwieldy reality. This very simplification, in turn, makes the phenomenon at the center of the field of vision far more legible and, hence, far more susceptible to careful measurement, calculation, and manipulation.

The invention of scientific forestry in late 18th century Prussia and Saxony serves as something of a model of this process.[1] While the story of scientific forestry is important in its own right, I plan to use it here as a metaphor for the forms of knowledge and manipulation characteristic of large institutions with sharply defined interests, of which the state is perhaps the outstanding example. Once we have seen how simplification, legibility, and manipulation operate in forest management, we can then explore how a similar optic is applied by the modern state to urban planning, rural settlement, land administration and agriculture.

A. Parable of the State - and Scientific Forestry

The early modern European state, even prior to the development of scientific forestry, viewed its forests primarily through the fiscal lens of revenue needs. To be sure, other concerns such as timber for masts, shipbuilding, state construction, and sufficient

[1] Henry E. Lowood, "The Calculating Forester: Quantification, Cameral Science, and the Emergence of Scientific Forestry Management in Germany", pp. 315-342 in Tore Frangsmyr, J.L. Heinbron, and Robin E. Rider, eds. *The Quantifying Spirit in the 18th Century* (Berkeley: Univ. California Press 1991). The following account is largely drawn from Lowood's fine analysis.

fuelwood for the economic security of its subjects were not absent from official management. These added concerns, too, had heavy implications for state revenue and security.[2] Exaggerating only slightly, one might claim that the crown's interest in forests was resolved through its fiscal lens into a single number: that number being the revenue yield of the timber which might be extracted annually.

The best way to appreciate exactly how heroic this constriction of vision is, is to notice what is left out of its field of vision. Lying behind the number indicating revenue yield are not so much trees as 'commercial wood', representing so many thousands of board feet of saleable timber and so many cords of firewood fetching a certain price. Missing, of course, are all those trees, bushes, and plants holding little or no potential for state revenue. Missing as well, are all those aspects of trees - even 'revenue-bearing' trees - that may be useful to the population but whose value cannot be converted into fiscal receipts. Here I have in mind the uses of foliage as fodder and thatch, fruits as food for domestic animals and people, twigs and branches as bedding, fencing, hop poles and kindling, bark and roots for medicine and tanning, sap for resins and so forth. The actual tree with its vast number of possible uses is replaced by an "abstract" tree representing a volume of lumber or firewood.

From a naturalist's perspective, nearly everything is missing from the state's picture. Gone are the vast majority of flora, the grasses, flowers, lichen, ferns, mosses, shrubs, and vines. Gone, too, are reptiles, birds, amphibians, and innumerable species of insects. Gone is the vast majority of fauna except, perhaps, those of interest to the crown's gamekeepers.

From an anthropologist's perspective, nearly everything touching on human interaction with the forest is also missing from the state's tunnel vision. Except for its attention to poaching, which does impinge on either the state's claim to revenue in wood or its claim to royal game, the state typically ignores the vast and complex, negotiated social uses of the forest for hunting and gathering, pasturage, digging valuable minerals, fishing,

[2] The most striking exception was the royal attention to the supply of 'noble game' (e.g., deer, boar, fox) for the hunt and hence to the protection of its habitat. Lest one imagine this to be a quaint pre-modern affectation, it is worth recalling the enormous social importance of the hunt to such recent 'monarchs' as Erich Honneker and Tito.

charcoal-making, trapping, and food collection as well as its significance for magic, worship, refuge, etc.[3]

If the utilitarian state cannot see the real existing forest for the (commercial) trees, if its view of its forests is abstract and partial, it is hardly unique in this respect. A certain level of abstraction is necessary for certain forms of analysis and it is not at all surprising that the abstractions of state officials should reflect the paramount fiscal interests of their employer. The vocabulary used to organize nature typically betrays the overriding interests of its human users. In fact, the term "nature" is, in utilitarian discourse, replaced by the term "natural resources" in which the focus is on those aspects of nature that can be appropriated for human use. A comparable logic extracts from a more generalized natural world those flora or fauna that are of utilitarian value (usually marketable commodities) and, in turn, reclassifies those species which compete with, prey on, or otherwise diminish the yields of the valued species. Thus, *plants* that are valued become *crops*; the species that compete with them are reclassified as *weeds*, and the insects that ingest them are reclassified as *pests*. Thus, *trees* that are valued become *timber* while species that compete with them become "trash" trees or underbrush. The same logic applies to fauna. Those *animals* which are highly valued become *game* or *livestock*, while those animals which compete with or prey upon them become *predators* or "*varmints*."

The kind of abstracting, utilitarian logic which the state, through its officials, applies to the forest is thus not entirely distinctive. What is distinctive about it, however, is the narrowness of its field of vision, the degree of elaboration to which it can be subjected, and above all, as we shall see, the unique capacity of the state to impose (in part) its optic on the very reality it is observing.[4]

Scientific forestry was developed from about 1765 to 1800, largely in Prussia and Saxony. Eventually, it would become the basis of forest management techniques in France, England, the US and throughout the Third World. Its emergence can hardly be

[3] For an evocative and wide-ranging attempt to explore the changing cultural meaning of the forest in the west, see William Pogue Harrison, *Forests: The Shadow of Civilization* (Chicago: University of Chicago Press, 1992).

[4] This last is a kind of reverse Heisenberg principle. Instead of altering the phenomenon observed through the act of observation, so that the pre-observation state of the phenomenon is unknowable in principle, the effect of (interested) observation in this case is to alter the phenomenon in question over time so that it, in fact, more closely resembles the stripped down, abstract image the lens had revealed.

understood outside the larger context of centralized state-making initiatives of the period. In fact, the new forestry science was a sub-discipline of so-called "cameral science" - an effort to reduce the fiscal management of a kingdom to scientific principles that would allow systematic planning. Traditional domainal forestry had hitherto simply divided the forest into roughly equal plots - the number of plots coinciding with the number of years in the assumed growth cycle.[5] One plot was cut each year on the assumption of equal yields (and value) from plots of equal size. Owing to poor maps, the uneven distribution of the most valuable large trees (Hochwald) and very approximate cordwood (Bruststaerke) measures, the results were unsatisfactory for fiscal planning.

The first attempt at more precise measurement was made by Johann Gottlieb Beckmann on a carefully surveyed sample plot. Walking abreast, several assistants carried compartmentalized boxes with color-coded nails corresponding to five agreed upon size-categories of trees. Each tree was "tagged" with the appropriate nail until the whole sample plot was covered. Having begun with a specified number of nails, it was a simple matter to subtract those remaining from the initial total and arrive at an inventory of trees by size-class for the entire plot. The sample plot had been carefully chosen for its representativeness, allowing the foresters then to calculate the timber and, given certain price assumptions, the revenue yield of the whole forest. For the forest scientists (Forstwissenschaftler) the goal was always to 'deliver the greatest possible *constant* volume of wood'.[6]

The effort at precision was pushed further as mathematicians worked from the cone/volume principle to specify the volume of saleable wood contained by a standardized tree (Normalbaum). Their calculations were checked empirically against the actual volume of wood in sample trees.[7] The final result of such

[5] In the late 17th century Colbert had extensive plans to 'rationalize' forest administration both to prevent poaching and to generate a more reliable revenue yield. To this end, Etienne Dralet's *Traité du Régime Forestier* proposal regulated plots (tire-aire) "so that the growth is regular and easy to guard." Despite these initiatives, nothing much came of it in France until 1820 when the new German techniques were imported. Peter Sahlins, "Forest Rites: The War of the Demoiselles' in Ariège, France (1829-1831)", unpublished paper presented to the Program in Agrarian Studies, Yale University, January, 1992.

[6] Lowood, *op.cit.*, p. 338.

[7] Various techniques were tried: cutting an actual tree into very tiny bits and then compressing it to find its volume; putting wood in a barrel of known volume and adding measured amounts of water to calculate the volume of the barrel *not* occupied by the wood, etc. Lowood, *op.cit.*, p. 328.

calculations was the development of elaborate tables with data organized by classes of trees by size and age under specified conditions of normal growth and maturation. References to these tables coupled with field tests allowed the forester to estimate closely the inventory, growth, and yield of a given forest. In the regulated, abstract forest of the Forstwissenschaftler, calculation and measurement prevailed and the three watchwords were "minimum diversity", "the balance sheet", and "sustained yield".

The achievement of German forestry science in standardizing techniques to calculate the sustainable yield of commercial timber and, hence, revenue, was impressive enough. What is decisive for our purposes, however, is the next logical step in forest management. That step was to attempt to create, through careful seeding, planting and cutting, a forest that was easier for state foresters to count, manipulate, measure and assess. The fact is that forest science and geometry, backed by state power, had the capacity to transform the real, disorderly, chaotic forest so that it more closely resembled the administrative grid of its techniques. To this end the underbrush was cleared, the number of species was reduced (often to mono-culture), planting was done simultaneously and in straight rows for large tracts. These management practices, as Lowood observes,

> produced the monocultural, even-age forests that eventually transformed the *Normalbaum* from abstraction to reality. The German forest became the archetype for imposing on disorderly nature the neatly arranged constructs of science. Practical goals had encouraged mathematical utilitarianism, which seemed, in turn, to promote geometric perfection as the outward sign of the well-managed forest; in turn the rationally ordered arrangements of trees offered new possibilities for controlling nature.[8]

The tendency was toward "regimentation" in the strict sense of the word. The forest trees were drawn up into serried ranks, as it were, to be measured, counted off, felled, and replaced by a new rank-and-file of lookalike conscripts. At the limit, the forest itself would not have to be seen; it could be "read" accurately from the tables and maps in the foresters office.

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[8] Lowood, *op.cit.*, p. 341. See also, Harrison, *op.cit.*, pp. 122-23.

This utopian dream of scientific forestry was, of course, only the *immanent* logic of its techniques. It was not, and could not, ever be realized in practice. Both nature and "the human factor" intervened. The existing typography of the landscape and the vagaries of fire, storms, blights, climatic changes, insect populations, and disease conspired to thwart foresters and to shape the actual forest. Given the insurmountable difficulties of policing large forests, the adjacent human populations also typically continued to graze animals, poach firewood and kindling, make charcoal, and generally make use of the forest in ways that prevented the foresters' management plan from being fully realized.[9] Though, like all utopian schemes, it fell well short of attaining its goal, the critical fact is that it did partly succeed in stamping the actual forest with the imprint of its designs.

Facts-on-Paper, Facts-on-the-Ground

The administrators' forest cannot be the naturalists' forest. Even if the ecological interactions at play in the forest were known, they would constitute a reality so complex and variegated so as to defy easy shorthand description. The intellectual filter necessary to reduce the complexity to manageable dimensions was provided by the state's interest in commercial timber and revenue.

If the natural world, however shaped by human use, is too unwieldy in its "raw" form for administrative manipulation, so too are the actual social patterns of human interaction with nature bureaucratically indigestible in their raw form. A hypothetical, but realistic, case of land tenure arrangements may help demonstrate why this is so. The land tenure practices I describe here are all ones that I have encountered in the literature or in the course of field-work.

Let us imagine a community in which families have usufruct rights to parcels of cropland during the main growing season.

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[9] See, for example, Honoré de Balzac's *Les Paysans*, (Paris: Pleiades, 1949), E.P. Thompson's, *Whigs and Hunters: The Origin of the Black Act* (New York: Pantheon, 1975), Douglas Hay, "Poaching on Cannock Chase", in Douglas Hay, et. al., eds., *Albion's Fatal Tree* (New York: Pantheon 1975) and Steven Hahn, "Hunting, Fishing, and Foraging: Common Rights and Class Relations in the Postbellum South", *Radical History Review* 26 (1982), pp. 37-64. For a directly opposite German case, see one of Karl Marx's first published articles linking the theft of wood to the business cycle and unemployment in the Rhineland: reported in Peter Linebaugh, "Karl Marx, the Theft of Wood, and Working-Class Composition: A Contribution to the Current Debate", *Crime and Social Justice* (Fall-Winter, 1976), pp. 5-16.

Only certain crops, however, may be planted and every seven years the usufruct land is redistributed among families according to family size and the number of able-bodied adults. After the harvest of the main season crop, all cropland reverts to commons where any family may glean, graze their fowl and livestock, and even plant quickly-maturing, dry-season crops. Edible wild plants growing on the margins of fields, along water courses, and on bunds are available to those who gather them. Trees which are known to have been planted are, together with their fruit - the property of the family which planted them, no matter where they are now growing. Fruit fallen from such trees, however, is the property of anyone who gathers it. When a family fells one of its trees or it is felled by wind, the trunk of the tree belongs to the family, branches to the immediate neighbors, and the "tops" (leaves, twigs, fronds) to any poorer village who carries them off. Land is set aside, exceptionally, for use or leasing out by widows with children or dependants of conscripted males. Usufruct rights to land and trees may be "let" to anyone within the village but not to anyone outside the village unless no one in the community wishes to use it.

Let us also imagine that fishing rights are distributed so that anyone may take fish (by net, weir, or hook-and-line) from canals and streams. In flooded usufruct fields, however, while anyone may fish with hook-and-line for small fish, the larger fish - taken usually when the field is drained - belong to the owner of the crop growing in that field.

After a crop failure leading to severe food shortage, many of these arrangements are re-adjusted. Better off villagers are expected to assume some responsibility for poorer relatives - by sharing their land, by employing them, or by simply feeding them. Should the shortage persist, the council of lineage heads may inventory food supply and begin daily rationing. In case of an outright famine, the women who have married into the village but have not yet borne children will not be fed and are expected to return to their natal village.

This description could be further elaborated; it is itself a simplification. But it does convey some of the actual complexity of property relations in contexts where customary local arrangements have tended to prevail. To describe the usual practices in this fashion, as if they were laws, is itself a serious distortion. They are better understood as a living, negotiated tissue of practices which are continually being adopted to new ecological and social circumstances - including of course, power

relations. Their very plasticity is the source of micro-adjustments which may or may not lead to shifts in prevailing practice.

Imagine, if you will, a written system of positive law that attempted to represent this complex skein of property relations and land tenure. The mind fairly boggles at the clauses, sub-clauses, and sub-sub-clauses that would be required to reduce these practices to a set of regulations which an administrator might understand, let alone enforce. If, in principle, they could nevertheless be codified, the resulting code would necessarily sacrifice much of the plasticity and subtle adaptability of practice. The circumstances that might provoke a new wrinkle in practices are too numerous to foresee, let alone to specify in a regulatory code. That code would, in effect, freeze a living process. Changes in the positive code designed to reflect evolving practice would, at best, represent a jerky and mechanical adaptation.

And what of the *next* village, and the village after that? Our hypothetical code-giver, however devilishly clever and conscientious, would find that the code devised to fit one set of local practices would not travel well. Each village, with its own particular history, its own ecology, its particular cropping patterns, kinship alignments, and economic activity would require a substantially new set of regulations. At the limit, there would be at least as many legal codes as there were communities.

Administratively, of course, such a cacophony of local property regulations would be a nightmare. Notice, especially, that the nightmare in question is not a nightmare experienced by those whose particular customs are being represented but rather by those -i.e., state officials - who aspire to a uniform, homogeneous, national administrative code. Local practice is perfectly legible to those inhabitants who 'live' it on a day-to-day basis. Its details may be often contested and far from satisfactory to all of its local practitioners, but there is no doubting its familiarity; local residents have no difficulty in grasping its subtleties and using its flexible provisions for their own purposes. State officials, on the other hand, cannot be expected to decipher and then apply a new set of property hieroglyphs for each jurisdiction. The very concept of the modern state is inconceivable without a vastly simplified and uniform property regime that is legible, and hence manipulable from the centre.

Use of the term "simple" to describe modern property law, whose intricacies provide employment to armies of legal professionals, seems grossly misplaced. It is surely the case that property law has in many respects become an impenetrable

thicket for ordinary citizens. The use of the term "simple" in this context is thus both *relative* and *perspectival*. Modern freehold tenure is tenure that is mediated through the state and therefore readily legible only to those who have sufficient training and grasp of the state statutes to allow them to decipher it. Its relative simplicity is lost on those who cannot break the code, just as the relative clarity of customary tenure to the villagers who live it is lost on the mystified outsider.

The major, but not the only, driving force behind a simple and legible system of property is the need for a reliable format for taxation. Here, there are some instructive parallels between the development of modern, fiscal forestry and modern forms of taxable property in land. Premodern states were no less concerned with tax receipts than modern states. But, like pre-modern state forestry, the techniques and reach of the state left much to be desired.

Absolutist France in the 17th century is a case in point.[10] Indirect taxes - e.g., excise levies on salt, tobacco, tolls, licenses and the sale of offices and titles - were favored forms of taxation inasmuch as they were easier to administer and required far less in the way of information about landholding and income. The tax-exempt status of the nobility and clergy meant that a good deal of the landed property was not taxed at all, transferring much of the burden to wealthy commoner farmers and the peasantry. Common land, though it was a vitally important subsistence resource for the rural poor, yielded no revenue either. In the 18th century, the physiocrats would condemn all common property on two presumptive grounds; that it was inefficiently exploited and that it was fiscally barren.[11]

What must strike any observer of absolutist taxation is how wildly variable and unsystematic it was. Collins found that the major direct land tax, the *taille*, was frequently not paid at all and that no community paid more than one third of what they were assessed.[12] The result was *routine* state reliance on exceptional measures to make good shortfalls in revenue or to pay for new

[10] This brief description is drawn largely from James B. Collins, *Fiscal Limits of Absolutism: Direct Taxation in Early 17th Century France* (Berkeley: University of California Press, 1988).

[11] P.M. Jones, *The Peasantry in the French Revolution* (Cambridge: Cambridge University Press, 1988), p. 17.

[12] Collins, *op.cit.*, pp. 201, 204. It was precisely this capacity to evade taxes that give the fiscal regime a degree of unintended (from the top at least) flexibility and avoided even more open rebellion in the troubled 17th century.

expenses, particularly military campaigns. The crown exacted "forced loans" (rentes, droits aliénés) in return for annuities which it might or might not honor; it levied exceptional hearth taxes (fouages extraordinaire) and, above all; it billeted troops directly on communities, often ruining them in the process.

The billeting of troops, a common form of fiscal punishment, was to modern forms of systematic taxation as the drawing-and-quartering of would-be regicides (so strikingly described by Michel Foucault at the beginning of *Discipline and Punish*) was to modern forms of systematic criminal incarceration. Not that there was a great deal of choice involved. The state simply lacked both the information and administrative grid that would have allowed it to exact a regular revenue from its subjects more closely tied to their capacity to pay. As with forest revenue there was no alternative to rough and ready calculations with a corresponding fluctuation in yields. Fiscally, the pre-modern state was, to use Charles Lindblom's felicitous term, "all thumbs and no fingers"; it was incapable of fine tuning.

Here is where the rough analogy between forest management and taxation breaks down. In the absence of reliable information about sustainable timber yield, the state might either inadvertently overexploit its resources and threaten future supply, or else fail to realize the level of proceeds it might sustain.[13] The trees themselves, however, were not political actors while the taxable subjects of the crown were most certainly political actors. They signalled their dissatisfaction by flight, by various forms of quiet resistance and evasion, and *in extremis*, by open revolt. A reliable format for taxation of subjects thus depended not just on discovering what their economic condition was, but also on trying to judge what exactions they would vigorously resist.

The next step, one to which all modern states aspire, is to measure, codify, and simplify land tenure in much the same way as scientific forestry reconceived the forest. In no way could the state begin to incorporate the luxuriant variety of customary land tenure. The historical solution, at least for the liberal state, has typically been the heroic simplification of individual, freehold, tenure. Land is owned by a legal individual who disposes of wide powers of use, inheritance or sale and whose ownership is represented by a uniform title deed enforced through the judicial

[13] This assumes that the crown wants to maximize its long run proceeds. It was and is common, of course, for regimes in political or military crises to mortgage their future by squeezing as much as possible from their forests and/or their subjects.

and police institutions of the state. Just as the flora of the forest were reduced to *Normalbaum*, so were the complex tenure arrangements of customary practice reduced to freehold, transferable, title. In an agrarian setting, the administrative landscape was blanketed with a uniform grid of homogeneous land, each parcel of which has a legal person as owner and, hence, taxpayer. How much easier it becomes to asses such property and its owner on the basis of its acreage, its soil class, the crops it *normally* bears, and its assumed yield, than to untangle the thicket of common property and mixed forms of tenure. The cadastral survey, the "permanent revenue settlement" and the Torrens system of land titling in British colonies were precisely the technique by which a simplified fiscal space could be defined.[14] As in the case of the forest, it provided the means to extract a presumably sustainable fiscal yield. The modern land register and its tax roll was the equivalent, for land tenure, of the scientific foresters' table of timber growth and yield.

The creation of a regional or national market in land and a cadastral survey for tax assessment by officials from outside the community required, above all, a standard measure for land. Customary land measures in most of Europe varied widely by locality and reflected a far greater interest in crop yields and the labor needed to achieve them than in the more abstract qualities of a field, such as how many square meters it enclosed. Thus, in different parts of France, units such as *journal*, *morgen*, *hommée*, and *fauchée* indicated how long it would take a man to plow a field. A five journée field could be plowed by a man using standard gear in five days. Depending on the soil, the slope of the land, the kind of plow animals, the plowshare, and so on, a journal would vary greatly from locality to locality as it was a unit of work, *not an abstract unit of area*. In the same fashion, the Irish would refer to 'a farm of two cows or a farm of five cows'. The amount of land required for a 'farm of two cows' might be much greater in a region of poor land in western Ireland than in a rich central county. A centralized cadastral survey, though it might also include a classification of the soil quality and field use (e.g. arable, meadow, pasture, wood lot), had to replace these exotic local measures with a standard, universal measure that was the same throughout the country. Occasionally, as in Sweden, the

[14] It goes without saying that the homogenization that serves fiscal ends also is crucial for commodities entering the market. A modern market in land is virtually inconceivable where every property bears all the particular traces of the land rights and customary arrangements from which it arises.

customary term might be preserved but its plasticity eliminated forever by fixing it as a uniform areal measure. Customary forms of measurement (not just for land but for weights, textiles, volumes of grain, etc.) were simply not sufficiently legible either to commodity markets or to central administrators. As one study put it, 'The complexity of such early units of measurement, their incompatibility with other measures, and their variation made them unsuitable for cadastral mapping and with capitalism, for which uniform and simple systems are needed'.[15] Freehold title and standard land measurement were to the market in real estate what central bank currency was to the marketplace.

If the web of customary land tenure was a mystifying hieroglyph to outsiders and state officials, the new forms of individual, freehold tenure were now a mystifying hieroglyph to those whose terrain was being recast. The new forms of tenure, however simplified and uniform they might seem to an administrator, flung villagers willy nilly into a world of unfamiliar objects and institutions: title deeds, land offices, law, courts, fees, assessments, applications, cadastral surveys. They faced powerful new specialists in the form of district officials, surveyors, lawyers, and judges whose rules of procedure and decisions were unfamiliar. A central consequence of the new tenure system - one might more accurately say its very purpose - was to map a terrain of taxable real property that was perfectly legible to any clerk or trained state official. At the same time it radically devalued local knowledge and autonomy. Such forms of specialized knowledge backed by state authority profoundly changed the balance of power between the locality and the state. Where the new tenure system was a colonial imposition - i.e., where the new system was totally unfamiliar, imposed by alien conquerors using a radically different language and institutional context -the transformation conferred unique opportunities for those who first plumbed the mysteries of tenure administration. Thus the Vietnamese *secrétaires* and *interprètes* who served as intermediaries between the French officials in the Mekong Delta and their Vietnamese subjects, were in a position to make great fortunes. By concentrating on getting the paperwork in order - the title deeds and appropriate fees - they occasionally became,

[15] Roger J.P. Kain and Elizabeth Baigent, *The Cadastral Map in the Service of the State: A History of Properety Mapping* (Chicago: University of Chicago Press, 1992), p.122. See also Eugen Weber, *Peasants into Frenchmen: The Modernization of Rural France, 1870-1914*, (Stanford: Stanford University Press, 1976), Chapter 3, "The King's Foot".

overnight, landlords to whole villages of cultivators who had imagined they were opening common land free for the taking. They might, of course, occasionally use their knowledge to see their compatriots safely through the new legal thicket. Whatever their conduct, their fluency in a language of tenure specifically designed to be legible and transparent to administrators, coupled with the illiteracy of the rural population under them to whom the new tenure was undecipherable, was a momentous shift in power relations.

The actual practices of land tenure - the facts-on-the-ground - did not yield quickly, passively, or entirely to the new tenure regime. Owing to the vagaries of enforcement and the practical interests and values of villagers, a wide variety of unsanctioned and/or illegal tenure practices persisted. Forms of common property survived in popular practice though they might now be legally defined as poaching or trespass. Customary restrictions on sale might continue to be observed for fear of informal local sanctions, although not recognized in law. If the real forest never quite came to resemble the simple homogeneity of the scientific forest's tables, even less did real tenure practices quite come to resemble simple transferable, freehold property so long as the people on whom it was being imposed had vital interests which led them to resist it. The new scheme, thanks to the power behind it did, however, as in the case of scientific forestry, shape actual tenure practices increasingly in its mould.

'Vos papiers, Monsieur'

This stock phrase, by which a gendarme addresses a man he wishes to question, illustrates the degree to which even face-to-face encounters in the modern state are mediated by standardized documents. Just as paper currency, as an abstract and uniform unit of value permits many-tiered exchanges between economic actors who are not known to one another, so do the citizens of the modern state come to be symbolized by paper representations: birth certificates, identity cards, title deeds, tax returns, death certificates, etc.

As representations, these pieces of paper come as we shall see, to take on a life of their own. Consider the following experience, not at all unusual, I believe, from the U.S. Army. A recruit, having recently finished basic training was assigned by his major, the task of preparing his regiment's account books for the monthly inspection by the divisional authorities. The books were in

complete disorder. Being a clever fellow, the recruit soon realized that the validity of the books mattered less than their conformity to the canons of military accountancy. Accordingly, he made certain that all the figures tallied correctly and that every transaction was represented by the appropriate purchase orders and receipts. Where a paper trail was absent, he manufactured one, whether or not it recorded an actual transaction. The tidy and "paper-perfect" account books were judged the best of all regiments in the division and his commanding officer won much praise for the regiment's financial order. Winning the "divisional colors" every month for the best-kept accounts was important enough to the regiment's commander that he promised the recruit "permanent" leave as long as he repeated his success. Now that he had mastered the creation of "paper-order" in the account books, the recruit vacationed for four weeks each month, returning two days before the inspection of the accounts to reproduce his small miracle.

The first thing to appreciate about the modern state is that most of its officials are, of necessity, usually at least one step - and often several steps - removed from direct contact with citizens. *They observe and assess the life of their society by a series of simplifications and shorthand fictions that are always some distance from the full reality these abstractions are meant to capture.* Thus the foresters' charts and tables, despite their power to distil many individual facts into a larger pattern, do not quite capture (nor are they meant to) the real forest in its full diversity. Thus the cadastral survey, the title deed and tenure contracts are a very rough, and sometimes misleading, representation of actual existing rights to land use and disposal. The functionary of any large organization actually "sees" the human activity of interest to him largely through the simplified approximations of documents and statistics: e.g., tax proceeds, lists of taxpayers, land records, average income, unemployment numbers, mortality rates, trade and productivity figures, the cases of cholera in a certain district. These stylized facts are, of course, a powerful form of state knowledge making it possible to discover and intervene early in epidemics, understand economic trends that greatly affect public welfare and/or state power, and generally to form policy with many of the crucial facts at hand.[16]

[16] See Ian Hacking, *The Emergence of Probability: A Philosophical Study of Early Ideas About Probability, Induction and Statistical Inference,* (Cambridge: Cambridge University Press, 1975).

State simplifications, by their very nature, have a particular character. Most obviously, they are observations of those aspects, and only those aspects, of social life that are of official interest. They are also, of course, nearly always written or numerical facts recorded in documents. Third, they are typically *static* facts. Even when they appear dynamic, they are typically the result of multiple static observations through time. Observation of, say, land records or income figures over two or more points in time may reveal a greater inequality in landownership or an increase in income, but it will not reveal how this new state-of-affairs came about or whether it will persist. Finally, most stylized state facts are aggregate facts. Aggregate facts may be impersonal (e.g., the density of transportation networks) or simply a collection of facts about individuals - e.g., employment rates, literacy rates, residence patterns. For most purposes, state officials need to group citizens in a way that permits them to make a collective assessment.

Facts that can be aggregated and presented as averages or distributions *must* forcibly be *standardized* facts. However unique the actual circumstances of the various individuals who make up the aggregate, it is their sameness, or more precisely, their differences along a standardized scale or continuum that are of interest. The working lives of many people, for example, are exceptionally complex and may change from day-to-day. For the purposes of official statistics, however, "gainfully employed" is a stylized fact; one is or is not gainfully employed. The problems of how to categorize many rather exotic working lives are, in the final analysis, covered over by the categories reflected in the aggregate statistics.[17] Those who gather and interpret such

[17] There are at least three problems here. The first is the hegemony of the categories. How does one classify someone who works largely for relatives who may sometimes feed him, sometimes let him use some land as his own, and sometimes pay him in crops or cash? The decisions, sometimes quite arbitrary, about how to classify such cases are obscured by the final result in which only the prevailing categories appear. The second problem, and one to which we shall return, is how the categories - more particularly the state power behind the categories - shape the data. For example, during the recession of the 1970s in the U.S. there was some concern that the official unemployment rate which had reached 13% was greatly exaggerated. A major reason, it was claimed, was that many nominally unemployed were working in the informal economy "off-the-books" and would not report their income or employment for fear of being taxed. One could say then and today that the fiscal system had provoked an "off-stage" reality that was designed to stay out of the data bank. The third problem is that those who collect and assemble the information may have very special interests in what the data show. During the Vietnam War the importance of "body-counts" and "pacified villages" as a measure of counter-insurgency success led

aggregate data understand that there is a certain fictional and arbitrary quality to each of the categories they must employ - that they hide a wealth of problematic variation. Once set, however, these thin categories operate unavoidably *as if* all cases similarly classified are in fact, homogeneous and uniform. All *Normalbaeume* in a given size range are the same; all auto-workers (if we are classifying by industry) are the same, all Catholics (if we are classifying by religious faith) are the same.

To this point, I have been making a rather straight-forward, even banal, point about the simplification, abstraction, and standardization which are necessary for the observation by state officials of the circumstances of some or all of the population. I want, however, to make a further claim, analogous to that made for scientific forestry, that *the modern state, through its officials, attempts - with varying success - to create a population with precisely those standardized characteristics which will be easiest to monitor, count, assess, and manage.* The utopian (immanent) tendency of the modern state, continually frustrated, is to reduce the chaotic, disorderly, social reality beneath it to something more closely resembling the administrative grid of its observations.

This tendency is perhaps one shared by almost all large hierarchical organizations. As Chisholm, reviewing the literature on administrative co-ordination concludes, 'Central coordinating schemes do work effectively under conditions where the task environment is known and unchanging, where it can be treated as a closed system'.[18] The more static, standardized, and uniform a population or social space is, the more legible it is to the techniques of state officials. I am suggesting that state officials endeavor to transform the population, space, and nature under their jurisdiction into the closed system without surprises that they can best observe and control. The reason that they can, to some considerable degree, make their categories stick and impose their simplifications, is because the state, of all institutions, is best equipped to *insist* on treating people according to its schema. If you want to defend your claim to real property you are normally obliged to defend it with a document called a property deed, and in the courts and tribunals created for that purpose. If you wish any standing in law, you must have the documents (e.g., birth certificate, passport, identity card) that officials accept as a claim

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commanders to produce inflated figures which pleased their superiors - in the short run - but increasingly bore little relation to the facts-on-the-ground.

[18] Donald Chisholm, *Coordination Without Hierarchy: Informal Structures in Multiorganizational Systems* (Berkeley: University of California Press, 1989), p.10.

of citizenship. The categories used by state agents are not merely a means to make their environment legible; they are an authoritative tune to which much of the population must dance.

Some of the most taken-for-granted categories with which we now routinely apprehend social reality had their origin, I believe, in just such state projects of standardization and legibility. Consider something so fundamental as naming practices. Until at least the 14th century, the great majority of Europeans did not have permanent patronyms. An individual's name was typically an amalgam of his (if male) given name and his father's given name. Thus, in the English case, William *Robertson's* male son might be called Thomas *Williamson* (son of William) while Thomas' son might be called Harry *Thompson* (Thomas's son). Note that the grandson's name, by itself, no longer bears any evidence of his grandfather's identity, making any tracing of descent through names impossible. The adoption of a *permanent* patronym - a largely state project connected to taxation and inheritance - greatly improved the legibility of kinship and property. The last names were often quite arbitrary; John who owned a mill became, say, John Miller, while John who made cartwheels became John Wheelwright, and their male descendants retained the patronym whatever their subsequent occupations. *Universal* last names, something that was achieved quite late, particularly among the propertyless, was a great step forward in the legibility of the entire population to state officials - most especially tax officials. It is a process still occurring in much of the Third World. One might, in this context, examine still other state-impelled standard specifications which further improved the capacity of state agents to identify an individual. Here the creation of birth and death certificates,[19] *specific* addresses (e.g., not John-on-the-Hill), identity cards, passport numbers, social security numbers. Such legibility plays an enormous role not only in taxation, but also in conscription, criminal investigations, etc.[20] The standardization of individual identities goes hand in hand with the creation of standardized, homogeneous space. Specifying settlements with permanent, official names, creating

[19] It was not only Nicolai Gogol in *Dead Souls* who was struck by the fact that fiscal death and physical death were not the same. For tax purposes fiscal death in Tsarist Russia was delayed and a family was obliged to pay the full annual head tax on any family member who had been alive during even a minute portion of the fiscal year. It is a staple and bitter irony of many colonial literatures.

[20] In the film, *The Witness*, a modern detective finds himself at a loss when thrust into an Amish community with no telephone numbers and a small number of very common last names. I owe this astute observation to Benedict Anderson.

municipalities, counties, all with sharp, unambiguous boundaries such that all space was named, has also been a vital element of state-formation - allowing state officials to locate - to pinpoint - a specific individual in its grid.

A great part of state-making consists in the comprehensive mapping of a nation's population, its physical space, and its natural resources. Without such mapping - and without the simplifications, standardization, naming, and classification that make it possible -most of the activities of the modern state would be inconceivable.

Cities: Legibility from Above and From Below

An aerial view of most medieval cities, or of the oldest quarters (medina) of a middle Eastern city that has not been greatly tampered with, has a particular look to it. It is the look of disorder, more precisely, it conforms to no overall, abstract form. Streets, lanes, and passages intersect at varying angles with a density that resembles the intricate complexity of some organic processes. In the case of a medieval town where defensive needs required walls, and perhaps moats, there might be traces of inner walls superseded by outer walls, much like the growth rings of a tree. A representation of the city of Bruges around 1500 illustrates the pattern.

Bruges c. 1500

What definition there is to Bruges is provided by the shape of the river and canals which were (until they silted up) the lifeblood of this cloth-trading city and by the market-place and castle square.

The fact that the city plan, having developed without any overall design, lacks a consistent geometric logic does not mean that it was in the slightest mystifying to its inhabitants. One imagines that many of its cobbled streets were nothing more than the surfacing of footpaths that repeated use had traced. For those who grew up in its various quarters, the town would have been perfectly familiar, perfectly legible. For a stranger or trader arriving for the first time, however, the town was almost certainly confusing, simply because it did lack a repetitive, abstract logic that would allow a newcomer to orient herself. The cityscape of Bruges in 1500 could be said to privilege local knowledge over outside knowledge - including that of external political authorities. Historically, the *relative illegibility* of some urban neighborhoods (or of their rural analogues of hills, marshes, and forests) to outsiders has provided a vital margin of political safety from control by outside elites. A simple way of determining whether this margin exists at all is to ask whether an outsider is likely to need 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, such insulation has proven politically valuable in such disparate contexts as 18th and early 19th century urban riots over bread prices in Europe, the F.L.N.'s (Front de Libération Nationale) tenacious resistance to the French in the casbah of Algiers,[21] or in the politics of the bazaar that helped bring down the Shah of Iran. Illegibility has been and remains, then, a non-trivial resource for political autonomy. It functions, spatially, in much the same way a difficult or unintelligible dialect would function linguistically, to impede communication and understanding.

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. While there is very definitely a political and administrative logic to geometrically

[21] Eventually broken, though at great long run political cost, by tenacious police work, torture, and networks of local informers.

regular cityscapes, there is also a strong aesthetic associated with the Enlightenment that looks with approval on straight lines and visible order. The prejudice it nowhere more clearly expressed than by Descartes himself:

> 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 or 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 is chance more than the will of some men using their reason that has arranged them thus. [22]

Descartes' 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, all built according to a single over-arching plan. There are, of course, many cities approximating Descartes' model. For obvious reasons, most have been planned from the ground up as new, often utopian, cities. Where they have not been built by imperial decrees, they have been designed by the founding fathers of new towns so as to create repetitive and uniform squares for future settlement.[23] A bird's eye view of central Chicago in 1893

[22] René Descartes, *Discourse on Method*, Translated by Donald A. Cress (Indianapolis: Hackett Publishing Co., 1980), p.6. Quoted in Harrison, *Forests*, *op.cit.*, p. 111-12, emphasis added.

[23] Petersburg is the most striking example of the planned utopian capital, a city Dostoyevsky called "the most abstract and premeditated city in the world." See Marshall Berman, *All that is solid Melts into Air: The Experience of Modernity* (New York: Penguin, 1988), Chapter 4. The Babylonians, Egyptians, and of course, the Romans build "grid-settlements". Long before the Enlightenment, right angles were seen as a cultural work of superiority. As Sennett writes, "Hippodamus of Miletus is conventionally thought the first city builder to conceive of these grids as expressions of culture; the grid expressed, he believed, the rationality of civilized life. In their military conquests the Romans elaborated the contrast between the rude and formless camps of the barbarians and their own military forts, or castra." Richard Sennett, *The Conscience of the Eye: The Design and Social Life of Cities* (New York: Norton, 1990), p. 47.

(Philadelphia in the mid-18th century would do equally well) may serve as an example of the grid city.

Chicago 1893 - billedet skal stå på højkant

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. Even the rivers seem scarcely to interrupt the city's relentless symmetry. For an outsider - or a policemen - finding an address is a comparatively simple matter; no local guides are required. Local knowledge is not especially privileged vis-a-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. Delivering mail, collecting taxes, finding a felon or conscript, - providing he is at the address given! - planning public transportation, water supply, and trash removal are all made vastly simpler by the logic of the grid.

Two 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 *outside*. Like a marcher in a parade, or like a single riveter in a long assembly line, the larger design of the city is not instantly accessible to a pedestrian in the middle of this grid. 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. This spatial fact is perhaps inherent in the process of urban or architectural planning itself, a process that involves scale models and miniaturization upon which patron and planner gaze down exactly as if they were in a helicopter.[24] 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 this kind. It follows, I believe, that such plans, which have the scale of toys, are judged for their sculptural properties and visual order, often from a perspective that no (or very few) human observers will ever actually replicate. The grand plan of the ensemble is likely to be far removed from the experience of those "living" in the city at ground level.

A second point about an urban order easily legible from outside is that it has no necessary relationship to the "order" of life as it is experienced by its residents. While certain state services may be more easily provided and distant addresses easier to locate,

[24] See the mind-opening book by geographer, Yi-Fu Tuan, *Dominance and Affection* (New Haven: Yale University Press, 1984).

such apparent advantages may be negated by perceived disadvantages such as the absence of a dense street life, the intrusion of hostile authorities, the loss of the very spatial irregularities that make for gathering places, informal recreation, cosiness, and neighborhood feeling. The formal order of a geometrically regular urban space is just that: formal order. Its visual regimentation has a ceremonial or ideological quality, much like the order of a parade or a barracks. The fact that such order "works" for municipal and state authorities in administering the city is no guarantee that it is satisfactory for citizens. Provisionally, then, we must remain agnostic about the relationship between formal spatial order and social experience.

The vast majority of old world cities are, in fact, some historical amalgam of a Bruges and a Chicago. Although more than one politician, dictator, and city planner has devised plans for the total recasting of an existing city, the cost of such dreams - both financial and political - has generally meant they never left the drawing boards. Piecemeal planning, by contrast, is far more common. The central, older core of many cities remains somewhat like Bruges while the newer outskirts are more likely to exhibit a regularity of several sets of plans. Sometimes, as in the sharp contrast between old Delhi and the imperial capital of *New* Delhi, the divergence is formalized.

Occasionally, authorities have taken quite draconian steps to *retrofit* an existing city. The redevelopment of Paris by Baron Haussmann under Louis Napoleon was an enormous public works undertaking stretching from 1853-1869. It absorbed unprecedented amounts of credit, it uprooted thousands of people, and it could only have been accomplished by a single executive authority not directly accountable to the electorate.

Paris c. 1860 - side 288
- skal stå på højkant. Skær i øverste vandrette kant hvis nødvendigt

The plan reproduced here shows the new boulevards constructed to Hausmann's measure as well as the pre-revolutionary inner boulevards which were widened and straightened. For all its disruption and the legibility it added, the retrofit bears strong traces of its accommodation with an older Paris. The outer boulevards, for example, follow the line of the customs wall of 1787. Haussman's scheme was far more than a new street plan. The increased legibility of the boulevards was replicated above and below ground in rail lines and terminals, centralized markets (Les Halles) water and gas lines, and a new public drainage system.[25] Even with unprecedented authority and financial resources, however, the existing city and its inhabitants proved a more formidable obstacle to the imposition of planned spatial grid than did the forest or the city begun from zero.

High Modernism and State Power

If we hope to understand the wellsprings of many of the massive, failed experiments in 20th century social engineering - unprecedented experiments whose cost in human suffering has been equally unprecedented - then, the mere logic of state simplification and order will not suffice. It is a necessary ingredient but not in itself sufficient.

Aspirations for the 'rational' organization of society and nature have nearly always far outstripped the actual capacity for planning and control. Enlightenment advances in scientific observation and experiment, which we saw at work in the case of forestry, certainly raised those aspirations to a new level and fuelled hopes of their realization. Until the nineteenth century, however, the reach of state-planned order greatly exceeded its grasp. As an extractive mechanism, the 18th century European state was a great advance on its predecessors. It had become increasingly efficient in pumping revenue, grain, and conscripts from countryside and city. State officials, especially under absolutism, had mapped much more of their kingdoms population, land tenure, production and trade than before. And yet, there is more than a little irony in the term "absolutism" itself,

[25] As Mark Girouard notes, the plan included public facilities and institutions such as parks (notably the huge Bois de Boulogne), hospitals, schools, colleges, barracks, prisons, and a new opera house. in *Cities and People: A Social and Architectural History*, (New Haven: Yale University Press 1985), p.289. Roughly a century later, against greater odds, Robert Moses would undertake a similar retrofit of New York City.

inasmuch as it was more an assertion and claim than a reality. The authorities lacked the consistent coercive power, the fine-grained administrative grid, or the detailed knowledge that would have permitted them to undertake more intrusive experiments in social engineering. To give their aspirations full reign, they required an even greater confidence or hubris, a state machinery that was apparently equal to the task, and a society they could master.

The template for many of the tragic development failures in the Second and Third World can be located, as many have recognized, in Western historical experience. Outcomes, however, have been generally more tragic in the ex-Second and Third World than in the West. The kinds of failures I have in mind are collectivization in the ex-Soviet Union, communalization and the Great Leap Forward in China, massive population resettlements and frontier cultivation schemes (e.g., Virgin Lands Scheme, Ujamaa Villages), large scale 'conquests of nature' such as huge dam and irrigation projects, the diversion of rivers, etc.

My argument is a provisional attempt to account for the difference in outcomes by specifying which elements of Western development ideology and practice were shared by the (ex-) Second and Third Worlds and which were not. I hope the rest of this paper will go some way toward establishing the first part of my case, but I will, for clarity's sake, state the larger argument here.

Many of the most tragic episodes of 'state development' in the late 19th and early 20th century originate, I would argue, in a particularly pernicious combination of three elements. The first is the aspiration to the administrative ordering of nature and society, an aspiration we have already seen at work in forestry, but raised to a far more comprehensive and ambitious level. *High modernism* seems an appropriate term for this ideology which I believe was shared, until very recently, by virtually all 'developmental elites,' whether their names were Robert Lilienthal, Vladimir I. Lenin, or Julius Nyerere. The second element is the use of the power of the modern state, without restraint, as an instrument of these designs. The third is a weakened or prostrate civil society which lacks the capacity to resist these plans. The ideology provides, as it were, the desire, the modern state, the possibility of acting on that desire, and the incapacitated civil society the levelled terrain on which to build (dis)utopias.

We will return shortly to the premises of high modernism. But here it is perhaps important to note that with the great, and diagnostic, exception of Nazism,[26] the great state-sponsored calamities of the 20th century have been the work of progressive elites calling themselves socialists or communists. Why? Because, I believe, it is usually only progressives (again Nazism is the exception) who want to bring about *huge*, often utopian, changes in peoples habits, work, living patterns, moral conduct, and world view. They want these changes urgently enough that they are willing to bring them about by the only institutional mechanism powerful enough to enforce them: namely, the state. Thus it is that utopian plans of social engineering are joined to statist and anti-democratic tendencies. The potentially lethal combination is often encouraged by the slowness and recalcitrance of the 'human material' who are the objects of the exercise. If, as is often the case, the progressive elites take power on the heels of a revolution and/or after a devastating war, they inherit a relatively prostrate society which they can imagine refashioning root-and-branch. The revolutionaries of 1789 were not the last to believe they were making a fresh start with "year one" of the revolutionary epoch and with the names of the days of the week and month suitably redesigned. The conceit of a "year one" or "year zero" found, say, in the Russian and Cambodian revolutions is a trademark of high modernism's rejection of history and tradition. After a revolution with considerable popular backing the elites are likely to begin with the political capital of enthusiastic support from those who share a part of the same vision of progress or, at the very least, a common hatred for the previous order.

Conservatives are rarely prone to such calamities of hubris because their ambitions are so much more limited. They may care little for civil liberties and may undertake whatever brutalities seem necessary to remain in power. But they do *not* require huge utopian changes which necessitate turning society upside down

[26] I will not pursue the argument here, but Nazism is, I think, best understood as a reactionary form of modernism. Like the progressive left, the Nazi elites had grandiose visions of state-enforced social engineering which included, of course, extermination, expulsion, forced sterilization, selective breeding, etc., and which aimed at 'improving' genetically, on nature. The case for Nazism as a virulent form of modernism is made brilliantly and convincingly by Zygmunt Bauman, in *Modernity and the Holocaust* (Oxford: Oxford University Press, 1989). See also, Jeffrey Herf, *Reactionary Modernism: Technology, Culture and Politics in Weimar and the Third Reich*, (Cambridge: Cambridge University Press, 1984).

to create new collectivities, new cities, new family and group loyalties, and new people.

It is not that utopian aspirations *per se* are dangerous. As at least one political philosopher remarked, a map without utopia on it is not worth having. One can scarcely imagine a social or political vision that does not assert that purposeful human action can improve the conditions of life for one's fellow citizens. Where this utopian impulse goes wrong, I believe is when it depends exclusively on the application of state power for its achievement. Where it goes brutally wrong is when the use of state power is not restrained by an elite commitment to democracy and civil rights or by, above all, a mobilized civil society that can put up stiff resistance and force a compromise.

What is "high modernism," then? It is best conceived as a *strong* version of the beliefs in scientific and technical progress associated with the process of industrialization in Western Europe and North America from, say 1830 until the First World War. At its centre was a supreme self-confidence about continued linear progress, the development of scientific and technical knowledge, the expansion of production, the rational design of social order, the growing satisfaction of human needs, and, not least, an increasing control over nature (including human nature) commensurate with scientific understanding of natural laws. *High* modernism in this context is a particularly robust, comprehensive version of these convictions that looks to apply the benefits of technical and scientific progress - usually through the state - in all fields of human activity.[27]

It would have been hard *not* to have been a modernist of some stripe at the end of the 19th century if you were living in industrializing Europe. How could one fail to be impressed - even awed - by the vast transformations wrought by science and industry? Anyone who was, say, 60 years old in Manchester, England would have witnessed in that lifetime a revolution in cotton and wool textile manufacture, the growth of the factory system, the application of steam power and astounding new mechanical devices to production, a revolution in metallurgy, transport (especially railroads), and growth of mass-produced cheap commodities. Anyone even slightly attentive to scientific discovery, the advances in chemistry, physics, medicine, math,

[27] I have benefitted greatly from David Harvey's discussion of modernism in his *The Condition of Post-Modernity: An Enquiry into the Origins of Cultural Change* (Oxford: Blackwell, 1989). See also Marshall Berman's insightful book: *All that is Solid Melts into Air: The Experience of Modernity*, (New York: Penguin, 1988).

and engineering would have almost come to expect a continuing stream of new marvels - e.g., the internal combustion engine, electricity. The unprecedented transformations of the 19th century marginalized and impoverished many, but even the victims recognized that something revolutionary was afoot. All this sounds rather naive today when we are far more sober about the limits and costs of technological progress, and have a post-modern scepticism of any 'totalizing' discourse. Still, it is to forget the degree to which modernist assumptions still implicitly prevail in much of our lives and, above all to overlook the great enthusiasm and revolutionary hubris that was part and parcel of high modernism.

Although high modernism may have originated in later 19th century Europe and North America, it has spread far beyond its *locus classicus* in both space and time. It appeals to a wide clientele because it promises to deliver the goods (i.e., material progress) and also because, as we will see in detail later, it promises to place great authority in the hands of state officials and experts. It is compatible with wildly divergent political commitments. Thus such disparate figures as Franklin Roosevelt's New Deal planners (e.g., the founders of the Tennessee Valley Authority), the factory owner Robert Owen and the planner/architect LeCorbusier shared a high modernist faith with the likes of Lenin, Kruschev, Abdul Nasser, the Shah of Iran, and Julius Nyerere. In each case their resources, the kind of state power available to them, and the resistance of civil society determined how much of their high modernist vision was, in fact, implemented, but their commitments to rational, state-assisted, progress through planning were remarkably similar.

High modernism as a variant of modernism, in my use of the term, has several distinctive features that bear emphasis. First, and foremost, it implies a truly *radical* break with history and tradition. Insofar as rational thought and scientific laws could provide a single answer to all empirical questions, nothing ought to be taken for granted. All of those human habits and practices from the structure of the family, the patterns of residence, moral values, and forms of production which were inherited, and hence not based on scientific reasoning, would have to be re-examined and re-designed. The past was typically the product of myth, superstition, and religious prejudice. It followed that 'scientifically' designed schemes for production and social life would be superior to received tradition. No wonder, as Bauman observes, that modernity '...is an age of artificial order and grand

societal designs, the era of planners, visionaries and - more generally - '*gardeners*' who treat society as a virgin plot of land to be expertly designed and then cultivated and doctored to keep to the designed form'.[28]

The implications of this view are deeply authoritarian. If a planned, scientific social order is simply better than the accidental deposit of historical practice, two conclusions follow. Only those who have the scientific knowledge to discern and create this social order are fit to rule in this new age and those who, through retrograde ignorance, refuse to yield to the scientific plan of the future deserve to be swept aside.

There is no mistaking the utopianism here either. If one thinks of native tongues as the most distinctive and entrenched of customary practices, then the international Esperanto movement that aimed to replace European tongues with a single, scientifically designed, artificial language was surely emblematic of utopian high modernism. The high modernists of linguistics prepared a language they hoped people would want to speak in (because of its obvious superiority) just as the high modernists of urban design prepared a city they hoped people would want to live in.[29]

A second feature of high modernism is that it not only envisions a change in people's material environment, but it envisions improving human nature itself. At the high tide of modernism most people were convinced that social and genetic engineering could produce human material that was healthier, more intelligent, more productive, and aesthetically more pleasing. Here I am not only referring to pseudo-science of phrenology, eugenics, and race science which reached its grisly culmination in Nazi Germany. This was just one possible tangent of a primary belief in human self-determination and perfection: the belief that human nature was a tabula rasa on which science could write something new. Milder forms of human engineering were practiced on the industrial working class. In Robert Owen's New Lanark and later at the Cadbury model town, Bourneville, attempts were made to regulate the intimate details of daily life as well as work rhythms. In Bourneville, residents were instructed to close their mouth while sleeping and to brew their tea for

[28] Bauman, *op.cit.*, p. 113, emphasis added.

[29] The problem was that both Esperanto and the completely planned city were alien products to the people who were expected to speak it and live in it, respectively. Their own language and towns were, by contrast, things they and others like them had had some small hand in shaping.

precisely three minutes.[30] Social reformers in the United States in the early 20th century, convinced of their scientific knowledge of domestic order, hygiene, and child-rearing attempted to change the furniture, clothing, eating habits, house-cleaning, and infant-care practices of European working class families. At one point bottle feeding was preferred over nursing, precisely because a scientific formula, virtually by definition had to be superior to mother's milk. The growth of public health, sanitation, medical, mental health, and police bureaucracies which supplied the scientific rationale for such micro-interventions in personal life have been analyzed in some detail, thanks in large part to the work of Michel Foucault.[31]

The third, and most obvious, aspect of high modernism is its nearly limitless ambition to transform nature to man's purposes.[32] How completely the utopian possibilities gripped intellectuals of almost every political persuasion is captured in this paean to technical progress in the Communist manifesto where Marx writes of '...subjection of nature's forces to man, machinery, the application of chemistry to agriculture and industry, steam navigation, railways, electric telegraphs, clearing of whole continents for cultivation, canalization of rivers, whole populations conjured out of the ground..'.[33] It was, in fact, this promise, made plausible by capitalist development which was for Marx the point of departure for socialism which would, for the first time, place it at the service of the working class. The intellectual air in the mid-19th century was filled with vast engineering projects for the benefit of mankind. In 1869 one such project was completed with enormous consequences for trade between Europe and Asia: the Suez Canal. The pages of *Le Globe*, the organ of utopian socialists of St. Simon's persuasion discussed an endless stream of massive development projects: e.g., the Panama Canal, the development of the U.S. gigantic energy and transportation plans. This belief that it was man's destiny to tame

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[30] Robert Fishman, *Urban Utopias of the 20th Century: Ebenezer Howard, Frank Lloyd Wright, and LeCorbusier* (New York: Basic Books 1977), p.93

[31] *Discipline and Punish: the Birth of the Prison*, Translated by Alan Sheridan (New York: Vintage Books, 1979).

[32] Here I want to *dis*associate myself from the broadside case made against the Enlightenment by Adorno and Horkheimer to the effect that the celebration of purely instrumental reason leads directly to the extermination camps. This is to miss, as many others have pointed out, the contribution of the Enlightenment ot the dignity of the individual and the liberal insistance on enshrining individual rights in positive law.

[33] Quoted in Harvey, *op.cit.*, p. 99.

nature in mankind's interest and safety was perhaps the keystone of high modernism, if only because so many of the results of vast engineering projects were already manifest.

Once again the authoritarian and statist implications are clear.[34] The very scale of such projects means that, with few exceptions, such as the early canals, they require large infusions of tax monies or debt. Even if one could imagine, in a capitalist economy, financing them privately, they typically require a vast public authority empowered to seize private property, relocate people against their will, and coordinate the work of many separate state agencies. In statist societies such power is often already built-in to the political system - whether that system be Louis Napoleon's France or Lenin's Soviet Union. In non-statist societies such tasks have required new public authorities or "super-agencies" having quasi-governmental powers to construct great flood control projects, road and transportation systems, new towns and cities or, to send men to the moon.

High modernism ought to appeal greatly to those classes and strata who have most to gain from this worldview. It is *par excellence* the ideology of the bureaucratic intelligentsia, technicians, planners, and engineers. Only they have the skills and knowledge to conceive, plan, and carry out such great works. The position accorded them is not just one of rule and privilege but rather one of responsibility for the great works of nation-building and social transformation. Under their hand rivers are tamed for irrigation and power, new industrial complexes built and set in motion, populations resettled, new cities created. It is a role tailor-made to raise an elite avant-garde to prominence. Some of the 'heroes' of high modernism in the 20th century, capitalist West include David Lilienthal, Robert Moses, Hyman Rickover, Jean Monnet, and Robert McNamara.

Those who have most to lose from high modernism are, roughly speaking, those whose lives as producers are small scale and autonomous, inasmuch as high modernism favors the large-

[34] Prudhon's early critique of state-based utopian socialism is prophetic. The would "reconstruct society on an imaginary plan, much like the astronomers from their own calculation would make over the universe." "In promoting a radical, generally egalitarian restructuring of society, the aim of the utopian socialists and the others may be laudable in itself, but their schemes become pernicious when combined with the belief that their goals are to be achieved through the agency of the state or of some other organ whose decisions will be imposed on the whole. The communist project is betrayed by the governmental idea." From *General Ideas of the Revolution*, pp.90,106, quoted in George Crowder, *Classical Anarchism: the Political Thought of Godwin, Prudhon, Bakunin, and Kropotkin* (Oxford: Clarendon Press, 1991), p. 98.

scale and the hierarchical. Smallholding peasants, independent artisans, petty-traders and shop-keepers would fall into this category as well as, perhaps, independent professions.[35] High modernism of the capitalist or statist variety is likely to threaten their livelihood.

State socialism, as one might expect, has been a very hospitable soil for high modernist thought and practice. A combination of revolutionary victory, the social destruction of a devastating civil war, a Bolshevik worship of modern technology and the machine (above all, the tractor and electricity), and popularly-shared utopian expectations conspired to produce an especially robust version of high modernist gigantism. The Bolsheviks ushered in an age of engineers and huge schemes: the White Sea Canal, collectivization, crash industrialization, etc. It was a statist, 'developmental' utopia. That is, it brought together an older "administrative utopia" tradition preoccupied with the regimentation of the population and of physical space with a renewed intelligentsia desire for 'forced march' modernization and industrialization.[36]

An early critic of Bolshevism in power, Jan Waslow Machajski, pointed directly to the privileges it accorded the educated.[37] In his book, *The Mental Worker* he used Marx, Michels, and Mannheim to label Marxian Social democracy as the "self-interested ideology of the radical intelligentsia." He argued that the socialist intelligentsia wanted to abolish capitalism and nationalize production. The workers would become the wage-slaves of the intelligentsia who would, in turn, live like the bourgeoisie.

If, as is often the case, the intelligentsia conceives its mission as one of raising the cultural level of the population, then its role is doubly grandiose. It is not just changing the work-life and material conditions of its people, it is making them a better and more enlightened people. The project of electrification was for Lenin and most Bolsheviks not merely the delivery of a vital service but part of a vision of bringing light, sanitation, hygiene to their dark (narod) subjects sunk in poverty and ignorance. Lest

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[35] The difficulty with independent professions, in this context, is that most professionals can be readily absorbed into large bureaucratic structures both private and public. Many professionals, perhaps most, actually work as architects, engineers, designers, physicians within state-like hierarchical institutions. They are thus 'amphibians' in a way that the independent peasant or artisan is not.

[36] Both strains are analyzed with great insight in Richard Stites' *Revolutionary Dreams: Utopian Vision and Experimental Life in the Russian Revolution*, (New York: Oxford University Press, 1989).

[37] Ibid, p.73

this seem a uniquely Bolshevik conceit, the same sense of cultural mission can be found in the early years of the Tennessee Valley Authority or the Rural Electrification Administration during the New Deal in the U.S. Trotsky, for his part, emphasized planned urbanism as an integral part of the Bolshevik cultural mission. He wrote of new cities (see *Literature and Revolution*) built with the compass and the ruler that would replace the chaos of traditional cities. Against those "disurbanists" who would abandon the city, he was adamant.

> [The City] lives and leads. If you give up the city...there will remain no Revolution, but a bloody and violent process of retrogression. Peasant Russia, deprived of the leadership of the city, not only will never get to socialism, but will not be able to maintain itself for two months, and will become the manure and peat of world imperialism.[38]

High modernism joined to a cultural project not only makes the technical intelligentsia into a benevolent patron and educator of its people. It provides intellectuals with the large historic responsibility that may contribute to their morale, their solidarity, and the sacrifices they are prepared to make. High modernist, utopian plans serve two other functions. First, they offer a vision of the future that is in sharp contrast to the disorder, misery, and unseemly scramble which elites in all likelihood see in their daily foreground. One might in fact speculate that the more intractable and resistant the real world the planner faces, the greater the need for utopian plans to fill, as it were, the void that would otherwise inspire despair. Second, high modernism raises, by definition, the status of the intelligentsia who become an exemplar of the learning and culture to which their compatriots might aspire. Given its ideological advantages as a discourse, it is hardly surprising that so many Third World elites have marched under the banner of high modernism.

[38] Ibid, p. 197.

Métis: Particular Knowledge with a Context and a History

When state simplifications take on heroic dimensions, when they are part of a utopian modernist vision and backed by the full weight of state power, they can, and have often, been deadly. Why? One way of understanding the harm they may inflict, is to examine the way in which they make abstractions of nature, of human activity, *and* of the human actors who engage in that activity.

The Greek concept of *métis* provides us with a means of comparing local knowledge to the more general, abstract knowledge deployed by the state and its technical agencies. Before explaining the concept itself, a brief example will illustrate the 'vernacular' character of 'local' knowledge.

When the first European immigrants to North America were learning how and when to plant new cultivars, such as maize, their native American advisors instructed them to 'plant corn when the red oak leaves were the size of a squirrel's ear'. Embedded in this advice is a finely observed sense of the succession of natural events (e.g. the particular plant that flowers, just before a certain species of bird returns, just before the first hatch of a certain insect) which always, or nearly always, happens in that precise sequence. A botanist might observe that the first growth of red oak leaves is keyed to the rising temperature of the ground that, in turn, assures that maize will grow and that the probability of a killing frost is very small. Compare this advice to that typically found in a farmer's almanac which might suggest planting corn after, say, the first full moon in May or after a specified date, say, May 20th. This formula requires adjustment by latitude and altitude; it would not work equally well in Connecticut and Vermont, on the coast and inland, or in valleys and on the hills. The date is also probably arrived at on a fail-safe basis, as the worst thing that can happen for those who sell an almanac is to have its advice lead to a crop failure. As a result of this 'commercial' caution, some valuable growing time may be sacrificed in the interest of certainty. The Native American maxim about corn planting is 'vernacular' in the sense of relying upon the local ecosystem (red oaks and squirrels) rather than on a nearly universal code (the calendar). Nevertheless, it is applicable wherever red oaks and squirrels jointly occur, it is quite precise in

its own terms, and it almost certainly gains a few days of growing time while not appreciably raising the risk of a hard frost.[39]

The Native American advice on when to plant maize represents the accumulated wisdom of local experience as it is embedded in actual practices. These forms of local knowledge, I call *métis* following the usage of Jean-Pierre Vernant and Marcel Detienne in their discussion of Greek concepts of knowledge in *Cunning Intelligence (métis) in Greek Culture and Society.*[40] The failures, both human and technical, of many high modernist experiments in social engineering occur, I believe, not merely because they are bureaucratic and inflexible but because they ignore or violate precisely this sort of knowledge embedded in local practice.

Odysseus is frequently praised for having *métis* in abundance, although its typical English translation as "cunning" hardly begins to do it justice. *Métis*, broadly understood, represents the kind of practical skills acquired in responding to a constantly changing natural and human environment.[41] Sailing, boxing, fishing, and (more cooperatively) dancing or team sports are good examples of skills that require constant adjustments and finely tuned reactions to an environment that cannot simply be controlled or engineered. Other spheres of activity that typically have a high component of *métis* (virtually any activity requires some métis) are those of professionals who respond to accidents or natural disasters. Successful emergency medical teams, line crews after a storm, Red Adair's team capping oil well-head blowouts and fires, and farming and pastoralism (particularly in precarious environments), all require a high degree of *métis*. What is distinctive about the situations in which *métis* is relevant is that 1) they are similar but never precisely identical, 2) they require quick and practiced adaptation that becomes almost 'second nature' to the practitioner, 3) they may involve 'rules of thumb,' but skill is typically acquired through practice (often apprenticeship) and a developed 'feel' or 'knack' for strategy, 4) they resist simplification to deductive principles which can

[39] The Bavarian peasant formula was that the danger of a killing frost was past when the first grape vine leaves appeared. See Erich Landsteiner, "Bauerliche Meteorologie", *Historische Anthropologie: Kultur, Gesellschaft, Alltag*, Vol. 1, No. 1, pp. 43-62.

[40] Originally published in french as *Les Ruses d'intelligence: La Metis des grecs* (Paris: Flammarion, 1974).

[41] I have benefitted here from Steven Marglin's paper, "Farmers, Seedsmen, and Scientists: Systems of Agriculture and Systems of Knowledge" (unpublished paper). Compare my use of *metis* with his contrast between *techne* and *episteme*.

successfully be conveyed through book-learning, and 5) the environments in which they are practiced are so complex and non-repeatable that formal procedures of rational decision-making are impossible to apply. A shorthand way of assessing the degree of *métis* implicated in an activity is to ask whether one would prefer as a guide (e.g. mountain climbing guide, airplane pilot, orthopaedic surgeon),[42] someone with long and successful experience to someone who had learned the activity as a formal, didactic exercise. *Métis*, then, is a particular kind of wisdom possessed by someone (or, by a group) who has acquired a practiced "touch" or "eye" for an activity based on practical experience.

It is apparent that *métis* is nearly the opposite of the formal model of scientific method and Cartesian reasoning from first principles.[43] It is, in turn, at loggerheads with state simplifications which require a uniform administrative grid of categories which can be applied across the board. The two ways of proceeding are, I think, largely incommensurable. A farmer's intimate knowledge (some of it the distilled wisdom of his/her community and ancestors) of such things as the micro-climates, soil, water flows, crop successes and failures, seed varieties, pests and weeds on a particular farm is irreducibly local. In another setting it would have to be greatly revised. The same would be the case with local forms of land tenure, forest use, grazing, subsistence routines, petty-trade, etc. It is just such successful local adaptations embodying the *métis* of individuals, kinship groups, and communities over which the abstractions of state-sponsored high modernism run roughshod. The results are typically melancholy not just for the human subjects of the experiment, but also for the state itself when its utopian expectations fail.

The simplification and abstraction required in any large-scale administrative exercise is not, in itself, injurious. They are, in fact, a necessary concentration of focus that permits measurement, quantification, and comparisons. One can hardly expect the office of land records to pay meticulous attention to matters such as

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[42] Notice how "local" and "specific" the expertise of these specialists is: the climbing guide may be best at Zermatt where his experience lies, the airplane pilot best at Boeing 747s, and the orthopedic surgeon best at knees. It's not entirely clear how much of their *metis* is transferrable if it were a question of the Matterhorn, 727s, and hands, respectively.

[43] I overlook, for the moment, the important fact that ethnographies of actual scientific practice have emphasized the role which *metis*-like aptitudes for improvisation, metaphorical understanding, and experienced 'hunches' play in the actual conduct of scientific research.

kinship ties, ecology, or informal exchanges of work and grain. In this respect the narrow optic of state simplification is not unlike the restricting of focus in scientific experiments on the key variables of direct interest.

Agronomy as a scientific field can be taken as representative. Experiments typically involve a single crop and its response to variations in a specified input (e.g. one kind of fertilizer, pesticide, moisture, etc.) with all other factors held constant so the results will be unambiguous. The "response" in which the experimenters are interested is also monochromatic; usually it is the 'yield per unit of land ' or the net profit per unit of land. The level of simplification and abstraction from ordinary agricultural practice is necessarily heroic. Actual farmers, to take West Africa as an example, may plant several crops simultaneously in the same field (e.g. intercropping, relay cropping) and, of course, they have in mind a host of other outcomes beside yield. To mention only a few other aims that farm households might be interested in: they may want to harvest a crop before the sons go off to work in town; they may want to spread the labor peaks of harvesting so they don't have to hire non-family labor; they may want a crop that will store or transport well; they may want a crop which will provide straw or grazing stubble for their livestock, they may want stable yields; they may want a crop that is tasty, and so on. All these considerations are eminently rational and each household will have its own mix of concerns, ones that may change season to season. No agricultural research station could possibly build all these motives into its experiments or it would be, in the end, reduced to having an experiment design for each household, each season.[44]

The fact that actual farmers neither farm on experimental plots where conditions can be controlled nor have single quantitative objectives that can be unambiguously maximized *does not preclude* a fruitful relationship. Scientific agricultural research does discover important new facts and regularities and farmers are not uninterested in crop yields and net return. So long as farmers are free to modify, adopt, or not adopt the knowledge from agro-economic research, it becomes another source of possible innovation in cultivation practices.

While actual farmers are likely to try, or at least consider, the knowledge provided by scientific agriculture, the reverse is very

[44] I ignore, here, the complications that would arise from distinguishing the obvious differences in preference schedules that are likely to characterize each member of a given household.

rarely the case. It is perhaps the ideology of scientific method and the episteme of the controlled experiment that leads to a form intellectual imperialism in which knowledge not gained through the instruments of scientific experiment is not considered knowledge at all. A kind of willful neglect of the agricultural and ecological knowledge embodied in many traditional practices has, until recently, greatly handicapped scientific research in agriculture, particularly in the Third World. As Paul Richards has shown, the actual practices West African cultivators have quite consistently been more successfully (even by the narrow criterion of yields) adapted to the soils, rainfall, and ecological conditions of a highly diverse landscape than the typical recommendations of western-style agricultural research stations.[45] The fact that scientific agricultural research operates under the self-imposed handicap of ignoring the wisdom of practice (métis) is not directly injurious to cultivators themselves, although it does sharply limit its potential benefit.

When this tunnel vision becomes potentially deadly is when it is deployed by a coercive state determined, usually in the name of progress, to use its techniques to totally transform the life of its subjects.

Space restrictions and, perhaps, the reader's patience as well, preclude a more detailed discussion which I hope to provide elsewhere. Still, a brief example may help clarify what I mean and suggest the possible value of a more elaborate analysis. The residential pattern of many Tanzanian peoples, most particularly their geographical dispersal, typically reflected a very complex adaptation to grazing and subsistence requirements of a semi-arid environment- the *métis* of long experience. The ruling party's (TANU and Nyerere's) decision in the 1970s to settle nearly everybody into new (*ujamaa*) villages was taken in relative ignorance of these complexies. Imagining that a concentration of population would make it easier to deliver services (education, health care, water), to inaugurate mechanised cooperative farming under TANU supervision, and to spur the production of cash crops for export, the state bureaucracy pushed ahead. Simple, quantitative goals came to prevail: e.g. the number of *ujamaa* villages that officials in each district had 'created'. The new villages were laid out in legible grids by state surveyors following the standard ('one size fits all') format; houses only a few feet out

[45] Paul Richards, *Indigenous Agricultural Revolution: Ecology and Food Production in West Africa* (London: Hutchinson, 1985).

of alignment with the new grid were occasionally knocked down and rebuilt to bring them into perfect accord with the surveyor's line. The result, as one might have suspected, was economically and socially disastrous for much of Tanzania's rural population inasmuch as it violated any number of sensible practices necessary to pastoralism and agriculture as well as to the diversification of subsistence sources based on long experience. It has taken years to undo the damage it did to viable, productive human communities.

The 'sub-species' of high modernism driving Nyerere and TANU bore (not excluding their 'socialism' and infatuation with the Chinese communes of the day) a distinct Western intellectual lineage. The logic behind *ujamaa* villages was that large scale farms were inherently superior to small farms, that the more mechanised the enterprise the better (hence the emphasis on tractors), and that concentrated 'town' living was inherently superior to rural dispersal. One could find almost exactly the same suppositions behind Lenin's view of Russian agriculture[46] *or* among the planners of the Tennessee Valley Authority during the New Deal of Franklin Roosevelt.

For all his rhetorical attention to African traditions, when Nyerere wrote that it was high time Tanzanians were made to live in "proper villages", it was a cultural revolution he had in mind. This variant of high modernism serves several manifest and latent purposes. It elevates the knowledge and values of the vanguard elite; it gives them the high goal and responsibility of modernizing their people, it justifies their rule and whatever draconian measures they feel is necessary, and finally, it radically *devalues* the knowledge and practices of the population whose lives they are transforming. Popular resistance can be dismissed as obscurantism and "starting from zero" is justified. It is only such strong convictions, I believe, that can explain why such policies (e.g. collectivization, *ujamaa* villagization) are pursued long after evidence accumulates of the suffering they are causing, of the coercion required to apply them, and the actual failures of production which they have brought in their wake.

[46] Lenin's determined emphasis on electrification was perhaps unique- in degree if not in kind. The silence, invisibility, and long-distance transmission of electricity gave it, I think, almost magical properties for early modernists.