ECONOMIC DECLINE IN HISTORICAL PERSPECTIVE: SOME THEORETICAL CONSIDERATIONS

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Economic decline is a curiously difficult topic. We deal very comfortably with economic growth; we deal with its opposite awkwardly and unnaturally, much the way we write or throw with our off hand. The asymmetry stems from long practice, from habit. Our habits of thought have been shaped by our theory of the world economy, and, even more, by our theory of history; and neither has made us conversant with decline.

1. Our theory of history

The Whig interpretation: the nineteenth century

Our theory of history, so deeply imbedded that it takes an effort even to recognize it as a theory, is a theory of history as progress; and in this we are children of our times.

Through most of recorded history general progress was considered impossible. Human interaction was seen as zero-sum: the wealth of nations required the poverty of other nations, progress here implied decline there.

In the nineteenth century England and the Western World experienced industrial development, sustained economic growth, unprecedented material progress: *mass* progress, that had been all but inconceivable. Progress became the new religion: in Its name, as formerly in that of the True Faith, the West justified colonial conquest and the new imperialism.

That same faith defined Man, foretold the future, interpreted the past. Man was the tool-maker (not the picture-painter, or story-teller, or god-worshiper, or clothes-wearer, or anything else that distinguishes our species); the future held out limitless improvement; the past was the history of progress, specifically of technical progress, of that particular progress that was the pride and miracle of the West. The triumph of that ideology has been complete: we ourselves have no mental categories to describe the vast sweep of human history other than the stages of technological progress, from the "stone age" on.

This interpretation of history as progress, which we have absorbed in our grade-school texts, is the Whig interpretation of history. It serves our image of ourselves--we Western Europeans, better yet we North-West Europeans, to be altogether candid we Anglo-Saxons (in Europe and overseas)--as the pinnacle of God's creation. Everything that brought humanity closer to Us was progress. We

have agriculture, its invention was progress; we have a Church and a State, their creation meant progress; we have money and markets, their development came with progress; our many Revolutions, political and economic, were all steps in the path of progress.

This definition of our history and of ourselves is imbued with contempt for our ancestors, and even deeper contempt for our non-white contemporaries: the former were backward, the latter remain congenitally so (or merely follow our example). That contempt dares no longer speak its name, but in the nineteenth century it was entirely overt: Frederick Maitland airily described early medieval cultivators as "thriftless barbarians," and the ruins of Great Zimbabwe were considered evidence that some white race once inhabited the area.[1]

In the Whig view *homo faber* can change only for the better. Civilizations may decline--the Middle Ages lay between two culturally superior epochs--but productive capacity cannot and does not. Economic "decline" can only be relative: the Near Eastern and Mediterranean economies were once developed, but they failed to move forward, and fell behind as leadership passed to the countries on the banks of the English Channel.

With Northwest Europe in the van--as God intended--economic progress sharply accelerated, and the glacial pace of the preceding centuries was in comparison a long stagnation. The non-progressive slave economies of antiquity, the equally non-progressive feudal economies of the medieval period were at last superseded: capitalism was born, enterprise was unleashed, and the commercial, agricultural, and industrial revolutions followed in rapid succession.

The Whig interpretation is thus a theory of history as progress that is at once continuous, in the sense that man the producer moves only forward, and discontinuous, in the specific sense that the curve of progress displays a kink, a sudden increase in the pace of advance. The kink itself is tied to a new *mentalité*, perhaps, as Max Weber argued, to a new religion, certainly to the appearance on center stage of ourselves, history's best and brightest.[2]

The Whig interpretation in the twentieth century: the early dissenters

Over the twentieth century the hegemonic Whig view was subjected to some ineffectual sniping; a significant, if partial, revision; and a broad-front challenge that bids fair to dethrone it.

The snipers were scholars whose fire carried, but failed utterly to divert the Whig juggernaut from its course. One such was C. E. Stevens, whose fine chapter in the first volume of the *Cambridge Economic History of Europe* argued that the agricultural techniques of ancient Rome had been perfected to the point that any further intensification of production was constrained directly by the area's limited rainfall.[3] He thus challenged the Whig notion that the Mediterranean peoples' enduring retention of those techniques--their failure to adopt the more modern methods evolved north of the Alps--was evidence of backwardness; but his essay was read only by a few specialists, and is today all but forgotten.

Even earlier, in the 1920s, Mikhail Rostovzeff had described the ancient economy as an essentially capitalist system: agricultural rather than industrial, to be sure, but otherwise not unlike our own. His work too was read primarily by specialists; in the broader intellectual community it was noticed only by the marxists, who naturally found the notion that capitalism could have preceded feudalism simply preposterous.[4]

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[1] F. W. Maitland, *Domesday Book and Beyond*, Cambridge, 1897, p. 518; P. D. Curtin *et al.*, *African History*, New York 1978, p. 284.

[2] Max Weber, *The Protestant Ethic and the Spirit of Capitalism*, New York, 1958.

[3] C. E. Stevens, "Agriculture and Rural Life in the Later Roman Empire," in J. H. Clapham and E. Power, eds., *The Cambridge Economic History of Europe*, vol. 1: *The Agrarian Life of the Middle Ages*, (Cambridge, 1942), pp. 89-117.

[4] M. I. Rostovzeff, *A History of the Ancient World*, Oxford, 1926; P. Anderson, *Passages from Antiquity to Feudalism*,

Marxists are of course Whig fundamentalists, whose orthodoxy is sustained directly by the words of the Prophet; but their fellow travelers can countenance dissenting views, and of these heterodox *gauchistes* none proved more interesting, or influential, than Karl Polanyi.

Politically, Polanyi was anti-capitalist. Intellectually, he espoused the Whig view that capitalism was a recent system, and the specifically marxist view that it was destined to disappear; but his broader thesis was anti-Whig, anti-Marx, and even anti-Smith. Man, he claimed, does not have a natural tendency to truck and barter: the market is not natural to man--internal markets are spawned and sustained by external trade--and capitalism, which entrusts to the market the basic organization of society, is so unnatural as to be unsustainable. Human societies had typically and normally been based not on self-interested exchange, but on reciprocity and redistribution; the Graeco-Roman world invented the market (the *agora*, the *forum*), but only modern Europeans had made the market their fundamental social institution. Capitalism was an innovation, but far from representing progress it was a terrible aberration.

Not everything here was new. Henri Pirenne too had believed that internal markets disappear if they are not continuously created by external trade: early medieval Europe had reverted to a natural economy when and because the expansion of Islam had closed the Mediterranean, so that "*Charlemagne, sans Mahomet, est inconcevable*." Pirenne was of course enormously influential, and even Douglass North would subscribe to the view that medieval Europe remained market-less and money-less until external trade recreated internal markets; but Pirenne's influence was on the interpretation of that specific distant period, and did not otherwise affect the broad view of human history.[5]

On a different level, too, Polanyi's evaluation of the capitalist revolution exactly paralleled the conservative evaluation of the great communist revolutions of the twentieth century. The most orthodox Whigs were again the marxists, who alone could see 1917 (and 1949) as the legitimate successors to 1215, 1649, 1688, 1776, 1789, and 1848.[6] Non-marxist Occidentals considered them deviations from the True path; but they were the deviations of alien peoples, and did not affect our sense of ourselves as God's chosen.

But Polanyi reinterpreted our own world, our own past. *The Great Transformation* was an eye-opener: in portraying the Glorious Revolution not as the triumph of representative institutions but as the defeat of a Crown bent on defending the peasantry from expropriation, in decrying, as the marxists could not, the transition to capitalism, he challenged the very notion that our history was a history of progress. Simply by proposing a different interpretation, he showed that what we had accepted as fact was itself interpretation, *an* interpretation: the Whig interpretation.[7]

Polanyi also reinterpreted the worlds removed from ours by time or distance. His effectiveness here was altogether greater, possibly because the claim that our market system was unique to us in fact dovetailed nicely with our Whig presumptions (and *présomption*), possibly too because his pernicious suggestion that our economic theory is relevant only to our own society was only too readily accepted by scholars trained in other disciplines. Be that as it may, his influence among students of the early civilizations, and again of pre-colonial Africa, was immense, and

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London, 1974.

[5]H. Pirenne, *Mahomet et Charlemagne*, Paris, 1937; D. C. North and R. P. Thomas, "The Rise and Fall of the Manorial System: A Theoretical Model," *Journal of Economic History* 31 (1971), pp. 777-803. With respect to the broad view Pirenne was of course entirely Whiggish, and his enchanting *Medieval Cities: Their Origin and the Revival of Trade* (Princeton, 1925) is very much a celebration of our own civilization.

[6]François Furet, *Le passé d'une illusion: essai sur l'idée du communisme au XXe siècle*, Paris 1995.

[7]K. Polanyi, *The Great Transformation*, New York 1944.

permeated post-war textbooks.[8] His star is mercifully waning, but even at its height he shone as an anti-economist, not an anti-Whig.

The Whig interpretation in the twentieth century: the Reformation

The Whig reformation that produced the present-day orthodoxy was due very largely to the influence of Lynn White, jr. In the early 1960s Lynn White cogently argued that the technology that allowed early modern Europe to sail the oceans and conquer distant empires was itself the product of the preceding centuries. The medieval period was technologically progressive: very much like our own epoch, and correspondingly unlike those that came before.[9]

The Whig chronology was thus amended, but the basic interpretation was unchanged. Our progressive *mentalité* was different from, and superior to, that of our earlier ancestors; but it was older, by some one thousand years, than we had thought. The kink in the curve of progress was merely moved back from the end of the Middle Ages to their beginning, to when Western Europe was enriched by the germanic races.

Subsequent works buttressed both this reformed interpretation of the Middle Ages, and the unreformed interpretation of classical antiquity. Medievalists like Roberto Sabatino Lopez described the commercial revolution of the Middle Ages, and suggested that capitalism was in fact already alive and well at least in medieval Italy.[10] Even the marxist school accepted the new view of the Middle Ages: not of course by admitting that capitalism might have antedated the enclosure of England's open fields, but by discovering a "feudal dynamic" driven by the dialectical conflict between lords and serfs.[11]

There was nothing in our stars to prevent a reformed interpretation of the pre-medieval period as well. Rostovzeff on the classical economy and Stevens on classical technology had already shown the way. The marxists' class-conflict between medieval lords and serfs begged for an analogous conflict between ancient masters and slaves, for a "classical dialectic" that would make even the slave mode of production, like its successors, inherently progressive. In White's own work, indeed, the contrast between the "progressive" Middle Ages and the "unprogressive" earlier period is transparently forced--inventions that were applied only much later are presented as evidence of inventiveness if they are medieval, and as evidence of a lack of interest in their application if they are classical--and appears as little more than an unnecessary, indeed unfortunate, rhetorical device.

But there was in ourselves the wish to feel superior to our forefathers as well as to our contemporaries, our Whig predisposition to conserve the defining kink in the curve of progress. Lynn White's reformed view of the Middle Ages was accepted, his unreformed view of antiquity was too familiar, too flattering, to provoke dissent.

Far from being challenged, in fact, his portrayal of classical antiquity was repeated from a very prestigious pulpit, the Chair in Ancient History at Cambridge University. Professor Moses Finley was politically left-wing, intellectually a disciple of Karl Polanyi's; in *The Ancient Economy* he stressed the non-market nature of the classical economy, and the (to us) entirely alien mind-set that lay behind

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[8]See K. Polanyi *et al.*, *Trade and Markets in the Early Empires*, Glencoe, IL, 1957, and, for example, W. I. Davisson and J. E. Harper, *European Economic History,* New York, 1972, and Z. A. Konczacki and J. M. Konczacki, eds., *An Economic History of Tropical Africa. Vol. 1. The Pre-Colonial Period*, London, 1977.

[9]L. White, jr., *Medieval Technology and Social Change*, Oxford, 1962.

[10]R. S. Lopez, *The Commercial Revolution of the Middle Ages, 950-1350*, Englewood Cliffs, NJ, 1971.

[11]Anderson, *Passages*; R. H. Hilton *et al.*, *The Transition from Feudalism to Capitalism*, London, 1976; T. H. Aston and C. H. E. Philpin, eds., *The Brenner Debate: Agrarian Class Structure and Economic Development in Pre-Industrial Europe*, Cambridge, 1985.

it. His monograph was a direct attack on Rostovzeff's interpretation of the ancient world, and agreed entirely with Lynn White's.[12]

But Finley's case against Rostovzeff is very weak. The suggestion that ordinary workers were not interested in reducing their burdens by improving their methods, or by obtaining through exchange what they could not easily produce themselves, seems gratuitous. His argument that Pliny reveals a non-capitalist *mentalité* because he described the amenities, rather than the revenues, of his newly acquired villa is not only puerile--John D. Rockefeller might have done as much--but entirely irrelevant: the senatorial aristocracy may have had enough money to despise it, but the equestrian class was certainly acquisitive, and Trimalchio is proof enough that entrepreneurial freedmen were sufficiently numerous and successful to irritate their social betters. This reader, at least, was convinced by Finley--that Rostovzeff must have been right: if that was the case for the prosecution, the defence could rest.

The defence did not rest. Kenneth White's *Roman Farming* provided extensive documentation of the steady improvement of agricultural techniques in classical antiquity. White was a student of Finley's; his mentor's influence is evident in the book's incongrous last chapter, which appeals to the ancients' non-modern *mentalité* to explain the stagnation of classical agriculture. Finley's influence may have been intellectual, blinding White to the thrust of his own evidence, or more directly hierarchical; in any event White soon freed himself from it, and his subsequent *Greek and Roman Technology* is a unabashed paean to the technological dynamism of the ancients.[13]

The kink in the curve of progress thus seems altogether bogus, and in due course, surely, it will be recognized as such. But in the broader intellectual community the influence of Kenneth White has yet to supersede that of Moses Finley and of Lynn White, and the current orthodoxy reflects the interpretation of antiquity of these last. This is evident in Joel Mokyr's superlative *Lever of Riches*, whose only significant fault is precisely its Reformed Whig orthodoxy, its belief in the kink in the curve at the end of antiquity.[14] Mokyr actually explores the reasons for the lack of progress in classical times, and traces it to the slave economy; but his argument that slavery blocked bottom-up improvements because the slaves' minds and ingenuity were left unused reveals only the extent to which he interprets classical slavery through the prism of its more familiar counterpart in the New World. Slavery in America was a peculiar institution in more ways than one, and in using large numbers of slaves in lash-driven effort-intensive activities it was historically exceptional; in classical times where slaves were numerous (and, as in the United States, overwhelmingly home-born) they worked largely as independent artisans and cultivators, no different in this respect from the working classes of the later, progressive epochs.[15]

The Whig interpretation in the twentieth century: the Cultural Revolution

The Cultural Revolution of the 1960s was not only Chinese. In the West, too, the dominant ideology came under attack, a broad-based, grass-roots attack that shook it to its foundations.

The counterculture rejected the Whig definition of Man--to *homo faber* it preferred *homo ludens*--and, with it, the Whig notion of progress, the Whig goal of ever-increasing material abundance.

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[12]M. I. Finley, *The Ancient Economy*, London, 1973.

[13]K. D. White, *Roman Farming*, London 1971; K. D. White, *Greek and Roman Technology*, London 1984. Rumor has it that Finley was White's dissertation supervisor, and that the last chapter of *Roman Farming* was added at Finley's insistence; *The Ancient Economy* may itself have been a defensive move, to parry White's thrust.

[14]J. Mokyr, *The Lever of Riches: Technological Creativity and Economic Progress*, Oxford, 1992.

[15]S. Fenoaltea, "Slavery and Supervision in Comparative Perspective: A Model," *Journal of Economic History* 44 (1984), pp. 635-68, and references therein.

Others challenged the very feasibility of that goal. The early running was made by the Club of Rome, who pointed to the looming exhaustion of the world's mineral reserves.[16] It was of course a flash in the pan--at any point in time our known reserves are like that portion of the road ahead that is illuminated by our head-lamps--but even as it faded into oblivion its deeper message was far more cogently diffused by the very successful environmental movement, which began slowly but steadily gained converts. Converts from the Whig faith: not by chance, it would appear, the virulent, visceral anti-environmentalists are those who most need that faith to buttress their image of themselves.

This need to define merit by material progress has in fact been made more urgent by the proscription of the alternative criterion that declared us the best, immediately and automatically: the traditional Southern Comfort, the criterion of race. Racism emerged from World War II in very bad odor, and in the 1960s the Civil Rights movement made it Incorrect for good and all.

The Whig faith, the Whig interpretation of history were born in and of a racist age, but as the marxists had already shown they are not themselves intrinsically racist. The proof of this particular pudding has recently been provided by Jared Diamond, whose delightful *Guns, Germs and Steel* presents a thoroughly non-racist, entirely Correct recasting of the Whig view: civilization blossomed where it did not because of "our" mental superiority--our greater inventiness--but because our natural environment made the invention of agriculture, and above all the *diffusion* of that invention, easier than in other parts of the world. We were not smarter, we were luckier: history is driven by a different engine, but it continues to run on the Whig track of constant progress.[17]

This new-found humility is long overdue, but as far as the interpretation of history is concerned it is little more than a new coat of paint. The deep challenge to the Whig interpretation lies elsewhere. It too dates back to the 1960s: to the works of different scholars, working in different fields, linked if at all only by the air they then breathed.

The first, seemingly innocuous blow was struck by an English agrarian historian, Joan Thirsk. In 1964 her article on "The Common Fields" subverted the conventional view that the common-field system had remained essentially unchanged since the Saxon immigrants had brought it to England. Rather, she argued, it evolved over time, essentially as population growth reduced the available supply of pasture and generated pressures for a more intensive use of the arable. This evolutionary view of the common fields was quickly adopted by medieval historians, and became the new conventional wisdom; for present purposes what matters is that the key to the evolution of agriculture was found not in technical progress but in progressive intensification.[18]

The transition from the two-field to the three-field system could naturally be reinterpreted in this light, and Thirsk herself would similarly reinterpret the agricultural revolution, which she described with wonderful concision as "the application to the fields of the methods of the garden."[19]

A similar approach was almost simultaneously applied to an even broader canvas by a Danish development economist, Ester Boserup--perhaps not by chance from a small country, and again a woman. In *The Conditions of Agricultural Growth: The Economics of Agrarian Change under Population Pressure* (1965) she rejected the conventional view that tropical Africa's population density is low because output per unit of land is limited by the inhabitants' backward agricultural

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[16]D. H. Meadows *et al.*, *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*, New York, 1972.

[17]J. M. Diamond, *Guns, Germs, and Steel: The Fates of Human Societies*, New York, 1997.

[18]J. Thirsk, "The Common Fields," *Past & Present*, n. 29 (1964), pp. 3-25.

[19]The quoted phrase is a personal recollection from a presentation at Chapel Hill some twenty-five years ago; colleagues in the field also remember it, from other venues. In so many words it seems never to have appeared in print, but Joan Thirsk has kindly confirmed that it properly summarizes the interpretation she was then developing, and to which she continues to subscribe; see J. Thirsk, *Alternative Agriculture. A History: From the Black Death to the Present Day*, Oxford, 1997.

techniques. She suggested taking low population density as a given--a very reasonable assumption, given the tropical disease environment--and argued that the supposedly primitive techniques were in fact an efficient adaptation to the relative abundance of land. Slash and burn agriculture yields very little per acre of land--each plot is cultivated for a year or little more, and then abandoned for decades--but is enormously productive *per unit of labor*. The trees are killed with an axe--used not to fell them, but simply to strip off a ring of bark--and then burned. The ash fertilizes the soil, which is naturally loose because nothing grows under the forest canopy; a simple digging stick suffices to make a small hole and plant the seed-root. Cultivation is all but effortless; the only catch is the long fallow--some three decades long--required to let the forest grow back. The technique is labor-saving but very land-intensive, and only extremely land-rich cultivators can afford to use it.[20]

Where population pressure is greater, the land has to be cropped more often. Where it has to be cropped almost every year, only grasses grow back--and labor-intensive plowing becomes necessary to break the sod. Africans do not use the plow not because they are backward, but because they can afford not to.

Analytically, Boserup's point is that slash and burn agriculture and plow agriculture correspond not to two different production functions--of which the latter is the more advanced, so that once it has been acquired the former is forever obsolete--but to two different techniques, with dissimilar factor proportions, within a single production function that includes them both (Figure 1, ignoring, for the moment, the references to hunting and gathering).[21]

Culturally, she brought out the Whig, racist roots of the conventional view of African agriculture. We have always known that *American* agriculture produces less than European agriculture per unit of land, but more per unit of labor, because Americans are more land-rich than Europeans; we never took the low American yields per acre as evidence of backwardness. But since in our racist hearts we know that Africans are inferior, we know too that their low yields per acre correspond to a backward technology--a technology which has to be backward, because our own ancestors had abandoned it long ago, as they traveled the road of Progress. Boserup, miraculously free of both prejudices, looked at the evidence; and on the evidence Africans are merely more American than the Americans themselves.

Boserup's book also has an incongruous last chapter, curiously up-beat: we need not worry about African population growth, it argues, because agricultural techniques will naturally adapt and become more intensive. True enough, but hardly the point: what she has shown is rather that as population grows agriculture becomes more intensive, cultivators have to work harder to feed themselves, and living standards decline. But Africa's future is Europe's past, and from Boserup's analysis the Whig interpretation of history receives a double blow: the transition from slash and burn to settled agriculture resulted not from technical progress but from population pressure, and it was accompanied not by rising but by falling standards of living. The process Thirsk identified within plow agriculture in medieval and modern England was found by Boserup writ large across the various forms of cultivation and the continents--and, implicitly, over the millennia.

The undermining of the Whig view was not entirely women's work. Richard Lee, an American anthropologist, reported in 1968 on his investigation of primitive hunters, the Khoisan of the Kalahari desert.[22] His Whig presumptions had of course led him to expect a miserable people, barely surviving on the margin of subsistence. Much to his surprise he found that the Khoi-san fed

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[20]E. Boserup, *The Conditions of Agricultural Growth: The Economics of Agrarian Change under Population Pressure*, Chicago, 1965.

[21]Similarly, Thirsk's argument would be that the evolution of plow agriculture represents right-ward movement along the single curve of the lower panel, and not successively higher curves in the upper panel.

[22]R. B. Lee, "What Hunters Do for a Living, or, How to Make Out on Scarce Resources," in R. B. Lee and I. DeVore, eds., *Man the Hunter*, Chicago, 1968, pp. 30-48.

themselves with very little effort, and even less pain; their foraging expeditions were marked not by anxiety, but by the joyous expectations we bring to our picnics. Primitive life in the desert was surprisingly easy; in the bountiful environment of our own temperate zones, the life of our "primitive" forefathers must have been scandalously good.

Lee thus suggests that Boserup's interpretation of agricultural "progress" can be extended right back to the beginning of agriculture itself. We humans began to till the land not when we discovered a new technology that rescued us from our previously precarious existence, but when growing population pressure forced us to use methods that were already familiar but had simply been avoided as unnecessarily burdensome. Figure 1 can thus be considered in its entirety: "hunting and gathering" is not as the Whig presumption would have it the most primitive subsistence technology; it is rather the most land-intensive, the appanage of the human race so long as we remained very thin upon the ground. Eden was not a dream, but a distant memory; and our own version of the Fall seems to tie it to the discovery, if not of sex, at least of the role of sex in reproduction. We became fruitful and multiplied; we multiplied ourselves out of God's free lunch, and have since had to gain our bread with the sweat of our brows.

The Whig interpretation today: quo usque tandem*?*

Within anthropology the cultural revolution has run its course. Lee's heretical views naturally provoked an orthodox reaction, but to little avail.[23] The discovery that some social groups had abandoned "higher" forms for "lower" ones (settlement for nomadism, market involvement for subsistence, cultivation for hunting and gathering) suggested that human history was not in fact a history of progress. The discipline recognized that "the primitive" was a cultural construct, erected by us to glorify ourselves; by the 1980s anthropology had gone off into deep epistemology, deconstruction, and a generally narcissistic study of itself.

Within economic history, as seen above, the (reformed) Whig orthodoxy still holds sway. We continue blithely to presume progress where there need not have been any progress at all; when we try to understand the past we exclude *a priori* the hypotheses that are inconsistent with our prejudices, though they may make altogether better sense than those we are willing to consider.

A pertinent example is provided by the analysis of the transition to agriculture--"the first economic revolution"--proposed by Douglass North and Robert Paul Thomas.[24] Their analysis is, almost to the end, entirely Boserupian. Hunting (and gathering) and cultivation are two alternative techniques, both known from the start, which differ however in their returns to effort. In hunting these returns are initially high, but rapidly fall off: both as effort increases at any point in time, and over time, as in the absence of private property herds tend to be over-hunted. In cultivation returns are lower than the initial returns to hunting, but they are also relatively constant, and do not fall off (either over time or as more effort is applied) as the returns to hunting do. In this analytical setting the transition to agriculture is caused by population growth, which reduces the return to hunting until if falls below that of cultivation (and then continues to reduce it, as herds are depleted, until the activity vanishes altogether). Hunting thus gives way to cultivation; but in the process the return to labor *falls*, and living standards are reduced.

But North and Thomas put a Whig twist on the story. The herds may have been common property, but cultivated land is inevitably the private property of the cultivator. "The first economic revolution was not a revolution because it shifted man's major economic activity from hunting and

[23]M. Sahlins, *Stone Age Economics*, New York, 1972; E. N. Wilmsen, *Land Filled with Flies: A Political Economy of the Kalahari*, Chicago, 1989.

[24]D. C. North and R. P. Thomas, "The First Economic Revolution," *Economic History Review* 30, 1977, pp. 229-241. For an extended discussion of another example see S. Fenoaltea, "Transaction Costs, Whig History, and the Common Fields," *Politics and Society* 16, 1988, pp. 171-240.

gathering to settled agriculture. It was a revolution because the transition created ... exclusive property rights which ... provide a direct incentive to improve efficiency and productivity... It is this change in incentive that explains the rapid progress made by mankind in the last 10,000 years in contrast to his slow development during the long era as a primitive hunter-gatherer."[25]

But there is a cloud to that silver lining. Property is theft, or at least a condition for theft; one can grant that cultivation and private property emerged when resources became scarce, and that they changed incentives, and still tell a very different story. The transition to cultivation created novel opportunities to appropriate the fruits of the labor *of others*: agriculture was midwife not to efficiency and productivity but to theft, specifically to the systematic, institutionalized theft we call exploitation.

Hunters and gatherers are essentially immune to exploitation. Their capital is their human capital, their knowledge of nature: they live off the land, and if pressured can simply disappear into the broader environment. Not so the cultivator. Cultivation requires physical capital: the growing crops, and even more specifically the wages-fund, the stored prior harvest that provides nourishment until the next one. The cultivator's capital is tangible, immobile; it can be threatened with destruction, it can be appropriated. Agriculture indeed created new incentives: it radically changed the payoff to the capacity for violence.

The lack of charity begins at home, and the first effect of cultivation was no doubt the subjugation of women. But the male heads of families would themselves remain free only where they formed a strong republic; the more common fate of the ordinary cultivator was subjection to a *seigneur*, to a blackmailing armed tax-collector who had either conquered him or "defended him from conquest." Agriculture allowed the rise of an idle aristocracy, who lived the good life on the products and labor services it extracted from its subjects.

A nobility, a clergy, a State with its army and bureaucracy require the exploitable *peones* that appeared when agriculture did. Civilization followed upon agriculture, as the Whig story has it, but not because the working man's productivity had risen at last to where it yielded a surplus over his own subsistence. As a result of agriculture, rather, the surplus over subsistence formerly consumed as leisure by common men and women was transformed into extra work and extra output--implying falling productivity and declining living standards--to support the new ruling class and its retainers. The reason civilization appeared first in rainless river-valleys is transparent: in the great desertification of a few thousand years ago those who fell back on those rivers were trapped there, and while humans elsewhere could still escape the tax-collector their only alternative to supporting the rulers was death among the dunes.

The growth of the human population thus had a doubly depressing effect on the living standard of the common man: it not only evicted him from Eden, but subjected him to taxation. Agriculture, the City, the Church, the State are not signs of Progress--as the Whig interpretation has it, simply because we have them still--but the consequences of the Fall.

Which story is correct? On an admittedly casual reading of the literature, the archeological evidence seems to support the revisionist view. The transition to agriculture seems to have been accompanied not only by the spread of weapons (and the first warrior gods, where the hunter-gatherers had fertility goddesses), but by the rise of slavery (skeletons deformed by incessant hard labor), and a general decline in the standards of nutrition (shorter skeletons).

In sum, technical progress would appear to have been continuous, in both senses of the term: no doubt accelerating over time, but smoothly so, with no discernible break between the epochs of our traditional taxonomy. But until very recently it would also appear to have been outpaced by the productivity-reducing effects of population growth. The human story writ large appears to be a story of rising work effort, to maintain the workers themselves, and then also to support the drones that profited from growing scarcity: it is, as *Genesis* reminds us, a story of decline.

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[25]North and Thomas, "The First Economic Revolution," p. 241.

2. Our theory of the world economy

The Ricardian legacy: comparative advantage and growth

When we think of decline our typical frame of reference is not the entire human race but its bits and pieces, the nations or regions that "fall" as others "rise." We believe that relative wealth, power and status are intimately bound up with technical leadership--the more prosperous countries are the more advanced on the road of Progress--and our instincts tell us that the winners of this competition somehow owe their success to a superior economic strategy, possibly to a superior *commercial* strategy.

Mercantilism was of course the pursuit of precisely such a strategy; but as we all know the discipline we call "economics" emerged as an attack on the very concept that public interference in the domestic economy or with international trade could promote the wealth of nations. Mercantilism was the pursuit of the impossible by means of the ineffectual; free trade benefited all concerned, and tended in fact to spread world-wide the material progress of the leaders. Once again, the theory contemplates only progress; decline is inconceivable, save through a wilful renunciation of the benefits of trade, a self-punishing return to autarky.

Of course there could be exceptions: by interfering with trade one could exploit a national monopoly, or increasing returns--the stuff of Mill's infant industries, or, more recently, of endogenous growth, multiple equilibria, and much new-fangled trade theory. New-fangled in being neo-mercantilistic--it seems to have been spawned, in the West, by *le défi japonais*--but entirely traditional in tying economic supremacy to superior productivity.

But let us go back the beginning, to the history of economic thought. In the late eighteenth century Hume's specie-flow theory had shown the futility of the attempt to attract specie (somewhat speciously, as it were, as specie hoarded in a war chest would clearly have been sterilized; but more on Hume anon). Contemporaneously, Smith had argued that trade was mutually beneficial, at least in the presence of complementary absolute advantages. Early in the nineteenth century Smith's argument was generalized, with astonishing intelligence, by David Ricardo: even a country with *no* absolute advantage gained from trade, simply by specializing in the branch of production in which its absolute disadvantage was relatively low, in which it therefore possessed a "comparative advantage." That is the model of trade with which we grew up; it is wonderfully insightful, but of no help at all in understanding relative decline.

Ricardo's opus is commonly described as the first treatise in abstract economic theory.[26] But the *Principles* can also be read as a political tract in theoretical (dis)guise, a tract fully engaged in the great policy debate of post-Napoleonic Britain: the controversy over the political power of the landed aristocracy, and the practical expression of that power, the protection of grain. The "model of trade" that demostrates that free trade benefits "everybody" area-bombs protection in general; the precision attack on the protection of grain is elsewhere, and unfolds deceptively as a "model of growth."

Ricardo's "growth model" too is astonishingly intelligent. In that model the endowment of resources, which the "trade model" considers fixed, is allowed to vary. More precisely, capital and labor can vary over time: their supply shrinks if their remuneration is inadequate to maintain them, and grows instead if that remuneration exceeds the "subsistence" minimum. Land, though, is in fixed supply. Land therefore exists and is available regardless of its remuneration: "rent" is not necessary to maintain the fixed factor "land" as "profits" and "wages" are necessary to maintain the variable factors "capital" and "labor." By the same token, "land" cannot be accumulated; it cannot grow as capital and labor can, and therefore sets an overall limit to the national economy.

As the supply of capital and labor increases, and that of land does not, the productivity and real remuneration of the variable factors decline, and the productivity and real remuneration of the

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[26]D. Ricardo, *On the Principles of Political Economy and Taxation*, London 1817, and, for example, R. Backhouse, *A History of Modern Economic Analysis*, Oxford 1985.

fixed factor increase.[27] In the logic of the model, growth is the accumulation of capital and labor, and it continues until the real returns to these variable factors fall to their subsistence levels. The wage good is corn; the subsistence wage is a quantity of corn per worker, and obviously positive. Capital is also corn, understood as the wages fund that maintains the work force from harvest to harvest. The subsistence return to capital may be set at zero: "capital" is maintained if the harvest, the wages-fund, is constant from year to year.

The natural limit to growth is given by the maximum carrying capacity of the land. At that point the harvest just maintains a labor force that just produces that self-same harvest: in the corn-labor space of Figure 2 it corresponds to the intersection of the corn-from-labor production curve and the labor-from-corn subsistence line (point $C3,L3$).[28] With diminishing returns, when the average product of labor equals subsistence the marginal product of labor is *less* than subsistence: the "natural" maximum is most easily interpreted as an economic equilibrium in the context of a communist society that exacts labor and shares the product. In a market economy, wages equal labor's marginal product; the "communist" equilibrium is achieved with market socialism, with the return to state-owned land distributed to the workers themselves, or, with private property, if land-ownership is egalitarian, so that the peasants' earnings from the land similarly supplement their earnings from their labor.

A different equilibrium emerges in a market economy with *concentrated* property-ownership and a land-less proletariat.[29] The agricultural labor force stops growing when its *marginal* product falls to subsistence, even though its total product--the available wages fund--is then well in excess of its collective subsistence (Figure 2, point $C2,L1$).[30] The entire harvest ($C2$) may be "capital" available to support agricultural workers, but only part of that wages-fund ($C1$) is so used. The rest ($C2 - C1$) could "return itself" simply by being stored: with Weberian-calvinist property owners, real (labor and output) growth would stop when the marginal-product real wage falls to subsistence, and the annual surplus would simply be added to the ever-growing hoard of idle "capital."

But Ricardo made two further assumptions. The first is that corn is storable only from harvest to harvest, and then rots away overnight. This eliminates the property-owners' storage option: "capital" cannot be conserved, it can only be reproduced by being recycled through the land and the cooperating agricultural workers. Any return is better than none, and the workers' marginal product can fall below subsistence: with Weberian property owners the entire harvest would be reinvested in a wages-fund, supporting a larger agricultural labor force ($L2$), which would in turn produce a larger harvest, and so on. The market equilibrium would again coincide with the communist one, the "natural" limit to growth ($C3,L3$).

The second is that among property owners the only (Weberian) savers are the capitalists. Growth therefore comes to an end well short of the "natural" limit (again at $C2,L1$ instead of at

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[27]Ricardo did not of course also invent marginalism, and his theory of rent appeals to differential quality rather than to overall scarcity; but that is a beauty blemish. The principle of diminishing returns is clearly grasped, and that is all that's needed.

[28]In corn-labor space, corn-per-worker appears as a slope. For any given L and C the average product per worker (C/L) is the slope of the ray from the origin to the corresponding point on the production curve; the marginal product per worker (the change in C per unit change in L) is the slope at that point of the production curve itself. At ($C3,L3$) the *average* product equals subsistence.

[29]The land-owners must of course be assumed to limit their own reproduction. For simplicity, in what follows their share of the total population is considered negligible.

[30]This is of course the heart of the Cohen-Weitzman model that ties depopulation in sixteenth-century England to enclosures, identified as the transition to capitalism (from medieval communism) or at least to profit-maximization (from labor-force maximization): J. S Cohen and M. L. Weitzman, "A Marxian Model of Enclosures," *Journal of Development Economics* 1 (1975), pp. 287-336.

C3,L3), when and because the entire surplus over the subsistence of capital and labor accrues to the land-owners, who (unlike the capitalists) do not save and invest (in Figure 2, *C2 - C1* is the surplus consumed by the land-owners, *C1* is the capital that supports *L1* agricultural workers).

If the harvest were storable, growth would stop (at *C2,L1*) even if the land-owners saved and accumulated, and the "social" limit to growth would be attributable to the market, to concentrated private property, to institutions Ricardo has no wish to impugn. With non-storable grain, growth would continue to its "natural" limit if the land-owners too saved and invested; with non-storable grain, the "social" limit to growth is set specifically by the profligacy of the aristocracy, to its dissipation of the surplus as consumption.

Ricardo's polemical purposes require the twin assumptions that land-owners do not save, and that corn can be stored only until the next harvest. The first assumption is historical nonsense, as it was precisely the landed aristocracy's investments in land and infrastructure improvement that developed England to the brink of the industrial revolution; the second is nonsense pure and simple. Ricardo needed both to "prove" that growth ends when and *because* the surplus accrues to the land-owners. The "growth" model thus reveals the class conflict it was artfully created to reveal: the conflict between the productive classes, the capitalists and the laborers, on the one hand, and the parasitic class, the landed aristocracy that neither works nor saves, on the other.

In the early nineteenth century Britain's rising industrial classes challenged the hegemony of the landed aristocracy that imposed the Corn Laws. Ricardo's "growth" model provided the industrial interest with an entire arsenal. It tied the continuation of growth to the liberalization of the grain trade, that would allow Britain to maintain its workers with foreign corn and thus overcome the limits set by its own supply of land; it delegitimized land rent, and *a fortiori* its increases due to the Corn Laws, as socially unnecessary; and it delegitimized the political ascendancy of the landed aristocracy, the parasitic, consuming class whose private interest--unlike that of the productive classes who work or save--conflicts with the common good.

There may be odd assumptions built into Ricardo's "growth" model, but they make perfect sense in light of its political, polemical purposes. The repeal of the Corn Laws--free trade--is clearly not "good for everybody" *within* Great Britain; but it is justified all the same, for those who stand to lose are *les ennemis du peuple*.

Ricardian growth, the ancien régime *economy, and trade*

In Ricardo's interpretation growth stops where it does (at *C2,L1*) because land-owners consume their income (*C2 - C1*) instead of saving it. In fact, of course, even the surplus that the land-owners consume is a wages-fund. They do not consume that grain themselves: it maintains a labor force (*L2 - L1*), but it is a labor force that produces goods and services for the aristocracy and not "corn." There is a strong odor of physiocracy to all this: at some point, a distinction must be made between wages-funds and "capital," or between "productive" and "unproductive" capital and "productive" and "unproductive" labor. A market economy grows to its "natural" (zero-surplus) limit if all labor is "productive" (and, with concentrated property, if corn is non-storable); it stops growing with a non-zero surplus if that surplus is not "productively" invested in the activity that reproduces "capital" (corn, the wages-fund).[31]

Ricardo's "growth" model is in fact a compact model of an *ancien régime* economy: the aristocracy extracts surplus as rents and taxes, and spends it on services and luxury goods supplied by artisans and merchants. Let us assume, for simplicity, that the land-owners extract only the competitive return to land, and that the workers earn and retain the competitive return to labor. In the short run, the wage can exceed subsistence; labor's income can be represented by a ray analogous to

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[31]The surplus is not "productively" invested if it maintains "unproductive" workers, or if (being storable) it is simply hoarded; but the economy and the labor force will be larger (*L2* instead of *L1*) if the surplus is consumed than if it is saved and hoarded. Dishoarding is expansionary, hoarding contractionary: there is a strong odor of Keynes, too, to all this.

the subsistence line, but with a slope equal to (and varying with) the marginal product of agricultural labor. Figure 2 still serves, but the illustrated ray now represents wage income, and, implicitly, another, flatter ray represents subsistence.[32] Let us further assume, again for simplicity, that wage-good and luxury-good employment map directly into rural, agricultural employment on the one hand, and urban, industrial employment on the other. The land-rent that accrues to the aristocracy maintains urban industry: the "corn" harvest ($C2$) is used, as Ricardo tells us, in part ($C1$) to maintain the labor force ($L1$) that (re)produces that harvest, in part ($C2 - C1$) to maintain the urban labor force ($L2 - L1$) that produces "cloth." As noted, Ricardo sees things as a physiocrat: the "corn" workers are "productive," the "cloth" workers are not.

We have a different take on things, and identify development with "industry" and cities. Ricardo models a closed economy, with a unique equilibrium: his concern is however with trade and protection, with an open economy that allows multiple equilibria, determined by trade policy.

To keep things simple, let us imagine a world of two regions with identical supplies of land and labor, agricultural technology, and (Ricardian) institutions; both are represented by the closed-economy equilibrium ($C2,L2$) depicted by Figure 2. If we superimpose two copies of Figure 2, and rotate one through 180 degrees, pivoting on ($C2,L2$), we obtain Figure 3: it is a conventional box diagram, and the sides of the box measure the overall total of whatever appears on the axes. The lower-left origin is here assigned to region $R1$, the upper-right to region $R2$. The assumption of a uniform real wage extends across the two regions; this avoids needless geometric clutter and complexity, with no effect at all on the logic of the model.

Figure 3 brings out Ricardo's multiple equilibria. Case 1 considers the two regions independent, and closed; each has its agriculture and the industry supported by its agricultural surplus, and the whole is no more than the sum of the parts. Case 2 keeps them independent, but opens them up to trade in manufactures only. We can imagine the product of, say, x linen-workers in $R1$ exchanging for the product of x wool-workers in $R2$: the consumption picture becomes more complex, but the production equilibrium remains that of case 1.

Case 3 keeps the regions open and trading, and allows the exchange of "cloth" for "corn." At the limit, the entire surplus of one region--say $R2$--is exported to $R1$, in exchange for $R1$'s manufactures. The production equilibrium is now in $L3$: the number of workers in $R2$ is the rural labor force alone ($L4 - L3$), consuming ($C4 - C3$), and the labor force in $R1$ is $L3$, nourished by the total product of $R1$ ($C2$) and the (extracted) surplus of $R2$ ($C3 - C2$). The artisans producing for the aristocracy in $R2$, and the cities in which they live, are in $R1$.

This third case is naturally interpreted as a case of "unequal trade" between the developed core and the underdeveloped periphery. As in the comparative-advantage model of trade, the sparsely populated region exports agricultural goods, the densely populated region exports industrial goods. But the logic is inverted: the land/labor ratio is not given but endogenous, and causality runs from developing industrial exports to having a dense, urbanized population rather than vice versa. The Netherlands were more densely populated than Poland because the cities that produced for the Polish aristocracy were in the Netherlands.

The "model of trade" assumes given resources, and the reduction of tariff barriers merely increases specialization; trade is everywhere the handmaiden of (Smithian) growth. Ricardo's "model of growth" lets resources vary, and illustrates a variety of alternative outcomes. Imagine that the freeing of Britain's trade moves the equilibrium from case 1 to case 3, with Britain as $R1$ and its trading partners as $R2$. Britain experiences trade-led growth, and becomes "the workshop of the world": not just by specializing, and turning foreign artisans into foreign peasants, but by expanding its resource-base, and turning foreign artisans into British factory workers. Britain's trading partners

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[32]Given the production curve $C(L1)$ and the total population $L2$, the labor-market equilibrium condition $C' = (C - C'L1)/(L2 - L1)$ determines the division of the product and of the labor force. If $L1$ is below the equilibrium level, for example, the agricultural wage C' exceeds the surplus per residual worker ($C - C'L1)/(L2 - L1$), generating an equilibrating movement of labor into agriculture.

correspondingly experience trade-led *decline*, the "development of underdevelopment": they lose their industrial sector, and their economy shrinks. Imagine that America's industrial tariff moves the equilibrium from case 3 to case 1, with America as *R2* and its trading partners as *R1*. The American economy benefits from the tariff, but not just because it thus exploits its monopoly position as an exporter of raw cotton: rather, the tariff attracts resources, and effectively moves to America the foreign industrial workers that with free trade its agricultural surplus maintains overseas.

It is Ricardo's open-economy "model of growth" with variable resources, not the familiar "model of trade" with given resources, that seems to capture what we mean by "decline": the transition from densely populated, urban, industrial core to sparsely populated, rural, agricultural periphery.

The wealth of nations and the relative mobility of commodities

The Ricardian growth model thus seems to capture the rise and fall of national economies; but developed only so far its implications seem rather meager. In Figure 3, the closed-economy case 1 and the open-economy core/periphery case 3 differ in the location of population and industrial production, but little else: in both regions the real wage is unchanged, and so is the luxury consumption (measured in "corn" or labor-units) of each region's aristocracy. Nobody loses; if anything, the landowners in the periphery gain because they now consume the manufactures of the core, which they clearly prefer to their own. Trade may not be good for everywhere, but it remains good, or at least not bad, for everyone: mercantilist success appears possible, but curiously uninteresting.

Further implications appear, however, if we recall that mercantilism aimed at capturing the international carrying trade as well as the world market for luxury goods; that transport costs were once very high, and especially so where the cargo had to be defended against bandits and pirates; and that as ships or wheeled vehicles shuttle back and forth transportation is produced jointly in both directions.

The relative prices of joint products are determined by relative demand. Per unit of weight or volume, "cloth" is worth much more than "corn," and with trade balanced in value terms the physical flow of "corn" is much greater than that of "cloth." Manufactures travel in ballast, practically free; primary products bear almost the full cost of the round trip, because they alone require the available capacity. The price of "cloth" is thus much the same everywhere; with traditional, costly transportation the price of "corn" in the periphery is a fraction of its price in the core.

The "growth" model here doubly undercuts Hume's quantity-theory case against mercantilism. The successful transition from periphery to core entails (Ricardian) economic growth; as the volume of transactions rises, the equilibrium stock of specie would increase even at unchanged prices. But prices also change. The "law of one price," correctly understood, says only that interlocal price differences cannot exceed the cost of the good's relocation. With high transport costs the equilibrium gold price of subsistence is necessarily much lower in the periphery: Hume's equilibrium requires a much *higher* price level in the core, and the transition from periphery to core entails an inflow of specie. The decline from core to periphery entails an outflow of specie, and gold prices fall; gold coins tend to become inconveniently valuable or inconveniently small, and are naturally replaced by silver. The currency of the periphery is Charlemagne's silver *libra*, the currency of the core is the gold *fiorino* or *ducato*.[33]

Figure 3 assumes an equal "corn" surplus in *R1* and *R2*; but if the gold price of "corn" in the former is *n* times its equivalent in the latter, so too is the gold rent. The aristocracy of the core is *n*

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[33]Indeed, if in the initial closed-economy equilibrium *R1* and *R2* are equally endowed with specie, *R2* will pay for its imports of manufactures (which we assume are preferred to the local product because of their superior quality) with specie until the local price levels drift far enough apart to sustain the export trade in agricultural goods. See S. Fenoaltea, "Europe in the African Mirror: The Slave Trade and the Rise of Feudalism," *Rivista di storia economica* 15 (1999), pp. 125-165.

times richer than that of the periphery: in terms of Figure 3 it consumes *n* times the manufactures because it consumes as manufactures the product of the entire labor force (*L2 - L1*) which it employs, while of the equivalent labor force (*L3 - L2*) serving the aristocracy of the periphery only a fraction (1/*n*) is engaged in manufacturing, and the residual (*n* - 1)/*n* provides international transportation. More generally, the core-aristocracy has *n* times the purchasing power of the periphery-aristocracy in all international markets of interest to both. It is the highest bidder for the world's best artists and artisans (and *grandes horizontales*, as noted by Carlo Cipolla, who was a man of the world); in time of war it can hire *n* times as many mercenary troops.[34] To become the core was to become powerful as well as rich: Colbert's subsidies to the *manufactures royales* were an investment in military power.

The wealth of nations and the relative mobility of labor

Figure 3 also assumes an equal real wage in the core and in the periphery. That equality might appear to be a long-run equilibrium condition, despite the presence of transport costs that limit factor-price convergence, on two alternative grounds. One is labor mobility: as labor moves to where the real wage is higher, interlocal differences in real wages are progressively eroded. The second is the "iron law of wages": in the Ricardian long run the real wage returns to subsistence, which is presumably everywhere the same.

Or perhaps not. As seen above, Boserup's Africa appears to have remained relatively underpopulated because of the harsh tropical disease environment; the latter prevented population from reaching the Ricardian subsistence equilibrium, or, equivalently, generated that equilibrium with a "subsistence" (zero-growth) real wage higher than that of the temperate zones. Within the temperate West, however, the disease environment was essentially common, and the simple assumption built into Figure 3 would appear to be appropriate to the Ricardian long run, even without labor mobility.

Africa also reminds us of the slave trade, a massive migration that paradoxically exacerbated the relative labor-scarcity of tropical Africa and relative labor-abundance of its Old-World destinations.[35] That ("Leontief") paradox is readily resolved, however, if we recall that Africa exported slaves to pay for its imports (of "cloth," in fact largely cloth), and that the structure of trade depends on relative mobility as well as relative prices. Ricardo's model of trade neglects transport costs, and ties trade only to (autarky) relative prices; but if transport costs are high relative mobility may well outweigh relative prices, and a region may "paradoxically" export goods that are locally dear.[36]

Thus the African slave trade. The coasts that lacked such relatively mobile potential exports as gold or ivory (or grains of pepper) could only export ordinary tropical goods--"corn"--or labor. Labor is more mobile than "corn," because the laborer in effect contains his entire future "corn"

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[34]C. M. Cipolla, *Before the Industrial Revolution: European Society and Economy, 1000-1700*, New York 1976, p. 84.

[35]In fact, labor was also relatively abundant in the Caribbean, which voluntary migrants avoided, and where subsistence was expensive (and largely imported).

[36]A ready example is provided by Argentina's exports, which before the coming of refrigerated ships included locally valuable hides, but not locally free meat, because hides were relatively mobile. Formally, we can define a "coefficient of mobility" m as the ratio of a good's price in the destination market P_d, net of the transport charge T, to the price itself: $m = (P_d - T)/P_d$. If transport costs are zero mobility is perfect and $m = 1$, if transport costs exhaust the delivered value of the good m is non-positive and the good is, in the case considered, non-tradable. Since transport costs depend on weight and distance, and not (or much less) on value, over a given distance m increases with P_d, i.e., it is greater for high-value goods than for low-value goods. The merchant invests a sum I, and seeks the highest return from the sale of his goods at destination. In the origin country (o) he can purchase $X_a = I/P_{oa}$ or $X_b = I/P_{ob}$; his net receipts in the destination country (d) are in the one case $X_a P_{da} m_a$ and in the other $X_b P_{db} m_b$. Good A is more profitable if $X_a P_{da} m_a > X_b P_{db} m_b$; but $X_a P_{oa} = X_b P_{ob} = I$, so A is more profitable if $(P_{ob}/P_{oa})m_a > (P_{db}/P_{da})m_b$. If $m_a > m_b$, A will be exported in preference to B even if, to a lesser extent, $(P_{ob}/P_{oa}) < (P_{db}/P_{da})$, i.e., even if the price of A in the origin country is relatively *high*.

surplus in one compact, transportation-saving package. Before the coming of the steamship transport costs exhausted the delivered value of African "corn," but not of African labor: African labor was exported even though in Africa it was relatively productive, and relatively dear.[37]

In terms of Figure 3 the African periphery paid for its "cloth" imports from the core by delivering "corn" to the core. It exported labor (future "corn") rather than (present) "corn" because the high cost of transporting "corn" meant that a given net increase in the supply of delivered "corn" was obtained at a *lower* cost in African labor-power by shipping Africans, who then produced "corn" within the core, than by shipping to the core "corn" produced by Africans in Africa. The market supported this efficient trade because slave prices were higher in the core than in the periphery, even though they were there lower with respect to the local price of "corn," because "corn" prices were much higher in the core: the slave trade was driven by a price-level gradient, and not, as our standard model of migration leads us to expect, by a productivity (real-wage, relative-scarcity) gradient.

This does not mean that our intuition that free and forced migrations respond to the same market forces is wrong. It is simply misplaced, for the free migrant who mimics the slave is the *temporary* migrant, not the selfish permanent migrant of our standard model.[38] Unlike the permanent free migrant but like the slave, the temporary migrant moves up a price-level gradient, and can move *down* a productivity gradient: he is attracted to the core by the higher *monetary* savings he can obtain, even with a lower real wage, and he repatriates those savings to the periphery, where their purchasing power is altogether higher. Unlike the permanent free migrant but like the slave, the temporary migrant is akin to a commodity export: he yields foreign exchange, pays for imports, sustains the real exchange rate (and reduces alternative exports). The liberalization of trade can therefore *increase* his incentive to migrate, even in the presence of factor-price convergence, by increasing the periphery's commodity imports; Eastern Europe and Africa used to export slaves, they now export temporary migrants. Unlike the permanent free migrant but like the slave, too, the temporary migrant will tend to originate in areas burdened by high transport costs, which reinforce his relative mobility; that is why the Swiss Guards are Swiss. Temporary migration is like the slave trade, and both are better understood through our standard model of trade, expanded to recognize relative mobility on a par with relative prices (comparative advantages), than through our model of (free, permanent, selfish) migration.[39]

The equal real wages of Figure 3 thus appears to represent a Ricardian long-run equilibrium only with *immobile* labor (and a similar disease environment). With mobile labor, and labor more mobile than "corn," it will pay to move labor rather than corn until the resulting reduction in transport costs is fully offset by the resulting increase in corn production costs. In equilibrium, therefore, agriculture is more intensive in the core than in the periphery: in the core the productivity of land is higher, that of agricultural labor *lower*, than in the periphery.

This mobile-labor equilibrium is illustrated in Figure 4, which reproduces all the elements of Figure 3. The distribution of the world's workers has adjusted to the point that *R2* can profitably

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[37]The value of a slave (s) is $P_s = kP_c(w - C)$, where k is a coefficient of capitalization (that depends on the slave's expected working life, and on the interest rate), P_c is the price of "corn," w is the real wage (the marginal "corn" product of labor), and C is the slave's subsistence, also in "corn." Neglecting differences in k, if only because migration tended to reduce expected lives, the relative price of a slave (P_s/P_c) depends on w. Slave and "corn" exports from origin o to destination d are equally profitable only if $(P_{oc}/P_{os})m_s = (P_{dc}/P_{ds})m_c$; but slaves are more mobile than "corn" ($m_s > m_c$), and indifference accordingly requires $(P_{oc}/P_{os}) < (P_{dc}/P_{ds})$, that is, $w_o > w_d$.

[38]The "unselfish" permanent free migrant, who is the source of remittances, is an intermediate case; if so altruistic as to live at subsistence and remit his entire surplus he is the exact equivalent of a slave. To avoid burdening the text, unselfish free permanent migrants will henceforth be ignored.

[39]Anthropometric measures suggest that the Irish in nineteenth-century England also migrated to a lower-real-wage destination, exactly like African slaves; with the expanded model of trade and migration, that paradox too is resolved.

export *both* "corn" and labor to *R1*.[40] In the core the agricultural labor force is *L1B* > *L1*, the total labor force *L3B* > *L3*; in *R2* the (entirely agricultural) labor force is (*L4 - L3B*) < (*L4 - L3*). The marginal product of labor--the real wage--is accordingly lower in *R1*. This failure to equalize marginal products does not signify inefficiency, however, as it permits a saving in transportation, in the number the non-agricultural workers in *R1* (and in the world) who produce intermediate goods and services rather than final consumables.[41]

The broken line off the diagonal illustrates the consumption of "corn". Its slope corresponds to average "corn" consumption per worker, which in the core is even less than the relatively low marginal product of labor, and in the periphery even more than the relatively high marginal product of labor: in *R1* the difference reflects either the remitted savings of *R2*'s migrant workers, which supplement the earnings of the free labor force in *R2*, or the difference between the imported slaves' marginal product and their subsistence, which is remitted to *R2* in payment for the slaves, and invested by the local landowners in slave-breeding for export.[42] In the Ricardian long run population is constant in both regions, but only because of the continuing flow of workers from the periphery to the core; in the core itself, the native population is not self-sustaining.

Mercantilist thought tied the wealth of nations to the size and poverty of the population. Granting the classist reduction of "the nation" to the elite, Ricardo's growth model illuminates the logic of that belief on a variety of levels.[43] Trivially, in the closed economy considered by Figure 2 exogenous demographic growth reduces wages and raises land rents (with a heightened real effect, as elite consumption is labor-intensive, and workers' consumption land-intensive). Less trivially, in the universe of open economies considered by Figures 3 and 4 the relative mobility of commodities implies that the wealth of the aristocracy is greater in the core than in the periphery, and the relative mobility of labor implies that real wages are lower in the densely populated core than in the periphery. But the deepest key to the mercantilists' insight may be in the transition between the two equilibria. A higher closed-economy population density was associated with an earlier transition to agriculture, a longer history of exploitation, an older civilization--and greater refinement in the production of luxuries. When trade linked the various local economies the more densely populated regions were those whose manufactures were desired by elites everywhere, and who therefore became the core. Because they had the largest population, the poorest workers, they became the richest, most powerful "nations" in the world.

Urbanization, productivity and the wealth of nations

Within a national economy, the urban center is the core, the countryside is the periphery; space and transport costs imply that agriculture is more intensive near the city than further away.

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[40]Above, footnote 37.

[41]The number of transport workers is in proportion to the capacity needed to move "corn," and corn shipments are (*C3B - C2B*) < (*C3 - C2*).

[42]The constant slope of the consumption line in *R1* implicitly assumes that the foreign slaves or temporary migrants are evenly distributed across the two sectors. One could assume that these were concentrated in agriculture, in which case the consumption line would be even flatter out to *L1B*, and then parallel to the slope of the production curve at the production point; but the complication seems pointless. The remittances to *R2* by the free migrants or the slave-importers pay for, and take the form of, manufactures exported from *R1*.

[43]The mercantilist "nation" excluded the common people, which like slaves or cattle were considered mere means of production. Our per-capita measures, which show poverty where they saw wealth, reflect our post-Enlightenment humanism; if a future enlightenment converts us to mammalism the denominator of the per-capita measures will be broadened even more, and New Zealand's vast sheep herds will show poverty where we now see wealth.

From this perspective, the above results are perfectly familiar; but the analysis sheds new light on some old questions.

Until comparatively recently, urban populations were not self-sustaining. The traditional assumption is that in the cities poor sanitation raised the death rate above the birth rate; the resulting shortage of urban labor induced the steady inflow of migrants that was necessary if the city was to survive at all. The rural migrants were attracted by a higher real wage; the measures that suggest otherwise are explained away by assuming non-measured urban consumption (the "bright city lights").

Both the urban-morbidity assumption and the urban-amenities assumption are *praeter necessitatem*. If labor is mobile the rate of population growth is systematically lower in the core, and if national population growth is small, the urban population is not self-sustaining. That "corn" is less mobile than "cloth" implies that life is dearer, and the money wage higher, in the city; that labor is also more mobile than "corn" implies that the city attracts workers who consume less than they earn and remit their savings, even if, and therefore until, the urban real wage is relatively low. Urban residence pays only so long as one is working, and thus tends to be a life-cycle phenomenon: one is raised in the countryside, works in the city, and retires to the countryside. The mechanism still operates: middle-class Americans, who can afford to raise their children where they work, then retire away from their (sub)urban home; Third-World migrants can afford fewer luxuries, and their children are raised back home by their grand-parents. Prior to the demographic transition, of course, retirees were few and far between. What would have been the rural deaths of the old appear as the urban deaths of the middle-aged, masking the final part of the life-cycle; non-workers were overwhelmingly children, but the same market forces kept them disproportionately in the periphery, and flowing to the core when they reached working age.

Within the international economy, we naturally assume that per-capita output is higher in the "developed" core: a long literature infers productivity from urbanization rates, and even Angus Maddison's numerical estimates do exactly that.[44] The underlying intuition seems rooted in our Whig faith, in the belief that cities appeared when technical progress finally lifted productivity to the point where the labor of ordinary people at last yielded a surplus over their own bare subsistence; but as seen above it is at least even money that cities actually appeared when population pressure and declining productivity allowed the appropriation of the (reduced) surplus by an idle ruling class.

In fact, the urban share of the population corresponds to the share of the surplus over subsistence only if that entire surplus is consumed as urban goods; and that is most unlikely, for a multitude of reasons. If the social shares of the harvest correspond to the competitive factor shares, as assumed above, short of the Ricardian long run the agricultural labor force retains more than its bare subsistence, and consumes part of the surplus; but peasants typically consume surplus not as urban luxuries but as leisure and low-quality manufactures that they produce themselves. Only the surplus that accrues to the elites is spent on urban goods; and even if all of it is, as also assumed above, the relationship between urbanization and productivity is moot. As population grows and productivity declines, rents rise and wages fall; the urban share changes by assumption as factor shares do, but it can increase or decrease, depending on the elasticity of substitution between land and labor.[45] Paul Hohenberg and Lynn Lees analyze urbanization rates in medieval and modern Europe in these terms,

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[44]A. Maddison, *The World Economy: A Millennial Perspective*, Paris, 2001.

[45]With a unit elasticity of substitution (a Cobb-Douglas production function) factor shares remain constant, and do not vary as population grows. With high substitutability the share of rent declines; with perfect substitutability and constant returns to scale the production curve flattens to a straight line with a positive intercept ($C = C^* + aL1$), the real wage is constant, and so is the total rent of land (equal to C^*, which clearly declines as a fraction of C as population grows and output increases). With low substitutability as population grows the marginal product of labor falls faster than its average product, and the share of rent increases: with $C = aL1 - bL1^2$, for example, the average product of labor is $(C/L1) = (a - bL1)$ and the marginal product is $w = (a - 2bL1) = (C/L1) - bL1$; the rent share is $(C - wL1)/C = bL1^2/C = bL1^2/(aL1 - bL1^2)$, with a derivative with respect to L1 equal to $abL1^2/C^2 > 0$.

and implictly assume low substitutability; they trace rising urban shares to exogenous population growth, and thus associate them with falling productivity.[46]

The elites of course extracted surplus as taxes as well as rents; but this is of little comfort, as the workers' share of the surplus cannot be considered uniformly negligible, or even merely uniform. Even ignoring the occasional peasant republics, the State was not everywhere the executive committee of a predatory ruling class, and as recalled above the Crown might be the peasants' ally against the aristocracy.[47] Even if the State was entirely predatory, moreover, the extraction of the entire surplus over subsistence was only its objective; the extent to which it actually approached that limit varied over time and across space, for it depended, as John Pettengill reminded us, on the technology of violence.[48]

Furthermore, if more is needed, the aristocracy itself does not consume only urban luxury goods. It may consume luxury goods that are in fact largely rural, like the textiles of modern Europe's "proto-industry." It consumes services in varying proportions, depending for example on whether or not it retains a private force of men-at-arms, and these services are themselves produced where the aristocracy chooses to live: the *consuming* city is the aristocracy's capital, and its weight clearly depends on the aristocracy's preferences as well as on its share of the surplus.[49] The weight of the *producing* city also varies, *ceteris paribus*, with relative prices: urban growth in medieval Europe seems tied to the decline of anarchy not because productivity therefore increased, but because the reduction in banditry and piracy drastically reduced the barriers to trade and specialization.

Productivity and the share of the surplus over subsistence constrain urbanization rates, but the constraint is rarely binding. Actual urbanization rates clearly reflect not the extent of that surplus but its distribution across classes, and its allocation among goods, services, and leisure. If examined at all carefully the link between urbanization and productivity dissolves like the grin of the Cheshire cat: it is moonshine.

Urbanization and productivity in the core and the periphery

Moonshine is heady stuff, and the above assumption that the rent of land maintains the urban-industrial labor force takes a good swig. Thus fortified, we can reconsider urbanization and productivity in the core and the periphery; and to avoid here unnecessary complications we can go right back to Figure 3. The explicit variables are only corn and labor, and all production is measured, democratically, in the wage good. The real wage and agricultural productivity are assumed equal in the core and the periphery. The marginal real product of labor is everywhere equal, but the *average* real product is not. In both regions, the per-capita product (per-capita consumption) is the sum of the real wage (which is also the corn-product equivalent of the core's urban output per worker), plus the per-capita rent; and since the aggregate rent is the same in the two regions the per-capita rent and total product are clearly higher where the total population is lower. The core has a higher rate of urbanization, but even with a good swig of moonshine it has a lower product per head.

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[46]P. M. Hohenberg and L. H. Lees, *The Making of Urban Europe, 1000-1950*, Cambridge, MA, 1985.

[47]Europe's loss of population seems to have led to a Domaresque increase in servitude in the high Middle Ages, and to a reduction in servitude after the Black Death; the difference seems due to the greater strength of higher authority in the later period, which protected free peasants from enserfment. See S. Fenoaltea, "The Rise and Fall of a Theoretical Model: The Manorial System," *Journal of Economic History* 35 (1975), pp. 386-409.

[48]J. Pettengill, "The Impact of Military Technology on the Income Distribution," *Journal of Interdisciplinary History* 10, 1979-80, pp. 201-226.

[49]Cemeteries embody the preferred residential pattern, and suggest systematic differences in tastes: Italians house their dead in little walled cities, Anglo-Saxons plant them in landscaped countryside.

One is tempted to trace this result to Ricardo's physiocratic notion that non-agricultural labor is "unproductive," but its logic is altogether simpler. Agriculture is land-intensive, and its product remunerates both land and labor; traditional handicrafts are labor-intensive, and remunerate (little more than) labor alone. A higher product *per worker* in agriculture is *in ipsis rebus*: if we divide the total number of hooves in the herd by the number of sheep we will get exactly four if the herd includes only sheep, and inevitably more than four if it includes a proportion of goats.

If commodity transport costs are neglected (or negligible) the analysis ends here. Historically, they were very heavy; they drove apart the relative price of "corn" and "cloth" in the core and the periphery, and generated the relative wealth of the core aristocracy.

Different relative prices generate an index-number problem, which can here be exploited. To keep things simple, we can normalize to one, in value terms, the core's units of labor, of "corn," and of "cloth." If we measure everybody's product not in wage-goods but in luxuries, the result depends on the prices we use. If we use the core's relative prices, Figure 3 is of course unchanged, save for the relabeling of the "corn" axis to read "cloth"; but if we use the periphery's relative prices a unit of "corn" counts not as (1/1) but as (1/n) units of "cloth." The per-capita "corn" product is higher in the periphery than in the core, but not even close to n times higher, and the measured per-capita product is (finally) significantly higher in the relatively urbanized core: enough so as to overwhelm the real-wage difference brought out by Figure 4, which can accordingly be left aside.

Maddison's early numbers are often inferred from urbanization rates, but theoretically measure the per-capita product in local currency, deflated by a Geary-Khamis purchasing-power-parity index. In the present context this index naturally gives considerable weight to the periphery's imported luxuries at the periphery's relative prices; enough so, once again, that the measured product is plausibly higher in the core, despite its lower real wages in mobile-labor equilibrium.

But that measured product must be interpreted with considerable care. Precisely because it gives a large weight to imternationally traded luxuries, in a world of high transport costs it inevitably favors the areas that produce them: if today's rich consumers in the West spent their surplus over subsistence on delicious udder-fresh yak milk expensively rocketed over from its Asian source, the measured product of the average Tibetan would come out very high indeed.

A higher Geary-Khamis-deflated per-capita product clearly does not imply, as we are wont to assume, that "the people" were better off where the average product was higher. What the measure actually captures is the extent to which the *aristocracy* was better off, though the masses were not, in the core than in the periphery. As a per-capita measure in any but a crude statistical sense it fits the mercantilist identification of "the nation" with the narrow elite far better than our own broader sense of society.

Moreover, Geary-Khamis deflation eliminates the negative association of per-capita product and "development" (urbanization)--which appears paradoxical only because of our Whig preconceptions--at a certain cost. In the closed-economy case 1 interpretation of Figure 3, the procedure yields equal per-capita products in the two regions (even if the local "cloth" products are distinguished, in which case "corn" alone is in the common basket used to calculate the deflator). In the open-economy case 3 interpretation, recognizing transport costs, Geary-Khamis deflation yields a per-capita product in the periphery that is not only lower than that of the core, but lower than its own in case 1.[50] In the periphery real wages are unchanged, and wage-earners less numerous; it is the aristocracy that bears the burden of the measured decline, that is impoverished by trade. But the aristocracy of the periphery clearly prefers a small quantity of imported "cloth" (bundled with a lot of transportation) to a much larger quantity of domestic "cloth"; by our usual revealed-preference canons it is not impoverished but enriched.

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[50]In passing from case 1 to case 3 the deflated per-capita product of the core cannot increase: "corn" consumption per capita is unchanged, while elite "cloth" consumption is unchanged in the aggregate and correspondingly reduced in per capita terms.

One can of course defend the statistical result by abandoning the unchanged-tastes assumption of the revealed-preference argument. In a Veblenesque world the aristocracy of *R2* was satisfied with domestic "cloth," because it knew no other; upon discovering the cloth of *R1* it suddenly felt dowdy and provincial, and its welfare was truly reduced by trade. Perhaps so; but this successful operation may kill the patient, for status games are zero-sum. Veblen rescues the numbers that are inspired by the Whig interpretation only at the cost of severing the link between production and welfare: the numbers are "right, " but meaningless.

Maddison's numbers are the result of an admirable research effort, but to remain untroubled by his use of urbanization as an index of productivity one must accept the Whig faith--and quell one's residual doubts with a dose of something strong. It is not at all clear that they measure what we would want them to when we examine historical cases of decline.

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Figure 1
The interpretation of the evolution of agriculture

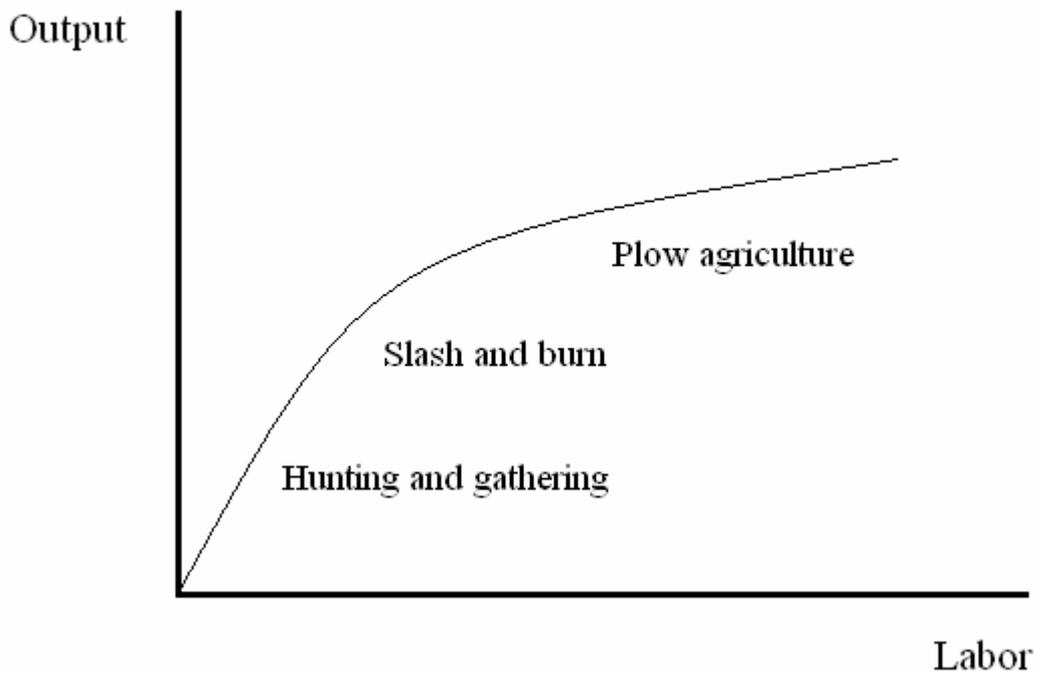(a) The standard view
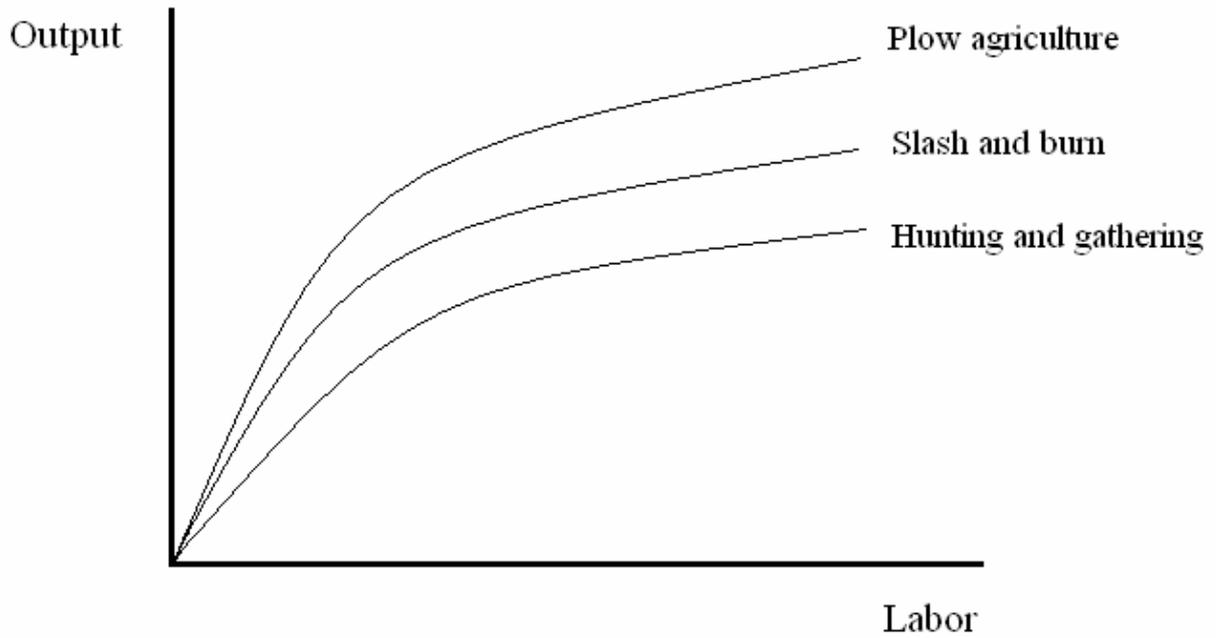
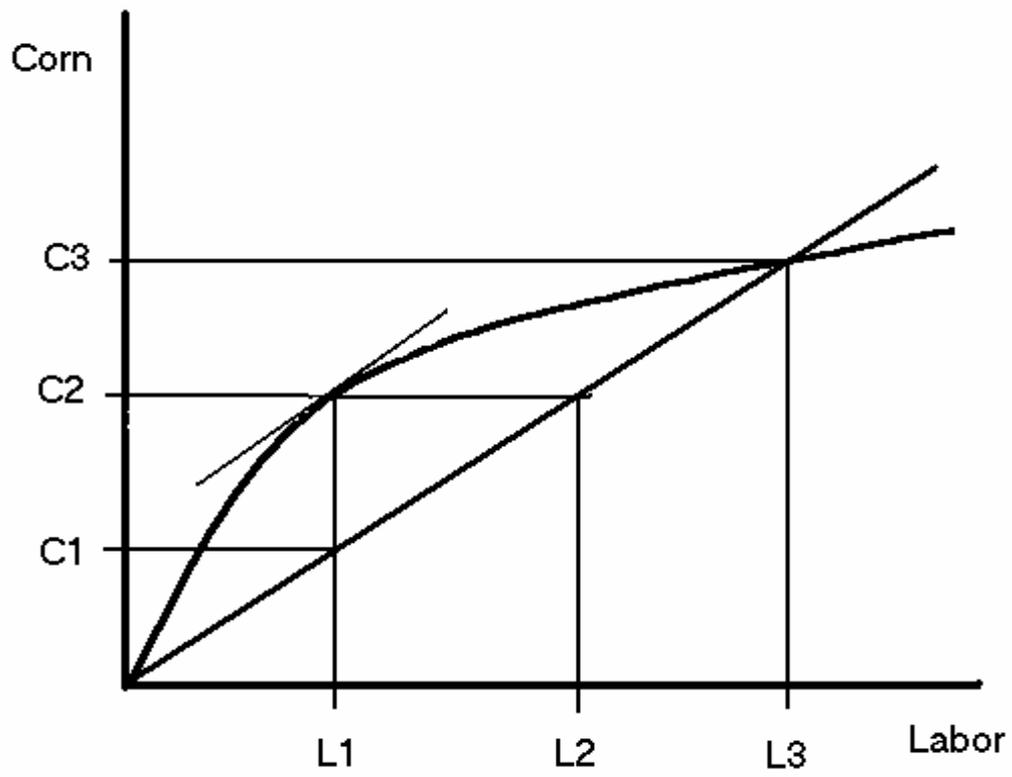(b) The revised view

Figure 2
Ricardo's "growth" model

Figure 3
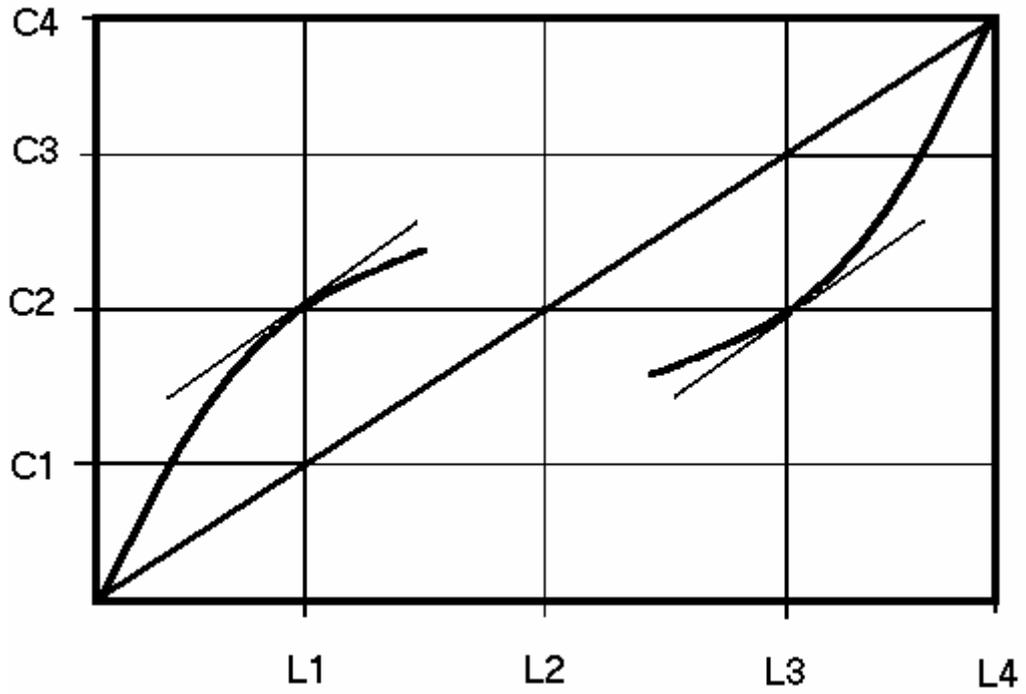Ricardo's "growth" model and interregional trade

Figure 4
Ricardo's "growth" model and interregional trade:
the long-run equilibrium