"THE INDIVIDUAL, THE MARKET AND THE INDUSTRIAL DIVISION OF LABOR"

AXEL LEIJONHUFVUD

in Carlo Mongardini, ed., **L'INDIVIDUO E IL MERCATO**, Roma: BULZONI EDITORE, 1995, pp. 61-78.

[Page numbers of original in brackets]

Bodo and M. Baudot

As a point of departure, contrast two Europeans 1000 years apart in time. I intend the two to be in some measure 'typical', but will make no elaborate Weberian claim to present you with 'ideal types'. One of the two, in fact, is or was an actual individual; the other, admittedly, is a figment of my imagination. The real person is Bodo, a 10th century serf of the abbey of St. Germain des Pres, about whose life and economic circumstances the British historian, Eileen Power, unearthed an amazing amount of concrete information in the archives[1]. To match him, I have invented a M. Baudot, whom I imagine to be a `representative Parisian' presently residing in St. Germain.

In comparison with his modern day counterpart, Bodo had short life expectancy, was unfree and uneducated, and lived a life of unceasing hard physical labor. His typical supper would make M. Baudot shudder. Bodo was poor. The two are separated by a thousand years of economic development. The question to be discussed is how this process of economic development has changed the place of the individual in society. I will approach the question, as you would expect me to, from a narrowly economic perspective.

We may think of Bodo and M. Baudot as located in economic networks of cooperation. Whether we look at them as producers or as consumers, M. Baudot's network would look incredibly large, complex and elaborate compared to Bodo's. Relatively few people cooperated, directly or indirectly,[62] with Bodo in producing his output and, similarly, few people cooperated in producing his real income, that is, for his consumption. Moreover, Bodo's network was relatively permanent. It tied him to the *same* people from day to day, year to year. This contrasts to the flexibility of the network sustaining M. Baudot. The people who have contributed to the production of what he consumes today are likely to be a rather different set from those who happened to supply him yesterday - even taking the regularity of the Frenchman's daily routine into account.

Imagine a list of all the individuals that contributed some *value added* to

[1] Power (1963).

Bodo's consumption over a year of his life. At the top of the list, we would find Bodo himself - or else his wife, Ermentrude - showing that he (or she) produced by his own labor a very large proportion of his consumption. When we have added in all the family members (Wido, Gerbert, and Hildegard), we certainly have more than 50% of total value added accounted for. When the members of his village community are taken into account, we will already be quite close to 100 percent.

For added concreteness, imagine mapping the network of cooperating individuals supplying Bodo, putting them in relationship to him in space and in time. We might draw the width of the connecting lines proportional to the weight of the individual's contribution to the total value added towards Bodo's consumption. The map would show almost all of the contributions to his consumption basket to be made by people very close to him in space. A little salt, say, from the Bay of Biscayne might be the extent of his dependence on inter-regional trade. Our imaginary map might be a little bit more impressive on the average in its temporal depth than in its spatial extent. Although most of the capital used in providing for Bodo's consumption should be attributed to maintenance activities of the relatively recent past, proper accounting might still acknowledge the previous generations that cleared the fields, built his house, and made some of his implements.

These maps would tell us (if we did not realize it already) that Bodo *knew* most of the contemporaries that helped produce for his consumption and that he *remembered* many of those who contributed to it in the past.

Doing such maps for M. Baudot simply boggles the imagination. All the resources of Gosplan (back in Breshnev's time) might not suffice to track down and organize the information for this single individual. But we know, of course, that the spatial map would be world-wide and that the temporal one would, to use a term from the Austrian school of economics, show “greater roundaboutness” of the production processes sustaining his consumption. M. Baudot constantly draws on the efforts of people halfway around the world from him, whom he has never met, and of whose existence [63] he is hardly aware. On the other hand, while he may or may not know his immediate neighbours, he is not economically dependent on them in any significant way.

For the purposes of this paper, economic development is conceived of as the evolution of increasingly more complex structures of the division of labor[2]. This growing complexity of the networks of cooperation is accompanied by the increasing functional differentiation of the men and women that are its elements. M. Baudot may feel that modern life is complicated and, in weak moments, yearn for the simplicities of a bucolic past. But he has little cause for complaint. Whatever his job, he is not competent to replace Bodo. He is functionally too specialized and simply does not have Bodo's *range* of skills.

What drives this evolution is simply that greater functional differentiation will produce a higher standard of living (in all sorts of dimensions) *provided* it is

[2] Organismic analogies have to be handled with great care, I know, but you may think of our imaginary maps as “neurological tissue-samples” drawn from two different economies. A neurologist consultant might judge the 10th century sample to be drawn from a more primitive organism than the other one.

possible to sustain the corresponding patterns of cooperation across more people, across wider space, across longer spans of time. The proviso is, of course, all-important. Normally, at the margin of accustomed practices and routines, the prospective benefits to increased division of labor probably constitute a rather weak force[3]. It is easily offset by political risks, by monetary instability, by protectionism - or simple by high costs of communication and transportation limiting the "Extent of the Market" on which, as we know, the Division of Labour depends. Occasionally, technologically based innovations will raise the marginal incentive dramatically in some parts of the system, which is why we so often tell the story of economic development as a series of invention and innovation episodes. But the weak evolutionary force is there all the time. When we take a 1000-year time-span, its importance becomes obvious.

Reciprocity and Redistribution

Using the terminology of anthropologists (e.g., Polanyi), Bodo's life was governed in the main by fixed redistributive relations; reciprocity relations [64] may have been of some importance within his village; exchange played hardly any role at all. (Actually, the nearness to Paris makes Bodo unrepresentative. He had seen the Big City!) He occupied a node in a network of fixed rights and obligations linking persons of different status in the feudal hierarchy by personal bonds of dominance and subjugation. The transactions taking place along these personal bonds were obligatory, rather than voluntary. In return for his obligations to perform or deliver weekwork, boonwork, *corvée,* and *banalités,* Bodo enjoyed certain reciprocal usufruct rights. But no equal value condition linked his rights to his obligations. In the feudal rent, land rent in our sense and taxes were inextricably mixed.

Similarly, wealth and power would not be conceptually distinct categories to a feudal lord or abbot. Wealth in this context is not to be thought of as generalized purchasing power over all things sold in markets. For rural society, land and labor power were the sources of wealth, but they were not objects of (freely alienable) private property. Wealth consisted rather of the totality of your rights to require specific persons to do specific things.

The list of specific things demanded of Bodo was such as to govern his life, day by day, through the cycle of seasons. The waking hours during the year when Bodo could choose at will what to do were few. It may be worth noting that this was not necessarily because his status was that of a serf. The obligatory nature of most work in a village was in large part technologically determined. The cultivation methods and corresponding collective organization of work determined what most people were to do on any given day of the year. The distinguished classical historian Martin P:son-Nilsson made a hobby of the 18th century village ordinances adopted by free peasants in his (and my) home

[3] Or GATT negotiations would not be so difficult! In abnormal situations, when the task is to restore patterns of cooperation disrupted, for example, by war, the perceived incentives can of course be very large.

province of Sweden. His characterization of the working life of the peasant -- who, for present purposes, we may call Bo -- was that “once he stepped over the threshold of his home, he was no longer a free man”. Now, there is some question in my mind whether we should picture Bo as stepping out or coming in, but on the former interpretation at least, my point is borne out. The fact that the rights and obligations governing life in the villages were defined in such a way as to be, in effect, conditional on the methods of production, made these communities technologically very conservative[4]. Outside fairly narrow bounds, methods of cultivation could not be changed without infringing on somebody's usufruct rights. Innovation, therefore, could not be a matter of individual initiative. To bring about a change in land-use required a collective [65] decision and the negotiation of side-payments[5]. This illustrates a more general point: in economies governed by reciprocity and redistribution, the opportunity to innovate is not decentralized and the system tends to be technologically inflexible. Having found one sustainable solution to the division of labor, the medieval rural economy tended to propagate itself over time by replication rather than by evolution.

Markets and Money

It will not suffice to say that all this is changed through exchange replacing redistributive arrangements. It is true that exchange introduces the important notion of transactions that are voluntary on both sides and on terms acceptable to both parties. But one has to be more specific. To many people, barter is the prototypical form of exchange. Yet, it seems, barter is present on the margin of all societies while (to my knowledge) not being of more than marginal significance in any. Introducing barter exchange into Bodo's environment will not put it on the evolutionary track towards an ever more complex division of labor. For that we need *monetary exchange* and also *anonymous markets.*

Every society must of necessity have some social mechanism that controls the amount of resources that individual members can appropriate and ties this amount to the respective members' contribution to that society, according to whatever framework of rights and obligations is in force. In Bodo's case, this control is enforced on a bilateral basis. The bailiff or steward of the abbey will hold him accountable for the obligations on which his rights in the community depend. For it to be feasible to change over from this redistributive economy to an entirely voluntary one -- wherein the typical agent chooses what to do and for whom and, quite independently, what to acquire and from whom -- requires an accounting system encompassing the entire society. *Money will* do.

We might imagine a development in which the relationship between lord and serf changed into a barter trade between landlord and tenant, freeing Bodo to bargain for himself and, perhaps, to improve the unequal terms of his position. But neither *mezzadria* in Italy, nor sharecropping in America [66] has been rated

---

[4] This was true also of guild-regulated artisanal manufacturing.

[5] In a so-called “free market system”, successful innovators do not have to compensate those who lose from technical change. The comparative implications for the overall rate of innovation are obvious.

favorably by economic and social historians as an institution liberating the peasantry. One cannot claim for the use of money that it will free the working man from taxes imposed by the powerful, but it will liberate him from the tyranny of the *fixed bilateral* relationship.

The great American institutionalist, Wesley C. Mitchell, perceptively stressed the "role of money" rather than the "role of exchange" in the great transformation of Western society [6]:

> "When money is introduced into the dealings of men, it enlarges their freedom. For example, when a personal service is commuted into a money payment, the servitor has a wider choice in the use of his energy and the lord a wider choice in the use of his income. By virtue of its generalized purchasing power, money emancipates its users from numberless restrictions upon what they do and what they get. As a society learns to use money confidently, it gradually abandons restrictions upon the places people shall live, the prices they shall charge, and the goods they can buy. Its citizens have both a formal and a genuine freedom in these respects wider than is possible under an organization in which services and commodities are bartered. Adam Smith's 'obvious and simple system of natural liberty' seems obvious and natural only to denizens of a money economy".

One more point remains to be made in this context, however. It is possible to introduce money and yet not evolve the kind of market that we tend to take for granted. The American anthropologist Clifford Geertz made a thorough study of the organization of and the transactions in a Moroccan bazaar[7]. He used to delight in saying that economists could not explain anything about this bazaar economy. While I cannot pretend to exhaust the limitations of economics that Geertz had in mind, one of them might be sketched as follows. Suppose we recorded a large sample of exchanges in the *suq* over some period of time. The economist would find that his supply-and-demand model could explain only a quite minor proportion of the total variance in the terms of exchange in the sample. The anthropologist (or sociologist) would do far better because he would approach the study with the (correct) understanding that it was vital in these transactions to know the identities of the parties and their respective places [67] in a complex social matrix of religious, sectarian, ethnic, tribe, clan, and status affiliations. Money is widely used in these bazaar exchanges. But for all the rivalrous higgling and haggling that characterizes the bazaar, it is ruled by a logic of reciprocity [8], not by that of competitive market exchange:

The English pioneer of neoclassical economics, H. Stanley Jevons, postulated a "Law of Indifference" to justify his treatment of price in a given market as unique. (Having just one price in a market, obviously,. makes conveying the logic

---

[6] Mitchell (1944), p. 200.

[7] Geertz *(1979)*.

[8] Reciprocity relations in the *suq* were not fixed, but fluid, a matter of tenous trust, rather than unalterable ascriptive status. Yet the result is an economic organization very different from a network of anonymous markets

of supply-and-demand analysis a great deal easier). By this “Law”, Jevons meant simply that if all sellers tried to get the highest price possible while all buyers looked for the best bargain, the resulting market process will converge to a unique price. In economics today, this is regarded as a little technical assumption that hardly needs to be mentioned. It is more interesting if we take “indifference” in a sociological sense. Then, the “Law” means that the identities and affiliations of the parties to a market transaction are irrelevant to the terms of it. No nepotism, no *tangenti,* no nothing!

This fits the Moroccan bazaar not at all. The interesting thing is that it fits Western markets fairly well all the way back to the Medieval revival of trade. Medieval regulation of trade went to great lengths to ensure that markets would function so that all parties would, as far as possible, face the same price. In particular, authorities tried to ensure “thick” markets, so that prospective buyers would not find themselves facing a monopolist, or sellers a monopsonist. They did so by concentrating exchange in time and in space, by establishing fairs and, locally, by making trade legal only on certain days and in certain places. The whole panoply of city regulations against forestalling and engrossing, etc. had this aim. And, of course, the Church's *just price* doctrine provided the ideology that gave coherence to this welter of regulations across Europe.

The main objective of these Medieval regulations may have been fairness. But the “thick” market also serves economic efficiency. A market is a device for people to compare the values that they individually put on the thing traded. The greater the number of market participants, the higher is the probability that the good will move to its highest valued use in the community in question[9]. This is the allocational efficiency of competitive [68] exchange as a mode of economic organization on which static price theory concentrates. This branch of economics takes technology as given, however. From an economic historical perspective, the point to make is rather different. As monetary exchange across anonymous markets expands and the spheres of economic life regulated by reciprocity and redistribution shrinks, the evolutionary potential of the system increases. This mode of economic organization multiplies the number of nodes in the network of economic cooperation at which individual initiative can be taken to *change* “how things are done”. It sets the stage for the increasingly complex division of labor.

When exchange encroaches in this manner on interactions among individuals in society that were previously governed by reciprocity or redistribution, the corresponding social roles and affiliations lose their economic rationale. Their social importance is thereby weakened. In cases where the basic rationale turns out to have been economic, they will erode away until, eventually, the relationships to which they gave rise are no longer recognized. The dimensionality of the social matrix is, in effect, reduced. It is simplified in a direction that is often egalitarian or democratic, but the social structure becomes less variegated[10] just as economic structures become more complex.

As more and more relationships in society become governed by commercial

[9] The usual caveat had better be mentioned: “...in the absence of externalities”.

[10] Cf. PETER SELLERS, “Lord Badminton's Memoirs” .

contract or come to be understood, by analogy, in contractual terms, recognized *obligations* become fewer and fewer and the very concept of obligation begins to lose meaning. The elimination of obligations, not undertaken as part of a calculated and freely chosen bargain, is at the core of the "increased freedom" that the economist claims for the spread of monetary exchange, as my quote from Mitchell makes clear. But without obligations to God or man, the individual also finds himself in a world where nothing is permanent but where all human relationships are subject to cost/benefit recalculation by either party at any time.

The Industrial Division of Labor

The increased functional differentiation in the economy that comes with industrialization is different in kind from that which is made possible by the coordination of activities through monetary exchange. Although eventually [69] it multiplies markets as well as specialized productive functions, it is on the division of labor *within,* rather than between, manufacturing enterprises that we should focus in the first instance to understand this difference in kind. This industrial division of labor changes the social position of the individuals in ways that have nothing *per se* to do with the spread of exchange at the expense of reciprocity or redistributive relationships in society [11].

Adam Smith saw only the very beginning of the replacement by factories of the guild-regulated system of artisanal manufacture that still dominated in his day. But as everyone who has ever opened the *Wealth of Nations* (to p. 1) knows, the building of that theoretical edifice starts from the account of the division of labor in a pin-making factory that he apparently found in the *Encyclopédie*[12]*.* In artisanal manufacture, let us suppose, each artisan performs an entire sequence of operations required to produce a marketable commodity. Smith described how production could be reorganized so as greatly to increase the productivity of labor, even though the tools and technology utilised were not changed. The way to do this is to "divide the labor", making each worker specialize in one task in the sequence of tasks that constitute the production process. It will be convenient to call this "vertical" division of labor[13]. For a variety of reasons, this reorganization will extract greater output from a given workforce. The organization of work in the factory that brings this about is more complex than in the artisanal shop in the straightforward sense that more people cooperate in the production of any given unit of output.

Two observations about the vertical division of labor are important at this stage. First, it tends to create complementarily between the inputs at various stages. Although an anachronistic model for parts of what is to follow, the simple image of the assembly line makes the point clear. If one machine breaks down or one worker absents himself, the line comes to a halt until repairs can be made or

---

[11] In this section I am relying extensively on my earlier paper on "Capitalism and the Factory System" (1986).

[12] I note the fact that Diderot's statue is to be found across the street from l'Eglise de Saint Germain des Pres, although I have so far failed to ascertain the relevance of this observation.

[13] This term brings up a number of relevant associations from contemporary economic theory. Otherwise, Karl Marx's "serial manufacture" is just as descriptive.

a replacement found. Second, it becomes possible to operate the factory with workers that have a much narrower range of skills than the one-time [70] artisans in the same branch of manufacture. A number of social implications are immediate:

The one that came to concern Adam Smith the most was the reduced skill and versatility required of the average factory worker. The repetitiveness and monotony of the work meant that the workman's intelligence was never challenged. Smith came to fear, therefore, that while the factory system would indeed multiply the “wealth of nations” it would also produce an inferior breed of men [14]. The reduced skill requirements also made it possible to introduce female and child labor in industries where they had not previously been employed. The vertical division of labor also “alienates" the worker from his product. Unlike the journeyman artisan, the unskilled worker can take no personal pride in the quality of the output. More importantly, he does not have the young artisan's prospect of promotion and higher social status in his lifetime. Furthermore, a firmer work-discipline is required for the vertical division of labor to pay off: workers cannot work at their own pace; they have to be on time; random absenteeism must be subject to strong sanctions. Inside the manufacturing firm, the “increased freedom” of the individual is not much in evidence in the early stages of industrialization[15].

Capitalists and Workers

We are historically conditioned to take for granted that, in-manufacturing, “capital hires labor” and controls the firm. But the theory of the division of labor, as far as we have taken it, does not rule out the possibility of “labor hiring capital”, that is of labor controlling the organization and renting the capital equipment being used in production. We cannot leave it there.

For reasons to be discussed later, the Smithian technology will show increasing returns to scale. For the individual enterprise this means that unit [71] costs are lower at high rates of output. Since lower cost firms will drive others out of business, surviving firms in a decreasing cost industry tend to earn a monopoly rent. The complementarity of inputs makes this *a joint* rent, which is to say, the sales revenue of the firm cannot be attributed to the various inputs on the basis of ascertainable marginal productivities since these are, in fact, undefined. The distribution of this joint rent becomes a bargaining problem, the solution to which may be bounded by, but will in general not be uniquely determined by, the various cooperating factors' alternative opportunities in other

---

[14] He had conclusive evidence. As one traveled from the Scottish Highlands to the Netherlands, via the lowlands of Scotland and England, Smith noted, it was plain to see that people's intelligence monotonically decreased. The Netherlands was of course where the division of labor had been driven the farthest in Smith's time.

[15] The rural immigrants to the cities of today's East Asian “Tigers” are going through much the same experience as the English newcomer to Manchester or Birmingham 150 or 200 years ago.

markets.

“The Division of Labor depends on the Extent of the Market”. Growth of the market will offer opportunities for driving the functional differentiation of both labor and capital equipment further. In the early stages of industrialization at least, the implications for capital and labor are not symmetrical, however. The typical machine becomes a highly specialized piece of equipment, “dedicated” to particular tasks in the manufacture of a particular product. This specialized machine may have no alternative uses, but it is, on the other hand, not quickly or easily replaced. The typical factory worker works at a specialized task but a basically unskilled one. He could easily and quickly qualify for many other similar jobs elsewhere, but is on the other hand himself replaceable with equal ease. In brief, the functionally differentiated machine has a “thin” market, while the worker performing a highly differentiated function has a “thick” market. This asymmetry in the position of the two factors of production affects their bargaining power. But there is another element to the situation as well.

Suppose for a moment a world in which “capitalists” were people who had to put their money into specific pieces of capital equipment that they would then contribute to some productive enterprise for an agreed upon remuneration (which could be either a specified sum or a share of revenue). When such an enterprise is set up, the incentives will be strong to drive the functional differentiation of machinery and jobs as far as the extent of the anticipated market will allow. The enterprise may secure a monopoly profit for itself in this way; even if it does not, it has maximized its chances of survival in the struggle with other lowcost producers. But there would be an even stronger *dis*incentive in the case we are imagining. Each one of our machine-owner capitalists can block any coalition among the others which tries to impose a particular distribution of income. Assuming (as we do) that the machines are strict complements, a distributional agreement can be blocked by the simple withdrawal of a machine, reducing everyone's income to zero. (Finding a replacement, remember, is difficult because of the thin market for highly dedicated machines). The core of this threat game is [72] empty, which means that our imagined case is more or less impossible -- it would not be a stable social institution. If this were the situation, we must suppose that our capitalists would refuse to invest in highly specialized capital but would instead put their money into multi-purpose equipment, such as trucks or basic lathes. But in that case society would be foregoing the economies of scale. Falling back on more nearly linear technologies, everyone would end up a lot poorer.

The solutions to this hypothetical dilemma are, of course, either sole ownership (or family ownership) of firms or, more particularly, the jointstock corporation. In the latter, the capitalists hold title only to a share of the firms' earnings while the corporation itself controls all items of physical capital that are at the same time complementary to other inputs and too specialized to be easily replaceable. This institution is stable against the kind of threat outlined above and, in that respect at least, offers safety to investors. Two further implications deserve notice:

First, the solution is one where, in effect, ”capitalists unite” in a legally

permissible cartel, called a “firm”, and hire labor. Now, from a technical standpoint, the firm is engaged in production using workers and machines as joint inputs. The distribution of net income after material inputs have been paid between the workers and capitalists, who as a group own the machines, cannot be objectively determined on marginal productivity grounds. But it will not be in any sense “evenly divided” (whatever that would mean). Under the assumptions outlined, the capitalists will divide the entire joint rent (if any) between them whereas labor gets no more than what its alternative earnings would be elsewhere.

Second, “labor hiring capital” (and excluding capital from a share in the joint rent) is not a feasible alternative. A completely symmetrical solution would require a worker to sell his own person into slavery in return for an equity share in the enterprise. Note that the labor-owned and -operated enterprises that occasionally emerge eventually turn “capitalist” quite automatically, if for no other reason than to allow the original owners to retire and take their “shares” with them.

Labor can get a share of the joint rent of the capitalist enterprise only if it can threaten to reduce the capitalists' income substantially. This requires a union. Workers must be able to bargain “as one” , as do the capitalists on the other side of the table. But the thickness of the outside market for relatively unskilled labor adds a requirement that the capitalists do not have to worry about on their side, namely, the ability to exclude outsiders from competing for the jobs in the firm. To be successful, the union must be capable of destabilizing the “capitalist solution” to the general bargaining [73] problem. If it demonstrates this capability too often, however, the effect will be perverse -- capital will flow elsewhere where it will not be held hostage[16].

This bargaining problem over a joint rent is one where no obviously “fair” solution, grounded in more fundamental and widely shared social values, offers itself. The history of labor relations in the Western world over the last 150 or so years shows the industrialized countries struggling, often violently, for some sustainable distributive balance in a situation where no stable equilibrium really exists [17].

The Evolution of Complexity

It remains to explain the nature of the increasing returns associated with industrial manufacturing and its connection to the growth of complexity in developing economies. Both topics also need to be taken beyond the “within firm” context to which I have limited myself so far [18].

---

[16] Occasionally, a bargain sharing the joint rent will be sustained for a long time. The agreement reached by the United Autoworkers under Walter Reuther and the Detroit Big Three in the late 1940's basically lasted for about 40 years. The share in the monopoly rents of the firms gained by the autoworkers provided them with real wages approximately twice as high as in American manufacturing in general. When foreign competition eventually eroded the joint rents, this real wage level became unsustainable.

[17] The theory sketched here also has implications for the analysis of unemployment. Cf. Leijonhufvud (1992) pp. 35-5.

[18] Cf. my previous paper (1989).

How far the division of labor can be driven (assuming conditions favorable to the coordination of complex interactive processes) depends on the "extent of the market" for the final product. As the market grows, Smith would have us look first for further *subdivision of labor* to occur. We may think of this as dividing a workstation on an assembly line into two successive ones; both the equipment and the workers would become more specialized and average factor productivity on that line would rise. Another source of increasing returns I call *parallel lines economies*[19] . In any production process, one will find machines or workstations which, although capable of yielding a continuous stream of productive services, are idle much of the [74] time. The simplest example assumes that we have an assembly line where one workstation is idle half of the time. It is then possible to double the output, without doubling all inputs, by building a parallel line and utilizing this station continuously.

These sources of scale economies interact so that their realization in one dimension often opens up new opportunities in others. Perhaps the most important example is that of the vertical subdivision of labor producing some tasks that are so simple and "mechanical" that their *mechanization* more or less "suggests itself". When a new machine is introduced at a stage of a production process that was not previously mechanized, it is to be expected that it will be idle much of the time -- which is to say, a new avenue for "parallel line economies" has opened up.

Smith indeed conceived of mechanization as *a consequence* of the prior organization of labor according to division of labor principles in the way just described. What neither he nor Marx seems to have realized sufficiently is that this introduces an evolutionary tendency that runs counter to that which would chain workers to simpler and simpler, more and more mindless tasks. It will replace workers with machines at precisely the most repetitive, brain-numbing tasks while at the same time creating new jobs of a type that do require the exercise of skill and judgment in the operation, maintenance, repair, and refitting of machinery.

The description just given of these processes of increasing functional differentiation in production applies to the productive system as a whole. It was not necessary to distinguish between the cases where two successive stages of production take place within the same firm and those where they are separated by market transactions between firms. But our conference theme*, The Individual and the Market*, really demands of us some understanding of the interpenetration of markets and hierarchies in the organization of the division of labor in society. Our previous analysis contains some clues to where the boundaries between firms can be expected to go.

Consider, to begin with, the question of why the individual workstations on an assembly line are not separate firms, buying their intermediate input from the preceding station, processing it, and then selling to the succeeding station. A sufficient reason is that the workstations are without alternative suppliers and without alternative customers. They would face each other as *bilateral*

---

[19] The importance of this source of scale economies has been stressed particularly by N. Georgescu-Roegen. Cf., esp. his (1972).

monopolies therefore. The bilateral monopoly case is again one for which the economist's theory of exchange will not provide a determinate outcome. We know the reason: Once again we have the mutual threat of reducing the counterpart's income to zero by refusing to buy or to sell, as the case may be. [75]

Does this sound overly abstract and “theoretical”? It is an eminently practical and “worldly” consideration, I assure you. We see it at work in the frightening collapse of the manufacturing sectors of the former Soviet Union. The central planners had built the Soviet economy as a set of vertically integrated industries of giant plants, many of which are monopolies in what they produce and often more or less monopsonies in some of the inputs they require. The political disintegration of the Soviet system (both the loss of hegemony over the “satellite” economies and the dissolution of the USSR) has spawned innumerable problems of exactly the type referred to. It is as if we had not just boundaries between firms, but borders of sovereign and quarrelling states, cutting across our assembly line[20].

A production process will tend to be vertically integrated - and the vertical division of labor, therefore, to be organized *within* the firm - when (a) there is complementarity between inputs at different stages of the process, and (b) either alternative suppliers or alternative customers of the intermediate goods in the process are lacking. This second condition is obviously also a matter of the scale of the system. As the economy grows, new firms and entire new industries are spawned as the production of various components, intermediate goods, and pieces of equipment, previously part of vertically integrated firms, reach sufficient volume for competing, specialized producers to emerge[21]. These new firms will also begin to elaborate their internal division of labor in pursuit of economies of scale.

The conclusion you should draw from this is that increasing returns is a property of the entire network of cooperation in production[22]. The mental habit of associating increasing returns with monopoly firms tends to obscure this fact. In the growing system, producers of more or less close substitutes keep emerging; when, as a result, apparent monopoly rents are all but eliminated by competition, we may lose sight of the pervasiveness of these increasing returns. But competition only makes the producer's surplus of the monopolist into a consumer's surplus, it does not eliminate the social benefits of the vertical division of labor. It may be that we should regard a [76] large proportion of GNP as a national joint rent. Doing so would put issues of income distribution and the welfare state in a rather new light!

---

[20] You will note that one of the implications of our analysis is that pressing ahead with privatization will do nothing to alleviate the situation.

[21] The process is well described in Allyn Young's classic paper (1928).

[22] To return once more to the Soviet system, this is the lesson Gosplan never properly grasped. Utterly convinced of the economies of scale that could be realized by building giant plants, the Soviet central planners had no understanding at all of the systemic scale economies that are only realized by continuing functional differentiation at all levels.

Prologue

The relative ease with which past developments can be rationalized after the fact is misleading. The evolution of the division of labor is a process we do not at all control, cannot predict, and only half understand. The one thing that can be said with considerable confidence is that the "stylized facts" analyzed in this paper are not permanent features of our world.

Some of the emerging determinants that will change our world can be discerned. Whether they will actually come to predominate, or be offset by tendencies of which we do not as yet have a grasp, is another matter. A few notes will have to suffice:

For more and more products the extent of the relevant market is becoming world-wide. Markets that were previously local or national are exposed to competition from far-away places and the monopoly rents earned in those markets - which may have been shared by labor - are consequently eroding.

Historically, the strategic factor the relaxation of which served to enlarge the extent of markets was transportation costs. Today, it is communications, especially tele-communications and digital information transmission.

The replacement of mechanical and mindless factory jobs by machines is accelerating and with the advent of computerized robots taking over many functions that were not particularly mindless as well. Employment in manufacturing is likely to decrease also in countries managing to hold or increase their share in growing world outputs. This tendency will be stronger to the extent that the new jobs in the maintenance, servicing, and reprogramming of these machines end up in new "service sector" firms, rather than inside the old manufacturing giants. For economic policy, the future of some manufacturing sectors may resemble today's agricultural problems: a dwindling proportion of total employment, but continual, embarrassing output surpluses[23].

The robots are becoming more versatile, less "dedicated" to particular [77] tasks, more easily re-equipped and re-programmed. In short, they are becoming more like the workers in Smith's and Marx's theory of the division of labor. This increased versatility of computer controlled machinery reduces the incentives for vertical integration in manufacturing and creates a tendency towards smaller producing units [24]. At the same time, the tide may be turning from "serial" to "heterogenous manufacturing", in Marx's terms[25]. Marx used the latter term to characterize the manufacture of watches in Switzerland in his day: the various components were made by different, small, competitive firms and only assembled by the coordinating firm. More and more things are being marketed today by relatively small firms which shop the world for the best, low-cost subcontractors and component manufacturers and which, in this manner, pull together and then again dissolve patterns of cooperating producing units brought

[23] As I write this concluding section, my wife draws my attention to the day's *La Repubblica* wherein Luciano Benetton reveals that the next Benetton plant scheduled to open in Italy will be *unmanned.*

[24] Cf., my *(1989)* and compare *The Economist's April 17-23, 1993,* cover story: "The Fall of Big Business".

[25] Capital, pp. 375ff.

together for particular purposes[26]. The traditional big, vertically integrated producers do not have the versatility and flexibility required by this new form of competition.

Whether this bodes well or ill for Bodo, I do not know. But the Individual is going to find himself, before long, in quite different Marketplace from the once we have been used to philosophize about. [78]

References

The Economist, April 17-23, 1993, "The Fall of Big Business".

CLIFFORD GEERTZ, 1979 "Suq: The Bazaar Economy in Sefrou", in Geertz et al., *Meaning and Order in Moroccan Society: Three Essays in Cultural Analysis,* Cambridge: Cambridge University Press.

NICHOLAS GEORGESCU-ROEGEN, 1972 "Process Analysis and the Neoclassical Theory of Production", *American Journal of Agricultural Economics.*

AXEL LEIJONHUFVUD,1986 "Capitalism and the Factory System", in Richard N. Langlois, ed., *Economics as a Process: Essays in the New Institutional Economics,* Cambridge: Cambridge University Press.

----------, 1989 "Information Costs and the Division of Labor", *International Social Science Journal,* XLI, May.

----------, 1992 "Keynesian Economics: Past Confusions, Future Prospects", in Alessandro Vercelli and Nicola Dimitri, eds., *Macroeconomics: A Survey of Research Strategies,* Oxford: Oxford University Press.

KARL MARX, 1906 *Capital,* New York: Modern Library.

WESLEY C., MITCHELL, 1953 "THE ROLE OF MONEY IN ECONOMIC HISTORY", *Journal of Economic History,* 1944, Supplement, reprinted in F.C. Lane and J.C. Riemersma, eds., *Enterprise and Secular Change,* Homewood, Ill.: Richard D. Irwin, Inc.

KARL POLANYI, ARENNSBERG C.M. AND H.W. PEARSON, Eds.,1957 *Trade and Market in the Early Empires ,*Glencoe, Ill.: The Free Press.

[26] Here we may find the seeds of a development that would run counter to the tendency of markets to "invade and destroy" social structures, for this kind of fluid market organization may functionally require the support of strong social mores upholding, for instance, the "sanctity" of handshake agreements.

EILEEN POWER, 1963 *Medieval People,* 10th edn. New York: Barnes & Noble.

La Repubblica, May 25, 1993, interview with Luciano Benetton by Giuseppe Turani.

PETER SELLERS, “Lord Badminton's Memoirs”, *The Best of Peter Sellers,* New York: Angel Records 35884.

ALLYN YOUNG, 1928 “Increasing Returns and Economic Progress”, *Economic Journal,* 1928.