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Technology, Labor Interests and the Law: Some Fundamental Points and Problems

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Abstract

The symposium of which this essay is a part deals with technology and law with particular reference to the interests of workers. Perhaps needless to say but nonetheless important, each of the three topics-technology, law and worker interests-has had a long history of controversy about factual or positive and normative considerations.

Technology, Labor Interests and the Law: Some Fundamental Points and Problems

**Warren J. Samuels, A. Allan Schmid, James D. Shaffer,
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I.

The symposium of which this essay is a part deals with technology and law with particular reference to the interests of workers. Perhaps needless to say but nonetheless important, each of the three topics—technology, law and worker interests—has had a long history of controversy about factual or positive and normative considerations. It is *not* our intention, and certainly not our expectation, either to resolve the thorny issues involved in the three topics and their interconnections or to solve the difficult, complex, and delicate policy problems through some concrete program or panacea. It is our objective to identify the critical issues, something of what we know about them, and something of what is involved in any effort to work them out. We come, that is to say, neither to propose nor to render complete policy analysis of other's proposals but to advise as to what is involved, inevitably, in any efforts somehow to reconcile, whether through law or otherwise, the conflicts between technology and labor interests.

We believe that very deep and perennial questions are involved in any discussion of the conflicts between technology and worker interests, that these questions are involved even when not brought to the surface and directly confronted, and that we ought to make them explicit as part of our advisory, and informational, analysis. These questions include the following: Whose interests are to count, and how? Whose interests are to be made a cost to others, and how? Who is to control the introduction of new technology? Given the fundamental importance of access to jobs, how can protection of employment be institutional-

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ized? It is obvious that questions such as these involve fundamental considerations of the organization and control of the economic system.

Although we do not propose specific solutions to the policy problems inherent in our subject, our advisory analysis is predicated upon certain ultimately normative premises which ought to be made explicit: (1) That it is desirable to protect worker interests in employment. Not all such interests will be discussed, nor will the ones we do discuss be treated equally. (2) That it is desirable to facilitate and promote technological innovation. Technological development historically has been the critical factor in the improvement of living conditions for all persons, particularly in the industrialized economies, and it remains the, or at least a, prerequisite for the enlargement and enhancement of the human welfare potential. (3) That it is desirable to maintain, even to enhance, the openness and flexibility of the economic system in matters of structure and behavior. In relation to this we generally assume the continuation of private enterprise-type economic system. We note that these assumptions could be, and in the past often have been, used in connection with analyses quite different from the one undertaken here. For example, we will deal with quite fundamental points concerning the definitions of inputs and outputs, distribution, and incentives, in some respects at least quite differently from their conventional treatments.

One additional assumption ought to be made explicit. We abstract from the problem of inflation. We do this largely to render our task manageable. We do not deny the importance of inflation as a problem. We generally do feel that were political and economic wills propitious, policies could be adopted to resolve the problem of inflation, including the trade-off between inflation and unemployment, perhaps through some combination of fiscal, monetary, and incomes policies together with the (or some of the) policy options discussed below. (For example, if inflation is due, as the theorists of incomes policies maintain, to the contest over income and wealth, insofar as that contest involves the struggle for jobs, then it is plausible to argue, or at least to suggest, that resolution of the unemployment problem can possibly contribute to the defusing of the contest in its engendering of inflation.) But especially we omit inflation as a problem because we want to discuss other things. In doing so we do not intend to denigrate the difficulties of solving it.

Finally, we do want to stress the importance, both in the real world and to our analysis, of the behavioral, structural, and market, as well as performance consequences of the introduction of new policy ar-

rangments. Indeed, the analytical and practical, substantive problems of institutional innovation are no less, and perhaps much greater, than those of technological innovation. There are, for example, market consequences and problems consequent to institutional innovation. That there generally is a difference between the two forms of innovation—the consequences of technological innovation generally are not given the same policy analytic treatment as are those of institutional innovation (not that the latter all receive such treatment, by any means), especially when questions of legal change are involved—is of concern to us and accounts, in part, for the direction which some of our advisory analysis takes.

Our discussion commences with consideration of the economics of technological change in relation to unemployment, moves on to consider certain fundamental matters of institutional organization and adjustment, then to consideration of a variety of policy options, and concludes with the identification of a problem for labor interests which, while illustrative of the point made in the immediately preceding paragraph, may be of far greater significance to labor in this country than technological unemployment as such.

II.

The most conspicuous question concerns the relation of technological change to unemployment. Looking at this question from an historical perspective one must be struck by the difference in view between short term adjustment problems and long term progress. The fact is that in the advanced industrial societies during the last century or so, population has enormously increased, the fraction of the population actively engaged in production has decreased, the length of the work week has substantially decreased, and real per capita income nonetheless has increased many times over. The principal factor which has permitted these developments has been technology. The basic analysis with regard solely to employment-unemployment involves several factors.

In the case of exogenous technological change, while such change tends to be labor-saving, its effect on employment in the particular industry affected depends on several factors. Most important, it depends on the labor-intensity of the industry, the more labor-intensive the less the adverse impact on employment, and on the elasticity of demand for the industry's output, the more elastic the stronger the demand for and employment of labor. Labor-saving technological change results in lower cost of producing a given level of output. If it is assumed that the

price of the good reflects the cost of production, then price will fall with costs, and the quantity demanded of the good will rise. Hence, the more elastic the demand for the good, the greater will be the increase in quantity demanded, in response to the price drop, and the more labor, and other resources as well, will be needed to satisfy demand. As for labor intensity, the more labor-intensive is an industry to begin with, the more labor will be required to meet the increase in demand after the technological change has taken place. That is, a given technological change will have a *proportionally* larger effect on employment in an industry where employment is low to begin with, and a proportionally smaller effect on employment in an industry where employment is high to begin with. Therefore, even within a industry subject to labor-saving technological change, there is no necessary reduction in employment.

Moreover, in the event that technological change does displace workers from jobs, it is likely that workers will be reabsorbed in other industries. The result will be greater output at lower factor cost, that is, higher real per capita incomes permitted if not generated by technological change.

In the case of induced technological change, where labor-saving technological change is generated by expected future increases in wage rates, not past increases, the outcome is the same as in the case of exogenous technological change. More output is available at less resource cost after the technological change. Labor displaced from one sector is reabsorbed in some other sector.

Such, in summary, is the standard economic analysis of the matter. It has the indisputable advantage of being highly consonant with the long-term performance of the economy. There are, however, at least two immediate assumptions which differentiate the short from the long term. One is the reabsorption assumption; the other involves adjustment costs; and, of course, the two are related, although there can be short term adjustment costs even absent reabsorption problems.

The assumption that displaced labor is reabsorbed elsewhere in the economy is not always true in reality. Due to at least cyclical and structural problems, there may not be the effective demand elsewhere in the economy for the displaced workers to be reemployed. This means that the improvements due to technology have serious hardship costs for the displaced workers. The principal significance of this for both the workers (and their families) and society is obvious: In modern society, income is secured principally through access to jobs. In the absence of jobs, there is typically much human suffering. If one understands the

objective of the economy to be the production of human welfare through material productivity, not technological virtuosity or profit as an end in itself, such a situation must be understood to involve economic failure.

The traditional assumption of zero, or at most negligible, adjustment costs also is dubious. Even with reabsorption of displaced workers in other jobs, say, after a short period of frictional unemployment, there are serious adjustment costs. While these are strikingly significant for older workers, they are not necessarily negligible for younger ones and their families. Unemployment due to technological displacement may ruin a worker and his family's financial security. Relocation from one region of a country to another, loss of one's immobile assets in home and community, retraining from one set of job skills to another, damage to personal identity and confidence as well as dignity, loss of control over one's job situation—all these and other consequences of technological unemployment constitute costs which must be reckoned in any social accounting of the costs and benefits of technological change. When these adjustment costs, which likely are not negligible for many workers even in the best of times, are compounded by failure of reabsorption, the human tragedy can be severe and both the family and social consequences can be serious.

It is quite easy to make presumptuous pronouncements in such matters. However, there are numerous subtleties and complexities. Often what is transparently clear can be only one, and only a temporary, a manifestation of something much more dynamic. Often, too, what seems congruent with one's, or with society's, interest by one criterion may not be so by another which upon inspection may be given a higher ranking. And critical to the entire process is the distributional problem encompassing both power and outcomes.

III.

It perhaps ought to be acknowledged that, even in the absence of problems of unemployment and adjustment costs borne by labor, technological change is not an unmixed blessing. The economy, and indeed society, has become increasingly fragile with the development of technology and its industrial applications. In particular, the ecological systems of the workplace and the larger community and the physical and mental health of both working and nonworking populations, including the as yet unborn, have become heavily dependent upon industrial processes, the production of their necessary inputs, and the disposal of

their products and byproducts, including wastes. The human welfare potential implicit in higher production and higher productivity cannot be reckoned solely on its own terms. While most contemporary discussion takes place within a systemically and technologically laden context, there are deeper, if more relativistic and elusive, considerations which also must enter into contemplation and social decision.

The question of uncertainty and its implications also ought to be acknowledged and, indeed, emphasized. The economic future is radically unknowable; our ignorance of it is due not to lack of information but to the fact that the future will not exist and be knowable until it happens, the result of the aggregate of our actions. No one, then, can be certain of the outcome of technological change. People have different subjective views of uncertainty and the costs and benefits likely to be realized in the now-uncertain future. This difference of views, and the underlying difference of viewpoints, casts doubt on any one group having monopoly-like power in control of technological innovation. Such results in an arbitrary and skewed distribution of costs and benefits to the extent that the group with the power to make decisions acts upon its own perception of costs and benefits. To define costs and benefits is really to define for policy purposes people's property rights. Union-generated work rules thus often are held up to scorn for their adverse impact upon innovation and productivity. But these work rules operate no differently than does management decisionmaking over the adoption of new technology. Whereas union-generated decisions will tend to effectuate certain worker interests, management-generated decisions will tend to effectuate certain managerial, or corporate, interests, such as cash flow enhancement and/or timing of innovation *vis-a-vis* depreciation of an existing plant. The future is made through giving effect to such considerations. No one party takes into account in its calculations of advantage all the costs and all the benefits of their decisions. The introduction of technology will be controlled, whether by worker interests or company interests; the former is more conspicuous than the latter but both control innovation and the future, and in those regards are functionally equivalent. In this connection it perhaps also ought to be noted that there is by no means a complete set of rights enabling full participation by all persons or parties in articulating their preferences, for example, as to possible trade-offs between alternative work rules, productivity (however defined), and the type of society people may prefer to live in. In such matters people are caught in asymmetrical adversarial, not exchange, relationships.

IV.

Obviously critical to any discussion of technology and unemployment is productivity and, less obviously, critical to any discussion of productivity is distribution. Distribution is important in its own right; it also governs the level and pattern of production and of productivity with respect to which any welfare implications apropos of technology and unemployment will have meaning. We want in this connection to make a number of points; each could bear considerably more amplification than the present circumstance permits.

First, technology is both a dependent and independent variable. Most discussion of the effects of technology, as on employment and unemployment, take technological change as a given. Here we are principally interested in how distribution affects the consequences wrought by technological change. But technology also is a dependent variable; even when denominated exogenous (*vis-a-vis* induced), it is generated by operative factors one of which is power. The distribution of power governs the allocation of resources to research and development whence cometh new technology. The distribution of power helps govern the adoption of technology. Considerations of power enter into the development and adoption of technology, not productivity considerations alone. Moreover, while technology can be perceived as an imperative force driving industrial structure and evolution, extant technology does comprise an array of production alternatives. The very largest level plant is not necessarily the most efficient. Choice between technologically modern production systems is not based solely on costs; considerations of strategic advantage in a system of power also enter into the decisions.

Second, technological innovation is the principal vehicle of the process of creative destruction deemed by Joseph Schumpeter in his work *Capitalism, Socialism, and Democracy*, to deeply mark the modern industrial capitalist system. There is creativity and there is destruction. The creativity and the destruction are not always distributed proportionally, indeed, they rarely if ever are.

Third, if the problem of technology in relation to material progress and employment-unemployment is one of managing technological advance, that advance can be managed in different ways and in different directions. Both the generation and the (creative and destructive) effects of new technology will depend in part upon the distribution of power. The distribution of rights, governing whose interests will count, for example, as a cost to others, will channel the cost-price structure in terms of which costs and benefits will tend to be reckoned and with

respect to which any utilitarian judgment thus reached will be tautological. A different structure of rights will lead to a different generation or configuration of technology and a different set of market outcomes. The management of technological advance will be a function of the distribution of power and the rationalization of the outcomes of technological advance will be on terms generally presuming that distribution of power.

Fourth, more broadly, it is true both that distribution is a function of market forces and that market forces are a function of distributional, that is, structural factors. The actually achieved outcome in an economy is not one that has been predetermined. It is the outcome of a complex network of interrelationships and decisions at the bottom of which is an existential circularity between structure and performance at the core of which is distribution.

Fifth, unemployment therefore can be contemplated to be a function not so much of technological advance and displacement but of the structure of power which channels technological change and development. Any notion that unemployment is "natural" is specific, at best, to the extant structure of power. There is no necessary reason in the nature of the economy that technological change and employment be in conflict. There is no reason why the power structure which channels both technology and employment-unemployment cannot be altered to enhance employment and to minimize the adjustment costs borne by labor, whether or not the reabsorption assumption is found, or made, to hold. Technology can be introduced in ways which cater to the interests of those who would otherwise be injured. Barriers to entry can be eroded if not totally eliminated; barriers to employment as such, for example, on the basis of age, similarly can be reduced. To the extent that unemployment is power-structure specific, unemployment can be reduced through changes in power structure, changes which, among other things, would take more into account the interests of those so adversely affected by technology. The same point applies to unemployment due to other causes, for example, cyclical instability.

Sixth, there are several points to be made concerning productivity. First, productivity is not only a physical matter. It is a matter of creation of value, for example, as "determined" through market forces or through political decision, the supply and demand of automobiles and pizza pies in the former instance and of bombers and missiles in the latter. As such, productivity is highly, indeed ultimately, circumstantial. An increase in the demand for a product, for example, will increase the value productivity of the workers engaged in its production

even if they do nothing differently. Second, productivity is a collective phenomenon. Although our ideology and, to some extent, our economic theory of distribution, which in this respect if in no other is heavily influenced by our ideology, affirm distribution in accordance with individual productivity, in reality what we produce and how much we produce is a function of a vast collective enterprise extending over several generations. We receive individual factor incomes, wages, etcetera, but those incomes represent in the aggregate both individual hard work and the total productive organization and operation of society within which, and only within which, that hard work can be effective. Considerations of individual productivity cannot properly be invoked to counter proposals for structural or distributional change in order to effectuate alterations in economic performance, for example, in unemployment.

Seventh, it should be clear that both the existence and the distribution of the benefits and costs due to technological change are governed by the distribution of power. Corporate profits and costs, labor gains and costs, the direction taken by the mediating role of government (law)—these and other factors are given existential substance by distributional or structural factors. Who receives what benefits and who bears what costs are questions not written in stone but have “answers” or “solutions” reached on the basis of the distribution of power and of power play undertaken thereon. Power play determines whose interest is protected and effectuated. Power play governs the circumstances and the manner in which new technology is introduced, who gains, and who loses.

Eighth, it should be clear that new institutions can be adopted to channel the market and to affect the genesis and distribution of the benefits and costs of new technology. Existing institutions are not written in stone; they, too, have been the product of institutional evolution and adjustment; that process continues. Whatever one may think of the “self-adjusting” market, the market operates within and gives effect to the institutions which form and channel it. “Productivity” as conventionally reckoned emerges only within, and in a sense tautological with and specific to, the institutions which form and channel the market and the operation of the market as such. To judge proposed new institutions deficient or inefficient on the basis of market outcomes (for example, the extant cost-price structure) produced by the existing institutional configuration is to give effect to the latter. Whereas a new institutional structure would produce outcomes, including a new cost-price structure, by which the extant ones would be deficient. There is no metacriterion by which conclusively to choose between them, although

existential choices are made through decisions leading to institutional alteration and adjustment.

Ninth, if the introduction of technology and the accrual of profits therefrom are partly a function of the state of the law, which helps govern power structure through determining relative rights, then it is understandable that various interest groups will attempt to influence the law in its governance of technology and profit. In the nineteenth century, for example, capital accumulation was abetted by a legal system which, in part through various legal defenses against worker legal action, distributed the risks of production away from capital owners to workers. This situation continued well into the twentieth century when it was partly, perhaps substantially, altered through workers' compensation statutes and various developments in tort and statute law establishing and sanctioning warranties and other modes of consumer protection. It is not surprising, therefore, nor is it novel in principle, for the International Association of Machinists (IAM) "New Technology Bill of Rights" to attempt to protect the interests of workers already in jobs. But, if the nineteenth century approach achieved accumulation of capital through the establishment of a privileged position for capital owners, the IAM approach protects against unemployment through a privileged position for the already employed, neglecting those who are unemployed and who are not so well employed. To say that is not to denigrate their proposal. Whatever "solution" to the continuing problem of technology and employment-unemployment is worked out, it will come about largely through various groups doing what comparable groups always have done, namely, seek to protect and effectuate their interests. It is one of the ironies of the traditional reabsorption assumption, however, that a tension exists between the frequently unrealistic assumption of reabsorption capacity and the efforts, due in part to the absence of reabsorption opportunities and in part to traditional internal protectionist motives, to establish privileged positions. Still, the manner and mode of the introduction of technology does bear on worker interests and is worked out through institutional rearrangements, and, it is important to note, it is tendentious to call "privileged" what is the result of necessary efforts to (re)determine the institutions which govern that manner and mode.

Tenth, it is important to note that when law abetted the accumulation of capital through legal arrangements shifting risk away from capital to consumers and to workers, it was not some abstract category "capital" which was maximized. What is called "capital" in all such discussions is really a vector of a multiplicity of components and not a

one-dimensional thing which can be given a simple and singular ordering. For example, machinery can be produced with greater or lesser attention, through various design features and protective devices, to worker safety, and with lesser or greater designed tolerance levels affecting the use and safety of the finished product for consumers. Overall more "capital" in some sense was accumulated than otherwise would have been, but it is important to recognize that the law affected the structure of accumulation, and the structure of production, consumption, and employment as well.

Eleventh, the distributional problem applies not only between capital and labor but also within the ranks of labor, particularly organized labor. Trade unions, in their bargaining over wages, hours and working conditions, for example, must contemplate the trade-off between total labor remuneration and the employment level. All other things being equal, a richer bargaining package may be enjoyed by the union members who continue to have jobs but not by those who arguably are displaced in the process as company management adjusts the size of its workforce (level of employment) to the new price of labor. There is, willy nilly, a distribution of benefits and distribution of costs. Not all union members will be in the position denominated above as "privileged." More will be said of this situation below.

Twelfth, it must be stressed that the protection by law, or for that matter by contract, of one's interests *is* important to the enhancement of one's opportunity set and realization of one's interests. It is better to have rights than not to have them. Two additional points, however, must be juxtaposed thereto. First, the rights and opportunities of one party often tend to correlate with costs and denial of opportunities imposed on others. To say this, of course, is not by itself to denigrate the protection of interests, through rights, for any party. It is, rather, to state an existential fact and condition, thereby underscoring the necessity of choice as to whose interests are to count, in part as a cost to others. Second, the protection given by law and/or by contract to one party's interests always is problematic and circumstantial, a function of the operation of other rights and, *inter alia*, market conditions and behavioral responses. Thus, for example, protection of worker interests within a firm, for those who continue to have jobs, may expose those jobs, and the viability of the firm itself, to the competitive drive of other firms who have been able to avoid the need similarly to protect worker interests. Protection of interests in one firm or group of firms actually may generate a market for those employers who can induce workers to work with no or appreciably less protection of their putative

interests, thereby enabling the new firms to outcompete with existing ones. There are limits to the effectiveness of collective action at the subgroup level, a lesson which historically led to the adoption of unemployment compensation as a requirement at the national level in order to prevent interstate rivalry, at the behest of intrastate business interests, reducing the scope and level of benefits. Within the private sector, the “progressive” employer may be unable to compete with less socially conscious firms.

Thirteenth, there is tendency to adopt a managerial[ist] approach in considering questions such as those under review here. It is easy to agree, or to see, that there must be an incentive system driving the labor force. It is easy to assert some “natural” rate of unemployment which operates to diminish our appreciation of the personal and social cost of unemployment. It is easy to hypothesize the voluntary nature of unemployment consequent to a view that given a willingness to accept a lower wage rate there would be no unemployment, so that any unemployment is voluntary due to a refusal to accept the lower wage rate. But reality is much more complex than these positions tend to recognize. Even with workers willing to accept lower wage rates, there may not be jobs for them. The level of offered employment may be limited by the level of planned output, which in turn may be adversely affected by the condition of unemployment. Lower wage rates may only dry up effective demand and, with it, jobs. Given that there always is an incentive and reward system, the question is not whether to have one but *which* one, a question to which we shall momentarily return.

V.

Most conventional analysis—partial static equilibrium microeconomics and welfare economics—takes technology and input and output definitions, among other things, as given. But one of the consequences of technology is the reformulation of the meaning—the very nature or economic significance—of inputs and outputs. New technology means new outputs, new forms of old outputs, and altered economic significance or meaning of inputs. This is manifestly important in its own right but it points to an even more fundamental and broader underlying process: the definition of output. The output of the automobile industry obviously is automobiles but to stop there, as does much discussion, is unduly to narrow the scope of analysis and understanding. The output of the automobile industry, what people seek and get from it, includes not only transportation vehicles but jobs; incomes in the

form of wages, salaries, and dividends; and, in a profound sense, mankind or humanity itself. As writers of different political persuasions have pointed out, the principal product of industry is people, the nature of the human being who is shaped and cultivated by industry. This is an important philosophical point; it is of enormous cultural and ethical significance. But it also is of vast practical importance. The output of the automobile industry is the physical automobile plus *some* quantum element of worker, consumer, and third-party safety. The effect of occupational and health safety regulation, of consumer protection legislation, and of environmental protection regulation is to redetermine the legal definition of commodities. The “effective commodity” is what it is because of the sum of and interplay between market and legal forces. To maximize output, or the value of output, first requires a determination of the definition of output, and also of input[s], and this involves determining whose interest is to be protected, in part by making them a cost to others. This is done, in part, through legal rights or the functional equivalent of rights, as in safety and environmental protection legislation.

It has been appreciated for some time by all except the most naive or reactionary that in the absence of protective legislation, workers (and also consumers) will bear the brunt of market adjustments and risk. Labor is particularly exposed to technological change and rarely has the economic wherewithal to sustain the economic destruction visited upon it by economic creation. Even more generally, there are overhead costs, to use John Maurice Clark’s felicitous term, as described in his book *Studies in the Economics of Overhead Costs*, of labor just as there are of capital. The cost of maintaining, of sustaining, and of [re]training the worker and his progeny is important. They are as pertinent to the production enterprise—on the levels of both the individual firm, or plant, and society as a whole—as they are to the family unit. But these human capital costs are conventionally handled as consumption costs. The production enterprise, insofar as it can depend on the treatment of such expenses as consumption items by households, is able to achieve the externalization of those costs every bit as much as it does when it is able to pollute the air or water and shift costs to create externalities for others. If external costs and benefits must be taken into account in that area, so too must the displacement and other costs of technological innovation and adjustment be reckoned in the evaluation.

One way to do this is to include in the rights which define inputs and outputs the costs, or the provision for the costs, of displacement

and retraining of workers in the case of technological innovation. This can be accomplished through negotiation or custom at the level of the individual company or plant. But such a solution is exposed, as indicated earlier, to the competition from those companies who are able, for whatever reason, to avoid the internalization of costs, whether they be of conventional externalities or of labor displacement, which can readily be included among the other externalities. But whether it is done, and however it is done, providing the protection is tantamount to redefining inputs and outputs, here to include the internalization of cost which otherwise and hitherto has been borne by households. A "Worker Impact Statement," much as an environmental impact statement (or what Kenneth Boulding has called for in *The Economy of Love and Fear*, a distributional impact statement), would identify the costs shifted to others by technological innovation and permit the hopefully rational deliberation of solutions to the problems posed thereby.

VI.

One of the arguments frequently encountered in discussions of adjusting the impact of technological change on workers is that any such adjustments may have (undesirable) incentive—disincentive— effects on workers. It is, as noted above, easy to adopt a managerialist approach, to more or less blindly consider the need to maximize output and thereby to maximize pressures—rewards and incentives—on workers to produce. But technological innovation is something to which workers adjust; their actions and demands have some impact upon the innovation process but they are not the critical actors. Moreover, there always is *some* incentive system. The operative question is not whether but which, whose, for what ends. Once it is recalled that incentive systems operate to maximize or optimize production of output, and that the definition of output involves a necessary prior determination of which/whose interests are to count as a cost to others, the objection that any such redetermination of the definition of output will adversely affect incentives to produce is tautological with and gives an effect to the preexisting definition of output, whereas the critical point at issue is precisely the definition of output thence to be maximized or optimized. Stated differently but to the same effect, optimization requires a definition of that which is to be optimized and that, and not the role of incentives per se, is typically what is at issue. Too much of the static conventional analysis obscures the process by which the ends of the incentive system are determined as well as such questions (and their

respective and interacting governing processes) as who determines, why, and with what consequences.

One must be wary not only of a managerialist perspective, in which one assumes the position and point of view of the employer-manager of labor, but also that of expert technician. Inasmuch as *any* determinative decision regarding production and costs is predicated upon *some* definition of output, and *some* disposition of potentially externalized costs, such as pollution or worker retraining, one must ask of the expert advisor or expertise-based decisionmaker precisely on what values his decisions are predicated. These definitions are not fully given to the engineer, scientist, lawyer, economist, or manager. They are made through a process of decisionmaking which is profoundly influenced by power, that is, by forces governing whose interests are to be made a cost to someone else. That the someone else may not realize that they are bearing costs due to the policy decisions of others, or that the someone else may somehow respond in one behavioral fashion or another, does not negate the fact that for the moment at least the someone else is in the disadvantaged position of having to bear costs visited upon them by others. Rights structure and channel incentives, and rights can be exercised, *de jure* or *de facto*, by technicians of various types who, so far as they know or are concerned, are only doing *their* job.

VII.

The principal policy strategy which government can pursue is that of full employment. There must be sufficient aggregate effective demand to sustain a full employment economy. This must be combined with other policies and programs, such as manpower retraining. Deliberate generation of unemployment in pursuit of the control of inflation is extremely undesirable; it is much more an admission of failure than of any success in combating inflation. Deliberate generation of unemployment to control labor power in the market and in collective bargaining also is extremely undesirable. It is inhumane deliberately to deny through public policy access to jobs and income so necessary for most persons. The active pursuit of full employment is not guaranteed of success, especially in light of our correlative failure to contain inflation and our experience with stagflation, simultaneously increasing rates of both inflation and unemployment. Especially must we avoid, if not utterly dispel, the *laissez faire* idea that problems will solve themselves, that the economy is at an optimal level or condition no matter what the level of unemployment, because anyone can get a job if only

they would lower their desired wage rate, so that if they are out of work it is voluntary, not involuntary, unemployment. The fictions and tautologies by which certain writers attempt to prove that the present is the best of all possible worlds staggers the imagination. Policy must promote a stable price level, full employment, and dynamic technological change. Failure to promote and to achieve full employment denies access to jobs and income for those who require such to live, absolutely wastes productive capacity of the society, denies businessmen the opportunity to engage in profit-making activity, and destroys the ostensible fundamental *raison d'être* of the economic system.

VIII.

One of the major points which we want to make is that the promotion of labor interests *vis-a-vis* technology is not a simple matter. No single partial solution is adequate nor is a general solution possible. There are fundamental, systemic problems which cannot be solved from only one perspective, nor only once for all time and for all people. However, an array of partial solutions can be worked out. This brings us to another major point of ours: Society, that is, the competing interest groups which comprise society not all of which are equally well organized, must work out the array of partial solutions. The array which is worked out will be a function of the power structure which governs whose interests are to count. Inasmuch as it is precisely the question of whose interests are to count—when interests centering on employment, profit, and technology are in conflict—which policy must address, for us to assert certain policies as conclusive (not to say effective!) would be for us to assume whose interests are to count. This we refrain from doing, in part because (and not surprisingly!) we do not agree on major issues of strategy, in part because some of us are unwilling to be presumptive as to whose interests are to count. But this diffidence does not completely disarm the policy analyst. We can articulate a variety of options, a number of critical considerations, and the relevant experience of other countries, the latter without any assumption that institutional transference between societies is either necessarily desirable or easy.

We first note several critical considerations. The first is to underscore the desirability of maintaining flexibility and openness. This is a subtle matter, if for no other reason than that anyone could point to an established right, for example, a property right, a collective bargaining right, a contractual right, or a welfare entitlement right, and assert

that the system would be more flexible and/or more open without such a right and its protected interest. In every system there will be and must be rights or the functional equivalent of rights. The issue is not rights or no rights but which rights. Nonetheless the policy analyst can attempt to identify the interests omitted or damaged by the institutionalization of a right or, for that matter, the deinstitutionalization of a right. (Regulation is the creation or logical equivalent of a right; deregulation engenders the opposite right.¹) Thus, one can distinguish between the right to the job which one presently holds and the right to a job. One can also distinguish between policies which protect the already protected, and which may further burden others, and policies which extend the range of protection. Thus, certain policies advocated by the IAM proposals can be interpreted as protecting an existing labor aristocracy while neglecting the unemployed and other employed workers with differentially lower capacity to assert themselves. Such considerations do not operate conclusively to rebut the IAM proposals but do raise questions of who else's interests might also be protected. Some policies, of course, protect both those already protected and those not yet protected; and others protect the hitherto unprotected. Perhaps one would want to avoid as far as possible a resurgence of neomercantilist protectionism selectively pursued on the basis of power and influence. Yet even here labor may well have been taught by organized business which historically has pursued protection (and not always and probably not most importantly through tariffs and quotas), often with the support of the particular industry's unions.

Second, we want to reaffirm the importance of the behavioral consequences of any policy innovation or new institutional arrangement. The most fundamental limit which we observe constraining the IAM approach is that the firms which in good conscience attempt to cooperate and pursue its noble goals may find themselves unable to compete with other firms, domestic or foreign, which are able to introduce technology without the internalization of costs as prescribed by the IAM's New Technology Bill of Rights. Such a predicament would threaten the demise of the firms, the union, and the policy goals, as well as severely damage the workers whose protection is sought.

This brings us to our third critical consideration. Do we want to provide, or somehow work out, protection for workers on the level of

1. See Warren J. Samuels, A. Allan Schmid And James D. Shaffer, *Regulation and Regulatory Reform: Some Fundamental Conceptions*, in W. SAMUELS AND A. SCHMID, *LAW AND ECONOMICS: AN INSTITUTIONAL PERSPECTIVE* 248-66 (1981).

the individual firm, perhaps the individual plant, or on some more encompassing level? Many systems of worker protection around the world are on an enterprise basis, for example, Japanese lifetime employment guarantees and Soviet welfare benefits. This provides for greater local flexibility but at the price of systemic inflexibility because one is reluctant to leave an employer if one cannot transfer accumulated benefits. There also is the problem addressed above of opportunities for other firms to exploit benefit and protection differentials. Finally, there is the problem that workers, and of course nonworkers, not covered by such protective arrangements will not be protected at all, indeed may even be the recipient of residual economic risk and injury. A comparable consideration is that what will work, by some criterion, for large corporations may not work for small firms. This can be understood to be a general problem but also one which is still more critical if the economy is understood to be divided between a multiplicity of more or less price-competitive and exposed firms, and relative few largely, but by no means completely insulated, corporate giants who administer their own profits and markets.

Our fourth critical consideration also is one on which it is easy but extremely presumptuous to speak in a seemingly conclusive fashion. Nonetheless, the point is important. With rights, we are tempted to urge, must go obligations. Precisely what they are to be must be worked out; certainly it involves the potential surrender of valuable advantages, perhaps even of rights. For *illustrative* purposes, were labor unions to succeed in acquiring the protection sought in the IAM Bill of Rights, arguably one could urge, in the name of greater economic flexibility and openness, that dubious work rules be eliminated, that jurisdictional disputes be severely moderated, that protectionist opposition to patently beneficial technological innovation be reduced, and perhaps even that restraint on wage increases be exercised, and that more use be made of binding arbitration.

IX.

Let us consider a variety of arrangements each of which arguably possesses certain capacity to enhance the position of workers *vis-a-vis* technological innovation. Let us also note that each arrangement may have significance in terms of larger and/or different considerations than those relevant to this discussion.

(1) One method of enhancing labor's position, specifically the position of individual workers, is through the adoption of employee stock

option plans (ESOPs). These can have the effect of both enhancing worker interests in the financial and operating viability of the company for which each works as well as securing a form of nonlabor income, dividend income and appreciation from property. Of course, employees can prefer the opportunity to pursue other investment, or consumption, options. Indeed, the criterion of diversification of risks may suggest that worker security portfolios not be heavily weighted in the stock of the company for which they work. Moreover, such a solution can at best cover only a modicum of insecurity and for only a fraction of the society.

(2) Another method is the creation, in part through the modification of existing programs, of effective and honored programs which establish a social floor (or minima) below which worker income will not be allowed to fall in the event of economic dislocation or disaster. A society which recognizes the exigent necessity of a job in order to have income will not only promote effective full employment policies but, also recognizing the collective nature of productivity, will provide unemployment compensation and perhaps other supplements in order to maintain an effective floor of protection. This can occur apropos of both cyclical and technological (and other structural) unemployment. To the extent, paradoxically, that other programs are successful, such as full employment and manpower training, such programs will be of generally secondary significance but of great personal importance for those who must avail themselves of their benefits.

Much to the same effect would be institutionalization of a guarantee of employment and adequate income. This could be achieved through programs implementing government as the employer of last resort and wage supplements. The point is to recognize and give effect to an overriding social obligation to provide employment and income.

(3) Extremely important is the adoption of effective manpower training and retraining programs. These programs must be directed to and available for both the unemployed, or prospectively unemployed, and the underclass who have as yet not been socialized into the labor force. There must be general training programs, union apprenticeship programs—whatever array is necessary to train, upgrade, retrain, and modernize worker skills, skills which are necessary simultaneously for the collective productive enterprise and for the individual earning of incomes.

The United States has a long way to go in manpower training programs. Existing programs have often trained workers for jobs that were not in increasing demand. Also, the "training" programs often involved

little real training. Finally, the programs often failed to devote attention to placing workers in jobs. Retraining programs will have to be redesigned to avoid the problems which have arisen in the past. Retraining must be technically effective, for jobs which will exist, and in an environment of adequate aggregate effective demand. Moreover, retraining for the purpose of producing enhanced supplies of certain skills should lead to the production of new output and not the driving down of the wage rates of workers already in the market.

We must appreciate that job creation, through full employment policies, and manpower retraining are very attractive, for the reasons given above and also specifically because the displaced workers are likely candidates for re-employment. But manpower retraining programs cannot be allowed to retain the image that they are for failures or losers. Such programs must be recognized by all as a vital component of the collective productive enterprise.

Other countries, principally in Western Europe, have developed and utilized manpower training programs as part of larger national ventures. In Sweden, for example, the combination of full employment policies and manpower retraining programs (along with "subsidized" income supplements) has meant that workers have come to share with employers a recognition that technological proficiency is necessary for domestic full employment, competitive position in foreign trade, and profitable business enterprise. As in France, manpower training programs are coordinated with other collective efforts, private and public, to channel investment and production in desired directions, thus generating training in advance and in anticipation of needs. Manpower training programs can be vital and contributing factor in a technologically progressive society. They can be programs in which participation carries no stigma of failure but rather the badge and prospect of continued participation and advancement.

(4) Sweden, it also may be pointed out, has an array of public and private arrangements which promote full employment and price stability which generally have been quite effective in the past (although somewhat less so in recent years). In addition to the usual array of government monetary and fiscal policies, the Swedish government employs countercyclical public investment programs in areas of ordinary public production of social capital, such as roads, public buildings, public utilities, and so on. Local governments are accommodated by the central government in participating in such programs. In addition, tax laws provide lower corporate net income taxes for corporations which set aside in an investment reserve fund monies which are spent or not

spent in accordance with countercyclical policies and timing established by the government. Thus, both public and private spending readily can be generated to combat prospective contraction, and both spendings can be moderated to combat prospective inflation, all with minimal jockeying for legislative favor and largesse, because the enabling statutes are already in place and ready for use.

(5) Certain Italian experience also is suggestive. In the Italian automobile supply industry, small firms which have developed through subcontracting have generated both the learning of new skills by artisans and the development of new technology and skills in nonautomotive lines. These firms are centers of technological creativity in which the workers themselves are prime movers. The implication is clear: Notwithstanding the decline of the United States automobile industry, there are thousands of skilled tool and die makers, machine shops, and other firms which have constituted the infrastructure of the auto industry. They comprise a resource which can be further developed and can contribute both to the collective productive enterprise and to jobs and career opportunities for the present and future generations of highly skilled, indeed technologically proficient, workers. Conceivably this can be part of a larger program to develop flexibility in production, variety in outputs, and stream of innovation, with quality products now geared to the mass market, now geared to special needs, all based on skills that cannot be simply transferred or easily replicated or reproduced. This can be done in large corporations but it also can be done, and perhaps more readily, in small enterprise, thereby also nourishing competition, a powerful base for high technology, production flexibility, capacity for product modification, output diversity, and opportunities for innovation, all with the universal further development and dense application of labor skill. One also can envisage sets of geographically proximate if not contiguous firms with complementary skills and capabilities, sharing their skills and machine facilities informally and collaborating through cooperative arrangements for the provision of jointly required inputs and the production and marketing of jointly produced outputs. There also is some relevant Japanese experience which can be drawn on in such matters.

(6) Other Japanese experience is perhaps even more suggestive. In addition to the (nonuniversal) practice of lifetime employment, apropos of which workers are protected against technologically (and otherwise) based dislocation by internal policies which effectively consider worker incomes an overhead cost, workers systematically share in the net benefits of technological innovation through biannual bonuses based on en-

terprise profits. Workers are thus given protection in a manner which at the same time constitutes incentives to promote technological innovation, as is accomplished through other institutional arrangements, for example, in Sweden.

It is possible to institutionalize through collective bargaining the obligation of individual companies to retain workers except, perhaps, in the most extraordinary circumstances of financial exigency. Doing so would create incentives within the firms for the effective retraining of workers. The problem here is that competitors not so obligated will tend to have market advantages. This may suggest that legislation could operate to institutionalize such arrangements in the large corporations, though the competitive problem would still arise in re small competitors. The point is to create institutions with the socially functional incentives.

In this and in other connections, it may be pertinent to point out that Japanese and other Western European managers tend to have longer profit horizons than does United States management, and perhaps tend to devote somewhat less attention to short run cash flow and to financial maneuvers geared much more to corporate power (and security) through diversificatory acquisitions often directed at cash flow and much less to considerations of enhanced physical production.

X.

One of the principal concerns which seems to have led to the IAM proposal for a New Technology Bill of Rights is the threatened displacement of skilled workers. Surely the acquisition and utilization of skills is satisfying to the worker and of value to society. Surely, too, the premiums which skilled workers command are at least in part a function of their relative scarcity; if the supply of skilled workers were larger, their utilization may be no less enjoyable, but they likely would command lower relative incomes. Moreover, as is the case with the professions, there may be a tendency for the skilled to use their skills as a weapon over others; arguments predicated upon skill tend often to be as presumptive as many others and to be used as reinforcers of established power positions.

Perhaps the critical point, however, is that the continued development of skills is more important than the maintenance of protected markets for already acquired skills. Yesterday's skilled craftsman can be today's and tomorrow's skilled technician, engineer, or programmer. The robotic displacement of skills likely means demand for new skills.

Once again the distinction must be drawn between the right to the job which one is in and the right to a job. Surely, too, in a dynamic world of technological innovation the already skilled tend to have the advantage over the unskilled in regard to the learning of new skills, even though they may prefer to maintain the status quo of their old skills, sometimes also to the disadvantage of consumers.

If it is true, or to the extent that it is true, that the concern over displacement of skills is a defensive reaction, such reaction may be overcome or finessed by effective retraining programs both within and outside of industry. Without denigrating the instinct of workmanship engendered by skilled work and all the pride and joy that goes with it, the critical problems arguably are, first, jobs per se, and, second, minimal dislocation and adjustment problems. In a society in which such problems were largely avoided, the progression from skill to skill through retraining in response to technological innovation would be itself a matter of pride rather than the occasion for fear.

That workers, especially skilled workers, engage in defensive maneuvers and arguments, is neither surprising nor indefensible. The possession of skills constitutes the effective property holdings of workers and there is no reason why they should be less interested in the defense of their positions than any other owners of property.

XI.

Much of the IAM Bill of Rights amounts to further extension of the participation by workers, or their representatives, in the decision-making process of the organizations for which they work. There are two important but contrasting points which we want to make here. First, if one believes that individuals should participate in the making of decisions which directly, and perhaps indirectly as well, affect them, then worker participation in what hitherto has been the preserve of management is to be applauded. Without economic democracy, it can be and indeed has been argued, political democracy may be a sham. If the boss on the job has the prerogatives of the landlord of the feudal past, the worker is still the hired hand, a second class factor of production and, by extension, citizen and being. Second, however, it seems to be the case that under worker-managed systems not all workers are interested in taking advantage of opportunities to participate in decisionmaking. A group of workers with an interest in managing tends to assert itself and, what is more, to be willingly allowed to do so by the other workers. Quite aside from other sources of managerial hierarch-

ism, this development, which may or may not be inevitable, suggests that worker participation in decisionmaking is important to workers only to the extent that they do not have it and that when they have it they take it for granted. Decisionmaking participation may have scarcity value. But perhaps the problem needs to be restated. Perhaps the problem is not whether every worker participates in decisionmaking but that there is a system of worker participation and, moreover, that the strong tendency for a class structure to develop in United States industry be reversed. Managerial positions tend not to be filled by promotions from the ranks of nonmanagerial workers. Both managerial workers, who tend to consider themselves a class apart (which, because of the careers of their fathers, and increasingly their mothers, and their education, they culturally are), and workers, to whom their *job* is so important, view each other with distrust and antagonism, each attempting to retain, if not to enhance, whatever advantages they already have. If control over work, control per se, is the problem, then a new set of mores, a new industrial common law, must be evolved which converts what is now so much a zero-sum game into a positive-sum game. To say that such should be done is not to establish how it can be done or what the result will look like. As suggested earlier, the parties will have to work out the solutions, not have them laid down for them by experts.

XII.

Although it is an abstract and trans-systemic matter, the fundamental underlying institutional problem is the existence in all economies of the wage system in which some persons work for other persons. For all the rhetoric which accompanies socialist movements and socialist regimes, no socialist theorist or system has found a substitute for the wage system. Some substitute system, which it is beyond our competence to construct, no doubt will have its own generic problems. But it is important to understand that many of the problems addressed in this article arise or acquire their specific form due to the universal predominance of the wage system.

XIII.

On a more practical level, the IAM is concerned about technological displacement of its skilled membership. Other unions are concerned about management calls for wage cuts and other concessions. It may be that the more immediate threat to the union movement is a revitaliza-

tion of the efforts by management to deunionize, or further deunionize, United States industry.

XIV.

But there is another phenomenon which, it seems to us, transcends both technological displacement and deunionization so far as the future welfare of United States workers is concerned. This is the internationalization of the labor market to an extent never before realized and probably never before contemplated. With the growth of the multinational corporation, corporations no longer fully identify with their country of incorporation, with the country of citizenship of its officers, such that it is sort of second nature for them to produce in that country and hires its nationals. Multinational corporations now have a planetary horizon and will locate plants around the world using the same decisional criteria hitherto used within a country, a principal difference now being that foreign labor becomes increasingly substitutable for domestic labor, thus forming, or taking advantage of a newly formed, world labor market. The adjustment and displacement problems due to this are likely to swamp those due to technological innovation, although, of course, the two are not unrelated. One irony here, of course, is that direct and indirect government subsidization of corporate foreign investment has contributed to these developments. So much for the fiction and illusion that markets are immune from government action, for good or bad.

XV.

We conclude thus. Jobs as a means of access to income are critical for most persons. The consciousness of workers accordingly is focused on their jobs, not on something designatable as "careers." For those who organize production, whether they be capitalists, entrepreneurs, managers or commisars, the economy is largely a game in which they engage in moves and strategies in pursuit of more meaningful self-identity, prestige and status, income and wealth, and meritocratic career. The game performs a social function[s]: it enables the production of output with which people live and in the production of which they are themselves produced. If the economic game cannot be conducted in a way which provides jobs, income, and satisfaction for all, then it must be reckoned a failure. Those who have advantageous positions in that game risk more than they know or seem to realize. Considerations of

both humanity and expediency militate in favor of deliberate efforts to work out “better” solutions to the problems addressed in this article. Ideology and power will work only so far.

Epilogue

One of the principal themes of this article is that the impacts of technology are always mediated through social power, that it is power, not technology per se, that affects employment-unemployment. We would like to amplify the argument in the following manner.

First, there is an implicit assumption in the foregoing of a more or less conventional industrial labor force and industrial technology. We have not dealt with an important topic, namely, the way in which technology already has changed the United States economy and likely will continue to do so in the future. We mean the development of a service economy dominated by so-called high technology. A fundamental characteristic of this newly developing economy is the increased role of information, including its creation, manipulation, control and concentration. The power structure which controls technology and the operation of labor in the information society is likely to be quite different from that operative in the past industrial or machine society.

Second, this means that technology itself has an impact on the power structure and is not merely mediated through power. The technology of the future will place new and perhaps unique power in the hands of certain persons and groups. This may be particularly important if the culture of poverty operates to deprive the poor of the kinds of socialization necessary to acquire the new cognitive skills required for the information society.

Thus, on the one hand, power is capable of being reinforced by technology, while on the other, technology may change power structure. The latter is one of the unintended social impacts of technology.

Third, while we focus on a broad, aggregate notion of technology, we are aware, and indeed stress, that technology is not homogeneous in its social impacts. While there are imperative aspects of technology, there also are choice aspects of technology, that is, we often have a choice of the specific instrumentation or adoption of technology within a given aggregate technology. Thus there are certain combinations of technological characteristics (smaller scale, less complexity, less centralization or concentration of power, etcetera) which have “softer” social impacts, while other “hard” impacts come from the same technology with opposite characteristics.

Fourth, we reiterate our assumption of a continuation of the private enterprise-type economic system. We have focused our analysis on technology not to avoid the more ideologically loaded issues of power, stratification, and so on. Indeed, we have stressed power as both a dependent and independent variable, along with technology itself. We do not denigrate consideration of more fundamental change(s) in the economic system than we have discussed—although we continue to stress the great difficulties necessarily encountered in designing and predicting the outcomes of such major changes, including the role of wishful thinking.²

2. We wish to acknowledge the help of Denton Morrison in preparing this epilogue.