answers to these questions—answers that take us beyond the labor process into the state, the school, the family, and the culture industry or that rely on the construction of a Marxist psychology. In this study I will selectively appropriate the insights of these developments but will relocate them within the labor process. I will return to Marx's focal concern, but with the ammunition of Marxism.

Conclusion

The defining essence of the capitalist labor process is the simultaneous obscuring and securing of surplus value. How does the capitalist assure himself of surplus value when its production is invisible? Marxist theories of the labor process have frequently referred to fragmentation and atomization of the working class at the point of production—essential features of the obscuring of surplus value—but these theories do not explain how surplus value is secured.[30] Obscuring surplus value is a necessary but not sufficient condition for securing surplus value. In other words, it is necessary to explain not only why workers do not act according to an imputed set of interests but also why they attempt to realize a different set of interests. The labor process, therefore, must be understood in terms of the specific combinations of force and consent that elicit cooperation in the pursuit of profit.

By examining changes in the labor process at one particular factory over a period of thirty years I hope to illuminate the mechanisms of organizing consent on the shop floor, of constituting workers as individuals rather than members of a class, of coordinating the interests of labor and capital as well as those of workers and managers, and of redistributing conflict and competition. In short, I shall discuss the mechanisms through which surplus value is simultaneously obscured and secured, in addition to those outlined above; this is the subject of parts 2 and 3. In part 4 I shall show how variations in markets and imported consciousness have effects only within limits defined by the labor process, and in part 5 I shall explain the source of those changes in the labor process that enhance its capacity to obscure and secure surplus value.

2

Changes in the Labor Process

Three

From Geer Company to Allied Corporation

The particular plant in which I worked for ten months as a miscellaneous machine operator between July 1974 and May 1975 and which constitutes the empirical context of my inquiry is the engine division of a multinational corporation, referred to here as Allied Corporation. For eleven months, between October 1944 and August 1945, Donald Roy worked in the same plant as a radial-drill operator. It was then part of what he called Geer Company. On the basis of his observations, Roy wrote a series of seminal studies on restriction of output.[1] I shall liberally refer to his voluminous doctoral dissertation, which vividly portrays life on the shop floor at the end of World War II.

Roy was interested in why workers do not work harder, and at one point he even goes so far as to measure the time "wasted" on the shop floor.[2] Yet, in recording his observations, he continually refers to the authoritarian system into which he had been inserted and how management treats workers as "yardbirds." Thus, the concluding paragraph of his dissertation reads:

> The hunch here is that somewhere in the continual reciprocal interplay between the hostile communication of mutually threatening "bosses" and "Yardbirds" and the divergence of the norms of their respective groups lies an explanation for restriction that can point to procedures for its substantial reduction. Administrative adjustments of the piecework incentive may effect some gains in worker output, but production cannot be expected to approach potentialities until major operations of reconstruction change basic group relationships. The institution of a participative social structure, in which Yardbird Man assumes first-class citizenship, may solve the problem.[3]

Beginning where Roy ends—that is, beginning with the "authoritarian system"—the logical question becomes: Why do workers work as hard as they do?

In the period when Roy undertook his research, the most natural and important work to respond to was Roethlisberger and Dickson's *Management and the Worker* and the writings of Elton Mayo. Roy's major contribution has been to cast doubt on the universal validity of the conclusions then being drawn from the Western Electric studies.[4] Nevertheless, his dissertation does provide many insights into the sources of cooperation as well as noncooperation. Unfortunately, the restricted framework in which he posed his questions went along with the "closed system" analysis that was then dominant in studies of industrial relations (particularly those influenced by the Chicago School).[5] The environment was generally ignored, and the study stopped at the factory gates. In addition, Roy's observations are entirely limited to what went on around him while he worked on second shift. What he could not gather from participant observation is not to be found in his work. We therefore learn virtually nothing about Geer Company, the union, other departments, the nature of various markets, and so on. His insistence on being a closed (secret) participant observer imposed serious limitations on the material he could collect. My own approach was very different. I took the job with the explicit consent and knowledge of management as to why I was there. They agreed to provide me with access to managerial records and data. In assessing changes since 1945, I have had to reconstruct the social and economic context of

Geer Company from interviews with management (particularly with retired managers) and workers, from odd comments in Roy's thesis, and from information available in business journals.

The task of this chapter will therefore be to place Geer Company and Allied Corporation in their different social and economic contexts. In the following chapters I will compare Roy's observations, supplemented by my reconstructions, with the organization of work as I found it in 1974–75.

Geer Company in 1944

Geer Company began operations in 1881 at a railroad junction in southern Illinois. It produced railroad supplies and moved to the Chicago area around the turn of the century. In the first few years it became involved in the manufacture of two-cylinder air-cooled engines and then, between 1910 and 1920, entered the booming business of automobile engines. It was one of the first companies to make an eight-cylinder engine. Competition in the automobile industry forced Geer into a new market—engines for trucks. It became one of the leading producers in the field. The railroad-supplies business dipped in the first quarter of the century, and Geer entered into the production of diesel engines in the late twenties. In 1933 it negotiated a contract with the Navy for the manufacture of diesel engines for lifeboats. After World War II began, demand for engines soared, and, like so many other companies in the defense industry, Geer rapidly expanded from a jobbing shop, with net sales of about $3.5 million and net profits of around $41,000 in 1939, to a relatively large concern, with net sales of $45.5 million and net profits of $907,000 (see table 1). In other words, there was a fifteen-fold increase in sales and a more than twenty-fold increase in profits. As regards the number of employees, before the war there were less than 1,000; at the end of the war there were almost 4,000.

At the beginning of the war Geer also got involved in the lift-truck business and in producing engines not only for cars, trucks, and lifeboats but for tanks and even airplanes. Just before he left in September 1945, Roy received the following V-J Day statement from the president of the company:

Table 1 **Annual Financial Position of Geer Company**

Year	Net sales (In millions)	Net profits (In thousands)	Earnings per Share of Common Stock	Number of Employees
1936	$ 3.7	$ 199.4	$8.86	880
1937	5.4	354.9	1.93	535
1938	3.5	156.3	0.84	n.a.*
1939	3.5	41.3	0.22	739
1940	4.3	113.6	0.62	1,278
1941	12.3	615.4	3.34	n.a.
1942	24.8	788.4	4.21	2,675
1943	36.7	900.1	4.81	3,780
1944	45.6	942.6	5.04	3,922
1945	45.4	906.9	4.85	2,694
1946	22.8	977.7	4.72	2,429
1947	30.5	1,832.9	4.43	2,500
1948	26.0	1,101.4	2.66	2,500
1949	22.4	707.6	1.71	1,450
1950	17.7	656.4	1.59	1,568
1951	29.2	1,127.6	2.72	n.a.
1952	40.5	1,075.6	2.60	n.a.

Source: *Moody's Industrials.*
*Not available.

The Geer Company is now 64 years old and has built up a world wide commercial trade in several important industrial fields where it expects to expand with the cessation of wartime demands.

Nearly all Geer products are readily adjustable to peacetime use, such as all types of gasoline and Diesel engines, railway maintenance products, earth drills, multiple gauge railway cars, industrial chore boys, and other leading lines.

In consequence, although Geer will be affected similarly to other companies, having gone "all out" for four years building products for the armed services and lend-lease, by cancellations and adjustments of present governmental products, we feel that this company has a vast future of peacetime activity immediately ahead and we are planning to successfully compete for this actual and prospective increased commercial business.

During 1945 Geer employment mounted to near the 5000 mark, and to date there have been virtually no layoffs. Geer now has effected reduction of the 48 hour week to 40 hours, working on a five day basis, and this will, of course, spread the work to

take care of many employees. Geer has enjoyed excellent management-labor relations during the entire war.

During the adjustment period there is bound to be some cutback in employment, but Geer hopes to keep this as low as possible and to continue to increase its commercial production, including export trade. The fact that Geer products are so readily adaptable to commercial use and that Geer has a reputation all over the world makes us confident that Geer can soon show a peacetime advance that will compare favorably with any other company.[6]

Geer's wartime success is an example of the economic boom that lifted the entire economy. Thus, in the United States as whole, corporate profits rose from $9.3 billion before taxes in 1940 to $24.3 billion in 1944, or, after payment of taxes, from $6.4 billion in 1940 to $10.8 billion four years later.[7]

By contrast, labor was expected to exercise self-restraint during the war. The United Steelworkers of America established a local at Geer Company in 1937, and that was when the first contract was signed. During Roy's sojourn in the Jack Shop, he experienced only negative attitudes toward the union.[8] Here, again, Roy's observations must be seen, at least in part, as a reflection of wartime conditions.[9] As Joel Seidman remarks:

> To too great an extent there was a tendency [during the war] to treat the wage dollar as inflationary, but to look upon the salary of the executive or the earnings of business as a necessary incentive to peak production and a proper reward for competent performance. The outcry by supporters of the Little Steel formula against Roosevelt's proposal to limit income after taxes to $25,000 a year suggests that many who examined the problems of consumer purchasing power suffered from a pronounced class astigmatism.[10]

After 1942, the Little Steel formula stabilized and in effect froze wages at their January 1941 level.[11] At Geer Company the minimum wage rose from 62.5 cents an hour in 1937 to 75 cents an hour in 1942 and to 80 cents in 1945. In addition, following Pearl Harbor there was a general freeze on labor mobility, and this reduced the bargaining power of management, since firing a worker was difficult.[12]

> Owing to the general shortage of labor that existed at the time of the writer's employment in the Jack Shop, transferral, instead of firing, was used as an extreme disciplinary measure. Many workers would have welcomed being fired.
>
> "No, they won't can you. A while back one of the tool grinders got sore, and tried to quit, but, they wouldn't release him. He tried to get canned by laying off three days at a time, coming in late, and sitting down on the job and refusing to grind a tool except when he felt like it. He did a couple of hours work a day. Finally he refused to grind a tool for the superintendent; but still he didn't get canned. They finally transferred him to day shift."[13]

At the same time, the labor freeze reduced the bargaining strength of workers, since they could not voluntarily quit:

> If I could get another job without waiting sixty days for a WMC referral, I would have walked out of this place long ago. That sixty day wait gives a man plenty of food for thought, especially if he is supporting a family.[14]

As one of their contributions to the war commitment, union leaders in the A. F. of L. and CIO entered into a no-strike pledge with the government.[15] In return, union leadership was granted security of membership, which allowed unions to maintain, and in some instances to increase, membership. Management was encouraged to assist unions by implementing checkoff systems. One of the very few occasions on which Roy ever set eyes on a shop steward was soon after he had begun work, when the steward came round to ask him to sign a checkoff form. Overall union membership expanded during the war from 10.3 million workers to 14.8 million. By safeguarding union membership and, above all, the unions' financial status, the maintenance-of-membership clause dampened the militancy of union leaders and drove them apart from the rank and file. In many industries union-management relations were routinized during the war under enforced industrial peace. Collective bargaining and the institutionalization of the union function as an agent of enforcing worker discipline spread to many sectors of the economy.[16] Fringe benefits also increased in many industries as a substitute for wage increases.[17]

The combination of union cooperation with government imposed restraints on labor, backed up by military force where necessary, and

the processing of unresolved grievances through the overworked War Labor Board left workers defenseless against managerial abuses. Bad working conditions, long hours, and the accumulation of unresolved grievances created widespread discontent.

> In prewar years the strike weapon often backstopped local grievance procedures and provided an incentive for management to resolve grievances at the lowest possible level. But with the adoption of the no-strike pledge this incentive evaporated and grievances left unresolved were dumped into the lap of a distant and cumbersome War Labor Board. Local unions found themselves "plagued by a malady of unsettled grievances" which undermined the solidarity and effectiveness of the union.[18]

The response from the rank and file was frequently militant action in the form of wildcat strikes, walkouts, or sitdowns. While 1942 was a quiet year for strikes, discontent mounted in succeeding years, and in 1944 the number of strikes reached an all-time high. Most of these were relatively short wildcat strikes, always staged in opposition to the union, except, of course, in the case of the United Mineworkers.[19] In Geer Company, Roy reported one walkout, prompted by the company's failure to fire an employee who refused to join the union, and one sitdown strike, which concerned the prices of piece-rate jobs and the lack of warm water for washing up.[20]

With the collapse of much of the government business after the war, Geer Company had to reorganize and reduce its volume of production, but it continued to operate most of its lines, consolidating the materials-handling department, where lift trucks were built, while allowing some of the railroad supplies to be phased out. Table 1 indicates the changing fortunes of Geer Company and its employees after the war.

The Decline of Allied Corporation

After the war, Geer Company began selling diesel engines to a construction-equipment company that was subsequently bought out by Allied Corporation. Allied Corporation had always been in the top 100 United States industrial corporations as measured by net sales. Before World War II, *Fortune* had referred to Allied as

America's Krupp: "Its enterprises were so numerous that it believes only one other company in the world—Krupp of Essen—is capable of producing a greater assortment of those primary tools with which man wrests goods and power from the earth." With annual sales of around $500 million, Allied Corporation was a giant compared to Geer, which had annual sales of $30 million.

Farm and construction equipment were Allied's biggest money-makers, even before the war, while their capital goods accounted for large net sales but made little profit. The main area of expansion has continued to be in agricultural and construction equipment, and a number of lines in the capital-goods business have been dropped. Whereas the immediate competitors of Allied's Tractor Division, as it was called then, built their own engines, Allied was still buying its engines from outside suppliers, such as General Motors. Having immediate access to and direct control over one's own supply of engines offered such competitive advantages that it was only a matter of time before Allied would develop its own engine division. Geer Company, which was now selling diesel engines to Allied, was an obvious candidate. Allied bought out Geer in 1953. From the point of view of the Geer shareholders—mainly confined to a single family, although a number of executives also held stock—the take-over was very lucrative. During the war the plant had been worked to its limit, and after the war management had allowed the plant to run down. It was in poor shape. There had been relatively little reinvestment of profits. Machinery needed replacement, and the factory building was in poor repair. I shall return later in this chapter to what became of the engine division. In the next few paragraphs I wish to describe the postwar fortunes of Allied Corporation as a whole.

Renowned for its paternalistic and conservative labor policies, Allied Corporation experienced an eleven-month strike at its major plant in 1946. In succeeding years it recovered, and until 1952 it was, according to *Forbes,* "the apple of Wall Street's eye due to its remarkable sales growth and intelligent diversification." However, in the two decades after 1952, Allied entered upon a course of setback, crisis, and decline. Earnings per share fell from $4.09 in 1951 (an all-time high) to 57 cents in 1961, when it experienced its first crisis, and then dropped further, to 47 cents in 1967. For reasons that I will briefly explain, in 1968 earnings showed a net loss

of $5.24 per common share. After hitting the low point of 42 cents per share in 1971, earnings rose, reaching $1.77 per share in 1974. To what can we attribute the decline of this powerful multinational corporation?

When Harrington took over as chairman and chief executive officer in 1951, he instituted a program of centralization, with the following results, as reported by *Business Week:*

> Some executives were overloaded and unable to function effectively. For instance, when Geer Company was acquired in 1953, it became a separate third division, but its sales force reported to the general sales manager of the Tractor Division.... To complicate things further, the Tractor Division had four different businesses to oversee.... Says a Geer man: "The sales manager had 68 people reporting to him and was trying to oversee 16,000 altogether from his desk in a corner of Allied Corporation's headquarters."

Also, according to *Forbes,* Harrington had so overbuilt the company that in 1961, for example, it was operating at only 60 percent capacity.

At a time when major corporations had long since passed from centralized, functionally departmentalized divisions to decentralized, multifunctional divisions,[21] Allied Corporation was moving in the opposite direction. Accordingly, when Crosland took over as chief executive in 1955, he immediately reorganized. The two major divisions were split into five. Geer remained separate. Nevertheless, Allied Corporation retained an anachronistic organizational structure. It was only in 1962, following a further crisis, that Allied Corporation brought in consultants. According to *Forbes:*

> It was apparent to both Crosland and to the outside consultants that Allied Corporation's old-fashioned corporate organization was hampering the company as much as were its manufacturing facilities. Allied had continued to group its men in departments by the jobs they performed: sales, engineering, production. It had never gotten around to grouping them by the more modern concept of the markets they served.

The general manager who took over the engine division in 1957 told me, "Yes, Allied has been in trouble, but that is because we made the change to decentralized, autonomous divisions, each

responsible for showing profit, much too long after everyone else."

But the pattern of corporate organization was not the only problem. Originally the principle of industrial diversification was based on the logic that, if one line should suffer a decline in any one year, it was likely that another line would do well and compensate. The overall strength of the company would thus be maintained. *Forbes* commented in 1961 on Allied's failure compared with its competitor's success in this regard:

> . . . the very proposition on which Allied Corporation's diversification was based had gone sour. One capital goods cycle was supposed to balance another. Farm equipment with a rhythm of its own was to provide further balance. But all of the cycles went down at once.

But the most fatal drawback to the strategy of diversification was that, in each of the product lines in which it specialized, Allied Corporation was far weaker than its rivals, who were both less diversified and had bigger sales than the entire Allied Corporation and therefore operated on significantly higher profit margins. In 1969 *Forbes* noted, "In nearly every field Allied Corporation is too small, too old. Its competitors benefit from larger volume, newer plants, and widespread integrated manufacturing and marketing facilities." Summarizing Allied's disastrous performance in 1961, *Forbes* commented:

> . . . Allied Corporation [was left] with a net profit margin of less than one cent on the dollar, barely a quarter of what it was earning a few years ago. Of Allied's major rivals . . . no one was taking this kind of beating in 1961. Most, in fact, were at least holding their own and many were showing improved results.

Its problems were compounded by an expensive antitrust case, which cost the company $127,500 in court-imposed fines and more than $20 million to settle suits filed by customers.

Apart from reorganizing the corporate structure, Crosland cut back his labor force in 1962, and salaried employees took a pay cut. Allied Corporation also bowed out of a number of the capital-goods markets in which its reputation had originally been established.

There was a clear reluctance to take such steps, as *Fortune* reported in 1967:

> Crosland's view of management still remains largely passive. An associate once heard him compare Allied Corporation to a log floating down a stream, which is the economy, and its executives to ants trying to cling to that log. Even when things looked brightest, company statements attributed the bulk of sales and earnings growth to increased demand and gave almost no credit to management's actions.

The year 1967 was a trying one for the corporation and its new chairman, Hillary. Most of the year was spent fighting off suitors who were attempting to buy out Allied Corporation. Among those showing an interest were the Ling-Temco-Vought corporation, General Dynamics, Signal Oil and Gas, City Investment, and Gulf and Western. The most serious challenge came from Ling-Temco-Vought, but it backed down, for reasons that remain obscure, when the directors of Allied Corporation turned down their second offer. The most sustained effort, however, came in the following year, from White Consolidated. Allied resorted to creating a new block of shares, which it sold to a Rockefeller interest and a large European automobile company. Hillary also took Allied into the household-appliance market in order, it was speculated, to establish an antitrust case against the proposed merger with White Consolidated. Eventually the latter withdrew.

Soon after assuming control, Hillary decided to write off in a single year the losses that were due to past mistakes. This raised a few eyebrows on Wall Street, but the Securities and Exchange Commission regarded it as legitimate. Accordingly, in 1968, Allied Corporation registered a $122 million deficit on its tax forms, though it presented this, by some intricate bookkeeping, as a loss of $54 million to its shareholders! Hillary set about streamlining the organization, cutting corporate staff from 1,510 to 138 and reducing employment by 3,400. After a few fateful years under his chairmanship, a boom in the farm-equipment business, together with the discontinuance of unprofitable products and the adoption of more successful ones, arrested the corporation's decline, at least for the moment.

The Fortunes of the Engine Division

What happened to Geer Company when, in 1953, it became a division of Allied Corporation? Not much. The takeover agreement left Geer management intact for at least another three years. There are reports of continual friction during the period between Geer management and Allied headquarters over such matters as production priorities and sales. Geer management maintained a diversity of products and sometimes resisted the immediate demands of the larger corporation. Some lines were gradually discontinued. First to go were some of the railroad supplies. Roy's Jack Shop disappeared in 1956. In 1957 the old general manager left, and a new man—Wilson—took over. He had had experience in running other Allied plants, and his task was to reorganize the old Geer Company.

Before he arrived, there was much concern on all levels of management that many personnel would be dismissed and new ones brought in. Wilson, however, decided to make do with the old management and replaced none. But he did introduce a number of other changes. He brought new tooling to the plant and began to plan for the movement into a new building. In 1961 the materials-handling department split off and became an independent division in another town. The engine division became formally constituted as such and moved to a new plant about a mile from the old one. In line with changes taking place throughout the corporation at that time, Wilson initiated new relations with the other divisions of Allied Corporation. As part of corporate policy, each division was now placed on a profit-making basis, and, before it could buy engines, its purchasing department had to sign a contract indicating the size of the order and its duration. Each purchasing department, whether of the tractor, lift-truck, or construction-equipment division, would be held to the original contract or incur penalties for its violation, even though the agreement was between divisions within the corporation. In this way the engine division was able to finance tooling without risk to its profits. Nevertheless, the engine division was to remain a service division within the corporation. The prices at which engines were to be sold were negotiated each year and fixed in a way that left only the slimmest of profit margins for the engine division.[22]

Orders from within the corporation naturally took priority over any commercial venture the engine division could establish for itself outside Allied. Yet it was the outside business that was profitable and provided the basis for expansion. Accordingly, incentives for top management in the division were not based on commercial ventures, which frequently ran counter to the interests of the corporation as a whole, but on the fulfillment of annual plans, which established a range of targets for the year's production.

Conclusion

From this brief narrative history it is possible to isolate two sets of forces that shaped the changes that occurred in the organization of work at Geer and Allied between 1945 and 1975. The first is the secular changes in the labor process due to the consolidation of the new patterns of industrial relations that emerged during World War II. Superimposed on such "processual" change, which affected the entire organized sector of the economy, is the "situational" change experienced by Geer Company. In 1945 it supplied engines, railroad jacks, lift trucks, and other equipment to a number of companies as well as to the government. In 1975 the plant served as an engine division of a large multinational corporation. The effect of this movement from the competitive sector to the monopoly sector has to be disentangled from the independent effects of historical change affecting the United States over the past thirty years. I shall turn to this task in part 5, but first I must specify the nature of the change I am seeking to explain.

Four

Thirty Years of Making Out

The study of changes in the labor process is one of the more neglected areas of industrial sociology. There are global theories, which speak generally of tendencies toward rationalization, bureaucratization, the movement from coercive to normative compliance, and so forth. There are the prescriptive theories of human relations, of job enrichment, job enlargement, worker participation, and so on, which do express underlying changes but in a form that conceals them. There are attempts to examine the implications of technological change for worker attitudes and behavior, but these do not examine the forces leading to technological change itself. There are also theories of organizational persistence, which stress the capacity of enterprises to resist change. The few attempts at concrete analysis of changes in the labor process have usually emerged from comparisons among different firms. Such causal analysis, based on cross-sectional data, is notoriously unsatisfactory under the best of conditions, but when samples are small and firms diverse, the conclusions drawn are at best suggestive. As far as I know, there have been no attempts to undertake a detailed study of the labor

process of a single firm over an extended period of time. Thus, my revisit to Geer, thirty years after Roy, provides a unique opportunity to examine the forces leading to changes on the shop floor. In this chapter I am mainly concerned with documenting the nature of those changes, leaving their explanation to later chapters.

Technology

Whenever technology changes its character, it has a transformative impact on the organization of work. However, the study of technological innovation and adoption is still in its primitive stages. Apart from the conventional models of neoclassical economics, which stress the cumulative role of science in the pursuit of ever greater efficiency, there have been few attempts to examine the political and social forces leading to technological change in advanced capitalism. A notable exception is the recent work by David Noble, which suggests that capitalists choose among available technologies not only to increase productivity but, in addition, to gain control over the labor process and push smaller capitalists out of business.[1] A recent study of the mechanization of harvesting shows that growers develop new technologies but that adoption is contingent on the level of class struggle.[2]

Undoubtedly the examination of the forces leading to technological change is important. However, if we are to understand the changes in the labor process that are brought about by social imperatives other than those introduced by new machines, we must keep technology constant, since it would be impossible to isolate its impact. Fortunately, machine-tool technology, in its principles at least, has remained relatively constant over the past century, with the exception of the recent development of computer-controlled machines. It therefore provides a useful basis for studying "nontechnical" sources of change in the organization of work. Thus, the machine shops described in the writings of Frederick Winslow Taylor bear a remarkable resemblance to those of Geer and Allied.[3] The agglomeration of speed drills, radial drills, vertical and horizontal mills, chuck and turret lathes, grinders, etc., could be found in essentially the same forms in machine shops at the end of the nineteenth century as they are today. Even in the layout of its

machines, the Jack Shop, where Roy worked, closely resembled the small-parts department where I worked. The organization of work and the incentive schemes, as well as the various forms of output restriction and the informal worker alliances, all described by Roy, are to be found today and can be traced back to the turn of the century.

However, outside the small-parts department there have been major changes in technology, in the direction of increased automation. The most impressive change at Allied came in the machining of rough cylinder-block castings. First introduced at a Ford plant in 1935, these monstrous integrated machine tools are programmed to perform several operations simultaneously (milling, tapping, boring, drilling, grinding, etc.) at each work station before the cylinder block is automatically transported to the next work station. Despite, or perhaps because of, its sophistication, this elaborate technology was out of order much of the time. In some departments one or two computer-controlled machines had been installed, but they, too, seemed to experience considerable downtime. Generally, the wide variety and relatively small volume of engines produced at Allied made it uneconomic to transform the technology of the entire plant, and, when new automated equipment was introduced, it frequently created more problems than it solved. As I shall suggest toward the end of this chapter, piecemeal technological innovation can easily become the focus of struggles on the shop floor.

Even in the small-parts department, by no means the most technologically sophisticated of the departments of the engine division, machines are now more reliable, flexible, precise, and so forth than they were in 1945. A very noticeable change from Geer is the absence of the huge belt lines that used to power the machine tools. Now each machine has its own source of power. In the remaining sections of this chapter I shall indicate how these small changes in technology have become part of, have facilitated, and have sometimes stimulated changes in productive activities and production relations.

The Piece-Rate System

In a machine shop, operators are defined by the machine they "run" and are remunerated according to an individual piece-rate incentive scheme. While machine operators comprise the majority of workers on the shop floor, there are also auxiliary workers, whose function it is to provide facilities and equipment as well as assistance for the "production" workers (operators). For each production operation the methods department establishes a level of effort, expressed in so many pieces per hour, which represents the "100 percent" benchmark. Below this benchmark, operators receive a base rate for the job, irrespective of the actual number of pieces they produce. Above this standard, workers receive not only the base rate for the job but, in addition, a bonus or incentive, corresponding to the number of pieces in excess of "100 percent." Thus, output at a rate of 125 percent is defined as the "anticipated rate," which—according to the contract—is the amount "a normal experienced operator working at incentive gait" is expected to produce and represents 25 percent more pieces than the base rate. Producing at "125 percent," an operator will earn himself or herself an incentive bonus that adds around 15 percent to the amount earned when producing at 100 percent or less. Earned income per hour is computed as follows:

Base earnings (determined by job's labor grade)
+ Base earnings × (% Rate - 100%) (if rate is greater than 100%)
+ Override (determined by job's labor grade)
+ Shift differential (25 cents for second and third shifts)
+ Cost-of-living allowance

In 1945 the computation of earnings was simpler. The system of remuneration was a straight piece-rate system with a guaranteed minimum. There were no extra benefits. Each operation had a *price* rather than a *rate.* Earnings were calculated by simply multiplying the number of pieces produced in an hour by the price. If the result was less than the guaranteed minimum, the operator received that guaranteed minimum, known as the day rate. If output was greater than that corresponding to the day rate, an increase of 25 percent in the number of pieces led to a 25 percent increase in earnings. How the day rate was determined was not always clear. It reflected not only the job but also the operator's skill. Thus Roy received a day rate of 85 cents per hour, but Al McCann, also working on a radial drill on second shift but a more experienced operator, received a day

rate of $1.10. The day rate on first shift was 5 cents lower than on second shift, so that, to make 85 cents an hour, Joe Mucha, Roy's day man, had to work harder than Roy. The price for a given operation, however, was the same for all operators.

The two systems thus encourage different strategies for achieving increased earnings. In 1945 Geer operators might fight for higher day rates by bargaining individually with management, but this did not guarantee them increased earnings if they were regularly turning out more pieces than corresponded to the day rate. Furthermore, the very operators who might be eligible for higher day rates would also be the ones for whom a guaranteed minimum was not so important. So the way to drive up income was to increase prices, and this could be accomplished either by fighting for across-the-board-increases on all prices or by fighting with the time-study man for improved prices on particular jobs. Operators did in fact spend a great deal of time haggling with time-study men over prices. These ways of increasing earnings are now relatively insignificant compared to two alternative methods. The first is via increases in the base earnings for the job and the fringes that go along with each labor grade. These are all negotiated at three-year intervals between management and union. Under the present system, the methods department is not necessarily involved in changes in the *price* of an operation, since this varies with base earnings. Increases in fringes, such as override, are also independent of the piece-rate system. The second method is to transfer to another job with higher base earnings—that is, of higher labor grade—or with easier rates. Frequently, the higher the labor grade, the easier the rates; for to encourage workers to remain on the more skilled jobs, of the higher labor grades, and thereby avoid the cost of training new workers, the rates on those jobs tend to be looser. In 1945, when earnings were closely tied to experience and less associated with particular types of jobs, transfer to another job was frequently used as a disciplinary measure, since it was likely to lead to reduced earnings.[4]

The implications are not hard to foresee. Whereas in 1945 bargaining between management and worker over the distribution of the rewards of labor took place on the shop floor, in 1975 such bargaining had been largely transferred out of the shop and into the conference room and worker-management conflict on the shop floor

had found a safety valve in the organization of job transfers on a plant-wide basis. As a consequence of changes in the system of remuneration, management-worker conflict has abated and individualism has increased.

Making Out—A Game Workers Play

In this section I propose to treat the activities on the shop floor as a series of games in which operators attempt to achieve levels of production that earn incentive pay, in other words, anything over 100 percent. The precise target that each operator aims at is established on an individual basis, varying with job, machine, experience, and so on. Some are satisfied with 125 percent, while others are in a foul mood unless they achieve 140 percent—the ceiling imposed and recognized by all participants. This game of making out provides a framework for evaluating the productive activities and the social relations that arise out of the organization of work. We can look upon making out, therefore, as comprising a sequence of stages—of encounters between machine operators and the social or nonsocial objects that regulate the conditions of work. The rules of the game are experienced as a set of externally imposed relationships. The art of making out is to manipulate those relationships with the purpose of advancing as quickly as possible from one stage to the next.

At the beginning of the shift, operators assemble outside the time office on the shop floor to collect their production cards and punch in on the "setup" of their first task. If it has already been set up on the previous shift, the operator simply punches in on production. Usually operators know from talking to their counterpart, before the beginning of the shift, which task they are likely to receive. Knowing what is available on the floor for their machine, an operator is sometimes in a position to bargain with the scheduling man, who is responsible for distributing the tasks.

In 1945 the scheduling man's duties appeared to end with the distribution of work, but in 1975 he also assumed some responsibility for ensuring that the department turned out the requisite parts on time. Therefore, he is often found stalking the floor, checking up on progress and urging workers to get a move on. Because he has no

formal authority over the operators, the scheduling man's only recourse is to his bargaining strength, based on the discretion he can exert in distributing jobs and fixing up an operator's time. Operators who hold strategic jobs, requiring a particular skill, for example, or who are frequently called upon to do "hot jobs" are in a strong bargaining position vis-à-vis the scheduling man. He knows this and is careful not to upset them.

By contrast, Roy complained that the scheduling man was never to be found when he needed him and, when he was around, showed little interest in his work.[5] This caused great annoyance when the time clerks were not sure which job Roy had to punch in on next. Equally significant was the relative absence of hot jobs in 1945.[6] In sum, the department takes its responsibility to get jobs finished on time more seriously, but, so long as operators are making out, this responsibility falls on the shoulders of the scheduling man rather than on the foreman or superintendent.[7] The change is possibly a result of heightened departmental autonomy and responsibility, reflected in departmental profit-and-loss statements and in the penalties incurred by the company when engines are delivered late to the customer.[8]

After receiving their first task, operators have to find the blueprint and tooling for the operation. These are usually in the crib, although they may be already out on the floor. The crib attendant is therefore a strategic person whose cooperation an operator must secure. If the crib attendant chooses to be uncooperative in dispensing towels, blueprints, fixtures, etc., and, particularly, in the grinding of tools, operators can be held up for considerable lengths of time. Occasionally, operators who have managed to gain the confidence of the crib attendant will enter the crib themselves and expedite the process. Since, unlike the scheduling man, the crib attendant has no real interest in whether the operator makes out, his cooperation has to be elicited by other means. For the first five months of my employment my relations with the crib attendant on second shift were very poor, but at Christmas things changed dramatically. Every year the local union distributes a Christmas ham to all its members. I told Harry that I couldn't be bothered picking mine up from the union hall and that he could have it for himself. He was delighted, and after that I received good service in the crib.

Many of Roy's troubles also originated in the crib. As in 1975, so in 1945: there were not enough crib attendants. Roy dramatically shows how the attendant who tries to serve operators conscientiously becomes a nervous wreck and soon transfers off the job. Problems may have been more acute under Geer, in Roy's time, since tools and fixtures were then located in the crib according to size and type rather than assembled in pans according to job, as in 1975. On the other hand, there were always at least two crib attendants when Roy was working at Geer, whereas in 1975 there was never more than one on second shift.

While I was able to secure the cooperation of the crib attendant, I was not so fortunate with the truck drivers. When I was being broken in on the miscellaneous job, I was told repeatedly that the first thing I must do was to befriend the truck driver. He or she was reponsible for bringing the stock from the aisles, where it was kept in tubs, to the machine. Particularly at the beginning of the shift, when everyone is seeking their assistance, truck drivers can hold you up for a considerable period. While some treated everyone alike, others discriminated among operators, frustrating those without power, assisting those who were powerful. Working on the miscellaneous job meant that I was continually requiring the truck driver's services, and, when Morris was in the seat, he used to delight in frustrating me by making me wait. There was nothing I could do about it unless I was on a hot job; then the foreman or scheduling man might intervene. To complain to the foreman on any other occasion would only have brought me more travail, since Morris could easily retaliate later on. It was better just to sit tight and wait. Like the crib attendants, truckers have no stake in the operator's making out, and they are, at the same time, acutely conscious of their power in the shop. All they want is for you to get off their backs so that they can rest, light up, chat with their friends, or have a cup of coffee—in other words, enjoy the marginal freedoms of the machine operator. As one of the graffiti in the men's toilet put it, "Fuck the company, fuck the union, but most of all fuck the truckers because they fuck us all." Operators who become impatient may, if they know how, hop into an idle truck and move their own stock. But this may have unfortunate consequences, for other operators may ask them to get their stock too.

While it is difficult to generalize, it does appear that under Geer the service of the truck drivers—or stock chasers, as they were called—was more efficient. For one thing, there were two truckers in 1945 but only one in 1975 to serve roughly the same number of operators. For another, as the setup man told me from his own experience,

> "In the old days everyone knew everyone else. It was a big family, and so truck drivers would always try and help, bringing up stock early and so on. In those days operators might not even have to tell the truck driver to get the next load. Now everyone moves around from job to job. People don't get to know each other so well, and so there's less cooperation."

As they wait for the stock to arrive, each operator sets up his machine, if it is not already set up. This can take anything from a few minutes to two shifts, but normally it takes less than an hour. Since every setup has a standard time for completion, operators try to make out here, too. When a setup is unusually rapid, an operator may even be able to make time so that, when he punches in on production, he has already turned out a few pieces. A setup man is available for assistance. Particularly for the inexperienced, his help is crucial, but, as with the other auxiliary personnel, his cooperation must be sought and possibly bargained for. He, too, has no obvious stake in your making out, though the quicker he is through with you, the freer he is. Once the machine is set up and the stock has arrived, the operator can begin the first piece, and the setup man is no longer required unless the setup turns out to be unsatisfactory.

The quality and concern of setup men vary enormously. For example, on day shift the setup man was not known for his cooperative spirit. When I asked Bill, my day man, who the setup man was on day shift, he replied, "Oh, he died some years ago." This was a reference to the fact that the present one was useless as far as he was concerned. On second shift, by contrast, the setup man went about his job with enthusiasm and friendliness. When he was in a position to help, he most certainly did his best, and everyone liked and respected him. Yet even he did not know all the jobs in the shop. Indeed, he knew hardly any of my machines and so was of little use to me. Roy experienced similar differences among setup men.

Johnny, for example, was not a great deal of help, but when Al McCann came along, Roy's life on the shop floor was transformed.[9] Al McCann had been a radial-drill operator of long experience and showed Roy all the angles on making out.

In 1945 there were more setup men than in 1975; this was due in part to wartime manpower policies but also to a greater need for setup men. Fixtures and machines have improved and become more standardized over the past thirty years, and the skill required in setting up has therefore declined. Moreover, under Geer, there was greater diversity in the operations that any one machine could perform, and it therefore took operators much longer to master all the jobs that they would have to run. On the other hand, it appears that mobility between different machines is now greater and average experience therefore less than at the end of the war. Roy also reports that, according to his fellow workers, the setup function was itself relatively new; this suggests again how recent was the specialization of the functions that earlier were performed by a single person—the foreman.

The assigned task may be to drill a set of holes in a plate, pipe, casting, or whatever; to mill the surface of some elbow; to turn an internal diameter on a lathe; to shave the teeth on a gear; and so on. The first piece completed has to be checked by the inspector against the blueprint. Between inspector and operator there is an irrevocable conflict of interest because the former is concerned with quality while the operator is concerned with quantity. Time spent when an operation just won't come right—when piece after piece fails, according to the inspector, to meet the specifications of the blueprint—represents lost time to the operator. Yet the inspector wants to OK the piece as quickly as possible and doesn't want to be bothered with checking further pieces until the required tolerances are met.

When a piece is on the margin, some inspectors will let it go, but others will enforce the specifications of the blueprint to the *n*th degree. In any event, inspectors are in practice, if not in theory, held partly responsible if an operator runs scrap. Though formally accountable only for the first piece that is tagged as OK, an inspector will be bawled out if subsequent pieces fall outside the tolerance limits. Thus, inspectors are to some extent at the mercy of the

operators, who, after successfully getting the first piece OK'd, may turn up the speed of their machine and turn out scrap. An operator who does this can always blame the inspector by shifting the tag from the first piece to one that is scrap. Of course, an inspector has ample opportunity to take revenge on an operator who tries to shaft him. Moreover, operators also bear the responsibility for quality. During my term of employment, charts were distributed and hung up on each machine, defining the frequency with which operators were expected to check their pieces for any given machine at any particular tolerance level. Moreover, in the period immediately prior to the investigation of the plant's quality-assurance organization by an outside certifying body, operators were expected to indicate on the back of the inspection card the number of times they checked their pieces.

The shift since the war is clear. Under Geer, as Roy describes it, the inspector was expected to check not only the first piece but also, from time to time, some of the subsequent pieces. When the operation was completed on all the pieces, operators had to get the inspector to sign them off the old job before they could punch in on a new one. The responsibility has now shifted toward the operators, who are expected to inspect their own pieces at regular intervals.[10] Furthermore, improved machining, tooling, fixtures, etc., permit greater worker control over quality. It is now also argued that problems with quality result, not from poor workmanship, but from poor design of the product. For all these reasons, we now find fewer inspectors, and the trend is toward decreasing their numbers even further.[11]

When an inspector holds up an operator who is working on an important job but is unable to satisfy the specifications on the blueprint, a foreman may intervene to persuade the inspector to OK the piece. When this conflict cannot be resolved at the lowest level, it is taken to the next rung in the management hierarchy, and the superintendent fights it out with the chief inspector. According to Roy's observations, production management generally defeated quality control in such bargaining.[12] I found the same pattern in 1975, which reflects an organizational structure in which quality control is directly subordinated to production. Not surprisingly, the function of quality control has become a sensitive issue and the

focus of much conflict among the higher levels of Allied's engine division. Quality control is continually trying to fight itself clear of subordination to production management so as to monitor quality on the shop floor. This, of course, would have deleterious effects on levels of production, and so it is opposed by the production management. Particularly sensitive in this regard is control of the engine test department, which in 1975 resided with production management. The production manager naturally claimed that he was capable of assessing quality impartially. Furthermore, he justified this arrangement by shifting the locus of quality problems from the shop floor to the design of the engine, which brought the engineers into the fray. Engineering managment, not surprisingly, opposes the trend toward increasing their responsibility for quality. Therefore, the manager of engineering supported greater autonomy for quality control as a reflection of his interest in returning responsibility for quality to the shop floor. To what extent this situation has been preserved by the vesting of interests since Allied took over from Geer is not clear.[13]

After the first piece has been OK'd, the operator engages in a battle with the clock and the machine. Unless the task is a familiar one—in which case the answer is known, within limits—the question is: Can I make out? It may be necessary to figure some angles, some short cuts, to speed up the machine, make a special tool, etc. In these undertakings there is always an element of risk—for example, the possibility of turning out scrap or of breaking tools. If it becomes apparent that making out is impossible or quite unlikely, operators slacken off and take it easy. Since they are guaranteed their base earnings, there is little point in wearing themselves out unless they can make more than the base earnings—that is, more than 100 percent. That is what Roy refers to as goldbricking. The other form of "output restriction" to which he refers—quota restriction—entails putting a ceiling on how much an operator may turn in—that is, on how much he may record on the production card. In 1945 the ceiling was $10.00 a day or $1.25 an hour, though this did vary somewhat between machines. In 1975 the ceiling was defined as 140 percent for all operations on all machines. It was presumed that turning in more than 140 percent led to "price cuts" (rate increases), and, as we shall see in chapter 10, this was indeed the case.

In 1975 quota restriction was not necessarily a form of restriction of *output,* because operators *regularly* turned *out* more than 140 percent, but turned *in* only 140 percent, keeping the remainder as a "kitty" for those operations on which they could not make out. Indeed, operators would "bust their ass" for entire shifts, when they had a gravy job, so as to build up a kitty for the following day(s). Experienced operators on the more sophisticated machines could easily build up a kitty of a week's work. There was always some discrepancy, therefore, between what was registered in the books as completed and what was actually completed on the shop floor. Shop management was more concerned with the latter and let the books take care of themselves. Both the 140 percent ceiling and the practice of banking (keeping a kitty) were recognized and accepted by everyone on the shop floor, even if they didn't meet with the approval of higher management.

Management outside the shop also regarded the practice of "chiseling" as illicit, while management within the shop either assisted or connived in it. Chiseling (Roy's expression, which did not have currency on the shop floor in 1975) involves redistributing time from one operation to another so that operators can maximize the period turned in as over 100 percent. Either the time clerk cooperates by punching the cards in and out at the appropriate time or the operators are allowed to punch their own cards. In part, because of the diversity of jobs, some of them very short, I managed to avoid punching any of my cards. At the end of the shift I would sit down with an account of the pieces completed in each job and fiddle around with the eight hours available, so as to maximize my earnings. I would pencil in the calculated times of starting and finishing each operation. No one ever complained, but it is unlikely that such consistent juggling would have been allowed on first shift.[14]

How does the present situation compare with Geer? As Roy describes it, the transfer of time from one operation or job to another was possible only if they were consecutive or else were part of the same job though separated in time. Thus Roy could finish one job and begin another without punching out on the first. When he did punch out on the first and in on the second, he would already have made a start toward making out. Second, if Roy saved up some pieces from one shift, he could turn those pieces in during his next

shift only if the job had not been finished by his day man. Accordingly, it was important, when Roy had accumulated some kitty on a particular job, that he inform Joe Mucha. If Mucha could, he would try to avoid finishing the job before Roy came to work. Shifting time between consecutive jobs on a single shift was frequently fixed up by the foreman, who would pencil in the appropriate changes. Nonetheless, stealing time from a gravy job was in fact formally illicit in 1945.

> Gus told me that Eddie, the young time study man, was just as bad, if not worse, than the old fellow who gave him the price of one cent the other day. He said that Eddie caught the day man holding back on punching off a time study job while he got ahead on a piecework job. He turned the day man in, and the day man and the time cage man were bawled out.
>
> "That's none of his damn business. He shouldn't have turned in the day man," exclaimed Gus angrily.
>
> Gus went on to say that a girl hand-mill operator had been fired a year ago when a time study man caught her running one job while being "punched in" on another. The time study man came over to the girl's machine to time a job, to find the job completed and the girl running another.
>
> Stella has no use for time study men. She told me of the time Eddie caught Maggie running one job while being punched in on another. Maggie was fired.[15]

I shall have much more to say about time-study men in chapter 10, but these examples do suggest that, while chiseling went on, it was regarded as illegitimate at some levels of management.

What can we say about overall changes in rates over the past thirty years? Old-timers were forever telling me how "easy we've got it now," though that in itself would hardly constitute evidence of change. To be sure, machines, tooling, etc., have improved, and this makes production less subject to arbitrary holdups, but the rates could nonetheless be tighter. However, an interesting change in the shop vernacular does suggest easier rates. Roy describes two types of jobs, "gravy" and "stinkers," the former having particularly loose and the latter particularly tight rates. While I worked in the small-parts department, I frequently heard the word "gravy" but never the word "stinker." Its dropping out of fashion probably reflects the

declining number of jobs with very tight rates and the availability of kitties to compensate for low levels of output. How do Roy's own data on output compare with 1975 data? Recomputing Roy's output on piecework in terms of rates rather than dollars and cents, I find that during the initial period, from November to February, his average was 85 percent and that during the second period, from March to August, it was 120 percent.[16] During the first six months of 1975, the average for the entire plant was around 133.5 percent. For the different departments this average varied from 142 percent among the automatic screw machines and automatic lathes to 121 percent in the small-parts department, where I worked. The small-parts department functions as a labor reservoir for the rest of the plant because turnover there is high, rates are notoriously tight, and it is the place where newcomers normally begin. Nonetheless, of all the departments, this one probably most closely resembles Roy's Jack Shop in terms of machines and type of work. Thus, overall rates are indeed easier to make now, but my experiences in my own department, where most of my observations were made, bore a close resemblance to Roy's experiences.[17]

What is the foreman's role in all these operations? He is seen by everyone but senior plant management as expediting and refereeing the game of making out. As long as operators are making out and auxiliary workers are not obstructing their progress, neither group is likely to invite authoritarian interventions from the foreman. For their part, foremen defend themselves from their own bosses' complaints that certain tasks have not been completed by pointing out that the operators concerned have been working hard and have successfully made out. We therefore find foremen actively assisting operators to make out by showing them tricks they had learned when they were operators, pointing out more efficient setups, helping them make special tools, persuading the inspector to OK a piece that did not exactly meet the requirements of the blueprint, and so on. Foremen, like everyone else on the shop floor, recognize the two forms of output restriction as integral parts of making out. When operators have made out for the night and decide to take it easy for the last two or three hours, a foreman may urge more work by saying, "Don't you want to build up a kitty?" However, foremen do not act in collusion with the methods department and use the

information they have about the various jobs and their rates against the operators, because rate increases would excite animosity, encourage goldbricking, increase turnover, and generally make the foreman's job more difficult.

However, the operator's defense, "What more do you want? I'm making out," does have its problems, particularly when there is a hot job on the agenda. Under such circumstances, operators are expected to drop what they are doing and punch in on the new job, "throwing everything they've got" into it and, above all, ignoring production ceilings—though of course they are not expected to turn *in* more than 140 percent. On occasions like this, unless the foreman can bring some sanctions to bear, he is at the mercy of the operator who may decide to take it easy. For this reason, foremen may try to establish an exchange relationship with each individual operator: "You look after me, I'll look after you." Operators may agree to cooperate with their foreman, but in return they may expect him to dispense favors, such as the granting of casual days, permission to attend union meetings during working hours, permission to go home early on a special occasion, etc. One of the most important resources at the disposal of the foreman is the "double red card," which covers time lost by operators through no fault of their own at a rate of 125 percent. Red cards may be awarded for excessive time lost while waiting for materials because a machine is down or some other adventitious event occurs that prevents an operator from making out. Bargaining usually precedes the signing of a red card; the operator has to persuade the foreman that he has made an earnest attempt to make out and therefore deserves compensation. Finally, one may note, as Roy did, that rules promulgated by high levels of plant management are circumvented, ignored, or subverted on the shop floor, with the tacit and sometimes active support of the foreman, in the interests of making out.

In 1945 foremen and superintendent played a similar role in facilitating making out, although they seemed to view many of these activities as illicit. The ambivalence of Steve, Roy's superintendent on second shift, is revealed in the following conversation.

> I told Steve privately that I was made out for the evening with $10.00.
>
> "That's all I'm allowed to make isn't it?" I asked.

Steve hesitated at answering that one. "You can make more," he said, lowering his eyes.

"But I'd better not," I insisted.

"Well, you don't want to spoil it for yourself," he answered.[18]

Shop management frequently sided with operators in their hostility to the methods department when rates were tight and making out was impossible. Yet operators were always on the lookout and suspicious of foremen as potential collaborators with the methods department. The primary criterion by which foremen were evaluated was their relationship with time-study men.

> As already indicated, the second shift operators felt, in general, that the "better" supervisors were on their shift. They cited the connivance of Brickers, Squeaky and Johnson [day-shift supervisors] with the enemy, the methods department, pointing out that they were "company men," would do nothing for the workers, would not permit loafing when quotas were attained, and "drove" the operators on piecework jobs that were regarded as "stinkers." On the other hand, the night shift supervisors were known to have "fought for their men" against the "big shots," sought to aid operators in getting better prices from time study, winked at quota restriction and its hours of loafing, did not collaborate with methods in the drive to lower "gravy" prices, and exhibited a pleasing insouciance when operators puttered away on day work.[19]

Another possible change revolves around the attitude of the foreman to goldbricking. Certainly, in 1945, foremen were not well disposed toward operators' taking it easy when rates were impossible, whereas in 1975 they tended to accept this as a legitimate practice. In general, Allied operators appeared to be less hostile and suspicious of shop supervision and exhibited greater independence in the face of authoritative foremen. As suggested earlier, foremen are now also relieved of some of the responsibility for the completion of particular jobs on their shift, this function being assumed by the assertive presence of the scheduling man. In all these respects my account of changes are similar to those described by Reinhard Bendix, Frederick Taylor, Richard Edwards, and others, namely, the diminution of the authority of the foreman and the parceling-out of his functions to more specialized personnel.[20]

The Organization of a Shop-Floor Culture

So far we have considered the stages through which any operation must go for its completion and the roles of different employees in advancing the operation from stage to stage. In practice the stages themselves are subject to considerable manipulation, and there were occasions when I would complete an operation without ever having been given it by the scheduling man, without having a blueprint, or without having it checked by the inspector. It is not necessary to discuss these manipulations further, since by now it must be apparent that relations emanating directly from the organization of work are understood and attain meaning primarily in terms of making out. Even social interaction not occasioned by the structure of work is dominated by and couched in the idiom of making out. When someone comes over to talk, his first question is, "Are you making out?" followed by "What's the rate?" If you are not making out, your conversation is likely to consist of explanations of why you are not: "The rate's impossible," "I had to wait an hour for the inspector to check the first piece," "These mother-fucking drills keep on burning up." When you are sweating it out on the machine, "knocking the pieces out," a passerby may call out "Gravy!"—suggesting that the job is not as difficult as you are making it appear. Or, when you are "goofing off"—visiting other workers or gossiping at the coffee machine—as likely as not someone will yell out, "You've got it made, man!" When faced with an operation that is obviously impossible, some comedian may bawl out, "Best job in the house!" Calling out to a passerby, "You got nothing to do?" will frequently elicit a protest of the nature, "I'm making out. What more do you want?" At lunchtime, operators of similar machines tend to sit together, and each undertakes a postmortem of the first half of the shift. Why they failed to make out, who "screwed them up," what they expect to accomplish in the second half of the shift, can they make up lost time, advice for others who are having some difficulty, and so on—such topics tend to dominate lunchtime conversations. As regards the domination of shop-floor interaction by the culture of making out, I can detect no changes over the thirty years. Some of the details of making out may have changed, but the idiom, status, tempo, etc., of interaction at work continue to be governed by and to

rise out of the relations in production that constitute the rules of making out.

In summary, we have seen how the shop-floor culture revolves around making out. Each worker sooner or later is sucked into this distinctive set of activities and language, which then proceed to take on a meaning of their own. Like Roy, when I first entered the shop I was somewhat contemptuous of this game of making out, which appeared to advance Allied's profit margins more than the operators' interests. But I experienced the same shift of opinion that Roy reported:

> . . . attitudes changed from mere indifference to the piecework incentive to a determination not to be forced to respond, when failure to get a price increase on one of the lowest paying operations of his job repertoire convinced him that the company was unfair. Light scorn for the incentive scheme turned to bitterness. Several months later, however, after fellow operator McCann had instructed him in the "angles on making out," the writer was finding values in the piecework system other than economic ones. He struggled to attain quota "for the hell of it," because it was a "little game" and "keeps me from being bored."[21]

Such a pattern of insertion and seduction is common. In my own case, it took me some time to understand the shop language, let alone the intricacies of making out. It was a matter of three or four months before I began to make out by using a number of angles and by transferring time from one operation to another. Once I knew I had a chance to make out, the rewards of participating in a game in which the outcomes were uncertain absorbed my attention, and I found myself spontaneously cooperating with management in the production of greater surplus value. Moreover, it was only in this way that I could establish relationships with others on the shop floor. Until I was able to strut around the floor like an experienced operator, as if I had all the time in the world and could still make out, few but the greenest would condescend to engage me in conversation. Thus, it was in terms of the culture of making out that individuals evaluated one another and themselves. It provided the basis of status hierarchies on the shop floor, and it was reinforced by the fact that the more sophisticated machines requiring greater skill also had the easier rates. Auxiliary personnel developed characters

in accordance with their willingness to cooperate in making out: Morris was a lousy guy because he'd always delay in bringing stock; Harry was basically a decent crib attendent (after he took my ham), tried to help the guys, but was overworked; Charley was an OK scheduling man because he'd try to give me the gravy jobs; Bill, my day man, was "all right" because he'd show me the angles on making out, give me some kitty if I needed it, and sometimes cover up for me when I made a mess of things. In the next chapter I will consider the implications of being bound into such a coercive cultural system and of constituting the labor process as a game.

The Dispersion of Conflict

I have shown how the organization of a piecework machine shop gives rise to making out and how this in turn becomes the basis of shop-floor culture. Making out also shapes distinctive patterns of conflict. Workers are inserted into the labor process as individuals who directly dictate the speed, feed, depth, etc., of their machines. The piece wage, as Marx observed, "tends to develop on the one hand that individuality, and with it the sense of liberty, independence, and self-control of the labourers, on the other, their competition one with another."[22] At the same time, the labor process of a machine shop embodies an opposed principle, the operator's dependence on auxiliary workers—themselves operating with a certain individual autonomy. This tension between control over machinery and subordination to others, between productive activities and production relations, leads to particular forms of conflict on the shop floor.

I have already suggested that pressures to make out frequently result in conflict between production and auxiliary workers when the latter are unable to provide some service promptly. The reason for this is only rarely found in the deliberate obstructionism of the crib attendant, inspector, trucker, and so on. More often it is the consequence of a managerial allocation of resources. Thus, during the period I worked on the shop floor, the number of operators on second shift expanded to almost the number on first shift, yet there was only one truck driver instead of two; there were, for most of the time, only two inspectors instead of four; there were only two

foremen instead of four; and there was only one crib attendant instead of two or three. This merely accentuated a lateral conflict that was endemic to the organization of work. The only way such lateral conflict could be reduced was to allow second-shift operators to provide their own services by jumping into an idle truck, by entering the crib to get their own fixtures, by filling out their own cards, by looking through the books for rates or to see whether an order had been finished, and so on. However, these activities were all regarded as illegitimate by management outside the shop.[23] When middle management clamped down on operators by enforcing rules, there was chaos.

In the eyes of senior management, auxiliary workers are regarded as overhead, and so there are continual attempts to reduce their numbers. Thus, as already recounted, the objective of the quality-control manager was to reduce the number of inspectors. Changes in the philosophy of quality control, he argued, place increasing responsibility on the worker, and problems of quality are more effectively combatted by "systems control," design, and careful check on suppliers, particularly suppliers of castings. But, so long as every operation had to have its first piece checked, the decline in the number of inspectors merely led to greater frustration on the shop floor.

A single example will illustrate the type of conflict that is common. Tom, an inspector, was suspended for three days for absenteeism. This meant that there was only one inspector for the entire department, and work was piling up outside the window of Larry (another inspector). I had to wait two hours before my piece was inspected and I could get on with the task. It was sufficiently annoying to find only one inspector around, but my fury was compounded by the ostentatious manner in which Larry himself was slowing down. When I mentioned this to him, jokingly, he burst forth with "Why should I work my ass off? Tom's got his three days off, and the company thinks they are punishing him, but it's me who's got to break my back." In this instance, conflict between Tom and the company was transmuted into a resentment between Tom and Larry, which in turn provoked a hostile exchange between Larry and me. "Going slow," aimed at the company, redounds to the disadvantage of fellow workers. The redistribution of conflict in

such ways was a constant feature of social relations on the shop floor. It was particularly pronounced on second shift because of the shortage of auxiliary workers and the fact that the more inexperienced operators, and therefore the ones most needing assistance, were also on that shift.

Common sense might lead one to believe that conflict between workers and managers would lead to cohesiveness among workers, but such an inference misses the fact that all conflict is mediated on an ideological terrain, in this case the terrain of making out. Thus, management-worker conflict is turned into competitiveness and intragroup struggles as a result of the organization of work. The translation of hierarchical domination into lateral antagonisms is in fact a common phenomenon throughout industry, as was shown in a study conducted on a sample of 3,604 blue-collar workers from 172 production departments in six plants scattered across the United States:

> . . . work pressure in general is negatively correlated to social-supportive behavior, which we have called cohesive behavior, and positively related to competitive and intra-group conflict behavior. Cohesive behavior is generally untenable under high pressure conditions because the reward structure imposed by management directs employees to work as fast as they can individually.[24]

The dominant pattern of conflict dispersion in a piecework machine shop is undoubtedly the reconstitution of hierarchical conflict as lateral conflict and competition. However, it is by no means the only redistribution of conflict. A reverse tendency is often found when new machinery is introduced that is badly coordinated with existing technology. Here lateral conflict may be transformed into an antagonism between workers and management or between different levels of management.

To illustrate this point, I will draw upon my own experience with a machine that is designed to balance pulleys so that they don't break any shafts when they are running in an engine. The balancing machine, introduced within the past five years, is very sensitive to any faults in the pulley—faults that other machining operations may inadvertently introduce or that may have been embedded in the original casting when it came from the foundry.

The pulley is seated on a fixture attached to a rotating circular steel plate. The balancing plate and pulley can be automatically spun, and this indicates two things: first, the place where excess stock should be removed to compensate for imperfections in the pulley and, second, the degree of imbalance in the pulley. When an area of excess weight is located, holes are drilled in the pulley to remove stock; the pulley is then spun again and more holes are drilled as needed. This process is repeated until the pulley balances to within one or two ounces, according to the specifications on the blueprint. The most difficult part of the job is getting the balance set up. Before any pulley can be balanced, it is necessary first to balance the fixture and plate by placing clay on the plate. This complicated procedure for setting up is designed to ensure that the pulley is indeed balanced when the dial registers it as being balanced—that is, when the pulley is turned through 180 degrees on the fixture, the recording is still within one or two ounces, or whatever the specification happens to be.

The small pulleys were easy. Often they didn't even need balancing. Just a touch from the drill to indicate they had been attended to was all that was necessary. That was gravy. But the big seventy-five pounders presented a very different picture. They were the most difficult to balance and naturally the most critical. It was tough enough hauling them up onto the balance and then taking them off, let alone balancing them to within an ounce. Both Bill and I tried to pretend they weren't there, although there were always a good number sitting by the balance, four or five layers of sixteen, piled on top of one another. We balanced them only when we had to, and then with extreme reluctance. They often posed insuperable problems, due to defects in the castings or in the taper, which meant that they would not fit properly on their fixture. On one or two occasions I came on second shift to discover the unusual sight of Bill cursing and sweating over the mess the pulleys were in and hearing him say how, after ten years on the miscellaneous job, he was getting too old to face it any more. "It's all yours, Englishman. Perhaps they'll give you a little bonus to keep you on," he laughed. It wasn't so much that the pulleys were not offering him enough money, since Bill would have his time covered with a double red card. It was more that he had been defeated; his job had taken over; he had lost control.

No amount of energy or ingenuity seemed sufficient to get those pulleys to balance, yet they still had to be delivered to the line. "They expect me to make pulleys on this machine. Well, I only balance pulleys, and if they won't balance, they won't balance. They don't understand that if they've got blowholes in them they just won't come down."

I came in one day at 3 P.M., and Bill warned me that the big shots would be breathing down my neck for the seventy-five pounders. "Those pulleys are hot, man!" Sure enough, no sooner had he left than I found myself encircled by the foreman, the night-shift superintendent, the foreman of inspectors, the scheduling man, the setup man, and, from time to time, a manager from some other department. Such royal attention had me flustered from the start. I couldn't even set up the balance properly. The superintendent became impatient and started ordering me to do this, that, and the other, all of which I knew to be wrong. It was futile to point that out. After all, who was I to contradict the superintendent? The most powerful thought to lodge in my head was to lift the pulley off the balance and hurl it at their feet. As the clay piled up on the plate, way beyond what was necessary to balance it, the superintendent began to panic. He obviously thought his neck was on the line, but he had little idea as to how the machine worked. He was an old-timer, unaccustomed to this new-fangled equipment. And so he followed the directions on the chart hanging from the machine—directions that Bill had instructed me to ignore because they were wrong. When the superintendent thought the plate was balanced, we started drilling holes in the pulley—more and more holes, until the surface was covered with them. Clearly something was wrong. I'd never seen such a mess of holes. But the superintendent was more concerned with getting the pulleys out of the department and onto the engines. He didn't dare ask me to turn the pulleys through 180 degrees to see if they were really balanced—the acid test. I knew they wouldn't balance out, and probably so did he. By the end of the shift I had managed to ruin twenty-three pulleys.

The saga continued the following day. When I arrived at the balance, the superintendent was already there, remonstrating with Bill, who was trying to explain how to balance the plate. He was surrounded by yellow-painted pulleys—the pulleys I had "balanced"

the night before—which had been pulled off the engines just before they were due to be shipped out. Amazingly, no one was after my neck. The superintendent was fussing around, trying to vindicate himself, saying that the chart was misleading. It wasn't his fault, he complained, and how much better it was in the old days before we had these fancy machines that didn't work properly. Bill was not upset at all, even though he'd been on the pulleys all day. It didn't take much imagination to see why, since he was now a hero, having retrieved the situation. Management had come round to him in the morning demanding to know what incompetent had balanced the pulleys. Since he alone knew how to work the balance, Bill sensed his newly won power and importance. The superintendent, however, was in hot water, and his prestige, already at a low ebb, had taken a further dive. No one was particularly surprised at my ineptitude, since I had never demonstrated any mechanical skill or understanding.

I have just described two types of conflict that can result from the introduction of a new piece of technology. In my first example, the new machine was out of tune with the surrounding technology and as a result turned what was potentially a lateral conflict into one between management and worker. In my second example, the new machine allowed an operator to monopolize some knowledge (and this is quite likely when the machine is unique to the shop); this enhanced his power and led to a severe conflict between shop management and middle management when the operator was not around.[25] There is no space here to explore other patterns of conflict crystallization, dispersion, and displacement. All I wish to stress is the way in which the specific organization of work structures conflict and how direct confrontation between management and worker is by no means its most common form.

Indeed, over the past thirty years conflict between management and worker has diminished, while that among workers has increased. This was how Donald Roy reacted to my obeservations at Allied:

> Your point in regard to the big switch of hierarchical conflict to the side of inter-worker competition pleases me immensely.... But in retrospect I see that in my time the main line of cleavage

> was the worker managment one. With the exception of the mutual irritations between machine "partners" of different shifts operator relations were mainly cooperative, and most of the auxiliaries (stock chasers, tool crib men, etc.) were helpful. There were employees in the Jack Shop then who recalled the "whistle and whip" days before the local union was organized.[26]

There are a number of suggestions in his dissertation as to why there should have been greater antagonism between management and worker and less competition and conflict among workers. First, because of wartime conditions, there were more auxiliary workers for the same number of operators. Second, there was a generalized hostility to the company as being cheap, unconcerned about its labor force, penny-pinching, and so on,[27] whereas the attitudes of workers at the engine division of Allied were much more favorable to the company. This was exemplified by the large number of father-son pairs working in the plant. If your son had to work in a factory, many felt that Allied was not a bad place. Third, Allied treated its employees more fairly than Geer. Part of this may be attributed to the greater effectiveness of the union grievance machinery in 1975 than in 1945. Furthermore, as part of Allied, a large corporation, the engine division was less vulnerable to the kinds of market exigencies that had plagued Geer Company. It could therefore afford to treat its employees more fairly. Also, Allied did not appear to be out to cut rates with the militant enthusiasm that Roy had encountered. Fourth, as Roy himself notes above, the period of CIO organizing was still close at hand, and many Geer employees remembered the days of sweatshops and arbitrary discipline. Among the workers I talked to, only the older ones could recall the days of the "whistle and whip," and, when they did, it was mainly in reference to the tribulations of their fathers.

Conclusion

Between Geer Company of 1945 and Allied Corporation, thirty years later, the labor process underwent two sets of changes. The first is seen in the greater individualism promoted by the organization of work. Operators in 1975 had more autonomy as a result of the following: relaxed enforcement of certain managerial controls, such

as inspection of pieces and rate-fixing; increased shop-floor bargaining between workers and foremen; and changes in the system of piece rates—changes that laid greater stress on individual performance, effort, and mobility and allowed more manipulations. The second type of change, related to the first, concerns the diminution of hierarchical conflict and its redistribution in a number of different directions. As regards the relaxation of conflict between worker and management, one notes the decline in the authority of the foreman and the reduction of tensions between those concerned with enforcement of quality in production and those primarily interested in quantity. The greater permissiveness toward chiseling, the improvement of tooling and machines, as well as easier rates, have all facilitated making out and in this way have reduced antagonism between worker and shop management.[28] The employment of fewer auxiliary workers, on the other hand, has exacerbated lateral conflict among different groups of workers.[29]

These changes do not seem to support theories of intensification of the labor process or increase of managerial control through separation of conception and execution. What we have observed is the expansion of the area of the "self-organization" of workers as they pursue their daily activities. We have seen how operators, in order to make out at all, subvert rules promulgated from on high, create informal alliances with auxiliary workers, make their own tools, and so on. In order to produce surplus value, workers have had to organize their relations and activities in opposition to management, particularly middle and senior management. We shall see in chapter 10 how workers actively struggle *against* management to defend the conditions for producing profit. For Cornelius Castoriadis, this represents the fundamental contradiction of capitalism:

> In short, it [the deep contradiction] lies in the fact that capitalism . . . is obliged to try and achieve the simultaneous exclusion and participation of people in relation to their activities, in the fact that people are forced to ensure the functioning of the system half of the time *against* the system's own rules and therefore in struggle against it. This fundamental contradiction appears constantly wherever the process of management meets the process of execution, which is precisely (and par excellence) the social moment of production.[30]

But if the self-organization of workers is necessary for the survival of capitalism, it also questions the foundations of capitalism.

> When the shop-floor collective establishes norms that informally sanction both "slackers" and "speeders," when it constantly constitutes and reconstitutes itself in "informal" groups that respond to both the requirements of the work process and to personal affinities, it can only be viewed as actively opposing to capitalist principles new principles of productive and social organization and a new view of work.[31]

But is making out as radical as Castoriadis claims? Or is it, as Herbert Marcuse would argue, a mode of adaptation that reproduces "the voluntary servitude" of workers to capital? Are these freedoms and needs, generated and partially satisfied in the context of work and harnessed to the production of surplus value, a challenge to "capitalist principles"? Does making out present an anticipation of something new, the potential for human self-organization, or is it wholly contained within the reproduction of capitalist relations?[32] We can begin to answer such questions only by examining more closely the relationship between making out and the essence of the capitalist labor process—the simultaneous obscuring and securing of surplus value. To this I now turn.