

THE HUMAN FACTOR PROBLEM AND POST-FORDISM

The Case of the Automobile Industry

by

ANTONIOS KANIADAKIS

A thesis submitted to the Department of Sociology in  
conformity with the requirements for the degree of Master  
of Arts

Queen's University  
Kingston, Ontario, Canada

July, 2001

Copyright © Antonios Kaniadakis, 2001



National Library  
of Canada

Acquisitions and  
Bibliographic Services

395 Wellington Street  
Ottawa ON K1A 0N4  
Canada

Bibliothèque nationale  
du Canada

Acquisitions et  
services bibliographiques

395, rue Wellington  
Ottawa ON K1A 0N4  
Canada

*Your file* *Votre référence*

*Our file* *Notre référence*

The author has granted a non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

L'auteur conserve la propriété du droit d'auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

0-612-63320-9

**Canada**

## **ABSTRACT**

This thesis is about the Human Factor Problem (HFP), that is, the need to manage/control/coordinate people, and to incorporate them efficiently into particular settings and environments provided by specific systems and models of social and economic organization. Here the HFP is examined in relation to the area of work and more specifically, the case of the automobile industry (AI). The HFP, in its present form, can be identified through some current issues and debates regarding recent developments in the system of organization of work. In other words, the attempt of post-Fordist management to solve the HFP has generated discussion among scholars regarding the socio-economic implications of this attempt, in relation to workers, firms and to society as a whole. These issues and debates refer to workers' skills, democratization of the workplace and empowerment of the workers, union-management relationship, workplace surveillance, productivity and job satisfaction. Data, drawn from various case studies on the AI and from relevant government reports and statistics, conclude that the successful attempt for resolution of the HFP is dependent upon various contingency factors, such as workers' interpretation of the post-Fordist system, wages, the degree of union involvement in the shop floor, the

degree of intensity of the tasks, the degree of autonomy that workers experience, regional characteristics and other particularities.

## **ACKNOWLEDGMENTS**

There are a few individuals involved in this thesis, directly or indirectly, which I would like to thank. These individuals are: my first and second supervisors Dr. Elia Zureik and Dr. David Lyon, my professors Dr. Annette Burfoot, Dr. Roberta Hamilton and Dr. Bart Simon, and my close friends Nicolas Vazintaris, Peter Diavolitsis and Yiota Toumpa. I would also like to thank Dr. Bob Pike who helped me during my first days in Kingston.

Special thanks to my professors from the University of Crete Dr. Minas Samatas and Dr. Maria Kousis for their invaluable support.

Last, but not least, I would like to thank my family and especially my mother Eirini Kaniadakis, who has most patiently tolerated my absence from Greece.

This thesis is dedicated to the memory of my father Konstantinos, whose spirit has always been the greatest source of knowledge and dignity, and also to my beloved nephews Manos, Konstantinos, Giorgos, Konstantinos II, and to my sweet newborn niece Beba.

## **TABLE OF CONTENTS**

<b>ABSTRACT</b>	i
<b>ACKNOWLEDGMENTS</b>	iii
<b>1. INTRODUCTION</b>	1
<b>2. SOCIETY, TECHNOLOGY AND WORK ORGANIZATION</b>	8
2.1. TECHNOLOGY AND SOCIETY	8
2.2. TECHNOLOGY AND WORK	19
2.3. EVOLUTION OF WORK ORGANIZATION SYSTEMS	23
2.4. POST-FORDISM	31
<b>3. THE HUMAN FACTOR PROBLEM, CURRENT ISSUES AND SOCIETY</b>	39
3.1. SKILLS	39
3.2. DEMOCRATIZATION AND EMPOWERMENT	47
3.3. UNION-MANAGEMENT RELATIONSHIP	49
3.4. SURVEILLANCE AND PRIVACY	52
3.5. PRODUCTIVITY	55
3.6. JOB SATISFACTION	57
3.7. THE HUMAN FACTOR PROBLEM AT THE LEVEL OF SOCIETY	61
<b>4. THE HUMAN FACTOR PROBLEM AND THE GLOBAL AUTO INDUSTRY</b>	72
4.1. AUTOMOBILE INDUSTRY - THE MODEL INDUSTRY	73
4.2. HISTORY AND PROFILE OF THE GLOBAL AUTO INDUSTRY	76
4.3. SKILLS AND AUTO INDUSTRY	86
4.4. DEMOCRATIZATION & EMPOWERMENT IN THE AUTO INDUSTRY	96
4.5. UNION-MANAGEMENT RELATIONSHIP IN THE AUTO INDUSTRY	100

4.6. SURVEILLANCE, PRIVACY AND THE AUTO INDUSTRY	106
4.7. PRODUCTIVITY AND THE AUTO INDUSTRY	109
4.8. JOB SATISFACTION AND AUTO INDUSTRY	112
4.9. CONCLUSIONS	116
<b>5. CONCLUSIONS</b>	119
<b>BIBLIOGRAPHY</b>	129

## **1. INTRODUCTION**

This thesis is about the management of the human factor in the context of the new technology in the manufacturing sector. In particular I want to assess the claims of post-Fordism.

We view manufacturing industries as formal economic organizations (organized in a specific way, with certain objectives), and product of the industrial revolution and of the capitalist mode of production. Their ultimate organizational goal is to increase their profits and to maintain their existence. Technology is a very important factor in the operation of manufacturing industries, and since the foundations of capitalism technology has played a significant role in the transformation and evolution of manufacturing. Technology, for manufacturing industries, is a tool that helps them achieve their goals. This is the context in which technology is viewed by this kind of economic organization.

Traditionally, a major problem of the manufacturing industries was and remains what we will be referring to as the *Human Factor Problem* (HFP). How can industrial firms manage/coordinate/control the human factor, that is to say, the workers, and integrate them into the production process



in such a way that technology will achieve the desirable results. However, the HFP does not only refer to the organization of work in manufacturing industries, but it rather refers to the totality of social and economic life. It is a general problem of social and economic organization of all kinds of societies throughout history.

After the industrial revolution and the rise of capitalism, the HFP appears more intense and more complex. Thus, we will provide a socio-historical analysis of the development and evolution of manufacturing industries, within the above context, dating back to the industrial revolution. We can see what strategies industries applied in order to solve the problem of managing humans. In other words, we wish to find out how these industries managed workers in order to make the best out of technology. For example, in the different phases of the capitalist mode of production, what methods of control were used to manage industrial workers? How did we proceed from Taylor's "scientific management" to post-Fordist management techniques?

Our analysis will be informed by the discussion about the so-called major sociotechnical "revolutions" caused by the explosion in the development of new information technologies and thus, we will discuss the transitions to

different, more technologically advanced, industrial production paradigms. We will see how new sophisticated technology, together with the general "humanization" of management, has changed the processes and strategies of integrating and controlling workers into the production process.

Therefore, with the coming of post-Fordism, alongside the information technology revolution, we are experiencing the realignment of human management. Post-Fordism appears to have a solution to the problem posed by the human factor. More specifically, the post-Fordist program promises to address issues such as skilling/de-skilling, productivity, workplace democratization, surveillance/privacy, workers' satisfaction and management/union relations. The post-Fordist paradigm claims to produce positive outcomes regarding the above issues. In other words, the introduction of new technology and new management techniques appears to contribute to the upskilling of workers, increases in productivity, the democratization of the workplace through the introduction of new organizational models of production process (team-work, self-management etc.), an increase in job satisfaction, protection of the worker's privacy and the encouragement of cooperation with unions. All these claims

appear very appealing to both corporations and workers. If we consider these claims together with the actual practices that manufacturing industries follow, such as re-training of the workers, transfer of workers to different positions, introduction of team-work, re-organization of production process etc., we will be able to evaluate the attempts being made to solve the HFP, as well as the different level at which management is now exercised. Therefore, the assessment of the attempt of post-Fordist management to solve the HFP can be achieved through close examination of the current issues and debates that rise from that attempt. The investigation of the issues above can give an answer to whether or not post-Fordist management is successful, and also point to the implications resulting from management's attempt to solve the HFP for workers, firms and for society as a whole.

Despite the vision of total automation, industrial manufacturing activities "have to" include humans. This fact calls for their more efficient integration and control within the framework of the whole production process. Unlike technology, which is relatively controllable, the human factor is seen as needing special treatment in order to become amenable to control. In this sense, we may argue that manufacturing industries require a particular type of

worker, with specific characteristics and qualities, which management strategies try to create. This type of required worker seems to change while the production paradigms and the management strategies also change throughout history, but the actual goal remains the same: to find ways for the most efficient integration of the worker in accordance with the levels of technology that characterize the various industrial production systems.

A basic element of the notion of management is that of power. Power, however, has to be exercised in a way that is legitimate, that is to say, to achieve desirable levels of authority. The whole discourse that has been developed about the new methods of management (empowerment of the workers, more autonomy, end of boring and repetitive tasks, etc.), that is to say, the whole post-Fordist program as it is presented above, provides such a promise for legitimation. Of course, we must not ignore the contribution of the union movements in the industrial transformation and the humanization of management.

This thesis will examine how manufacturing industries, in light of the technological development and the coming of post-Fordism, have tried to solve the problem of managing the human factor and transforming it into profitable human capital for the corporation. Is management successful?

Whether it is or not, the sure thing is that post-Fordist practices moved the task of managing workers at a different, more indirect (non-authoritarian) level. We will consider, in particular, the case of the auto industry (AI).

For the purposes of this research project we will draw various examples from the Canadian case and from other developed western countries.

Our data will be based on secondary sources and already existing data, such as case studies, government reports and statistical measures from various countries, mostly from North America and Europe.

This thesis consists of three major and one concluding chapters. The first chapter deals with the nature of technology and its relation to society and work. It also includes a historical reference to the development and evolution of the management techniques from the early factory system to the present post-Fordist methods. Also, we provide a sort of ideal type of the post-Fordist system as various scholars have identified it. In the second chapter we become more specific and try to shape what we call HFP and view it at the level of work and then at the level of society. We do this by examining the various issues and debates that arise from the attempt to resolve

the HFP. In the third chapter we examine the case of the AI. In the first part of the chapter we provide a socio-historical profile of the global AI and we also refer to the representativeness of the AI as a model subject matter in order to study issues on work organization. In the second part of the chapter we examine the HFP in relation to the AI. This thesis concludes with some observations regarding the status of the HFP.

## **2. SOCIETY, TECHNOLOGY AND WORK ORGANIZATION**

The present chapter consists of four successive and inductively deployed parts. The first part refers to the discussion about technology and society in general, where a few definitional matters are addressed. In the second part we deal with technology in relation to the area of work as an important socio-economic activity, with special reference to industrial work. In the third part we provide a brief note on the socio-historical evolution of work-organization systems, from the early factory system to post-Fordism. In the last part we deal more specifically with the general characteristics of post-Fordism as a work-organization paradigm that is of central concern to this thesis.

### **2.1 TECHNOLOGY AND SOCIETY**

There is a big debate, academic and non-academic, around technology and the relationship between technology and society. Various questions arise, most of which are still unresolved, concerning the nature of technology and how it affects or is affected by society. Therefore, we are witness to the use of terms such as "technological determinism", "technological neutrality", "social construction", "social shaping" of technology, and so on,

through which social scientists try to attach meaning to technology and figure out its nature. These questions and the variety of answers to them have their roots in the difficulty one faces when conveying a definition of technology. Indeed, there is a plethora of different definitions, a fact that contributes to the maintenance of the debate around technology and society. In this chapter we will refer to a few definitions in order to exemplify the abstract and relativist character of the notion of technology as it has been used by some authors.

One basic criterion that is used when authors attempt to define technology is the distinction between "material" and "non-material" (social) elements of technology. This distinction in turn is useful in distinguishing technology from "machine". Schement & Curtis (1995) address the difference with reference to social thinkers such as Franz Reuleaux and Lewis Mumford. They conclude that, in spite of the fact that individuals (they have American society in mind) freely substitute technology for machine, technology encompasses more than machinery itself. As they say, "*it is a direct result of the social relations which make the application of technology possible*" (174). They argue then, that technology is not just the material tools by themselves, but it is something more than that. It is in a



sense, the way that individuals use these tools. Schement and Curtis also refer to Fernand Braudel and his distinction between "material technology" and "social technology" (176-177). We can understand this distinction as the interrelation between the two categories. That is to say, social technologies give individuals a basis for how they should use the material technologies. Social technologies are the non-material strategies, while material technologies are the expression and the application of these strategies. Therefore, according to Schement and Curtis, technology consists not only of material tools, but also of practices, methods, and rationally organized human behaviours - all of which are known as "techniques".

Definitions and distinctions of this kind by various authors highlight the relationship between the material and the social. Harold Lasswell for instance defined techniques as "The ensemble of practices by which one uses available resources to achieve values" (in Schement & Curtis, 1995:174). Similarly, Robert Merton notes that "Technique refers to any complex of standardized means for attaining a predetermined end. Thus, it converts spontaneous and unreflective behaviour into behaviour that is deliberate and rationalized" (in Schement & Curtis, 1995:174). Lastly,

Jacques Ellul argues that "Technique is that totality of methods rationally arrived at and having absolute efficiency...in every field of human activity" (Ellul, 1964:xxv). Therefore, technique for these authors is what makes human behaviour a "goal-oriented rational action" with the Weberian meaning of the term. In this sense, techniques are the means of rationalization of human activity. With these definitions, however, one has to be very careful with their use, because there is always the danger of considering as technique the totality of human activity, as evident in Ellul's above quotation.

Following the distinction between material technologies and "techniques", some authors attach to technology the characteristic of practicality, which makes technology appear as the means of rationalization of social life. A. Svorikine argues that "Technology may be defined as the means of work, the means of human activity developing within a system of social production and social life" (in Schement & Curtis, 1995:175). Emmanuel Mesthene, defines technology as "...the organization of knowledge for the achievement of practical purposes" (in Schement & Curtis, 1995:175), and Everett Rogers defines technology as "... a design for instrumental action that reduces uncertainty in the cause-effect relationships involved in

achieving a desired outcome" (in Schement & Curtis, 1995:176). Kaplinsky argues that technology refers to the general material content or process, while technique refers to the way in which technology is developed for a specific purpose (in Grint & Woolgar, 1997:8). Lastly, a very interesting definition of technology comes from George Ritzer (2000). His definition is based on the distinction between "human" and "non-human", but approached from a different angle than the one mentioned above. For Ritzer, what distinguishes human from non-human technologies is related to who exercises control over whom. Human technology (a screwdriver for example) is controlled by people, while a non-human technology (i.e. regulations, procedures and techniques) controls people (104). Therefore, Ritzer's perception of the human/non-human elements of technology is opposite to the other authors mentioned above.

Besides the distinction between material and non-material technologies, other distinctions have been made by various authors in order to help them isolate the notion of technology and define it. Jayaweera, for example, suggests that technology should be distinguished from invention. Inventions, according to Jayaweera, are characterized by neutrality, while technologies are inventions which are

organized expressions of a particular culture's productive structures (in Grint & Woolgar, 1997:8). As we can see, Jayaweera attributes to technology the characteristic of "social intention". That is to say, technology takes place only when societies employ inventions for various purposes, according to the situational socio-economic needs of society. Penn distinguishes between "technology" and "technicality", and emphasizes the conflict between capital and labour (in Grint & Woolgar, 1997:8).

Defining technology is a difficult task. All the definitions and the various distinctions mentioned above may be valid or less valid depending on the perspective through which technology is viewed and its various contexts. This is primarily a result of the complexity of the present society and the great variety of forms into which technology is shaped and expressed socially. In this sense, we could agree with Winner who argues that the definitions of technology change through time and place (in Grint & Woolgar, 1997:9). Therefore, "valid" definitions of technology can be given only within a situational framework where it is clear what the notion of technology includes. Additionally, the major distinction between material and non-material technologies can prove to be quite problematic. The great variety and diversity of

technologies do not make it easy to identify the difference without inevitably proceeding to arbitrary categorizations. Within an industrial organization for instance, where does material technology stop and non-material or social technology begin? Therefore, we may argue at this point that what is important is not to come up with an inclusive, neutral and general definition of technology. This will never happen without raising objections. What is really important for students of technology is to identify the motives, the processes and the circumstances through which various conveyors attach meaning to technology. As Grint and Woolgar put it: "... the relevance of technology lies in actors' interpretive activities rather than in any objective account of its capabilities or effects (Grint & Woolgar, 1997:138). In our case, for example, automobile firms view technology as a form of capital, as a means that will bring them more profit. The meaning, then, that technology takes under different social circumstances, is more important than to try to give a general, objective definition. Thus, for the purposes of this thesis, as we will see later on, technology will be viewed within the social circumstances provided by the area of industrial work organization and production.

The problem of defining technology is very closely associated with the discussion around the relationship between technology and society. The basic debate is formed around a fundamental question, which resembles the egg-chicken riddle: "Does society determine technology, or does technology determine society?". Terms such as, "technological determinism", "technological neutrality", "social construction" and "social shaping" of technology have been created by technology theorists in order to describe and identify power relationships between technology and society. Does technology alter human behaviour and social relations or do social relations create and shape technology? A great variety of approaches has been developed in order to give an answer to this question. Some of them argue that technology is indeed an autonomous factor that determines society and that changes in technology cause changes in society (cf. Bell: 1976, Large: 1980, Castells: 1996). And others, supporting the social constructivist and social shaping perspectives, argue that technology is a product of the social relations within a given society (MacKenzie & Wajcman: 1985, Bijker et al: 1987, Grint & Woolgar: 1992). Beside those opposing views, some more relativist and moderate views of "soft determinism" or "conditional determinism" have been

developed, which argue that technology can become autonomous and determine society only if certain conditions allow for it (Heilbroner: 1972). Of a relativist character is the view of Schement & Curtis (1995) on the relationship between technology and society. By examining this relationship at macro, meso and micro levels, they argue that the balance between technology and society differs in each of these levels. At the macro level, society is the determining factor. At the meso level, the level of the group, plays a more active role. It causes changes in groups, organizations and institutions by necessitating adaptations. Finally, at the micro level, technology appears to be more crucial by limiting the power of individuals, in terms of the structure of the workplace or the centrality of TV in the leisure time of the individuals, etc. (195).

Additionally, a popular view on technology impact, specifically in relation to work organization, is the so-called *contingency model*. According to this model, the impacts of technology depend on a variety of factors, such as organizational context, technology selection process, implementation process, nature of the specific technology, management philosophy, employee attitudes, etc. (Liker et al. 1999:578-593). At the level of society and within the

framework of the discussion on whether technology determines society or not, Heller (1987), by supporting the contingency model of technology, argues that technology does not determine society, rather it provides for options, based on particular contingencies, which may reconsider the impact of technology on people (Heller, 1987:24-25). Grint and Woolgar (1997), on the other hand, have criticized this view. They agree with Heller in denying technological determinism, however, they argue that "to retain the idea that technology still has independent effects, is to underestimate the significance of the interpretative component of human-technology interaction" (Grint and Woolgar, 1997:16).

As we will see in the following chapters, our findings from the case of the AI support a combination of the contingency model and the interpretative model of the impacts of technology. In other words, the effects of the introduction of new technology and new management techniques in the AI are highly dependent on various contingency factors and particularities of a certain region, country or plant, and also on how autoworkers themselves interpret new technology and changes in the organization of work.



Similarly with the problem of definition of technology, trying to give a definite, objective and final answer to whether technology is the determining factor of society or not, is an incongruous attempt that leads to arbitrary generalizations and misinterpretations. Again here we have to look at the special context, the specific technology in question, and the specific framework of social relations in which this technology is used, in order to see to what degree technology is determining human behaviour.

As stated in the introduction to this chapter, the technology that we will be dealing with in this research project is the whole post-fordist paradigm. That is to say, the way in which the industrial production process is organized at the present time, as opposed to previous forms of organization of industrial work. Therefore, we view technology within the framework of a very specific human activity, which is the industrial work organization. Thus, we will focus on the characteristics of this specific technology, which may be defined as: the means (material and non-material, practices, processes, etc.) through which work is organized for the achievement of a very specific goal, which is profit making and maintenance/survival of the industrial economic organization, within the

competition of a specific market. Additionally, this technology will be viewed in its form as an ideal type, meaning that we acknowledge the fact that this type of technology does not appear in the same form everywhere in the world, and also that there are still in use work-organization technologies of the past. However, there are a few characteristics and principles expressed by this new paradigm that have shaped its ideal form, and thus, it becomes possible to examine it as such.

## *2.2 TECHNOLOGY AND WORK*

As we said before, we view the area of work as a human activity like the rest of social activities. However, we acknowledge its importance within society, as it has been shaped historically, and its elevation to the top of societal values especially after the industrial revolution. Also, work, as one important human activity, provides a framework where technology is expressed in a specific way. Thus, industrial work, which is the focus of this thesis, provides the basis for specific kinds of technology to be developed and applied. The specificity of the kinds of technology that develop within the industrial environment is closely related to the corporate goal (profit).

Therefore, the constructed nature of industrial technologies is characterized by profit-making qualities.

What constitutes an industrial technology within the framework that we described above? Following our definition, we can say that industrial technology consists of material (advanced computers, robots, etc.) and non-material elements (management techniques, training sessions, etc.). It is important to emphasize here our view of the whole post-Fordist program of industrial work organization as one complex technology with many constitutive elements.

The industrial-work-organization technology came about with the coming of the industrial revolution. The emerging patterns of work within the new capitalist economy created the intensive need for a way that the production process would be organized. Therefore, the technological developments of the era are not only about the steam engine, the spinning jenny, Cort's process in metallurgy, or the general replacement of hand-tools by machines (Castells, 1996:34). They include techniques and methods of managing and coordinating those material technologies, but most importantly, of managing, coordinating and controlling large numbers of workers (Nightingale, 1982:36), who were forced to abandon their agricultural way of life and gather

into the urban environments to help in the development of capitalism - the transformation of the working humanity into a "labour force", a factor of production, an instrument of capital (Braverman, 1974:139). In that sense, people become part of this process and they bring with them problems that cause headaches to the owners of the means of production and to work organizers. Therefore, in order for industrial technology to succeed in its purpose, it had to develop the ability to cope successfully with the problems caused by humans involved in the industrial production process.

In this thesis it is argued that historically, in industrial work organization, the major fundamental problem for those who organize the capitalist production process has always been what we will refer to as the "human factor problem" (HFP). The great source of uncertainty, unpredictability and inefficiency in a rationalizing system, such as industrial organization, is people (Ritzer, 2000:104), that is to say, the "human factor". Therefore, industries had to manage/coordinate/control the human factor in order for the production system in question to achieve the desired results. Unlike the material parts of the system, the human factor is relatively difficult to control. In that sense, we may argue that industrial work

requires a specific type of worker, with specific characteristics and qualities, and thus, the organizers of the process try to create that type. When the apiarist wants to produce honey, the best way to do it is to employ bees. Only bees have the appropriate qualities for producing honey. The same happens with industrial workers. Lyon (1999), for instance, points out that everywhere in the new global informational economy workers are forced to be flexible, prepared to move geographically, if they wish to keep their jobs or find new ones and they must adjust to flexible schedules, add time, or reduce time, in what amounts to a "just-in-time-labour" system (1999:272). Of course, workers are not born with the qualities of an ideal type of industrial worker, and that is where the problem lies. As we will see later on, this type appears to be different in the various stages of the history of capitalism. Each system of industrial work organization requires its own type of worker. There have been various attempts and various strategies and methods which have been used in managing the human factor and creating each time the appropriate type of worker since the early stages of the development of capitalism. Those strategies may be seen as part of the whole system, as an element that comprises the notion of production systems as one technology. A

historical retrospection of the strategies used in managing and controlling workers since the beginning of the industrial work organization, will highlight what we have argued before.

### *2.3 EVOLUTION OF WORK ORGANIZATION SYSTEMS*

In the period that was characterized by the so-called "early factory system", as Donald V. Nightingale (1982) argues, a strident Spencerian ideology provided those who owned the means of production with a moral basis for unlimited and unilateral control over their property, including employees. According to this ideology, the success of the few and the powerful was a reflection of personal virtue and natural superiority (36). The biggest problem that the owners of the means of production encountered at this phase, was how to make people work within a new system that is suitable for industrial environment. Thus, factories were facing the problem of attracting labourers from rural to urban life (38). In other words, workers did not want to become a part of the emerging industrial technology. At this initial point, the workers became restless, truculent and uncooperative and expressed a general unwillingness towards working in industry (38). This was a result of the sudden change in

their lifestyles with their transition from rural to industrial way of living and working.

The owners of the means of production, and organizers of the production process, had to cope with problems caused by the disoriented work force. Therefore, they adopted the "appropriate" management practices. "Despotism, cruel exploitation, arbitrary use of power, subjective and capricious treatment of subordinates" (Nightingale, 1982: 36-37) were the directions followed at this stage of capitalist industrial production.

The HFP of this era is associated, then, with the willingness of the population - willingness, in the sense of the quick acceptance of the new condition and quick adjustment and conformity, and not willingness in the sense that they had a choice - to become industrial workers, to become the bees that will build the capitalist apiary. An example of that unwillingness and the difficulties in the adjustment of people into the new conditions resulted from the industrial development is the rise of the so-called "Luddites' movement", which started in Nottingham around 1811. Kirkpatrick Sale (1995) describes the conditions under which the Luddites' movement started:

"Having for centuries worked out of their cottages and small village shops on machines that, though far from simple, could be managed by a single

person, assisted perhaps by children, they (Luddites) suddenly saw new, complex, large-scale machines coming into their settled trades, or threatening to, usually housed in the huge multistory buildings rising in their ancient valleys. Worse still, they saw their ordered society of craft and custom and community begin to give away to an intruding industrial society and its new technologies and systems, new principles of merchandise and markets, new configurations of countryside and city, beyond their ken or control (Sale, 1995:3).

Luddism can legitimately be characterized as a movement, but it was also an amorphous pattern of events, an unfolding development rather than a formal and fixed organization or doctrine (Sale, 1995:75). Luddites, then, were engaged in a series of specific actions against industrialization and the introduction of machines. These actions include pseudonymous letters, nighttime raids, public demonstrations, attacks in factories, machine breaking, etc. (ibid.). E.P. Thompson has felicitously characterized the Luddist movement as "a violent eruption of feeling against unrestrained industrial capitalism" (in Sale, 1995:75).

Therefore, the type of worker required from the early factory system was the one that would adjust and conform quickly to the new environment. The exercise of personal, direct control over the laborer from the owner of the means



of production, that is to say, the typical subjection of the labour to capital, was the way to succeed.

Later on we have the rise of modern bureaucracy in the industrial work organization. With the rise of bureaucracy a major fundamental change took place, regarding the management practices of the industrial organizations. Bureaucracy made possible the depersonalization of authority (Nightingale, 1982:39). Obedience of the workers was now rendered not to a person but to a set of impersonal principles. Bureaucracy may be considered as a very successful social technology at that time, if only for the reason that it weakened workers' resistance by diffusing authority and power at an impersonal level.

Almost simultaneously with the rise of bureaucracy, at the level of the shop-floor and the relationship between the first line supervisor and the worker, we have the development of so-called "scientific management" or "Taylorism", named after its inspirer, Frederic Winslow Taylor (1856-1915), and it is associated with the Fordist system of production (assembly line)<sup>1</sup>. Taylorism is based on the organization of production, step by step, according to

---

<sup>1</sup> The term Fordism refers to the mechanized, mass-production manufacturing methods developed in the USA by Henry Ford between 1908 and 1914. He divided previously complex work tasks into a number of simple operations, applying the principles of Scientific Management, known as Taylorism, and also standardized the design of the product to eliminate all variation (Abercrombie et al, 1994).

scientific principles. By applying science in the organization of production processes there could be achieved the "one best way" of executing industrial tasks. This philosophy, of course, gave its own solution to the HFP. The solution was the codification of human working activities, on the basis of scientific principles, into bureaucratically organized procedures. Managers were to take a body of human skills, abilities and knowledge and transform them into a set of non-human rules, regulations and formulas, and once the human skills were codified, the organization no longer needed high-skilled workers (Ritzer, 2000:110). Therefore, the separation of "mind" work from "hand" work was Taylor's answer to the HFP. In order for this system to be successful, specific kinds of workers were needed. According to this model, the ideal type of workers had to be human beings "with minimal intelligence and ability, humans that resemble animals" (ibid.). That is to say, little mental ability and much physical strength were the required skills, in order for them to be able to reciprocate efficiently to their "scientifically" pre-designed tasks.

Therefore, with Taylorism we have the separation of the conception from the execution of work, partition and restructuring of tasks, and selection by managers of the

"one best way" of execution. Also, there occurs substantial subjection of the worker and de-skilling. The basis of control of the workers was direct, personal supervision and control by management of the manner and the time of execution of a task.

With Taylorism however, the HFP took new dimension since Taylorist management practices were considered as non-humanistic. Thus, we have the development of other, more human-centered, views regarding the HFP, such as the "Human Relations" and the "Human Resources" approaches.

The Human Relations and Human Resources approaches are two related but slightly different views on the role of workers and the solution that they offer to the HFP. However, both of them start with the view that workers should have more active roles within the factory and thus, we have the introduction of new terms such as "participative management", "self-direction", "self-control", "productive capacity of the employee", etc. (Nightingale, 1982:48). The difference between the two views is the following: under the Human Relations perspective, the manager shares information, consults with subordinates, and encourages self-direction solely to improve subordinate satisfaction and morale. On the other hand, according to the Human Resources perspective, the

manager allows subordinate participation because more effective decisions are made by those directly involved in and affected by the decisions. This perspective proposes that morale and satisfaction are related to participation, but that they result from the climate of creative problem-solving generated by participative management (ibid.).

We may argue here that these two views are an attempt to reconcile the interests of employers and the employees. Also, the evolution of the view from Human Relations to Human Resources perspective expresses something else: We said before that management encourages subordinate participation in decision-making. The Human Relations perspective does that for the satisfaction of the employee while the Human Resources perspective actually believes that subordinate participation will bring more efficiency in production. Why is this? Because managers no longer possess the technical knowledge necessary for decision making, in terms of the production process. The Human Resources perspective was dominant between 1960 and 1980. That was also the period of the great explosion in the development of information technologies and their application in industrial activities. New advanced manufacturing technologies, such as Numerically Controlled machines, made their appearance and were adopted by

industrial organizations. Therefore, with the development of this kind of technology and complex machinery, management was not able any more to control the production process in the same way it used to, simply because they didn't know the ramifications of the new technology (see for example Collinson & Collinson, 1997). Thus, they had no other choice but to introduce participation of subordinates in the production process. Here again we have the emergence of a new type of industrial worker. This new condition requires workers to possess the appropriate knowledge and technical skills (an expression of non-material technology) in order to become more integrated with the new information technologies and contribute to efficiency, productivity and profitability for the industrial organization. This did not happen out of the altruism of management, rather it happened out of technological necessity. Additionally, this must not make us think that suddenly workers gained control of their work, became autonomous and possessed power (see Harley, 1999:41 for the myth of empowerment of the workers). As we will see later on, management adopted other methods of control, most of which are related, as we will see, to what is called "responsible autonomy" (Friedman, 1977), in order to manage this new type of worker.

The same period, around 1970s, saw the introduction of the so-called post-Fordist system of production. It developed as a new technological paradigm of industrial production and adopted new management techniques and strategies of control of the workers, inspired by the human-centered approaches that we described above. Of course, this new production system had to take into consideration and reexamine the HFP afresh and try to give a more suitable solution that adapted to the new conditions.

This new system of organization of production, to which we will be referring as post-Fordism, has been given many other names, depending on various theoretical perspectives and approaches of the phenomenon, and also depending on its various elements that have been emphasized by different authors.

#### *2.4 POST-FORDISM*

Around 1970s, then, a change in the industrial condition, and at a societal level as well, was diagnosed. While many authors agree that this change actually happened, a debate ensued about what happened next. Authors started talking about post-industrial societies (Bell, 1973; Touraine, 1971), technological societies (Ellul,

1964), post-modern societies (Etzioni, 1968; Breed, 1971), knowledge economies (Machlup, 1962; 1980; Drucker, 1969), computerized societies (Martin and Norman, 1970), super-industrial societies (Toffler, 1971), third industrial revolution (Stine, 1975; Stonier, 1979), industrial-technological society (Ionescu, 1976), information society (Martin and Butler, 1981; Lyon, 1988), second industrial divide (Piore and Sabel, 1984), network society (Castells, 1996), even post-capitalist society (Drucker, 1993), to mention just a few terms that attempt to describe the condition after the identification of the change (Beniger, 1986). More specifically, regarding the area of industrial work organization, a multiplicity of perspectives and paradigmatic views dominated the discussion depending on the specific authors in question (e.g. see Liker et al, 1999:585). As a response to the crisis of the old, Fordist economy, there are also a few models suggested, which are related more closely to the mode of production and work organization. These models are the post-industrial model, the flexible specialization model, the lean production model and the neo-Fordist model (Smith, 2000:8-29).

In this thesis, we will not get into the debate on which term describes best the new industrial reality, neither will we devote space in outlining what every

perspective says. What we will do here is to try to construct an ideal type of the new industrial paradigm/program at the meso level of the factory organization<sup>2</sup>, examine it as such, and state and develop our argument within specific analytic frameworks. Critics of the post-Fordist theory have taken issue with its one-sided attention to markets and technologies, and its consequent neglect of the normative and ideological influences that shape managerial practices (Vallas, 1999:69). Therefore, the focus of our analysis will be at the level of the HFP and the way post-Fordist management deals with it and compares to previous paradigms.

Let us now refer to some general and generally accepted views by various authors, in their characterization of the post-Fordist economy. We have to mention here again that these characteristics are not found to the same degree everywhere in the world (see for example Barchiesi, 1998, a case study of the South African Motor industry where Fordist and post-Fordist elements co-exist), and that this is an ideal type of the new paradigm. Then, we will move on and refer to the ways and solutions that

---

<sup>2</sup> We might cross the lines among the micro, meso and macro levels at times. Besides, the three levels are connected and interrelated and the crossing of their limits is rather imposed, inevitable and appropriate, as well.



the post-Fordist paradigm has to offer regarding the HFP, as developed by advocates of post-Fordism.

The characteristics of the post-Fordist paradigm of work organization have been identified and crystallized through the comparison between the old Fordist and the new post-Fordist condition. Thus, the following elements (see Ritzer, 2000:182) have been attributed to the latter:

Declining interest in mass products and growing interest in more customized and specialized products, as opposed to the mass production of homogenous products that characterize Fordism.

Shorter production runs. Huge Fordist factories producing uniform products are replaced with smaller plants turning out a wide range of products.

Flexible production. New more advanced technologies are replacing the inflexible Fordist technologies, such as the assembly line.

More capable workers. Post-Fordist systems require more from workers than was required from their predecessors. For example, workers need more diverse skills and better training to handle more demanding and more sophisticated material technologies. These new technologies require workers who can handle more responsibility and

operate with greater autonomy. This is again in opposition to the previous ideal workers of Taylorism.

Greater differentiation. As post-Fordist workers become more differentiated, they come to want more differentiated commodities, lifestyles, and cultural outlets. In other words, greater differentiation in the workplace leads to greater differentiation in the society as a whole. The result is more diverse demands from customers and thus greater differentiation in the workplace.

These are the main characteristics, according to Ritzer, that mark the new post-Fordist mode of production. Now we will refer specifically to the HFP and to the claims of supporters of the positive outcomes of the post-Fordist work organization, as well as, the techniques through which these outcomes can be achieved.

It seems that the new post-Fordist program has a new solution to suggest, regarding the HFP. More specifically, it promises to address issues such as skilling/de-skilling, productivity, workplace democratization, job satisfaction, surveillance/privacy, and management/union relations. Behind all those issues lies the HFP and its impending confrontation. Supporters of the program claim that it produces positive outcomes regarding the above issues. In

other words, the post-Fordist work organization appears to contribute to the up-skilling of the workers, an increase in productivity, democratize the workplace (empowerment thesis), increase job satisfaction, protect workers' privacy, and enhance cooperation between management and workers' unions. As mentioned before, new management techniques have been introduced in the post-Fordist workplace that will ensure the solution of the HFP. Such techniques include Total Quality Management (TQM)<sup>3</sup> (see Noori, 1990:186; Webb, 1996:251; Paniagua & Julian, 1999), self-regulation of the workers, training and increase of the technical skills of the workers, employee participation in problem-solving, promotion of group and team work, etc. (Sorensen, 1996:101) (Also, see following chapters).

The development of these new management techniques is a result of the not-yet-autonomous character of the material technologies of production. The total automation of the production process cannot be achieved - the reasons for that are less technological and more sociopolitical - and the production process has to include humans. Also, as stated before, these new management techniques are in

---

<sup>3</sup> TQM is the culture of an organization committed to customer satisfaction through continuous improvement. More specifically, the TQ Concept means: integrating the quality development, the quality maintenance, and quality improved efforts of various groups in an organization so as to enable marketing, engineering, production and service at the most economical levels which allow for full customer satisfaction (Noori, 1990:186).

response to the emergence of a new type of industrial worker with increased technical skills and knowledge.

By looking at the automobile industry, we will examine the character of the new management techniques as the answer of the post-Fordist program to the HFP. We will examine one by one the post-Fordist claims mentioned above, we will critically assess them, and we will try to develop and support our argument. We will present changes in the management techniques as an attempt to solve the HFP. Also, we will argue that despite all the changes that took place historically and the claims of gradual humanization of the workplace by management, at a deeper philosophical level the perception of the worker as part of the industrial production process remains the same throughout history. In this sense, we argue that the new management techniques that came about, with a whole new discourse and literature that support it, do not differ much from the former "exploitative" program by Taylorist management. Post-Fordist management has the same goal as the Taylorist one. To create a certain type of worker, implement the new standards of industrial production, integrate/assimilate workers in the process, and effectively control them. In other words, solve the HFP. We do not claim here that the HFP has not found a solution. Post-Fordist management

techniques did solve it as all the former paradigms did. However, the issue that remains unresolved and neglected is at what cost did the HFP find a solution? In other words, how does the attempt to solve the HFP affect workers? These kinds of issues will engage our interests in the remaining parts of this thesis.

It needs to be specified here that the study of the automotive industry in this thesis must not be considered as a case study per se. It has been chosen for the reason that the automotive industry is where the changes and the evolutions that we described before appear and have been applied in their totality.

### **3. THE HUMAN FACTOR PROBLEM, CURRENT ISSUES AND SOCIETY**

The changes in industrial work organization, as we mentioned in the previous chapter, are associated, time-wise and contextually, with the debate around changes at the macro level of society. This chapter is divided into two parts. In the first part we briefly present the current issues/debates that are related to changes in the work organization paradigm and how these issues can be associated with the HFP. Thus, we deal with the up-skilling/de-skilling issue, the empowerment thesis, the change in union-management relationship and the issue of workers' privacy. In the second part of the chapter we deal with the changes at a societal level. We will try to reach some conclusions concerning the present form of society in light of changes in the work organization paradigm and post-Fordism's attempt to solve the HFP.

#### **3.1 SKILLS**

One of the most discussed issues, in light of the changes in the work organization paradigm, is that of workers' skills. The up-skilling/de-skilling debate is a fundamental one advanced to legitimate or to anathematize the new condition in the post-Fordist workplace. The issue in question refers to whether the new work organization

paradigm with its application of advanced information technologies (IT) increases or decreases the skills of workers. The relevant accounts given by scholars are divided. Some argue that flexible manufacturing calls for flexible multi-use equipment, which in turn requires employees to acquire a broad range of skills to master the variety of tasks (Bemmel & Reshef, 1991:235), and others, the advocates of the de-skilling thesis, argue the exact opposite, deriving their position from elaboration of Braverman's *Labour and Monopoly Capital* (1974). However, the debate over workers' skills begins with the definition of skill. There are various definitions that have been given to *skill*, some of which are more encompassing than others. Two major perspectives have been developed regarding the issue of the definition of skill. These are: the *task-analytic approach* and the *social deterministic view*.

Task analysis assumes that skill is an objective aspect of a job and can be measured scientifically (Attewell, 1992:50). Rating the complexity of the job's tasks on dimensions and then determining the overall skill entailed in the job by calculating the average complexity of these various dimensions or a weighted sum of the score

for each dimension, the measurement of a job's skill level can be achieved (ibid.).

The social deterministic view, on the other hand, makes a distinction between the idea of *skill* and the idea of a *skilled job*, by saying that in the first case, one focuses on aptitudes and the complexity of particular tasks and the skill needed to perform each task, while the second case concerns an occupation that is socially labeled and remunerated as a "skilled job" (ibid:49). Therefore, according to the social determination view, skill is not only an objective measure of the complexity of certain tasks, but it is also an attribute of jobs, an attribute governed by complex political struggles in the workplace (ibid:50).

In conclusion, it seems that the key debate between task analysts and social determinists over the definition of skill, is related to the question of whether having strategic power in the workplace can allow an occupation to attain a skilled status, even if there is no underlying "real" skill in its execution (ibid:51). Also, the social deterministic view shows that changes in the skill levels are not only due to changes in the levels of technology, rather they result from a more complex process where many



social, political, economic and cultural factors are involved.

Let us now proceed to the up-skilling/de-skilling debate and briefly outline the major arguments presented by the advocates of each side and offer some commentary on them.

The up-skilling thesis advocates, who derive their position from the works of Blauner(1964) and Woodward(1958), have advanced arguments to support their claim that the new work conditions tend to increase the overall skill level of the workforce. Their first argument refers to the nature of technology associated with the present system of production. They argue that the new advanced computer technology is about to change the traditional work practices of Taylorism that require few skills from workers (Smith, 2000:41). A second argument refers to up-skilling as a pursuable goal for firms in order for them to flourish in the context of the new economy. Firms operate in a competitive and ever-more rapidly changing environment. Enhancing the skill levels of the workers increases the chances of a firm to survive in this environment. Thus, it is in the rational self-interest of managers to ensure that the skill levels of the workers will rise, which is also in the interests of the workers

(Smith, 2000:44). In this view, everybody is happy and workers work with capital to pursue their interests, which lie right next to those of the owners and controllers' of the means of production. A third argument, finally, refers to the lack of empirical evidence to substantiate such a trend of a rise in the de-skilled workforce (ibid.).

The first argument about the nature of the technology associated with the new work organization paradigm is a typical case of technological determinism, a fact that renders it weak. The new advanced computer technology will set humanity free from all its problems, including ones in the area of work. However, the second and the third arguments are indeed very powerful. The relationship between firms and workers' unions gives a basis for the argued "common" interests of capital and workers, as we will see later on. Also, the lack of evidence which shows de-skilling of the workforce is used by the advocates of up-skilling to prove their point. Nevertheless, there is evidence to be found from many studies in various countries that suggests an increase in the overall skill level of workers. Peter Cappelli (1993) for example, by using data obtained from 56,000 US production workers over an eight-year period, suggests a significant upskilling of production jobs. Cappelli also suggests that not only has

each job experienced upskilling but also the overall distribution of production jobs has shifted away from a less skilled content to a more skilled one (Cappelli & Rogovsky, 1994:211). In Canada, the *Working With Technology Surveys* (McMullen, 1996) also suggests increase of skills and especially in establishments with the highest use of information technologies.

On the other hand, the de-skilling thesis argues that the pressures of capital accumulation relentlessly force employees to simplify the labour of skilled manual and "mental" occupations, and to separate the two, using new technologies to transfer production knowledge into the hands of managerial employees (Vallas & Beck, 1996:341). In other words, management aims at the de-skilling of the workforce in order to control easily workers by treating them as replaceable parts of the production process (Smith, 2000:34-35). The responses that the de-skilling thesis advocates give to the arguments of the post-Fordist literature are also very strong. They say that there is a difference between "job enlargement" and "job enrichment", that is, between "multitasking" and "multiskilling" (Menzies, 1996:94). Canadian workers in the telecommunication industry, for example, can easily identify that difference in the workplace and they insist

that their jobs are indeed degraded: "Instead of putting six capacitors in, we can now put six resistors in. Big deal!" (ibid.). Another example that supports this argument is the study conducted by Bob Russell (1997) of the University of Saskatchewan. Russell compares two companies in the soft rock potash mining and milling industry. Although these companies share a common technology, relations with the same union, membership of almost identical number and composition, and the same product market, they differ with respect to the labour force management strategies that are employed. One firm remains committed to traditional employment relations, including scientific management and bureaucratic authority, while the other is based on post-Fordist production relations. With respect to the labour process impacts, in the company that employs post-Fordist techniques, Russell's evidence clearly comes down on the "multitasking", as opposed to "multiskilling", side of the debate (Russell, 1997:49).

Another argument of the deskilling thesis states that since "skill" has been conceptualized and measured in diverse ways (see Hughes & Lowe, 2000:32), many of the empirical studies that show increase in the overall skill levels of the workforce, count work as skilled that ought not to be counted as such (Smith, 2000:47).

Finally, workers may spend more time in front of computer screens but managers fail to provide operators with access to comprehensive information regarding the enterprise. Under these circumstances, work with computers is neither more interesting nor more skilled (ibid:36).

However, there is a tendency that shifts the focus from the workers-management relationship and places it at another level. With the introduction of numerically controlled machines in US workplaces, as David Noble (1984) concludes, skills that were previously embodied in the worker are now objectified in the machine. Also, Harley Shaiken (1984), in his study on the introduction of numerically-controlled machine tools in US factories, argues that numerical control, involves transferring the control of a machine from a skilled worker to a preprogrammed set of instructions (47). This is a disadvantage not only for the workers but for the management as well, since the task of control of the workers is now executed by the machines and not the management itself. We will expand more on the issue of skills in our next chapter when we deal with the case of the automobile industry.

### 3.2 DEMOCRATIZATION AND EMPOWERMENT

Another major issue that dominates the discussion about the new industrial work organization paradigm is the so-called "empowerment thesis". The empowerment thesis is associated with the promise of a more democratic workplace that offers autonomy and control to employees. Empowerment is defined as "the belief that new forms of work organization are overturning traditional managerial structures and returning control to employees" (Harley, 1999:41). Although the notion of empowerment has been defined in various ways (for some examples, see *ibid.*43), its main argument is that the new management techniques, such as Total Quality Management (TQM), teamwork groups, consultative committees, etc. appear to increase production and give workers more autonomy and control over the production process. In other words, with this "win-win" outcome everybody is happy (see *ibid.*42; Parker & Slaughter, 1995:42).

The empowerment thesis has been criticized a lot and it is considered to be a myth by many authors. Harley (1999), for instance, argues that the empowerment techniques represent relatively minor modifications to dominant, pre-existing, organizational forms and practices, and fall a long way short of a 'paradigm shift' or the

emergence of the 'post-bureaucratic organization' (Harley, 1999:44). Also, critics suggest that there is little evidence that the new management techniques provide workers with increased power or influence (i.e. Cunningham et al. 1996). Findings from various workplaces support this view. Collin Hales (2000), for example, presents evidence from studies of hotel companies, a theme park, chemicals and telecommunications manufacturing plants, where empowerment programs were introduced. This evidence suggests that there are big contrasts between the empowerment rhetoric and what happens in reality (505). Also, a study based on the 1995 Australian Workplace Industrial Relations Survey, which surveyed around 20,000 employees and 2,000 workplaces, concluded that management practices associated with empowerment do not contribute to workers' autonomy (Harley, 1999:53). Other authors suggest that empowerment may be associated with work intensification. Legge (1995) for example, suggests that the rhetoric of empowerment that "we are all managers" might be recognized as a "mask" of the intensification and commodification of labour (325). Thompson & McHugh (1995) also report on studies, which showed that techniques such as Total Quality Management are geared towards eliminating slack and waste in the system, and workers have reported that "empowerment" involved

considerably harder work (188). Finally, regarding excellence in production as associated with the empowerment thesis, it is argued that this does not mean the ability to produce a more durable or environmentally responsible product, and it does not mean providing better service. The companies define excellence largely in systems terms: faster, cheaper, equals better (Menzies, 1996:107).

In relation to the HFP, the "empowerment thesis", given the existing evidence that refutes it, can be seen as an attempt for promotion and legitimation of the new post-Fordist management techniques.

### *3.3 UNION-MANAGEMENT RELATIONSHIP*

Another relationship that has been challenged and transformed with the change in the work organization paradigm is that of management-union relationship. The workers' participation programs that aim to decentralize decision making within the firm have changed union-management relationship (Frost, 2000:265). With changes in the economic and social working environments, it is argued that an era of cooperation is now needed (Kochan et al., 1986; Heckscher, 1988; Bluestone & Bluestone, 1992).

Traditionally, unions have been the organized form of representation of the workers in the conflict of interests



between capital and labour; it is the right and need of workers to have a voice in decisions affecting their jobs (Perline, 1999:148). However, in the new post-Fordist environment, the labour-capital conflict appears to be more settled if not overcome. The new relationship, schematically, appears to be as follows: management has sought to generate worker and union commitment to its goals (lower cost, higher productivity, higher quality) and in exchange it claims to provide greater employment security, greater worker autonomy and more enjoyable work (Frost, 2000:265).

This attempt of management to approach unions, even though it seems as a perfect solution that puts an end to the capital-labour conflict, has been hotly debated. The major argument is that this new management-union relationship will result in the weakening of union bargaining power and ultimately the undermining of the unions very survival and growth as an institution of worker representation, and as a force of social change (ibid: 265-266). In other words, the reconstituted management-union relationship will mark the beginning of the real subsumption of labour to capital.

A result of the new union-management relations is a general decline in unionization. In the US for example, and

in Canada but not to the same degree, the past two decades have witnessed a significant decline in unionization (Riddell, 1993:2). Union density also declined during the 1980s in a number of other countries - including Japan, the Netherlands, Italy and the United Kingdom (ibid). This general decline in union membership is evidence that unions lose their significance as the representative of the workers and it also loses of its bargaining power. More recent measures, however, reveal a slight increase in union membership in the service sector. In the US, for instance, in the period 1999-2000, although the vast majority of service workers remain unorganized, union density increased from 5.5 to 5.6 percent (Union Membership in 2000 - UAW web page).

The new management-union relationship represents an angle of the organized attempt of the post-Fordist program to solve the HFP. We must mention here that management's attempt at gaining worker's cooperation, even though it appears more intense, successful and redefined after the introduction of post-Fordist organizational forms and the use of powerful information technologies (Castells, 1996:278), has had a long history. The formation of Whitley Councils (named for J.H. Whitley, chairman of the investigatory committee from 1916 to 1919, who recommended

their formation) and Joint Production Committees in Britain during both WWI and WWII, respectively; the Labour-Management Committees under the War Production Board in the US during both world wars and various profit-sharing plans and human relations projects and experiments during early 1900s, are a few examples (Giordano, 1992:8).

### *3.4 SURVEILLANCE AND PRIVACY*

Another issue that emerges in the context of new technology and the workplace is workers' privacy. The issue itself is not recent and it has its roots back in the beginning of the nineteenth century when Jeremy Bentham and Robert Owen developed techniques of surveillance of workers for the improvement of production (Rule, 1996:66). However, with the development of "intelligent" surveillance technologies and the reconstruction of the organization of work, the problem of workers' privacy appears now reconstituted.

With the transition to post-Fordism, as we have seen, a change occurred in management techniques along with the introduction of computer technologies in production. These technologies are providing ample ground for reinterpretation of the boundaries between appropriate and inappropriate management practices (Smith H.J., 1994:200).

With this transition, a question is raised as to whether or not workers' privacy is being invaded. There is much ambiguity regarding which types of data are appropriate for an employer to collect *before* and *during* the employment relationship (ibid.).

During the hiring process employers can collect information about their potential employees by using the application that has been submitted, results of medical examinations, references, employment history, employment agency applications, etc. (see Gandy, 1996:139). However, the greatest concern for the workplace is the case of surveillance techniques during the production process, in day-to-day jobs (Smith H.J., 1994:201).

Techniques, that involve more than just one information technology, are being used for surveillance during the production process. These new techniques of surveillance in the workplace are often less obtrusive, but more invasive (Lyon, 1994:130). Examples of such techniques are: computerized tasks that measure each employee's productivity; electronic badges that trace worker's location for physical tracking of the employees (Smith H.J., 1994:201); plastic cards, electronically stored fingerprints, retinal patterns or voice tests are used by workers to gain entry to the workplace or to areas within

it; bar-coding techniques allow employers to break down employee days into minute-by-minute allocatable hours for billing purposes, as well as, to measure efficiency; electronic monitoring (Lyon, 1994:129-130), and many others. All these surveillance methods reveal a trend in which the focus is more on the worker than on the work itself (Regan, 1996:21).

Successful employee surveillance, however, cannot only be achieved through the increased use of information technologies. In other words, surveillance over workers cannot be absolutely achieved through the development and increased use of advanced information technologies alone. The new information technologies of surveillance have to be seen along with the change in management techniques, both of which express the change in the work organization paradigm and the transition to post-Fordism. "Teamwork" is an example of a new management method that has been introduced in post-Fordist workplaces, and among other things, it contributes to the successful surveillance and control of the employees, in a less direct way, as we will see. Even though teamwork is considered a reversal of the Taylorist attempts to isolate workers in time and space and standardize their activities (see Clegg, 1981), it can be a very sophisticated method of horizontal surveillance,

which, while operating in nominally autonomous work teams, is enacted through group scrutiny (Sewell, 1998:410). This peer group scrutiny creates a sort of self-disciplinary atmosphere within the team, which in Foucauldian terms, is achieved through the exercise of the so-called "biopower" (see *ibid*:404). In other words, teamwork can be seen as a technique of horizontal surveillance that aims at the subjugation of bodies and at the controlling and disciplining of workers (Burrell, 1998:19). As David Lyon explains: "workers typically find themselves more watched, not just by managers but by workmates and, in a sense, by themselves" (Lyon, 1994:125-126).

The trend of increased workers' surveillance makes perfect sense, from the perspective of the post-Fordist management. The logic that the attempt of the solution of the HFP is based on, poses the need to collect as much information as possible regarding workers' performance - it's the 'information society' after all. All the collected information, then, is used in order to discipline, coordinate and control workers.

### 3.5 *PRODUCTIVITY*

Productivity is another current debate/issue associated with the new work organization paradigm of post-

Fordism and the HFP. The basic question regarding this issue is this: after all the restructuring of the mode of production, have we witnessed an increase in productivity levels or not? This question, as easy as it might seem, is not that easy to answer after all. The difficulty of this question rests upon the fact that levels of productivity are not easily measurable, especially after the reorganization of work, the creation of new tasks and the introduction of new information technology. Therefore, the inadequacy of economic statistics to capture movements in this new type of economy, has led to measures, as evidence reveals, that show a productivity slowdown for the last two decades, especially in the service sector (Castells, 1996:78). In the manufacturing sector, however, the case appears to be completely different. In countries such as the US and Japan, productivity levels in the manufacturing sector have increased dramatically in 1979-89 period and even more during the 1990s and especially in the sectors that include electronics manufacturing (ibid:79-80). This difference between the service sector and the manufacturing sector, it is argued, is due to the difficulty in measuring productivity, especially in white-collar occupations in the service sector where there is not a clear material product that is being produced. Also it is argued that the service

sector appears to be less productive than the manufacturing sector because of the relative delay in the diffusion of the changes of the work organization paradigm from the manufacturing sector to the service sector and to the rest of the economy (ibid:78-79).

As studies of the relationship between organizational structures, information technologies and productivity in Canadian firms (Sharpe, 1999) have shown, the productivity increase is not only due to information technology adoption itself, but rather due to the whole reorganization of the working process (ibid.41). Overall, we may say that there is indeed an increase in productivity rates in manufacturing since the rise of post-Fordism and the reorganization of work. This productivity improvement can be considered as an indicator that the HFP has been solved, at least partially, and that the whole system of post-Fordist work organization actually works. In the next chapter we will examine the issue of productivity again, as related to our specific case of the auto industry.

### *3.6 JOB SATISFACTION*

Before we move further and talk about some general conclusions about the HFP at the level of society, we will refer to the issue of workers' satisfaction. Job



satisfaction represents an overall assessment of one's job and it is a general indicator of the quality of one's work experience (Berg, 1999:113). Even though it constitutes a subjective measure of individual well-being, it is a particularly powerful measure since it is strongly correlated with mental health, life expectancy, heart disease, turnover and absenteeism (ibid.). By means of questionnaires, a study of 207 automobile manufacturing workers in the US, assessed the physical and mental health, as well as many work-related factors such as stressors, the quality of work relationships, participation and influence in decision making and health behaviours. The study found that decreased job satisfaction, which results from increased job insecurity, increases physical symptomatology, causes chronic stress and serious health problems for workers (Heaney, Israel and House, 1994).

There is a significant number of studies conducted that relates job satisfaction to various factors such as gender, environment, etc. What is of interest here, is the level of job satisfaction as related to the change of the organization of work and the introduction of new technology. The results vary across sectors and workplaces. Some studies find increased job satisfaction levels, while

some others find a decrease and still others reach more neutral conclusions.

Survey data from 1,300 employees in the Australian telecommunications industry, for example, indicate that job satisfaction is positively influenced by computer usage, computer training and some other demographic characteristics (Zeffane, 1994).

On the other hand, a study based on ethnographic data from four manufacturing facilities in the US, show that "employee involvement", which was introduced as a program within the framework of an organizational change initiative, did not fulfil the predictions regarding the expected increased levels of job satisfaction among workers (Scarselletta, 2000).

Another study, based upon a random sample of 1509 members of the US Silicon Valley workforce, compared job satisfaction levels between a high-tech, "post-Industrial" workplace with that of a "traditional" industry, and found no significant differences between them (Gamst & Otten, 1992). Of course, these findings are not consistent but they bring about doubt on the argument, which says that high-tech workplaces are more satisfying than the more traditional ones.

Finally, a study using data from a sample of 1,355 hourly workers in the US steel industry across 13 plants, examined how different practices associated with high performance work systems (worker's motivation, training programs, etc.) affected the job satisfaction levels of the workers (Berg, 1999). Taken as a whole, this study showed that high performance work practices had a generally positive effect on job satisfaction. However, Berg argues, the effect of these practices on workers depended very much on how the jobs and work roles were defined (130).

As we can see from the above studies, job satisfaction is affected by various factors and the levels differ among different workplaces and sectors. Although job satisfaction levels may be an indicator of the degree of intensity of the HFP in individual cases, we cannot easily reach a uniform conclusion related to the whole economy. There are many contingency factors and individual interpretations of the working conditions that affect the levels of job satisfaction that have to be taken into consideration when examining a particular case. In the next chapter we will give some examples regarding the automobile industry, from various countries and workplaces.

### 3.7 THE HUMAN FACTOR PROBLEM AT THE LEVEL OF SOCIETY

After this overview of the current issues/debates surrounding the discussion about the change in the work organization paradigm, we will move to the discussion about the conclusions that can be made at a societal level in relation to post-Fordism. In other words, we will see how change in the work organization paradigm affects society and what changes can be identified at the macro level that are related to the HFP.

As we mentioned in the previous chapter, during the 1970s and 1980s a significant amount of accounts were produced dealing with the change at the societal level that started happening two or three decades prior. The development of information technologies and the reorganization of work led analysts to the identification of major societal changes. These changes, however, have many different angles depending on the different perspectives, and the various aspects that have been analyzed by authors. At this point we will focus on the importance of the HFP in the area of work, and how it can be expanded at a societal level. It will be argued that the area of work, even though it is a big and important area, reflects only one of the many expressions of the HFP, which

remains vital in all social activities at the present system of social organization.

James R. Beniger, in his account *The Control Revolution: Technological and Economic Origins of the Information Society* (1986), deals with the concept of "control" and views it as the driving force for the evolution of the constitution of modern societies, within a process that started with the industrial revolution. He argues, for example, that information technologies are not new forces only recently unleashed on an unprepared society, but merely the latest installment in the continuing development of the *Control Revolution* (Beniger, 1986:vii).

Beniger identifies a crisis of control with the rise of industrialism. The reason for the control crisis is, as he argues, the fact that for the first time in history, by the mid-nineteen century, the social processing of material flows threatened to exceed in both volume and speed the system's capacity to contain them (Beniger, 1986:219). Thus, because of this major societal change we have a control crisis in transportation, in production, in distribution, in consumption and generally, a control crisis in the systemic functions of industrial capitalism as an economic and social system.

Beniger, then, argues that as a response to the crisis of control, there followed a control revolution, which continues to this day. He talks about bureaucracy as a control technology that developed in response to the crisis, that is to say, as a critical machinery for control of the societal forces unleashed by the industrial revolution (ibid:6). Within this setting, Beniger views the development of the present advanced information technologies, and by extension, all the evolutions in the mode of production, not as a cause but as a consequence of societal change, as natural extensions of the control revolution already in progress for more than a century (ibid:7). Therefore, according to Beniger, the way society is organized is an outcome of its attempt to overcome the control problems that were generated by the rise of industrialism.

Beniger's view is quite convincing and he bases it in a very detailed historical analysis of industrialism. However, we would like to build on Beniger's ideas further by exemplifying the importance of the need for exercise of control on humans as a major factor that interacts, shapes and is shaped by the specific social, economic, political and cultural relationships of each era. In other words, the HFP may be seen within the framework that Beniger provides,

that is to say, within the framework of the Control Crisis-Control Revolution scheme. Therefore, as we argue in this thesis, the development and extensive use of advanced information and communication technologies in production, along with the change of the work organization paradigm and the transition to post-Fordism, are changes that express the latest form of the attempt to find solutions for the HFP. These new developments in technology and management do not only aim to control processes but humans as well. Also, as we will see, the HFP does not refer only to the area of work but it extends to the rest of society. We need to specify here that the form that the post-Fordist system took as a response to the HFP is due to the social framework in which it evolved. That is to say, the capitalist relations of production provided the basis on which post-Fordism developed its techniques in order to resolve the HFP.

The methods of organization of work and production in manufacturing are expanding and cover all sectors of the economy. Harry Braverman (1974) for example, showed this expansion in a systematic way by arguing that the service sector is being "Taylorized" in a similar way as factory work. The reason for this expansion is due to the nature of Taylorism as the explicit manifestation of the capitalist

mode of production (ibid:86). In other words, as capitalism diffuses into economic and social life, its methods of organization follow and tend to include all spheres of human activity. Braverman's *Labour and Monopoly Capital* was heavily criticized at many levels. Marxists have criticized his work as too simple, too exclusively focused on managerial strategies and that he offers one-sided, objectivist conception of the labour process, ignoring the subjective dimension of work, the larger political, economic and ideological context, and that he neglects working class resistance to capitalist control (Meiksins, P., 1994; Lewis 1995; Spencer, 2000). Non-Marxists, on the other hand, focused on the methodological problems associated with the definition and measurement of skills (Lewis, 1995:479).

Regarding the diffusion of the Taylorist methods of organization Kumar argues that: "Taylorism was not intended to apply simply to the lower levels of the workforce. It contained the explicit principle of 'functional management' which implied that standardization and simplification were to be features of managerial as well as manual work" (Kumar, 1995:19). This explains why the greatest resistance to Taylorist methods of management came from middle managers and supervisors and not from the shop-floor



workers (Lash and Urry, 1987:170-171). Indeed, as Scarbrough and Burrell (1996) argue, middle managers may have "de-managed" themselves out of existence, by rationalizing and codifying their own activity in business process re-engineering (177). As evidence shows, in 1991 alone, nearly one million US managers earning over \$40,000 lost their jobs (in Collinson and Collinson, 1997:376). Middle managers were found too costly, resistant to change, a block on communication, that they under performed, and engaged in politicking (Collinson and Collinson, 1997:376). Thus, in the 1990s, the labour of the "salarariat" - group of expert, highly skilled managers and technicians - has become highly disposable (Burrell, 1996:59-61; Collinson and Collinson, 1997:376), a fact which shows that the changes in the organization of work do not affect only the lower levels of the workforce. In this context, female managers are found to be more disadvantaged than male managers. More specifically, despite assumptions which say that in the age of flatter hierarchies and teamworking, women are progressing into management, evidence shows that persistent organizational barriers are impeding and even reversing the 'feminization' of management (Collinson and Collinson, 1997:401).

The expansion of the methods of organization of work and production continues and covers the organization of social life. This is where the "Social Taylorism" project comes about, and it is associated with bringing even more areas of social and cultural life within the purview of capitalist activity and market rationality (ibid:155; Sewell, 1998:408).

This expansion of the methods of work organization to the spheres of social and cultural life continues with post-Fordism, which is the introduction of new management techniques, and change in the work organization paradigm. As we saw earlier on in this chapter, with the current issues/debates that come along with the new work organization paradigm, there are changes taking place in the new post-Fordist workplace which refer to workers' skills, workers' privacy, job satisfaction, union-management relationship, workplace democracy and productivity. The new post-Fordist management techniques, in order to provide a solution to the HFP, changed the profile of the modern workplace, yet retained certain essential factors. The logic of the capitalist system of social organization, however, calls for an equivalent adjustment of the rest of social and cultural life to the purposes of capitalism. In other words, social and cultural

life needs to be organized in a way that fits into the capitalist logic and serves and facilitates capitalist maintenance and further development. This is the wider expression of the HFP at a societal level.

Besides the sphere of work and production, therefore, the sphere of leisure and consumption has seen a major impact resulting from the reconstruction of the work organization paradigm (Kumar, 1995:155). Kumar, for instance, talks about the "home centered society" provided by the new technologies (ibid.). Internet, videocassettes, cable television, microwaveable TV dinners, tele-banking, tele-education, tele-working etc. are methods of keeping people in their homes. The present society, Kumar says, wants to gather people all up in one place, reuniting activities previously dispersed by the industrial revolution (157-158). The purpose of this strategy is to encourage individualization. The home becomes the preferred site of individual activities, but it generates no collective purpose or sense of shared family values (ibid: 158). As a result, the vitality of the public sphere suffers, and there is no need or place for collective or group activities (158).

As we can see, the HFP at the level of social and cultural life finds its solution through the return to the

home, as a place, and the increase of individualism and depoliticization. The "death of the social" that Baudrillard (1983) talks about sounds like the perfect answer to the survival and rejuvenation of capitalism at this phase of its history. By "death of the social", Baudrillard identifies a condition which characterizes contemporary society and expresses a major transition. He argues that the center of gravity within the capitalist mode of production has moved from the abstraction of the exchange of material products to the operationalization of all exchanges under the law of the code; this constitutes the passage to the "political economy of the sign" (Smart, 1992:121). In this way, Baudrillard describes the major transition from the modern to the post-modern era, where the "sign" (a non-material element) acquires increasing centrality, not only in terms of production and consumption, but additionally, in terms of everyday life (ibid.).

Thus, the dominance of the sign and the sphere of culture, along with the development of the media, contribute to the death of the social and its replacement with the inert mass, with a "silent majority", which is socially and politically inert, with no social substance, which stays at home and devotes itself to the consumption

of media messages. This is a creation of capitalism in its attempt to maintain itself. That is to say, the "death of the social" and its replacement with the mass, provides a quite suitable answer to the HFP at a societal level, that is to say, to the need of effective management and assimilation of the populations into the settings of present capitalist societies. In other words, capitalism is not dying with the social in a simultaneous death. On the contrary, the death of the social is what keeps capitalism alive. Also, the sphere of economy *does not* lose its importance under the prevalence of the sphere of culture, as it might seem in the first place. What is most likely to happen, as the passive consumption of non-material signs reveals, is not the domination of culture over economy, but rather the "economization of culture", its commodification and its direct trading as consumable-at-home product.

Therefore, people are subjected to a paradigm of organization of social and cultural life, which is equivalent to the work organization paradigm that defines and controls social relations. This paradigm that we call post-Fordism does not constitute a new society or a New World. Even if post-Fordism is identifiable, it betokens no new principle that will make a distinction between old and new kind of society (Kumar, 1995:167). The rise of a new

work organization paradigm is simply the expressions of capitalism's well known disposition to change and modify its practices in accordance with the requirements of economic survival and growth (ibid:168). Therefore, post-Fordist society remains a capitalist society. Power relations are maintained and the need of control and management of people (the HFP) remains an issue. The only things that have changed are the methods and techniques of controlling people, of solving the HFP. Can we say that the present society is a society of the "management of the human factor"? We argue here that every society, since the rise of capitalism, is a society of the "management of the human factor", in the sense that there is always a need for an efficient management of the populations. The present society is just the latest version of that kind of capitalist society, which develops its own techniques, and therefore, offers its own solution to the HFP.

#### **4. THE HUMAN FACTOR PROBLEM AND THE GLOBAL AUTO INDUSTRY**

In the previous chapter we examined the current issues/debates that emerge in light of changes in the work organization paradigm and we reached some conclusions about contemporary society. We concluded that the HFP, as it can be identified in the area of work, is only one expression of it; it is part of a wider problem that refers to the totality of the human activity and social organization. We showed, for example, how the HFP expresses itself in the area of leisure and consumption and how the system of social organization attempts to solve it.

At this point, however, we will discuss how the HFP applies to a specific industrial sector, the automobile industry, and also, the forms which the issues/debates, presented in the previous chapter, take in the context of this specific industry. The chapter begins with a discussion about the suitability of the automobile industry as a representative case in order for one to study the changes in the work organization paradigm as related to the HFP. Next, we will provide a socio-historical profile of the industry as it has been developed and evolved worldwide. The chapter continues with elaboration on the current issues/debates discussed in the previous chapter,

with the automobile industry as its specific focus. Thus, we will discuss skills, democratization and empowerment, union-management relationships, workers' privacy, productivity and job satisfaction. For this purpose we will draw examples and data about the Auto Industry from various countries and geographic regions, mostly from North America. The chapter will end with conclusions about the HFP in the automobile industry.

#### *4.1 AUTOMOBILE INDUSTRY - THE MODEL INDUSTRY*

In order to examine the HFP in a more comprehensive way, as it relates to the area of industrial work organization, the AI has been chosen as a representative field of industrial activity. The representativeness of the AI derives from several factors:

The first and the most obvious element that reveals the representativeness of the AI is the fact that the name of Henry Ford, owner of the Ford Motor Company, has come to characterize a whole era of industrial production. The term "Fordism" refers to the system of industrial production that was dominant in the period from the 1920s until the 1970s, which is characterized by mass production (Morales, 1994:15). The international and intersectoral recognition of the term "Fordism", is in itself evidence regarding the



influential role of the AI in shaping economic and social activities. Given the centrality of the AI we should expect to find most of the features of post-Fordism present in the AI case (Law, 1991:6).

Besides the terminology, however, there are other things too that put the AI at the centre of attention. AI constitutes an "ideal type" of the history of industrial work organization. The introduction of Taylor's scientific management methods in the AI is an example of the intensity in which the evolution of the work organization paradigms has been expressed in this specific industry. Nowhere has the Taylor-like rationalization of the workplace been carried further than in the AI (Shaiken, 1984:26). This is another reason that makes the AI a suitable case in order to study changes in the organization of work, which are closely related to the HFP. Also, with the rise of post-Fordism, in the era of international competition and flexible responses (Morales, 1994:15), the AI is part of a world system and only few major markets are not influenced or controlled by the multinational motor corporations (Bloomfield, 1991:19). From the above we can conclude that the history of the AI is closely associated with the history and development of industrial capitalism.

Since all the features of post-Fordism can be found in the AI, it is expected that the issues/debates that we discussed in our previous chapter will emerge more intensively in the AI, as well. For example, the skills of workers were always a central issue in the AI. Henry Ford's production methods have become virtually synonymous with the minute subdivision of work and time-and-motion studies (Shaiken, 1984:26), and are associated with techniques that led to the de-skilling of workers. Also, AI was always based on high skill levels, including manual skills. A SOFI (Soziologisches Forschungsinstitut) survey of the German Automobile Industry in 1989 showed that despite automation, more than the three quarters of the production jobs in AI can be classified as "manual work in direct contact with the product" (Kern & Schumann, 1992:115).

Another example has to do with the unions in the AI. Although there is a tendency for decline in unionization (Babson, 1995:13; Howes, 1995:170), the AI, as part of the manufacturing sector, remains a highly unionized sector compared to other sectors of the economy. For example, the manufacturing sector in the US for the year 2000 counts 2,832,000 union members, while the same year the service sector, had 1,884,000 members, i.e., less by one million workers (Union membership in 2000-UAW web page).

A final reason that made us choose the AI for the purposes of this research project, is its big size, and thus, its significance for the global economy. AI is either the largest or one of the largest industries in the world (Law, 1991:1). In the period from 1960 to 1973, the global production of the world AI expanded rapidly from 16.4 million to 39.2 million cars respectively, while in 1987 it reached 45.6 million cars (Bloomfield, 1991:21). Also, during the same period (end of 1970s), there were 5-6 million jobs that depended on the industry in the major producing nations (Law, 1991:1). In the US alone, the year 2000, saw the production of 17.33 million cars, which is a 2.8% increase from the year before when the production reached 16.88 million units (The US Auto Industry 2000 in Review-UAW web page). Thus, the AI provides particular insight into issues of changing industry structure and appropriate industry policy. The AI remains central to the economic welfare of most advanced industrialized nations and key industrializing countries (Morales, 1994:3).

#### *4.2 HISTORY AND PROFILE OF THE GLOBAL AUTO INDUSTRY*

The AI is a typical industry in the history of the manufacturing industries. The history of its evolution is similar to that of other modes of industrial production.

Therefore, we can distinguish three historical periods of automobile production: The first, beginning in the 1890s and continuing to the 1920s, consisted of the *craft era*; the second, lasting from the 1920s to the end of the 1970s, was the era of the rise and decline of *mass production*; the third and current period, from the 1970s and after, is characterized by *international competition and flexible responses* (Morales, 1994:15).

After 1970s, then, new forces began to undermine the traditional structure of the AI. Among the many forces of change are shifts in the world economy, the redefining of technology and markets, and consequent alterations in the structure of firms and patterns of location (Bloomfield, 1991:19). Based on these factors, we can make a distinction between two levels of analysis regarding the AI. The first level is the *global level*, at which we can see the development of the AI as a global process and the way it was affected by the tendency for globalization of the economy. This also gives us a picture of which geographic regions are the bases of the global automobile production nowadays. The second level is that of the *labour process*. At this level one can identify changes that took place at the level of the firm. In other words, the level of the

labour process refers to the changes of the work practices and the organization of production within the workplace.

Regarding the first level of global processes, it is agreed among scholars of various perspectives that the global diffusion of the lean production model is an essential part of the regeneration of the global economy (Smith, 2000:120). Within the global economy, the core activities of production, consumption, as well as their components (capital, labour, raw materials, management, information, technology, markets), are organized on a global scale, either directly or indirectly through a network of linkages between economic agents (Castells, 1996:66). The global economy is a recent phenomenon and it means that the economy, through the use of advanced information and communication technologies, works as a unit in real time on a global scale, and implies a degree of functional integration between internationally dispersed economic activities (Castells, 1996:92; Dicken, 1992:1). Such an economy is strongly related to capitalism and its tendency to expand throughout the world, which means that capitalism is the vehicle for economic globalization (Waters, 1995:66).

A form of expression of economic globalization is the operation of the multinational enterprises, which engage in

foreign direct investment (FDI) and organize production of goods and services in several countries in the world (Waters, 1995:76). Those enterprises are rather international networks of firms (supplier networks, producer networks, customer networks, standard coalitions, technology cooperation networks), and of sub-units of firms, than one-unit enterprises with centralized management (Castells, 1996:192). Therefore, multinational enterprises make alliances with other enterprises all over the world, and create networks and linkages. In the process they split the production process in several junctions throughout the globe, in order to be able to make all kinds of exchanges, technology transfers, production licensing, the division of component manufacture and assembly, market sharing, or rebadging (Waters, 1995:79). Examples of such alliances are the General Motors-Toyota alliance, the KLM-Northwest alliance, etc. (Waters, 1995:78-79). The multinational enterprises, through those linkages and networks, make FDI in order to reduce the cost of production by using cheap labour, is one example. Thus, American firms tend to invest in Latin America and some parts of Southern Asia; Europeans in Africa, Brazil, Southern Asia and Eastern Europe; and Japanese firms

dominate investment in East Asia and Australasia (Waters, 1995:79).

The process of globalization of the economy has an effect on the so-called *international division of labour*. As we saw, in regard to the multinational enterprises, we are experiencing the globalization of production through networks and linkages between economic agents all over the world depending on production needs for specific products (e.g. Automobile Industry). This is happening in different places in the world simultaneously with little time and space constraints. This fact causes changes in the international division of labour.

International division of labour, as Waters sees it, has to do with a self reproducing relationship of domination and dependency between metropolitan and peripheral societies, in which relationship, binary division such as developed/underdeveloped, modern/traditional, first world/third world, and the like, are profound (Waters, 1995:71). Therefore, commodity production is being split into fragments that can be assigned to whichever part of the world that can provide the most profitable combination of capital and labour. This new kind of international division of labour has a

technical character and it can, therefore, be the vehicle for a genuine globalization of production (ibid:74-75).

On the other hand, Castells (1996) believes that the new international division of labour does not take place between countries but between economic agents placed along four positions of a global structure of networks and flows, using the technological infrastructure of the information economy as its basis (147). These four positions are: producers of high value, based on informational labour; producers of high volume, based on the lower cost of labour; producers of raw materials, based on natural endowments; and the redundant producers, reduced to devalued labour (ibid.). Therefore, Castells believes that it is the characteristics of labour that are important rather than the characteristics of the country.

More specifically, by the early 1970s, the AI was clearly part of a world-system, with its production and marketing branches reaching out far beyond its roots in previously autonomous national areas (Bloomfield, 1991:19). Geographically, three production regions dominate the industry, regions that have been changing in relative significance since 1973. Those are North America (USA/Canada), Western Europe and Japan, the so-called *triad* (Humphrey et al, 2000:1). North America's share of world



output has experienced a decline as new competitors have arisen and as motorization has diffused more widely (Bloomfield, 1991:21). In 1977, for example, North America accounted for 35.2% of world vehicle output, while a decade later its proportion had fallen to 27.1% (ibid.). During the same period in Western Europe there has been no major change in its relative world position within the AI (ibid:23). Unlike North America, Japan has experienced a significant output expansion. For example, Japan's share of world output grew from 20.7% in 1977 to 26.4% in 1987 (ibid:24).

During the 1990s, however, the scene has changed somewhat. Japan has been in recession since 1992 (production dropped by 2.5 million vehicles between 1990 and 1997); Europe has gone through a period of stagnation; and North America has been experiencing a recovery, with production having increased by 2.7 million vehicles over the same period (Lung, 2000:17). On the other hand, there is a new phenomenon that is taking place during the 1990s. That is, the remarkable increase in production outside of the triad. Production in the rest of the world jumped by 58.7% from 1990 to 1997, corresponding to the assembly of nearly 4.6 million extra vehicles (ibid.). This significant increase is taking place in countries such as South Korea,

Brazil, China, Mexico, India and some countries of Eastern Europe such as Poland and the Czech Republic (ibid: 18).

Freyssenet and Lung (2000) summarize the current global AI condition within four processes: Financial globalization - companies that are permanently subject to erratic fluctuations in exchange rates; the liberalization of world trade and deregulation; regional integration - the constitution of regional entities around each pole of the *triad*; and finally the emergence of the newly industrialized countries, particularly in Asia (73-76). These identifiable processes have major effect on the AI as they reinforce the global character of the competitive process (ibid:73).

However, changes did not happen only at the global level with the organization of production and distribution at an international scale. There are changes that refer to the level of the labour process itself with the introduction of new work practices into the workplace (Stewart and Garrahan, 1995:518).

As we mentioned above, while the early AI in Europe was dominated by craft practices, the overlapping principles of Taylor's scientific management and Ford's sequentially interdependent assembly line combined in the formative years of the US AI to yield the powerful mass

production paradigm (MacDuffie & Pil, 1997:10). Thus, mass production characterized by an extreme specialization of resources, by a standardized product design, a centralized hierarchy and by a separation of conception and execution of tasks, became the dominant model for the AI in the US and gradually, influenced the rest of the world (ibid.).

The mass production paradigm or Fordism was dominant in the AI until the 1970s, when the organizing principles in the industry started shifting towards flexible or lean production, in short post-Fordism (ibid:11). The changes in the automobile markets resulted in the shortening of product life cycles, and thus, automobile companies could no longer rely on economies of scale, rather they must innovate constantly to anticipate the changing demands of their customers (Morales, 1994:22-26). The general characteristics of lean production express a sort of inversion of the elements that characterize the previous model of mass production. Thus, the system of lean production is based on more general resources (multi-skilled workers, general-purpose machines, fewer functional specialists), that facilitate the handling of a greater variety of product designs, more decentralized authority and a higher degree of integration of conceptual activity

with the execution of production tasks (MacDuffie & Pil, 1997:11).

The changes at both global and labour process levels, which marked the transition from Fordist to post-Fordist system of production and of work organization techniques in the AI, have a significant effect on economies and societies generally. As we saw in the previous chapter, the shift from Fordism to post-Fordism is not relevant only to the AI, but it rather affects the totality of social and economic organization. The implications of this change, however, gave birth to several issues and debates related to work as an economic and social activity. In the previous chapter we examined those issues/debates as they are expressed generally with reference to the area of work and to the resolution of the HFP at a more general level, and we drew examples from various industries and workplaces. At this point, however, we will examine the same issues/debates, in reference to the AI. In other words, through examining the current issues/debates, we will show how the HFP is perceived and understood within the AI, the techniques that are used for its resolution, and the implications of this attempt for the workers, their unions and the automobile companies.

### 4.3 SKILLS AND AUTO INDUSTRY

In our previous chapter we discussed, in general terms, the issue of skills and the debate regarding the up-skilling or de-skilling of the workforce in post-Fordist workplaces. We outlined the major arguments of the two opposite theses and we provided a few examples from various studies in different countries and workplaces. Echoing our argument in the first chapter, the issue of skills, in relation to the HFP, is associated with the need for a new type of worker, with specific characteristics and qualities, who will be able to operate efficiently within the emerging post-Fordist system of work organization. Also, at the level of bargaining power, the issue of skills is important in terms of managing to ensure a skilled status for a specific occupation, a fact that will result in a higher level of wages for these occupations. However, higher skills does not always mean higher wages, as we will see later on. Finally, the variety in the findings of different studies regarding the skill levels of a specific workforce is due to other contingency factors that are associated with the specific area, the specific sector, the specific country, the specific plant, and so on.

Taking the above into consideration, we will now proceed and examine the issue of skills in relation to AI.

Various data from studies and surveys in several countries will be used in order to identify the conditions of the up-skilling/de-skilling debate in the AI, in particular, as an important feature of the whole discussion presented in this thesis regarding the HFP and its resolution.

In addition to being physically demanding, the AI has always been a tough environment in which to work (Stewart and Garrahan, 1995:517). Thus, the resolution of the HFP appears complex. With the introduction of post-Fordist work organization techniques in the AI, the production has become leaner and there are claims that among other things, lean production and new management techniques contribute to the increase in the skill levels amongst workers, as these new techniques involve "working smarter rather than harder" (Stewart and Garrahan, 1995:520). This is mainly the argument of the advocates of the new economy regarding the skill levels of the workforce employed in the AI.

National governments have acknowledged the current changes and have tried to take further actions in order to prepare their economies for adjustment to the new conditions. A report on the Canadian AI (1998), for instance, emphasizes the importance of high-skilled workers for the industry's international competitiveness and it is stated that during 1990s, the Canadian AI invested heavily

in new manufacturing processes and technologies, including total quality management programs, computer-aided design, just-in-time inventory systems and computer-aided manufacturing, all of which have increased the industry's need for a more highly skilled labour force (21). That is to say, the Canadian government has undertaken an initiative to introduce programs that will increase the skill levels of the Canadian autoworkers.

In general, the Canadian government has expressed the intention to increase the skill levels of the workforce in every sector by introducing and providing funding for relevant programs. More specifically, Canada established the so-called *National Occupational Standards*. Occupational Standards describe the skills and knowledge needed to perform competently in the workplace and they help companies and individuals plan their skill development and maintain their competencies (HRDC web site-National Occupational Standards). Occupational Standards are developed by employers and employees working together through a Standards Development Committee. This committee selects a small group of practitioners to develop a draft occupational analysis, which then is validated nationally. The analysis becomes occupational standard when it is

endorsed at the industry level (HRDC web site-National Occupational Standards).

Human Resources Development Canada (HRDC) contributes to the development of occupational standards through technical advice and guidance and the introduction of various funding programs. Such programs include *Sectoral Partnership Initiatives (SPI)*<sup>4</sup>, *Science and Technology Internship Programs (STIP)*<sup>5</sup> and *Labour Mobility Projects* (these projects allow Canadian workers access to jobs across Canada).

Studies on the autoworkers' skills have reached conclusions that skill levels increase or decrease according to the content of the job. For example, a case study on the effects of technological change and organizational restructuring on workers' tasks and skills at the General Motors assembly plant in Linden, New Jersey (Milkman and Pullman, 1991), indicates that the changes in this plant had highly polarized effects on the workforce: skilled trades workers experienced skill upgrading and gained enhanced responsibilities, while production workers underwent deskilling and became increasingly subordinated

---

<sup>4</sup> Canadian government facilitates partnerships with Canadian industries, encourages and assists in the development of sector partnerships. These partnerships work by encouraging key players in sectors to work together and by supporting projects that promote skills development for Canadians (HRDC web site-Funding Programs).



to the new technology (123). This case supports the contingency model of technological change, which gives emphasis to the importance of managerial discretion and organizational culture in shaping the outcomes of technological change (ibid:144). In other words, as Spenner (1985) argues, the same innovations in two different firms can affect skill requirements in different ways (146).

Regarding the content of the job, Peter Wickens, a Sunderland, England, Nissan plant manager, even though he admits that lean production is suffused with Taylorism and the logic of the assembly line, argues that other aspects of the system, such as teamwork, enlarged responsibilities of production workers and worker involvement in continuous improvement of the production process, compensate for these rigidities and allow for moving away from alienated work and create fulfilling, meaningful jobs (Wickens, 1993:27). However, Bratton's study (1992) of six Japanese manufacturing transplants in Great Britain challenges Wickens' view. Bratton found that large-batch producers adopted a deskilling approach to organizing the labour process. The Japanese owners put a premium on workers' autonomy and technical skills only in small-batch, high-

---

<sup>5</sup> STIP are organized by the Canadian government with collaboration with sectors that refer to unemployed or under-employed post-secondary graduates (HRDC web site-Funding Programs).

value-added workplaces, i.e., plants whose technology and production process traditionally have required a skilled workforce for operational reasons (Bratton, 1992:203).

Also, Graham's (1995) study of Subaru-Isuzu, indicates that the content of work in lean plants is not much different from that in auto assembly plants in the 1950s. This means that most jobs were found to be fragmented, standardized, short-cycled and repetitive. Although workers perform multiple tasks, all of them are routine and easily learned.

The same argument is supported in another study by Berggren (1992) about the Swedish AI. This study presents six case studies of organizational and technical change in the Swedish AI between 1970 and 1990. Berggren acknowledges the breadth of the new Japanese methods of labour utilization, but, as he argues, 'this is far from being equivalent to a general reskilling of the production force' (1992:43). Among the many interesting findings regarding the Swedish AI, Berggren concludes that the demand for flexibility, for most workers, means that they are alternating between similar repetitive tasks. This is multitasking rather than multiskilling (ibid:44). Also, to a varying degree, training in group-based problem solving, basic industrial engineering and quality control techniques

was also provided, but the bulk of work still consists of very standardized and factory-specific operations, as opposed to the possession of competencies by workers that are of a general value to the labour market (ibid:45).

Data from a study of Canadian AI suggest the same, that is, workers find lean work more intensive and more complex, and the experience supports the view of multitasking rather than that of multiskilling (Rinehart et al, 1997). Finally, case studies of UK and US auto firms operating in Britain, do not support claims of higher skill levels, or claims that the new lean production system is associated with the 'working smarter, not harder' argument (Stewart and Garrahan, 1995). More specifically, two-thirds of the workers surveyed say that new management techniques have resulted in work becoming harder as opposed to smarter (ibid:531). Also, the same study talks about the re-definition by management of existing tasks as skilled. Stewart and Garrahan found that workers perceive this redefinition of skill and knowledge as the discourse in which less skilled work, based on existing knowledge, becomes the means for enhancing effort and productivity, rather than enhancing skill (ibid.). In other words, management redefines existing tasks in order to convince workers that they are more skilled so they will put more

effort into the production process and increase productivity and profit.

The conclusions that we can reach from the data and the studies outlined above are the following: we cannot say for sure if the skill levels of workers in the AI have increased or decreased, in terms of overall assessment. Contingency factors may affect workers' skills in different regions or countries. Even within the same plant, skill levels may have increased or decreased depending on the nature of a specific job.

Another conclusion is that the definition of skill, that is, what is considered to be skilled work varies from study to study, a fact that makes it difficult to generalize and reach an overall conclusion regarding the skill levels in the AI.

A very important conclusion here is that there is a difference in the perception of the upgrading of skills between management and workers. As we saw above, management celebrates the increase of skilled jobs as a positive outcome of the application of new management techniques and the introduction of new technologies, while workers, in most cases, experience the upgrading of skills as an intensification of tasks and of effort. This puts into

question the 'working smarter-not harder' argument of post-Fordist management.

An interesting aspect that shows the complex character of the issue of skills is revealed when we relate skill levels to workers' wages. We argue here that "high skill levels" does not mean "high wages". Even in cases that autoworkers manage to ensure a skilled status for their occupation, this does not mean that they can guarantee a higher wage. There are new models of work organization emerging in individual plants, which show that high skill levels and post-Fordist management techniques can be compatible with low wages. An example of this trend is shown in a study of the independent Canadian auto parts manufacturer, Magna International Inc. (Anderson & Holmes, 1994). As this study shows, high skill levels can be compatible with low wages without the industry losing its competitiveness and its success. As this study states, Magna seems to have pursued a strategy that combines an innovative German-style technical approach to product development and process engineering that produces sophisticated and highly engineered products, with the emerging, distinctly American model of small, non-union plants in which production workers are low-paid (656). This model of relatively low wages that is consistent with the

production of sophisticated, highly engineered products is becoming increasingly prevalent in the North American AI, particularly in the US (ibid.). Also, studies of American AIs in Mexico show the combination of high skills with low wages. A study in Hermosillo plant by Harley Shaiken (1995) shows that although the workforce was skilled and easy to pick up new skills because they were relatively literate, the wages could not go up. The constant exhortations to achieve higher quality and productivity and the frequent comparisons to auto plants throughout the world raised inevitable comparisons to wage levels in industrial countries (Shaiken, 1995:256). Workers did not aspire to parity, but felt they were significantly underpaid (ibid.).

Therefore, the claim that skill levels of autoworkers are increasing may not be as definite as it seems to be in the first place, in terms of whether more workers benefited from the reorganization of the working process. The need for lower production-cost has made work organizers search for new strategies that will combine high skills with low wages, at least in cases where this situation applies. This trend, though, is related to the decline in unionization and we will refer to it again later on.

#### 4.4 DEMOCRATIZATION & EMPOWERMENT IN THE AUTO INDUSTRY

As we saw in the previous chapter, the post-Fordist literature presents the claim that the new management techniques contribute to the empowerment of workers and to the creation of a more democratic workplace. In other words, workers appear to gain more autonomy and control over the production process, through the elimination of former Tayloristic managerial structures. However, research findings from various workplaces that underwent reorganization of their working practices, put the empowerment thesis into question. Let us now proceed and examine the case of the AI regarding the empowerment of autoworkers.

The previous, Fordist model of work organization is characterized by the limited role of individual workers in workplace decision making, that is to say, the Fordist system largely excludes individual workers from decisions about planning, workplace design, or how day-to-day production problems should be resolved (Lewchuk & Robertson, 1997:37). Even compared with the nineteenth century craft workers, the workers in Fordist systems indeed have limited roles (ibid.). With the coming of post-Fordism there is a promise that this situation is changing. The new management techniques claim to create flexible,

empowered workers which will blur the division of labour between management and production workers (ibid:38). Research findings, however, that are based on the perception of autoworkers give a somewhat different view of the conditions regarding empowerment.

For example, in a study sponsored by the Canadian Automobile Workers, Lewchuk and Robertson (1996) surveyed 1,670 workers employed at 16 different suppliers of automobile components, and found no support for the hypothesis that lean production empowered workers or improved the quality of working life. More specifically, Lewchuk and Robertson used some indicators of what constitutes good working conditions and empowerment. Such indicators were: ability of workers to change things they do not like about their jobs, ability to influence when work is done by varying the rhythm of work over the course of the day, ability to leave the workstation to attend to personal matters, etc. The lean plants studied scored significantly worse on many of the indicators of good working conditions including empowerment, compared to more traditionally organized Fordist plants.

Another study by Steven Babson(1993) of 2,400 workers at the Mazda assembly plant in Flat Rock, Michigan, far from finding that the organization of work empowered



workers, it would seem that, by design, Mazda management created a system which tightly controls workers. Babson found that the span of responsibility of Mazda workers had increased through their participation in the process of improvement. This participation, however, was structured by management in such a way that management and not the workers controlled the process. For example, each worker was provided with a programmed work sheet which defines each job in minute detail, including the tasks to be performed, their sequence and the number of seconds allotted for each task. Deviation from this plan is discouraged, as consistency in following the work sheet is seen to ensure quality (Babson, 1993:7).

Lewchuck and Robertson (1997) again, examine the relationship between new forms of work organization and worker empowerment. They use data collected from a survey of 2,424 Canadian autoworkers employed by Ford, Chrysler, General Motors and CAMI (joint venture between General Motors and Suzuki). Workers were asked a wide range of questions about their workload, health and safety conditions, empowerment, and relations with management. Lewchuck and Robertson use the same indicators of empowerment as in their previous study that we referred to above. Most of the results of this study contradict the

predictions of the proponents of lean production who have argued that this new model of work organization would empower workers and enhance the quality of working life (59). That is, there was little evidence that motor vehicle workers in these plants were empowered.

On the other hand, a study by Diana Antonio (1999) in four American manufacturing plants, including automobile, examines the introduction of employee participation programs. The research methods included a survey of 50 employees in each plant, interviews of management and union representatives, observations during the plant visits, and the analysis of literature. According to the employee survey, the participatory programs in the four cases appeared to have been successful in giving a feeling of empowerment and teamwork to most of the respondents. However, most of these workers believed that participation had not changed financial rewards for innovating. Here emerges again the issue of introduction of post-Fordist techniques along with low wage and cost-saving practices that we discussed in the section of the issue of skills.

Post-Fordist management techniques claim to provide a solution for the HFP. However, the "economic axiom philosophy" of achieving the highest possible profit with the lowest possible cost poses the necessity of the

development of other techniques of work organization that will provide that opportunity. This reflects the Marxist principle of workers' exploitation, only in a more sophisticated way. Management attempts to create more "capable" workers with advanced qualities so there is more to be made out of the process of exploitation, in terms of human resources or human capital.

Overall, as most of the studies above show, we can say that in the AI workers do not seem to experience a high degree of empowerment, despite the attempts of post-Fordist management and the various worker participation programs that have been introduced. This trend, as we saw in the previous chapter, is found in other workplaces too, from other industries and other sectors of the economy. At least, in terms of the workers' perception of their own jobs, the empowerment thesis does not seem to work. In the cases that it works, empowerment is not accompanied with high wages.

#### *4.5 UNION-MANAGEMENT RELATIONSHIP IN THE AUTO INDUSTRY*

The relationship between workers' unions and post-Fordist management appears to be reconstituted and placed within different settings than the ones that dominated the Fordist period. Management has approached unions, and now

there is a more cooperative environment between the two. Also, there is a significant decline in unionization in all kind of industries, especially in manufacturing.

According to Lowell Turner (1991), labour-management relations are structured by two variables: first, the extent to which unions are integrated into the process of managerial decision-making, and second, the existence of laws or corporatist bargaining arrangements (12). In some countries, such as Germany, both of the above variables can be found. In some other countries, such as Japan, only the first variable can be found, where workers and their unions are integrated into the process of managerial decision-making. This integration, however, is defined on management's terms and corporatist bargaining arrangements do not exist, due to the fact that unions and workers are not supported by national laws (Green, 1996:164). In North America, none of the above variables can be found. Unions are not integrated into managerial decision-making because the US National Labor Relations Act and Canadian labour laws do not provide the legal basis for independent participation in managerial decision-making, although integration does occur in a single firm or plant basis at management's initiative (ibid.). Finally, in Canada and the US, corporatist bargaining structures are weak. In both

countries, organized labour associations are fragmented, but organized labour in Canada, unlike the US, enjoys popular and political party support sufficient to allow it to have a meaningful impact on labour law reforms (ibid.).

Turner argues that in order for labour unions to survive, they must abandon adversarial arms-length bargaining strategies and become integrated into a firm's managerial decision-making, which involves substantial participation with management regarding plans to organize work before actual decisions are made (Turner, 1991:16). This, however, poses questions on whether unions will possess the authority to influence managerial decisions within any given inter-firm power relations.

As we mentioned before, there is a continued decline in unionization, especially in manufacturing industries. The US manufacturing sector in the year 2000, for example, experienced the largest decrease since 1992. Union density - the number of union members as a percent of total wage and salary workers - in U.S. manufacturing fell from 15.6 percent in 1999 to 14.8 percent in 2000, a continuation of a 20-year trend (Union Membership in 2000-UAW webpage).

In AI, the measures reveal similar trends. The traditionally highly unionized AI experiences decrease in unionization. Data for the year 2000 referring to the US

AI, show that less than half the AI workforce is organized. Unions represented 48 percent of skilled and production workers in 1999, down from 61 percent at the beginning of the decade. While auto industry employment grew by more than 100,000 during the 1990s, the number of union members shrank by 51,000. The result: a significant decline in union density (Union representation and earnings in the AI-UAW web page).

Regarding the union earnings premium in the US AI, the traditional earnings premium enjoyed by union workers, although still robust, has declined since 1990. In 1990, unionized autoworkers earned 85 percent more per week than non-union workers. By the end of the decade that premium had fallen to 59 percent. Non-union workers' pay gained on the pay of union workers not because union wages fell, but because non-union workers saw greater real earnings growth during the recent economic expansion. In the US Midwest and South regions, where AI employment is concentrated, inflation-adjusted earnings rose 8 and 14 percent respectively for union workers, but jumped 23 and 27 percent respectively for non-union workers. Two factors may account for strong gain in non-union wages. First, non-union transplants opened a number of facilities in high-paying sectors such as assembly and engine production.

Second, in a tight labor market, non-union management may be forced to raise wages to resist organizing activities (Data from *ibid.*).

The data above reveal the tendency of the weakening position of workers' unions in the AI. This trend is a result of management's attempt to operate in a union-free environment. This attempt has led to the adoption of human resource practices of increased sophistication (Riddell, 1993:6). Employers now provide services and protection to workers that they previously could receive only in unionized firms. Also, as part of management's attempt to decrease unions' influence, automotive transplants generally favor 'greenfield' sites in rural or ex-urban areas where there are plenty of young people with no industrial or union experience, where wages are low and unemployment levels are very high (Rinehart et al, 1997:33). Managers of Honda in the US, for instance, admitted that they deliberately avoided locating in regions where workers had "picked up bad habits" (Kenney and Florida, 1993:101). Another example of this trend is provided by the case of Mexico which, after the North American Free Trade Agreement (NAFTA), has attracted investments from the developed countries. The attractiveness of Mexico is not only due to the cheap

labour option that keeps the wages low, but also due to the limited rights of workers and unions which are either weak, government dominated, or non existent (Shaiken, 1995:253). The Hermosillo plant, for example, is organized by an affiliate of the Confederation of Mexican Workers, the principal labour federation in Mexico, but the union is absent from the shop floor, and had contributed little in setting up the plant in the first place (ibid:254). In this context, management was free to install one of the most extensive applications of lean production methods in North America (ibid.). Also, Suzan Helper (1995) conducted a study of *maquila*<sup>6</sup> supplier firms manufacturing wiring harnesses - the bundles of wires that distribute electrical signals throughout the car. Based on interviews and fieldwork in two *maquila* firms, this study found that Mexican wiring-harness production combines, in varying degrees, just-in-time production and continuous improvement (kaizen) from above, with close supervision and control of wages (Helper, 1995:271). In these firms unions are weak or nonexistent (ibid:260).

As we can see, the solution of the HFP calls for the de-powering of workers' unions, as a means of reducing

---

<sup>6</sup> A *maquila* is an assembly or manufacturing facility located in Mexico in which U.S., Asian or European companies prepare goods for American consumers utilizing Mexico's inexpensive labor force, geographic proximity to the U.S., and temporary importation programs (Eaton, 1997).



workers resistance to management's attempts to increase the profit and the success of the firm and reduce the costs, as determined by the standards of a post-Fordist market. The less developed countries that can provide cheap, non-unionized labour provide a very attractive option for automobile firms.

#### *4.6 SURVEILLANCE, PRIVACY AND THE AUTO INDUSTRY*

As we showed in the previous chapter, workers' privacy has become a very important issue in post-Fordist workplaces, in light of the introduction of advanced information technologies of surveillance and new management techniques.

Currently, there is a lack of studies that examine workplace surveillance issues in the AI specifically. We can say, however, that AI workplaces are similar to factories in other industries, in terms of the surveillance techniques that are being used, such as electronic monitoring, computerized tasks, teamworking, etc.

For instance, in Japanese AI factories, in the Japanese transplants in the US and in Britain, at NUMMI and Saturn, there has been successful implementation of teamwork techniques, in terms of disciplining the workers (Durand, 1999:24). Through peer pressure, also known as

'management-by-stress' - which describes the way in which pressure is exercised on the pace of work - workers conform to the pace of work in a similar way as in Fordist workplaces (ibid:24).

Another relevant example is that of Fiat's 'integrated factory' (Camuffo and Micelli, 1999). In Fiat's factory there was an attempt at making the organization of work in auto assembly plants transparent, objective and 'scientific' by means of the so-called 'management-by-sight' techniques (ibid:218). In this case, the focus is not on the team dynamics, but rather on an information system, made up of diagrams consisting of indicators on product and process quality, costs, productivity, workers' skills and maintenance. Every unit should be managed and coordinated by this information system founded on the 'management-by-sight' concept (ibid:224). This example, therefore, shows an attempt to standardize and computerize the process of horizontal surveillance, that is to say, the surveillance that is enacted through peer group scrutiny resembles Tayloristic means of surveillance.

In the AI, as in other factories, the most obvious surveillance technique is that of electronic monitoring and computer-based performance monitoring. Such techniques have become a reality in AI workplaces. Although there is some

resistance from workers and their unions, it is not radical. According to the resolution adopted by United Auto-Workers (UAW) during its 1989 constitutional convention, for example, although they expressed their opposition to electronic monitoring practices, they seemed to accept it eventually by proposing federal legislation.

They content themselves with the following:

Federal legislation would:

- require employers which engage in electronic monitoring to provide affected employees with prior written notice of the form of monitoring;
- provide affected employees with a signal light, beeping tone, verbal notification, or other form of visual or aural notice to indicate when electronic monitoring is taking place. The same type of notice should also be provided to customers whenever an employer is engaging in telephone service observation;
- require employers to give workers access to any data collected through electronic monitoring devices and to limit strictly the disclosure of such data to others; and
- prohibit employers from using data collected by means of electronic monitoring to set production standards, or as the basis for disciplinary action or other performance evaluations (Workers' Privacy part II, 1993:331).

Also, the UAW developed the following model contract language on monitoring workers by computer:

- Management will meet and discuss how productivity information is gathered and used with the union. Every effort will be made to minimize the stress-producing features of productivity monitoring.

- Monitored productivity information will not be used to discipline workers.
- Monitored productivity information will be immediately available to the union upon request (ibid:341).

As we can see from the above, electronic surveillance methods have entered the workplace dynamically, and unions are not able to resist effectively with their moderate attitude regarding the issue.

As stated in the previous chapter, in order for the HFP to be solved increased workers' surveillance is needed. Advanced information technologies of surveillance and post-Fordist management techniques have made possible the disciplining of workers and, according to post-Fordist management, their efficient implementation into the production process.

#### *4.7 PRODUCTIVITY AND THE AUTO INDUSTRY*

In the previous chapter we talked about the change in work organization and the promise of increased productivity. As we saw, data from various countries show an increase of the productivity levels in the manufacturing sector and a corresponding slowdown in the service sector. We explained that this is partly due to the difficulty in measuring productivity levels within an economy that is

currently undergoing changes and reorientation of tasks and jobs, especially in the service sector.

Measures for the productivity levels in the AI, however, reveal an increased one over time. Data from the Canadian AI, for example, show that productivity increased 8.9 percent annually between 1993 and 1996 (The Automotive Competitiveness Review, 1998). More specifically, productivity of High-Volume Vehicle Assembly Plants, according to the 1996 report by Harbour and Associates Inc., Chrysler Canada Ltd. uses only 2.54 workers per day to assemble a car at its Bramalea, Ontario, facility, making it the most productive North American Big Three plant in 1996. Toyota's Cambridge, Ontario, facility, at 2.35 workers per day, is the most productive plant in Canada. The 1996 study of the worldwide auto industry by the Massachusetts Institute of Technology placed Canada second in productivity, behind only Japan and ahead of the United States, European countries, Korea and Australia (Canadian Automotive Industry Today, 1997).

Over the same period, from 1993 to 1996, the productivity levels in the US AI increased 6.6 percent annually (The Automotive Competitiveness Review, 1998).

Automotive firms have also managed to increase their productivity through the options provided by the process of

globalization and internationalization of automobile production. Therefore, we have the establishment of transplants from major automobile firms in less developed countries. For example, Japanese firms operating in Mexico have achieved important success in terms of quality and productivity, through combining traditional Fordist techniques with low wages (Shaiken, 1995: 248-249). These Japanese firms locating in Mexico were motivated primarily by the prospects of low labour costs (ibid:248). However, this process is reinforced by the Mexican government, which continues to follow a policy of holding wages down in order to attract investments (ibid:257).

As the data reveal, then, post-Fordist management has managed to increase the productivity of autoworkers, a fact that ensures high levels of profitability for the industry. This means that post-Fordist management has managed to solve the HFP, that is to say, to control the workers and integrate them efficiently into the process of production. Increased productivity levels in the AI, however, are presented by management as a positive outcome of the work reorganization, but this does not say anything about the extent to which workers are satisfied with the new working condition. In the next section we will refer to studies on job satisfaction of the autoworkers.

#### 4.8 JOB SATISFACTION AND AUTO INDUSTRY

Job satisfaction of autoworkers, although it expresses subjective opinions and is affected by many factors, constitutes a key issue in order to counterbalance the claims of post-Fordist management regarding the confrontation of the HFP.

As we showed in the previous chapter, studies on job satisfaction report various findings. Most of those studies, however, acknowledge the fact that job satisfaction can be attributed to diverse, multiple causes. Studies in AI reach similar conclusions.

One study investigates job satisfaction levels among fifty-five automotive technicians working in Southeastern Pennsylvania automobile dealerships (Meldon and Eisenhauer, 1996). This study, by using a questionnaire that measures thirty-five reward and non-reward variables identified in the job satisfaction literature, indicates that technicians receive fewer work-related rewards and experience low levels of work satisfaction. This brings us back to the discussion about management solving the HFP in the most cost-saving way. As the above findings reveal, workers are not satisfied with cost-saving practices. It seems that in order for the HFP to find a more effective solution, management has to pay workers more. This study also

acknowledges the relative character of job satisfaction measures, that is to say, it acknowledges that worker satisfaction is affected by diverse, multiple causes.

Another study examines job satisfaction levels as related to new management techniques of work organization, such as teamwork (Levesque & Cote, 1999). This study examined General Motors workers in Boisbriand, Canada using questionnaires. The authors found that within the same plant workers expressed different views on job satisfaction. The authors relate these differences to the various ways that workers assess the concept of teamwork. Some workers, for instance, view teamwork more as a constraint, others assess it more positively, and between these two extremes are workers whose assessment is fairly neutral (108). Also, job satisfaction levels are related to the pattern of social relations within their teams, in particular relations between workers and the team leader. This study is an example of the relative nature of workers' satisfaction and its relation to many contingency factors, which vary among different regions or firms. Mac Duffie and Pil (1997) pointed out that the diffusion of lean production model over the next few years will likely be based on a dual movement: on the one hand, the basic elements of this model (team work, just-in-time systems,



continuous improvement etc.) should become increasingly widespread; but, on the other hand, the implementation of the elements of this model are likely to vary considerably according to regions and firms.

Another study by Shaiken et al. (1997) at General Motors Saturn Corporation plant and of Chrysler's Jefferson North plant presents impressive success stories in terms of quality and productivity. Contributing to these results are a high degree of workers' satisfaction and considerable autonomy on the shop floor (1997:44). More specifically, in this study, more than 120 workers were interviewed from both plants. The workers rated both plants highly and positively, particularly when compared with the plants where they previously worked. An important component of this high rating was attributable to more worker autonomy than is generally found in other plants (ibid:19). The authors, however, found that autonomy has a varied and complex dual meaning in the plants studied. For many, autonomy is expressed through extensive participation in teams, while for others, autonomy simply means an atmosphere in which they experience less direct supervision on the job (ibid:44). It is worth mentioning, however, that in these plants there was relatively high union involvement, Especially at Saturn, which has arguably the

most far-reaching worker and union involvement in production decisions of any major firm in the US (ibid:23). Also, the authors find that these plants have important differences from what is considered as a model of lean production plant.

From the above we can conclude that in the AI job satisfaction levels are associated with many variables, such as financial rewards that accompany the introduction of new work organization techniques, the different interpretations of these techniques by the workers and the resulting social relations within the workplace, and the levels of autonomy that workers experience within the workplace. Overall, we can conclude that the solution of the HFP by post-Fordist management in terms of producing satisfied workers, remains unsettled. The debate remains open and the success or failure of post-Fordism to achieve high levels of job satisfaction differs from case to case. Contingency constraints can not be overcome easily. Also the cost-saving attitude that many firms follow does not facilitate the solution of the HFP in terms of workers' satisfaction and consequently their willingness to accept and welcome management's initiatives. Based on new management techniques and workers' satisfaction, we agree with the argument of Shaiken et al. (1997), that is, the

presence or absence of teams, or other management methods, is less important than the manner in which they are implemented and integrated into the production process.

#### 4.9 CONCLUSIONS

After presenting the case of the AI, we are able to reach some major general conclusions regarding the HFP in this specific industry.

First, our data show high levels of contingency in terms of the various work practices and the social effects that their use produces. The particularities of different countries, regions, firms, even in positions within the same firm, is a very important factor and they have to be taken into consideration when studying changes in work organization and the implications resulting from the change. Also, within this framework, we must mention the important role of workers' perception and interpretation of the new system of work organization. The success or failure of the post-Fordist management, as we saw in many of our cases, is based on workers' shop-floor experiences and views. On the other hand, the contingency factor does not mean that we cannot reach to some general conclusions and identify national and international trends regarding the

type of work organization and the techniques that are being used to solve the HFP.

Second, several studies and cases in the AI show that post-Fordist management expresses a cost-saving attitude in its attempt to solve the HFP. This can be proved by the low wages that even more skilled workers are paid in the relevant cases referred to here. The principle of spending less and profiting more is manifest in the AI. However, this does not seem to make autoworkers very satisfied.

Our third conclusion is related to the previous one. Despite the claims and expectations of post-Fordist management that the new management techniques and the new information technologies will solve the HFP, data based on workers' personal opinion show that resolving the HFP is not being carried out successfully. As we saw above, for example, autoworkers overall do not seem to feel more empowered, more skilled, and in some cases more satisfied as a result of the new working conditions. The HFP is claimed to be resolved, but the question is, how can this happen when at least some workers think otherwise? Therefore, as we stated before, the success or failure of a production system is very much dependent upon the perceptions and interpretations of the workers themselves.

Summarizing, we can say that the solution of the HFP by the new management techniques, in the AI, is solved in some aspects, while in other aspects remains a problem. As we saw, post-Fordist management has succeeded to increase productivity, to devitalize unions, justify and legitimate the use of surveillance techniques for the disciplining of the workers, and in some cases, to satisfy workers. On the other hand, workers do not feel more skilled across the board, that they are empowered or, in many cases, more satisfied with the new working conditions. This shows again what we have argued before that the attempt for resolution of the HFP seems to be successful or unsuccessful depending on which perspective it is seen from. From management's perspective and in relation to matters that are more important to management and to the firm, such as productivity, profitability, de-unionization, etc. the HFP seems to have found its solution. On the other hand, from the workers' perspective and in relation to matters that are important to workers, such as privacy, empowerment, less intensive work, higher wages, etc., the HFP seems to still await a solution.

## **5. CONCLUSIONS**

This thesis dealt with the HFP. It was examined at the level of the organization of work and, more specifically, it was viewed within the context of a specific industry, the AI. The HFP was also viewed at a broader societal level and it was been identified as a general problem that societies face and try to solve. In this chapter, we will present some conclusions that this thesis led us to, regarding the area of work, and society in general, in the context of the HFP.

Conceptually, the HFP has to do with the need of managing people. It takes many forms within different contexts of human activity and it is associated with the beginning of the industrial revolution, the creation of the factory, and the concentration of large numbers of people in urban environments. Right away, techniques and discourses were developed for the efficient confrontation of the problem, within the capitalist settings. Thus, we have the development of management techniques that aim to solve the HFP, which can be viewed within the framework of a wider paradigm of social organization which is undergoing transformations throughout time in order to adjust to emerging conditions in economies and societies.

As we described in our first chapter, in the area of work, societies have experienced transitions to different work organization paradigms, from the early factory system to the present post-Fordist work organization model. These transitions have been influenced by many social factors, such as the actions of social movements; technological development; the development of managerial science, which resulted in the development of more sophisticated confrontation of the HFP; etc. Whichever the managerial model and perception of the HFP, its nature remains the same at all periods in history, which has to do with the most efficient way of implementation of the human factor and its adjustment to the social relations of production, as they change with time.

As stated in this thesis, the HFP refers not only to the area of work, but rather it constitutes a structural feature of social organization in general. The system itself develops the appropriate institutions (governmental or not), such as educational systems, public policies, ideologies of consumption, lifestyle models, etc. that all aim to the efficient adjustment of populations in the capitalist settings. This is our first conclusion on the reference of the HFP to society as a whole.

Our next conclusion is that although labour-management relationships appear to be more settled and that is based on common interests, the relationship between labour and capital is not settled at all. The cost saving approach that management tends to follow maintains the intense relationship and preserves the gap between workers and owners of the means of production.

Betcherman et al (1994), argue that the new Human Resource Management Model is directed towards two possible paths: On the one hand, there is the "low-cost" path, characterized by non-standard jobs, while on the other hand, there is the "high-performance" path which features a skilled labour force, flexible work organization, commitment to training, employee involvement in decision making etc. (7-9). In this thesis, however, we identified a third path, which combines low labour cost with high performance and profitability, as case studies of the AI show. This third model, which expresses management's innovative spirit, keeps workers' wages low and the struggle between labour and capital alive. The low-cost approach, even if it is combined with other management techniques and the application of advanced information technologies, sets barriers to the effective confrontation of the HFP.



Our next conclusion is related to the contingency factor that we mention throughout this thesis. The process of organization of work is characterized by great complexity and there are many factors involved in it. Such factors refer to the complexity of the technology that is adopted, local organizational traditions of each country, region or even plant, political interests and other local particularities. For this reason, the borderlines between different work organization paradigms are blurred and generalizations are very hard to make. What we have found out in this thesis is that the contingency factor in manufacturing and specifically in the AI, is very high. The lack of uniformity that characterizes the literature and the case studies that were reviewed in this thesis are proof of this. On the other hand, developments in the organization of work at a global, more general level can be identified, crystallized and studied in the form of an ideal type. That is to say, high levels of contingency do not prevent generalizations in terms of identifying global models and trends regarding the organization of the work process. That is what we have done in this thesis while studying the HFP.

Another conclusion that we can reach is related to the success or failure of the new post-Fordist management to

solve the HFP. The success or failure is highly dependent on workers' interpretation of the new management techniques. As we saw from studies on empowerment, on skills, and on job satisfaction, workers have the ability to evaluate the new working conditions and show if the new system has achieved the desirable results or not.

The next conclusion has to do with the system's attempt to create the type of worker, appropriate to function in the most efficient way, within the framework of the post-Fordist condition and settings of working relations. As we mentioned in the first chapter, the production process, for reasons that are more political and less technical, has to include humans. In order, however, for the system to function in the best way possible, people have to be characterized by certain qualities that the system itself determines. As we saw, the principles of Taylorism, by separating the conception from the execution of a task, wanted the worker to remain unskilled and rely mainly on physical power. Today, Taylorist principles have been "demonized", and a new type of worker has emerged as a requirement for the post-Fordist condition. According to post-Fordism's advocates, the new type of worker has to be highly skilled; more flexible, in terms of being able to operate in a variety of tasks; able to work in teams; more

involved in decision making; self-directed and self-controlled, etc. On the other hand, as we saw from the case of the AI and from examples from other workplaces, management prefers workers that are not involved in unions or have less union experience, and also workers who are willing to accept low salaries. These are some of the qualities that post-Fordist workers have to acquire in order to fit into management's objectives. The existence or not of this ideal type of worker provides an indicator on whether the HFP is being solved. However, as we showed in this thesis, the process of creation of this type of worker raises important issues and debates regarding social and economic implications.

The examination of these issues/debates here reveals the complexity of the process of solving the HFP and its strong association with the totality of societal structures and institutions. At the level of society, the process of creating the ideal worker parallels the process of creating the ideal citizen, or the ideal member of society, or the ideal consumer etc. The categorization of people into statistical categories that Baudrillard talks about (Baudrillard, 1983:20; Smart, 1992:129), is an expression of the process of creating certain types of social and economic beings and managing them efficiently.

In terms of measuring recent trends in the organization of work, we discover that all these relatively recent developments have not yet been made clear and have not yet been embodied into some certain, standardized and widely accepted categories. This is revealed by the intensity of the debates that we examined and by the difficulty in coming to an agreement on what are the effects and the social implications of the changes in the organization of work; for workers, for organizations and for society as a whole. This also has to do with the contingency factor that we referred to above and with the differences in findings from studies conducted in various countries, regions, sectors and workplaces. For example, the studies presented in this thesis do not all reach the same conclusions regarding the issues of workers' skills, workers' empowerment, union-management relationships, workers' privacy, productivity and workers' job satisfaction. However, this problem is fundamental in social sciences and it is not easily solvable as long as different perceptions and different schools of thought exist.

Overall, as the review of the case studies shows, we may argue that there are certain conditions that contribute to the success or failure of post-Fordist management to

solve the HFP. As we saw above, one factor that tells us if the HFP is solved or not, is the workers' views, perceptions and interpretations of the working conditions. Other conditions that could bring the HFP closer to its resolution are: higher wages, more autonomy, more involved unions in decision-making and less intensive jobs. Also, the existence of high levels of contingency in the organization of work, constitute the manner in which new technology and new management techniques are implemented and integrated into the production process. These are more important than the presence or absence of such technologies and management techniques. This is where management should focus its attention in order to solve the HFP more effectively. Post-Fordist management should take into consideration all the contingencies and then it should find the most appropriate way of implementing and integrating new models of management and new information technologies of production along with the Human Factor into the production process. The careful examination of all the particularities of each plant or region would give the opportunity to management to create certain social relations of production within the firm.

The need for management of the human factor today is not less intense than it was in the early factory era. What

have changed since then are the methods and techniques that are used to solve the HFP. New management techniques and methods of organizing the labour process, along with the introduction of advanced information technologies, have resulted in a more sophisticated confrontation of the HFP. However, the deep philosophy and perception of the human factor remains the same. It is viewed as a form of capital, which since firms cannot exclude from the production process, they develop techniques in order to integrate it in the most effective possible way that will benefit the firm towards the fulfillment of its economic goals.

As stated earlier in this thesis, the present society is a society of the management of the human factor, like any capitalist society of the past. The rise of industrial capitalism came along with the need of managing populations, a need that is maintained until today at the same degree. The HFP is a fundamental component of capitalism and it constitutes one of its determinants. In this sense, the changes of management techniques and of the organization of the work process throughout the history of capitalist societies can be seen as attempts of the capitalist system to solve the HFP. These attempts aim to adjust the human factor within the settings and framework that the social and economic situations of each era impose,

given the different means that management possesses, such as new technology and new developments in management methods.

## BIBLIOGRAPHY

Abercrombie, N., Hill, S. and Turner, B.S. (eds) (1994), *The Penguin Dictionary of Sociology*.

Anderson, M., and Holmes, J. (1994), "High-skill, Low-wage Manufacturing in North America: A Case Study from the Automotive Parts Industry", *Regional Studies*, 29, 7, pp. 655-671.

Attewell, P. (1992), "Skill and Occupational Changes in U.S. Manufacturing" in Paul S. Adler (ed), *Technology and the Future of Work*, Oxford University Press: New York.

Babson, S. (1993), "Lean or Mean: The MIT Model and Lean Production at Mazda", *Labour Studies Journal*, 18, pp. 3-24.

\_\_\_\_\_ (1995), "Lean Production and Labor: Empowerment and Exploitation" in Steve Babson (ed.), *Lean Work: Empowerment and Exploitation in the Global Auto Industry*, Wayne State University Press: Detroit.

Barchiesi, F. (1998), "Flexibility and Changes in Forms of Workplace Subjectivity: A Case Study of the South African Motor Industry", *International Sociological Association (ISA)*.

Baudrillard, J. (1983), *In the Shadow of the Silent Majorities or, The End of the Social*, Semiotext(e).

Bell, D. (1976), *The Coming of Post-Industrial Society: A Venture in Social Forecasting*, New York: Basic Books.

Bemmels, B., & Reshef, Y. (1991), "Manufacturing Employees and Technological Change", *Journal of Labor Research*, Volume XII, number 3, Summer, pp. 231-246.

Beniger, J.R. (1986), *The Control Revolution: Technological and Economic Origins of the Information Society*, Harvard University Press, Cambridge, Massachusetts.

Berg, P. (1999), "The Effects of High Performance Work Practices on Job Satisfaction in the United States Steel Industry", *Relations Industrielles/Industrial Relations*, 54, 1, pp. 111-135.



Berggren, C. (1992), *Alternatives to Lean Production: Work Organization in the Swedish Auto Industry*, ILR Press, Ithaca, New York.

Betcherman, G., McMullen, K., Leckie, N. and Caron, C. (1994), *The Canadian Workplace in Transition*, IRC Press, Industrial Relations Centre, Queen's University at Kingston.

Bijker, W.E., Hughes, T.P. and Pinch T. (eds) (1987), *The Social Construction of Technological Systems: New Directions in Sociology and History of Technology*, Cambridge: MA, MIT Press.

Blauner, R. (1964), *Alienation and Freedom: The Factory Worker and His Job*, Chicago: University of Chicago Press.

Bloomfield, G.T. (1991), "The World Automotive Industry in Transition" in Christopher M. Law (ed.), *Restructuring the Global Automobile Industry: National and Regional Impacts*, Routledge: London and New York.

Bluestone, B., & Bluestone, I. (1992), *Negotiating the Future*, New York: Basic Books.

Bratton, J. (1992), *Japanization at Work*, London, Macmillan Press.

Braverman, H. (1974), *Labour and Monopoly Capital*, New York: Monthly Review Press.

Breed, W. (1971), *The Self-Guiding Society*, New York, Free Press.

Burrell, G. (1996), "Hard Times for the Salaried?", in Harry Scarbrough (ed.), *The Management of Expertise*, London: Macmillan Press LTD.

\_\_\_\_\_ (1998), "Modernism, Postmodernism and Organizational Analysis: The Contribution of Michel Foucault", in Alan McKinlay & Ken Starkey (eds), *Foucault, Management and Organization Theory: From Panopticon to Technologies of the Self*, SAGE: London.

Cappelli, P. (1993), "Are Skill Requirements Rising? Evidence from Production and Clerical Jobs", *Industrial and Labor Relations Review*, April, pp. 515-530.

Cappelli, P., & Rogovsky, N. (1994), "New Work Systems and Skill Requirements", *International Labour Review*, 133, 2, pp.205-220.

Camuffo, A., and Micelli, S. (1999), "Teamwork and New Forms of Work Organization in Fiat's 'Integrated Factory'", in Jean Pierre Durand, Paul Stewart and Juan Jose Castillo (eds.), *Teamwork in the Automobile Industry: Radical Change or Passing Fashion?*, International GERPISA Program 'Emergence of New Industrial Models', Macmillan Business.

Castells, M. (1996), *The Rise of the Network Society*, vol. 1, Blackwell Publishers.

Clegg, S.R. (1981), "Organization and Control", *Administrative Science Quarterly*, 26, pp. 545-562.

Collinson, D.L., & Collinson, M. (1997), "Delaying Managers: Time-Space Surveillance and its Gendered Effects" in *Organization Articles*, Volume 4, 3, pp. 375-407.

Cunningham, I., Hyman, J., and Baldry, C. (1996), "Empowerment: The power to Do What?", *Industrial Relations Journal*, 27, 2, pp. 143-154.

Diana A. (1999), "Changes in the American Workplace: Case Studies of the Introduction of Employee Participation in Four Manufacturing Plants", *Dissertation Abstracts International*, 60, 5.

Dicken, P. (1992), *Global Shift: The Internationalization of Economic Activity*, 2<sup>nd</sup> Edition, New York and London: The Guilford Press.

Drucker, P.F. (1969), *The Age of Discontinuity*, New York, Harper and Row.

\_\_\_\_\_ (1993), *Post capitalist society*, New York: Harper Business.

Durand, J.P. (1999), "Introduction: The Diversity of Employee Relationships" in Jean Pierre Durand, Paul Stewart and Juan Jose Castillo (eds.), *Teamwork in the Automobile Industry: Radical Change or Passing Fashion?*, International GERPISA Program 'Emergence of New Industrial Models', Macmillan Business.

Eaton, D. (1997), *Transformation of the Mexican Maquiladora Industry: The Driving Force Behind the Creation of a NAFTA Regional Economy*, NLCIFT (softcover).

Ellul, J. (1964), *The Technological Society*, New York, Knopf.

Etzioni, A. (1968), *The Active Society: A Theory of Societal and Political Processes*, New York, Free Press.

Freyssenet, M., and Lung, Y. (2000), "Between Globalization and Regionalization: What is the Future of the Motor Industry?" in John Humphrey, Yveline Lecler and Mario Sergio Salerno (eds.), *Global Strategies and Local Realities: The Auto Industry in Emerging Markets*, GERPISA, Macmillan Press.

Friedman, A.L. (1977), *Industry and Labour: Class Struggle at Work and Monopoly Capitalism*, London: Macmillan.

Frost, A.C. (2000), "Union Involvement in Workplace Decision Making: Implications for Union Democracy", *Journal of Labor Research*, XXI, 2, Spring, pp. 265-286.

Gamst, G., and Otten, C.M. (1992), "Job Satisfaction in High Technology and Traditional Industry: Is there a Difference?", *The Psychological Record*, 42, pp. 413-425.

Gandy, O.H., Jr. (1996), "Coming to Terms with the Panoptic Sort", in Elia Zureik & David Lyon(eds), *Computers, Surveillance and Privacy*, University of Minnesota Press: Minneapolis and London.

Giordano, L. (1992), *Beyond Taylorism: Computerization and the New Industrial Relations*, St. Martin's Press.

Graham, L. (1995), *On the Line at Subaru-Isuzu*, Ithaca.

Green, W.C. (1996), "The Transformation of NLRA Paradigm: The Future of Labor-Management Relations in Post-Fordist Auto Plants" in William C. Green and Ernest J. Yanarella (eds.), *North American Auto unions in Crisis: Lean Production as Contested Terrain*, SUNY Press.

Grint, K. and Woolgar, S. (1992), "Computers, Guns and Roses: What's Social about being Shot?", *Science, Technology and Human Values*, 17, 3, 366-380.

\_\_\_\_\_ (1997), *Machine at Work: Technology, Work and Organization*, Polity Press.

Hales, C. (2000), "Management and Empowerment Programmes", *Work, Employment and Society*, 14, 3, pp. 501-519.

Harley, B. (1999), "The Myth of Empowerment: Work Organization, Hierarchy, and Employee Autonomy in Contemporary Australian Workplaces", *Work, Employment and Society*, 13, 1, March, pp. 41-66.

Heaney, C.A., Israel, B.A., and House, J.S. (1994), "Chronic Job Insecurity among Automobile Workers: Effects on Job Satisfaction and Health", *Social Science and Medicine*, 38, 10, pp. 1431-1437.

Heckscher, C.C. (1988), *The New Unionism*, New York: Basic Books.

Heilbroner, R. (1972), "Do Machines Make History?" in M. Kranzberg and W.H. Davenport (eds), *Technology and Future: An Anthology*, New York: Meridian.

Heller, F. (1987), "The Technological Imperative and the Quality of Employment", *New Technology, Work and Employment*, 2,1, pp. 19-26.

Helper, S. (1995), "Can Maquilas be Lean? The Case of Wiring Harness Production in Mexico", in Steve Babson (ed.), *Lean Work: Empowerment and Exploitation in the Global Auto Industry*, Detroit: Wayne State University Press.

Howes C. (1995), "Are Japanese Transplants Restoring US Competitiveness or Dumping Their Social Problems in the US Market?" in Steve Babson (ed.), *Lean Work: Empowerment and Exploitation in the Global Auto Industry*, Detroit: Wayne State University Press.

Hughes, K.D., and Lowe, G.S. (2000), "Surveying the 'Post-Industrial' Landscape: Information Technologies and Labour Market Polarization in Canada", *CRSA/RCSA*, 37, 1, pp. 29-53.

Human Resources Development Canada, *Funding Programs*, in [http://www.hrdc-drhc.gc.ca/hrrib/hrp-prh/english/organizations/funding\\_e.shtml](http://www.hrdc-drhc.gc.ca/hrrib/hrp-prh/english/organizations/funding_e.shtml)

\_\_\_\_\_, *National Occupational Standards*, in [http://www.hrdc-drhc.gc.ca/hrrib/hrp-prh/english/nos/occstd\\_e.shtml](http://www.hrdc-drhc.gc.ca/hrrib/hrp-prh/english/nos/occstd_e.shtml)

Humphrey, J., Lecler, Y., and Salerno M.S. (2000), "Introduction" in J. Humphrey, Y. Lecler and M.S. Salerno (eds.), *Global Strategies and Local Realities: The Auto Industry in Emerging Markets*, GERPISA, Macmillan Press.

Industry Canada (1998), "A Report on the Canadian Automotive Industry", *The Automotive Competitiveness Review*.

Industry Canada (1997), "Canadian Automotive Industry Today", *Automotive and Transportation Branch*.

Ionescu, G. (ed.) (1976), *The Political Thought of Saint-Simon*, Oxford, Oxford University Press.

Kenney, M., and Florida, R. (1993), *Beyond Mass Production: The Japanese System and Its Transfer to the U.S.*, Oxford: Oxford University Press.

Kern, H., and Schumann, M. (1992), "New Concepts of Production and the Emergence of the Systems Controller" in Paul S. Adler (ed.), *Technology and the Future of Work*, New York and Oxford: Oxford University Press.

Kochan, T.A., Katz, H.C., and McKersie, R.B. (1986), *The Transformation of American Industrial Relations*, New York: Basic Books.

Kumar, K. (1995), *From Post-Industrial to Post-Modern Society: New Theories of the Contemporary World*, Blackwell.

Large, P. (1980), *The Micro Revolution*, London: Fontana.

Lash, S., & Urry, J. (1987), *The End of Organized Capitalism*, Cambridge: Polity Press.

Law C.M. (1991), "Motor Vehicle Manufacturing: The Representative Industry" in Christopher M. Law (ed.),

*Restructuring the Global Automobile Industry: National and Regional Impacts*, Routledge: London and New York.

Legge, K. (1995), *Human Resource Management: Rhetorics and Realities*, London: Macmillan.

Levesque, C., and Cote, P. (1999), "Teamwork in the Context of Lean Production: Constraint or Opportunity?", *Relations Industrielles*, 54, 1, winter, pp. 80-110.

Lewchuck, W., & Robertson, D. (1996), "Working Conditions under Lean Production: A Worker-Based Benchmarking Study", *Asia Pacific Business Review*, Summer, vol. 2, pp. 60-81.

\_\_\_\_\_ (1997), "Production without Empowerment: Work Reorganization from the Perspective of Motor Vehicle Workers", *Capital and Class*, 63, pp. 37-64.

Lewis, A. (1995), "The Deskilling Thesis Revisited: On Peter Armstrong's Defense of Braverman", *Sociological Review*, 43, 3, August, pp. 478-500.

Liker, J.K., Haddad, C.J., and Karlin, J. (1999), "Perspectives on Technology and Work Organization", *Annual Review of Sociology*, v 25, pp. 575-96.

Lung, Y. (2000), "Is the Rise of Emerging Countries as Automobile Producers an Irreversible Phenomenon?" in J. Humphrey, Y. Lecler and M.S. Salerno (eds.), *Global Strategies and Local Realities: The Auto Industry in Emerging Markets*, GERPISA, Macmillan Press.

Lyon, D. (1988), *The Information Society, Issues and Illusions*, Cambridge, Polity Press.

\_\_\_\_\_ (1994), *The Electronic Eye: The Rise of Surveillance Society*, Minneapolis: University of Minnesota Press.

\_\_\_\_\_ (1999), "The Changing Meaning and Value of Work in a Globalized Information Society", in Margaret S. Archer (ed.), *Towards Reducing Unemployment*, Rome, Pontifical Academy of Social Sciences.

Mac Duffie, J., and Pil, F. (1997), "Changes in Auto Industry Employment Practices: An International Overview" in Kochan et al. (eds.), *After Lean Production: Evolving*

*Employment Practices in the World Auto Industry*, Ithaca: ILR, Cornell University Press.

MacKenzie, D., and Wajcman J.(eds) (1985), *The Social Shaping of Technology: How the Refrigerator Got its Hum*, Open University Press, Milton Keynes: Philadelphia.

Martin, J. and Butler, D. (1981), *Viewdata and the Information Society*, Englewood Cliffs, N.J., Prentice-Hall.

Martin, J. and Norman, A.R.D. (1970), *The Computerized Society*, Englewood Cliffs, N.J., Prentice-Hall.

McMullen, K. (1996), "Skill and Employment Effects of Computer-Based Technology: The Results of the Working with Technology Survey III", CPRN Study No W01, Ottawa: Canadian Policy Research Networks Inc.

Meiksins, P. (1994), "Labor and Monopoly Capital for the 1990s: A Review and Critique of the Labor Process Debate", *Monthly Review*, 46,6, November, pp. 45-59.

Meldon, B.G., and Eisenhauer, P. (1996), "Every Week is a Struggle: Job Satisfaction in Car Dealership Automotive Technicians", *Sociological Viewpoints*, 12, fall, pp. 15-34.

Menzies, H. (1996), *Whose Brave New World? The Information Highway and the New Economy*, Between The Lines: Toronto.

Milkman, R., and Pullman, C. (1991), "Technological Change in an Auto Assembly Plant: The Impact on Workers' Tasks and Skills", *Work and Occupations*, 18, 2, May, pp. 123-147.

Morales, R. (1994), *Flexible Production: Restructuring of the International Automobile Industry*, Polity Press.

Machlup, F. (1962), *The Production and Distribution of Knowledge in the United States*, Princeton, N.J., Princeton University Press.

Nightingale, D.V. (1982), *Workplace Democracy: An Inquiry into Employee Participation in Canadian Work Organizations*, University of Toronto Press.

Noble, D. (1984), *Forces of Production*, New York:Knopf.

- Noori, H. (1990), *Managing the Dynamics of New Technology: Issues in Manufacturing Management*, Prentice Hall, Englewood Cliffs, New Jersey.
- Paniagua, L., and Julian A. (1999), "Total Quality: A New Name for Taylorism", *Sociologia-del-Trabajo*, 37, fall, pp. 41-58.
- Parker, M., & Slaughter, J. (1995), "Unions and Management by Stress", in Steve Babson(ed), *Lean Work: Empowerment and Exploitation in the Global Auto Industry*, Wayne State University Press: Detroit.
- Perline, M.M. (1999), "Union Views of Managerial Prerogatives Revisited: The Prospects for Labor-Management Cooperation", *Journal of Labor Research*, XX, 1, Winter, pp. 147-154.
- Piore, M.J. and Sabel, C.F. (1984), *The Second Industrial Divide: Possibilities of Prosperity*, New York, Basic.
- Regan, P.M. (1996), "Genetic Testing and Workplace Surveillance: Implications for Privacy", in David Lyon & Elia Zureik (eds), *Computers, Surveillance and Privacy*, University of Minnesota Press: Minneapolis and London.
- Riddell, W.C. (1993), "Unionization in Canada and the United States: A Tale of Two Countries", *Queen's Papers in Industrial Relations*, Queen's University at Kingston.
- Rinehart, J., Huxley, C., and Robertson, D. (1997), *Just Another Car Factory? Lean Production and Its Discontents*, ILR Press, Cornell University Press, Ithaca and London.
- Ritzer, G. (2000), *The McDonaldisation of Society*, New Century Edition, Pine Forge Press.
- Rule, J.B. (1996), "High-Tech Workplace Surveillance: What's Really New" in David Lyon & Elia Zureik (eds), *Computers, Surveillance and Privacy*, University of Minnesota Press: Minneapolis and London.
- Russell, B. (1997), "Rival paradigms at Work: Work Reorganization and Labour Force Impacts in a Staple Industry", *CRSA/RCSA*, 34, 1.



- Sale, K. (1995), *Rebels Against the Future: The Luddites and Their War on the Industrial Revolution-Lessons for the Computer Age*, Addison-Wesley Publishing Company, New York.
- Scarborough, H., and Burrell, G. (1996), "The Axeman Cometh: the Changing Roles and Knowlwdges", in Stewart R. Clegg and Gill Palmer (eds), *The Politics of Management Knowledge*, London: SAGE Publications.
- Scarselletta, M. (2000), "Between Tradition and Innovation: The Cultural Contradictions of Employee Involvement", *Dissertation Abstracts International*, 60, 8, Feb, 2157-A.
- Schement, J.R., and Curtis, T. (1995), *Tendencies and Tensions of the Information Age: The Production and Distribution of Information in the United States*, New Brunswick, Transaction Publishers.
- Sewell G. (1998), "The Discipline of Teams: The Control of Team-based Industrial Work through Electronic and Peer Surveillance", *Administrative Science Quarterly*, 43, pp. 397-428.
- Shaiken, H. (1984), *Work Transformed: Automation and Labor in the Computer Ages*, New York: Holt, Reinhart and Winston.
- \_\_\_\_\_ (1995), "Lean Production in a Mexican Context", in Steve Babson (ed.), *Lean Work: Empowerment and Exploitation in the Global Auto Industry*, Detroit: Wayne State University Press.
- Shaiken, H., Lopez, S. and Mankita, I. (1997), "Two Routes to Team Production: Saturn and Chrysler Compared", *Industrial Relations*, 36, 1, January, pp. 17-45.
- Sharpe, A. (1999), "Organizational Structure, IT, and Productivity: Can Organizational Change Resolve the Productivity Paradox?", *Applied Research Branch Strategic Policy HR Development Canada*, January.
- Smart, B. (1992), *Modern Conditions, Postmodern Controversies*, Routledge: London & New York.
- Smith H.J. (1994), *Managing Privacy: Information Technology and Corporate America*, The University of North Carolina Press, Chapel Hill and London.

Smith, T. (2000), *Technology and Capital in the Age of Lean Production: A Marxian Critique of the New Economy*, SUNY Press.

Sorensen, K.H. (1996), "Of Men and Machines-Technology and Working Life Discourses", *Acta Sociologica*, v 39, pp. 98-108.

Spencer, D.A. (2000), "Braverman and the Contribution of Labour Process Analysis to the Critique of Capitalist Production - Twenty-Five Years On", *Work, Employment and Society*, 14, 2, June, pp. 223-243.

Spenner, K.I. (1985), "The Upgrading and Downgrading of Occupations: Issues, Evidence and Implications for Education", *Review of Educational Research*, 55, pp. 122-154.

Stewart, P., and Garrahan, P. (1995), "Employee Responses to New Management Techniques in the Auto Industry", *Work, Employment and Society*, 9, 3, pp. 517-536.

Stine, G.H. (1975), *The Third Industrial Revolution*, New York, G.P. Puntam's Sons.

Stonier, T. (1979), "The Third Industrial Revolution-Microprocessors and Robots", in *Microprocessors and Robots: Effects of Modern Technology on Workers*, Viena, International Metalworkers' Federation.

Thompson, P., and McHugh, D. (1995), *Work Organization: A Critical Introduction*, (2<sup>nd</sup> Edition), London: Macmillan.

Toffler, A. (1971), *Future Shock*, New York, Bantam Books.

Touraine, A. (1971), *The Post-Industrial Society*, New York, Random House.

Turner, L. (1991), *Democracy at Work: Changing World Markets and the Future of Labor Unions*, Ithaca: Cornell University Press.

United Auto Workers (2000), "The US Auto Industry 2000 in Review", in [www.uaw.com](http://www.uaw.com)

\_\_\_\_\_ (2000), "Union Membership in 2000", in [www.uaw.com](http://www.uaw.com)

\_\_\_\_\_ (2000), "Union Representation and Earnings in the AI", 2000, in [www.uaw.com](http://www.uaw.com)

Vallas, S.P. (1999), "Rethinking Post-Fordism: The Meaning of Workplace Flexibility", *Sociological-Theory*, 17, 1, March, pp. 68-101.

Vallas, S.P., and Beck, J.P. (1996), "The Transformation of Work Revisited: The Limits of Flexibility in American Manufacturing", *Social Problems*, 43, 3, August, pp. 339-361.

Waters, M. (1995), *Globalization*, Routledge: London and New York.

Webb, J. (1996), "Vocabularies of Motive and the 'New' Management", *Work, Employment and Society*, Vol. 10, 2, pp. 251-271.

Wickens, P.D. (1993), "Lean Production and Beyond: The System, Its Critics and the Future", Inaugural Professional Lecture, University of Sunderland.

Woodward, J. (1958), *Management and Technology*, London: HMSO.

International Labour Office (1993), *Workers' Privacy Part II: Monitoring and Surveillance in the Workplace*, Geneva, v.12.

Zeffane, R. (1994), "The Influence of Computer Usage on Employees and Managers' Satisfaction: Findings from the Australian Telecommunications", *Human Systems Management*, 13, 4, pp. 269-282.