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**POWER RELATIONS AND LEAN PRODUCTION
THE FOUCAULT APPROACH IN RESEARCH
ON FIAT AT MELFI**

by

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To obtain a clear picture of the results of research on “Lean Production and Labour Force in the Automobile Industry” in relation to the Fiat factory at Melfi two preliminary points must be understood aright.

The first concerns lean production as an “epoch-making model”, and here we must make it clear from the outset that the focus here will not be on an enterprise model but rather a model of labour organisation implemented in manifold ways as it adapts to the various contexts. The principle lean production implements is that of *just in time*, departing from Fordism to redefine power relations both in the automobile factory itself and in relations with the suppliers associated with it, and indeed in the context which the industrial complex forms part of.

The second point to clarify is that theoretical framework of research is the Foucault approach. This is not to say that the entire field of analysis was thus conceived from the outset. It was in fact the researchers who opted for this line in consideration of the fact that the arena was that of conflicting power relations. Now that the first stage of inquiry has been completed, the reasons behind reference to Foucault in themselves prompt some fact-finding work in – continual – progress.

Lean production: an epoch making model?

According to the *Machine that Changed the World*, “lean production will supplant both mass production and the remaining outposts of craft production in all areas of industrial endeavour to become the standard global production system of the twenty-first century” (Womack et Al. 1990: 278). Produced by the Massachusetts Institute of Technology study group on the automobile industry, the forecast was based on the fact that this manufacturing system, “results in a better, more cost-efficient product, higher productivity, and greater customer loyalty” (ibid.: IV).

Analyses conducted by GERPISA (Groupe d'Etude et de Recherche Permanent sur l'Industrie et les Salaries de l'Automobile) confute this thesis. Lean production, “an amalgam of profit strategies and industrial models which are different and incompatible, cannot be the industrial model of the twenty-first century” (Freyssenet et Al. 1998: 45).

Not only is it a mistake to consider lean production the ‘one best way’, but, the GERPISA findings have it, in the past no other ‘best ways’ can be made out in the automobile industry. “The three supposedly successive production systems, craft, mass

production and lean production,” we read in their report, (ibid.: 2) – “are actually the result of historic amalgams and conceptual ambiguities. The so-called craft system includes craft-based companies, but also genuine industrial companies (...). ‘Mass production’, otherwise known as the ‘Taylor-Ford’ system, encompasses different models, even if they do share certain principles in common (...).”

The GERPISA studies on the automobile industry involved a great many experts in various fields, convincingly showing that innovations in space and time have not come about, and do not come about with the diffusion of an enterprise model, but rather through the adaptation of the available know-how to various environments a particular moments. The variety of innovative practices is the outcome of a hybridising process, or in other words of the “complex interaction of productive models with national and societal effects, (...) not simply as a process of compromise and retreat but also as an important dynamic of innovation and learning” (ibid.:1-2).

What the car manufacturers have done is to “place their bets on the type of spatial recomposition that would carry the day, in order to select the most appropriate profit strategies, modes of internationalization, product ranges, production organization, and employment relations: in short, their industrial models. The choices they made, strongly influenced by their past trajectories, would in turn have an impact on the recomposition of the global economy itself”. (Freysenet et Al. 1998: 42).

The conclusion is that “there are no pure productive models to imitate: both ‘Fordism’ and ‘Sloanism’ encompassed a wide variety of practices and, even within contemporary Japan, Toyota’s system is not hegemonic” (Boyer et Al. 1998: 375).

The GERPISA project shows that Fordism saw the proliferation not of the Fordist automobile enterprise but, in manifold versions, a Sloanist enterprise that, having superseded the technological rigidities of the Ford model, was better suited to societies where stratification differed from the US pattern. So much is not in contradiction with the “epoch-making” view of Fordism as a historical phase in the development of capitalist society, characterised by labour organisation based on the assembly chain for the purposes of mass production. In fact, this conceptual interpretation does not take reference from entrepreneurial criteria and choices but, to use Foucault’s terminology, from the social genealogy of power.

The genealogical approach makes the work at chain a metaphor transcending the enterprise, revealing how a society is disciplined in a particular period. Similarly, lean production in this context is taken as metaphorical representation of the times we now live in, and again the metaphor does not refer to the enterprise model but to the new forms of social control that lean production is propagating.

The *just in time* system is certainly one of the ‘tools’ applied by the lean enterprise (Freysenet et Al. 1989: 30), finding manifold entrepreneurial applications and, indeed, we encountered the tool at the Melfi Fiat plant. Here, however, we shall not take it as a mere organisational tool but rather as a controlling principle, at work within the enterprise but also transcending it. In fact, research has shown in concrete terms that, on examination, the disciplinary area defined by *just in time* reveals new forms of linkage between the automobile factory and its suppliers and the general social context of the industrial complex, and they are forms of such impact as to restructure the overall social relations.

The results of this research transcend the case of Melfi not only in virtue of the powerfully innovative “locomotive” effects of the automobile industry (and in the '90s Melfi proved exemplary as a model of lean production), but above all because they concern the social restructuring that lean production is bringing about the whole world over. The fact that it finds its way into such a diverse range of environments (cfr. Durand, Stewart, Castillo 1999) demonstrates that it can reasonably be take as a metaphor of a social conditioning we might define as “epoch-making” to point out how far removed it is from the Fordist model.

Disciplining the lean production labour force: the Foucault approach

For many reasons, Foucault's theory became the guide-line in research on Melfi.

In the first place, in Foucault's theory power relations have an independent status marking them out from other relations, and are posited as objects of knowledge to define an area that is not given a priori. In this research the area is theoretically defined by the *just in time* connections. Analytically, it involves the Melfi Fiat factory, the supplier firms connected with it, and the surrounding field. Production relations are given, assumed in this analysis which is concerned with power and not exploitation, power as a disciplining activity being effect and condition of the latter.

Secondly, Foucault's is a theory of power based on conflict. It turns the focus of analysis towards power as command and resistance to it. "Resistance is never in a position of exteriority in relation to power" (Foucault 1979: 95).

A fundamental feature of Foucault's work is the focus on the ways in which power relations serving the purposes of command were conceived and created at a time when the generalisation of capitalist relations had played havoc with the pre-existing order. Reference to the total institutions (prisons, mental homes, hospitals) has – some argue – made determination of forms of resistance problematic. However, power is not to be identified with these institutions but rather with the effects they produce and react to.

Foucault's analytic tool is the mechanism of power (*dispositiv*), which leads research in a field in the direction of a set of techniques that bring individuals to experience social activities as matters of common sense and well-being, without seeing the source of the control. Resistance to the control thus obtained does not, however, arise from the discovery of this concealment, but from the contradictions between subjective needs and the normalised social practices. It is subjectivity that produces resistance, over and above the question of identifying who is wielding power. However, the clash between subjectivity and normality tends to identify the mechanisms of power and those involved.

According to Foucault, this resistance rarely emerges in a radically forceful manner, and it must therefore be sought in the variable multiplicity of points that structure power relations in a given area. Defining the sense of his research, Foucault explained (1991: 74): "I worry about comprehending the effective mechanisms of domination; and I do so it, so that those who are inserted in certain relations of power, who are implicated in them, might escape them through their actions of resistance and rebellion, might transform them in order not to be subjugated any longer".

Thirdly, Foucault's theory sees as the basis of power relations control mechanisms of a structural type that define a space producing power effects independently from those in power. "What is needed - says Foucault (1979: 200) - is to place a supervisor in a central tower and to shut up in each cell a madman, a patient, a condemned man, a worker or a schoolboy".

The metaphor has a general relevance, and each specific population has its own specific central tower – its own Panopticon exerting the control function. As we know,

however, this function is performed independently of the supervisor, by the sheer force of the messages the tower sends out, and the relations activated by them in the collective imaginings. It is enough for the recipients to be within sight range of the central tower to know, also, that they can be kept watch over, and punished.

Foucault made no specific study of the factory, but he often made reference to it in his general observations, wavering between seeing the workers as a population in a panoptic field or as objects under direct personal control. These two lines intersect, as for example in the observation that: “What was now needed was an intense, continuous supervision: it ran right through the labour process; it did not bear - or not only - on production (the nature and quantity of raw materials, the type of instruments used, the dimensions and quality of the products), it also took into account the activity of the men, their promptness, their zeal, their behaviour (...). A specialized personnel became indispensable, constantly present and distinct from the workers” (Foucault 1979: 174)

The two lines of disciplining – inherent in the production process and at the managerial level – have often been confused. “Surveillance (the all-seeing eye of the Panopticon) became a managerial function”, Sakolovsky observes, for example (1992: 240). This confusion has stood in the way of research on the control techniques inherent to the factory structure, well beyond the electronic panoptic mechanism (Zuboff 1988), where analogy with the panoptic structure of Bentham and Foucault is readily appreciated.

Thus the development of research at the structural level finds specific stimulus in Foucault’s approach. In the factory the central tower is objectified in the material components of the productive structure defining the fields of visibility and producing the information flows that serve the purposes of disciplining. The Taylorist approach to worker management arose precisely because of the limits of a control system created by a productive structure designed to subsume bodies, and not minds. In lean production these limits are exceeded, and research on the panoptic effects must extend both within the factory and outside it. In society it is the factory itself that acts as a central tower normalizing social relations with the arms of employment and wages.

In the fourth place, finally, Foucault leads us to associate this structural dimension with the relational area. Panoptic technologies define the field of the everyday normalized practices, but the social relations implicit in the practices underpin normality

– provided that they are perceived as being marked by common sense and the common good, whether between peers (a team, for example) or asymmetrical (as in the case of Human Resource Management). The disciplinary effect is based on the communicative contents of these relations which are interpersonal, unlike the panoptic effect based on informative contents directed to the single individuals.

This dual dimension of analysis is an important factor when we look to Foucault in our endeavours to understand the situation brought about by lean production (McKinlay and Starkey, 1998). In the *just in time* epoch the work-force must be extremely adaptable to changes in pace and task, and they must be capable of following the flow of information and communicating over their work. Thus information and communication become two analytic components of the control activity.

The control achieved through information is specifically panoptic and flows from a structural source. “Who is subjected to a field of visibility, and who knows it, assumes responsibility for the constraints of power he makes them play spontaneously upon himself; he inscribes in himself the power relation in which he simultaneously plays both roles; he becomes the principles of his own subjection” (Foucault 1977: 203).

By contrast, the control achieved through communication is relational, presupposing – within the area defined structurally to inform on normal behaviours – inter-subjective relations that underpin the panoptic control, or reduce to normality that which, on the structural level, remains indeterminate. In the factory the communicative relations reinforce the effectiveness of the panoptic control. They can be asymmetrical as in the case of Human Resource Management, or even symmetrical as in the case of teams where workers are in formally equal positions and the normalized behaviour is structurally determined. But the communicative capacity is not produced inside the factory, and contradictions can arise from relations in society.

Foucault and the disappearance of conflict in the factory

Are there any contraindications to the Foucault approach?

In the past few years a terminology has found circulation that denies the existence of conflict in the work place: “employment becomes membership, control is redefined as commitment, management transmutes into leadership” (McKinlay e Taylor 1998: 173). In a review of British industrial sociology it was suggested that this position was at least

strengthened by a heavy ideological effect originating with Foucault. In the literature – and not only in that concerning the Foucault approach – “resistance has been squeezed out by the success of the new management practices” and “conflict disappears from the [labour] process [theory] partly because of the tendency to believe there is a monopoly of knowledge by the management and its agents” (Thompson and Ackroyd 1995: 624).

Thus, given that the British tradition of research on industrial labour revolved around resistance and misbehaviour, “all quiet on the workplace front?” is the question the authors of the review ask themselves.

The idea that a Foucault approach ideological effect lies behind this situation is surprising, since Foucault’s theory is one of conflict. Before considering the specific effects of the Foucault approach, a point to stress is that research is affected by various other factors producing the concealment of conflict.

To begin with, in the past it grew on the assumption that union activities and conflict were much the same thing, as were open conflict and resistance. The identification dates back to the Fordist period, when the recomposition between labour and capital “was the outcome of relations of contractual strength on the battle ground” (Oliveri 2000). Lean production sees transition “from the conflict/contract to the negotiation/participation”, which implies “representation of the capitalist production area in terms of a neutral place where things are produced on the basis of common interest” (ibid.). This new positioning of the union in the factory influences research, especially when no due account is taken of the distinction between union-organised conflict (which seems to be fading away) and subjective resistance (which persists).

Secondly, as Fiocco (1998-9: 76) points out, what is happening is that the emergence of antagonistic subjectivity is now taking on different forms from those of the past, and for this very reason it is hard to distinguish in the apparent social peace. “This peace is apparent because not only minor conflicts are expected by the management, but also subsumed in internal social relations, concealed by the group form, and addressed by handling the evident tensions as if they were normal operational disorders of labour in co-operation”.

Thirdly, we often find in the literature a confusing overlap between commitment and subjectivity. The latter is an expression of human needs. Commitment defines

adherence to order imposed, and is not self-expression if the worker. The clash between subjectivity and normality tends to produce resistance and conflict.

Thus it is no easy matter for the researchers to identify, or even sense, the new forms of resistance in the factory, nor are they helped by the methodological indications of Foucault. Therefore they concentrate on the control practices, and end up seeing power as the command achieved through them rather than a process of the subjection of resistance to command.

The theoretical contribution of research on Fiat at Melfi

Research developed with detailed analysis along three major axes: work in the Fiat factory at Melfi; work within its supplier firms with particular reference to the seat production filiere, and the environment – the field – around the industrial plant the work-force comes from. These three axes are inscribed within the space of power relations defined by *just in time*.

The results of the research are presented separately by the various authors and vary in scope, reflecting diversities in the starting points and levels of analysis so far conducted. Preliminary perusal of the literature has yielded useful indications on relations within the automobile factory, while the field work at Melfi provided a basis for detailed analysis involving some important problems. However, the problems relating to the other two axes proved harder to address. In the case of relations between automobile factory and supplier plants some methodological indications came from criticism of the various interpretations the literature offers on these relations. With regard to the field some hard thinking had to be done – based in part on the on-site activities – to emerge from the purely descriptive impasse occurring in the greenfield and brownfield literature, and produce a theoretical framework that should serve for future investigations.

All the works are based on qualitative methodological approaches: field observation (with some short stages at Fiat), interviews and case analyses. The researchers are in part faculty staff in part younger phd students.

Of course, the attention to detail implies a need for synthesis. Each paper seeks to achieve this in its own area, with specific reference to the particular objects of analysis.

Here I shall attempt to tie in the results, taking due account of their possible theoretical importance over and above the particular case of Melfi.

On the whole, the contribution research makes to our understanding of the power relations being forged in lean production phase lies in:

a. Identification of productive pattern based on cells, connected just in time not only within the automobile factory but also in the industrial filieres, spatially fragmenting the labour force and controlling it – an alternative to Fordist concentration.

b. Qualification of the field of an industrial settlement as a place of social and institutional relations not already given (greenfield or brownfield) but produced to discipline the labour force to the flexibility and commitment demanded by lean production.

c. The importance attributed to structural features in control of the factory labour force with identification of some structural mechanisms (the *kanban*, the cell, as well as the electronic panoptic of Sewell and Wilkinson) and relational mechanisms (the team, the Human Relations Management in a specific form we called 'power fluidising', and the Unions), controlling the labour force in the factory.

Redefining the productive and social structure in the period of lean production

In the period of lean production the productive area configures as a constellation of filieres of firms linked up just in time within which the labour force is fragmented, subjected to disciplinary and normative conditions varying from firm to firm. This fragmentation is penetrating into the productive process itself with the modular factory (Sivini 1999).

The result of the separation process for workers placed under the command of bodies juridically independent but integrated in filieres has been described as “extensive cellularisation” (Fiocco 2000). However, the process serves not only to dissociate the labour force, but also to discipline it on new bases according to the production needs of the firms connected just in time in the filiere (Pulignano 2000).

The analysis of the Melfi Fiat supply filiere points up that the automobile factory, as such, exercises a panoptic function for the labour force of the firms linked with it just in time. “The apparently neutral, objective nature of the ‘tense flow’, Pulignano (2000) points out, conveys the internal command to each productive unit along the filiere as if

it had originated from the client. In this respect, working conditions (timetables, rhythms, workloads, etc.) seem simply to respond to the immediately visible objective to guarantee the flow rather than satisfy the financial and strategic interests of the supplier firm. In this context the worker's perception reaches beyond the confines of the firm". This structural pressure is reinforced by the relational pressure. "The management passes on the just in time pressure to the workers, making them 'feel part of the firm'" (ibid.)

Implementation of just in time means a labour force not only entering into the productive process body and mind, but also one that is obliged to dissociate its own phasing from the social phasing. De Angelis (2000) explains how the flexibility of lean production depends on rigid individual timetables based – for the workers – on three-week cycles organised in variable day and night shifts, made up for with days off every three weeks on – ever varying - week days. Both the firm and unions justify the system with the need to distribute compensatory days off and wage incentives for night and Saturday work equitably among all the workers. In reality, it was adopted because it constitutes a "work buffer available to make up for possible lack of staff or support production peaks with recourse to overtime" (De Angelis 2000).

For the workers, as Vitale (2000) points out in his analysis, this means "destructuring/restructuring of the daily routines". It also calls for intervention in the environment to deal with the contrasting needs of social relations between those in the factory and those outside it.

In this latter respect the firm has already taken steps by hiring workers not on the basis of skills but on their acceptance of flexibility and the social consensus to it. In collaboration with the local institutions it has also taken steps aiming at the eventual acceptance of new normative codes based on the ideology of 'local development', making economic growth a 'matter for the local community', "a collective goal around which the sociality in general is reorganised" (Vitale 2000). It is to this end that the conditions of the workers are subordinated, while the stress they experience tends to be confined to the non-generalisable, individual sphere. Thus resistance lacks the impact capable of producing a different 'common sense'. At the same time, as it concerns the field of the workers' relational needs, it cannot be re-absorbed into the new sociality.

Analysis of these changes leads to the conclusion that the greenfield does not exist but is produced as an area of lean production operations. “Every new phase”, Vitale concludes, underlining the differences between the present and Fordist periods, “is marked by the emergence of a new production model whose implementation depends on the activation of a whole range of worker control and normalisation systems to adapt them – against their resistance – to a new organisation of work. This means that the labour force introduced into the new productive processes must *in every case* be produced as ‘green’” (ibid.).

Control systems in the lean factory

Reorganisation of factory work in the form of productive microcells has been defined as ‘intensive cellularisation’. The structural and relational mechanisms analysed – without any claim to be exhaustive – concern the factory as a whole, relations between the cells and the labour force within the cells.

There are three structural mechanisms, namely *kanban*, electronic panoptic and the cell. Analytically, they have different control functions, the first secure the process order resulting from division into cells, the second the work performance, the third the way the work is to be performed.

Within this structural context other means operating at the communicative relational level have also been studied: social relations within the team, human resource management, and unions that underpin the control system since by agreement with management their general aim is to prevent conflict in the factory.

The complex of information and communicative relational mechanisms tends to create a participatory control in which, as Foucault put it, the soul becomes the prison of the body. Separate analysis was made of the mechanisms due to division of labour between the researchers. The results converge in a sort of cumulative process following the steps of the electronic Panopticon defined by Sewell and Wilkinson (1992) and Linhart’s participatory mechanism (1995), which has led to use of the term mechanism also for the other control systems research went on to examine.

The mechanisms analysed are to be taken as so many pieces of a sort of jigsaw puzzle that, once completed, affords an overview of the structural and relational powers governing the factory. The assumption is that each piece has cumulative effect, although

the risk is that contradictions in the control effect between one piece and the other may escape attention. Analysis has not yet been carried out on resistance in relation to each mechanism, although the Foucault approach to control would have required it. Finally, not all the pieces are available yet. For example, the analysis of the time and methods system within the factory carried out by De Angelis would, according to the Foucault approach, lead to definition of important another structural mechanism.

On the basis of these point we shall now go on to a brief examination of – firstly - the structural mechanisms and then the relational instruments. We shall then go on to examine the problems involved in the effects of control and resistance, considered in the research but not systematically developed.

Structural mechanisms

Kanban is considered a control instrument specific to intensive cellularisation in that it concerns the relations between the work units designed to insure the productive flow. Defined by Ohno himself as ‘autonomous force of the line production line’, *kanban* consists of visual, aural and paper signals. At the organisational level these signals have communicative functions between the production cells, indicating the need for intermediate products downstream. At the level of control they convey the information on behaviour necessary to keep the connection between the cells in process. The source of this information lies in the cells downstream, thus concealing the management’s orders. The workers know that the production objective is defined by the management, but in practice they sense it as an imperative objectified in the material and organisational structure of the flow.

Electronic Panopticon. The electronic Panopticon, pointed out by Sewell and Wilkinson (1992), consists of a highly pervasive monitoring system aiming at verification of organisational efficiency while exercising control effects at various levels. A general function is performed by the electronic displays scattered around the factory, which afford a real-time picture of the state of production. ‘Everyone knows, at all times, of any gap between goal and reality, but they also know that this means they must set out to solve the problem’. If they do not jump to it, or in other words if the workers resist the command conveyed by the electronic system, then the apparent

objectivity of the display becomes an arm used by the team foremen to increase the production flow with man-to-man talks and bonuses.” (Fiocco 1998-9: 78).

Two other types of electronic panoptic control – which would merit further examination – are accomplished by monitoring means of production as condition of productive performance and product in process. Departures from the functional and/or quality norms lead to the attribution of subjective responsibilities, thus placing the workers, who cannot be monitored directly, in a distinctly visible position that produces control.

If *kanban* “conveys apparent inversion of the managing process, with the result that every cell seems to have to produce just in time because of operating needs downstream, Fiocco argues (2000), the electronic Panopticon tends to induce a mental habit of doing what has to be done responding to signals”. “The cumulative effect, Fiocco adds, is that the workers tend to attribute the signal itself with the power to impose rules for their behaviour, as was the case with the woman working on painting (a ‘blank’ with the next cell being signalled by a siren), who burst out angrily during an interview with “That damned siren, sooner or later I’m going to smash it” (ibid.).

The control achieved with these two structural instruments works through information flows.

The cell. The cell controls are also definable at the structural level, generating relational forms of the type Linhart described as a ‘participatory instrument’ (1995: 98). The relations are in fact imposed by the cellular structure, and they define the field of visibility where the worker performs, informing him or her how to perform.

At the level of integration of the various production activities the cell is based on tasks including not only the primary operation but also others such as quality verification, prevention of malfunctions, maintenance of own tools and the solution to problems that do not fit in with routine procedures. While in general respecting the specific roles, the assignation of tasks in the cell is kept fluid to allow for the changing needs of the flow, which implies a form of co-operation independent of the goals of individual action, and is thus structural in origin although, in the literature, “the synergetic potential of the cell tends to be taken as the product of the voluntary self-activation of its members” (Fiocco 2000).

The relational mechanisms

The *team*. As we have seen, the cell define a structural normality. Daily, individual self-activating practices generate in the team inside the cell, and any individual departure from what – even though not routinised – is generally taken to be disciplined behaviour has consequences for the whole team. Thus within the team a strict informal surveillance is applied, which “eventually leads to the formulation of normative criteria for individual behaviour that – not having been imposed by the management in an authoritarian, hierarchical manner – take on the appearance of *free expression* of the group” (Caputo 2000). This social pressure is a relational type of control, and can be exercised by peers since its source, as we saw above with reference to Fiocco’s analysis, is structural.

Fluidisation of command. By contrast, managerial control is based on explicit power asymmetry finalised for the reproduction of a structurally defined order which the managers themselves adjust to. The literature shows diverging positions on the question of the functions that this control – in the form of human resource management – must have in lean production. On the one hand, it is assumed that it must be soft because teamwork produces commitment, on the other that it must be hard because the production process is vulnerable. Neither position takes account of the fact that control over labour is in the first place applied structurally, and that the disciplinary function of human resource management is to support the effectiveness of the structural mechanisms should subjectivity emerge (Fiocco 2000).

It is precisely in this direction that the ‘fluidisation of command’ mechanism studied in depth by Commisso (1999 e 2000) seems to operate. Contact between management and workers is characterised by informal-relational practices, so that command actually flows in the form of friendly individual relations, apparently independent of roles. Moreover, a counterweight system in the operating command roles tends to eliminate arbitrariness in the exercise of power and show that fair solutions can be reached provided they are compatible with production objectives. The normalising effect of the fluidisation of command lies in the way every form of individual or collective resistance is addressed as if it were a normal operating disorder in work.

The unions. The activity of the unions, whose institutional position and practice in the Fiat plant at Melfi are analysed by Oliveri (2000), also moves in this direction. At

the level of labour organisation its function, exercised through representatives in the factory, is to assess the problems concerning the workers with the aim of settling them in terms of the negotiation system. At the level of control, it serves to reinforce the participatory logic, assuming that there is no room for conflict in lean production as all forces must converge in safeguarding the vulnerable production flow.

Effects of control and resistance

In brief, on the evidence of the various pieces of the jigsaw analysed in research it can be demonstrated that power is inscribed in the structure and in the vertical and horizontal communicative relations, which aim at securing the commitment of the workers in the factory in order to resolve the rigidity of productive organisation with the flexibility of work. If, however, we are to follow Foucault in regarding control activity in terms of social relations, much still remains to be done to explore the field of its effects and the field of resistance.

In the literature, the field of effects ranges from the 'strategic subordination' of the workers (Burawoy 1985: 10) to identification with both work and firm. In the former case behaviours conform to norms that have become interiorised as serving in the interests of wages, incentives, job security or career, changing with the changing conditions that bring them about. In the latter case they are ends in themselves, imperative and even capable of reverse the sign of contradictions between work and non-work. "Employees do not express a concern that the employer wants more work; their primary expressed concerns are that their body, their social needs, their incapacities, or families do not let them do more work better. The enemy is no longer the managers' expectations. The company integrated into the self, leaving ones' body and non-work relations as oppositional" (Deetz 1998: 166).

In our work on Melfi the problems revolving about the effects of control were not specifically addressed, research focusing on the control instruments and their capacity to produce behaviours conforming to the norms and, correlatively, the behaviours of resistance. No explicit attention was given to the question of coherence between behaviours and attitudes, and there was therefore no possibility – supposing it may exist – of assessing the extent to which commitment in work derives from identification with

the firm or rises from sheer strategic subordination, the latter attitude being apparently frequent among the workers in the supplier companies. (Pulignano 2000).

Again, the resistance indicators also refer in general to behaviours rather than attitudes. The forms resistance to control takes within the factory have been analysed by Fiocco (1998-9), with global reference to the structural instruments. On the evidence of research in Melfi three fronts of emerging antagonism were defined, taking antagonism as the process by which the worker becomes subject of his or her own practices against the constraints imposed.

The concept of subjectivity implicit in this process clashes with the concept of commitment, often defined with the same term subjectivity. Commitment defines adherence to the order imposed and is not self-expression the worker.

One front of resistance is to be seen in the micro-conflicts creating social tensions within the productive cell. Here the fluidisation of power has the effect of transposing resistance to the level of operating malfunctions. Nevertheless, with individual negotiation the workers learn to negotiate in the first person, with no delegation.

The second front considered by Fiocco is that of tacit resistance. "Not paying attention to what one is doing, not having the mind on the job, doing as little as possible, hoping the line gets blocked all represent the initial displacement of antagonistic subjectivity against the rules of the game" (Fiocco 1998-9: 84). Resistance may be immediate or reflective, but in general there is scant awareness of antagonism.

The third front is that which denotes the emergence of the collective subject, conscious rejection of the imposed identity leading to behaviours counter to the productive flow.

This attempt to analyse resistance come up against certain limits.

In the first place, according to the Foucault approach it should concern each of the mechanisms, because analytic identification of a mechanism is only possible when specific control activities are deployed to act on specific forms of resistance.

Secondly, analysis of forms of resistance must take account of the new sociality in being a factory worker distinguishing this from the Fordist phase, which leads us to wonder whether the factory is the only place to define resistance, or whether we should begin with the contradictions within the field and between field and factory.

Thirdly, with the focus on the workers' commitment as a feature distinguishing the organisation of lean production from Taylorist organisation, the resistance and resistance potential brought about by physical stress tends to be underrated – not in the aims and considerations of but in the analytic framework itself.

In his study on time schedules at the Melfi Fiat factory De Angelis offers detailed analysis of the causes of this stress. The workers are recruited over an extensive geographical area to avoid creating worker-dense zones, thus being subjected to the inconvenience of distance, while also being subjected to continual change in day and night shifts and having to do overtime when necessary. The impact on social relations is enormous (Vitale 2000). Time saturation in the factory is moreover greater than in the other Fiat plants, performance normally being characterised by intense rhythms and repetitiveness which can be further stepped up to recover productive volumes, while the time allotted to operations is constantly being revised in accordance with a philosophy of continuous improvement.

The production layout at Melfi is characterised by innovative technological solutions to reduce the harmful effects of noise and fumes and lighten the physical strain, but the tensions produced by the shifts and intensity of work are indeed formidable. On the one hand attention to quality tends to flag, with the result that an increasing number of vehicles end up in the workyard to be put back into shape by workers on overtime. On the other hand tensions lead to resignation (Sivini 1999: 11). Finally the impact of the continual change in the shifts has an enormous impact on social relations outside the factory.

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