

the trend of the times, the nature of contradiction in a socialist country and the essential requirement of socialism. The theories of class and class struggles are not completely denied by the objective of the harmonious society, while the focus has been deviated from armed struggles to reform and coordination so as to correct and prevent the oversimplification and one-sidedness of the past treatment of the problems of class and class struggles.

Overall, the harmonious society that China is going to construct differs both from that advocated by Khrushchev and from the erroneous arguments list above. While the latter two are, by nature, the negation of contradiction, classes or social strata and class struggles, the harmonious society, as hitherto discussed, is not.

[BE] HENRI HOUBEN

Contact Information

Address: Institut d'Etudes marxistes (INEM)

Institute of Marxist Studies

68 rue de la Caserne

1000 Bruxelles - Brussels

Belgique - Belgium

Telephone: 32 (0)2 50 40 154 (office)

32(0)2 415 92 49 (private)

Fax: 32 (0)2 513 98 31

Email Address: inem@marx.be (office)

henri.houben@worldonline.be (private)

Homepage: www.marx.be

Henri Houben was born in 1958 in Liège (Belgium). He obtained a bachelor's degree in sociology in 1980 and then studied economics. He obtained a Ph.D. in Economics from the Catholic University of Louvain-la-Neuve (UCL), near Brussels. The subject was "Evolution of production systems in the automobile industry: from Fordism to Toyotism". He works as assistant lecturer at UCL, at the Department of Applied Economics.

Henri Houben has published papers in several reviews, mainly in Belgium, in particular in *Marxist Studies* and *Contradictions*. He regularly gives courses on economic subjects for the Institute of Marxist Studies. His main topics of research are the theory of Marxist economy, the development of transnationals, the power of the capitalist lobbies, the automobile industry, globalisation, the economic crisis, and the creation of European power, specially the Lisbon strategy. He is also a member of the antiglobalisation association Attac

in Belgium (website in French: <http://bxl.attac.be/spip/>).

Taylorism, Fordism, Toyotism, or the History of Capitalist Rationalization of Labor

[BE] Henri Houben

The history of capitalist rationalization of labor is the history of capitalist ways of raising exploitation of workers. In the first book of *Capital*, Marx devotes many pages to these policies of employers for increasing surplus value.

It is interesting to note that Frederick Winslow Taylor took up the reflection where Marx left it, but in the service of employers. He decomposed labor into tasks (as the division of labor of the manufacture had done before him) and the task into gestures. Each one of those gestures was then analyzed. Implicitly, he then decomposed the latter and in particular the time each gesture represented into three categories, which were to be essential for every rationalization of labor:

- Directly productive time, i.e. the time during which the worker is attached to an operation of strict transformation of commodities, e.g. the assembling of a forward wing of a car;

- Indirectly productive time, i.e. the time during which the worker carries out an operation which does not strictly transform the commodity, but which is necessary in the sequence of movements ; e.g. the movements the workers make to get the parts essential for production, in this case, the wing that has to be fitted on the car;

- Idle time, i.e. the time during which the worker carries out movements which have nothing to do with or are not necessary for the production of commodities; that is the case with waiting time, when, on an assembly line, the preceding vehicle has already passed and the following has not yet reached the work-post.

Let us call the first category H_p (directly productive time), the second H_i (indirectly productive time), the third by H_e (idle time, time to eliminate), we obtain the following

definition of H, representing the hours worked by a worker in a certain lapse of time:

$$H = H_p + H_i + H_e$$

This decomposition has the aim of making part of the time commonly considered as productive, either directly or indirectly, unproductive. Thus these times are then eliminated and a simple task requires less time. The time taken up by a task thus approaches the following equation:

$$H = H_p + \varepsilon$$

where ε represents the smallest possible quantity of additional working time. This is the base of every rationalization of labor.

For instance, Frank Gilbreth, friend and disciple of Taylor, studied the gestures carried out by a bricklayer. After a certain time he considered that one of these could be transformed into a useless gesture (bending down and rising up to take the brick and mortar) by adding a table near at hand. In this way, a movement previously indispensable for the construction of the wall all of a sudden becomes useless, H_e , and is eliminated. The gestures are thus rationalized, diminished. All together Gilbreth managed to reduce the number of gestures necessary to build a wall from eighteen to five and to increase the number of bricks laid in a day from 960 to 2.800. The energy previously used to bend down and get up, “a monstrous effort” in the terms of the author, could be devoted to raising the intensity, the speed with which the gestures could be carried out.

Rationalization often revolves round indirectly productive work, once necessary and which the “experts in labor science” try to make superfluous. In this way, the total time for a task, H, must as nearly as possible approach the time which is devoted only to directly productive work, H_p , which “really” adds value to the commodity (in the words of management technicians themselves).

The fact of rationalizing labor and eliminating part of this time which has become useless, permits the reduction of production time. The firm which launches into this operation thus diminishes the individual value of its commodities below the social value and benefits in extra surplus value.

Taylor and Taylorism initiated, among capitalists, a reflection on the rationalization of labor which has gone on developing ever since.

Frederick Taylor and Henry Ford or Taylorism and Fordism are often associated. In fact, their departure point was totally different. For Taylor began with a given production process and analyzed previously defined tasks in that framework. Ford, on the other hand, changed the process completely. It was production that changed and the rationalization of labor stemmed from these modifications.

The first transformation made by Ford was to obtain standard components. Then, he disposed each worker and each machine in sequential production order. At the beginning, workers passed the object to be assembled from hand to hand. However, that was not very efficient. Hence the idea of putting this object on a continually moving conveyor belt. The

assembly line appeared in 1913. It gave rise to important gains. Globally speaking, assembly time passed from 216 hours in 1913 to 127 hours in 1914.

Fordism brought a quadruple superiority in rationalization.

Firstly, it was the mechanism of the assembly line which fixed the norm and all the workers had to adapt to it. With Taylor, a tired worker could take time off for a breather. He was only under the constraint of the foreman. Here, however, it was not possible to cheat. The objects went past, as Chaplin's film *Modern Times* showed so well.

Secondly, the assembly line ensured fluidity between operations. There was no longer any lost time between the latter, which was not guaranteed by Taylorism.

Then, as the vehicle passed in front of each work-post in the same lapse of time, interdependence between the different tasks became necessary. In the case of the brick-layer, the speed he worked at and the number of bricks he laid were not at all in relation with the rest of the work. He was supposed to have enough bricks and mortar. On the other hand, if the assembly line was fixed to produce 60 cars an hour, that meant that each car passed in front of each work-post for one minute and that the worker only disposed of that time to carry out his task. However, it was the same for everyone and the tasks had all to be defined to correspond to this period.

Finally, this allows us to come to the fourth advantage: continuous improvement. If production increased without additional capacity, the factories had to be run faster. That redefined the tasks, because the cars no longer passed by every minute, but, for instance, every fifty seconds. It was an incentive to discover permanently new ways of producing and thus to rationalize labor.

Ford was also associated with mass consumption. He is said to have foreseen that, in order to sell his products, a market was necessary and could be constituted by his own workers. That is supposed to be the origin of his decision in January 1914 to double his workers' pay. However, with this method and above all with the assembly line, work in Ford factories was hell. The new immigrants rushed into them in their search for work and for funds which would allow them to go and settle in the West. They quickly left to go to other automobile manufacturers, where Taylorism was applied. If the staff rotation rate was on average 100% in the automobile industry at the time, it was 380% at Ford. It was principally to stabilise this labor force that Ford decided to double wages and to go from 2.5 dollars a day to 5 dollars. Ford was not at all social.

It could be thought that with Fordism the height of worker exploitation had been achieved. But Toyota and its engineer who had become production director, Taiichi Ohno, arrived. The point of departure of the Toyota experience was the end of the war and the defeat of the Japanese fascists. Production was rationed and in particular that of vehicles. For the directors of Toyota, the question was: how to develop profitable production, in the face of high-powered American competition?

Taiichi Ohno was sent to direct the engine department. Ex-textile machine engineer, he

was astonished to discover that each machine was activated by one worker. He perfected what he would call autonotation, i.e. the possibility for the machine to stop automatically and thus to function in an autonomous way. For, if the machine does not possess such a system, a worker must be there all the time to keep an eye on it, so that if it goes out of control, he can stop it in time. With the automatic stop device, such a control was no longer necessary and the worker could be occupied elsewhere.

This procedure enabled an increase in productivity and thus in engine production. However, vehicle sales were subject to quotas. What use was it to manufacture more engines if they could not be fitted on to cars? It was at that moment that Ohno began working on his concept of just-in-time: producing only what was necessary at a given moment. That demanded thinking out the production process from the opposite end: instead of manufacturing and then trying to sell these products (“push” system), it was sales that had to determine production (“pull” system).

The condition is that the whole production process is flexible. Different models have to be manufactured, with different components, since it is impossible to know ahead of time exactly which cars will be sold. That means that different cars must follow one another on the assembly line and that workers must adapt their work according to the specificities of the car going past. In the same way, since sales can be variable, frequent one month and rare the next, there must be a whole reserve of flexibility both to raise or lower the quantity of work to be carried out and to modify the tasks to be effected on the assembly line. Toyota possessed precisely that. On the one hand, it could reckon on a practically permanent system of over-hours which it could do away with if sales dropped. On the other hand, Toyota introduced a system of alteration of tasks.

But, undoubtedly the most important innovation in the framework of the rationalization of labor, wage-earners were going to have to work in groups, in “teams”.

How does this work ? It is better to take an example. Let us suppose that the time fixed by the assembly line is one minute, but that the real time occupied by the members of a team of six people is on average 55 seconds. That means that in the beginning, the time allocated to the group was 360 seconds. In fact, thanks to routines and habits, the wage-earners used only 330 seconds.

Management reduces the time allocated to 90 % of what it was before, i.e. 324 seconds. It is no longer to the Methods Office that this objective is assigned, but to the group itself. The latter has internal meetings and is faced with the obligation of finding the 36 seconds of gained time demanded by management. In theory there are 30 seconds which are easy to find, those spared by working to a routine. For instance, beforehand, a worker who had to fit a bumper took several screws at a time to save the time getting them one by one. The few seconds gained allowed him to take a breather. However, now, as management demands a saving of time, this particular trick becomes part of the normal manufacturing process. In this way, the team can function with 324 seconds instead of the 360 previous

ones and the assembly line can produce 66 cars an hour.

Supposing there is no increase in production. In that case, the speed remains sixty automobiles an hour. How are the 324 seconds divided among the members of the team? The first five receive sixty seconds and the last the remaining 24 seconds.

It could be thought that the 324 seconds would be equally distributed among the six workers, i.e. 54 seconds each. On this point, Yasuhiro Monden, who with the help of the management of Toyota theorized the production system of the Japanese manufacturer, is categorical: there can be no question of that. He wrote about the equal distribution of waiting time (his example is of six workers, from A to F, of whom the sixth, F, is effectively engaged for 15 seconds): *“After operations have been reallocated to workers A through E, the 0,75 minutes of waiting time for worker F should not be disposed of by distributing it equally among the six workers remaining on the line¹. If it were, it would simply be hidden again, since each worker would slow down his work pace to accommodate his share of the waiting time. Also, there would be resistance when it came time to revise the standard operations routine again. Instead, a return to step 1 is necessary to see if further improvements can be made in the line to eliminate the fractional operations left for worker F.”²*

So, they will try and find the extra 24 seconds in the process. If the group manages to do that, it means they are able to function as five and can eliminate a wage-earner. For the firm, that is a huge gain. The worker in question will doubtless not be fired. He will be reclassified within the factory, which will however function globally with less staff. But management comes back and says: “OK. Now we will allow you only 292 seconds”.

This description or this interpretation could be thought exaggerated. However, Masaaki Imai, president of the Kaizen Institute in the United States, explained the intention of Taiichi Ohno in a publication of the Institute: *“For example, let’s suppose that a start-up department has the requirement to make 100 cars par day. Mr. Ohno would give the department the resources to make 90% of what was required. Specifically, they received 90% of the manpower required, 90% of the space, 90% of the equipment, etc. The manager would have no choice but to work overtime to meet his quota. As time went on, the department team would find problems or obstacles that would be resolved or overcome through the implementation of kaizen activities. No sooner would one obstacle be hurdled than another would be uncovered and addressed with kaizen. The hurdles could be in quality, in machine reliability, in human resources or in paper work. Regardless of type, they were overcome with kaizen until the department was able to put out 100% of the*

1 In the example of Monden, there were originally seven workers of whom one had already been eliminated.

2 Yasuhiro Monden, Toyota Production System. An Integrated Approach to Just-In-Time, Institute of Industrial Engineers, 2nd edition, London, 1994, p.182.

requirements without any overtime. As soon as a no overtime equilibrium was met, Mr. Ohno would come in and would again remove 10% of the resources. His way of managing came to be known as the Oh! No! system!¹.”

This opinion was supported by Taiichi Ohno himself in an interview on the BBC : *“If I found a job being done efficiently, I’d say try doing it with half the number of men, and after a time, when they had done that, I’d say OK, half the number again. ”* To explain what incited workers to discover such innovations in their work, he added in the same interview: *“ When they’re under so much pressure that they feel it’s a matter of life or death, they will come up with all kinds of ingenuity ”²*. It is called by critics “management by stress”.

Toyotism pushes rationalization of labor in favor of firms a notch further. It relies on two essential elements. First of all, rationalization is no longer applied only to individual work but to collective periods, those of a team. The periods which could not be reduced because they were too small, the periods of passing from one work-post to another can all be reduced by management at the level of a team. Secondly, by management by stress and the recovering of routines, Toyotism strongly intensifies labor. The pauses, the breathers, all that is taken from the workers to increase surplus-value.

A study in the NUMMI factory, an ex-unit of General Motors working according to Fordist principles and taken over since 1983 as a joint venture by GM and Toyota (but managed and organized by the latter according to its methods) shows the gain obtained by Toyotism: a wage-earner having to work one minute per car according to the old principles, was in fact occupied 45 seconds; the same worker following the precepts of Toyota, is occupied for 57 seconds³. The gain of 12 seconds per minute, or 20%, indicates the intensification of work demanded by the new production system.

In any case, Toyota benefits from it considerably. A small manufacturer producing a few thousand vehicles at the beginning of the fifties, it is in the throes of deposing General Motors as number one in the sector, with more than nine million cars sold. While US firms accumulate losses and European firms are continually restructuring, as are its Japanese rivals, Toyota is chalking up record profits for the sector: 14 billion dollars in 2006; 60 billion dollars since 2001 (more than DaimlerChrysler, Volkswagen, Renault and BMW together). It is imposing a norm which forces the other manufacturers to restructure permanently.

1 Masaaki Imai, *Kaizen Communiqué*, hiver 1988-1989.

2 Ian Hampson, “Lean Production and the Toyota Production System - Or, the Case of the Forgotten Concepts”, *Economic and Industrial Democracy*, august 1999, p.373.

3 Geert van Hootegeem & Frank Janssens (1993), *Nieuwe arbeidsvormen aan de lopende band. Verslag van een field trip naar Saturn, NUMMI en Ford Atlanta*, Steunpunt Werkgelegenheid Arbeid Vorming, Leuven, 1993, p.73.

In conclusion, contrary to what is frequently maintained in the West, working conditions are deteriorating everywhere under capitalism, in the Third World and elsewhere. This is not the effect of globalization or unfair competition of rivals using methods of overexploitation. It is entirely within the logic of capitalism. It is this logic which incites each firm to increase productivity and work intensity so as to obtain extra surplus-value. It is this logic which obliges the others to practise the same methods to avoid being eliminated from the sector. From that point of view, the liberation of labor can only come from outside capitalism. Marx gave many reasons for this, beginning with the private property of means of production, i.e. firms and factories. It is in this framework that the rationalization of labor is organized.

[IE] Terrence J. McDonough

Contact Information

Address: Department of Economics, National University of Ireland,
Galway, Ireland

Telephone: 353-91-493164 (office)

Fax: 353-91-524130

Email Address: terrence.mcdonough@nuigalway.ie

Homepage:

http://www.economics.nuig.ie/personnel/peoplepage.php?person_id=12

Terrence J. McDonough is an assistant professor of National University of Ireland at Galway. His undergraduate degree is from Goddard College, Plainfield, Vermont and his Ph.D. is from the University of Massachusetts at Amherst. He has been a visiting scholar at the Curtin University of Technology and the University of Newcastle, both in Australia. His current research interests include globalization, American and Irish economic history, political economy, the history of economic thought and economics education for labor and community groups. He is working on a short book on contemporary economics and the Great Irish Famine and a collection of essays on the history of Irish economic thought. He is the director of the CentreSTAGE project funded by the Irish Research Council on the Humanities and Social Sciences which is analyzing globalization as a new stage of capitalism. He is about to take up the academic directorship of a new MA in Public Advocacy and Activism.

His recent publications include: