Fordism and Socialist Development

I

Americanism and Bolshevism

In 1979 IDS held a seminar on socialist economic development. At the time socialism seemed to be in the ascendency. During the 70's socialist governments had come to power in Indo China and in the ex Portugese territories in Africa, Mozambique, Angola, and Cape Verde. Ethiopia had seen a successful socialist revolution against the feudal absolution of Haile Salassie, and in 1979 itself a socialist liberation movement took power in Zimbabwe, and the Sandinistas in Nicaragua.

Ten years later socialism is in crisis. In 1989 both Nicaragua and Vietnam were forced to introduce a quasi IMF package of deflationary measures to counter hyper inflation and threatened economic collapse. Mozambique officially abandoned Marism. In Ethiopia two versions of Marism were at war, as they were in Kampuchea, and most acutely, in June, in China's Tienanman Suare. Then, in the last months of the decade, came the historic events in Eastern Europe, and the emergence of powerful forces - most notably in Hungary - for whom the key issue is the transition from socialism to capitalism and the form it should take.

There have been many conjunctural explanations offered for this change in the fortunes of socialism, in particular the international debt crisis and the wars in which nearly all the newly established socialist regimes found themselves engaged during the 1980's. But at the heart of the crisis - and internally recognised as such - is a deeper structural issue, namely the model of socialist economic development. Eastern Europe's market reformers, Gorbachev's perestroika, Deng's opening to the West, Zimbabwe and Ethiopia's necessary practices all in their different ways mark a move from the old model, but have little common agreement on the new. Indeed the reforms are often seen as a retreat from socialism - in the economic

sphere at least - rather than offering a coherent alternative view of a new socialist way. Socialism is no longer advancing with history in its sails. While politically, militarily and socially it has been more than a match for capitalism in the developing world - economically the seam of progress has yet to be successfully struck.

The traditional model had its roots in the early years of Soviet development and it is those roots we must reconsider if we are to go beyond the current terms of the debate between a centralised command economy on the one hand and some version of liberal capitalism on the other. The Soviet vision of a socialist economy had three key stones: nationalisation, central planning and large scale production. The reform debates in Eastern Europe have centred on the second of these; Western critics have also raised the first. But it is notable that there has been much less discussion - in East as well as West - about the strategic objective of scale. Where problems in production have occured - the slow pace of innovation, the poor quality of goods, shortages, lack of variety - their cause is assigned to state ownership and central planning rather than the production strategy itself. Put another way, the overwhelming concern in the debate on socialist economics has been about property and circulation (planning versus the market) rather than about production.

One reason for the lack of concern in the Western literature at least is that the strategy of scale has been that which dominated Atlantic capitalism for the greater part of the twentieth century. In the East, the productive strategy was categorised as being a technical issue. Politically it was the growing scale of production which was seen as the historical force that would in the end require a revolutionary transformation of capitalism. Nationalisation and central planning were seen as the adequate forms of property and circulation for the unstoppable drive for scale.

Western Fordism

What we can now see is that this version of socialist economics mirrored a particular stage of capitalist development which has come

to be known as Fordism. Ford's Model T was introduced in 1913, four years before the October revolution. The principles it embodied - the scientific management of work, flow line production, standardisation and specialist tools - were all at the leading edge of American managerial and government concern. They reflected not only a particular form of production, but an approach to the economy and society more generally. They were part of a Fordist culture, which had machinery at its centre as the cutting edge of modernism. Scale, speed, electricity, science, standardisation, cheap commodities, functionalism, cities, the mass worker and mass society were all part of this culture, reflected in the Manifestoes of the Futurists, as much as in the buildings of Le Corbusier, in the rise of Domestic Science as much as in the designs of the Bauhaus. The doubts expressed in Fritz Lang's Megopolis (1926) or Huxley's Brave New World (1932) were swept aside not only by capital and the promoters of scientific management, but by the Left. Gramsci was only one among many who embraced Americanism and Fordism as the historical force which would deliver Europe from its reationary traditions.[1]

For the founding father of scientific management, F. W. Taylor (1856-1917) as for Ford, the starting point of the economy was the immediate process of production. For Taylor the issue was how to replace rule of thumb traditional methods of work by exact scientific knowledge. With a stop watch, tables and repeated scientific testing, he broke down work into simple tasks which he streamlined, and then gave workers formal instructions in what to do. Whether the work was shifting pig iron, shovelling, cutting metals (on which he spent 26 years experimenting), surigical operating or playing baseball, for him the approach was the same, and the costs savings discontinuous. Taylor developed a new structure of work - the clear division between mental and manual labour, narrow specialisation, the fragmentation and standardisation of taks, and strong vertical lines of authority. He replaced what Marx called the formal subordination of labour by its real subordination, taking the skill out of work, and putting control of production unequivocally in the hands of management. For Taylor it was management who should be held responsible for labour productivity: theirs was the job of ensuring

well maintained and appropriate tools, an efficient factory lay out, a flow of work to the worker, and the proper design of jobs. The worker's responsibility was solely to give a 'fair days work', in return for which Taylor said he or she should expect to receive wage increases of 30-100% as the result of the introduction of his Principles. Taylor's vision was one of industrial harmony where each side took a share from the increased productivity, while the fall in costs promised to universalise luxuries. He saw Scientific Management as offering a 'true democracy'.[2]

Ford applied Taylor's approach to a complex product. The planned, orderly progression of work now stretched from bringing iron ore from the mine, to making steel, casting engines, and assembling the thousands of components that had been similarly prepared. From the mine to the final freight car took 81 hours wrote Ford, instead of the earlier 14 days. Like Taylor he, too, sought to analyse operations into their constituent parts, to employ semi skilled labour, on fragmented tasks, with an above average wage.

The innovation which he took over from the Chicago Meat packers and made famous was the production line, an automatic link between the fragmented tasks, a synchroniser of work, a means for delivering work to the machanic, and embodying orderly progression. Ford painted with Taylor's brush but on a much larger canvas.[3]

Both men believed in science and reason; both had a mission to standardise - tools, tasks, procedures, and outputs; both saw mass production, lower costs and higher wages as a social vision of progress that would heal the divisions of class. Just as Taylor advised surgeons, Ford opened a hospital designed on his principles; he stated dancing classes that prohibited improvisation; he opened an assembly plant in Cork, the land of his ancestors, as part of a mission to modernise Irish culture. He saw the world through the lens of Taylorism, and the machine. For him mass production was not just a question of scale, but a new approach to production, to consumption and a way of life.

These concepts and methods were to spread to process and mass assembly industries, not just in America, but in the UK and, to a lesser extent, on the European continent as well. Town and country were refashioned around the motor car; homes were designed on mass production principles - to accommodate the radios, electric fires and the succession of white goods which came from the Fordist factories. Markets were also reshaped to accommodate the revolution in production capacity as was the economic role of the state. These were the structural features of Fordism which took root in the inter war period, and became the foundation for the post war boom.

Soviet Fordism

The Soviet Union took over the new American managerial innovations and placed them in the centre of socialist economic policy. For Lenin, writing in April 1918, the fundamental tasks of the revolution were not about equality or the democractisation of industry, but raising the productivity of labour and labour discipline. This was to become the dominant theme of Soviet economics for on it depended the survival of the revolution. The question was one of method. How was productivity to be raised? It was in this context that Taylor and Ford came to be seen as the twin spearheads of the advance in American 'forces of production'. "We must organise in Russia the study and teaching of the Taylor system, and systematically try it out and adapt it to our own ends", wrote Lenin[4], and it was Taylor's ideas, already known in Russia before the revolution, which were to inspire a whole movement on the Scientific Organisation of Work and Management in the early 1920's. Initially centred on institutes and production cells within factories and offices, and strongly supported by Lenin and the Bolshevok leadership, it had by the mid 20's been incorporated by the government and official trade union movement within their formal organisation.[5] It was at this time that Ford rose to prominence. His book 'My Life and Work' was translated and sold in large quantities. Pravda traced the progress of 'Fordism' in Russian factories. An Englishwoman visiting Russia in 1926 reported seeing Ford's name on banners in workers processions, and in 1927 Maurice Hindus wrote "Incredible as it may seem, more people have

heard of (Ford) than of Stalin .... Next to Lenin, Trotsky and Kalinin, Ford is possibly the most widely known personage in Russia."[6]

The background to this enthusiasm was the sharp distinction in Soviet Marxism between the forces and relations of production, the one technical, the other political. The October revolution had given the Soviet state power to change the relations of production. To change the forces of production, they had to look to advanced America. Thus Lenin thought it was possible to take the technical heart of Taylorism and transplant it to the Soviet body. "The Taylor system", he wrote "like all capitalist progress, is a combination of the refined brutality of buregois exploitation and a number of the greatest scientific achievements in the field of analysing mechanical motions, the elimination of superfluous and awkward motions during work, the elaboration of correct methods of work, the introduction of the best system of accounting and control".[7] It was the latter which he saw as 'the scientific and progressive' kernal of the Taylor system which could be separated from the capitalist husk and planted in the Soviet system. The same was true of Ford. If Lenin was the great political revoluntionary, Ford was the economic revolutionary. It was a belief in the simple equation that combined the two which underpinned the Soviet optimism for their new economic system. As Trotsky put it in 1924, "Americanised Bolshevism will conquer and crush Imperialist Americanism".[8]

We can distinguish two phases in the adoption of Americanism in the Soviet Union. In the first phase the emphasis was on (i) labour discipline, and (ii) hierarchical administration. It ran for the first ten years up to 1927 and drew its inspiration from Taylor. The second phase, while retaining and extending Taylorism, shifted the emphasis to (iii) central planning and (iv) large scale industry. This was the second decade of the revolution, the period of the first and second Five Year plans, and drew its inspiration both from Taylor and Ford. Together these four policies - labour discipline, line management, central planning, and mass production, - formed the main structures of Soviet Fordism, and of the traditional model of the

socialist economy which is still so strong today. We will deal with each in turn.

Labour discipline

"The task that the Soviet Government must set the people in all its scope is - learn to work", wrote Lenin in the Immediate Tasks of the Soviet Government in 1918. We must consolidate what we ourselves have won, what we ourselves have decreed, made law, discussed, planned - consolidate all this instable forms of everyday labour discipline... We must learn to combine the 'public meeting' democracy of the working people - turbulent, surging, overflowing its banks like a spring flld - with iron discipline while at work, with unquestioning obedience to the will of a single person, the Soviet leader while at work."[9] He insisted on this because the Russian was "a bad worker compared with people in advanced countries", because there are "many elements of distintegration who reveal themselves in an increase of crime, hooliganism, corruption, profiteering and outrages of every kind", because there are "many waverers and 'weak' characters who are unable to withstand the 'temptation' of profiteering, bribery, personal gain obtained by spoiling the whole apparatus". He characterised the problem as a struggle between petit bouregois laxity and proletarian organisation, and praised the "best part of the proletarian elements" in their fight for discipline.[10]

Trotsky took this perspective further by calling for the militarisation of labour. In 'Terrorism and Communism' - a book written in 1920 'in the car of a military train and amid the flames of civil war' Trotsky depicts human kind as 'a fairly lazy animal', hence the need for discipline. Since the life and death of Soviet Russia was being settled on the labour front, the issue of the discipline of labour was central. Because adequate incentives could not be provided, he argued for compulsory labour services, and this implied the militarisation of labour. He used the term 'militarisation' not simply because the War Department had experience of moving large quantities of labour around, and setting it to work, but because in his view the army itself had only been militarised by

the workers 2educating, hardening and militarising the peasant mass".[11]

He foresaw the same mechanism taking place on the civil front. At the 3rd Trade Union Congress earlier that year Trotsky had already put forward these arguments, and the view that in this situation the unions should be bypassed because of the need for absolute rthlessness in the suppression of disruptive bargaining and strikes.[12] This was widely opposed both by the party and the trade unions, and Lenin, too, distanced himself from Trotsky's unrestrained military analogy. But Lenin continued to support the approach in practice as he had done previously in the use of 'shock workers' ('udarnaki'), in the belief in military style production discipline, and in the backing of Trotsky's proposals for Production Propaganda.[13] It did not need a Taylor to impress on Lenin and Trotsky the significance of the issue of labour discipline. Taylor's importance was that he offered a detailed strategy for enforcing control over labour within the context of a scientific organisation of work. This is why Lenin urged the study and teaching of Taylor in Russia and why Trotsky bracketed 'progressive Taylorism' with militarisation. Significantly it was Trotsky who - concerned with labour productivity and discipline on the railways - called the first conference on the Scientific Organisation of Work in January 1921, the meeting which was to initiate the NOT movement.

Over the next four years NOT was to become one of the main economic movements of the NEP period. By 1925 a Russian language index contained 4,400 citations on NOT issues.[14] A network of Institutes, Production Cells, League of Time, and Inspectorates had been established. Their focus was labour productivity and the organisation of work. While the movement was careful to distinguish itself from Taylorism - indeed they chose the acronym NOT (the Russian for the Scientific Organisation of WOrk) to distance themselves from the exploitative sides of Taylorism, nonetheless the main currents in NOT shared Taylor's perspectives.

This was clearest in the case of the group around Gastev and the Moscow Institute of Work. The Institute had been set up in 1920, and

approved as the central body for NOT work by Lenin in August 1921. It came to promote an approach which was eventually to dominate Soviet practice.

We will pick out three features of its approach:

a) the rationalisation of work. Gastev like Taylor was task oriented. He believed that all production should be sub divided into narrowly defined, homogeneous tasks. Each task should be analysed scientifically and redesigned on the principles of simplified low energy human movement. He went further in suggesting that at the root of all tasks were two basic functions, 'the blow' and 'pressure', and he undertook detailed studies of the hitting of a chisel by a hammer, and the filing of metal. If workers could master these basic movements, Gastev thought they could master any skill, and he developed a basic training programme around this idea. With the standardisation of tasks and of training programmes, he was able to set up a mass production system of training, which he said taught skills 'ten times faster than the usual apprentice programmes based as they were on 'damned craft secrets'. Gastev's view was a mechanistic one. He saw individual workers as subsumed in a unified process of production in which human beings were machines, and machines were human, embodying the collective nervous energy of workers, and acting as an extension of their arms, feelings and thoughts. The worker is stripped of his or her individual personality, and becomes an automoton within this 'mechanised collectivism', with work determined by planning departments, outputs registered through written records and monitored by inspectors. It was a vision which, in spite of its Russian inflection, sttod side by side with that of Taylor.

b) Time and motion study. As part of his search for a 'total mathematicisation of psychophysiology and economics' Gastev's Institute gave a central place to the calculation of norms for each discrete operation. The stop watch became the symbol and instrument of the NOT approach, particularly for the engineers, and norms were established for numerous jobs and branches of Soviet industry throughout the 1920's.

c) Piece rates. Lenin and Trotsky had both argued for relating wages to work, Trotsky calling for differentials between the conscientious workers and the slackers. The Soviet Taylorists aimed to put such premia on a scientific basis, ensuring adequate wages for those meeting the norm but providing a material incentive through bonuses for over achievers. As with norm setting, so piece rates were extended over many parts of Soviet industry, accounting for 41% of all work in 1923, and 62% in 1927/8.[15]

The main objections to Gastev were:

- his narrow task approach; by starting from the individual job, he underestimated the ways of raising productivity through modern industry and collective organisation. As Strumelin put it, productivity can be raised through intensification, mechanisation and rationalisation. There was a continuing suspicion that Gastev's methods, like Taylor's, would lead to intensification. The alternative "broad" approach led to studies not just of production, particularly large scale production, but of childcare, the household and education, all of which were seen to be open to rationalisation and increased productivity.

- An underemphasis on labour protection; NOT contained a strong current which sought to use the principles of scientific management to protect labour at work. They were concerned with hygiene, the effects of stress, safety at work, and over work. They were suspicious of piece work and overtime, and argued for production norms which took labour's welfare as the base criterion (optimality) not the expansion of productivity (maximisation).

- The restricted scope of training; Gastev's programme subordinated people to production, treating them as parts of a machine driven process; education should be wider, preparing workers to play an active role in the organisation of production.

- The professionalisation of NOT, rather than the wide involvement of thw workers themselves in the project. There were many initiatives from within NOT to run campaigns, notably the League of Time founded in July 1923, to promote the struggle for time. The struggle consisted of three parts: accounting time, the distribution and planning of time, and the economising of time. The campaign was to apply not just to production but to all society. By March 1924 the League had 29,000 members in 62 cities, with 120 cells of time formed in Moscow in the first three months. Pravda had a struggle for time section; there were time theatre groups; literary and artistic time evenings and awards of watches to heroes of time.[16]

At the second NOT conference in 1924, leading Bolshivks like Zinoviev and Bukharin supported Gastev, while the left in the party and the unions supported the opposition, and although the resolutions effected a compromise, the real winner in the long term was Gastev. The Party and the Trade Unions moved in to shift control of the NOT movement to the official Workers and Peasants Inspection; the League of Time fell apart in 1925, NOT was professionalised; the Central Committee resolved that wages should reflect productivity and lifted the ceiling on bonuses; they also gave formal support to Gastev's training methods in 1926. With the support of the leading Bolsheviks, it was the narrow Version of Soviet Taylorism that prevailed, and became the dominant approach to the organisation of work in the traditional socialist model.

Centralised management

The Taylorist approach to the labour process implied a Taylorist form of organisation, specialisation of functions, standardisation of procedures, written communications, instructions and authorisations, and a strict hierarchy with a vertical chain of command and little horizontal co-ordination. It was a structure which had close parallels to the Weberian model of bureaucracy.

Lenin's position on authority will already be clear from his view on labour discipline. For him proletarian dictatorship meant not direct

control by workers, but the dictatorship over workers through those appointed by the representatives of workers. What was required was 'unquestioning subordination to a single will'. There was no conflict between Soviet democracy and individual dictatorial powers. Thus he strongly supported so called one man management against left trade unionists arguing for a measure of workers control. Early on the Central Committee approved decrees granting the executives of the railways dictatorial powers. Authoritarian hierarchy was for many years to remain a basic principle of Soviet management.

But authority was not enough. There was the problem of administration, the task which Lenin pivked out in 1918 as "coming to the fore."[17] The need for written instructions, authorisations, central co-ordination, inspection, all slowed down production if improperly organised. Bureaucratic procedures were particularly bad in the main state administration.

Lenin's answer was threefold: first an emphasis on the right personnel, the rooting out of bureaucrats and their replacement by the best of the proletariat; second the formation of political units to promote better administrative practices, again staffed by cadres and with strong political backing; the third was to apply Taylorist techniques to the administrative process itself.

The first conference to discuss organisation took place in 1920. In 1921 the Union of Soviet workers decided to standardise work processes in offices, and develop norms for clerical work. The Workers and Peasants Inspectorate was reformed to monitor and approve the efficiency of state administration. The Inspectorate in turn set up a Department of Normalisation which developed new methods of bookkeeping, stock control, office co-ordination, the flow of clerical work, and the organisational of typing. Forms were standardised, registration decimalised, and public enquiry offices and information desks reformed. They set up experimental stations within work units, including their own. The approach in every case was along Taylorist lines - focussing on the task, its rationalisation, the promotion of standardisation and specialisation, in short the creation of a machine for routine administration.

Indeed the question of administration became subsumed as merely one part in the general NOT movement.

As far as public administration was concerned it was notably unsuccessful. In 1923 Lenin called the state apparatus 'deplorable', which 5 years had done nothing to improve. The Workers and Peasants Inspectorate was too large, lacked authority, and suffered the same problems it was set up to address. Lenin had no other answer but to attempt to revitalise the Inspectorate, slim it down, inject new 'proletarian' blood into it, and repeat the call to banish from the state 'all traces of extravagence'.[18] He saw the problem in short as one of personnel - of will on the one hand, and training and culture on the other - rather than one of structure. The basic Soviet modle both of administration and industrial management was to remain that of Taylor, Emerson, Fayol and the Western School of Scientific Management.

Central planning

Taylorism implied planning, and planning had also been an inheritance of the Marxist tradition. For Engels socialism could be thought of as the operation of one big factory, where the plan replaces the market, and Lenin, Trotsky and other Bolsheviks were clearly influenced both by this, and the experience of the German trusts. Lenin talked of "labour planned and organised on a gigantic national (and to a certain extent international, world) scale" as the result of the revolution[19]; Bukharin and Preobrezensky saw war communism as superceding market relations, and Trotsky called for "a single economic plan covering the whole country and all branches of productive activity".[20] Yet with some exceptions - like the plan for electricity which Lenin praised as a 'real scientific plan' based on 'precise calculations by experts for every major item and every industry'[21] - the disorder and fragmentation of the Soviet economy in the first decade of the revolution meant that the application of Taylorism remained primarily at the micro industrial and administrative level.

The Supreme Economic Council (Vesekha) set up in 1918, and the State Planning Commission (Gosplan) set up in 1921, undertook some sector studies and commented on the work of particular economic departments, but co-ordination was weak and Gosplan did not live upto its billing as an Economic General Staff. Yet by 1927 both Vesenkha and Gosplan had produced draft Five Year plans, and by Spring 1929 Gosplan's First Five Year plan had been approved by the Government as the basis for a programme of rapid industrialisation. Detailed, directive, ambitious planning had come to the centre of the stage.

Most explanations of the success of commandist planning in the 20's against substantial technical, departmental, and political opposition, stress the Marxist (or at least Engelsian) theoretical tradition, the NEP market problems of the scissors crisis plus mass unemployment in 1923 and 24, and above all the decision to develop an autarchic economy centred on heavy industry rather than an agricultural led policy linked to world markets.[22] Yet the conjunctural and policy factors of the mid 20's do not explain the particular form that Soviet planning came to take. Nor do the perspectives of Marx and Engels necessarily entail the adoption of centralised material balance planning in an economy such as the Soviet Union at an early stage of development. This was a point made not only by the Soviet 'anti planners', but also by the 'genetic' planning tendency which emphasised the limited scope for planning given the situation in agriculture. Lenin himself opposed the more extreme ambitions of the planners[23]

What has received much less attention is the link between commandist planning and Taylorism, in spite of the fact that the version of planning that came to be adopted in the Soviet Union was unambiguously a Taylorist one. Not only had Taylor laid great stress on the functions of specialist planning departments both for individual work processes and for the enterprise as a whole - indeed this was at the heart of his distinction between mental and manual labour - but he had also elaborated a methodology of information and accounting which would allow such planning to function. These ideas had been extended by Western management theorists like the Frenchman Fayol (influential in the thinking in NOT) who had defined management

as comprising five elements: planning, organising, commanding, co-ordinating, and controlling. When the economy was thought of as a single gigantic firm, Gosplan's role can be seen to be an embodiment of Fayol's theory of management.

What we are suggesting is that Carr's argument that industrialisation and socialism in one country implies commandist planning is less robust than the thesis that Taylorism in the workplace and large scale industry lead directly into centralised national planning of the kind that emerged in the Soviet Union. The links between them can be most clearly seen in the Left Opposition. Side by side with his arguments for militarising the labour process, Trotsky was a major champion of planning, demanding more of it in 1923, drafting the resolution on detailed directive planning for the 12th Party Congress, and welcoming the 'dry columns of figures' that formed Gosplan's Control Figures for 1925-6 as 'the glorious historical music of growing socialism in which each figure is not only a photograph but also an order".[24]

It is significant, too, that the leading Bolshevik planner, Strumelin, who led the so called 'teleological' tendency in the planning debates of the mid 20's, and who was a principal architect of the 1st 5 year plan, was also a significant contributor to the debates on Scientific Management in the first half of the 20's. [25]

Mass Production

For the Bolsheviks as for the Taylorists the future for industrial growth lay with mass production. This is what excited the Soviet imaginstion with Ford. As with planning, the opportunities for putting this commitment to large scale industry into practise only came in the late twenties, above all in the first five year plan. The preconditions for such a strategy were electrification, transport, and a process of standardisation and specialisation. The question was where to specialise. Barzarov argued that priority should be given to those sectors where mass production was appropriate: on the one hand process industries like steel and

power; on the other consumer goods - for it was in consumer goods that much of American mass production was concentrated. For machinery which required high skill, 'German' type industry, Russia should rely on imports.

The principle of self sufficiency coupled with the emphasis on capital goods as the path to increased productivity led to Barzarov being denounced. But the first five year plan attempted to have it both ways. It concentrated on capital goods and processed intermediates, and it sought to produce them in volume. In the priority sector of metal fabricating, the strategy concentrated on tractors, trucks and heavy equipment. To produce these the government made a conscious choice to use American rather than German technology, not because of cost, but because America represented modernity.[26] In 1929 Ford was persuaded to construct a massive automative plant in Russia with a capacity of 100,000 vehicles a year. The Caterpiller crawler was produced at Chelyabinsk with an output of 1.5 million a year, nearly three times Caterpillar's entire US output. 1.2 million International Harvesters were produced at Stalingrad and Kharkov-twice the US output. Machine tool factories, the sector particularly dependent on skill, were little developed, and those that were built were organised like a Ford factory, with special purpose jigs and fixtures, semi skilled and casual labour, and a volume (in the milling plant) twice that of the leading US firm[27].

In all priority sectors the pattern was the same: giant plants based on Western technology. Sutton describes it as follows:

> "Western assistance was focussed by the Soviets upon simple, clear cut objectives; to build new, gigantic, mass production units to manufacture large quantities of simplified standard models based on proven Western design without a design change over a long period. Thus after the transfer of Western technology, simplification, standardisation and duplication became the operational asepcts of Soviet industrial strategy".[28]

Thus United Steel helped construct Magnitogorsk, the largest integrated iron and steel plant in the world. The turbine manufacturing plant in Kharkov, finished in 1935, had a capacity twice that of General Electric, until then the largest turbine producer in the world. The Moscow Elektroavod produced one fifth of all Russian electrical equipment and employed 25,000 workers. The Moscow Ball bering plant no 1 had a capacity almost equal to that of all Europe combined. Russia had the largest gear cutting machines in the world, one of the largest plants for the manufacturing of asbestos and rubber components, and so the list continues. Where they could not produce in volume they imported, following the Barzarov principle as applied to caital goods. In 1931 54% of imports was machinery and equipment. The Soviet Union took 78% of US exports of drilling machines, 74% of foundry and moulding equipment, 70% of milling machines, 66% of lathes, and in 1932 90% of all UK machinery exports.[29] Mass produced items were only 4% of imports in 1933.[30]

The belief in scale was applied not just to industrial production, but to its organisation (the trusts were amalgamated in 1929-31 in metals for example), to agriculture, to power stations, cities, hospitals, even barbers shops. "European socialism will learn techniques at the American school," wrote Trotsky in 1925. The first five year plan embodied these lessons.

Our argument is that Taylorist work organisation, centralised bureaucratic organisations, planning and scale are all part of a common economic strategy. Each implies the other. Taylor's methods are only worth developing for standardised tasks used in volume production; mass production requires planning, and centralised hierarchies. Taylorist deskilling helps make central control effective. But more than this, the Americanism of Taylor and Ford involves a common outlook, a particular culture. It shares the Enlightenment's commitment to the power of reason, to the idea that all is knowable, to the beneficient role of science - and its embodiment machinary - in human affairs. For Fordism as for the Bolsheviks the central economic question, the criterion of human progress, was the productivity of labour. Both Ford and Taylor

believed that advances in productivity allowed everyone to be better off. They had the viewpoint of production capital - finding the sphere of circulation, of money and finance, of distribution and consumption, an interruption if not a barrier to their project.

The Marxist tradition of the Bolsheviks shared much of this outlook: the progressiveness of capitalist technology, the belief in scale, in science, and a commitment to the conscious organisation of the economy. The theory of democractic centralism allowed the dictorship of the factory to be made consistent with the theory of democracy, and the careful distinction of forces and relations of production made capitalist technology consistent with the socialist project. Above all they shared the commitment to the machine, to the factory, and to the potential liberation which it implied. Subjectivity was dwarfed by this version of modernity:

> "You must Engineer the Philistines
> Drive Geometry into their necks
> Logarithms into their movements,
> The standardisation of words from pole to pole.
> Sentences according to the decimals system
> To destroy literature.
>
> Mad women give birth
> Give birth immediately, urgently".[31]

The words are those of Gastev, in whom the Bolsheviks and Taylorist traditions most evidently meet. Gastev had been a fitter, and had worked in car factories in France, then in various modern Russian factories, as well as being imprisoned under the Tsar. What Gastav reflects is not just the blending of two traditions. For our argument is more than that. It is that Taylor and Ford found fertile ground in Soviet Bolshevism. They concretised, systematised and extended a whole approach to the economic question which in the Bolsheviks had remained general. The Bolsheviks did not just learn technique at the American School. They imported its outlook and universalised it. It is in this sense that we speak of Soviet Fordism.

II

The Problems of Soviet Fordism

The promised gain from Ford's production system was a discontinuous fall in unit costs. Low priced necessities were to be the bridge that linked capitalist technology and the socialist project. But there were conditions necessary to achieve this potential, conditions which it took the Great Depression and the second world war for the West to set in place. In the Soviet Union these conditions were even harder to come by in part because they contradicted the declared goals of socialism and in part because of contradictions within the system of Soviet Fordism itself.

To begin with, the tendencies of Fordism as a system of production which were held in check by markets and decentralised ownership in the West found no such barriers in the East. The Soviet Union out-Taylored Taylor, and out-Fordised Ford.

The scale of plants was one sign of this. Another was the drive to standardisation, from Gastev's training modules to the organisational structure of enterprises. A third was the emphasis given to specialisation, products and even processes being concentrated in single plants to avoid the 'wasteful duplication of competition'.

A Taylor-type fragmentation of tasks was also taken to extreme lengths along with the norm setting and payment systems which went with it. Norms were laid down for operations of only a few seconds, which determined job prices to within a fraction of a kopek. The Molotov autoplant in Gorki had 210,000 norms, with eight skill grades and hundreds of different wage rates within each grade.[32]

Most striking of all, however, was the determination to push direct 'Fordist' co-ordination over an ever wider scale. Just as Ford integrated backwards to ensure his sources of supply, so the Soviet planners integrated whole branches-combining the anyway large enterprises into trusts, and the trusts into 'glavki'. The glavki would issue plans to the enterprises, receive requests for materials and investment from them, and engage in the detail of appointments or production scheduling within the firms. And the glavki in their turn would be grouped into Ministries and the Ministries combined by Gosplan across Republics and ultimately across the Union as a whole. Planning was to replace the anarchy of the market, an anarchy to which mass production were particularly vulnerable, Here was the embodiment of the 'direct socialisation of labour' of which Marx had spoken, the planning of collective labour according to the economy of time.

Ford himself had been hostile to the institutions of circulation. He campaigned against the power of bankers, and refused to make Ford a public company subject to the discipline of the stock market. He himself ran a large planned economy - with more than 98,000 workers in the River Rouge complex alone in 1929.[33] But these magnitudes were dwarfed by the Soviet project. They set up multi-multi-divisional corporations, and aimed to dispense with intermediate markets altogether. It was this potential to surpass Fordism which gave the Soviet economists such confidence in their model. With hindsight we can see that it made matters worse. For they developed a system with its own contradictions that no amount of political exhortation could overcome.

Labour

The first major question concerned labour. Ford had insisted that mass production required mass consumption. He said this not only because he needed markets for his cars, but because his (and Taylor's) strategy for the labour process required a premium wage and the promise of cheap mass produced commodities to spend it on. The

goods produced on the line became part of the system of discipline - the material incentive - for workers on the line.

The decision to concentrate on the capital goods industries and to consistently starve housing and light industry of resources, broke this link in the Soviet Union. Some social provisions improved - health and child care for example - but as far as the individual worker with the individual wage was concerned, what was on offer in exchange for the submission to Taylorism was a decrease in real wages, a shortage of goods, poor quality and queues. In distributional terms the control of prices was undoubtedly progressive, and in part the shortages and the queues represented rationing by time rather than rationing by price as in Western markets, But from the viewpoint of production it left Fordism with an unattractive carrot.

Similarly progressive policies were also to weaken the Fordist stick. In early 1929 there had been 1.7 million unemployed in the Soviet Union. By the end of 1930 there was a labour shortage, and this intensified during the years of the first 5 year plan. Between 1929 and 1932 the number of wage workers nearly doubled. From that time on, the Soviet Union and other East European socialist economies, have faced a continual labour shortage, while at the same time the Soviet government has seen a commitment to full employment as being one of the cornerstones of socialism.[34]

Even with mass consumer goods and the threat of unemployment, Western Fordism has faced continuing challenge from its mass workers, resisting the tyranny of the line. In the Soviet Union - in spite of the socialist government and the lack of independent unions to defend them - Soviet workers have also found ways of resisting. In the early 1930's labour turnover reached 152% a year in all industries, as workers went from job to job seeking better work and conditions. Discipline within factories broke down, absenteeism increased. Managers had to cede a greater control of work to the operators. As Filtzer put it:

> "Although the pressures of the first five year plan prompted managers to increase the strain on workers through higher tempos, speed up, and piece rate reductions, the labour shortage was already introducing counter pressures on them to reach accommodation with their workforces by making concessions over discipline, work speeds, output quotas, wages and product quality." [35]

Managers would press the planners for lower output norms, not just for themselves but to give greater scope for concessions to workers. Where norms were clear, as in mass production items, managers would try and combine work on them with work on non mass produced items on which norms were more flexible. As far as wages were concerned, while they were formally controlled through the planning mechanism managers found many ways to increase them in order to cut the turnover rate: paying at higher grades than those contained in the handbook; paying numerous bonuses on top of time wages (some factories had 100-300 such bonuses) paying for work that was never done, manipulating the norm fulfilment figures, or paying for defective output or stoppages. The hoarding of labour which has been a characteristic of Soviet type regimes and is normally cited as an example of waste may be seen as another means of cushioning a labour force against the full rigours of a Taylor system.

The key point is this. Tight labour markets, which have become a matter of policy for Soviet type economies, weaken the market discipline of labour on which Fordism has traditionally depended. The lack of consumer goods - the main object of industrial disputes in the early 30's in Russia, as in 1980's Poland - weakens the incentive which can be offered to industrial workers. Both these factors in turn blunt the measures of direct discipline employed in the Taylor system.

There have been a whole range of responses by Soviet type government to this central problem. Political exhortation is one (the so-called moral incentives). Stakhanovism was another - a Gastevian strategy which offered celebrity, bonuses and rationed goods to high performance workers, but which often disrupted production and was

opposed by managers and by many workers. The direct allocation of labour was a third strategy adopted both by Stalin (with his labour boks) and by the Chinese. The Chinese exercise this control in part through the allocation of social services by locality (restricting the geographical mobility of labour). Many socialist countries have used enterprise welfarism as a means of reducing labour turnover. Ovrall, however, it is still piece rate payment which remains the key discipline. If capitalism controls labour through the threat of job insecurity, socialism does so through the insecurity of the wage.[36]

One other device should be mentioned since it highlights the problem we are addressing. This is the "Economic business work partnerships" (VGMK's or intrapreneurial work teams) introduced in Hungary in the 1980's. An enterprise may subcontract particular jobs to private partnrships of its own workers. It may be the production of a non standard item, or more of what the partnership workers do for the firm in their 'public' day. The work tends to be done after hours, and is paid at higher rates. In 1984 more than 80% of state owned industrial enterprises had at least one of these partnerships. They provided a means of retaining core workers, and of increasing output. Their operations were described by a foreman and VGMK member at the Danube works:

> "In the partnership every minute affects the pocket. We organise our own jobs. We know who can be given what kind of an assignment. We are constantly thinking about how the job could be done more simply and faster. In a word, we use our heads. But in regular working time we have become accustomed to others thinking for us; we only carry out the directions. The largest part of our increase of productivity results from working with our brains" [37]

This represents the same overturning of the Taylorist division of mental and manual labour as we find in Japanese style practises in the West. The distinctiveness of the Hungarian approach is that it is using this new type or work organisation, under private, collective workers control as an incentive (and even as an experimental laboratory) for work in the state sector. Such a link

between public and private work has been used in other socialist countries, but mainly as a way of lengthening working time (the private plots given to co-operative workers in Vietnam are a case in point).[38] The Hungarian system, however, also encourages a change in the work process.

In the West Fordism has met with a history of resistance from the mass workers it has created. But it has used unemployment, competition and geographical mobility as means of restoring managerial control. The Soviet Union has politically refused to use such measures. But this left it in a dilemma. For having adopted a capitalist work process - with the fragmentation, deskilling, and alienation which that entailed - it held back from adopting the capitalist disciplines. It further compounded the problem by holding down consumption. The Bolsheviks thought they could have mass production without mass consumption, just as they could have mass production without a capitalist market. For them production was technical, quite separable from the political sphere of circulation - consumption, exchange and distribution, - which could be refashioned on socialist lines. Historical experience suggests that such a separation is problematic. Socialist economies have been driven either to put the labour market itslef under direct Fordist control, or to reintroduce the capitalist disciplines of unemployment and bankruptcy. Less common has been a third option - the search for the humanisation of the labour process itself.

Inflexibility

Because the cost economies of mass production depend critically on capacity utilisation, Fordism is particularly vulnerable to uncertainty. With high investment costs and low incremental ones a fall in output causes a sharp rise in average costs. In response to this capitalism has developed a set of instruments to ensure that production lines keep going.

On the side of demand Fordism stimulated statistical demand forecasting, advertising, instalment credit, and in the macro

economy, national collective bargaining linking wage rises to productivity growth, protected home markets, and Keynesian macro management. The aim of all these measures was to stabilise as much as to expand demand. Sloan's development of standard cost accounting at General Motors was designed to the same end, so that cost plus prices would be based on average capacity levels rather than following the average costs which were so sensitive to fluctuations. Finally those goods which could not be sold were stored as inventory or exported cheaply on the world market, rather than not being produced at all.

On the supply side, mass producers sought security of supply, through backward integration, long term contracts, and in some cases the control of raw materials supply. Ford has his own rubber plantation, his own timber producers and iron ore mines. Stocks were held 'just in case' to ensure no interruption to the flow of production.

Fordist mass production was in short an adapting rather than adeptive system. The rigidity came from its dedicated machinery, slow changeover times, and the long gestation period (and high cost) of new models. The sensitivity to capacity levels, and its vulnerability to uncertainty, meant that Fordism sought to stabilise its environment, or hold high cost buffer stocks, simple to allow its planned targets to be met. It was a producer dominated system in which, once a model had been decided upon through extensive market research, all the forces of marketing were called up to sell it.

In the Soviet Union the main problem posed by non adaptive technology has been on the side of supply rather than demand. The restrictions on the development of consumer goods, and their controlled prices, has meant that demand has generally exceeded supply. Producers could be confident that they would sell what they produced, and the same held true for the intermediate goods sector.

The difficulties came with supply. The shortage of inputs is experienced as the major problem of Soviety type economies. One survey of Soviet managers revealed that half their time was spent in trying to secure inputs.[38] The Hungarian economist Janos Kornai,

believes that Soviety type economies are necessarily shortage economies.[39]

There are problems with Kornai's thesis. Capitalism also has shortages but these are controlled by price. In as much as prices do not clear the market, there will be excess demand - for which shortages are another name. Kornai also talks of bottle-necks, and here the emphasis is on the greater inelasticity of supply in socialist as against capitalist countries. They key point we want to make is that a Fordist system is particularly vulnerable to such supply problems. Whereas Kornai emphasises the supply side of the issue we wish to shift the focus to the inflexibility of the users. Why this is important is that even if supply can be made reliable (and elastic), uncertainty will remain, as it has remained for Western producers. It can no more be eliminated by Western style markets than it can be by Soviet style planners. What then becomes central is the adaptability of the user.

In practise, socialist enterprises have found ways round the problem. First they have integrated backwards so that they control their own sources of supply. In the Soviet Union in the 1930's 26% of open hearth steel furnaces operated in machine building plants. The machine plants also made most of their own castings and forgings. Official policy was process and component specialisation; in 1931 there were efforts to create steel and machine building industrial districts, but with the partial exception of the 1940-54 period, metal working enterprises preferred to make rather than buy.=40

Secondly, socialist enterprises carry high amounts of stock. Kornai quotes figures of inventories being more than 6 times the level of output stocks in Hungarian enterprises in the mid 70's, though what is needed is comparative figures of annual stock turnover ratios.[41]

What is distinctive about socialist stockholding is that stocks are often used to trade for other required inputs outside the structure of the plan. Managers develop their own informal supply lines, with suppliers in both the formal and the informal economies.

Such informal supply lines outside or supplementary to the structure of the plan are a further means of countering shortages. Managers develop reciprocal relations with other enterprises; they may turn to the second economy, or to the regional party, and even to the planning office for supplementary supplies.

Lastly there is evidence that socialist enterprises may develop adaptive capacities which are more in line with modern Japanese practise than with US mass producers. Michael Burawoy who worked in similar machine shops in Hungary and the US, found the Hungarian plant yielded more control to the workforce, so that workers could improvise and readjust to component shortages.[42]

These practises - particularly the vertical integration, the high level of stocks, and the informal supply lines - have all been the targets of criticism by opponents of planning. Yet these are all classic features of Fordism particularly in areas without a long industrial history where regular supplies through the market cannot be relied upon. This is why Ford was so vertically integrated, and why German machinery companies are more integrated in the North than in the South. Centralised planning has undoubtedly increased the unpredictability of supplies, yet even so this sensitive variable of the Fordist system does not appear to have caused low capacity utilisation, nor to be the major reason for the difference in performance between East and West in spite of the working capital costs of the high levels of inventory. If Soviet Fordism is compared to Western Fordism rather than to an implied model of smaller scale flexible industry, then the main problems are likely to lie elsewhere.

Organisation and Information:

The third major issue has been organisational scale and structure. Much of the debate about Soviet type economies has been conducted in terms of the opposition plan versus market. The danger of such a circulationist approach is that it tends to push to one side the question of the organisation of production, which in itself involves

both the allocation of commodities and their production. In our view the many criticisms of socialist planning should be more properly directed at the specific model of Soviet organisation - we have described as Taylorist - rather than non market organisations as such.

One aspect of the organisational issue concerns information. Writers critical of Soviet type planning emphasise the volume of information that would have to be processed for a fully centrally planned system to work. Thus in the Soviet Union while 120-170 billion pieces of information are said to circulate in the economy, the planning system has only the capacity to deal with 2.7-3.6 billion. This shortfall it is argued leads to simplification, inaccuracy, delay, and a bombardment of indicators issued to enterprises. Even thought the plans are large and detailed - the tables comprising the Soviet plan run to more than 12,000 pages - they are still inadequate to co-ordinate the economy effectively.

Figures such as these are used as evidence of the impossibility of planning. The market, it is argued, is a more effective processor of such large quantities of information than central planning. But to pose the question in this way is to ignore the fact that the effective management of information has been at the centre of organisational theory and practice since the concentration of capital began. Indeed, were a calculation to be made of information circulating within and between the Fortune 500 corporations in the US, we could expect comparable figures to those from Russia. But the information would be structured in a different way. One of the great innovators in this field was Ford's great rival, Alfred Sloan of General Motors. He organised information flows within GM so that only a small sample passed through the centre - those he thought necessary for the taking and communicating of central decisions. The multi-divisional corporation which he developed - where the divisisions were semi autonomous firms within a firm, monitored from the centre through financial accounts - became the general pattern for Fordist corporations.[43] These in turn have now come to be seen as overcentralised. Japanese management has sought to decentralise information gathering, processing, decision taking and response to

direct operators and plant management, cutting down the inforamtion intensive hierarchies of Taylorist organisation. Prime information may have increased, but there has been an eceonomy of communication within the framework of the firm. Thus the existence of large quantities of information do not dissolve the problem of organisation. They pose it.

Seen in this light, Soviet economic organisation faced three difficulties. First they adopted Taylor's organisational model, which, even in its capitalist version, was information-heavy, demotivating, and inflexible. Second, they extended this model to the economy as a whole. Thirdly they demoted one of the key forms of information used to govern decentralisation within capitalist firms, namely financial indicators.[44]

The result has been a system with severe problems of specification and control. The market economists are right in linking the problems of quality, design, materials efficiency, and product mix in Soviet type economies with the informational inadequacy of centralised material planning. But they are not justified in their inference that the full package of arms length markets is the only adequate alternative.

There are two distinct issues. The first is final consumption, and what Alec Nove calls 'micro demand'. There is no satisfactory way, he says, of incorporating such micro demand into instructions passed down from hierarchical superiors, or more generally to plan in adequate quantities, save where the commodity in question is homogeneous (like electricity) or where the state itself is the customer (as in armaments). "What is the alternative, short of allowing 'horizontal' relationships between supplier and customer... to determine the product mix? But this is a market solution." [45]

Classical Soviet planning is certainly at its bluntest and most barrack like in terms of responsiveness to 'micro demand'. Though of course a market of a sort does exist - goods are exchanged for roubles in the final market - nevertheless this market is highly imperfect as a source of information for the planners. Prices

reflect costs rather than customer preferences; shortages and lack of choice devalue the significance of sales figures; producers are in any case assessed on the basis of output rather than sales. The virtual absence of information about customer preferences, and the lack of market discipline on the producers, means that the interests of production tend to be put above those of consumption. The planners have better information about the requirements of production, and the system of production has more power. Indeed classical Soviet ideology argued that this is as it should be, production should dominate consumption. Productive capacity was all.

For readers in the East, as in the West, these points are the ABC of the critique of Soviet planning. But they should also be aware that they are similar to the criticisms made of capitalist Fordism. Market mass production has led to standardisation and a reduction in variety, particularly serious in the sphere of cultural products, like food, drink, television, films, newspapers, records, tourism, even housing. Fordism is the era of the lowest common denominator. Even more is this the case given its tendency towards monopoly - both in production and distribution. The fact that two thirds of British food retailing is dominated by five companies, that there is even greater concentration in the manufacture of beer, of biscuits and of bread, does not eliminate the influence of consumers, but it channels and restricts it. With traditional mass production this must be so. To build the specialised machinery for a particular product or model, the manufacturer has to judge which of a possible range of products will sell best. Past price and sales information is only of limited value: for the new products are geared to the future. Thus mass producers have always invested heavily in consumer research, in demand forecasting, and - once the decision on product design is made - on the battery of advertising, credit, and mechanisms of distribution control which will ensure that the product plumped for by the producer will sell.

As French critics in particular have pointed out, the sphere of consumption is not independent of production, but increasingly moulded to it. It is not just the advertising of individual products, but the creation of a distinct Fordist culture of

consumption, one that both negates the experience of a Taylorist dictatorship in production, and at the same time reinforces it through validating the incentive of the wage. Divorced increasingly from material need, entering instead a realm of fantasy, and social distinction, the marketing strategies of Fordism have displaced the boundaries that necessity set to consumption.

This is only one aspect of a more general domination of the interests of production over consumption. In the late 19th century, the new unionism rose to protect labour against capital. A century later, the new economic movements (which in some countries have included the unions) have been focussed on the defence of consumers and communities against capital. They have highlighted how products and production processes have been designed to suit the priorities of capital, and have cut corners on the hazards to workers, consumers and the environment. This has been the charge against the chemical industry, the food industry (rapidly becoming an offshoot of the chemical industry), transport, nuclear power, and - in some radical versions - of the industrial 'eco-system' as a whole. It is the basis of the emerging green movement, and is already forcing a major re-orientation of strategy within those industries.

The mistake is to think that the introduction of the market will eliminate the dominance of production over consumption, and the restriction of diversity which is characteristic of centralised planning. It will certainly act as a check to these tendencies, but as long as production remains Fordist, there will be strong production pressures to override such a check.[47]

Nor is a market the only form of check. Introducing competition between producers is quite consistent with a system of rationing in the final market, particularly if performance is judged by the speed rather than the income of the sale. A stronger civil society and network of user groups would be the basis for the kind of consumer pressure that is now seen in the West. Production units and planners could also make much greater use of consumer surveys and customer response than is common in socialised industry. New distribution techniques such as electronic point of sale systems allow a close and

rapid means to monitor the detailed pattern of user responses to particular products: and they do not require a capitalist market mechanism in order to function. They can be applied to public swimming pools as to nationalised railways, to the use of museums as much as to primary health care.

What is at issue is how any production organisation relates to users. Is it a closed system, dealing with all outsiders as potential antagonists and at arms length, or is it an open system where outsiders - in this case users - are treated as sources of information and ideas, as potential co-operators in the micro planning of production, and as the group to whose welfare the system of production is geared?

Fordist systems are closed systems. The absence of market clearing prices, and profit centred assessment means that Soviet Fordism carries the tendencies of such a closed system to extremes. But the Soviety type system could in principle be changed into an open system without the free market package, just as the introduction of the free market package would not make the Soviet system into an open one. The issue is as much one of the orientation of the organisation as of the market rather than the plan.

There is a second internal organisational question. Given the requirements of a set of final products has been established, how can a planning system ensure that the right products are produced, in the right quantities, with the necessary quality and with an efficient use of materials? Critics argue that a planning system cannot do so. Central planners cannot give sufficiently detailed instructions to production units to ensure micro effectiveness and efficiency. Thus they can issue an order for 200,000 shoes to be made, but they cannot say "produce good shoes, that fit the customer's feet". Or - in the oft quoted example - if they specify an output of nails by weight, they may get only very large nails, while if they specify by number they will get a mass of small ones.[48]

It is often forgotten that Western Fordism also suffered from these problems. It was an extensive user of materials and energy. Its

need to maintain capacity levels required it to keep high levels of inventory, and produce excess stocks, which could only be sold at a markdown. It has specialist quality control on the shop floor, often organised by a separate quality control department, but quality has remained a major problem for Fordism. One recent account of US mass producers found quality problems accounting for between 15% and 40% of ex factory cost.[49] These difficulties are not confined to Soviet-type production. They are a feature of all traditional mass production. One of the key areas of innovation in Japanese manufacturing has been in the way they deal with quality, materials usage, and stock reduction.[50] These innovations have not been made by 'the market', but by new ways of organising the material side of production. They show that physical planning is not only possible, but is the everyday practise of Western capitalism. Factories have physical targets set in quantities - so many cars or bottles per day - and these quantities must be efficiently produced and of good quality. It is in short perfectly possible to issue an order for 200,000 shoes and require that they be good shoes which fit.

Centrally planned systems do have these problems in a much more severe form, but the main issues are obscured by collapsing the tensions of any real process of production into an appeal to the market. Socialist nails can of course be specified by weight as well as size. Quality inspectors could be required to approve goods which were to count towards output quotas, and indeed emphasis on such inspection has been a feature of Gorbachev's reforms. What is interesting in the Soviet case is why measures to improve specification and quality have so repeatedly failed.

Take quality as an example - a well recognised problem from the early days of the revolution. By the early 30's textiles and footwear factories were found to have between a quarter and a half of their output defective, and the railways reported a sharp decline in the quality of a range of their inputs.[51] Between 1934 and 1941 renewed emphasis was put on quality. In 1936, the Soviet government established a new criterion for evaluating success - being the output which properly met the plan's quality and assortment requirements. Managers were imprisoned for producing bad quality goods. The

Commissar for Non Ferrous Metals was dismissed in 1940 for emphasising quantity at the expense of quality. But in spite of this the new criterion did not catch on. Unqualified quantity remained the dominant criterion.[52]

The answer of course lies with the degree of centralisation not with the problems of planning as such. A central planning Ministry cannot specify each consignment of nails. It has to aggregate. The specification needs to the done at the appropriate level - in this case the factory manager - and systems of assessment at every level of the hierarchy have to be based on effective delivery to user requirements. This is what happens in contemporary capitalism, but not through the workings of an arms length market. After a customer makes the general decision to buy a Ford car, s/he is now faced with a bewildering number of decisions about colour, and accessories. These decisions are transmitted to factory managers and from thence to the shop floor to govern the bespoke production of the car which was ordered. Such decentralised specifications could work equally with a rationing system as with a free market one, and for many years did so in Britain with such things as National Health spectacles, or aids for people with disabilities.

Western Fordism has had its own problems of organisation and overcentralised information systems. It was a principle of scientific management that technical information was centralised in the hands of scientific managers rather than shop floor workers. New systems of corporate organisation have changed this, seeking to limit the production information that has to leave the operators. Computers are stripped out from the shop floor on the grounds that they are processing production information for a technical strata which should be advisers not controllers. Layers of middle management have been taken out, and hierarchies made flatter as co-ordination takes place horizontally rather than through vertical channels.[53]

Thus the problems exposed by classical Soviet-type systems are only an extreme form of the problems faced by Western Fordism and Taylorist organisation. The neo-liberal market is one way of

reforming an overcentralised system, one which has its own limitations, tensions and ambiguities. By emphasising the organisational issue rather than that of plan versus market, we have wanted to register the problems of market Fordism and to broaden the field of alternatives which are now open to the East.

Technical Innovation and Design

The key innovations of Fordism were organisational: Taylorism, the assembly line, Sloan's multidivisional corporation and the attendant new accounting systems were all about the organisation of production rather than technical innovation as such. Nevertheless they had implications for technology, both the type of technology required and the way in which technical innovation was organised.

The main features of Fordist technology and its organisation were as follows: responsibility for innovation was centred in a separate R&D department, divorced from immediate production; it tended to be concentrated on discontinuous changes - of both process and product - particularly related to the introduction of new models; much of it was geared to re-asserting managerial control over labour, that is to say confirming through technology the Taylorist project of deskilling, and the control of labour on the basis of timed tasks; it also followed a trajectory which confirmed the significance of size and the need for large scale organisation.

All these have come to be questioned over the past 20 years. At the same time as the rate of technical and model changes has been speeded up, and innovation has become a key focus of competition, it has been found that R&D departments need to be integrated to production engineering, and marketing, if the innovation is to be rapidly introduced and geared to the details of demand. Large chemical firms like Dow, are moving away from the idea of a new product which is then diffused (like their great success, nylon) to providing a materials service geared to specific customer demand. Like the motor manufacturers, the large chemical companies have found that

that discontinuous innovation can produce expensive failures, and that smaller, market oriented changes are safer.

The Japanese have put new emphasis on the benefits of step by step innovation - what they call continuous improvement, produced by a combination of R&D specialists and production workers. Their argument that workers are an important source of ideas - they refer to the "gold in workers' heads" - has meant, too, their early adoption of so called human centred technology in such fields as CNC lathes, and flexible manufacturing systems, in ways which US and UK management still firmly resist.

The diffusion of innovation and design capacity has also spread outside the large firms. In many fields there appear to be diseconomies as much as economies of scale in R&D, and networks of small, innovative firms have grown up. One consequence has been the development of technologies which do not require large organisations for their production. The electricity industry is a notable case in point, where smaller decentralised industries in Scandinavia, West Germany and Switzerland have followed a different technological path than those countries (notably the UK and France) which are dominated by public monopolies.[54]

If traditional Fordist technology is on the defensive in the West, it is doubly so in its Soviet variant. Again we find in the Soviet Union, Fordist structures taken to extremes.

Substantial resources are devoted to R&D (the USSR had over a third more people working in R&D than the USA in the early 80's) concentrated on branch research institutes separated from production. Their focus has been on discontinuous innovations, and the Birmingham studies show that they have had significant success. Julian Cooper found that though they lagged in data processing and electronics, they made progress (with Western assistance) in pulp and paper, colour TV and fertilisers, and had been early introducers of new technology in six sectors. During the 1970's US companies acquired 126 licenses from the USSR and Eastern Europe, and case studies show points of innovation in a wide range of sectors. Thus the Birmingham

researchers dispute the general tendency towards technological inertia in the Soviet system.[55]

Yet if there is a dynamic, it is one in which the problems of Western Fordism are accentuated. First there is the tendency towards giantism. The French and British centralised electricity regimes may put their emphasis on ever larger generators, but the Soviet Union is currently concentrating on a generator which will outrun them both. Second, the customary Fordist gap between design and production departments has in the Soviet Union too often become a chasm. The branch research institutes tend to be brushed aside by the branch ministries, the planners and the managers, for whom output maximisation is a priority above innovation. The rivalry between ministries further limits co-ordinated innovation, and reinforces the separation of design and operation.

One result is a slow rate of diffusion of those innovations that are made. Another is the absence of a general orientation of the research facilities to the needs of the producer units. The pressure for significant discontinuous innovations means that a whole field of incremental modifications, product improvements, and process adaptability is left to under-resourced production units.

The leadership and the cental planners remain deeply committed to innovation. Indeed they see technological change as the cutting edge of their general modernist project. We can even speak of a technological hubris - a view that the goal of economic development is the conquest of nature, and that the power of technology is such that it has no need to work with nature's grain. Rivers can be turned back, whole areas levelled. For many years the futurist image of socialism - shown for example in the murals of Diego Rivera - celebrated such a vision. The new Jerusalem was one of machines, works and polluting chimneys. This was a view shared by Western Fordism, and as in the West the technological failures and ecological disasters were hushed up and downplayed.

But in spite of this commitment - a commitment reflected in the size of the resources devoted to Soviet R&D - the mechanisms of central planning stood in the way of effective innovation.

It was not only the barriers of the branch ministries, and prime emphasis on output. It was also that the R&D production process was itself embraced by the shortage economy. Many of the Institutes lacked basic equipment and supplies. There was a lack of large scale testing facilities and pilot plants, which resulted in bottlenecks in the process of development. The poor quality of facilities, and declining relative wages led to high labour tunover in the Institutes. It is not surprising therefore that in spite of the commitment to innovation, the large resources devoted to it, and the evidence of some sectors in which the Soviet Union led the world, overall the Birmingham studies confirm that the USSR lagged behind America in technological development. But it was a lag behind a country which in many sectors was itself lagging, and it is to the causes of this second lag - rooted not in the relative strengths of different capitalist markets but in a quite different conception and organisation of innoviation and design - that socialist countries can profitably look for a way out of their corner.

Conclusion

We have been concerned with the classical version of the Soviet model. It has been subject to numerous modifications and reforms - most introducing a greater scope for markets, some, as in the Breznev era, seeking to extend the traditional central planning model even further. During the 1980's the pendulum has been swinging more widely - beyond liberalisation and the restoration of capitalism on the one hand to demands for a radical democratisation of the economy via workers self management plus democratic planning on the other. The axes of the debates have been as they always were - property, plan versus market, wage labour, direct versus representative democracy. Much less attention has been paid, save in China, to issues of production: types of labour process, technological

trajectories, alternative forms of organisation. Nor has there been much discussion of the different types of markets.

The result is that many of the basic tents of Fordism have remained unchallenged. The left have demanded the democratisation of a production system who material basis requires large degrees of centralisation, which posits a large semi skilled labour force, and is at the same time slow to adapt to changing needs and circumstances. The right have sough to restore a Fordism disciplined by the market - or in the more liberal versions - to incorporate the socialist economies as peripheral areas in the global division of labour of late Fordism. Both sides are worrying the carcass of an old mode - at the very time when new forms of production have been emerging in the West. The latter have come to be known as Post Fordism - a term that covers many different systems and social choices. These development - which like all such revolutions have been at first practical rather than theoretical - cast a new light on the production and organisational questions which have remained so frozen in the socialist debate.
We have indicated some of the directions of a post Fordist in the preceding discussion: the break from Taylorism and the multiskilling of the operator's function; the increased production flexibility stemming from more rapid changeover times and smaller plant size; the closer relations to users; the emphasis on decentralisation and the encouragement of horizontal links within and between organisations; the closer integration of innovation with other parts of production and the critical role of design. Above all there has been a shift away from the primacy of allocation and short term efficiency towards long term strategy.

All these have major implications for the organisation of a socialist economy. They suggest ways in which the existence of market transactions do not have to become the dominant form of relations, nor profitability the main criterion of and reward for success. They suggest a changed role for the state from engineer to educator, from architect to organiser. Instead of planning from above, the question becomes one of developing a common strategy, one whose realisation can encourage but which it cannot determine. Post Fordism in short

suggests the outline of a third way between late capitalism on the one hand and Fordist socialism on the other. The development of such an outline is the next task.

Notes

1 The cultural impact of Fordism in art, architecture, design, and town planning, are discussed in Reyner Baham's Theory and Design in the First Machine Age, Butterworth 1962. Le Corbusier stands as the most striking representative of architectural Fordism, seeing the house as a 'machine for living' designing a house called 'Citrohan' echoing the name of the French car, and demanding that "houses must go up all of a piece, made by machine tools in a factory, assembled as Ford assembles cars, on moving conveyor belts". For Gramsci see "Americanism and Fordism" in his Prison Notebooks, Lawrence and Wishart 1971, pp.277-318.

2 Taylor's main writings are collected together in Scientific Management, Harper Brothers, 1911. A summary of his views and other scientific management theorists can be found in L. Urwick and E. F. L. Brech, The Making of Scientific Management, Volume 1, Pitman 1951.

3 The best short summary of Ford's principles are to be found in his own entry on Mass Production in the Encyclopedia Brittanica 1929 edition. But it is well worth reading his other writings, notably My Life and Work, Heinemann, 1922, Today and Tomorrow, Associated Bookbuyers 1926, and My Philosophy of Industry, Coward-McCann, 1929. Robert Lacey's Ford, Heinemann, 1986 is a biography of Ford and his family.

4 V. I. Lenin, The Immediate Tasks of the Soviet Government, April 1918, reprinted in his Selected Works, Moscow, 1967 p.664.

5 The understanding of Taylorism in the Soviet Union has been discontinuously expanded for non Russian speakers, by the remarkable thesis by R. H. Jones, Taylorism and the Scientific Organisation of Work in Russia 1910-1925, University of Sussex, 1986. There is also a useful chapter on Soviet Taylorism in a second Sussex thesis by Mammo Muchie, Capitalist Technology and Socialist Development, The University of Sussex, 1986. Of purblished work, the most significant items are: J. A. Merkle, Management and Ideology - the Legacy of the International Scientific Management Movement, California, 1980; K. E. Bailes, "Alexei Gastev and the Soviet Controversy over Taylorism 1918-24" Soviet Studies, 29.3 July 1977, pp.373-394, S. A. Smith "Taylorism Rules Okay?" Radical Science Journal, No. 13 1983.

6 Quoted in A. Nevins and F. E. Hill, Ford, Expansion and Challenge 1915-33, New York 1957, p.604. This book has a useful Appendix on Ford in the Soviet Union.

7 Lenin, The Immediate Tasks... op.cit., p.664.

8 This is the final sentence of a speech given by Trotsky in July 28th 1924, and has been republished, together with another speech on the same theme, by Pathfinder Press as Europe and America, 1971. The approach embodied in these speeches is parallel to that of Gramsci's Americanism and Fordism, written at some time on or after 1929. Whereas Gramsci saw Fordism as revolutionising

archaic Italian society, Trotsky saw it as underlying American imperialism on the one hand, and providing the potential basis for the superiority of Bolshevism on the other. "To have Bolshevism shod in the American way - there is our task" ibid. p.33.

9 Ibid. p.675

10 ibid. p.671

11 L. Trotsky, Terrorism and Communism, p.149

12 Jones op cit p.95

13 V. L. Lenin, Once Again on the Trade Unions, in Selected Works, Moscow 1971, Vol. 3 p.546.

14 Muchie. op.cit p.508.

15 The figures are cited by Donald Filtzer in Soviet Workers and Stalinist Industrialisation, Pluto 1986 p.26 on the basis of a 1930 study ILO study. Interestingly a Ford executive visiting the Putilowitz tractor factory in 1928 said that he would begin to upgrade the factory by abolishing piece rates and raising wages. See Nevins and Hill, op cit, p.678.

16 The League of Time are in Jones op.cit Chapter 7, part 1. In 1927, the German literary critic Walter Benjamin visiting Moscow gave a vivid picture of the struggle for time "Trud, the trade union institute of the study of work, under its director Gastev, launched a poster campaign for punctuality. "Time is money" - for this astonishing statement posters claim the authority of Lenin, so alien is the idea to the Russians. They fritter everything away (One is tempted to say that minutes are the cheap liquor of which they can never get enough, that they are tipsy with time). If on the street a scene is being shot for a film, they forget where they are going and why, and follow the camera for hours, arriving at the office distraught. In his use of time, therefore, the Russian will remain 'Asiatic' longest of all." See his essay on Moscow in One Way Street, New Left Books, 1979.

17 V. I. Lenin, Immediate Tasks, op cit, p.650.

18 See one of Lenin's last documents, Better Fewer but Better, written dated 2nd March 1923, and written for the 12th Party Congress, in April. It is reprinted in Selected Works, Moscow, 1971, Volume 3, pp.776-788.

19 V. I. Lenin, How to Organise Competition, published originally in Janury 1918, and included in Selected Works, Vol. 2, pp.511-519.

20 L. Trotsky, Terrorism and Communism, op.cit, p.166.

21 V. I. Lenin, Integrated Economic Plan, February 1921, in Selected Works, Vol 3, p.555-562

22 See for example, Maurice Dobb, Soviet Economic Development Since 1917, RKP, 1966 Chapters 10 and 14, and E.H. Carr, Socialism in One Country, Macmillian, 1958, vol 1, Chapter 10.

23 E. H. Carr, The Bolshevik Revolution, 1917-23 volume 2, p.376.

24 Trotsky's celebration of Gosplan's control figures (whose date of appearance, August 20th, Trotsky suggested should be marked in the Soviet calendar) can be found in the opening pages of Towards Socialism or Capitalism, written in the second half of 1925, and published in English by Methuen in 1926. See also Dobb, op. cit, p.345, and E.H. Carr, Socialism in One Country, vol 1. op. cit, p.505.

25 Strumelin distinguished subjective and objective factors in raising the productivity of labour, and criticised Gastev's schemes for eliminating the subjective, and Gastev's strategies which implied an intensification of labour. Instead he suggested that the rationalisation of labour should emerge from statistical studies of demography, the analysis and classification of work, psycho-physiological studies of the worker's physical and phychic endowments, and technical aspects of the workers relation to the means of production. Objective factors such as the degree of mechanisation, natural resources, transport and energy form the link between the micro work of NOT and the macro need for planning. His teleological view of planning that it should impose targets which had been determined by human will had a direct connection to the micro management views of NOT, whatever the tendency. Mammo Muchie, op.cit, pp.520-524, and G.R. Barker, Some Problems of Incentives and Labour Productivity in Soviety Industry, Blackwell 1949.

26 David Granick, Soviet Metal Fabricating and Economic Development, University of Wisconsin, 1967, pp.21-7.

27 Ibid, pp.71-3.

28 A.C. Sutton, Western Technology and Soviet Economic Development Vol 2, Stanford 1971, p. 299. This book contains a mass of detail on the transfer of mainly American Fordist technology to the USSR, of which those mentioned in the following paragraph of the text are a small sample.

29 Ibid, p.137.

30 Granick, op.cit, p.15.

31 The translation is by Jones, and is one of many vivid examples he gives of the Fordist outlook in early revolutionary Russia. See his Taylorism... op.cit, p.223a.

32 Filtzer op.cit, p.210.

33 Nevins and Hill op.cit, p.687.

34 Part of the increase was met by women - who were employed in the main in the lowest paid and least skilled jobs, including such sectors as engineering, iron and steel and coal mining. In

engineering their proportion grew from 9% to 26% of the workforce, between 1929 and 1935, in cement from 10% to 31%, in coal mining from 8% to 24%, and in large scale industry as a whole from 29% to 40% over the same period. The bulk of the new industrial workforce, however, came from the countryside, particularly after collectivisation had played the role in Soviet 'primitive accumulation' that enclosures had done in England. By 1933 only 20% of industrial workers had worked as wage labourers before taking up industrial employment. The small, much more skilled industrial working class of the 20's (40% of workers in large scale industry in 1927 were skilled) had been replaced by a much larger, newly recruited body of mass workers similar to the labour force of Western Fordism. The change in the composition of the Soviet industrial workforce is a major theme of Donald Filtzer's book (see footnote 15 above) from which these figures, and the character of the new mass workers response is taken.

35 Filtzer op.cit, p.62.

36 This is a point made by Michael Burawoy on the basis of his comparative studies of American and Hungarian factories. See his article with Janos Lukacs, "Mythologies of Work; a comparison of firms in state socialism and advanced capitalism", American Sociological Review, vol 50, no 6, Dec. 1985, and Chapter 4 of his book, the Politics of Production, Verso, 1985.

37 This quotation and the analysis of the VGMK's are, from Avril Joffe's M.Phil dissertation, Hungarian Enterprises: a problem of Flexibility, Institute of Development Studies, September 1988, pp.63-5.

38 Nguyen Huu Dong, "Agriculture Collective, Agriculture Familial, Economie Socialiste: Quelques Hypotheses" Revue Vietnam No 1, December 1980, pp.6-24.

39 Janos Jornai, "The Hungarian Reform Process: Visions, Hopes and Realities", Journal of Economic Literature, December 1986, pp.1697-1737.

40 Ganick op.cit, pp.143-170.

41 Nornai op.cit, p.1719.

42 See particularly Burawcy and Lukacs, cited in note 36 above.

43 See Alfred Sloan, My Years with General Motors, Pan 1967; and the interesting discussion of the history of the multidivisional corporation in Michael Best, The New Competition, Polity, 1990, Chapter 2.

44 The structure and problems of Soviet economic organisation during the 1970's are well covered in W.J. Conyngham, The Modernisation of Soviet Industrial Management, Cambridge 1982.

45 Alec Nove, The Economics of Feasible Socialism, Allen and Unwin, 1983, p.75.

46 On consumption see Pierre Bourdieu, Distinction: a social critique of taste, RKP, 1984; Jean Baudrillard, Slected Writings, Polity 1988, and Andre Gorz, A Critique of Economic Reason, Verso, 1989.

47 One of the most original theoretical and historical treatments of the tension between Fordist production and the market can be found in the works of Alfred Sohn Rethel. His major theoretical work in English is Intellectual and Manual Labour, Macmillan 1979. A summary of the relevant part of the argument has appeared as "The dual economics of transition" in: CSE, The Labour Process and Class Strategies, State 1, 1976. A historical application of the argument can be found in: Economy and Class Structure of German Fascism, CSE Books, 1978.

48 Nove, op.cit, p.43 and 73-5, for the discussion of quality.

49 Edward Demin, Out of the Crisis, MIT, 1987. Deming is one of the major pioneers of statistical quality control; he found little scope for his emphasis on quality in post war US industry, came to play a major role in Japan, and now has at last been properly recognised in his home country by policy makers, notably in Massachussets.

50 On Japanese methods see Kiyoshi Suzaki, The New Manufacturing Challenge: Techniques for Continuous Improvement, Free Press 1987.

51 Filtzer op.cit, p.38.

52 David Grancik, Management of the Industrial Firm in the USSR, Columbia 1954, pp.153-6.

53 In addition to Suzaki, Japanese organisational practises are discussed in R.J. Schonberger, Japanese Manufacturing Techniques, Free Press 1982, and the same author's World Class Manufacturing, 1986.

54 On the comparative evaluation of energy strategy in Western Europe in relation to the structure of the industry, see: Institut d'Evaluation des Strategies Energetiques en Europe, Analyse du Role des Acteurs dans les Politiques de Maitrise de l'Energie en Europe, Paris 1988.

55 On Soviet Technological production see R. Amann and J. Cooper (eds.) Technical Progress and Soviet Economic Development, Blackwell 1986, particularly the chapter by Amann.