

Person : Montgomery, David
Date : 11/1/1990
Tape N# : 43A, 44A, 45A
Time code : 00:18:18:13
Subject : Technology

Antonello: Can you talk about the concept of time and the industrial revolution?

00:18:18:13b

One of the most profound changes that industrialization brought with it, has been a change in the meaning of time and everyday life. In one sense you might say that the industrial revolution of the late 18th, early 19th century brought the minute hand into people's consciousness. And the development of scientific management in the 20th century brought the second hand into people's consciousness in much the same way, on the clock.

The crucial transformation, it seems to me, is that people had customarily worked in order to accomplish specific task, worked on the land for example, very hard when there was a harvest to be brought in, when there was planting to be done and when that task was finished, the pace of work became much easier. Indeed the social life, the festivities, even the religious commemorations and ceremonies of people's life, were oriented around the seasons of tasks to be done.

00:19:55:18p With industrialization it seems to me, there developed first of all, a rapid increase in the amount of time that people devoted to work. This is especially obvious in the case of men's experience, because in many respects women's work had filled much much more of the day and of the year, even in pre industrial times than did the much more spasmodic work that men had traditionally done. But with the development of the factory system, the employers saw themselves as essentially buying the working time of men and women, and therefore concerned to make the maximum use of that time they had purchased everyday. With this therefore came the development of a discipline that went by the clock, a discipline that responded in many respects to bells.

Indeed in the experience of American factory workers, of the 1820's and the 1830's. One of the things that they talked most often about is bells. There are poems by women working in the factory that's describes their lives as hearing a bell in the morning, they rise to leave the boarding house to go to work. They hear another bell they eat breakfast, they hear a bell again they stop breakfast, they another bell it is time for lunch and so forth through the day. The interesting

testo intervista MONTgomery1.txt

thing about the poems is that there is never any description of what happens between the bells. Time is just passed at work, but the important thing are the breaks the beginning and the end are all defined in terms of periods of time in which work has to be done.

00:22:20:18P And this it seems to me makes a very different meaning to work, and a very different attitude toward work from the accomplishment of a task. When one is harvesting the wheat or baking a pie, the work begins when the harvest starts and is over when the harvest is ended or the pie is made. But when one goes to work from six o'clock in the morning until six o'clock at night, the work day indeed all of one's life comes to be defined around work itself, this is most clearly affected in everyday experience the lives of the workers who found themselves constantly trying to find ways to win some sort of personal freedom within this new discipline of time. Win it largely by staying away from work whenever possible by attempting to keep alive old festivities and religious holidays, to keep alive traditional customs of artisans, like Saint Monday.

Men in the craft ordinarily would spend their Mondays together with fellow workers, but enjoying life with the fellow workers, rather than on the job itself. And in many crafts we have recollections from the US of workers beginning gradually in the 18th century, early 19th century, beginning gradually to resume their work on Tuesday, often feeling a little hungover as they do so. By Wednesday work is rather steady, Thursday they realize that there are only two more days left in which to make the week pay, and so Thursday and Friday the hammers rang as hard and fast as they could. All through the day Saturday the pay would come, the beer would come into the shop and another weekend would begin.

00:24:43:08P Well it's understandable that the employers of wage labor found themselves attempting not only to enforce the discipline of the clock to make people work from the time the first bell rang until the time the quitting bell rang. But also to develop along with that a new mentality among the workers themselves, in which they would feel a compulsion to work, whenever those bells rang, and this was a major force behind much of the temperance movement in America and Britain, the attempt to drive out the drinking customs that formerly have been associated with artisan trade. The attempted religious reform to develop a sense of earnestness and serious life that should keep one working at all times. And above all, the attempt to develop forms of payment that would entice workers to devote all of their time on the job to working as rapidly as possible.

00:26:05:11P This is the key to not just the introduction of piecework, but to its new meaning. Many handicraft workers had worked by the piece in the sense that they were paid for the objects that they made. Great painters, Michelangelo was paid by the painting, this is piecework in a sense, for what he's done. But what changes with the industrial revolution with the development of capitalism, is that piecework becomes a form of payment for time.

By the middle of the 19th century in the US, in Britain, in Western Europe where piecework systems are so prevalent, the way in which the scale of payment was fixed is that the overseer would determine how many pieces a good worker could make in the course of a day or an hour. And then divide the average daily pay for that region by the number of pieces, so that if a worker wanted to make any kind of a living wage it was necessary to meet that standard of production. Whenever workers did meet the standard of production the employers would turn the standard up a little higher, make them go faster and faster yet.

00:27:41:18P So that much of the discipline of time actually was exercised through the forms of payment and one finds many of the workers struggle in the course of the middle and late 19th century. Tending to pivot around the payment itself because the smaller the price per piece that one got, the longer the hours of work you had to put in to make a living, the harder you had to work during those hours on the job. In this respect then, battles even over wages become in a very important way battles over the discipline of time itself.

Just one final thing on the question.....as the sense that time is money, to use the famous phrase of Benjamin Franklin and many others develop, and workers increasingly came to appreciate that it was their working time that they were selling for a certain amount of money, whether they were being paid by the day or being paid by the piece. The workers came to think more and more in these terms themselves, and therefore, and used those terms to wage their battle for a shorter working day. In other words to devote less and less of their energies to attempting to keep open the mixture of work and leisure, work and pleasure, work and drink that preindustrial time had developed.

00:29:27:12P But rather accept that there was to be a sharp separation between the time of work and the time of leisure, and attempt to do battle to shorten that time of work. All over the capitalist world by the middle of the 19th century, the demand for the eight hour

testo intervista MONTgomery1.txt

day has emerged as a central motivating demand of industrial workers. And it remains thus for 60 or 70 years, I mean the moment when the eight hour day largely did become the accepted social standard is WW1, and immediately thereafter. With very dramatic suddenness at the close of WW1, this struggle was in many senses won, but one finds in American, US trade unions, in the first international...60 years earlier in the 1860's, the demand put forward that the greatest desire, the first demand of the workers is for an eight hour day. One has more than a half century of constant battle to attempt to win this shorter time for the workers.

There was a poem that Americans used, I suspect it was known in other parts of the world as a little jingle, saying what we want is eight hours for work, eight hours for rest, eight hours for what we will, that our independence, our ability to be citizens, our ability to be something other than the tool of another human being, depended on winning time that belonged to us. So that a crucial aspect of the development of a new meaning of time psychologically and a new sense of time discipline is that time also then becomes a central issue of social struggle for the 19th and much of the 20th century.

00:00:46:06p

A central question that emerged for workers out of the new meaning of time was their battle for leisure itself, the battle to get outside of the factory. The battle to have some time in their lives that did not belong to their employers, and this was manifested in a number of ways,

One dimension one finds workers poetry about their jobs tending to say almost nothing about what they did there, just leaving the sense that they are spending time on the job rather than in any way doing anything to enrich and fulfill their lives themselves. It meant that the question of using the time of leisure that was won, with the shortening of working days or the winning of the half day off Saturday in the 19th century, as many did, meant that major commercial activities developed around entertainment, around leisure activities for working people. And these became especially important in the development of a ..of the culture of working class youth in the 19th and 20th centuries.

00:02:47:24p

It's vital I think to keep in mind that in the US, at the heyday of the

industrial revolution, the middle of the 19th century, the median age of the population was between 18 and 19 years old. This means then that most of the working force was either teenagers or people in their 20's still, that someone who had reached the age of 50 or 60 was an old man or an old

testo intervista MONTgomery1.txt

woman, in the 19th century. And much of the development of self presentation, the importance of clothing for example, to young people the importance of entertainment to them tended to hinge around the youth of so many of the factory operatives of the 19th century.

In this sense it seems to me one finds a growing sense among the young working people that the really important part of the day is or of the week is the part in which they have won some independence from the job itself.

The struggles of workers that tended to focus on the assertion of their craftsmanship their authority on the job it seems to me, tend to come much more from the skilled workers, who are much more often male, have much more often devoted most of the life to a single occupation. And there the sense of what went on in the workplace, on the job plays a crucial part in the way in which they formulate their demands and their struggles over the course of the 19th century.

00:05:01:18P The rules of 19th century

American trade unions for example, specify very clearly, how many parts the individual workers are supposed to make. Often provided fines or punishment for some worker who exceeded the norms set by other people on the job, regulated very carefully or tried to regulate very carefully the way in which workers related to each other on the job, would call for the expulsion from the union of someone who, as they would say then, connived at or undermined another person on the job. I tried to get a job away from you by buttering up to the boss, and promising to do more than you did, would be cause for ostracism, would be cause for expulsion from the union.

These questions become very vital social issues in the late 19th century, because the employers of course had enormous power to enforce their will, the ability to fire people and the ability to fine workers who violated the rules or did not live up to the employer's standard. And there was nothing that workers hated more in the 19th century than fines. I think they were in every capitalist countrey, that when you made a mistake, something goes out of your pay. I've even come across an account of the, probably the first great strike in Russia, Estonia in the 1870's in a textile mill. In a factory where- the managers had whipped and two jail cells, this is free Russia of the old days, had two jail cells in the factory for workers who misbehaved. But what the workers hated most of all was being fined, because they put up with that terrible job in order to earn some money. And when the money

testo intervista MONTgomery1.txt
was taken back this was the cruelest blow of all.

00:07:19:12p In the US,
workers in the textile mills constantly attempted to get the legislature to pass laws to forbid fines by the employees on the workers, only one place did they succeed, in the state of Massachusetts, in 1892. The Supreme Court of Massachusetts had made the quickest decision in its history, it took only four weeks to meet, hear the case about that law, and rule it unconstitutional. So that fines again could come back into the factory, but in those four weeks they were, in Lawrence Massachusetts for example, the workers were dancing in the street, their worst enemy the fine had gone.

These methods then of the employers, the fine, the firing meant that the pressure upon workers to obey the employers rules was always very serious. And the only way workers could counter this was to develop serious pressure on themselves and each other from the other direction, pass strong union rules, refuse to talk to somebody who surrendered to the employer. To engage in...to refuse to work under the rules that the employers would put down, to support the worker who lived according to union rules.

00:08:57:08p This becomes then a major struggle through the 19th century, in which the employers always said they're defending individual liberty against these tyrannical trade unions, who pass rules on how the workers can behave. And the workers of course said we are defending our right to be rational, self governing human beings, to make our own decisions as to how we are to work. So that these questions of control of the character of the job become central issues of struggle in the 19th century, side by side, with the battle over the working day. But they are questions that are fought most effectively by the skilled workers of the time, who can most easily define the terms of their own trade and can form...were the most effective in forming unions to attempt to uphold their rules at that time.

Antonello: How do you see technology? What about innovation..

00:10:38:22p Technology, I think has had many meanings for workers over the course of the 19th and 20th century. It is clear on one hand that technological innovation has often been used by employers to attempt to improve their control over the workplace and to break down the resistance of strong obsteporous groups of workers. Andrew Yury, the famous philosopher of manufacturers in England, writing in the 1830's said that the refractory hand of labor is best overcome when science is enlisted in the service of

testo intervista MONTgomery1.txt

industry, a new piece of machinery then can, if lets say, the mule spinners are the most effective trade unionists in the textile mills, then let us eliminate the spinning mule. And introduce ring spinning machines so that that sort of worker is no longer needed.

00:11:48:16P On the other hand, as early as the 1830's and 40's in the US, there were many active, articulate workers who um imagined that technological innovation could make life better for them. You would often hear them talking about the march of improvement as something in which we want to participate. The problem they said is that the new technology is introduced by the owners of the enterprises and for the purposes that they want to undertake.

The question facing a labor organization, a labor movement is how to use the possibility of technological improvement, how to make life better for working people themselves. Most of the work that was performed by men and women, even in modern high technology industry in the 19th and early 20th century, was still pushing and pulling, was still muscle work. One has to be very careful in using that famous phrase, labor-saving machinery. Labor-saving machinery often saved on the number of laborers employed for a particular job. But I think one can say safely that for the average man or woman work was harder in the 19th century than it had ever been before.

00:13:30:13P More of life was spent working, and working physically harder than, let's say medieval peasants had done. The stretching out of the year of work, the change over from that enormous exertion of heavy task like harvest time, to a time discipline that spread the work constantly. When combined with the character of much of modern technology,

for example, the most famous innovation of the 19th century certainly is the locomotive the railroad. And when we first think of the railroad, we think of a great steam locomotive with two men in it charging by, and the men wave out of the window at the children and drive the train down the way. And here is certainly an easier life than say carrying something on your back or driving a team of mules. And yet the engine is running on tracks that were laid by hand. Indeed of the American railroad labor force, the railroad employed many more people than any other industry in the 19th century in the US. Of that railroad labor force, in prosperous times as much as fifty percent were tracklayers, this meant people who worked with picks and shovels to put the tracks down, to repair the tracks across the country. In purely manual labor and most of the track laborers were people of peasant background, that came from the (?), that came from China,

testo intervista MONTgomery1.txt
came from Italy, came from Poland, came from the fields to the American south and brought with them strong arms and strong backs to make those railroad tracks. So that the great modern locomotive could race across it.

00:15:27:04P The point then is that the new technology of the 19th century still required enormous amounts of manual labor. A steel mill would be another obvious example, around these very modern furnaces would be dozens and dozens of men working by hand. You feed an open hearth furnace, you put the dolemite in it by racing up with a shovel full of dolemite and throwing it into the furnace. You have to learn to throw it in such a way that the shovel is between your face and the door of the furnace, otherwise your face will get burned off as you do it. And you do this all day everyday. Now this is very modern technology but it still can work only because of the very large numbers of physical workers that were around.

00:16:26:03P This begins to change in the US most dramatically in the 1920's and 30's, more and more mechanization begins to eliminate unskilled labor in the 20th century in the US. For example elevators and hoists on construction sites to carry a material up and down to a place hundreds and hundreds of men who used to carry them up and down. But then they..19th century, my point is that new technology had many (???), it did not necessarily mean that work was getting easier, but what it did mean for workers movements, was that the question of how to use the new technology and the ingenuity of workers for workers own advantage became the central question, or a central question of the movement. They knew for example, here's another irony of the thing, most of the innovation in an industry like metal working for example, were designed by workers themselves. Indeed they were the ones with the everyday experience on the job who knew what the plan was to solve, every worker right down to this day, every worker has his or her own private way of doing a job, in addition to the way the employer says to do it. And you keep that to yourself as you carry on a job. Everybody who's on a job for a long time learns to make little things that make the job easier, make it go faster, your way.

00:18:21:02P Much of the innovation in other words is coming from the workers themselves constantly through the 19th century and especially the first half of it. The laboratory, the company laboratory becomes more and more important after the 1860's and 70's, as the invention of new devices becomes a central undertaking of major corporations by the end of the 19th century and by our time. But the workers themselves had always played a major role in the development of innovations. The question was how not to stop them but how

testo intervista MONTgomery1.txt
to use them to their own advantage.

And indeed in a very ironic way this question fit not only into one of the important meanings that Marxism had for workers, but also into the behavior of revolutionary workers movement from the early 20th century, mainly Marx had of course always argued that a society collapses when the relations of production become a fetter on the forces of production. When a social order that at one point promoted social output, now comes to impede it. The Socialists took this mean that one of the first things that would happen when socialism was established is that the levels of productivity would put all capitalist experience to shame, watch our smoke, watch what we can do. When we're doing it for ourselves, indeed this attitude was even reflected in many of the revolutionary workers councils of the WW1 epic in Europe, in which the workers set out to demonstrate how much better they could do the job, when they were doing it for themselves, in what was usually brief moments that they had with the factories at their own command.

00:20:50:10P So the question of technology has always been one with very mixed meanings for industrial workers, there have been some traditional handicrafts to whom the meaning has been very simple and very brutal. The classic case all over the industrial world, is the case of the hand loom weaver. The new power weaving machinery of the mid 19th century simply drove handloom weavers to extinction. In Silesia, in Lancashire, in Bengal, in Philadelphia, they died, their children have to leave the trade if they want to continue. And clearly one would get from workers in that position a hatred of the new machinery itself, seeing this is what was destroying their traditional means of livelihood. But for...and some of that fear remains present well into the 20th century,

in the 1920's in the US, there were very few questions discussed more frequently in the labor movement than the question of technological unemployment, and indeed the great depression of the 1930's was often seen as the realization of these fears. And espacially the fact that productivity in most industries went way upward during the 1930's, innovation kept coming in very rapidly, especially after the very worst years of the depression. So that the general levels of output that the country had reached in 1928 had been reached again by 1937, with still 20 percent of the labor force unemployed.

00:22:53:08P Well, in this question then the fear that the new technology is going to mean permanent unemployment for large numbers of people, was a very

testo intervista MONTgomery1.txt

widespread fear indeed. And a question that has come back to us again in the 1970's and 80's with the closing down of so much American industry, with the relocation of plants made possible by the new technology when we know that the...along the border between the US and Mexico today is a region which now employs about 400,000 workers in branch plants of every major US corporation there. The average wage is between 60 cents and a dollar an hour that the workers get. The technology is as modern as anything in the US, if not more so, because the plants are brand new, they have just been put up. So the question of the portability of technology has given this question of what it means, what innovations can mean as a menace to society, when they are introduced with no social plan. Has given that question a new lease on life, just as it worried people in the 1830's and 40's, again in the 1920's, that question is back at the center of the stage in American worker's thinking today.

00:25:20:09p

The free trade zones along the border with Mexico, which had become so important today, exist because of the laws of both Mexico and the US, with Mexican taxes and welfare legislation not applying to factories that are established there. And conversely the US tariff laws require duties to be paid only on the value that's added in Mexico to the goods, not on the total value of what is manufactured there. So for parts to be fabricated there, on materials sent in from the US becomes something very profitable to do. The Japanese firms have been rather hesitant to move in because of their fears that the tariff laws might be changed, and they might be locked out of the US. So this is largely US firms that have established themselves in that area.

00:26:31:02p But the important point is that the technology that is used is computer control, microchip technology, with the new cutting materials, ceramics, laser etc, rather than the old high speed tool steel used earlier on in metal cutting. That the machines are largely numeric controlled, or computer directed, and that it is even possible today to develop a prototype in a factory or laboratory in the US, and program that onto a computer which can then be sent to Mexico or in other cases to Taiwan, Korea or the Philipines for production of the parts themselves. So that what has happened in connection with the new technology is the reoccurrence of some old issues in very new ways.

First and foremost, the question of employment, I've mentioned, has taken on a very profound meaning for the US because throughout the whole industrialization of the US, the basic process that was occurring was that labor from much of the world was moving to the industrial capital that was located in the US. Men and women came from Europe, Asia, from Latin

testo intervista MONTgomery1.txt

America to work in the enterprises that had been established here. With American capital not leaving these shores very much, except to be invested in the development of raw materials, plantations, mines, railroads, exports, ports in the third world yes, but not in manufacturing facilities around the world, until the 1950's and 60's.

00:29:09:23p The change

might have begun earlier if it hadn't been for the great depression and the war, but there was a great depression and a war, so the process has become most noticeable in the 60's and 70's. Where today essentially we see American capital and American technology moving out to labor in other parts of the world. The question then of what sort of a society that this will create in the US, is one that is uppermost in the concerns of the labor movement, especially today. But indeed all of us are wondering what kind of a country we will be living in in the future.

But it's a very new experience for American workers who have so often been accustomed to thinking of themselves as living at least materially much better off than workers elsewhere in the world. And now to realize that that exceptional status no longer exist for them, and indeed even to face as the ultimate prospect a global evening out of wages, that point will never be reached but nevertheless, seeing that as the tendency makes us very much concerned with certainly the obvious impact is the growing differentials of income in the US. The growing spread between the prosperous and the poor in this country.

00:30:52:04p The other great question that the new

technology has brought with it is the question inside those enterprises that are working in the US, how it's to be introduced, who's going to make the decisions and in what ways new computerized technology will play a role in the relations between workers and their employers. David Noble of Drexel University has done some extremely important work on this question, pointing out to us the large number of choices that were available for example in the machine tool industry. In the kind of computer control that were to be introduced. One can imagine many sorts of computer directions in which the worker himself has a crucial, decisive power in making use of the machine and in changing the program in directing what he's going to do.

Indeed modern computers have provided something that old utopian socialists dreams always could never conjure up, an actual device by which everybody that works in an enterprise can be informed to what's going on elsewhere or indeed around the world. What has happened is exactly the opposite, the

testo intervista MONTgomery1.txt

computer technology is used in the attempt to close off to make that information available only to certain people and not to the employees as a whole. Their task remains that of doing what it is they are told. The result is we are deluged in the US with marvelous visions of an information revolution that's going to make everyone a participant in some shining new democratic life, but what we've actually seen in practice has been moving in quite the opposite direction, it seems to me. But this means that this is a domain, a social conflict and decision right now, because the computer technology, per se, does not necessarily define one course or the other. The question is what sorts of social priorities are employed in determining what the usage is going to be, and indeed, even as Noble pointed out what the design of the machinery itself is going to be.

45A

00:00:46:10p

The major use to which employers have put technological innovations they introduced, of course there's always been the attempt to reduce labor cost, to make use of less skilled workers, to reduce the number of workers that they needed on a job themselves. Quite often innovations have led to the creation of some new skills for certain minorities among the workers. For example, the trade of tool and dye makers, is a product of the dilution of the work that machine operatives have done. In the 19th century a worker on a lathe or a milling machine would have to choose the cutting tools that were to be used, set the machine up in such a way to make the product that was required, use his own imagination, his own knowledge in solving the problem of making that part. In fact what most foremen did in the 19th century was to take a piece of chalk and either mark right on the part itself or write on the floor a picture of what they wanted. Make me ten of those, and the worker would go make ten of those and bring them back.

00:02:31:21p With the

development of scientific management and of specialized machine tools at the turn of the century, the actual work of producing the goods came to be carried on increasingly by unskilled workers because they had first of all, detailed instructions on how to do the job, but secondly most important, had jigs or fixtures for foreign tools with which to do it. So that when it was necessary to drill a hole for example, you would put the piece in a jig that would locate the piece so that the hole would be exactly in the right place, there would be an opening in the jig where you'd take the drill through, it would be almost impossible to do the wrong thing. You wouldn't have to lay it out with chalk, make your own measurements locate the piece, and make the hole properly. But this means then that in order to have an unskilled worker drill the holes, somebody has to make the

jig.

00:03:51:22P And this is the development of the trade of tool and dye maker. Indeed in the US census, there was no such category before 1900, and quite properly so, but the numbers went up very very rapidly, until about the 1930's. Here is the worker whose task it is to make the jigs, make the fixtures, make the forms, make the prototypes that then unskilled people can employ in actually turning out the product itself. This means then that the skilled worker is not eliminated, but the skilled worker is made an ancillary worker. The production worker is no longer skilled, the production worker now has the diluted unskilled task.

00:04:44:16P Now employers would constantly try and find ways then to rid themselves of the new skills that they have created. And with the development of numeric controlled machinery, computer controlled machinery, it becomes more and more often possible to do that. But what I think has happened is that in every instance that I can think of where workers have learned to turn a new form of production or a new technology to their own advantage, then the employers have sought a way to get rid of that, with still newer form of technology. And this is certainly the case with the numeric controlled machine tools, many workers in the US quickly began to learn how those machines functioned, and to become masters of them even though it was not intended. I have a friend for example, who was working a large tape operated boring mill one time, and when a large drill, something like a three inch drill was well into a piece of metal, the machine suddenly indexed to the right, the drill broke, flew right over his head, knocked off his helpers hat, fortunately it didn't come any lower than that and slammed into the wall behind him, of course everybody in the factory is trembling for fear, "what happened, what happened?" They checked back in the tape and discovered that a typographical error had been made by the stenographer, in those days the tapes were typed up. This man went to enroll in night school that night, he said either I master this thing or it's going to kill me. So that he got to the point where he could read what was going on, he could make changes in the program that was going on. Very soon with his knowledge then made himself as he intended to be the master of this new piece of machinery. As soon as he did so, a still newer form of computer controlled machine was then introduced because clearly what the employers were afraid of, is the power that workers then develop as they begin to master this new technology.

00:07:34:21P In one sense that race is always there, the innovations throughout....extreme case, this is not technology but it's a managerial device, but it's one of the

testo intervista MONTgomery1.txt

best known cases of the kind I know of. In the British metal working, in the engineering industry it's called there, the major battle of the employers in the 1890's, in the great blackout of 1897, was to win the right to introduce piecework payment into the metal working shops, which the union resisted ferociously. The unions were defeated in that strike and piece work was introduced, it continued to be the basic system of payment until the 1960's.

In the 1960's the employers began looking for ways to abolish piece work. The reason..by the 1960's all the workers in the British engineering industry belonged to unions. And those unions had strong shop stewards on the floor, so that every time a struggle developed over the price for a new job, for a new piece rate, the employer was now faced with the possibility of a strike with unified workers on them, and the bargaining power was greater on the workers' side. So that in the 1960's there was a major effort in the British Midlands, where I was at the time, to, as they say in America, to buy up the piece work system. To introduce a day work system of payment in the place of this, exactly the thing in the 19th century the workers had been fighting for, now the employers were fighting for because the workers had learned to master the piece work system once they were highly organized themselves.

00:09:48:16P

Taylorism and Fordism, appeared in the US roughly at the same time. Taylor's experiments coming earlier, but really coming to fruition around the same time that Ford's famous Highland Park plant opened in 1914. The very important common themes together with some significant differences that emerged. The key to Taylorism was the effort on the part of employers to expropriate the knowledge of their skilled workers. As Taylor protested again and again the everyday life of the factory was really run by its skilled trades people, rather than the employers because they are the ones who have the knowledge to carry on the basic production processes. This question was especially urgent in the metal working industries, where scientific management was born in the US. It's real easy association, American Society of Mechanical Engineers, is the great nursery of this movement in the late 19th and 20th century. And it was especially important there because the industries fabricating goods out of metal were dependent not only on skilled craftsmen but on a variety of skilled crafts, there wasn't just one craft to eliminate. There were the machinist, there were the molders, there were the pattern makers, there were the sheet metal workers, there were the boiler makers. Each of those particular groups of skilled workers controlling a different department of the shop, and

testo intervista MONTgomery1.txt

the work had to go from one department after another to produce the goods that were finally made. It was impossible simply to mechanize them out of existence, because in most metal working industries the production was in relatively shortruns, 20 or 30 of this part, 40, 50, 100 of that part, seldom would one worker be doing the same thing for more than, say at most, two or three days at a time before they would ship him on to another part.

00:12:23:06p So the question of attempting to systematize the knowledge of workers who could not be eliminated became the crucial task. And this was done primarily by the mechanism of time and motion study. To do a systematic study of the movements of that worker or of several workers doing the same task, and then to have engineers compare those movements and design what Taylor's colleague Gilbert called the one right way, to do each job. This would then be set into instructions that could be given to somebody who did not have the knowledge that those skilled workers that had been studied had. At the same time the stop watch would determine for the employers how much time the task should take, therefore how many parts an hour or a day the unskilled worker should put out.

00:13:23:18p Essentially then Taylorism was a method of attempting to expropriate the knowledge of the skilled workers to make a decisive separation between those who did the task and those who told those production workers what to do. There would then be a major elaboration of the supervisory task staff to direct these unskilled workers on the job, and indeed one of the major developments of the early 20th century is a very rapid increase in the number of foreman inspectors, troubleshooters on the job itself, that are necessary in order that unskilled workers can do the task as Taylorism prescribed.

The techniques that were developed by Taylor and his disciples emerged out of their own experience in metal working industries, but were put in such universal terms that it became possible to apply them in other industries. And by the 1920's, say, clerical workers in insurance offices and banks are now being subject to time and motion study to the breaking down of their work into its component parts to the close supervision and direction that Taylor developed. And finally, Taylor himself was quite convinced that it was possible to entice workers to work ardently according to the instruction that they were given. If one gave them a financial incentive, so some sort of incentive pay scheme becomes crucial to all of the early scientific management. When you reach your quota of work, you begin to earn a bonus of some sort. If you don't reach your quota of work, you're fired. So the average always goes up in production.

00:15:35:21b These techniques then focused in on systematizing the knowledge that the worker himself had. And amazingly enough despite the fact that he developed his techniques in the very advanced technological setting of the metal working industries. Taylor himself devoted rather little attention to what mechanization per se, could do to eradicate employers' needs for unskilled workers.

00:16:09:22b Mechanization was where Henry Ford began, the key to Ford's operation was the development of highly specialized machinery to do each particular task along the way of making a particular product. Now Ford was in a very unusual setting, to begin with. He made only one commodity, Ford cars, the Model T. They were all black, they all looked exactly the same. He would have in a Highland Park plant initially 14,000 workers, all toiling 8 hours a day to make a single thing, Model T black Fords, coming out the end. Not many companies can do this, most companies make a variety of things, but Ford was in this situation. Also in an industry that was growing so rapidly that the market seen for the moment insatiable. Ford motor company's Highland Park plant did not even have a storage lot, everything that was made immediately was put on a train to be sent off for sale, that couldn't last long. But in 1914, 1915, that could be done.

This meant then that it was possible for Ford literally to put all of the engineering and scientific knowledge needed to make a car, in steel, put it into the machinery itself. And have each single cut, each single operation made by a different piece of machinery. Then an unskilled worker could operate. All of these parts would then be brought together on a series of little assembly lines and then the entire thing finished on a final assembly line, which was of course the engineering marvel of the age in which thousands of different products would arrive at various points along the line just at the moment they're needed for some worker to reach up, grab the part, put it on, one would put it in place, the next would tighten the bolt, the next would make sure the bolts were fully tight, and so forth along the line. This meant that it was possible for Ford with his emphasis on mechanization to take the production of automobiles, which had developed in Italy, England, and especially France, the greatest automobile producer of the world until about 1908 1909. As an industry based on very highly skilled labor whose work was necessary to make these very delicate, intricate pieces of machinery that were being made. Ford was able to turn out the Model T Ford that could be made overwhelmingly by workers who were overwhelmingly first generation off the land. He and his engineers said we do not want people with the experience of machinists who come in with already established ideas as to how the job

testo intervista MONTgomery1.txt
should be done. We want people with strong backs, willing hearts who will come into the job.

00:19:33:00p But as soon as his factories developed around this system of using unskilled labor, it meant that Ford came to appreciate two corollaries of his work, much more quickly than Taylor did. One was, that if one wants to have this kind of totally mechanized mass production then there have to be customers, there have to be consumers to buy the products which are coming off in such enormous numbers. And it was no accident that his Model T Ford was a car so designed that any farmer in America could repair it, that it was almost indestructible, didn't need good roads. Extremely simple piece of machinery that could also sell at a very low price, but it meant then that it was important to Ford to have a mass consumer market, the goods who were produced had to be uniformed. And it was also in their interest to have a population with some money to buy. And the automobile industry has generally been friendly toward social policies that would encourage mass consumption in the US, as a result.

00:21:00:10p The other side of the question...so there's this very important question of what sort of a social policy, what sort of a society is to be created, and Ford from the 1910's on, devoted a great deal of attention to cultivating mass consumption, mass entertainment, all based on the highway, on the car, around the country itself. The other side of the coin is how to take a basically unskilled labor force largely of agricultural backgrounds, brought up in the task discipline of farmwork, rather than the time discipline which Ford had now carried to the nth degree how to adjust these workers to the new discipline. And it was toward that end that Ford established his sociological department and made his personnel work so famous. With two sides to it, side one, that any worker who qualifies receives exactly the same pay as any other worker, and an amazingly high wage for unskilled workers, 5 dollars a day, in 1915 is proclaimed.

In this sense it looks the opposite of Taylor, Taylor had a different individual piece rate, incentive pay for everyone. Ford is trying to do the same thing by paying everybody 5 dollars, no matter what they do. Because the work is controlled by the machine, the worker can't do anything about it. The important thing for the worker is to come everyday and stay at that machine all day, now the machine's going to set the pace on the job, not the worker in Ford. And secondly, that in determining who is eligible for the 5 dollar day, the sociological department looks into the personal behavior and the homelife of the worker. And so every worker then becomes investigated by the

testo intervista MONTgomery1.txt

socialological department, to see whether they have the right habits to see whether they go to church on Sunday, whether they come in every day, that works in their favor. Do they put money in the bank, that works in their favor, do they send money to their relatives in Europe, that's against them. Does their wife go to work, that's against them, do their children go to boy scouts, that's for them. This scorecard then is developed on every worker. To decide whether or not that person is eligible for the 5 dollars. No it's the 5 dollars means then, what is your personality, what is your character, what is your obedience on the job, it doesn't ask how well can you do a job, because that doesn't matter, the machine is doing that.

00:23:38:21p So Ford from the very beginning has these very profound social implications in terms of personnel policy, in terms of consumerism which were not immediately so evident in the case of Taylor's disciples and their work. Their work however, did have in a very important sense a much more universal applicability than Ford. Because very few enterprises can put all their technology fixed in machinery. Ford learned this when in 1927, he found that General Motors's new Chevrolets were outselling Ford, and it was necessary to stop making the Model T and to begin to make the Model A. To change from one kind of car to another they had to tear down the entire factory and build a new one. By the way, this was a precedent for what is now a curse of the American automobile industry to this day. Whenever there is a change of model, so drastic are the changes in machine tools that have to be introduced, that the company is in a position where it not only needs to but also can move the factory to a new site. And a change in model often means today a new location of a factory in the US. In a sense the Ford case is what set the precedent, was the first development of this kind of institutionalization of the technology in metal work, in the machinery itself.

00:25:30:01p Just one final point, there is a respect in which the personnel work, that Ford's socialological department began. By the end of WW1 had become a part of what Taylor's disciples were doing too, but for slightly different reasons. The reason is that as the production in factories that had been changed over by Taylor's disciples came more and more into the hands of unskilled workers, those factories themselves found that they were facing the same problem of the habits, the customs of those workers that Ford did. But also found that on the eve of WW1, the unskilled workers were becoming increasingly militant. And indeed in the US as indeed in Italy, as in France, as in Germany, As in England, the period between about 1910 and 1913 is a period of very dramatic strike activity dominated by the unskilled workers throughout the

testo intervista MONTgomery1.txt
industrial world.

00:26:38:02p This meant that the disciples of Taylor found that they had created Frankenstein's monster. Having gotten rid of their dependence on the skilled workers they're suddenly faced with militant unskilled workers, what to do with them. And this becomes the big question of personnel policy. It develops in the US, the Employment Managers Association, the attempts now to introduce into the center of every factory special officers whose task is to take care of the behavior and the problems of the labor force, this develops as a new profession. And faced with the militancy of workers in the WW1 epic, these personnel managers began to develop the new slogan of participation. Finding ways through employee representation plans to make the workers feel a part of the factory itself. These schemes that we now think are so new in quality of work life and participation in management and so forth, all were widely practiced in 1919,20,21, throughout American industry. First introduced as an attempt to defuse some of the militancy that workers had developed in the war years, and especially the unskilled workers themselves. The moral of the story, one of the morals of the story is perhaps, is that none of these formulas, Ford's or Taylors or anyone elses, for deskilling workers in such a way as to solve the labor question for all time ever ended up solving anything

→→