The distress which railroad men particularly suffered because of disabling accidents, as well as the helpless conditions of their families in case of their deaths, became a serious concern of the Baltimore & Ohio Railroad in the '70's. A thorough study was made of the activities of the English societies which attempted to meet these problems and finally in 1880 the railroad established a Relief Plan which has been in operation ever since. It is divided into two sections, one handles relief, the other savings. The former cares for a man injured or sick and for his family in case of his death, the money comes from regular fixed contributions of the members of the Relief Associations. These funds are guaranteed by the company which pays operating and administrative expenses. Up to December 1934 the Relief Plan had paid out nearly fifty and a half millions of dollars to Baltimore & Ohio employees.

The Savings Feature inaugurated in 1882 has been steadily supported by the men. It has operated from the beginning both as a Mutual Savings Bank and Building Association. In December 1934 there were seventeen and a half millions of deposits and about eight and a half millions in loans in the Savings Department. In 1881 the company followed these undertakings by a Pension Plan still with certain modifications in existence. These pensions are charged to monthly operating expenses. No pension exceeds fifty percent of a man's average monthly earnings and none is less than $25.00 a month. More than $20,000,000 has
been paid by the road for pensions since the inauguration of
the plan in 1884.

Before the end of our period the leading
roads of the country were adopting features of both the Baltimore
& Ohio Relief and Pension plan. Though in no case did
the adaptation cover the needs so thoroughly and generously.

1) Information supplied by the Director of the Public Relations
Department of the Baltimore & Ohio Railroad, 1935.
industries were so managed that they could support a short day. One employer who experimented in hours in this period was George McMurry, the head of a mill on the Kiskiminetus River, forty miles northeast of Pittsburgh,
making galvanized iron.

Mr. McMurtry was running his plant on a ten-hour day. Watching the men he became convinced that they "pumped themselves out in eight hours." Hours beyond eight were 'tired hours'. Dangerous hours, too, since it was in them that more work was spoiled, more accidents happened. He began experimenting with eight-hour shifts. The results were surprising. The men got more out of their machines in eight hours than in ten. As Mr. McMurtry put it, "They worked the tune of Yankee Doodle not to that of Old Hundred." (1)

The eight-hour shift was not applied by Mr. McMurtry to furnace men; those who in iron and steel mills make the "runs", working intensely for twenty to thirty minutes and resting as long while the furnace is made ready for the next heat. The Amalgamated Iron, Steel & Tin Workers opposed the eight-hour shift for furnace workers and when the American Federation of Labor began its crusade for an eight hour day refused to take part. Their reasons as shown by the proceedings of the Union were threefold.

In the first place their earnings would be less, since at that time it was not easy to make five heats in eight hours and they did not want to be hurried in producing what was called a reasonable output.

1) Tarbell, I. M. New Ideals in Business. (1917) Pages 172-173
The workman claimed he had more freedom under the twelve hour shift than under the eight hour, rest periods which he could use to suit himself in reading, card playing, talking.

The third reason which the report of the proceedings of 1894 emphasizes was the fear of the men that the eight hour shift would bring in new labor, make competition in jobs is that there would not be work enough to go around - a fear which influenced labor in all industries and which was behind much of this continuous agitation against immigration. (1)

Along with the study of the economic results of the long and short day was going considerable experimenting in what was called profit-sharing, an attempt to give the worker a reason beyond his daily wage for giving an honest and efficient day's work as well as for regarding himself a part of the establishment, willing to stay by to interest himself in the economies and the progress of the plant. What was sought was to make a stable and contented labor body and it was acknowledged by thoughtful employers that wages alone were not enough.

The interest in profit-sharing was stimulated by the experiments making at this time in most European countries. Thirty one French firms adopted some form of profit-sharing in the '80’s, raising the whole number reported in France in 1890 to seventy one. (2)


2) Gilman, N. B. A Dividend to Labor. Appendix No. 2. Page 366 (1899)
The returns were made sometimes in cash, sometimes in investments in a provident fund, frequently they were indefinite in amount following the profits of the company.

In the British Empire from 1880 to 1890 inclusive profit-sharing was undertaken by fifty one different concerns. (1) Usually they took the form of a bonus paid in cash. In a few cases the bonus was paid partly in cash and partly in stock in the concerns or in a provident fund supported by the company.

Up to the beginning of our period profit-sharing had been tried by but two concerns in the United States - the Peace Dale Rhode Island Manufacturing Company (2) and the Riverside Press of Cambridge, Massachusetts, but stirred by the unrest of labor and influenced no doubt by what employers in France and England and other European countries were doing some twelve concerns established one or another form of profit-sharing in the years between '79 and '90.

One of the most carefully prepared undertakings was that of Nelson Manufacturing Company of Edwardsville, Illinois.

Mr. Nelson was manufacturing brass goods in St. Louis in the '70's at the time the great railroad strikes tied up business. He was one of the employers of the country who

Appendix
1) Gilman, N. P. A Dividend to Labor. / Page 374 (1899)
2) Gilman, N. P. Profit Sharing. Pages 296-300
determined to work out a plan of industrial management which would meet what he considered the legitimate complaints of labor. Before making any move he carefully studied the different forms of profit-sharing which had been tried with more or less success in Europe. Convinced of the difficulty of carrying on any industrial experiment inside a great city, he moved his plant to Edwardsville, Illinois, and started there in 1890 a village which was called Leclaire, the name of the leader in French profit-sharing. He carefully explained the plan he had in mind to his employees: "The business," he said, "was to pay the current wage, earn a six percent dividend and take care of a sinking fund and other obligations." After this was done he proposed to divide among the employees the profits of the concern in proportion to wages. The plan was accepted and the employees from the start seem to have regarded themselves as actual cooperators, that is the notion that capital and labor were necessarily enemies, not partners, was wiped out. The dividend paid to labor varied of course, but never fell below ten and some years rose as high as thirty percent paid in stock. (1)

Years later, 1911, when Mr. Nelson celebrated the coming of age of his profit-sharing scheme he set down what he regarded as the secret of its success.

"We have not been ambitious to become great or rich; but we have sought to make business a means to independence and social life." (2)

1) Gilman, N. P. Profit Sharing. Pages 305-306. (1899
At the same time he gave his reason for the failure of several schemes that had been attempted in different parts of the country.

"The plans are usually arbitrary and coupled with restrictions. Immediate results are expected and not realized and the motive is better business, not more equal division." (1)

It was in this period that Proctor & Gamble of Cincinnati made their first experiments with profit-sharing. Their reasons they put frankly to their employees. It was to increase "diligence, carefulness and thoughtful cooperation," that profits might be raised, profits in which the employees would share.

The amount divided was to bear the same relation to the total profit as the amount of wages including the partners salaries were to the total cost of doing business. Only those who had been three months or more with the firm were to participate. These dividends were to be distributed semi-annually and the day of distribution was made a holiday. On the sixth Dividend Day in May of 1890 it was announced that $60,000.00 had been distributed as profit in the three years equal to about sixteen cents of the wages paid.

The "diligence, carefulness and thoughtful cooperation" which the firm sought had not, however, been fully secured and a new method was announced. The employees were divided into four classes and dividends followed merits, but this did not work to the firm's satisfaction.

1) Tarbell, I. M. New Ideals in Business (1917) Page 233
Just before and just after Dividend Days enthusiasm was great. The diligence was all that could be asked, but gradually this cooled off to return only as the next celebration approached. Instead of letting it go at that, thankful for what they were getting, the firm worked out an entirely new plan called "Trust Receipt Dividends for Employees Through Stock Ownership." This was not put into operation until 1903. Its relation to our period is that it was based on the experience of these years from 1887 on. (1)

Not infrequently the company that established a form of profit-sharing interested itself in the conditions under which the workman lived. Mr. Nelson in taking his factory out of St. Louis to Southern Illinois established a new town where under conditions the workman could build and own their own homes. The town's population was not confined to employees. If an outsider wanted to live in the place the company would build him a home allowing him, as it did employees to pay in monthly installments. His income and the size of his family were always taken into consideration in fixing the monthly payments to be made on the home.

There was practically no upkeep in Leclaire; it was not an incorporated town and the inhabitants looked after themselves, cared for their streets, the lighting, the water,

the ball grounds, the lake, the hall, the kindergarten. (1)

Altogether the most ambitious of the "made to order
towns" attempted in this period was that of the Pullman Car
common
Company. This concern was having an experience in industry
that of finding
in these years; it found itself in being shut in by the
in Pullman's case
growth of the city in which it was established/- Chicago,
Illinois. To insure room for growth and to give his labor
body better homes than the town offered the head of the
M.
concern Mr. George Pullman bought some four thousand acres of
land on the Illinois Central Railroad, ten miles south of
Chicago in the town of Hyde Park and set aside a well drained
tract for an industrial town which was laid out by the best
landscape gardeners in the country, and provided with the
most scientific drainage, sewage system and water supply.
The houses erected were of brick, attractive in style and
suited to a variety of purses; two rooms rented for $4.00 a
month; separate houses from $14.00 to $100.00 a month. These
houses had all of what were then modern conveniences; the
garbage was carried away every day; streets were swept and
watered; there was a single large market house and there was
an arcade onto which all the shops in the town opened.
There was a good hotel; there was a gymnasium, an amphi-
théatre for games, a beautiful theatre and the company

1) Tarbell, I. M. New Ideals in Business. From Interviews
and correspondence with Mr. Nelson by author. Page 144
Gilman, N. P. Dividend to Labor. (1889) Pages 323-333
provided a physician and medicines in case of accidents.

So healthy was Pullman that it is said that in the first three years the death rate was less than one third the average for an American town.

This undertaking attracted general attention. In the fall of 1884 representatives from the labor bureaus of thirteen different states, along with Mr. Wright, United States Commissioner of Labor, spent three days at Pullman studying the place and made a report signed by all of them. On the whole it was favorable. Rentals they found to be a little higher than in Chicago, but in Chicago you would have no broad avenues, no prompt collection of garbage, no such order and cleanliness. As a matter of fact the Commissioners concluded, that these advantages considered, the rents were really lower. (1)

The most serious criticism of Pullman was the fact that those who lived there had little or nothing to say about the town - they could not own their own homes though it was possible for them to go outside the limits of Pullman, buy land and secure help from the company for building. Most reflective employers felt that the American workman would not be willing to live permanently in a town where he was under

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so strict a guardianship, where he could not own property and had nothing to say about the government.

There was Mr. George McMurtry whose experiments in hours are spoken of above. Mr. McMurtry found, in 1890, that his plant was out-growing the land available in its vicinity. Accordingly he bought a farm of six hundred forty acres a few miles away and prepared to build both a model factory and a model town for his labor body.

His plans were made with the greatest care. He studied Essen in Germany, Creusot in France, the cooperative villages in Belgium and when it came to laying out a town he called on the best known specialists. When the streets were laid out, trees planted, water, sewerage and electricity in lots were offered to the mill men on terms which they could easily meet. Building was done through a building and loan company. In 1914 the author found that Vandergrift, as Mr. McMurtry named his town, had a population of four thousand five hundred people, most of whom were mill men owning their own homes. The building and loan association had never lost money except in one case.

Vandergrift is organized as a borough with a burgess and a council, usually men from the mill as are the men on the school and health boards. The churches are of their building and they make up the official boards. (1)

1) Tarbell, I. M. New Ideals in Business. Page 146 et sq. From personal investigation.
The fact that labor owns its homes and has a full voice in government at Vandergrift explains why its history should have been so different from Pullman where labor could own nothing, say nothing.

The most far-reaching of the contributions made inside industries by individuals and companies seeking to remove what they conceived to be legitimate causes of unrest in labor was the attack on shop management. The era of large scale production had come in the United States (1) but it was generally carried on by a scorn of science on the part of the employer, a devotion to hit and miss methods on the part of labor. Moreover, to attempt to prove anything in the average American machine shop, that is submit practice to observations and tests was ridiculed by management and fought by men. Even the mechanical engineer was still an empiricist building his engine on hunches. "Now boys we've got her done, lets start her up and see why she doesn't run" was the jocular introduction which one of the most successful mechanical engineers of the day gave to new machines of his own designing. (2)

Among the few men who at this time was carrying on his business, the making of machines, tools, at Midvale and the making of structural iron materials at the Edgemoor Iron Company, both near Philadelphia,

1) Wells, David A. Recent Economic Changes (1889) Pages 23,72 et sq.

was William Sellers (1) a Pennsylvanian, born in 1824. Sellers came of a scientifically inclined family and while learning his trade as a machinist kept his mind busy with the whys and wherefores of the physical world, when he finally came to a place of influence he distinguished himself by his bold experimenting, his scientific attacks in problems. It was Sellers' concerns which made the structural iron work for the Centennial Exhibition in 1876 as well as for that used in the Brooklyn Bridge cables. (2)

In 1878 the Midvale Steel Company took on as a day laborer a youth of twenty, Frederick W. Taylor, who because his eyes had given out had been obliged to give up Harvard for which he was prepared at Exeter after two years of travel and study in Europe. Unable to go on with his studies, Taylor chose to become a mechanic. He had served his apprenticeship and was beginning at the bottom at Midvale.

It was a case of trained brains counting for young Taylor was rapidly promoted. In turn he was laborer, gang boss, foreman of the machine shop, master mechanic, chief draftsman, chief engineer (3)

Made foreman he was confronted with the characteristic attitude of workmen at that time towards the job. It was to stretch them as far as possible, not do their best but only


2) Mawins, Allan. The Emergence of Modern America. (A History of American Life, VIII, 404
what they as a group agreed to do. As an apprentice Taylor had been shocked by this attitude and he had resolved if ever in a position of authority to overcome it. It was uneconomic but more fundamental in his mind it was stultifying. It broke down craftsmanship and manhood.

Taylor was no sooner made foreman at Midvale than he decided that the men/get from their machines a full day's work. But what was a full day's work? What could a particular machine do? He didn't know - nobody knew. He set to work to find out. By dividing the job into its parts, analyzing it he began to pick out wastes of time and motion. They were not by any means all in the men; they were in their machines; their tools, the shop conditions, the ways of management. Everything must be changed he saw if he was to get the full day's work he sought.

A chorus of doubts and jeers from above and below greeted his unheard of attempt to apply science to labor. Science was something for professors in laboratories. What had it to do with the way men worked? It certainly did seem a bizarre performance to apply it to the matter of shoveling/dirt, ashes, slag; but Taylor did it. He demonstrating that shoveling could be reduced to a formula and that formula taught to a man to his own and his employer's profit.

What Taylor was working toward was the best way to do each operation under his control, from the simplest to the most complex. Finding the best way to do a thing was his first
task. Persuading men to learn and follow the formula was a second and far more difficult one.

The systematic soldiering Taylor was attempting to break down was due first to the almost universal belief of workmen that there was only so much work to do in the world and that if a man did more than the amount considered "right" in the shop he was doing himself and his fellows out of jobs.

A second reason was that the men had learned by experience that if they showed they could easily do twice as much as they were doing and thus earn twice as much, the rate of pay was cut. They were not allowed to earn according to capacity. The system put a premium on inefficiency—"from the point of view of workmen justified soldiering."

Taylor seeking to get from a man all he had to give insisted that he be paid according to output. A first class man should be a "high priced man", he contended. Moreover, shop conditions should be such as to make it possible for a man to give his best. The upshot of his efforts was the demonstration of a principle he sought, that is, that high wages in a scientifically managed shop means low labor costs.

Taylor's attacks on existing forms of management were no less severe than that on the practices of workmen. He saw at the start that the chief obstacle to the full day's work he sought lay in management's, its failure to plan and control production.
Machines lay idle because there had been no careful provision to keep them busy. Men stretched out a job because they had no assurance that when it was finished another would be ready for them. Taylor wanted a shop where the production never ran behind or ahead of a carefully reckoned demand.

You, too, he told management, must submit to science as the men and machines are doing. But when he set out to reduce their operations to scientific terms he met an opposition stiffer than that of workmen. He were harder to convince, more stubborn in their resistance.

Chiefly they had to learn that the essence of the success of scientific management is co-operation – not formal but as Taylor said, "intimate and friendly."

This was not as difficult as it may sound. The business of management now was planning and controlling what they had planned. It was they who laid out ahead the day's work for each man at his machine; to him they went with their instructions, to them he went for explanations and suggestions. Office and shop intermingled. They realized their mutual dependence as they never had before, learned to respect each other for what they were worth. Under such conditions co-operation inevitably became "intimate and friendly." Men came to feel more or less as Taylor himself felt; that nothing of moment was ever accomplished save by co-operation. Praised once for certain demonstrations of great value, he wrote: 4
"I feel strongly that work of any account, in order
to be done rightly, should be done through true co-operation
rather than through the individual effort of any one man; and,
in fact, I should feel rather ashamed of any achievement in
which I attempted to do the whole thing myself."

The fact that by this system of management output
could be greatly increased alarmed many managers and men as
well. It meant over-production. Make too much and prices will
go down, said the employer - make too much and work will not go
around, said the men. Taylor argued otherwise: - "There is hardly
any worse crime to my mind than that of deliberately restricting
output; of failing to bring the only things into the world which
are of real use to the world, the products of men and the soil.
The world's history shows that just as fast as you bring the
good things that are needed by man into the world, man takes
and uses them. That one fact, the immense increase in the
productivity of man, marks the difference between civilized and
uncivilized countries, marks the one great advance we have made
on one hundred to two hundred years ago; it is due to that
increase of productivity that the working people of today, with
all the talk about their misery and their horrible treatment, live
almost as well as kings did two hundred and fifty years ago. They
have better food, better clothing, and on the whole more comforts
than kings had two hundred and fifty years ago. And that is due to
just one thing, increase of output." (1)

1) Scientific Management. The Amos Tuck School of Administration
and Finance, Dartmouth College, Hanover, N. H. 1912
Talk on the Principles of Scientific Management by
The principles he laid down for removing impediments to full production are as good for removing impediments to full distribution:

1. "Question everything - question the simplest, most self-evident, most universally accepted facts; prove everything.

2. "Only one variable at a time. Difficulty in getting down to the real variable. Great temptation to experiment with more than one variable in order to get quick results."
3. "Perhaps the greatest difficulty of the experiment is to hold the surrounding conditions constant and uniform while the variable is experimented with; that is to standardize surrounding conditions." (1)

Out of Taylor’s experiments and fights in the Midvale plant were laid in these years, 1878 to 1881, the basis of the Science of Management. It is doubtful if there was another plant in the country where his experiments with men and methods and machines would have been tolerated. It was not that Mr. Sellers always understood or agreed with what the young men were doing but trained to habits of research and experimentation he realized that Taylor’s methods and mind were original, persistent, directed to overcoming what Sellers’ common sense agreed were weaknesses in shop practices, machines, management in spite of the fact that industry as a whole accepted them and resented attempts to change them.

All of these attempts inside industry to improve conditions were watched and if considered important were reported by state and federal labor bureaus. One of the demands of organized labor had been the establishment of statistical bureaus which would report regularly the employed, extent and causes of unemployment.

Massachusetts had set up a bureau in 1869; Pennsylvania by in 1872. By 1880 seven states had them in operation; /the

end of the period twenty seven. (1)

The decision of the Federal Government to
add labor to its cares came in 1884 when a Bureau of Labor
was created by Congress with a Commissioner of Labor at its
head. It was for this Commissioner to make an annual
statistical report on the hours of labor and the earnings,
also to take up as his judgment dictated or Congress or
the Executive directed any demand or disturbance which needed
investigation before action. His business, generally speaking,
was to collect and spread facts which could be depended upon.

Luckily for the future of the new bureau the first
Commissioner of Labor was as good a man as there was in the
country for such an undertaking, Carroll D. Wright.

Mr. Wright now forty five years old had interested
himself actively in labor problems particularly in Massachusetts
from the year of his first term as a member of the State Senate
1872-'73 when he was able to secure the passage of a bill
compelling suburban railroads to run trains at hours
convenient for workingmen. He concerned himself particularly
with labor statistics and in 1880 acted as a special agent
on the factory system for the Tenth Census of the United States. (2)

Wright emphasized the ethical phase of labor problems
lecturing on that theme at the Lowell Institute in Boston in 1879
and again at Harvard in 1881. He was busy with statistical
work for his state when named to head the new

1) Messages and Papers of the Presidents. Index. Vol. X.
   Page 446

2) Published by the United States Government in 1892
bureau. (1) His reports made an immediate impression. This was particularly true of his findings in special cases.

Legislative bodies harassed by labor and an emotional public to pass laws forbidding or regulating this or that found in the Commissioner's reports the solid meat they needed to bite on. For example he took up in 1866 a standing demand in the platform of both the Knights and the American Federation of Labor, the abolition of convict labor. What was the factual basis of this charge, that it was injuring their trades?

The answer was an exhaustive study of the systems in vogue in each institution and in each state, accompanied by an excellent historical review of the handling of convict labor in other countries. The exact result, as far as the United States was concerned, showed that the product of all the prisons of the country was but 54/100 of one percent of the total mechanical products of the country. Nevertheless, at certain points convict labor was of a quantity and quality to displace free labor. This was true in the cooper shops of Chicago and vicinity.

In 1885, the last year of the investigation, 67 3/10 percent of the barrels and tierces and kegs sold and used in Chicago had been made in prisons. While the contractors' business had increased three hundred sixty percent between 1875 and 1885 the private business increased but thirty one percent.

1) National Cyclopaedia of American Biography. Vol. VI
"The manufacture of cooperage," said the report, "stimulated as it has been by the enormous meat-packing trade in Chicago, should have itself increased four or five fold during the last decade, and would have done so beyond a doubt if such opportunities for free development had been open as were enjoyed by other branches of manufacture. Instead of that it is now a feeble industry relatively than it was eleven years ago.

"But the proprietor has not been the only nor the greater sufferer in this struggle. Under the natural and inevitable operation of the contract system, prices have continually declined, and the citizen, in his fruitless effort to compete with the contractor, has visited every reduction in price upon the journey man cooper in the form of a reduction in wages. The consequence has been, as is frequently stated, that Chicago coopers have often been able to earn more upon the streets at any kind of unskilled labor than at the trade they have spent years to acquire." (1)

It was the most notable example presented by the report of the Commissioner on the effect of convict labor on free labor, but it was an example conclusive of what might happen if the system was freely adopted.

(1) It gave the legislator what he needed and it proved that this particular demand of labor was legitimate.

In his third report, that of 1886, Commissioner Wright gave a temperate and well-considered review of the strikes on the railroads of the Southwest in 1885 and 1886, the report quoted from above.

(2) It was good evidence that the labor bureau could be depended upon for fairmindedness, as well as for facts.

So important did Congress feel the bureau to be that in June of 1888 it created a Department of Labor of which Mr. Wright was made the first secretary and one after another.

in the next few years he investigated and reported on
matters of such vital importance to labor as Compulsory
Insurance, Building & Loan Associations, Housing of Working
People, Industrial Education, Slums of Cities.

The work of the Department of Labor was of very
particular interest to President Cleveland through both his
terms. It was he who suggested to Congress the wisdom of
grafting on to the Labor Bureau a permanent Commission empowered
to arbitrate controversies between labor and capital.

The letter in which he submitted this suggestion was
dated April 22, 1886, the moment when the General Board of
the Knights of Labor upon the request of a committee sent by
the House of Representatives to investigate the strikes on
the Gould roads of the Southwest had ordered the men back. (1)

"The present conditions of the relations between labor
and capital," said Mr. Cleveland, "is far from satisfactory.
The discontent of the employed is due in a large degree to the
grasping, heedless exactions of employers and the alleged
discriminations in favor of capital as an object of governmental
attention. It must also be conceded that the laboring men are
not always careful to avoid causeless and unjustifiable disturb-
ance."

In his opinion, went on Mr. Cleveland, the proper
means for settling these difficulties was voluntary arbitration,

1887. Pages 184-222
not by "arbitrators chosen in the heat of conflicting claims" but a "stable body" consisting of three commissioners, regular officers of the Government, "ingrafted" upon the Bureau of Labor. The Bureau should have added to its existing power that of investigating "the causes of all disputes as they occur, whether submitted for arbitration or not, so that information may always be at hand to aid legislation on the subject when necessary and desirable." (1)

Congress was not willing to follow Mr. Cleveland's suggestion in full. It did, however, pass a law in 1883 for arbitrating differences between interstate railways and their employers on condition that both parties should consent and neither be bound by the outcome. The arbitrators were to be specially chosen for each dispute according to a plan which the law set forth.

1) Letters and Messages of the Presidents. Vol. VIII. Pages 395-397