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YARD BRAKEMEN WAITING THEIR TURN AT RIDING CARS DOWN THE HUMP

DEATH CALENDAR IN INDUSTRY
FOR ALLEGHENY COUNTY

Each red cross stands for a man killed at work. or for one who died as a direct result of an injury received in the course of his work.

WORK-ACCIDENTS AND THE LAW

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FOUNDATION

WORK-ACCIDENTS AND THE LAW

By

CRYSTAL EASTMAN

MEMBER AND SECRETARY, NEW YORK STATE EMPLOYERS' LIABILITY COMMISSION

THE PITTSBURGH SURVEY

FINDINGS IN SIX VOLUMES

Edited by

PAUL UNDERWOOD KELLOGG

NEW YORK
CHARITIES PUBLICATION
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EDITOR'S FOREWORD

THE Slavs from Austro-Hungary, the Latins from the Mediterranean provinces, the Germans or the British-born, who come to Pittsburgh to do the heavy work of manufacture (and for Pittsburgh read the United States), come from a region of law and order to a region of law-made anarchy so far as the hazards of industry are concerned. For there is scarcely a country of modern Europe but has brought its statutes abreast of industrial progress and wrought out for itself, as we have not, some sensible adjustment between civil rights, human needs, and the ceaseless operations in which groups of men and powerful appliances are joined in producing what the world wants.

Laggard as the American states have thus been in what Mr. William Hard has called the "law of the killed and injured," it is ours to profit by the experience of the countries which have from five to fifteen years' headway in this field. An American system should, none the less, be grounded firmly in American conditions. Toward the understanding of these conditions, of the common causes of accidents, and their consequences in the actual household experience of working people, this book is contributed. Miss Eastman presents the findings of the first systematic investigation of all cases occurring during a representative period in a representative American district. No such body of facts has hitherto been available, and the investigation could scarcely have been better timed in relation to constructive efforts towards the establishment of industrial justice. The field work was carried on during 1907–08 as part of the Pittsburgh Survey and the results were published in brief in "Charities and the Commons" in March, 1909. During the past year state commissions have been appointed in Minnesota, Wisconsin and New York for the purpose of recommending legislation on this subject. Data quoted in Appendix IV from the first report of the New York Commission afford a comparison between the Buffalo and the Pittsburgh

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districts, and show that the problem is in no sense local. Of scarcely less significance has been the institution* by the largest employer of labor in the Pittsburgh district (the largest, also, in the United States) of a system of relief which may be said to be a recognition that a share of the income loss due to every work-accident should be a charge on the business. Employers' associations, labor unions, conferences of charities, legal and economic associations have taken up the question; in many quarters, dissatisfaction which three years ago was all but inarticulate is now assertive and purposeful. Yet as this book is issued, the rank and file of workers in no American state are protected adequately against economic loss due to the accidents of their work.

An equally momentous change manifests itself in the attitude being taken by engineers, superintendents and mechanics toward the prevention of accidents. The fact that the cases studied by Miss Eastman fell in a period before recent developments in this direction makes them more truly a reflection of the unregulated industrial practice with which the American public has to deal. At the same time, in Mr. Beyer's article,† we are able to present, as an illustration of methods of advance, the work of prevention extensively developed by the United States Steel Corporation under a central committee appointed in May, 1908.

This investigation, it should be borne in mind, was of fatalities and not of plants. The staff, within the limits of its time and means, concentrated on the first piece of work to be done—a study of the work-fatalities of which there was public record in a given year; the indications as to responsibility for the accidents which caused them; the distribution of the income loss which they involved. This plan eliminated any chance of partiality. Only the occurrence of a fatality in an industry during the period studied would bring it within the view of the inquiry; only the non-occurrence of a fatality would keep it out. Thus the method commonly employed by the physician or scientist in studying the occurrence of a disease with the hope of learning something as to its causes and effects was applied to the problem in hand. It is my belief that this outspoken, pioneer presentation will open up

* May 1, 1910. See Appendix VI, page 300

† Appendix III, page 244.

to public consideration, a situation which in our industrial districts has been weakly surrendered to inertia and trepidation.

The lives of men, the fair living of families—these are worth conserving to the uttermost against the risks of work. These the industries of America waste without tally.

PAUL U. KELLOGG
Director Pittsburgh Survey

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WORK-ACCIDENTS AND THE LAW

THE PROBLEM STATED

I. On December 4, 1906, James Brand,* a young structural iron worker, employed by the Fort Pitt Bridge Company, while passing over a scaffold to get to his work on the Walnut Street Bridge, fourteenth ward, Pittsburgh, fell 35 feet to the ground and was killed. Testimony at the coroner's inquest brought out the fact that a plank broke under him. The two pieces of the plank were picked up where they fell. At the broken end of each, the frost and dirt had worked into the wood several inches, testifying eloquently to an old crack, a crack of at least two weeks' existence according to the statements of those who looked at the pieces. Brand had nothing to do with the building of the scaffold.

II. On May 1, 1907, Frank Koroshic, a Lithuanian angle-shearman employed by the McClintic and Marshall Company, at Rankin, Pa., had finished his work for the day and, in order to get some waste with which to clean his hands, went over to a big punching machine with which he was familiar. It had a heavy fast-revolving wheel, boxed in with iron down to within two or three inches of the floor, to guard the workmen from accident. At one corner of the machine, in a hole, was some waste. According to the statement of the superintendent, Koroshic got down on his knees and, leaning with his left hand on the greasy platform a few inches from the wheel, reached with his right hand for the waste. As he bore his weight on his left hand, it slipped and slid into the wheel. In a second the hand was crushed.

III. On October 17, 1906, Adam Rogalas, a Russian laborer employed at $1.60 a day by the Iron City Grain Elevator Company of Pittsburgh, was sent with two other men to do some work in an adjoining building, used by the company for storage. On the floor above them grain was stored in bags. The supports of the floor gave way and it fell. One of the workmen escaped, another was injured, Rogalas was killed. At the inquest a building inspector testified that the

* Names of workmen are fictitious.

floor-supports were obviously inadequate. Rogalas had a wife, and four children, aged ten, six, five, and two; but he had no savings. According to Mrs. Rogalas, the claim agent of the company offered to settle with her for $400, which she refused. She put her case in the hands of a lawyer, and suit was entered for $20,000. Mrs. Rogalas got some washing to do; the city poor relief gave her $6.00 worth of groceries a month; she begged at the door of her Catholic church on Sundays; her sister, with a family of six, did what little she could; an occasional $10 was advanced by her lawyer. She was seen in severe winter weather, with shoes so old that her feet were exposed. Six months after the accident another child was born; it was the end of the year before her suit came to trial. The court instructed the jury to return a verdict for the defendant. The woman had lost her case.

IV. On August 5, 1907, Robert Reeve, a United States postal clerk, was working in the Baltimore and Ohio yards in Pittsburgh. The engine to which his car was attached collided slightly with another, so that by the jar he was thrown against one of the iron hooks on which mail pouches are hung and a bone behind his ear was injured. He was four days in the hospital, the charges for which the railroad company paid. He did not go back to work for four weeks. During this time his salary was paid in full by the government, $83.30. He received in addition $64 from a Mail Clerks' Association to which he belonged and to which he paid dues. He settled with the railroad for $250, of which his lawyer's fee took $100. Thus Reeve's slight injury, resulting, so far as we know, in nothing permanent, gave him a month's vacation on full pay, with $150 thrown in.

A social investigation is justified when there are grounds for belief that wrong exists in certain relations between individuals, a wrong of sufficient importance and extent to warrant concerted interference on the part of the community. When to such a belief is added a general conviction that this wrong results in a great public tax, a drain upon the productive forces of the community, the need for investigation becomes urgent. With regard to the work-accident problem, such a belief and conviction has long existed,—based not only upon newspaper stories, magazine articles, and hearsay, but upon the common knowledge and ex-

perience of working people. On the strength of it, this investigation was undertaken. It should give us facts, not isolated and unrelated, but massed and classified.

The incidents related above are isolated facts, the first two bearing especially upon the causes of work-accidents, the third and fourth upon their economic cost to the workman and his family.

If adequate investigation reveals that most work-accidents happen because workmen are fools, like Frank Koroshic, who reached into danger in spite of every precaution taken to protect him, then there is no warrant for direct interference by society in the hope of preventing them. If, on the other hand, investigation reveals that a considerable proportion of accidents are due to insufficient concern for the safety of workmen on the part of their employers, as in the death of Brand, then social interference in some form is justified.

If, again, investigation of a large number of cases shows that workmen and their families do not suffer economically from work-accidents, and that they often make money out of injuries, as Reeve did, then we are not warranted in interfering between employers and employes for the sake of further protecting the rights of the latter. But if investigation shows that the majority of work-accidents result in serious deprivation to the workers' families and consequent cost to the community, and that the economic loss is inequitably distributed, as in the Rogalas case, then we shall be warranted in advocating interference to adjust that burden more wisely.

The present study thus divides itself into two parts. Its purpose is to determine in the cases studied, (1) What are the indications as to responsibility? (2) What material loss and privation, if any, resulted to the injured workmen and their families? But these are not two distinct questions; there is an obvious interrelation between them. It is a fundamental doctrine of the civil law that if a loss is to be suffered he who is at fault shall suffer it, in order both to secure justice between individuals and to prevent future faults of the same kind. Therefore, we shall consider responsibility for work-accidents in its bearing on the determination of a just distribution of the economic loss; and we shall

consider the distribution of the economic loss in its bearing on the prevention of these accidents.

This discussion is based upon the study of a year's industrial fatalities and of three months' industrial injuries in Allegheny County, Pennsylvania. Together they make something over a thousand cases. What could be learned about them,—the circumstances of the accident, the nature and extent of the injury, the family responsibilities of the killed or injured worker, how large his income, what provision he had made for misfortune, how great the financial loss suffered by his family, what share of this was shouldered by his employer and by what means it was adjusted, what was the effect of the accident on the economic life of his family,—these facts were gathered. Such facts are needed if society is to solve justly the problems involved in work-accidents and to determine the extent to which its own interests are involved in that solution.

For fatalities, the period from July 1, 1906, to June 31, 1907, ending six months before the inquiry began, was selected in order that the economic consequences in each case might be the more closely estimated.

To begin with, we secured access to the coroner's files, and made a record of every industrial fatality reported during the year, including, whenever these items were given, the name and address of the man killed, his age, occupation, and conjugal condition, the name of his employer, the circumstances of the accident, names of important witnesses, and the verdict. Armed with these records we set out to complete each story. During this part of the work an Italian and a Slavic investigator were on our staff—the latter an engineer. In the majority of cases we found the family itself, and talked with wife, mother, father, son, daughter, sister or brother of the man killed. In many instances, however, the information came second hand, from neighbors or relatives, and in some cases no trace of the family could be discovered. In this visiting we often talked with fellow workmen, and sometimes with witnesses of the accident, and could supplement the inquest record of the fatality, as well as learn its economic outcome. Finally, an effort was made to verify

the whole story from the employer's records. Here we met with opposition, however, and succeeded in seeing the employers' records in only one-third of the cases. But the request led to interviews which threw light on the accident problem as a whole.

Many tours of inspection, of great help in analyzing the causes of accidents, were made with competent guides to steel mills, railroad yards and mines.* Interviews with workmen and superintendents concerning the prevention of accidents have made it possible to enrich the statistical story with some real though second hand experience.

The same course was followed with regard to the three months' injuries, substituting hospital records for inquest records. It was impracticable to cover a full 12 months' injury cases in the time at the disposal of the investigating staff. For the three months chosen—April, May and June—the injuries found on the hospital records equalled approximately the deaths of the whole year.

It is not maintained that so limited an inquiry will give a complete view of the industrial accident situation, but it will add to an understanding of it. Following the scientific method, we have taken a small "cross section" from the very heart and center of the problem. Allegheny County, which roughly corresponds with the famous Pittsburgh "Steel District," has a population of 1,000,000, of whom 250,000 are wage-earners. Seventy thousand in the steel mills, 20,000 in the mines, 50,000 on the railroads,—these are the great employment groups in Allegheny County; they are also the great accident groups. Most of the lesser industries in which accidents commonly occur are also represented in this district, as well as all the dangerous trades of a great and growing city not connected with manufacture. A concrete intensive study of Pittsburgh's accidents, therefore, should give us a practical exposition of this problem as it exists today in American industrial communities. Such is the aim of this book.

* Especial acknowledgment is due to representatives of the Carnegie Steel Company, the National Tube Company, and the American Steel and Wire Company for courtesies extended on tours of inspection; also, to representatives of the American Bridge Company, whose plant at Ambridge, Beaver County, however, was geographically outside the scope of this report.

PART I

THE CAUSES OF WORK-ACCIDENTS

CHAPTER I

PITTSBURGH'S YEARLY LOSS IN KILLED AND INJURED

IN a year when industrial activity was at its height,—that is, from July 1, 1906, to June 30, 1907,—526 men were killed by work-accidents in Allegheny County, Pennsylvania.

During three months, April, May and June, of the same year, the hospitals of the county received over 509* men injured in such accidents. It is impossible to state the total number of injuries during that quarter, because there is no available record except of cases received at the hospitals.† But even were an accurate estimate of the number of injuries in a year possible, it would be of little value. A scratched finger and a lost leg can not be added together if you look for a useful truth in the sum. It is better, therefore, not to try to estimate the total number of injuries in a year, but to concentrate our attention on the permanent loss of health and power involved in the injuries we are sure of. In 294 of the 509 non-fatal accident cases of which we have record (those received at the hospitals during the three selected months), it was possible to learn the nature and extent of the injury. One hundred and twenty-seven of the men escaped without permanent injury. Ninety-one sustained what is here called a slight permanent injury; for instance, a lame leg, arm, foot, hand, or back, not serious enough to disable a man, the loss of a finger, slight impairment of sight or hearing, and the like. Seventy-six men (25.5 per cent) suffered a serious permanent injury. Lest there should be doubt as to what is meant here by

* This number excludes those who died as a result of their injuries, those who were sent to the hospital only for dressing and did not remain over night, and those injured outside the county.

† The state factory law requires a report of each serious accident occurring in establishments under its jurisdiction, but the law is notoriously unenforced. All of the large companies and many of the smaller ones keep a complete report of every accident, but these are not open to the public.

"serious," it will be better to state exactly what these injuries were. Seven men lost a leg, sixteen men were hopelessly crippled in one or both legs, one lost a foot, two lost half a foot, five lost an arm, three lost a hand, ten lost two or more fingers, two were left with crippled left arms, three with crippled right arms, and two with two useless arms. Eleven lost an eye, and three others had the sight of both eyes damaged. Two men have crippled backs, two received internal injuries, one is partially paralyzed, one feebleminded, and two are stricken with the weakness of old age while still in their prime. Finally three men suffer from a combination of permanent injuries. One of these has a rupture and a crippled foot; another a crippled left leg, and the right foot gone; the third has lost an arm and leg. These 76 are the wrecks of 294 hospital cases.

TABLE I.—EXTENT OF INJURY IN 294 CASES—APRIL–JUNE, 1907*

Extent of Injury	*Number*
No permanent injury	127
Slight permanent injury	91
Serious permanent injury	76
Total	294

Estimating the hospital cases for a year on the same basis we have the Pittsburgh District annually sending out from its mills, railroad yards, factories, and mines, 45 one-legged men; 100 hopeless cripples walking with crutch or cane for the rest of their lives; 45 men with a twisted, useless arm; 30 men with an empty sleeve; 20 men with but one hand; 60 with half a hand gone; 70 one-eyed men,—500 such wrecks in all. Such is the trail of lasting miseries work-accidents leave behind.

Five hundred and twenty-six men dead does not necessarily mean 526 human tragedies. We all know men who would give more happiness by dying than they gave by living. But 500 men mutilated—here there can be no doubt. And time goes on. There has been no respite. Each year has turned them out as surely as the mills ran full and the railroads prospered,—as surely as times were "good." In five years there would be 2,500. Ten

* Exact data as to extent of injury in 215 cases could not be secured.

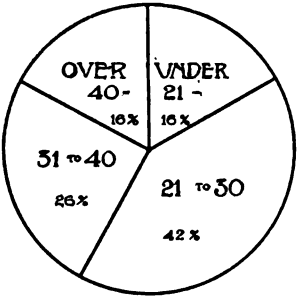
years would make 5,000, enough to people a little city of cripples, a number noticeable even among Greater Pittsburgh's 600,000. It is no wonder that to a stranger Pittsburgh's streets are sad.

This steady march of injury and death means suffering, grief, bitterness, thwarted hopes incalculable. These things cannot be reckoned, they must be felt. But the loss of youth and strength and wealth-producing power in those 500 yearly deaths, can be set forth to some extent in figures.

From the point of view of social welfare, the gravest feature of the situation is that the men killed in industry are young men. Eighty-four per cent of the men in the year's list of deaths were not over forty; 58 per cent were not over thirty.

TABLE 2* AND DIAGRAM 1.—526 WAGE-EARNERS KILLED IN WORK-ACCIDENTS IN ALLEGHENY COUNTY, PENN., JULY 1, 1906, TO JUNE 30, 1907, CLASSIFIED BY AGES

Age	*Number*	*Per Cent*
Under 21	82	16
21 to 30	221	42
31 to 40	137	26
Over 40	86	16
Total	526	100



Pittsburgh people generally have an idea that it is the foreign laborers, and not Americans, who are killed and injured in such numbers every year. Whether or not there is any moral comfort in this idea, it must be abandoned; 228, or 42.5 per cent, of the men killed during the year were American born.

It is a mistake, also, to suppose that it is the cheap, unskilled labor which suffers most from industrial accidents. In the

* The figures given in this and the two following tables have, of course, no relative significance. They are important as showing, absolutely, what a large proportion of the men killed are (*a*) in their prime, (*b*) American born, (*c*) skilled workers. Much greater numbers of accidents, set off against an accurate census of wage-earners in all trades, would be necessary as a basis for conclusions as to the relative risks of different industries.

TABLE 3.—526 WAGE-EARNERS KILLED IN WORK-ACCIDENTS CLASSIFIED BY OCCUPATIONS AND COUNTRY OF BIRTH

Occupations in Which Employed	*Aggregate*	Country of Birth						
		America	*Austro-Hungary*	*Italy*	*Ireland*	*Germany*	*Other Countries*	*Country of Birth Unknown*
Railroading .	125	89	15	12	3	2	2	2
Mining. . .	71	14	34	18	2	1	2	0
Steel manufacture	195	51	117	10	9	4	2	2
Other occupations	135	74	23	19	4	5	9	1
Total . . .	526	228	189	59	18	12	15	5

Pittsburgh District, generally speaking, $1.65 a day, or $9.90 a week is "good pay" for common labor. Only 16 per cent of the men killed during the year (whose earnings were ascertainable) were in this class of labor. And even including as unskilled those men in the steel mills who work seven days a week for $1.65 a day, making a weekly wage of $11.55, we have but 32 per cent unskilled.

TABLE 4 AND DIAGRAM 2.—WEEKLY EARNINGS OF 440 MEN KILLED IN WORK-ACCIDENTS*

Weekly Earnings	*Number*	*Per Cent*
Under $10 . .	71	16
$10.00–$11.99 .	71	16
$12.00–$14.99 .	89	20
$15.00–$19.99 .	158	36
$20.00–$29.99 .	44	10
$30.00 or over .	7	2
Total . .	440	100

There is no bright side to this situation. By industrial accidents, Allegheny County loses more than 500 workmen every

* In 86 cases earnings could not be ascertained.

year, of whom nearly half are American born, 70 per cent are workmen of skill and training, and 60 per cent have not yet reached the prime of their working life. Youth, skill, strength,—in a word, human power,—is what we are losing.

Is this loss a waste? This is a question which Pittsburgh and every industrial district must answer. If it is merely an inevitable loss in the course of industry, then it is something to grieve over and forget. If it is largely, or half, or partly unnecessary,—a waste of youth and skill and strength,—then it is something to fight about and not forget.

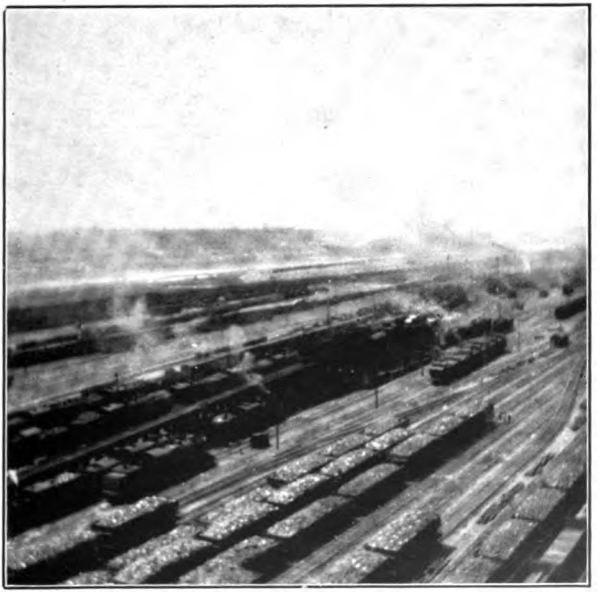
No thorough study of the causes of accidents had been made in the United States when this investigation was begun. Pittsburgh had not even counted its killed and injured. Therefore, although lacking engineering knowledge and practical experience, I have attempted in Part I to analyze and discuss the causes of 400 industrial fatalities from such sources of information as we had. The tabulation schemes in Part I are those which naturally suggested themselves. There has been no attempt to make technical classifications or to state with any finality the proportions of accidents which are preventable. Accidents have been analyzed roughly in two ways, in order to determine (1) how they happen, and (2) why they happen. The first question suggests the separate study of different industries covered by Chapters II, III, IV and V, in which accidents are grouped according to the characteristic processes or employments of each industry. The second question suggests the personal equation, responsibility, discussed in Chapter VI, where accidents are grouped according to the persons involved.

CHAPTER II

THE RAILROADERS

THE railroad history of Allegheny County for a year is a record of accomplishment and efficiency thrilling in its magnitude. Each of the three rivers is lined on both banks with shining tracks, from which here and there all through the county branch off smaller roads, tapping the products of a string of mining towns. In going down the Ohio River, unless your ears are dulled by custom you will notice that there are hardly three consecutive minutes, night or day, when it is not possible to hear the rumble of a train. Stand on some rugged hilltop and count the cars as they roll in and out of the Pittsburgh District,—iron ore, 11,000,000 tons a year, coming down from the Great Lakes, and countless carloads of coke and limestone to mix with it in those mighty blast furnaces. Then see how the trains are hurrying back in every direction, nearly 5,000 cars a day, loaded with steel rails, steel plates, steel beams, and all the other products of Pittsburgh's manufactories, and then 10,000,000 tons of coal, the output of Allegheny County mines for a year.

To the outsider, this is the marvel, this almost unbroken succession of smooth-rolling trains. But the initiated know how much greater a marvel is accomplished in the railroad yards. There are 22 of these great receiving, distributing, dispatching centers in the county; 10 immense ones outside the city, 12 within the city boundaries, where their intricate operations are complicated by limited space. Here, with the busy switching engines at it day and night, the long trains are broken apart, cars are classified and reclassified, placed on the tracks of some mill railroad or sent on to a further destination. Here, the "less-than-carload" freight, product of a thousand towns, is assembled and reassembled and sent on to a thousand other towns.



FREIGHT YARDS ALONG THE OHIO CROWDED WITH ORE CARS

Yet the railroads do not exist for freight alone. Spend a day in the Union Station. See the boys and girls early trooping to the city schools from outlying farms and villages; see the keen and eager faces of the commuters, refreshed by a night in the country, strong for the day's work. See the meetings of friends and families all through the day; see the coming of crowds of strange-garbed, wonder-eyed foreigners, to add by their endurance and strength to the power of Pittsburgh, and to gain, perhaps, for their children, some measure of the freedom and chance to live which America means to the happiest of her people. With late afternoon, comes again the long moving throng of commuters,—tired, dingy faced, eager now only to catch the train that will take them back to their wives and children, back to their little green lawns. Finally, at midnight, over there at the entrance, a big motor car whirls in under the lights, some great industrial executive steps out and hurries through to board the late express. Five minutes' conversation tomorrow morning in a certain New York office is of vital importance to his business and will affect the fortunes of thousands.

Thus the railroads serve all, from the humblest to the most exalted, so constantly, so faithfully, that they have become to society what the power of motion is to a human being. Suddenly deprived of them, the nation would lie nerveless and paralyzed.

But our view of the railroads is not complete. We must go to each of the unprotected, four-track, grade crossings in the populous mill towns, Homestead, Braddock, McKeesport, Duquesne,* and hear its tale of confusion, terror, and sudden death. We must go below the hurrying throng of travelers in the Union Station waiting room, to a small rough room far in the basement, where a leather couch waits for its burden, never empty for more than a few hours. We must pass through the railroad wards of the hospitals, see the injured lying there; we must stand at the gate and watch them go out one by one, some with eager eyes, glad to be free but feeble and needing weeks of care to make them well; others pitiful but braced up with defiant pride to meet those commiserating glances the world casts upon a one-armed man or a man with a wooden leg. We must listen to the story of many a

* It is reported that some of these have been protected since this was written.

sad-eyed mother who, in the early evening, sent forth her son laughing and fearless; who wakened in the anxious night to hear the steps of comrades, bringing him home to her, dead. We must know of the brave young widows who rose out of the shock and grief of death to begin a long, up-hill struggle for the support of little children.

It is the best American manhood in its youth and strength that we sacrifice daily in the cause of transportation. Of the 125 railroad men, conductors, brakemen, yardmen, etc., killed in active service in Allegheny County during the year under consideration, 77 were under thirty, and only 13 over forty; 89 were Americans.

Probably the work of a yard brakeman more continuously and inevitably involves risk to life and limb than any other trade, unless it be that of an acrobat, in which risk taking is a part of the commercial end itself. The twelve-hour working day, or night, of a yard brakeman is an almost continuous performance of what would be "feats" of skill and daring to an ordinary man.

Walking the tops of fast moving cars, adjusting couplings, turning switches, jumping off and on moving engines, the brakeman must have a mind intent on his work, the 12 hours through,—an ear alert for whistles and bells, an eye quick to give and receive signals in the language of flags, waving arms, and swinging lanterns. This attention must not lapse if he is to accomplish his work and avoid injury. On ground covered with tracks, he must dodge the switching engines that ply back and forth and also (in all but the largest yards) the occasional through train rushing past. His work goes on in all weathers,—rain, wind, snow, and sleet, —in blazing summer sunlight, and on black December nights.

Frederick Hoffman, statistical expert of the Prudential Life Insurance Company, tells us that among brakemen who die between the ages of fifteen and twenty-four, from 75 to 85 per cent die by accident.* The tables given here show that out of the 120 railroad employes who during the one year met violent death in the course of their work, 38 per cent were brakemen. Among the injured about the same proportion (42 per cent) are brakemen.

* Hoffman, F. L.: Physical and Medical Aspects of Labor and Industry. *Annals American Academy*, May, 1906, Vol. 27.

TABLE 5.—125 MEN KILLED IN RAILROADING, CLASSIFIED BY NATURE OF ACCIDENT AND BY OCCUPATION

Occupation	Aggregate	Nature of Accident								
		Run Over While Working or Walking on Tracks	Wreck	Jolted Off and Run Over	Crushed Between Cars	Fell Under Wheels in Getting On or Off	Struck by Some Object in Passing	Crushed While Working Underneath Cars	Miscellaneous	Unknown
Conductor	8	2	3	..	2	1	..	..	..	..
Engineman	7	..	5	1	..	..	1	..	..	..
Fireman	11	2	6	..	1	1	1	..	..	..
Brakeman	48	8	4	15	5	5	3	..	3	5
Trackman	15	15	..	..	..	..	..	..	..	..
Laborer	14	6	..	..	..	..	..	3	3	2
Miscellaneous	20	5	2	3	..	..	..	..	10	..
Unknown	2	..	..	..	1	..	..	..	1	..
Total	125	38	20	19	9	7	5	3	17	7

Let us consider some of the dangers involved in the brakeman's regular work, as they are indicated by these tables. First there is the duty of setting and releasing brakes. It is for this that he walks along the tops of fast-moving freights with such apparent ease and fearlessness. Table 5 shows that 15 brakemen fell from moving trains or cars, and were run over. Twelve fell from the tops of cars, three from engine foot boards. These last three cases are significant. One man was jolted off the board by a sudden starting of the engine; here was lack of care that proved fatal. One slipped off on a rainy night; here was a risk of the trade. One fell under the wheels of the engine because the footboard broke; here was lack of inspection.*

* This was a Pennsylvania Railroad case. The man killed told his father on his deathbed that the footboard broke. The father made a sworn statement of this in the proof of identity record. At the inquest, however, the father was not called upon. Two others who were on the footboard but cleared the track in falling, were not called as witnesses. The verdict was "accidental."

Among the 12 cases of men who fell from the top of a car, there are five which no one could explain. There was only the statement of some fellow workman that the brakeman must have slipped or stumbled and fallen between the moving cars. One man lost his balance while he was setting a brake, because the brake-chain broke. This kind of accident is said to be not uncommon. Often the brake-wheel or the brake-staff proves defective, and means death to a brakeman. Possibly some car inspector is responsible for such a condition. Constant inspection of rolling stock is impracticable in busy times when the demands of commerce are greatest.

The work in the yards is the classifying and distributing of cars. There are three ways of doing this, "poling," "flat-shifting" and "hump-shifting." "Poling" is an old fashioned way of shifting cars by means of a long iron bar or "poler" extending diagonally from a switching engine. The engine travels on a track at the side and shoves the cars along ahead of it. One man on our list, who was struck by a "poler," hung on and was carried some distance before he fell. He died an hour after reaching the hospital; the poler had caught him just under the heart. This method of shifting cars is considered very dangerous, and for this and other reasons is being abandoned.

In "flat-shifting," an engine comes up behind the draft of cars to be moved and gives it a shove, or a "kick," as it is called. The force of this "kick" carries the cars along until they reach the switch that has been left open for them. "Hump-shifting," though very much like this, will be described in some detail since it involves special danger to the brakeman.

There is in every large railroad yard a place called the "hump," or the "knuckle." It is a gradual rise of ground over which a "lead" track runs. A yard engine pushes a "cut" or "draft" of cars up one side of this little hill, and at the top the cars are "cut off" from the engine and allowed to roll down the other side. Many tracks turn off from the main "lead" track. There is a switch-tender on the ground with a list of the cars or drafts in their order and the number of the track to which they are consigned. He fixes the switch, and the cut of cars, rolling by the force of gravity rapidly down the "hump," turns

off on a certain track and travels along until it reaches its destination. This seems a simple and ingenious as well as economical device for getting cars where they are wanted, but it causes more deaths than any other class of railroad yard work.

A brakeman must of course ride each draft of cars as it is cut off. The cars are going fast, sometimes 15 miles an hour, though they average about 10 miles. They must start with force enough to carry them where they are wanted and to make them couple on to other cars on the same side-track. The brakeman's business is to accomplish the coupling. He must put on the brakes and slow the cars down to avoid their bumping too hard, but he must not slow them down too soon or there will not be force enough to make the coupling. It takes experience and skill to ride cars over the hump, and it takes "nerve." The men admit that they do not like to do it. One of them said to a young college-graduate engineer who offered to try it, "Don't you do it, Sonny. It looks all smooth and easy from here, but it isn't when you get on top."

Great pressure of work and consequent haste in distributing cars more than doubles the dangers of the "hump." A yard master explained it to me in this way:

"The trouble is that they get cutting the cars off too fast. For instance, suppose one man is taking down a draft of partly empty cars. He gets started, and then a draft of very heavy cars,—say nine of them,—is cut off back of him. They go much faster than his cars and are likely to catch him before he gets off the lead track. The brakeman on the draft behind often can't stop his cars in time, if they get to going too fast. If he can't, and they bump hard, it's all up with the first brakeman."

"Isn't there some way of avoiding that?" I asked.

"Of course if there were two brakemen sent out on a draft of cars, there'd be twice as much chance of stopping them, but the general rule is not to have two brakemen for less than ten cars. Then too, they ought not to cut them off so fast at the top."

Six of the brakemen included in the table were killed in "hump-shifting." For three of them there is not much of a story to tell: one slipped and fell off while riding his "cut" down; one lost his balance while putting on brakes; one was jolted off

when the cars bumped at the bottom. In the other three cases the evidence is full, and points clearly to possible prevention. There was an over-hasty "cutter," who sent down three drafts in too rapid succession. The first draft had not cleared the lead track in time for the next. The second brakeman, seeing this, put on his brakes to save the man ahead of him from a bump which might mean death. Meanwhile the third draft was coming down, and, before it could be stopped, bumped into the second, which had thus unexpectedly slowed up. The brakeman on the second cut met the very death from which he had saved the man in front. He was knocked off, run over, and killed.

A defective coupler meant death to a second brakeman. He was riding two cars down the hump. The first car of the "cut" behind him separated, owing to a bad coupling, and rolled down rapidly after his two cars. He was just climbing up the ladder of his rear car and reaching for the grab iron, when the loose car behind bumped and broke his hold. He fell face down on the track, and the wheels of two cars went over him.*

In the last of these six "hump" cases, defective cars and too rapid "cutting" combined with the inexperience of the brakeman to cause his death. Robert Holmes, a boy of eighteen, spent the first and last night of his railroading on the hump. He had asked for other work, but because it was Decoration Day and many men were off duty, he was told to go ahead. He rode one "cut" without mishap. On his second trip there was a cut of two cars pretty close behind him. Williams, the brakeman in charge of it, saw that he was going too fast, and tried to stop his cars. One he found had no brake; he ran to the other and was putting on the brake when the chain broke. He could only watch his cars go crashing into the one ahead. The boy was standing on the front of his car; the crash threw him face down across the track and the wheels went over him.†

Among these 15 fatal accidents, four at least might have been

* This happened in the McKee's Rocks yard of the Pittsburgh & Lake Erie Railroad. The master mechanic in this yard told me there was no reason why defective cars should be sent over the knuckle.

† This was a Pennsylvania Railroad case. A yard master on the same road told me that a new man ought never to be put on the hump at night,—the fact that the force was short was no excuse for it.

avoided. The rotten engine footboard, the imperfect brake chain, the defective coupler, the car without a brake sent over the "knuckle,"*—these are not inevitable conditions of transportation. Even if 11 of these deaths were a necessary sacrifice to the speed and efficiency of our railroads, it is none the less worth while to consider how the other four might have been avoided. Just where these fatal defects should have been discovered and repaired, only the railroad management can tell us.

Next to braking, the best known duty of brakemen is coupling cars. Since the Federal Safety Appliance Act of 1893, requiring automatic couplers, the number of accidents in coupling has been much reduced.† With the old chain coupling, men often had to run along between the ends of moving cars, in order to adjust the pin. By the act of 1893, however, it is unlawful for any railroad company "to haul or permit to be hauled or used on its line any car used in moving interstate traffic, not equipped with couplers coupling automatically, by impact, and which can be coupled without the necessity of men going between the ends of the cars." With these automatic couplers in good working order, it is never necessary to get caught between the ends of cars. The brakeman can raise the lock pin and open the knuckle and then stand aside while the cars couple.

Why then were there nine men killed in the act of coupling cars during one year in one county of Pennsylvania? Some, undoubtedly, because of their own haste and recklessness. If the cars do not "couple on" the first time they come together, not one out of ten brakemen, railroaders say, will take time to signal the engineer, wait for the cars to pull apart, readjust the knuckle and pin, signal the engineer again, and stand aside while the coupling is made. If a coupling doesn't work the first time, nine out of ten brakemen will go in between the cars and try to make it work. Thus sometimes they are injured or killed. At least three of the nine men thus killed, however, were obliged to go between the

* The same Pennsylvania Railroad yard master told me that brakemen are supposed to try the brakes before they start over the hump, but that they do not do it and are not disciplined unless there have been a number of accidents to men or equipment.

† See Appendix IX, for figures showing just how much the requirement of automatic couplers has reduced accidents to trainmen.

cars—two because the automatic coupler was broken or out of order, and another because he was making a chain coupling on shop cars. Also, it must be remembered that this law covers only those cars used in interstate traffic. There is no such requirement to be found in the statutes of Pennsylvania. Five of these nine coupling accidents occurred on steel company railroads, whose traffic is largely intra-state, and whose cars are by no means all equipped with automatic couplers.

The third division of the brakeman's duties is turning switches and flagging. This work has its dangers, too, for the brakeman is all the time dealing with a moving engine; either he is jumping on or off, or he is just a few feet ahead of it. There is the risk of stumbling in front of the coming wheels, and the risk of missing the step in getting on. Accidents of these two kinds have been included in the fifth column of the tabulation. Seven men were killed in this way. The example most commonly used to show a brakeman's recklessness is his custom of standing in the middle of the track to board a yard engine that is coming toward him. Although rules are often posted forbidding this, they are universally disregarded. Most railroaders would agree with the brakeman who said to me:

"You see, getting on in front your foot touches the footboard first, so if you slip there is no chance of saving yourself. Getting on at the side you take hold of the grab iron first, so if your foot slips there is some chance of hanging on. Yet I always get on in front myself. We all do. It's easy and simple. There is a kind of fascination about it. You win or you lose. It's a gamble. And then, it's not professional to get on at the side. No good railroader does it."

As a matter of fact, not very many men are killed in this way. If you watch them do it, you will see why. Their muscles and eyes are trained to it; it is as easy for them as going upstairs. Of the seven fatal accidents considered in this group, four might possibly have been avoided by getting on at the side; in one case it was snowing and the footboard was slippery; in the others there is no evidence except that the brakeman fell under the wheels as he tried to get on.

In the other three cases of this group, the cause of death was quite different. One man had been a switchman or yard brakeman

FREIGHT YARDS AT NIGHT

Photo by Hine

for fifteen years. He had just gone to work in the yard one dark November night. He jumped off the front footboard of his engine and ran ahead to turn the switch for the engine to go and get water. After the engine passed him he stood on the track, waiting for it to come back and ready to step up on the rear footboard and reach for the grab iron above. (According to the Federal law, all *yard* engines must be equipped with footboard and grab iron at each end.) The brakeman waited in the dark until the engine came to him, then stepped up for the footboard and reached out for the grab iron. There was no footboard and no grab iron, and the engine rolled over him. A *road* engine with step and grab iron only at one end, had been sent out for yardwork and no notice had been given to the brakeman.

One brakeman caught his foot in an unblocked frog; another stumbled over a piece of iron sticking in the guard rail. Each was run over by his own engine, which he had signaled to come ahead. Unblocked frogs are very common in Pennsylvania. There is no law requiring them to be blocked. While I was walking with a claim agent through the yards of one of the interstate railroads which prides itself on its perfect equipment, he drew my attention, with pride, to the way the frogs and switches were blocked, although the law does not require it. A number which were unblocked and many where the block was broken and useless were pointed out to him. "Well," he said, "I can tell you, you wouldn't find anything like that in Ohio." In Ohio since 1889 "all angles in frogs, switches and crossings in all yards, division and terminal stations, where trains are made up, must be blocked with the best known sheet steel spring guard or wrought iron appliances, approved by the commission of railroads and building." Pennsylvania is nineteen years behind Ohio in this matter of safety to railroad men. Yet a complacent railroad attorney in an address to The Railway Club of Pittsburgh stated that "Those details in the safeguarding of machinery or places of work which the employer perchance overlooks, are jealously safeguarded and enjoined upon him by a vigilant state and nation."

Leaving now the brakeman's special risks, and including all railroad employes, we find that the commonest fatal accident is that in which a man is run over while standing or walking on

the tracks. Thirty-eight were killed in this way, including brakemen, firemen, conductors, and, in especially large numbers, track walkers, section men and laborers. With the regular railroad men these accidents happen in the confusion of the yards, usually at night. Sometimes the warning whistle or bell fails; sometimes there is carelessness on the part of the man killed,—an indifference to danger that comes from long association with it. The trackmen who are run over are usually foreigners, and the same story is repeated over and over again: a hasty confused attempt to get out of the way of a train,—the fast express coming in the opposite direction,—the second whistle heard too late,—and one more "Dago" gone. Three men, however, were run down by fast trains coming upon them absolutely without warning, while they were at work on their knees between the tracks.

Cramped work places account for many factory accidents, but one does not think of railroad accidents as caused by crowding. Yet five of the 125 deaths were due to a blow from some object situated dangerously close to the track. An engineer while looking out of his cab window was struck in the head and killed by a projecting brace; a fireman, looking out of the cab window, was struck by a steel hopper car on the next track and killed. Those who must board moving trains at the side, in places where tracks are laid close together, are open to the similar danger of being struck and perhaps knocked off by some projecting part of a passing train before they have pulled themselves up clear. Two brakemen met death in this way. Another brakeman, in crossing a bridge at night, was struck in the head by a piece of scaffolding left by the bridge repairers. One death occurred because the platform of a coal tipple was built out too close to the track. Such a platform is needed to keep the coal from falling to the ground and also for the men who rake it down to stand on. For the safety of brakemen, especially at night, it should be 18 inches from the track, or else adjustable so that it can be raised when the coal chute is not in use. It is the duty of the coal company, however, not the railroad, to look after this.

Limited space sometimes makes it necessary to lay tracks

too close for safety. But with regard to preventing those accidents which occur because platforms, signal posts, mail cranes, etc., are placed too close to the track, there can be only two considerations: (1) How far away can they be placed and yet be practically useful in operating the road? (2) How near can they be placed and yet be practically harmless to the men who operate the road? It is not unheard of for legislatures to take up such questions. In 1905 a law went into effect in Ohio declaring unlawful "all mail cranes or livestock chutes which should be built so as to approach nearer than eighteen inches to the nearest point of contact with the cab of the widest locomotive in use or to be used on any railroad." This law was for the special protection of firemen and engineers. There was none like it in Pennsylvania in 1908.

In all kinds of railroad work, of course, signaling systems are of the utmost importance in securing safety, but such as depend upon individuals for successful operation must often fail. Two deaths in our list, however, were due to total lack of provision for warning men in defenceless positions. The gondola cars used for carrying coal, coke, ore, and limestone are so made as to unload mechanically by a trap which opens in the bottom of the car. Part of the load usually sticks to the cars and regular car cleaners are employed to get them ready for use again. These work sometimes in the bottom of the car, and sometimes underneath it. In either case they cannot possibly look out for danger and are in a defenceless position, unless a watchman is placed to see that no engine or car comes in on the siding on which the cars are standing, or unless a complete signaling arrangement is used. On the Pennsylvania Railroad repair tracks men are protected by a small blue flag (lantern at night) which may be removed by the car-repairer only. Even a conductor who removed one was disciplined. In the Edgar Thomson yards at Braddock a blue flag is put up in the middle of the yards while cars are being emptied and cleaned. No engine may come in while the flag is there, and it must not be taken down until the men are all out from under the cars.

Such an arrangement is simple and absolutely essential to the safety of the men working under the cars. Yet two car

cleaners were killed because there was no signal system to protect them. Each was employed by a coal company railroad, and was crushed while working under a car which stood on a siding. An engine or another car ran in on the siding without warning, and bumped the car under which the cleaner was working. In one case the brakeman testified that the only rule he knew anything about was, "It's every man's business to look out for himself." In the other case the superintendent said that he "didn't know whose duty it was to warn men under the cars, but he could see that some one might do it."

These two car cleaners were foreigners. A similar death came to an American boy in the Pitcairn shops, who was under an engine, cleaning the ashpan. In this case, however, it is not clear that the accident was due to an inadequate system of warning.

Besides the classes of accidents considered here, there were a number of exceptional accidents during the year in work connected with the railways. For instance, a gasoline pumping engine exploded and killed the pumper; a boy in the Pittsburgh and Lake Erie shops was caught in a belt and carried round the shaft; two signal repair men died from electric shock and a fall; one brakeman, while making a coupling on a trestle one stormy night, slipped and fell through; a bridge carpenter, sixty years old, was knocked off a bridge by an engine, because the boss carpenter, whose duty it was to warn all trains, had taken down the caution signal too soon and failed to warn the train in any other way. Fatal accidents like these are not uncommon.

Among the 17 miscellaneous cases, three will illustrate what is called the "carelessness of the man hurt." A drunken brakeman slipped, in getting off his train, and fell under the wheels,—one of the two cases of intoxication found among the railroad accidents. A flagman ventured needlessly to run between two cars to give a signal; they came together and crushed him. A young Italian laborer, who had come to America fifteen days before, and who had worked on the railroad just three days, was going out with the boss and two others on a hand-car. He heard a whistle and, looking up, saw a train coming toward the hand car very fast. It was actually a half mile away, but the Italian, in a sudden desperate fear and confusion, lost all reason and jumped

Photo by Hine

RAILROAD YARDS NEAR MILLS

off right in front of the hand car, so that its wheels ran over him before the men could stop it.

Each of these three cases would be put down in the average record as "due to his own carelessness,"—and yet they represent three totally different kinds of human weakness. The "carelessness" of the brakeman who came to his work intoxicated might be the dull indifference of a degenerate; the "carelessness" of the flagman who "took a chance on getting through," is a kind of daring common to all young men who amount to anything, accentuated by daily association with danger; while the "carelessness" of the unfortunate Italian is the pitiful insane terror of ignorance. Yet most employers include all these under that conveniently vague and expansive term, and say, "What can we do in the face of such carelessness?" But to the employer intelligently determined to reduce the number of industrial accidents, these three kinds of carelessness would suggest totally different lines of attack. (1) Can discipline among employes be made more searching and effective? (2) Is there anything in yard management, any tendency to over-emphasize dispatch and efficiency in the handling of cars, which tends to encourage and develop rather than lessen that natural recklessness in the men that do our work? (3) Have we any right to put foreign laborers directly into positions where their ignorance and inexperience will mean death to them in large numbers, even when it is to the economic advantage of both parties to use them in this way?

The consideration of wrecks* has been purposely left to the last, in order to present first a consecutive view of the risks of railroading when trains run without disaster. Twenty railroaders in our list met death in wrecks. As might be expected, the engineer and fireman who are comparatively free from the other risks, more than any other class are exposed to this danger. There were thirteen wrecks in all, a number of them causing two deaths, and one three. The evidence in all but four cases was comparatively clear, and the stories are worth considering in some detail.

To begin with the smaller wrecks, there were three slight

* Any collision or other train disaster severe enough to injure or kill a man has been included among "wrecks."

collisions in which an old "weak" car* gave way. In each case a conductor or brakeman happened to be standing on the end sill of the bad car, and was killed. To this group may be added the case of an engineer killed by his engine overturning at a curve in the track where the rails spread.

In only one wreck did the evidence point to a fault of the victim. He was conductor of a freight train of thirty cars on a little coal road called the Moon Run Branch. The engineer found the train getting too much headway and whistled for brakes. The seventh car had a defective brake and the train could not be stopped. Engineer and brakeman jumped and saved their lives; but the conductor stuck to the train. When the engine jumped a trestle and fell into a creek thirty feet below, he fell with it. Two men testified that this conductor knew of the defective brake and could have "removed" the car, and it was also said that he seemed to be under the influence of liquor when he boarded the train. Further inquiry, on the other hand, brought out the fact that he was a steady man who had occupied his position nine years. During the twelve months following, his place was filled by five different men. His family called attention also to the fact that he was sticking to the train and trying to set the brake on the seventh car when he was thrown, which would argue that he did not know it was broken. Responsibility for the condition of cars taken out, moreover, on most railroads lies with the conductor only in the most general way.

Fellow workmen were to blame in two wrecks. In one collision two firemen were killed on account of the negligence of a telegraph operator, who gave two trains the signal to go ahead on the same track. In another collision two brakemen were killed, on account of the negligence of the fireman and engineer.†

Two wrecks remain to be described, each of which suggests a serious criticism of road management. McCord and Andrews

* Two of these old cars were being used on the Pennsylvania Railroad, one on the Baltimore and Ohio.

† These are the two cases out of the year's industrial accidents in which the coroner's jury so far departed from its verdict of "accidental" as to recommend apprehending and holding the negligent parties for the Grand Jury, but nothing came of it. The telegraph operator disappeared; the fireman and engineer were acquitted.

were engineer and fireman, respectively, for the Carnegie Steel Company on the Union Railroad. On the evening of January 16, 1907, just before quitting time, they were sent for coal with a train from the Twenty-ninth Street mill to the junction yards. The Carnegie Steel Company has a contract to use a single track of the Baltimore and Ohio Railroad Company running close to the river underneath the Thirty-third Street bridge. McCord's engine collided with a Baltimore and Ohio engine coming toward him. McCord was scalded to death by steam; Andrews was thrown on to the river bank and fatally injured. The cause of the wreck was the steam which escaped from an exhaust pipe of the Carbon Steel Company on the river bank, obscuring the view for 150 feet along this single track. The trains were going slowly enough to stop if the engineers had been able to see ahead. This condition had existed for ten months, although two men at least had complained of the danger. The day after the wreck, the exhaust pipe was moved.

Three parties, it appears, were to blame here: The Carbon Steel Company primarily, for maintaining a dangerous nuisance; the Baltimore and Ohio Railroad Company for both running trains there and allowing another company to run trains there by contract while the nuisance continued; and the Carnegie Steel Company, employer of the men killed, for using another's road when in a dangerous condition, thereby sending its own men into danger.

On the night of March 13, 1907, a Pennsylvania Railroad engineer named Mikesell, was taking a heavy freight across a bridge at Deer Creek, Harmarsville. The creek was high and the pier gave way. The engine and the first cars went crashing into the water below carrying engineer, fireman, and brakeman to death. More than 15 men testified in the inquest on this case. Man after man testified that the foundations of that pier were altogether unfit for the weight put upon them, that they were built long ago when traffic was light, and for years had been inadequate. There seemed to be no difference of opinion about this. The only dispute was among different officials of the railroad company's inspecting department as to where lay the responsibility for the unsound pier.

Not one of these nine wrecks, of which we know the cause, was due to what is called in law an "act of God;" all could have been humanly avoided. The telegraph operator, the engineer and fireman, so far as we know, need not have been careless. The three old "weak" cars could have been removed from service. The car with a defective brake could have been held in the shop for repairs. A careful track foreman or section foreman would have mended the bad place in the track where the rails spread, before the engineer was killed. Adequate road supervision would not have allowed 150 feet of single track to be obscured by steam for ten months. An inspection department, even moderately efficient, would not have waited for the death of three men to bring to light the shallow foundations of the Deer Creek Bridge pier.

Looking back over these railroad accidents, we can draw a few conclusions. In the first place railroading is of necessity a dangerous occupation. In it, even with the most perfect equipment, human and mechanical, men will be injured and killed. With the equipment as it is, however, such risks are vastly increased. Confusion and awkwardness increase the risk of the inexperienced; habitual recklessness increases the risk of the experienced, in whom ease and skill in avoiding danger have developed at the expense of caution and fear. Faulty mechanical equipment, usually due to inadequate inspection, increases the risk of all. Back of all is the pressure for speed in handling the fast-increasing tonnage. The public demands it, and the whole railroad, from the president down to the yard brakeman, feels the demand. There can be no doubt that this accounts for much indifferent inspection, and for much of what is called carelessness.

Finally, the long hours of work in railroading have an important bearing on the accident problem. On this point it is worth while to quote a yard master from whom many things were learned.

"Is there any tendency on the part of the railroad management to emphasize speed and accomplishment at the expense of safety?" I had asked.

"Yes," he replied. "To tell the truth, the railroad company,

like every other business, is trying to get a little more out of a man than there is in him. There is less of this in the train service department than there is in the motive power and repair departments. Eighteen months ago every man in our yard and shops was working up to his limit making every minute count."

"What can be done about it?"

"Under present conditions," he continued, "they can't employ more men, that's certain. All the men that can work in a department are already employed. But the situation could be relieved greatly by giving the men much shorter hours, so they could work at this intense rate without becoming careless toward the end. It is almost always when a man has worked a long time that he gets careless. Up to last year it was not at all uncommon for a man to be called out to work 24 or 36 hours at a stretch. Now they've passed a law making 16 hours the limit for a railroad man. Yard men now usually work 12 hours, but when the yards are pressed they often work the brakemen the 16-hour limit. And when a man works 16 hours at a stretch it often means that he has been awake 18 or 20 hours, because there is a rule that a man must be called two and a half hours before he goes on duty. Shorter hours—an eight-hour day for all railroaders,—is about the most important thing I can think of to reduce the number of accidents."

CHAPTER III

THE SOFT-COAL MINERS

"NAOMI," "Monongah," "Jacobs Creek"—these names recall to a Western Pennsylvanian the sudden shock of terrible news, the recent horror of a mine explosion, long columns of gruesome details, street corner arguments about responsibility, schemes of relief for widows and orphans, etc. Such catastrophes rouse the attention of the public by their magnitude. But suppose one man shoveling coal in some small "room" far within a mine suddenly lies buried under a ton or two of slate,—this causes no comment in a mining community. The sound of such stories is dulled to the ears of the public by monotonous repetition. Indeed, few of these common mining accidents reach the newspapers. The victim is usually some obscure foreigner, living in a squalid mining village; the circumstances of the accident are not dramatic; it is a common occurrence. Newspapers cannot afford to print the same item again and again unless it is paid for as an advertisement.

The following telephone conversation, one end of which the writer overheard at the Coroner's office in Pittsburgh, is significant. A reporter called up the office for a story:

REPORTER:- - - - - - - - - ?

CORONER'S DEPUTY: "No, we haven't got anything for you today, Jim.——Well,—hold on.——There's a man killed by a fall of slate out at Thom's Run. You don't want that, do you?"

REPORTER:- - - - - - .

CORONER'S DEPUTY: "That's what I thought. No, there ain't anything else. So long."

During the year selected for this study of accidents (July 1906,-July, 1907) there were no mine explosions in Allegheny County although in the following December, over 200 lives were lost in the single disaster at Jacob's Creek. This absence of ex-

plosions in the year's mining catastrophes is fortunate for our purpose; it allows us to focus our attention on the everyday risks of the miner.

TABLE 6.—71 MEN KILLED IN MINING, CLASSIFIED BY PLACE WHERE ACCIDENT OCCURRED AND BY NATURE OF ACCIDENT*

Place Where Accident Occurred	*Aggregate*	Nature of Accident				
		Fall of Roof	*Operation of Trains*	*Electric Shock*	*Explosion of Powder*	*Miscellaneous Causes*
In "room"	45	43	..	2	..	..
In passage	20	5	9	3	..	3
In shaft	2	..	..	..	..	2
Outside mine	1	..	..	1	..	..
In miner's home	3	..	..	..	3	..
Total	71	48	9	6	3	5

The circumstances of ordinary mining accidents are comparatively simple and easy to understand. As the table indicates, 48 out of 71, or 67 per cent, of these deaths were due to a fall of slate or rock from the roof of the mine. On account of the absence of explosions, this percentage is somewhat high, but in 1906, 50 per cent of the coal mine fatalities in the United States were due to such falls of roof.† Common sense would suggest this as a danger in working mines. Sometimes what is called a "horse-back" falls, —a peculiarly shaped intrusive piece of rock or very hard slate which can, as a rule, be detected and taken down in time to prevent accident. But the usual thing is a fall of ordinary soft slate, more difficult to guard against. In modern mining where cutting machines and explosives are used there is much more danger of

* No table is offered of men injured in mining. There are few mining cases on the hospital records, largely because the mines are situated so far from the hospitals that the injured men are usually cared for in their homes by the local doctor. In all but two of the 12 injury cases in mining which were investigated, the accident was due to a fall of roof.

† Bulletin No. 333, Department of the Interior, U. S. Geological Survey.

falls of slate than where coal is mined in the old way with picks. Today in most mines the coal in each working room is undercut; that is, the coal at the bottom of the seam is sawed through horizontally to a depth of about five feet by a machine operated by electricity or compressed air, and the coal above is then blasted down. After this the miner and his helper shovel the coal into small cars, which are hauled by mules from the room along the butt entry to the main entry. There the cars from the different rooms are assembled in a train and hauled out of the mine.

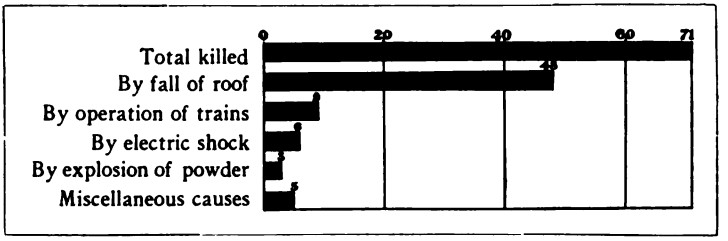
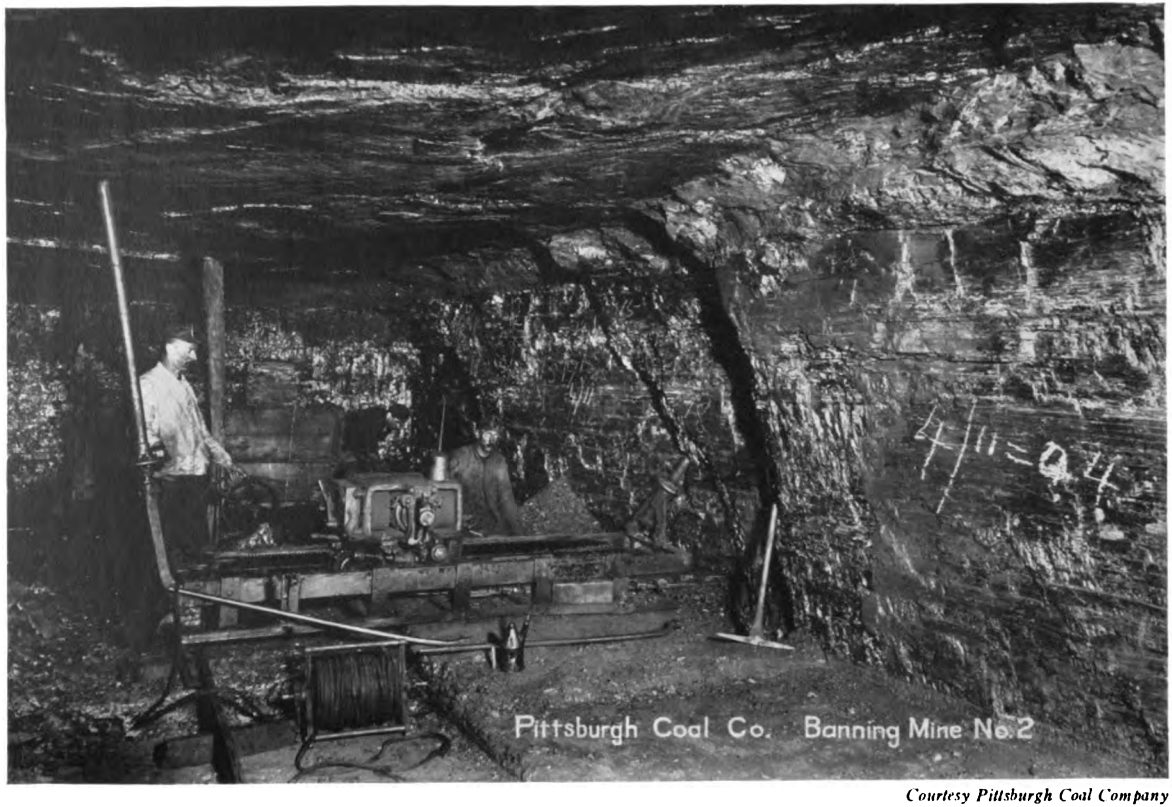


DIAGRAM 3.—71 MEN KILLED IN MINING, CLASSIFIED BY NATURE OF THE ACCIDENT

This frequent blasting naturally tends to loosen the roof and cause the slate to fall. To avert this danger, the miner props up the roof by placing timbers at frequent intervals (usually seven feet apart) and wedges in "cap-pieces" on top of these posts, to cover as many square inches of roof as possible. Further, he must keep watch for cracks, sound the roof often, and take down the dangerous pieces of slate before they fall. Thus a skilful and experienced miner can usually avoid danger. But sometimes the slate falls unexpectedly, even after every precaution has been taken.

The dangers of falling slate are recognized and provided against with some detail in the Pennsylvania mining law. To begin with, it is the duty of the mine foreman (who must have had five years' practical experience and have passed a state examination) to visit and examine each working place in the mine every other day, to "often instruct, and as far as possible, see that as the miners advance their excavations, all dangerous coal, slate and rock overhead are taken down or carefully secured against falling therein, or on the traveling hauling ways," and to see that



Courtesy Pittsburgh Coal Company

CUTTING COAL IN A MODERN MINE BY ELECTRIC CHAIN MACHINE

sufficient props of suitable size are delivered in the working places of the mine when required. Further, he must provide a book or sheet in some convenient place, on which the miners may write the number and size of props and cap-pieces and other timbers they need, together with the date of the order.

The law sets forth also the duties of the miner in this connection. He must examine his roof before beginning to work, after any stoppage of work during a shift, and after every blast. He must "take down all dangerous slate or otherwise make it safe by properly timbering the same before commencing to dig or load coal." He is required also to give his order for timbers at least a day in advance, but "in cases of emergency the timbers may be ordered immediately on the discovery of any danger." If, however, from any cause the working place cannot be made safe it is the miner's duty to leave, put up a danger sign, and notify the foreman.

In mines generating explosive gas or fire damp, a fire boss must be employed and must make a thorough examination of all parts of the mine before every shift. In such mines therefore the duty of regular inspection, placing danger signs, and marking rooms where posts are needed, usually devolves upon him, while the mine foreman has the general duties of supervision and instruction.

Such are the chief provisions of the bituminous mining law with regard to accidents from falling rock, slate and coal. To sum them up: regular and frequent inspection, instruction, and the prompt furnishing of proper materials are required of the foreman; constant watchfulness, prompt ordering and proper use of materials for safety are required of the miner.

Can anything be learned from the cases about the operation of this law? Twenty-two of the 48 deaths due to a fall of roof were, according to the evidence obtained, unavoidable. In the inquests on these 22 cases both foreman and fellow workmen testified that inspection had been made at the proper time, that plenty of timbers were on hand, and that they had been properly used. In three or four of these cases, a miner was crushed while in the act of taking down slate to prevent accident. Miners do this by putting a pick under the slate to the far side and then

pulling; as the slate falls they jump back. Skill and experience make this usually a perfectly safe operation, but of course a man may stumble and not get away in time.

In 14 cases such testimony as was given pointed to the carelessness of the miner killed. In certain records this testimony was convincing, going to show that the foreman had warned the deceased to use more posts and that he had not heeded the warning. But in most of the 14 records, there was merely the statement from a foreman (sometimes from a fellow workman also) that "he had visited the room after the accident, and thought from the look of things that if deceased had used one more post, he might have prevented the accident."

This kind of carelessness in miners is of a somewhat different nature from the love of risk developed in the typical railroader. It is a natural impatience at delay, an unwillingness to stop for anything that will interfere even temporarily with accomplishment,— a weakness perfectly familiar to those who have done manual work. A mine superintendent explained it in this way: "Suppose a man has his car almost full twenty minutes before quitting time,—a few more shovelsful will fill it. But he has come to a place where another post is required according to the regularly accepted distance, and it will take him fifteen or twenty minutes to set a post. He takes his pick, sounds up above, and says, 'Well, that sounds pretty good, I guess it'll hold.' And so he goes ahead to fill his car. Then as he is digging out the coal for his last shovelful, perhaps, a big chunk of the roof falls. His leg is broken, or he has a bad scalp wound, or if it is a heavy fall, he is taken out dead.—It seems as if they just hate to stop, and want to even things up at the end of the day."

Miners are paid by the ton and there can be no doubt that this prevailing human tendency to put off an interruption of work, is often accentuated by their eagerness to get out a big tonnage.

Six of the men killed by a fall of slate were "greeners;" namely, inexperienced miners. In two of these cases, a careless partner had not posted the roof well. In the other four cases, a foreman was at fault for allowing a "greener" to work in a room by himself, or with another as ignorant as he. A man must have considerable mining experience in order to know the signs of

danger, and for this reason a careful foreman always puts a "greener" at work in a room with an experienced miner.

In one case the slate fell in a room which had not been inspected for four days. Two men were killed by a fall of slate, not in a room, but in one of the galleries, for whose safe condition foreman and fire boss are altogether responsible. Testimony from fellow workmen in one of these cases, brought out the fact that the slate which fell had been hanging dangerously for some time, that the fire boss had been informed and had not had it taken down. In two cases posts were lacking, fellow-workmen of one man killed stating that he had asked for posts two days before and had not received them. This completes the list.

It is hard to get at the truth in this matter of ordering and delivering timbers. Miners and foremen are human; there must be friction and failure on both sides in such a matter. Foreman and fire boss are required at once to inspect a room where an accident has occurred, and, if death results, one of them is always summoned to the inquest. He almost invariably testifies, "I found plenty of posts in the room." Since it is his business by law to see that there are plenty of posts in the room, and since the inquest is a very casual, unimpressive performance, he could hardly be expected to testify otherwise. Private conversation with miners sometimes brings other information to light. An Italian, who had worked for years in the mines of this region, told one of the investigators that often miners do not get timbers for several days after they ask for them. An old Scotch miner of sixty, said that he asked for posts once and was told by the pit boss (foreman), an Irishman, "If you want any more posts you can go and cut 'em yourself." The Scotchman, unwilling thus to lessen his earnings for the day, went on working without the necessary posts. This man also said that he had often seen the foreman and boss hurry to a room where an accident had happened and fill it with posts, so that when the inspector arrived there would obviously be plenty of posts on hand.

Coming to the next largest group of fatalities, the record shows that nine men were killed as a result of the operation of trains of cars, or "trips" as they are called. There are three ways of hauling these trips, and each has its risks. The oldest way is

to use mules. There is a good deal of danger for the driver in using mules. He squats down on the tongue very close to their heels. They are often stubborn and unmanageable. Sometimes they jump to the wrong side of the track and cause a wreck, or they run away and cause a collision. Three of the nine men were mule drivers. One got down to turn a switch, his light went out, and he was knocked down by the mules and run over. The second was driving two teams of mules and having trouble with them. No one could say exactly how he was killed, but according to testimony in the case, he had complained several times to the foreman that one of his mules was unmanageable. The third mule driver was walking along beside his loaded train, and the mules, by jumping to the wrong side, threw four cars off the track. He was crushed against the side of the entry.

Another method is to fasten all the cars to a rope and haul them out of the mine by means of an engine outside. The man who rides on the train is called a "trip rider" or "trip runner." He must see that the cars are coupled before starting, and watch out for danger on the trip. This is a rather primitive method. In order to stop the cars the trip rider must get off and signal to the engineer outside by means of electric wires at the side of the entry. Often the signal is not received in time to avert danger. The more modern method of hauling is by an electric motor, with an engineer and brakeman on each trip.

In all these ways of hauling there is considerable danger of cars leaving the track. With heavy cars, small wheels, narrow tracks, and many sharp curves this can not be avoided. When a car does run off or get stuck, the cars behind it pile up badly, because the place is so narrow. Three of the nine men were killed in a wreck or collision of cars. In one case there was no trip rider; in the second a defective car caught upon another car in passing; in the third there was a defective brake.

Because of the danger in operating these trains, mining companies usually make it a rule that none but the men engaged in running the trip shall ride it.* As one superintendent explained, "We are not pretending to run cars for passengers; we are running

* One of the nine in this group, riding a trip contrary to rule, was jolted off and killed.

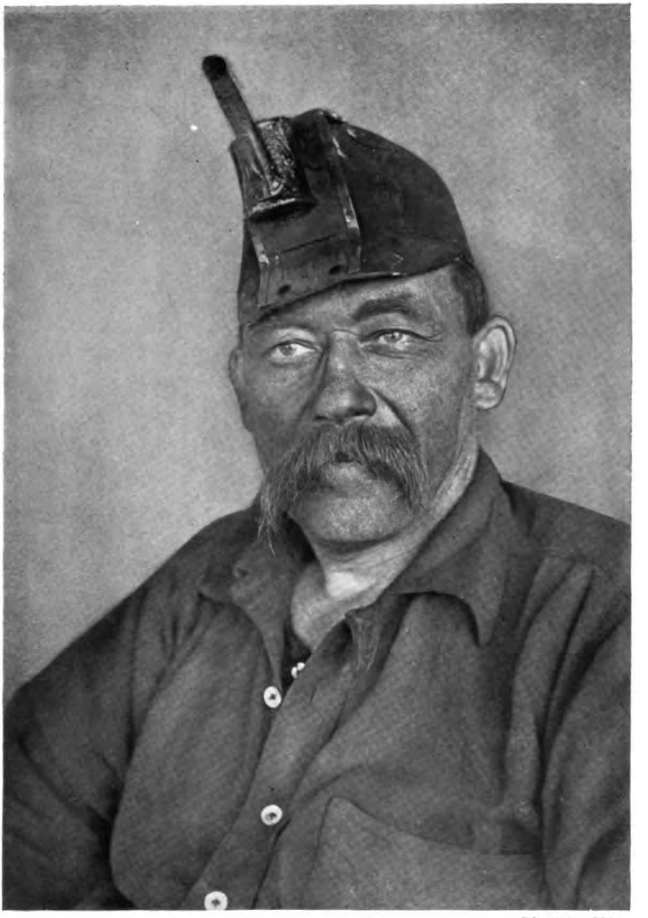


Photo by Hine

AN ENGLISH-SPEAKING MINER

them to get coal out." Such a statement leaves no room for doubt as to the risks incurred by the men who operate the trips. The mining law itself forbids all except drivers and trip runners to ride on full cars, and on empty trips where the speed exceeds six miles an hour.

But the miners do not escape all dangers from these trains by keeping off them. Not infrequently a miner who is walking to or from his work along the entry, is caught by a train in a place where there is not clearance for a man between the track and the wall. He is crushed against the wall in an effort to escape the train. Two of the nine men in this group were thus killed. Such accidents suggest practical questions: How wide is the entry? Are the miners obliged to walk in it? etc.

First, in regard to the Pennsylvania mining law: Section 4 provides that in all entries where hauling is done by animal power, there must be white-washed manholes every thirty yards, unless there is a space four feet wide between wagon and "rib" (namely wall or side of entry). In entries where the hauling is done by machinery, and in which persons employed in the mine must travel on foot to and from their work, these shelter holes must be not more than fifteen yards apart, unless there is a space six feet wide between car and rib. The law further provides in Rule 47 that no person shall be allowed to travel on foot to or from his work on any such hauling road, "when other good roads are provided for that purpose."

These provisions seem to cover the whole situation, but they do not. In the first place there is an exception; the requirements for locomotive hauling roads apply only to those "on which persons employed in the mine must travel on foot to and from their work." In mines where there is a separate "man entry" for the miners to travel on, the hauling entry need not meet these requirements. In company with the superintendent and foreman, I visited one of the best modernly equipped mines of the Pittsburgh Coal Company, which had a separate man entry. Yet miners continually traveled back and forth from work along the hauling entry. Our party also entered the mine by the hauling entry. I wondered why this was, and insisted that we go back by the man entry. So at the beginning of our return trip they took

me to an opening on to the man way. I looked into it, asked a few questions, and decided to go back by the track. It was obvious why the men preferred the dangers of the hauling entry to the safety of the man entry. The latter was dark from beginning to end; it was not more than five or five and one-half feet high, so that one would have to travel in a stooping position all the way, and the floor contained no path at all, but was covered with loose slate and big chunks of coal. In short, to go in and out by the man entry meant a mile or two of most difficult and tiresome walking at the beginning and end of a hard day's work. Therefore the miners prefer the other entry, where there are occasional lights, where there is a comparatively smooth place to walk, —between the tracks,—and where the roof is higher, and for long stretches high enough to let them walk upright.

Thus the exception made by the law in the case of mines which have separate man entries, as it actually works in this mine at least, leaves the miners traveling back and forth along a hauling road on which the requirements of the law are not carried out.

In another way the law fails to furnish complete protection. The wide space required between track and rib, is sometimes on one side and sometimes on the other. Owing to the frequent curves and the necessity of laying the track as straight as possible, this shifting of the wide space from side to side is probably unavoidable, but one can easily understand how, in the darkness and with a little confusion, it might lead to a tragedy. These two inquest stories are perhaps not unusual:

> Philip Zurich, who had been a miner for less than a week, was taken by train to a certain switch, 3500 feet into the mine, and told to wait there until another train came by, which would take him to his room. He waited over ten minutes, and meanwhile his light went out. Then he must have decided to go on by himself. He crossed the track, thinking the distance between track and rib was the same on that side. It was not so, however, and as he walked along in the dark, he was caught by a motor and killed.

> Edward James, admitted by his family to be a rather slow and stupid man, was entering the mine one day with his son, a boy of sixteen. The boy, who was ahead, saw a

motor coming and, calling to his father, ran for the manhole fifteen feet ahead. But the father was deceived about the nearness of the motor. (There was evidence of a broken headlight.) He called out that there was plenty of time, and went on walking in the track. When he suddenly saw that it was too late to get to the manhole, being confused and afraid of the live wire on the other side, he jumped to the narrow side, was caught, and killed.

The mention of a "live wire" in the last incident leads to the third group of accidents. In a modern mine there is another danger for those who work, or walk to and from work, in the entry,—the danger of electric shock. The transmission wires for the electric cutting machines are carried along the side of the entry and, in well-managed mines, are kept covered with dry boards; but the high voltage trolley wire, present wherever hauling is done by motor, is carried at the top of the entry and must of course be uncovered. Since the entry is only five or six feet high and since the trolley wire must shift from one side to the other in order to follow the track, it is seldom far from the heads of those who travel the entry. This is the reason why miners are careful to keep their caps dry.

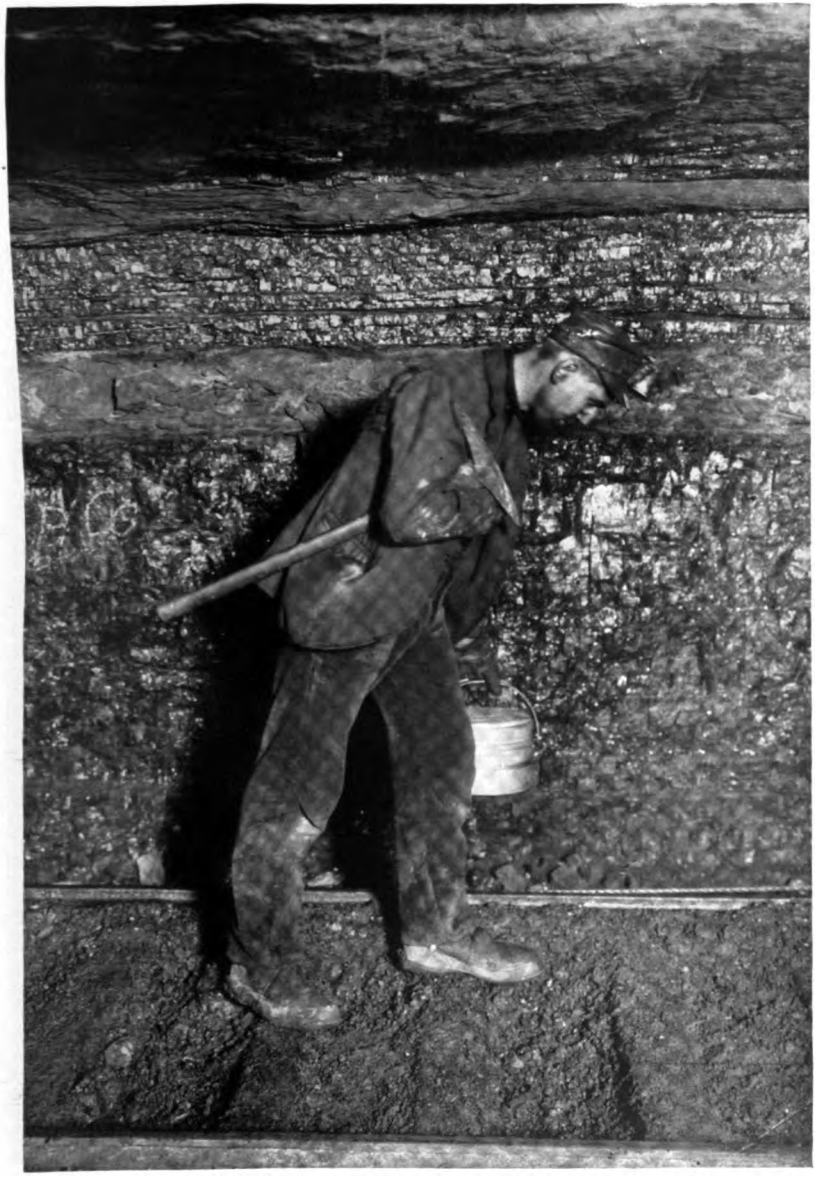
For the miners who while walking can keep their eyes on the wire, there is probably less danger than for those whose work is in the entry. When one sees trapper boys running back and forth over the rough ground, and brakemen jumping off their trains to turn switches, apparently without a thought for the big shining copper wire, never more than six feet from the floor, one wonders that they are not all killed.

Of the six deaths from electric shock mentioned in the table, however, only one was due to a trolley wire in the passage; a miner coming out from work, stumbled and struck his head against it. In this instance the wire was five and one-half feet from the ground. Of the other five accidents, two occurred in the operation of the cutting machine, evidence in one case bringing out the fact that the insulation was worn off. One man was found dead in the mine beside a new electric door with which a dangerous live wire was connected. The door was taken down immediately afterward. Another was electrocuted in a dangerous passageway

carrying many wires and used only by a few employes. Danger signs were put up immediately afterward. The sixth case was a peculiar one. The accident occurred outside the mine. Contrary to rules, a dumper who had been working overtime (14 hours in all), climbed into an empty car to ride down to the tipple. His boss, the weigh master, also rode. When the dumper started to get out, his neck touched the trolley wire, which was about seven and one-half feet from the ground, and he was instantly killed. The story of this man's death well illustrates the futility of a rule (except to protect an employer from liability) when foremen and other superiors neither enforce nor observe it.

Among the miscellaneous accidents two are of special interest. In each a "greener" was killed in the mine shaft. One was just stepping out of the cage when it started and caught him against the wall,—the fault of a careless "cager," no doubt. The other fell out while on his way up. The cage was open at both sides, with two feet of space between it and the wall of the passage. The wall is uneven and the cage goes up and down very fast. It was not known how this man fell, but new cages have since been installed in this mine. A mine superintendent when questioned about this accident, said, "Of course the elevator in the shaft has to be open on both sides because cars are hauled on it, too. In fact it's built for cars, not men. But it could have a railing or gate of some kind. I guess there never have been enough accidents of this kind to make them think of it."

Although there were no mine explosions in Allegheny County during the year we are considering, there were four deaths due to the explosion of powder in a miner's home, three of those killed being mine employes. Perhaps it is not generally known that miners furnish their own powder for blasting, as well as the oil for their lamps. It is customary also for them to keep the powder in their own homes. This somewhat startling domestic custom is explained by the miners as follows: "We have to buy powder in small quantities (usually 25 pound kegs) so that it won't be spoiled by dampness before we can use it. The company furnishes no place for us to store it in small quantities; hence we keep it in our houses." The company's explanation is this: "If the men would buy their powder from us it would be all right, but they want to



At the Day's End

be free to buy it where they choose and in what quantities they choose. Now, if we kept it for them in a safe place some distance off they would complain of having to go and get it before they went to work. If we let them keep it in large quantities at the pit mouth, it would be somewhat dangerous and there would be delay in getting it out. It is a difficult problem. So we let them keep it in their houses."

Plainly, the keeping of powder in the miner's home is "practical" in running a mine; whether it is "practical" in running a family can be determined from the following two incidents:*

> On December 13, 1906, late in the afternoon, Peter Matthies, a German boy of fifteen, who had worked in mines since he was twelve, went down into a basement room of his home to fill the powder can which he should take to the mine next morning. Two little brothers were with him. A lamp was in the room, but some distance away. The dust on the top of the keg, however, must have reached the lamp, for the whole keg blew up. Peter and one of his brothers were killed, the other boy lost all the fingers on one hand, and two little girls in a room above were badly burned. The house was almost destroyed.
>
> On the morning of February 27, 1907, at his home, Jerny Podobrick was trying to enlarge the hole in a keg of powder with his pick. A spark from the pick must have ignited the powder, for an explosion occurred killing both him and his son, a sixteen-year-old miner, who was with him.

One superintendent stated that, after a similar accident, he had made it a rule that only one can of powder and one gallon of oil could be kept in the miner's house; that the rest must be stored in his shed or outhouse. He had gone so far as to put up shelves in all the outhouses and hasps on the doors, telling the miners to get padlocks so that no one could steal their supplies. At the time of his last inspection the rule seemed to be working

* Three of the deaths resulting are considered deaths from industrial accidents, because the persons killed were mine workers, engaged at the time in getting powder ready to take to the mine.

well. Such a plan, although an improvement on the usual custom, does not altogether satisfy an outsider.

"We're running trains to get out coal, not to carry passengers,"—"The cage isn't built for men, it's built for cars,"—these sentences declare the principle on which most mines are operated. They contain a confession that the limit of safety has not been reached; they suggest a remote ideal. The time may come when the lives of the men who run the coal trains shall be as precious as though they were passengers; when "cages" used for men shall be built for men; when absolute safety for the men who work and walk in them shall be a universal measure for the height and width of entries. Practically all mining accidents such as those in the last three groups are humanly preventable.

Accidents such as were described in the first group,—those due to a fall of roof,—cannot be so easily disposed of. Here we are dealing with a great "natural" risk.

Belgium, France, Great Britain and Germany deal with this risk far more effectively than does America. A recent bulletin of the United States Geological Survey shows that in all foreign countries from which statistics are available restrictions in the maximum amount of explosives allowed to be used in any one blast have not only increased the safety from explosions of gas, but have also materially diminished the loss of life from falls of roof. The number of men killed from falls of roof and coal in France, for each 1,000 men employed, has fallen from 1.26 in 1871–1875, to .47 in 1896–1900.*

The steady decrease in the death rate from this cause is ascribed largely to the greater stability of the sides and roof when free from the jarring and fissuring effect of large charges of explosives. In Great Britain and Germany and Belgium the results are similar to those in France.

* 1871–1875	1.26
1876–1880	.95
1881–1885	.88
1886–1890	.63
1891–1895	.59
1896–1900	.47

Coal Mine Accidents: Their Causes and Prevention. Bulletin 333, U. S. Geological Survey, 1907.

In recent years more men have been killed in the mines of the United States per thousand employed than in the mines of France, Belgium or Great Britain.* Moreover, while in European countries the death rate from mining accidents is being reduced from year to year, in the United States it is increasing. Yet it is stated that "In no country in the world are the natural conditions so favorable for the safe extraction of coal as in the United States." The decreasing death rate in European mines can, then, be accounted for only by safer methods of mining,—more stringent regulations and an effective enforcement of them.

The terrible succession of mine explosions in recent years has at last stirred the American public to a national effort toward prevention. In May, 1908, Congress authorized the establishment under the Technologic Branch of the Geological Survey of a station for the investigation of mine explosions, and in December, 1908, this first station was opened in Pittsburgh. Other stations are planned.†

Perhaps an equally important step was taken when the State Department invited Great Britain, Germany and Belgium each to send their leading expert on mine disasters over here to to advise us. They came in August, 1908, and as a result of two months' study of our mining conditions made the following recommendations to the United States Government.‡

> "The United States Government should examine and test all explosives and should prohibit the more dangerous, permitting the use of such only as may be designated by the Government 'permissible explosives.' [This already has been done, and in May, 1909, the Government published a list of seventeen 'permissible explosives.']

* Number of men killed for each 1,000 men employed—averages for five years:

France (1901–1905)	0.91
Belgium (1902–1906)	1.00
Great Britain (1902–1906)	1.28
United States (1902–1906)	3.39

Bulletin 333, U. S. Geological Survey.

† A bill for the establishment of a Bureau of Mines has passed the House of Representatives by an overwhelming majority.

‡ Lyman Beecher Stowe, *The Outlook*, Sept. 25, 1909.

"All explosives should be made into cartridges and placed in closed receptacles before being carried into the mine, and each miner should be limited to the amount he needs for the day.

"The roadways in the mines should be kept as free as possible from loose coal which may be ground into dust. [Contrary to the previous opinion of many of our practical miners, coal dust is frequently the cause of explosions.]

"In mines containing as much as two per cent of gas, locked safety lamps only can be used without great danger.

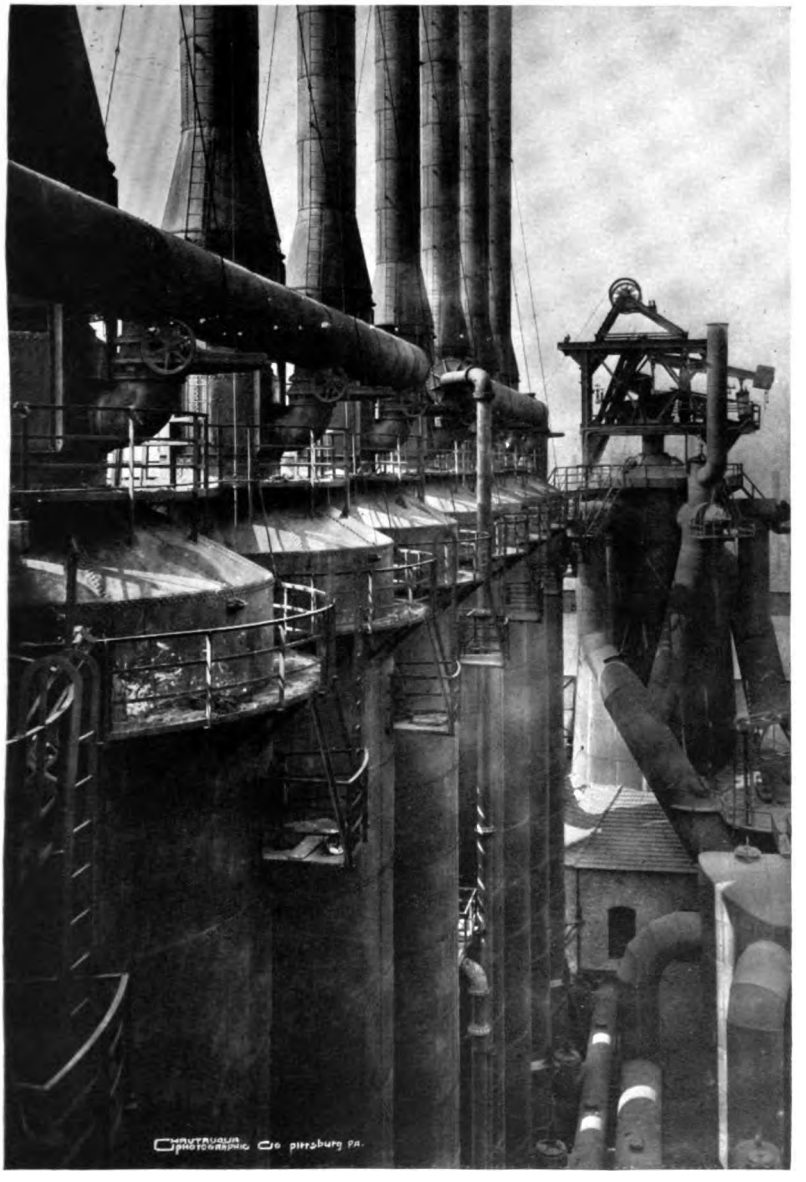
"Electricity can only under the most rigid safeguards be used without grave danger. It should be borne in mind that most insulating materials are soon destroyed underground, and that no live wires should be left exposed.

"All new construction, shaft lining and superstructures should be built, so far as is possible, of non-combustible materials.

"Thorough discipline about the mines is absolutely essential, and it can be effected only through the hearty co-operation of operators, miners, and the state.

"Safety and efficiency would be greatly promoted through the establishment in the different coal regions of special schools for the training of fire bosses, mine foremen, superintendents, and inspectors."

While these efforts are aimed at the prevention of explosions, there is no doubt that the ultimate result of such activity will be to reduce also some of the more commonplace risks of mining such as have been described.



THE BIGGEST TOOLS IN THE INDUSTRY
Blast furnace at right; at left a row of stoves where air is heated for the blast

CHAPTER IV

THE STEEL WORKERS*

THE superintendent of construction and the superintendent of the blast furnace department were on their way to work. They stopped at one of the furnaces to have a little joke with the boss blower, a friend of theirs. A few moments after they left him the whole side of the furnace blew out. The superintendents, running back to see what had happened, passed two Slavs being carried away on a stretcher. When the blast was turned off, so that they could get nearer, they found the body of their friend, burned beyond recognition and borne by the force of the explosion several feet from where he had been standing.

"And, ten minutes before," said the superintendent of construction, "we three stood there laughing, and not one of us had an idea there was anything wrong with that furnace. That's the way it is, mostly, with blast furnace explosions. They can't be foretold."

During our year of accidents there were two terrific, memorable blast furnace explosions in Allegheny County. On January 9, 1907, Eliza Furnace No. 2 (Jones and Laughlin Company) burst, pouring out a great stream of hot metal and killing 14 men. On May 21, 1907, Eliza Furnace No. 1 (of the same company), exploding in much the same way, killed five men, and injured many more.†

* It must be remembered that accidents tabulated in this chapter occurred from July 1, 1906, to June 30, 1907. The mills were visited during the spring of 1908 and conditions described were of that date. In the past two years a definite constructive policy of prevention has been adopted by several of the large steel companies. For a description of the safety committees, etc., see Chapter VII, Appendix III, article by David S. Beyer, chief factory inspector American Steel and Wire Company.

† The year taken cannot be considered exceptional in the matter of explosions. In the seven months following, there was an explosion in Homestead and one in Braddock, each with three or four killed and a long list of injured; also a big furnace explosion at Butler, just outside the county, in which again the number killed was 14.

A blast furnace is a great bulging steel shell lined with brick, about 90 feet high and 20 feet wide. Inside of it iron ore is reduced to pig iron, the first step in the process of making steel. The ore is dumped in at the top, with coke and limestone. Blasts of air heated to 1000° Fahrenheit in a row of immense stoves nearby, are sent through pipes into the furnace. This ignites the coke, and creates such a heat that the whole mass melts. Fluid metal is thus always boiling at the bottom of the furnace, while solids are constantly being fed in at the top. Every four hours the furnace men knock out a plug at the bottom, and what comes out is not ore and coke and limestone, but liquid pig iron.*

Blast furnace explosions are usually caused by a "hang," followed by a "slip." To explain: The mass of coke, ore, and limestone put into the top of the furnace often sticks to its sides in the process of reduction. This is called "a hang." Then it loosens and drops suddenly. This is called a "slip." Julian Kennedy, the well known construction engineer of Pittsburgh, explains it in this way:

> When a furnace is "hanging," the great mass of stock (coke, ore, and limestone), just beginning to melt and fuse, sticks stubbornly to the sides of the furnace, leaving a cavity between the molten matter below and this hanging stock, the under side of which forms an arch above. After this cavity reaches a certain size, a portion of the stock is liable to drop, breaking the arch and causing the stock above to come down with a rush. At the same time the compressed air in the cavity at the bottom of the furnace is released and goes up through the falling stock with a tremendous force. This rush of gases is often sufficient to lift the entire top of the furnace or throw it off. Consequently explosion doors and relief doors have been added. In case of heavy slips, sometimes 30 to 50 tons of ore, coke and limestone would be thrown out of a furnace in less than as many seconds. This is usually called an explosion, but is not in reality. If, however, the fall is excessive, or the furnace defective, the sides may give way and the molten metal burst out at the bottom, bringing death to all who are working near.†

* In Appendix II will be found a short and accurate description of the process of steel making by John A. Fitch, which will assist the reader in understanding this chapter.

† Some Modifications in Blast Furnace Construction. Address of Julian Kennedy to Engineers' Society of Western Pennsylvania, Jan. 15, 1907.

TABLE 7.—195 MEN KILLED IN STEEL INDUSTRY, CLASSIFIED BY NATURE OF ACCIDENT AND BY EMPLOYER

Nature of Accident	*Aggregate*	Employed by						
		Carnegie Steel Co.	*Jones & Laughlin*	*National Tube Co.*	*Pressed Steel Car Co.*	*American Steel and Wire Co.*	*Crucible Steel Company of America*	*Other Companies*
Operation of cranes	42	19	5	5	8	..	1	4
Falls	24	11	3	2	2	3	..	3
Explosions	22	2	19	..	..	..	1	..
Operation of railroad in yards	18	9	2	2	4	..	..	1
Operation of dinkey trains	13	10	2	1	..	..	..	..
Operation of rolls	10	4	2	3	..	1	..	..
Loading and piling steel and iron products	8	1	5	..	..	..	1	1
Electric shocks	7	3	3	..	..	..	..	1
Asphyxiation by furnace gas	5	1	3	..	..	1	..	..
Miscellaneous	46	13	7	8	2	5	5	6
Total number of men killed	195	73	51	21	16	10	8	16
Approximate number of men employed	..	23,337	9,125	16,000	6,000	4,487	4,982	..

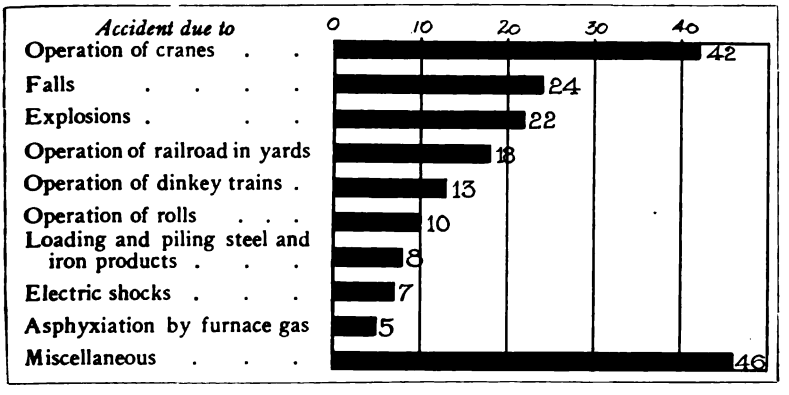


DIAGRAM 4.—195 MEN KILLED IN STEEL INDUSTRY, CLASSIFIED BY NATURE OF ACCIDENT

The two big disasters at the Jones and Laughlin furnaces in 1907, were, it is supposed, of the latter kind. According to testimony at the inquest, the furnace was not in either case defective. The explosions, so far as they were considered explainable, were held to be due to exceptionally heavy "slips."*

These blast furnace disasters are the most spectacular accidents in the industry, and are responsible for the largest number of fatalities which directly accompany the processes of making steel.

TABLE 8.—37 FATALITIES OCCURRING IN PROCESS OF MAKING STEEL IN MILLS †

Cause	*Number*
Explosions	22
Asphyxiation by furnace gas	5
Operation of rolls	10
Total	37

These 37 deaths were 19 per cent of all the steel mill fatalities studied.

Death by asphyxiation also is a not uncommon fate in the blast furnace department. The gas, always escaping in greater or less quantities at the top of a blast furnace, is a constant danger to the man working there. In the old style furnaces, where the charge is sent up in barrows on an elevator, there must always be a man on top to dump the load into the furnace. This is admitted on all sides to be an inevitably dangerous job. Modern furnaces, however, are charged mechanically by what is called a "skip-hoist." The loaded cars run up a steep track to the top of the furnace where they dump themselves, and then come down empty by another track. This method of charging has done away with one dangerous job. The men who "charge" the furnace are below, and only an occasional repair man has to risk asphyxiation by working at the top of the furnace.

Of five men in our table who met death by asphyxiation, only two were working at the top of a furnace. The other three

* Explosions often occur in the converting department, also, due mainly to the hot metal coming in contact with water. There were no clear examples of such explosions among the year's fatalities studied, however, and therefore, discussion of them is omitted.

† There has been no attempt to cover all kinds of accidents which may occur in the industries considered but merely such accidents as were represented in the year under consideration. This is true of all tables of causes.

Photo by Chautauqua Photograph Company

FILLING INGOT MOLDS WITH MOLTEN STEEL

"got gas" while pulling out "cooling plates." These bronze "cooling plates" are a comparatively new device, by which water is kept flowing close to the brick walls of the furnace. This cooling makes the furnace lining last much longer. Twenty years ago men were satisfied to make 100,000 tons of iron on one blast furnace lining. Now, with the cooling plates, they must make 1,000,000 tons to be satisfied.

Cooling plates must often be changed, because in the intense heat they deteriorate and crack, and when a plate cracks the water may come in contact with the iron and red hot brick and cause an explosion. Taking out an old cooling plate and putting in a new one is a difficult and dangerous operation, lasting perhaps two or three hours. A little gas escapes all the time the plates are being changed, and if a "slip" occurs in the furnace a great deal of gas may come out suddenly. The men working at the plates have to stand at the top of a ladder, in no position to get away quickly if such a thing happens.

The three men mentioned were Slovak furnace keepers, sent up by the foreman to remove a row of burned-out cooling plates. Gas came out in sudden and great volume and all three were killed.*

After the ore has been reduced to iron in the blast furnace, and the iron in turn reduced to steel in the open hearth or Bessemer department, comes another process,—"rolling" the red hot ingots of steel into beams and bars and rails for the market. In the "blooming mill" the ingot, "a massive block of steel, six or seven feet high, a foot or two feet thick and glowing red," is "rolled" into a long slim bar. This bar is heated again and sent on to a finishing mill, where it is "rolled" to whatever final shape is desired. It is before these rolling mills that the casual visitor stands, awed and fascinated. He sees the red block dumped on the roll table; he watches it as it passes rapidly back and forth in its trough, growing longer and slimmer after each encounter with the crunching rolls, until it slides smoothly away out of sight, and another ingot comes on. Here, it seems to him, must be the greatest danger to life and limb.

* Each of these men left a wife and children. One widow received $700, another $600, and the third, who was in Hungary, nothing.

But it is not so. Only 10 out of the 195 deaths in the steel mills can be laid to the rolls, and of these only four were due to the evident danger, the bar of red hot steel. The six others could easily have been avoided. Two men were caught in the gearing of a roll table.* Three were repair men. A millwright and his helper were repairing a cable on the cooling bed, when through a mistake the machinery operating the rolls was started, and both were killed. A pipe fitter had gone into a pit beneath the rolls to make repairs. The roller, not knowing he was there, signaled to the leverman to raise the roll table, which operates by weights moving up and down in the pit below. As the table was raised one of these weights struck and killed the pipe fitter.

Such accidents to repair men, from a too hasty starting of machinery, are astonishingly common in the steel mills. It is impossible to tell where the responsibility lies in each individual case. But it is clear, as in the case of the coal-car cleaners, that a signal system is lacking. If, in order to make some repair, a man must go where the least movement of the machinery will mean death to him, it would seem mere common sense to provide an adequate signal system to protect him. A big danger board can be hung over the starting levers, or a man be stationed there to warn all comers that the repair man is at work. Better still, wherever electricity is the motive power, what the men call a "cut-out" can be installed. The repair man can then remove a key from the switch-board, put it in his pocket, and go about his work, secure in the knowledge that no one can start the machine until he replaces the key.

Two men were killed by the red hot bar itself. One was pinned against a pile of beams by a bar that bent in moving through the rolls and jumped out of the guides before the motor could be stopped. The other in a hurry for tools, tried to run between two sections of the roll table, and a rail shot out of the rolls just in time to catch him.†

* No further evidence was obtainable in their cases, but in 1908, the year after these accidents happened, a well-covered gearing was still the exception in the rolling mills of the Pittsburgh District, in spite of the state law which requires that all gearing shall be covered.

† Testimony in the record did not reveal whether there was a bridge over the roll table which this man might have used. The accident occurred in the

The rollers in a Garrett or "looping" mill* are literally playing with fire. They are part of the continuous process of turning a three-foot steel "billet," four inches square, into "rods" a quarter of an inch thick, a process preliminary to making steel wire. After the billet has passed through eight or ten sets of rolls it becomes a long twisting red hot snake of steel, too soft to be guided further by machinery alone, and yet many steps removed from wire. At each pair of rolls, through which the fiery thing must pass, there stands a "catcher." As the head of the "snake" comes through one pair of rolls he seizes it with iron pincers, and turning quickly places it in the next pair, while the rest of the snake, forced continuously through the rolls, darts twisting down an iron-paved, inclined floor, in a long loop. At the bottom of this incline stands the "hooker," whose duty it is to watch these red hot loops, sometimes three or four running at once, guide them with his iron hook, and prevent them from getting snarled or tangled. Each process takes but a moment. As soon as the catcher has placed the end of one twisting loop in the rolls, he turns to seize another that is ready for him. This continuous activity grows more rapid and requires more skill as the "snake" becomes thinner and longer, and must go faster to make way for the next one. Thus the worker at the last set of rolls has the most difficult job of all.

This work demands so much of eyes and nerves and muscles, and is done in such intense heat, that the men work in half-hour shifts, six hours of work during a twelve-hour day. Even so, it is only exceptional men who will attempt it, and with all their skill and agility, there are frequent accidents among them. The "catcher," especially he at the last "pass" or set of rolls, stands encircled by "fiery ribbons of steel, twisting, darting, coiling, at a lightning rate of speed." Accidents here are likely

Duquesne Steel Works, in September, 1906. In May, 1908, I was taken through these works by the safety inspector and another officer of the Carnegie Steel Company. Many new overhead bridges were pointed out to me as instances of protective devices installed within the last seven months.

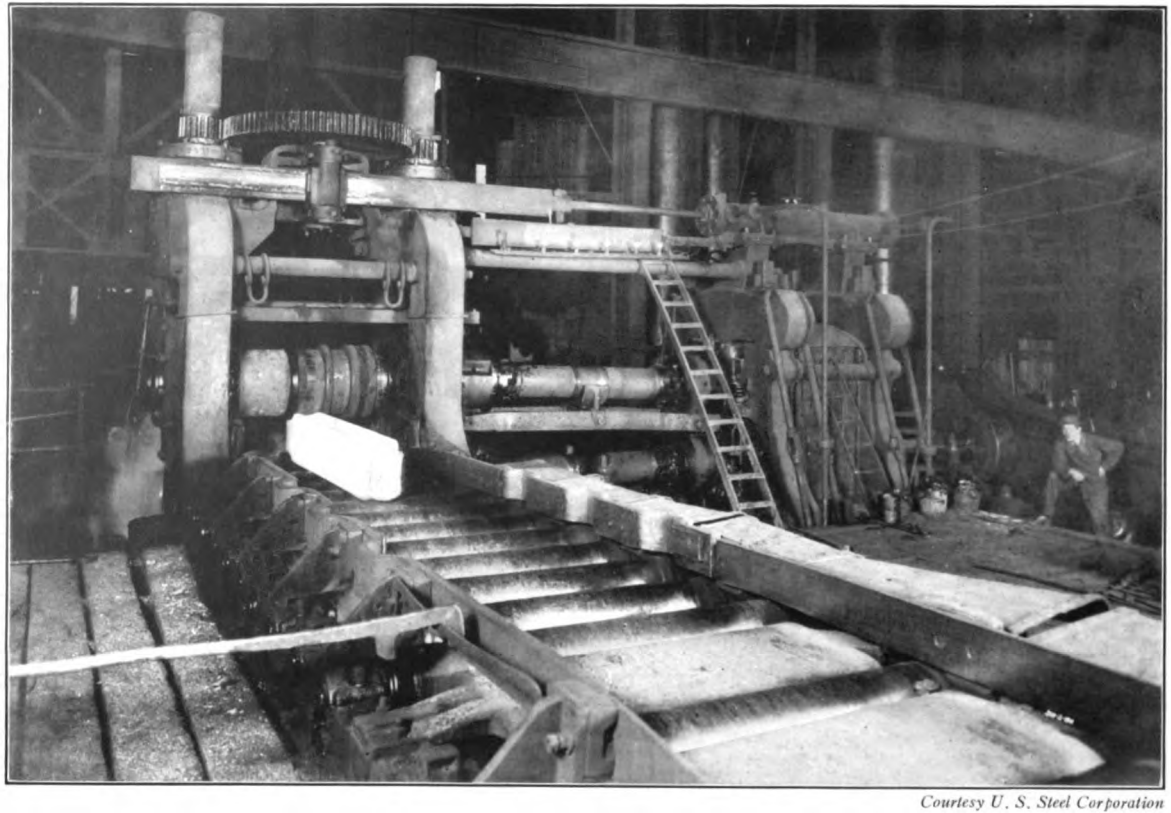
* There is another quite common type called a "continuous" rod mill, in which the rods are guided mechanically from start to finish,—thus doing away with both catchers and hookers.

to be fatal. If the rod catches a man's leg unprotected by a guard, it will burn through and he may die from shock and loss of blood. The catcher on our list of killed had a leg cut off by a hot rod, and died in four days. A few months later a hooker in the same mill had both feet burned off. A moment's lapse in agility and watchfulness may mean death, and such lapses will come to the best men, even when working hours are reduced to six.

One way to lessen the number of such accidents would be still further to reduce the hours, and shorten the shift. In the wire mill of the Pittsburgh Steel Company, it is said that the rollers work in fifteen-minute shifts.

The last rolling mill accident we have to consider is the death of Angelo Guira, a seventeen-year-old trough boy at the butt-weld furnace in a tube works. As each flat bar comes red hot out of this furnace, it is seized by the "welder" with his iron pincers. He brings its two outer edges together at the end, and passes it along until it enters the rolls. These rolls weld the two edges together the whole length of the bar, so that at the other side a finished, round, red hot pipe comes out and drops into the trough. And now comes Angelo's task. He stands at the opposite end of the trough, and every time a pipe drops into it he moves a lever. This dumps the pipe into the carrier which is waiting for it on a perpetually moving cooling bed, and leaves the trough empty for the next pipe. Little time is lost between pipes, and Angelo's task is not one to go to sleep over.

Angelo had been working a year at this, and, though so slight and small that they had hesitated to take him, he was now acknowledged by the day foreman to be the best boy he had ever had on the job. But Angelo began to get tired of standing up to work this lever. He saw that he could do his work just as well sitting down, so he built himself a bench. His day foreman warned him against sitting, but his night foreman evidently allowed it. Nothing had ever gone wrong, and Angelo was not afraid. One night at 10.30, either because he was not quite quick enough in dumping the trough, or because the welder was a little too quick—because of a second's hitch in co-operation—a pipe came through too soon, struck the pipe which was still there and sent it shooting



Courtesy U. S. Steel Corporation

HOT STEEL INGOT ENTERING THE ROLLS OF A BLOOMING MILL

The table gears on the right of this mill are covered with swinging guards of steel plate. (See page 79; also Appendix III.)

out of the trough, straight through the body of Angelo. If he had been standing up in his regular place, it was said that he would have been out of the pipe's way, or that he could have jumped aside. Afterwards, a stout iron plate was set up to stop the pipe if it jumped out again in that way. I have seen this guard. It seems simple and necessary. Yet it required the killing of Angelo to suggest the need to the mind of his employer.

The principal classes of fatalities which result, strictly speaking, from the process of making steel have now been considered. But these, as seen by Table 8, are only 19 per cent of the fatalities that occur in the mills where steel is made. Lurid newspaper accounts of such accidents as have so far been described determine the popular idea of steel mill accidents. They are not the everyday tragedies of the mills. If the accidents of the year chosen were typical, it can be asserted that nearly twice as many men are killed in the process of transporting materials and finished product from place to place in mill and yard, as are killed in the actual process of making steel. This distinction is purposely made. An outsider may wisely hesitate to make suggestions with regard to accidents connected with steel making, so much of which is a mystery to him. But the means of transportation used in the mills,—engines, cars, electric cranes,—there is no mystery about these. It does not take a steel expert to "see how they work." We may then take up these commonest fatalities of the steel mills from the point of view of prevention.

TABLE 9.—73 FATALITIES IN THE PROCESS OF HOISTING AND CONVEYING MATERIALS IN STEEL MILLS

Cause	*Number*
Operation of broad gauge railroads	18
Operation of narrow gauge railroads	13
Operation of cranes	42
Total	73

These 73 deaths were 37 per cent of all the steel mill fatalities studied.

Most of the large steel companies have a private railroad, its tracks running from plant to plant and from the regular railroad freight yards to the yards of its different mills. There are

the Union Railroad of the Carnegie Steel Company, the Monongahela Connecting Railroad of Jones and Laughlin, the McKeesport Connecting Railroad of the National Tube Company, etc. These roads carry freight only, and work exclusively for the company of which they are a part. Otherwise they are run like any other railroad. Accidents to the men handling these trains have been included under railroad accidents proper, but accidents to mill workers resulting from the operation of such trains or from the movement of any cars or trains on mill sidings, are included here.

Eighteen steel mill employes were killed in this way during the year. Four were run over, and two caught between cars while crossing tracks for a legitimate purpose. The testimony in these cases indicated here the carelessness of the man killed, and there the failure of bell, whistle, or other warning. There were two wrecks: a freight car "ran wild" and pinned a man against the wall; a collision in a dark place, where broad and narrow gauge tracks cross, killed another.* Four laborers were killed while riding, or attempting to board, trains in the yards; two of these men at least were knowingly disobeying orders. Two deaths in the group were due to ignorance of English, in which language warning had been given; one, to the total absence of warning. In the latter case a young Slav, just come to America, was sent by his foreman to work under a car. Meanwhile an engineer, on signal from the brakeman, who did not know that a man was under the car, backed up into it. The Slav was caught and killed—"like a dog," as his fellow countrymen said. At the inquest the foreman's only explanation was that he "had no one to give signals." Here again was that fatal lack of system for the protection of men in defenceless positions.

With the exception of the last case, these accidents are what one would expect from the running of trains day and night in the mill yards. The recital of them suggests a few improvements: overhead or underground passages might be built where men must cross tracks;† where this is impossible, trains might be run

* Lights and signals are especially important in mill yards, because the regular noises of the mill soon dull the ear to the sound of bell or whistle.

† The writer was taken through a new tunnel of this kind at the Edgar Thomson Works in the spring of 1908.

more slowly; rules forbidding mill employes to ride on the trains might be more rigidly enforced; ignorant non-English-speaking foreigners employed on or about tracks and cars might be under direction of a foreman who speaks their tongue.

The narrow gauge railroads on which the "dinkey" engines pull their little trains of ingot molds from converter to soaking pit, and on which much of the lighter hauling is done, although they cause many more injuries than the regular railroads, are responsible for fewer fatal accidents. Thirteen of the year's steel mill fatalities, however, were due to the operation of these "dinkey" railroads. The engineers and brakemen suffer most. Three were killed in wrecks. One collision occurred at a "blind" curve, another at a crossing where neither engineer could see ahead on account of the steam from nearby ladle sheds. In the third case the dinkey engine was hauling a long train of heavily loaded truck when the pin connection between it and the first truck broke. The engine, under full steam, dashed ahead, jumped the track, and crashed into some cars on a broad gauge track nearby. The engineer was killed. Dinkey trains very often jump the track when there is not an obvious cause, as in the case described. This is accounted for, as it is in the case of the little trains in the mine entries, by the fact that the track is narrow, the cars are often heavily loaded, and the trains moved rapidly. Also, as explained by a mill superintendent, it is difficult to keep the tracks in good repair, because they are in constant use except for a few hours on Sunday.

The brakeman on a dinkey train is called a "hook-on." This name suggests the kind of coupling used on the dinkey trains. It is the old "pin" coupling. The "hook-on" must go between the cars and while they come together literally "hook" one to the other with his hands. Agility and skill are required, to an unusual degree, because the cars between which the coupling is made are frequently loaded with hot steel. Many hands are crushed in making these couplings, and now and then a young "hook-on" is killed. Two reasons are usually given why automatic couplers would not be practical on dinkey trains: (1) because the sharp curves taken demand a very loose connection between cars, and (2) because with the molten metal spilling over

from the ingot molds an automatic coupler could not be kept in working order. It is a fact, however, that couplers have been perfected for different types of dinkey trains which can be worked entirely by a lever struck with the foot. These automatic couplers, which can be put on at a cost of from $10 to $30 a car, are considered practical and are being installed in the works of the American Steel and Wire Company, National Tube Company and others.*

In addition to this special risk in coupling, dinkey hook-ons run some of the usual brakeman's risks. Six were run over while trying to board a moving engine. In two cases this was accounted for by the fact that the engine was running too fast. (One engineer was drunk; the other admitted that he had lost control of his engine.) In the other four cases no reason for the accident was given in the record. These hook-ons are almost invariably boys from sixteen to twenty, chosen because the work requires rapid movements, great agility, and almost constant motion. They work 12 hours a day or a night, as the case may be.

It is surprising, considering how constantly these trains are running through the mills, to find that only three men not engaged in work connected with the dinkeys, were killed by them. Two were run over by the dinkey itself. One man was crushed by a heavy iron box carelessly left near the track with planks protruding from it. The engine struck the planks, and overturned the box, so that it fell upon him where he worked in a cinder pit below.

With regard to warnings and signals in the case of dinkey trains, it seems to an outsider that a distinction should be made between regular, frequent trips and irregular, unexpected trips. The regular trip, for example the taking of ingots from pouring crane to stripper, is of so frequent occurrence and so regular in its operation that a man working in the vicinity should be able to look out for it. The irregular trips, on the other hand, present an entirely different problem. The tracks wind in and around the mills, turning sharp corners, and the trains are likely to appear anywhere at any moment. To insure safety on such routes there must always be a man at the advancing end of the train to keep watch. This, it appears, is the policy now nominally adopted,

* See cut facing p. 68.

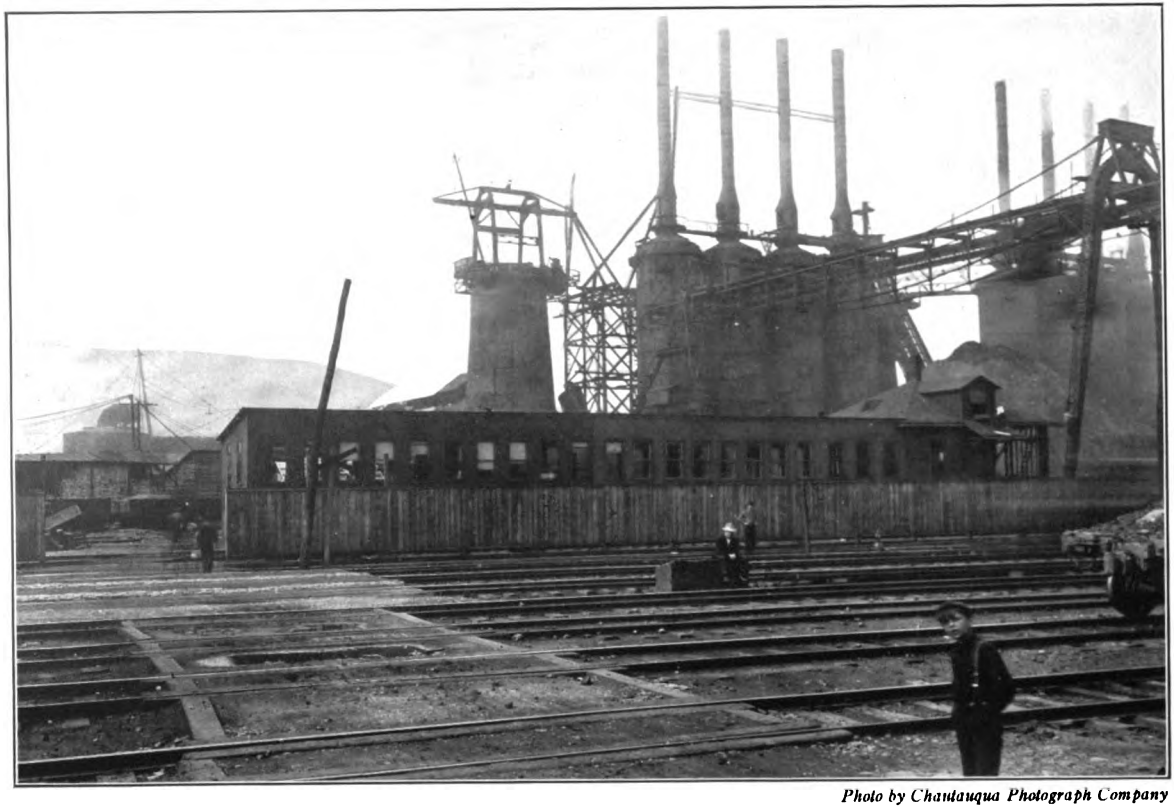


Photo by Chautauqua Photograph Company

DANGEROUS GRADE CROSSING AT ENTRANCE TO MILL YARD

the engineer being responsible for the track ahead and a brakeman for movements in the rear.*

Broad and narrow guage railroads together do not accomplish as much destruction of human life as the traveling cranes, which are so indispensable to the work of the steel mills. Reference is made to the great electric overhead cranes, operated with levers by a man who works all day in a little wooden or iron cab suspended from the crane and traveling with it. Heavy adjustable chains or ropes hang down from the crane by means of which the load is carried. Sometimes the chains are fastened around the load; sometimes immense hooks are used to grasp it. Usually the crane has a double action,—is in a sense two cranes. The big crane, or "bridge," consists of two great iron beams, extending the width of the building, with wheels at each end running on tracks fastened to the side walls perhaps 50 or 60 feet from the floor. This crane runs from end to end of the building. On the two beams which constitute this big crane are other tracks, and on these the small crane, or "trolley," runs from one side of the building to the other. It is from the "trolley" that the chains hang down. The little cab is usually suspended beneath one end of the "bridge," where it commands a clear view of the trolley and the floors over which it moves. The crane man, sitting in his cab, can move the load with one lever from one end of the building to the other. With another lever he can move it from one side of the building to the other. With a third lever he can raise and lower the load. Thus the crane is a perfect solution of the problem of moving heavy objects. It can place a load in the exact spot where it is wanted.

Watch this invaluable monster at work. See him pick up one set of massive rolls, carry it off, and bring back another to take its place. See him reach an iron hand down into the red depths of a soaking pit, pull out a glowing ingot, carry it away and place it carefully on the roll-table. See him gather up a great armful of finished steel plates and bear them out to be piled or loaded.

"A strong, swift, intelligent servant," says Industry. "What complaint have you to make against him?"

* Such a practice would obviously tend to prevent collisions, as would also the lighting of the tracks and keeping them clear of smoke and steam.

TABLE 10.—42 MEN KILLED BY OPERATION OF ELECTRIC CRANES IN STEEL PLANTS CLASSIFIED BY EMPLOYING COMPANY AND BY NATURE OF ACCIDENT

Employing Company	Nature of Accident						*Total Fatalities Due to Cranes*	*Total Fatalities in Steel Industry Due to All Causes*	*Per Cent of Fatalities Due to Cranes*
	Struck by Load or Hanging Part of Crane	*Crushed by Load which Slipped*	*Crushed by Load which Fell Because Chains Broke*	*Struck by Part of Crane Gearing, which Fell*	*Crushed, Run over or Knocked Off by Unexpected Movement of Crane*	*Miscellaneous*			
Carnegie Steel . .	5	5	1	1	4	3	19	72	26.0
Jones and Laughlin .	..	2	3	..	..	..	5	47	10.6
National Tube . .	3	..	..	1	1	..	5	26	19.0
Pressed Steel Car . .	1	4	..	2	1	..	8	16	50.0
American Steel and Wire	..	..	..	..	..	..	0	10	0.0
American Crucible .	..	..	..	..	1	..	1	8	12.5
Others	1	..	..	..	2	1	4	16	25.0
Total	10	11	4	4	9	4	42	195	21.5

"In one county of one state of our union he killed 42 men in a year."

"Yes—I grant you, he is a little destructive, but we couldn't possibly get along without him."

"Of course not. We don't ask it. But don't stand aside in that indifferent way and let him go on as he has. Remember he is only your servant after all. Study him, find out his weak points, train him. Try to make him a better servant, not only powerful and swift, but less destructive."

Thus one might speak if the crane were in truth what it often seems, some more than human monster chained to the service of men. But it is not. It is a machine, made by men, operated by men, powerless to accomplish or destroy except through the will of men.

The crane "hook-ons,"—the men on the ground who arrange the chains, and hook and unhook the load,—run greater risks than any other men connected with the operation of cranes. The hook-on must stand by, to steady the load and keep the chains in position, until the crane has actually begun to lift and the chains to straighten. There are three dangers therefore for the hook-on: the load may slip out as it is being raised and crush him; it may strike him as it swings; or a chain may break and let it fall. Similar dangers are involved in unloading the crane.

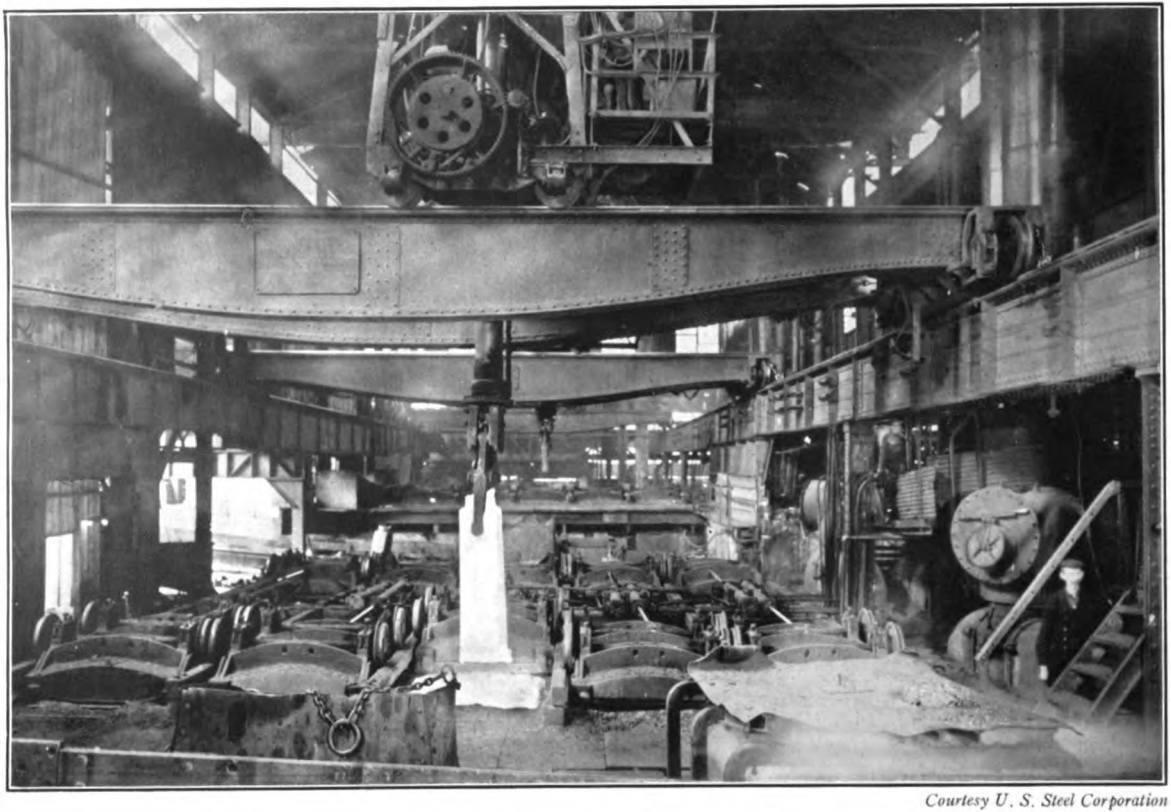
When a hook-on is killed by a load slipping from the crane chains, the accident is always laid to his carelessness in fastening the load. But the justice of this judgment is questioned. An engineer told me that it is next to impossible to insure a grip of the load under the thousand and one conditions which obtain, particularly in the handling of irregular shapes. On our list four hook-ons were killed in this way; once it was a heavy roll that slipped, once the side of a steel car, twice a load of steel bars or "angles." Each of the men thus killed was a common laborer and a Slav.

Accidents to those who load cranes are very common, even when the load does not fall. Four men struck by the load just as it was being lifted by the crane were instantly killed. Another was killed while using a crane to load ingot molds on a car. He was standing on the car to unhook the chains from the last mold as the

crane lowered it into place; a jerk of the chains at the wrong moment toppled the mold over upon him. Two men were killed while loading a car with steel billets by means of a crane. In each case the car was suddenly moved, without warning to the laborer in it, and he was knocked down and killed by a load swinging from the crane just above the floor of the car. Both accidents happened at night. In one case it was stated that the yard was dark. Both the men killed were foreigners, one of four months' experience in a steel mill, the other on his first night's work. Another hook-on was killed while standing behind a handcar, waiting to unhook the chains from a descending load of scrap. The scrap landed too near the end of the car, the car tipped, shot out from under the load, and ran over him.

The prevention of accidents in this group depends upon the skill and care of the man in the cab; upon the experience, caution, and alertness of those below who hook and unhook the load; and more than all else upon co-operation between crane man and hook-on. The crane man is usually an American boy of eighteen or twenty, the hook-on, a Slav, a common laborer. They must communicate largely by signals and in an atmosphere often thick with smoke or steam. There is one foreman for about seven cranes, so that for the most part these two work without direction. Several times we heard these complaints from fellow workmen of a hook-on who had been killed: "The crane boy didn't wait for a signal," "He jerked the chains up too soon," etc. The crane boys, on their part, complain of the stupidity and slowness of the hook-ons.

Many men not working with the crane are killed by it. Thus, the four men in the table killed by a load falling from a crane because the hook or chain broke, were laborers engaged in other work on the floor of the mill. Two of these deaths were made more horrible by the fact that the metal which fell was hot. The four men were Slavs. "Oh, that is significant," says a superintendent, "Americans would know enough to keep out from under those loads." In answer to this it will be well to tell the story of one of these Slavs. He was eighteen, and had been in this country three months. The foreman told him to go to work in a certain place. He refused at first because he was afraid of the great



Courtesy U. S. Steel Corporation

ELECTRIC CRANE DRAWING HOT INGOT FROM PIT FURNACE

bucket moving over his head. But the foreman insisted, telling him with a rough laugh that it did not matter whether he was killed or not. He went, afraid to lose his job.* A few minutes later a hook broke and the bucket, weighing with its load 6900 pounds, fell and crushed him. The crane operator testified at the inquest that he "never knew of hooks being inspected."

It is worth while to pause long enough over these four dead "Hunkies" to notice a special reason for being careless of the lives of aliens. They had no relatives in this country. Consequently, protected by the "non-resident alien rule," † their employers suffered practically nothing from these four fatalities. One man lived seven days, costing the company $7.00, besides his funeral expenses. In the other cases the funeral was the only expense, amounting to about $75 apiece.

Of the 11 crushed by a load slipping from the hooks or chains of the crane, five were engaged in other work, and all of the five again were Slavic laborers. In one case there was evidence of an incompetent crane man; in another the slipping was laid to a sudden jolt as the crane ran over a joint; in a third there was complaint of the way in which the load had been hooked on. In the others no reason was given.‡

These five accidents show that even though chains should never break, it is not safe to stay in the path of a working crane. The question remains, Is it ever necessary? The American Bridge Company, in its posted rules, forbids "the passing of any person under load carried by crane." These five men, however, were engaged in work when the crane load passed over their heads. Some mills may be so arranged that a man never has to work under a moving crane, but in most cases this is not so,—as is

* This story was told by the fellow workmen of the man killed. I asked a superintendent of the same company whether he thought it was true. "Well, he said, "it might be. There are foremen like that."

† According to Pennsylvania decisions, right of recovery for death does not extend to dependent relatives who are non-resident and alien.

‡ A careful, systematic, and frequent inspection would undoubtedly prevent breaks from the wearing down of chains, but "crystallization" inside of the chain, from which probably more breaks occur, cannot be detected. Chains exposed in cold weather are particularly likely to become brittle and to break when used. It is possible to reduce this tendency to crystallization to a minimum by annealing (or heating) all the chains at stated intervals. In many mills this plan has been adopted for chains used in outside work.

freely admitted by those who are connected with the work. In the National Tube Company works at McKeesport, I saw three men at work in a freight car so placed that every twenty minutes a tremendous load of pipes passed over their heads. It is hardly possible that the foreman should expect these men to climb out of the car and stand idle every time the crane passed.*

Signals and lights are as important in the operation of cranes as in the operation of dinkey trains. In the case of a foreman killed by a truck swinging from a crane, evidence brought out the fact that it was too dark in the mill for the crane man to see below, but that he was ringing a bell. A laborer was struck in the head by an empty crane hook which the crane man was carrying along without warning to the men below. Another empty crane hook caught in a pile of billets and pulled them over on a man who was marking them; light was lacking in this instance. There may have been special carelessness in these cases, as, for instance, where a crane man allowed his hooks to hang too low; but there can be no doubt about the importance of light in avoiding danger. Nor can there be any doubt about the importance of signals, although they lose their value as their number increases beyond a certain point. Constant repetition makes them almost useless.

Practically the question is, shall the crane man look out for the men below or the men below look out for the crane? Here the same distinction may be made that was suggested in connection with the dinkey trains, between the regular and irregular movements of the crane.† If these two classes of movements with

* An engineer's suggestion is that the use of magnets instead of chains and hooks will in time eliminate accidents due to the falling loads. The lifting magnet has been found equal to handling practically any form of metal that is used in the steel mills, except when heated above a black heat, and it is maintained that in mills where it is used accidents of this kind are much less numerous.

† When a crane man is doing regular work, repeated a dozen or more times an hour, the men working in the path of his crane, or near it, should be expected to anticipate the movements of the crane and look out for it. In fact they do this. I have seen men, apparently without any conscious effort, avoid the overhanging parts of a charging crane by a margin of less than two inches and do this again and again, with as little effort as a man would use to brush off a fly.

The second class of crane movements is in connection with their use in making repairs or in bringing material at irregular intervals from one part of the mill to another. It does not seem reasonable to expect men to look out for the erratic movements of such cranes. Therefore, in such work the responsibility should be upon the crane man, or foreman in charge, to see that the route is clear.

dinkeys and cranes were carefully distinguished, and every workman made responsible for avoiding the regular and frequent movements, and a crane man or train man always provided and held responsible for warning in case of irregular and unexpected movements, the number of accidents might be lessened.

The dangers of the crane to men on the ground or floor of the mill have been considered. But what of the crane man himself? Does he run any risks? So long as he stays in the cab he is comparatively safe, although there is an occasional crane wreck. The crane runs into an open switch and falls to the ground, or it "gets away," runs through the block at the end of the runway and crashes down, bringing cab and crane man with it. A crane man is more likely to be killed, however, by an unexpected movement of the crane while he is out on the runway on his way up or down, or while he is out on the crane examining something that has gone wrong. If the crane is started suddenly he may be crushed by the wheels or knocked off and killed. Repair men and electricians are liable to the same danger while working on a crane or its runways. Seven men were killed in this way during the year.

Such fatalities seem especially easy to avoid. It might of course be said that the crane operator should look out for the repair man and warn him, or the repair man get out of the way of the crane. But the repair man must do his work, the crane man must watch his load. Should it not then be said that it is an ill-considered economy to let a man go up to make repairs while the crane is running? And if it be answered that this is never intended, we ask, "What means are taken to prevent it?"

In some mills repair men are left to protect themselves by simply telling the crane man not to start the crane while they are up on it. This is not enough. Crane men forget. In a certain case the crane man answered, "All right," and a few minutes later, on a signal from below, he put his hand on the lever without thinking, almost automatically started the crane, and killed the repair man.

In some mills the danger board is used. How meaningless such a safety device can become is illustrated by the experience of a company safety inspector. The chief electrician in a mill which he was inspecting told him they had a danger board in every crane

cab. The inspector thought he would go around and see them. All of the cranes but one lacked danger boards, and one of the crane men in charge had never even heard of such a thing. In one cab only he found a small dingy card, hanging some distance from the switch. One side of it had once been red to indicate danger, but was now hardly distinguishable from the other. It hung neglected and unused. This was the only device he found for the protection of repair men and electricians in all the cranes of that mill.

A much better device is a plug which is necessary to complete the circuit and can be taken out and put in the pocket of the man who goes out on the crane. Of this method there are two complaints,—that the men do not take the trouble to use it and that if they do they may forget to put it back and thus tie up operations.

All this goes to show the futility of schemes for safety when the spirit of the mill is one of recklessness and speed. It is not seriously intended by anybody to stop the crane every time a repair is to be made; it would be against the interest of those concerned.

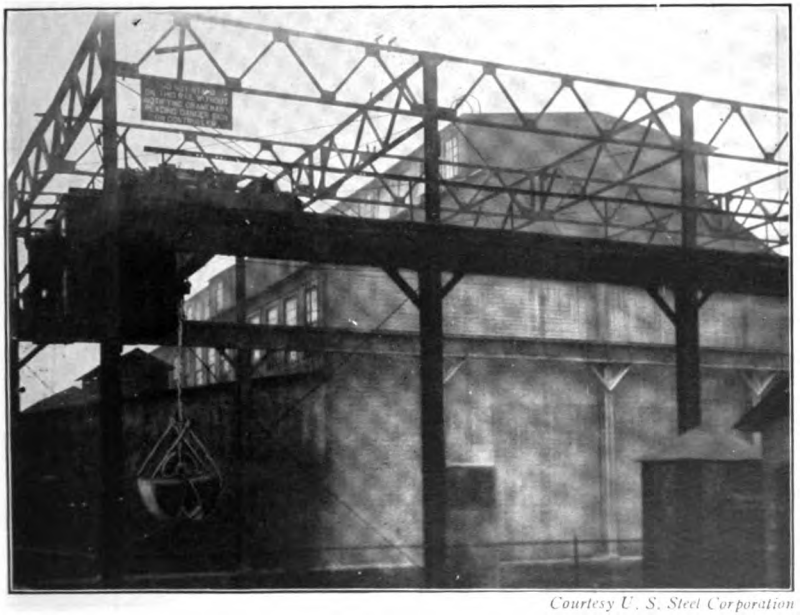
"Suppose a mill is running smoothly," said a superintendent in explaining this matter, "then something happens to the crane which carries ingots to the blooming mill. First thing you know, the rail mill will get through with the rail it is making and be ready for another ingot. When it doesn't come just in time the rail mill will be crying after the bloom mill; the bloom mill will complain to the ingot man; then the ingot man will go after the crane man. That's why the crane doesn't stop for repairs. The way mills are run now, there is no time to stop the crane. You see, there ought to be a man whose income is independent of how much steel is rolled, who has authority to say, 'That crane has got to stand idle until a certain repair is made.'"

To these 42 crane accidents might well be added six from the next two groups,—fatalities due to "falls" and "electric shock." To every man who goes out on the crane or on the runway to make repairs there is, even if the crane is stopped, the danger of falling. He is standing or walking on a greasy, rough, iron beam, perhaps 12 or 15 inches wide, and 50 or 60 feet up in the air. There is as a rule no railing; only skill can save him, and this some-

Courtesy U. S. Steel Corporation

INGOT MOULD CARS EQUIPPED WITH AUTOMATIC COUPLERS

When the cars are pushed together the coupling pin drops into the link automatically; to release it the lever shown on the corner of the car is raised by hand. (See page 60; also Appendix III.)



Courtesy U. S. Steel Corporation

CRANE RUNWAY OVER SCALE PIT

The sign at the upper left-hand corner is to remind anyone going on the runway to notify the operator and to place the proper "danger sign." There is a walk with railing the entire length of this runway. (See Appendix III.)

times fails. Three crane men and a rigger met death in this way during the year. Some engineers say it would be difficult to have railings on cranes and crane runways; no one says it would be impossible; indeed, some mills have installed them.

Imagine now that along beside this narrow runway is strung an electric wire carrying the current for the arc lights. It is within easy reach of a man on the runway. If a repair man becomes dizzy, and puts his hand on the wire to steady himself, he may strike a place where the insulation is worn off, get a shock, and fall. Two young men, one a boy of eighteen, were killed in just that way. The absence of railings makes these runways, where so frequently the crane man, the electrician, and the repair man must go, dangerous enough, but to string electric wires where they can be used as hand rails seems absurd. There is no certainty that the insulation of any wire is safe or that it may not be worn out.*

Coming now to the "falls," we find 24 men killed by falling from a height, or into pits or vats. Five of these accidents happened in connection with the construction or repair of blast furnaces. Of these, two were due to defects in scaffolding, and two to absence of railings, for which the man killed was responsible. The rest were such falls as might occur in any big mill. Two men fell from ladders, and one from a stairway owing to sudden dizziness. In a number of cases nothing could be learned except that the man was killed by a fall. In two cases the evidence indicates youth, inexperience, and lack of instruction.

Much is being done of late to prevent such accidents. In the large mills many railings are pointed out with pride to visitors, as recent safety devices. But much remains to be done in this line. Certainly in all high places where work has to be done at regular intervals, workmen should be protected by suitable railings. There are, however, many kinds of work, particularly in repairing and construction, which require men to go aloft in unusual places where it would be unreasonable to expect a railing.

* In "standard practice" among electricians, I am told, every live wire is considered as a bare wire, particularly if the insulation has been standing for any length of time.

But in general, the distinction made between regular runways in mid-air and places where special men go to make special repairs ought to be interpreted generously; a hand rail is not expensive to put up.

The four men killed by falling into pits or vats were foreigners. One was at work beside a galvanizing vat "pickling" coils of wire which were let down into the vat by block and tackle. A coil fell on the far side of the tank. The man reached across to put his hook into it, lost his balance, and fell in. In the foreman's report it is suggested that he need not have done this, because there were men on the other side who could more easily have reached it. There was no fence or railing about this vat. Of the three other accidents little is known; they all occurred at night.

Eight men were killed by the falling of piled material, a common accident in steel mills. It occurs often during the process of loading or piling bars, angles, pipes, or scrap. Sometimes a defective appliance is the cause, sometimes careless piling. Thus in one case billets of steel were being loaded on "a shaky buggy;" a watchman who saw that it was going to break down, called to the men to get out of the way, but one, a foreigner, did not understand the warning and was killed. In another instance, the chain holding steel billets on a wagon broke, letting a 400 pound billet fall on a man. Two men were killed in loading cars with pipe. In one case the pipes "spread" owing to careless piling; in the other case two pipes started to roll, and, apparently because there was not a sufficient block, rolled off the end of the car and crushed the man who happened to be stooping at the axle box. In these cases, as in the case of loading cranes, it is the Slavic common laborer who is killed.

The falling of a pile is more common at the tube mills than anywhere else, because perfectly round pipe is harder to pile safely than any other material. There can always be seen in the mill yards at McKeesport great square piles of finished pipe, sometimes 15 or 20 feet high. At first glance they look solid and secure enough, but a closer examination reveals the danger in the pile. Between the layers of pipe are placed narrow strips of wood, seven-eighths of an inch to two inches thick, with a small block

or cleat sometimes nailed on the end, and sometimes merely wedged in under the outside pipe. Between the bottom layers these wooden strips are crushed to half their original thickness by the weight of the pile. If one of these strips, thus weakened, is broken off by an accidental blow, the chances are that the outer pipes will drop off and the whole pile fall. This risk seems needlessly great. The suggestion has been made that if oak wedges with an inverted groove were used the pipe could not slip; and also that it would be possible to use light channel iron, or some other fairly rigid and substantial material, between the layers of pipes, and that such material could be bent up at the ends so as to hold the pipes from rolling much more securely than they are held by the present method.

Another danger is the giving way of the foundation, or sinking of the ground underneath the pile. The pipes at the tube works are frequently piled on a too light foundation. One of the accidents on the list perhaps illustrates this. Two Russian laborers were standing on one pile handing pipe up to men on a second pile, which was considerably higher, being 20 feet from the ground. Suddenly one end of this pile sank, and 300 21-inch pipes rolled off on to the lower pile, crushing the life out of the two Russians. The testimony attributed the accident to various causes. Some said that the wooden strips between the lower layers were found broken in two after the accident, others that the cleats used to hold the pipes had not been nailed on, still others that the ground gave way under one end of the pile. Obviously some support was inadequate.

It is unfortunate that this study of accidents in the steel mills is so limited. If we were considering 5,000 fatalities instead of 195 we should be able to classify the accidents here left in the miscellaneous group, and draw useful conclusions from them. Also, if full and fairly trustworthy accounts of each serious injury were available, it would be possible to study the causes of non-fatal as well as of fatal accidents. The latter limitation is peculiarly unfortunate in case of the steel industry, first because the proportion of injuries to deaths is much greater than in railroading and mining, and second because the causes of injury differ from the causes of death more decidedly.

But confessing its limitations, something has been learned from this study. The swift, fierce fires, the mighty processes, by which ore is made into iron and iron into steel, mean death to many workers. This we knew, or guessed, before. But we have learned further that railroads in the yards, dinkey trains throughout the mills, and traveling cranes overhead, as destroyers of life are much more to be feared than blast furnaces, converters, and rolling mills. We have learned also that as many men are killed by falls as by explosions of hot metal; that death by electric shock is more common than death by furnace gas. Have these observations any bearing upon the question of prevention?

TABLE II.—195 FATALITIES IN STEEL MAKING, CLASSIFIED BY CAUSES

Cause	*Number*	*Fatalities*	
Hot metal explosions	22		
Asphyxiation by furnace gas	5		
Operation of rolls	10		
Total		37 (19 per cent)	
Operation of broad gauge railroad	18		
" " narrow gauge railroad	13		
" " cranes	42		
Total		73 (37 per cent)	
Falling from height or into pit	24		57%
Electric shock	7		
Loading and piling of steel and iron products	8		
		39 (20 per cent)	
Due to miscellaneous causes		46 (24 per cent)	
Total number killed in steel making		195	

In the first place they take away a good deal of mystery. At least 57 per cent of the steel mill fatalities are simple, altogether within the understanding of the ordinary man. One does not need the training of an engineer nor the experience of a mechanic to see how the side of a steel car may slip from crane chains and fall on a man below, or how a machinist walking a greasy beam 60 feet in the air may lose his balance, or how a pile of iron pipe may fall and crush a man or two if something gives out at the bottom of the pile. The large steel companies have long defended a policy

of silence with regard to the number and character of their accidents, largely on the ground that any other policy would result in unintelligent hysterical outcry and clamor on the part of the public. If accidents in steel mills were altogether a result of processes which only experts can understand, there might be some reason in such a policy. But finding that at least 57 per cent of the fatal accidents studied were due to ordinary understandable causes, we can maintain not only that the public has a right to know the facts but that its possession of this knowledge is an important factor in the prevention of accidents.

If legislation is in view, there is a second significance in this 57 per cent of "simple" accidents. They serve to unite the steel

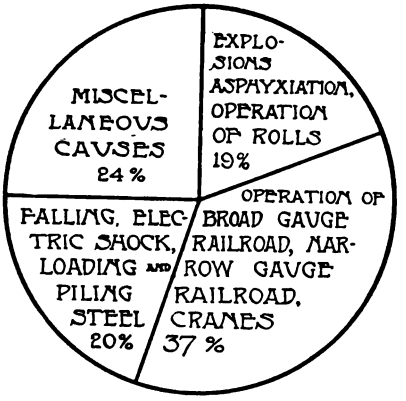


DIAGRAM 5.—PER CENT OF FATALITIES IN STEEL MAKING DUE TO VARIOUS GROUPS OF CAUSES.

industry with other industries in regard to its commonest accidents. Industrial railroads and traveling cranes are common in all large construction companies; in almost all factories there is repair work, cleaning, oiling, etc., to be done at a dangerous height; it would be hard to find a mill which does not use electricity. Therefore, legislation looking to the prevention of the commonest accidents of the steel mills need not be special legislation for one industry. It can be an extension of the present factory law.

One or two other conclusions press for statement. There can be no doubt that the unrelaxing tension and speed in the American steel mill makes for danger. To go slower would be to go backward in industry, and that is more than can be expected of

America. But by shortening hours of work the dangers of speed can be lessened; the minds and bodies of the men can be kept up to the pace of the mill. Greater intensity of work necessitates longer periods of relaxation. If the strain of the work cannot be lessened the duration must be. Think of the crane man, upon whose alertness and care depend the lives of several others. His is a hot, unpleasant, lonely job. There is no one to spell him. He cannot get down from his cab for any reason. And he works *twelve hours* every day in the year* except Christmas and the Fourth of July. No steel company can maintain that it has done everything to prevent accidents until it has reduced the working hours of men in such responsible positions.

Another observation which one cannot fail to make is not only that some companies maintain higher standards of safety than others, but that different plants of the same company, different parts of the same plant, are not kept up to equal standards of safety. The reason is obvious. "This isn't one of our best plants," an inspector will say. "You see, we're very much crowded here and that makes things more dangerous. Eventually, I suppose, we'll have to abandon this plant." Or, "This part of the mill is old. We haven't put safety devices in here. It would hardly pay. We are going to tear all this down in a few years." —Ordinary business economy, to be sure. But meanwhile men go on working in the crowded plant where things are not safe, men go on working in the old, badly lighted part of the mill where it "isn't worth while" to put in guards.

This sort of economy is of a piece with that of the miner who wants to finish loading his car and takes his chance of a fall of slate by failing to put up needed posts. It is human nature, but taking chances with other men's lives ought not to be so easy.

Let me illustrate by what I learned about the "skull cracker." Each time a ladle is filled with molten metal, part of

* In March, 1910, the executive officials of the United States Steel Corporation took steps to enforce a rule passed by the Finance Committee in 1907, hitherto remaining a dead letter. The order does away with loading, unloading, unnecessary repair work and other forms of special Sunday labor, and requires a 24-hour interval in the production of ingots. Blast furnaces and other continuous operations were not affected by this Sunday order.

the liquid mass cools and hardens round the sides before it can be emptied. By successive filling and pouring this accumulates until a "skull" is formed, which of course reduces the capacity of the ladle. It must be removed, broken up, and melted over again. The device used to break up these "skulls," and also pieces of "scrap" which are to be melted over, is called a "skull cracker." A big pear-shaped iron weight is lifted about 60 feet in the air and dropped. It comes down with force enough to break the iron piled under it into pieces fit for the furnace. The danger in this operation, from the flying chunks of iron, would be apparent to a child. Three men on our list were injured in this way,—one while working 200 feet away. While he was working at a skull cracker for the Carnegie Steel Company, a big piece of scrap struck and crushed the leg of Andrew Antonik, so that it had to be amputated. He said in telling of his injury, "The scrap always flies like that, but in the daytime we can dodge the pieces. At night you can't see well enough to dodge them."

In one mill two skull crackers were used. One was some distance removed from all other operations, and fenced in on three sides by a three-inch solid board fence some 30 feet high. The other was right in the center of things where men were passing frequently, it had no fence about it, and no protection for the men using it except a small, battered wooden shield. The danger to the workmen passing by was apparent from the fact that our guide was careful to take us on a wide detour around it.

In another mill a superintendent to whom these two skull crackers were described, said, "Well, it's the same way in our mill. We've got one skull cracker that's fenced in and one that isn't. I suppose it's that way in most every mill. You see, the new ones are fenced in, and the old ones aren't."

CHAPTER V

OTHER WORKERS

TO make the story of our year-long industrial disaster complete, we must consider accidents outside the three great employment groups. One hundred and thirty-five men who were neither railroaders, miners, nor steel workers, were killed in the course of their regular work. These fatalities were of the sort which might have occurred in any industrial community and are therefore of more than local interest. In their occurrence we find the same peculiar dangers of modern work,—power-driven machinery, electricity, explosives, etc., which have been discussed. But we also find many risks of work which have no peculiar relation to modern times,—accidents such as those of teaming and river work, which might have happened a thousand years ago.

TABLE 12.—122 FATALITIES IN MISCELLANEOUS EMPLOYMENTS

	Number Killed
Construction plants, electrical works, machine shops, foundries, factories, etc.	44
Elevator accidents	19
Construction work	18
Excavation work	8
Gas companies	5
Electric lighting, telegraph, and telephone companies	11
Street railways	4
Teaming	9
River work	4
Total number killed in these employments	122

These remaining fatalities have been classified in a somewhat arbitrary way. In the first group are considered the accidents of construction plants, electrical works, factories, foundries, and machine shops, because most of the accidents in each of these industries are of a nature common to all. Many indeed are similar

to those described in the last chapter. For instance, we find eight more men killed by the operation of electric cranes. In three of these cases a man was struck by a swinging load, in four the load fell, owing to the breaking of rope, cable, or hook. In one case a window washer was crushed on the crane runway. The story of this accident we give in detail:

> In August, 1906, Nicholas Kost, a young Greek, came to America to join his brother, leaving his wife and two children in Turkey. Neither of the brothers could speak a word of English, but through Russian friends they got work at a large electric and manufacturing plant. They were put into a gang of eight janitors. In the latter part of April, these eight men were set to washing windows in the mill. This is a long job. By May they had got to Section D, where there are a great many windows along the crane runway. The general foreman told the foreman of the window cleaners that he better postpone cleaning these windows till Sunday, when the crane would not be running. But the latter replied that he had other windows to clean on Sunday. So the window cleaners were put to work while the crane was running. Nicholas Kost among the others was instructed to look out for the crane, and when he saw it coming, to "tilt the window out and stand in the recess." The crane man, too, was told to keep a watch out for the window cleaners, and to call out a warning when he approached one. There are no signals on this crane and it runs quietly, so that in the noise of the mill its approach cannot be anticipated. All day long the work went on without mishap. But just before quitting time the crane man for the first time failed to give warning, the vigilance of Nicholas Kost had relaxed, and he was caught and crushed against a post by the wheel of the crane. He was able to walk home, but died the next day.

This story is taken from testimony of witnesses at the inquest; from the statement which Louis, the brother of Nicholas, made to the investigator; and from the company's record. There was no material difference in the three accounts, except that the company's record alone concluded that the death was due to the carelessness of Nicholas Kost himself. Must we accept this as the one reasonable and final conclusion? Certainly Kost's failure to protect himself against the irregular movements of an

electric crane, while cleaning windows 40 feet from the ground, is not the only failure to consider in this case.

Many other accidents typical of the steel mills are repeated in this group. Thus, four men were killed by electric shock, two by a collapsing pile of material, four by railroad trains in the yards, and two by a fall.

With the exception of 11 miscellaneous cases, the other accidents in the first group of 44 are connected with emery wheels, cog-wheels, circular saws, and shafting. The factory law of Pennsylvania has this to say about such mechanisms:

> Section 11. "The owner or person in charge of an establishment where machinery is used shall provide belt shifters or other mechanical contrivances for the purpose of throwing on or off pulleys. Whenever practicable, all machinery shall be provided with loose pulleys. All vats, pans, saws, planers, cogs, gearing, belting, shafting, set-screws, grindstones, emery wheels, flywheels and machinery of every description, shall be properly guarded."

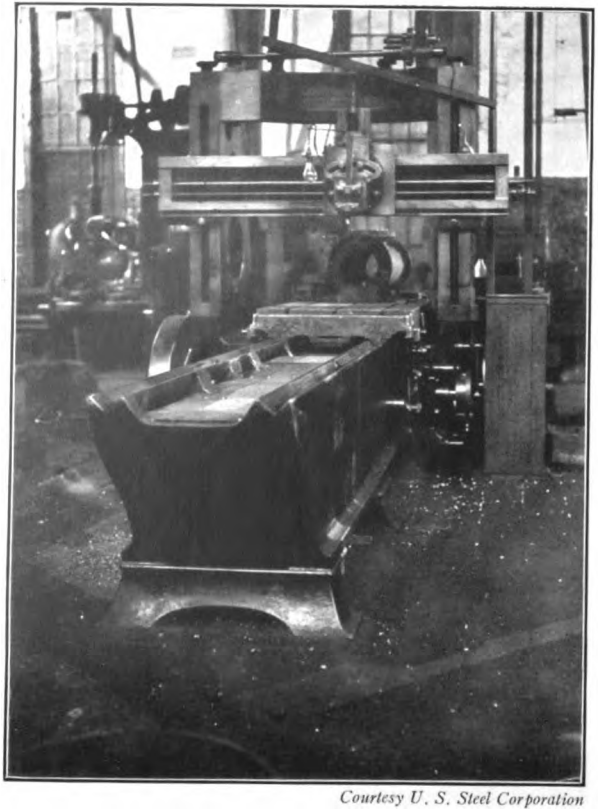
In spite of this sweeping command to the industrial establishments of the state, in Allegheny County alone in the year of our study 11 men* were caught up in belts and killed; one was struck and killed by the belt of a flywheel; one by a piece of a bursting grindstone; and three died as a result of having their arms caught in machinery. This takes no account of the non-fatal injuries from such causes. In our short list, amounting perhaps to half the injuries of a quarter of the year in one county, four hands were hopelessly mutilated by circular saws; one man was injured by the bursting of an unguarded emery wheel, and ten† men were caught in apparently uncovered gearing.

This list of accidents merely emphasizes the fact that the law as to guarding machinery is not enforced in Allegheny County,‡ a fact well known to all who have walked through the mills with

* This includes three cases in the steel mills.

† This includes cases in the steel mills.

‡ Conditions described, as already noted, were those of 1906, 1907 and 1908. There have been no developments in the factory inspection department in Pennsylvania to warrant the assumption that there has been any radical change since then in standards of enforcement.



Courtesy U. S. Steel Corporation

PLANER IN MACHINE SHOP

Showing the cavity inside the bed covered by a steel plate to prevent the workmen from reaching or falling into it and being caught by the traveling carriage

Courtesy U. S. Steel Corporation

SAFETY HOOD OVER CIRCULAR SAW

As a piece of wood is pushed under the front end of the runner, the hood rises automatically, resting on the upper surface of the board, which slides underneath it

their eyes open. Moreover, where an attempt is made to comply with the law, the words "properly guarded" are evidently interpreted freely to suit the convenience of the employer. Take for instance, the gearing at the side of roll-tables in the steel mills. Sometimes it is absolutely uncovered; often there is a strip of iron a foot wide across the top; in a few mills there is a complete latticed iron guard covering top and sides, with a hinge at the corner so that it can be lifted instead of removed for oiling or repairing the gears. This wide latitude of interpretation would make the law difficult for the most conscientious deputy factory inspector to enforce. If a set of standard guards were adopted by the factory department as standard for each of the common kinds of machinery, the law might be effective. Thus, devices are on the market entirely adequate to protect workmen from cutting their hands on wood-sawing machines, and a shield has been devised which practically eliminates the danger from a bursting emery wheel. If such guards and shields could be adopted by the factory department as standard and familiar to each inspector, evasion would be less easy. As it is, anything that looks like an effort at protection apparently passes for "properly guarded."

Accidents from belts and shafts are not so easily disposed of. They happen in two ways: A man passing near, or working beside, the shaft may be caught in the belt, or a man may be caught up while putting the belt on the shaft. Accidents of the first class can be prevented by a proper guard. Five of the shaft accidents were of this class. Accidents of the second class depend upon the speed at which the shaft is running, and more yet upon the skill and experience of the man throwing the belt on. Of six killed in this way only two were experienced in the work. A ladder broke under one of them and, grabbing for the belt to save himself a fall, he met a more terrible fate on the shaft. Fellow workmen of the other, a common Slavic laborer, assert that the shaft was not slowed down enough. In the other four cases the accident was due to the inexperience of the man killed. Two were Slavs of only a few days' experience in a factory. Two were fourteen-year-old American boys. One of these boys was obeying the direct orders of his foreman in trying to throw on the belt; the other had done it often with his foreman watching.

Next to the telephone, the elevator is perhaps the most indispensable requirement of modern city life. Without the elevator the present concentration of business in a great city would be impossible. The sky-scraper without it is inconceivable. But, like most of our modern devices for annihilating time and space, the elevator operates at a heavy cost. Our table shows 19 fatalities due to elevators, and this number includes only the "industrial" elevator accidents; namely, those in which the person killed was engaged at the time in his regular work.

Elevators seem to offer a peculiar temptation to recklessness; 14 of these 19 accidents involved carelessness. Here are a few instances. An errand boy poked his head through a small window in a shaft and was killed by the descending elevator. An elevator boy put his head over the gate after he had started the elevator upward, and was caught. One of the janitors in an office building, in a hurry to get his work done, attempted, against the rules of the building, to run an elevator and was killed. A seventeen-year-old dressmaker in a department store, running for an elevator that had started upward, slipped and fell through the opening.

In many of the cases, however, the carelessness is not all on one side. For instance, a man delivering goods at a restaurant, seeing no one on hand to run the elevator, tried to run it himself, although this was contrary to the rule. The elevator was out of order, and as he stepped on, it fell with him to the bottom of the shaft. No warning sign had been put up. In several instances, the owner of the elevator was exclusively at fault. In the case of an old night watchman, who fell down a freight elevator shaft in the dark, it was proven that no gates guarded the shaft.

The factory law of Pennsylvania recognizes the dangers of freight elevators (which are open usually on three or four sides). It requires gates or doors at every floor, so constructed as to open and close automatically by the action of the elevator as it passes. That this law is not strictly enforced is proven by the large proportion of fatal accidents in which the inquest brings out the fact that there were no automatic gates, that they were out of order, that they had been tied up for special work and not let down again, etc. And, although the law requires that the door or gate shall "form a substantial surface when closed," it is apparent, as in the cases of

guards for machinery, that there is no standard. One can see about the city gates of every type, from a close wire fence three feet high to a single five-inch bar about three feet from the floor. With passenger elevators, which are enclosed on all sides, the danger is much less, but it is not eliminated. A very careless operator may leave the door open when he takes the elevator away, and almost any operator will start the elevator and draw the door simultaneously, leaving for a moment an open space through which a person might fall. A Pennsylvania act of May 30, 1895, requires every elevator "then in use or thereafter constructed" to be equipped with an automatic locking device, but this statute is not part of the Factory Law, and in Pittsburgh there is no pretence of enforcing it with regard to passenger elevators. Such a law rigidly enforced would make the usual elevator accident impossible.

The house smiths working on narrow beams at the top of unfinished sky-scrapers, are among the thrilling figures of modern city life, and the skill of these "performers" is such that they rarely fall. Five were killed during the year in Pittsburgh. The others who lost their lives in construction work were carpenters, bricklayers, painters, and laborers. In most cases the accident was a fall. Two only were apparently inevitable deaths. Two were due to a defective scaffolding placed by the man who was killed. Five were due to a defect over which the victim had no control. Take for example the death of a young bricklayer's apprentice, working on a stack at the filtration plant. A rotten plank broke with him, and he fell 182 feet inside the stack.

Digging down into the earth involves almost as great danger as building up above it. In ditch digging there is the risk of the bank caving in; in quarrying the danger of a heavy rolling stone. But in all excavating work the greatest risks are from the explosives used. It takes a vigilant foreman to prevent accidents from dynamite among the ignorant Italians who usually handle it. One of the entirely unnecessary accidents of the year was due to the foolhardiness of an Italian named Leone. He and a number of other Italians were sitting around a fire at noontime. The foreman warned him to move certain sticks of dynamite away from the fire, but Leone, who was proud of his experience,

replied that he knew what he was doing. The dynamite remained, and an explosion occurred which killed three of his fellow countrymen and left Leone himself a cripple.

Italians are also almost exclusively employed in laying gas pipe. Five were killed in this work. As an example of their fates, here is the story of Ferdinando DiVito and Giuseppe Corecato:

> These two were sent by the foreman to cut off a 2-inch service line from a 20-inch gas main. DiVito got down into the hole, cut off the service pipe, and was attempting to put in a 2-inch plug when the escaping gas overcame him. Corecato, seeing that his friend was overcome, tried to pull him out of the hole. But he was not strong enough alone, and there was no help at hand. He also finally succumbed to the gas, and fell into the hole with DiVito. Five hours later the foreman missed them. He went with others and with ropes pulled up out of the hole the two bodies which told the story of this tragedy.

Here was a hero of whom the Carnegie Hero Fund Commission never heard. No one became interested in the case but the Italian priest, through whose efforts the gas company was induced to pay for Corecato's funeral and send $100 to Italy for the maintenance of his wife and two children. As for the old widowed mother of DiVito, who for three years had depended upon him for support, no one knows what has become of her.

In mills and mines the danger of electric shock is a secondary and incidental risk, one which might be almost entirely removed. But to the lineman, who deals every working day with electric power, it is a constant and apparently unavoidable danger. A lineman may touch a high voltage wire by mistake, or he may take hold of a low voltage wire which has become highly charged by crossing a high voltage wire at some distance. Thus the telephone man, while he deals directly with low voltage wires, runs just as much risk through the unforeseen crossing of wires, as the arc light man, who knows that he is dealing with dangerous wires. We can "chain the lightning," but it is always waiting its chance to strike. Nine linemen were killed during the year, and in no

case did evidence at the inquest indicate that any one was at fault.

The story of transportation does not end with the railroads. Much of it at Pittsburgh is done by the freight boats on the three rivers. This work also takes its toll of human life. Four "river-men" were drowned during the year. We are likely to forget, too, the importance of the teamster in the business of transportation. His job is a hazardous one. Crowded streets, trolleys, railroad-crossings, unmanageable horses, accounted for the deaths of nine teamsters during the year.*

Street railway accidents rarely result in injury to the men who run the cars. Only four traction employes were killed during the year. In two cases a car "got away," because of a defective brake. In a third case a conductor, just about to start out from the barns, was run down by a car while he stood between the tracks putting his trolley on the wire. On account of a defective headlight the motorman failed to see him. In the fourth case a car cleaner was crushed against a post in the barns while standing on the step of a car.†

This chapter with its arbitrary groupings and somewhat desultory description of the accidents of many employments has little value except to emphasize the dreary commonness of work accidents. We need not go to steel districts and railroad centres to find dangerous trades. In and around every city, work is being done which involves risk of life and limb to the men who do it. These risks are not wholly inevitable. Here too is something to fight about and not forget.

* Two of these men were intoxicated. The others were not in any way at fault.

† Space is lacking to describe the miscellaneous accidents mentioned in Table 12, page 76. Many of them only happened to be work accidents. Thus a street car collision in which a messenger boy was killed is considered a work accident, because the boy was at the time engaged in his regular work. Others were inherently industrial in character but were few of a kind.

CHAPTER VI

PERSONAL FACTOR IN INDUSTRIAL ACCIDENTS

"SO you've come to Pittsburgh to study accidents, have you?" says the superintendent, or the claim agent, or the the general manager, as the case may be. "Well, I've been in this business fifteen years and I can tell you one thing right now,—95 per cent of our accidents are due to the carelessness of the man who gets hurt. Why, you simply wouldn't believe the things they'll do. For instance, I remember a man,"—and he goes on to relate the most telling incident he knows, to prove his assertion.

This is the almost invariable reaction of the Pittsburgh employer and his representatives to a query about industrial accidents. And the statements of such men are the chief source of effective public opinion on the subject in Pittsburgh. There are many people, to be sure, who view the whole situation through startling red headlines and whispered tales of horror,—who believe, for instance, that numbers of men are burned up in furnaces every year, the story of whose destruction never gets beyond the mill. There are also thousands of people, including most of the workingmen themselves, who think about each accident as a distinct and separate incident, without generalizing or drawing conclusions. Neither of these groups, however, forms an effectual element in public opinion; one is hysterical, the other inarticulate. Most of the men in the community whose opinions count, have made up their minds about this accident question from what they have heard employers, superintendents, casualty managers say. In other words, they believe that "95 per cent of the accidents are due to the carelessness of the men." Those emphatic, reiterated assertions, those tales of recklessness often repeated,

Drawn by Joseph Stella

A Greener: Lad from Herzegovina

have grown into a solid, inert mass of opinion among business and professional men in the community, a heap of unreasoned conviction.

A clear understanding is needed of the extent to which the personal factor enters into the causes of industrial accidents if ways of prevention are to be developed and if we are to have any basis for judgment as to the equity of the present system of distributing the accident loss. My sources for such an analysis were in many respects unsatisfactory. The coroner's records were as a rule meager, sometimes illegible, and almost never clear and satisfying in detail. The testimony, moreover, has a tendency to lean to one side. The witnesses are employes of the company, including almost always the superior of the man killed. It is to his interest first to clear himself of all implication; second, to clear his employer. The easiest and safest way of accomplishing these ends is to blame the dead man. The same motives, in perhaps lesser degree, affect the fellow workmen who testify. It was seldom possible to supplement the inquest story by a conversation with eye-witnesses of the accident, and only in 191 cases was the employer's record available.*

In the absence of any other analysis of causes of work-accidents based on American experience, this is offered, not as proving conclusions, but as containing indications.

Whenever in any of the versions of the accident some responsibility was indicated, that indication is included in the tabulation. An accident is charged against the victim of it, if his act or omission in any way contributed to it, whether it was due to his carelessness, ignorance, or any other failing. The same rule is followed in the "fellow workmen" column. Between accidents attributable to the employer and those attributable to the superintendent or foreman, a rather sharp and arbitrary line was necessarily drawn. If the accident was due to some defective condition in the working plan or appliances, or to the furnishing of insufficient or inadequate material, it was checked in the "employer" column. But if the accident was due to some special failure in superintendence, as for instance, placing of ignorant

* The fact that the analysis is based on fatal accidents only, is also a material limitation.

men in dangerous positions, failure to warn, mistaken and dangerous orders, then it was charged, not against the employer, but against the superintendent or foreman.

TABLE 13.—410 WORK-ACCIDENT FATALITIES, CLASSIFIED BY EMPLOYMENT AND BY INDICATIONS OF RESPONSIBILITY*

Industries in which Accident Occurred	*Total Indications*	Indications of Sole or Partial Responsibility upon the Part of				
		Victim	*Fellow Workmen*	*Foremen, etc.*	*Employer*	*None of These*
Steel manufacture . . .	189	45	28	16	48	52
Railroading	91	16	12	9	32	22
Mining	86	31	5	11	14	25
Other industries . . .	135	40	11	13	53	18
All industries	501	132	56	49	147	117

This table has at least a negative usefulness in disproving conclusively the statement that 95 per cent of the industrial accidents are due to the carelessness of the workmen. For 117 out of these 410 fatal accidents, according to all the evidence attainable, no one is to be blamed.† The fatalities in this last group would commonly be called unavoidable. We have included here the two great furnace explosions at the Jones and Laughlin Steel Works; but with this exception the fatalities in this group happened without dramatic circumstances to make them memorable. A brakeman making a coupling on a trestle one winter night, slipped on the ice and fell through. A mule driver in a mine got down to change a switch, his light went out, and in the darkness he was knocked down and killed by the mules.

* Four hundred and ten fatalities out of 526 are included in this table; it was not possible to secure any evidence with regard to cause of accident in 116 cases. In some cases out of the 410 fatalities tabulated there were indications of a divided responsibility, so that the same case was entered in two or more of the columns bringing the total separate indications up to the figure given—501.

† In two or three of these cases an outside person might have been to blame, as for instance in the case of a messenger boy killed in a street car collision.

A teamster standing on a heavy load of machinery and driving out of the factory, bent down to escape the top of the gateway; as he did so, some piece of iron under him slipped; he lost his balance, fell to the ground and was run over. One by one, here and there throughout the country, these dreary things are happening.

There is little reason for lingering on this class of accidents. One cannot point to any very immediate hope of prevention. Safer ways of doing many things will in time be devised, but there will always be dangerous trades. My purpose in dwelling just here upon these accidents, is to make it clear that since 28 per cent of the fatalities are "unavoidable," it cannot be true that 95 per cent are due to the carelessness of the men killed.

In fact, considering all the evidence available, we had indication of some responsibility on the part of the victim in 132 out of 410 fatalities; of his sole responsibility in 68 fatalities. Even these 132 cases demand analysis. They represent not just "carelessness" as the word is commonly used, but a long list of human weaknesses, some common to us all, some resulting from special environment, some for which the man himself is not responsible, some for which he is.

Ignorance covers a large share of these cases, the ignorance of young boys, of those who are "green" at their job, of the tongue-tied alien, who finds himself for the first time a part of swift and mighty processes. In 22 out of 132 deaths in which the victim can be held accountable, he was "green." One was on his first night's work in a mill; one had been at his work four hours; another three days; eight, less than a month; four, less than two months; seven, less than six months. Nearly all these men were foreigners and eight of them had been among English-speaking people less than one year.

For example, in several cases where a miner was killed by a fall of slate, the evidence indicated that not enough posts had been used. In four such cases the man killed was a "greener." One had worked in a mine but two months. Two railroad cases are equally in point.

Garbia Lubitch, a Hungarian, who had been in America five months, was set to work alone digging a ditch under the

railroad tracks in a mill yard. He was working between the ties, when a train backed down without warning and ran over him. A foreman had told him in English to work at the side.

Thomas Korenz, a Slav, who had worked as a trestle laborer fourteen days and could speak no English, was sent with three of his countrymen to do some work under a car. Later, as a switching engine was about to couple on to the cars on this track, a brakeman was sent to warn any men who might be underneath. The three who could understand, hurried out from under the car, forgetting to explain the warning to Korenz. The brakeman, thinking that all was safe, signaled to the engineer to come ahead, and Korenz was killed.

Thirteen of the 132 who were in a measure responsible for their own deaths, were not men but boys. A fourteen-year-old assistant chemist was run over by an engine in the yards of a steel mill at night. A thirteen-year-old boy tried to pull up a freight elevator because one of the girls in the shop asked him if he could. It came up suddenly and fast, and struck him while he was leaning over. Two sixteen-year-old boys were killed while meddling with elevators. A newly landed Croatian lad of seventeen was killed by fooling with a switch with wet gloves on, watching the sparks fly.

In all these cases it could be said that there was no excuse. There was a path outside the tracks where the little chemist should have walked. The Croatian had been warned to keep away from the switch. The others had no business trying to run the elevators. It is all true, but they were children. We are too likely to think that a laborer must be grown up. We might expect that ten hours' work a day would take the nonsense out of any boy, but it doesn't. These very boys, full of mischief and daring in dangerous workshops, the boys who get hurt, are first cousins to the boys who, notwithstanding all the trouble they make, are most prized and most loved in the schools.

Two boys were killed in the Homestead steel works while they were asleep. Both accidents happened at 1:30 in the morning. One boy was a "pull-up," fifteen years old, who had worked

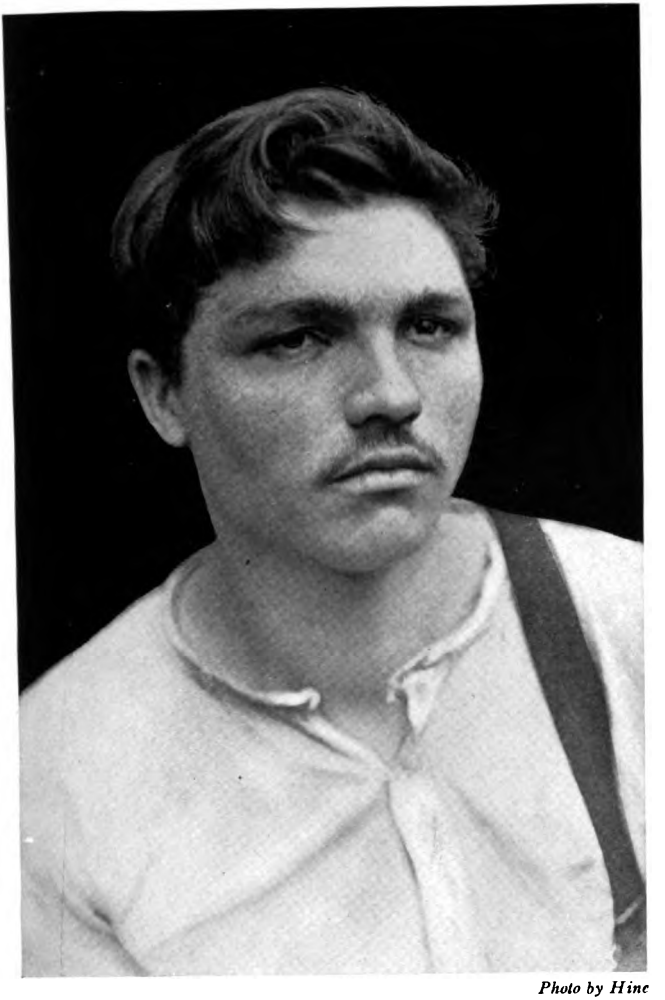


Photo by Hine

IMMIGRANT LABORER—A SLAV

eight hours out of a thirteen-hour night turn. He had a few minutes to rest, and went back of the furnace to lie down in a wheelbarrow. He fell asleep and was struck and killed by the extending arm of a ladle which the crane man was bringing back to the pit. The other was an eighteen-year-old "hook-on" who, after seven hours of his working night had passed, climbed into a buggy and went to sleep. The crane man, not knowing this, lowered an iron bucket on the buggy and killed him.

Many kinds of carelessness which we should heartily condemn in a grown man, must be expected in a boy. For this reason we class these 13 cases with the 22 cases of ignorance.

Next there were 12 deaths due to a condition on the part of the man killed over which he had no immediate control. A repair man climbing to a high place became suddenly dizzy and fell, although there was a railing to protect him. A young lineman, with a weak heart, was electrocuted by taking hold of a wire supposed to be dead but which had crossed another wire carrying 250 volts,—not enough to kill an ordinary man. A brakeman was run down in the yards, because of slight deafness. One man, afflicted with epilepsy, fell in a fit upon a steam exhaust and inhaled steam until he died. Here it might be said with an air of finality, "While these men were not immediately responsible, they were responsible for selecting occupations for which they were unfit." Are we sure that they were responsible? Reynolds, the epileptic, for instance, had a wife and four little girls under fourteen. Once before he had fallen from a crane and crippled his foot. Soon after he came back to work he was found lying on the railroad track just outside the works. After this he was discharged, but he came back and begged for work, and was finally taken on again to do brass filing for a few months until he could find something else. It was in an effort to hide his weakness that he met death, for when he felt the seizure coming on he got up quickly and went through a door to a place where no one could see him. It was there that he fell upon the steam exhaust.

Such men as these are seldom in a position to choose an occupation suited to their handicap. Society might do well to

protect them by a law setting certain physical standards for all those who seek employment in dangerous trades.

In eight cases there is evidence that intoxication of the victim was the cause of death. In two of these the evidence is very slight. In the others it is convincing,—a river watchman found drowned, with an empty whiskey bottle in his pocket; a drunken teamster who fell out of his wagon; a brakeman on a steel company railroad who came to his work intoxicated, tried to get on to a moving train and fell under the wheels, etc. There is nothing new to be said about such cases, except that they are rare. In only eight out of 410 fatalities, less than 2 per cent, is there any indication that the drunkenness of the man killed caused his death.

We have now covered 47 of the 132 fatalities which would be put down on the average employer's record as "due to carelessness" of the workman. In 22 cases the "carelessness" is found to be ignorance; in 13 cases it is extreme youth; in 4 cases it is physical weakness; in 8 cases it is drunkenness. Eighty-five cases are left in which there is indication, strictly speaking, of "carelessness" in one of its many dictionary meanings. Still, for a real understanding of industrial accidents these 85 cases cannot be classed as arising from the same cause.

Webster, among many synonyms for "careless," gives three which will help us to understand the problem of the careless workman: (1) "heedless," (2) "inattentive," (3) "rash."

Carelessness of the first kind need be considered but briefly. It is exasperating and hopeless, but fortunately rare. Koroshic, who appeared in the second story of the introduction, is a good example. A similar case was that of an Italian, Domenico Regreto, who had been digging a ditch in the yards of the Westinghouse Machine Works. Late in the afternoon, when it was getting dark, he wanted to rest awhile. He sat down on a car track and leaned up against a car. An engine came, pushing along some cars to couple on to the one against which he was leaning. The conductor saw Regreto, but too late, and of course when the cars bumped he was killed. He had worked for two years about these yards. "Heedless" is too mild a word. It was the heedlessness of a fool.

Some employers state that many of their workmen are of this type, but the stories of the 410 accidents considered do not bear out this opinion. Nor is it likely that the record of American industries for speed, efficiency, and output, could have been won with any considerable proportion of such workmen. A larger proportion of these "careless" cases belong rather under the term "inattentive." It may strike the reader at first that there is no great difference between this word and "heedless," and perhaps there is not. But the divisions will at least serve to demonstrate that the whole story is not told when we say that a man was "careless." They are at least a beginning toward clear thinking on this subject.

To illustrate the distinction: No thinking man would describe in the same terms the Italian who took his rest against the company's rolling stock, and a brakeman who was struck in the night by a piece of overhanging bridge construction about which the engineer had earlier warned him, or a rigger who was struck in the breast by a heavy roll swinging from a crane, which he might have dodged by stepping aside more quickly.

In steel mills an alert mind is the first requirement for safety. Even a visitor who has no concern in what is going on must keep a lively attention fixed upon his surroundings. With those who are doing the work, this attention is bound to be secondary and incidental, but to insure their safety it must be constant and keen. However instinctive this vigilance may become, it cannot be unfailing. Human powers of attention are naturally limited in at least two ways; heed can be given to but a limited number of things at a time, and to any one thing for but a limited time. Moreover, in the condition and environment of those in "dangerous occupations," there are often influences working to weaken the power of attention. The speed and intensity of the work, the heat and noise of the place, the weariness of the workers,—all these things tend to numb the faculties most needed for protection.

Between inattention and recklessness or rashness there is a wider distinction. Neither kind of carelessness so far described is of the same nature as that of the brakeman who stands in the middle of the track to board an approaching yard engine, al-

though he knows there is a safer way, or that of the machinist who throws a belt on without slowing down the shaft. Such acts as these are rash,—the conscious taking of unnecessary risks. A flagman, for instance, started to run between two cars to give a signal; the cars came together and crushed him. Paul Maczko, a Slav, in a hurry to get some tools, ran between rolls and roll table in a steel mill; a red hot rail shot out of the rolls just in time to strike him. A fireman, who was late, ran up on a trestle to catch his train, missed his reach and fell.

There is undoubtedly much of this spontaneous recklessness, especially among railroaders and structural iron workers, but few accidents result from it. A trapeze performer does his act a thousand times without missing. Through the demands of their profession, the yard brakeman and the housesmith acquire the same accurate discernment of distances, the same perfection of muscular co-ordination and control.

But another kind of recklessness, more deliberate than impulsive, often results in accidents. Joseph Karlick, a Hungarian carpenter, was putting up a guard rail and platform under some shafting. His coat caught in a set screw and he was carried round on the wheel and killed. Karlick was an experienced man, and if he had requested it the wheel would have been stopped. Henry Powell and several other men were piling up plates with the use of an electric crane. Regular blocks were provided for separating the plates, but as these were at a distance and the men were "in a rush," they used some castings which were at hand. Powell went in between two piles to unhook the crane chain from the last load of plates. A casting broke and allowed one of the piles to topple over and crush him.

The deliberate failure to take a precaution, illustrated by the latter group of cases, is a kind of recklessness in which the chief element is haste. In the spontaneous, impulsive kind of recklessness, illustrated by the first group of cases, the moving spirit is daring, "taking chances," the gambling instinct. In almost all reckless acts connected with work, however, both these ele-

* This case is a very good example of those accidents for which both employer and victim are responsible. The Pennsylvania factory law requires that all set screws shall be covered.

A Lucky Brakeman. Seven Serious Injuries in Five Years, and Still on the Job

ments are present. There is some ease or time-saving secured by almost every risk that workmen willingly take.

Let us look into the origin and meaning of these two elements in recklessness. To begin with, the typical railroaders and structural workers of today were boys only yesterday,—boys with a more than ordinary love of risk and daring, else they could not have become what they are. The law of the "survival of the fittest" prevails without hindrance in these dangerous trades. Take such a boy, then, and put him to work in an environment of constant danger. At first he is afraid, but the necessities of the work, as well as his temperament, help him to conquer his fear. As he loses the fear, he acquires the recklessness. This is natural, inevitable. A yard master of twenty years' railroading experience was asked whether he was afraid when he first went on the road. He said,

"I shall never forget the first night I was on. I was only seventeen then, and I was afraid every time I went to do anything, though I never let on. This lasted for about a week with me. Then I began to get over it. Now I never think of the danger. I don't feel any different about going to work in the yards than I would about working round the place here.

"Every man who starts in railroading has a fear at the beginning. Sometimes it lasts a few weeks. Sometimes he is always afraid, no matter how many years he is on the road. Such a man will never become a practical railroader, though, even if he has forty years' experience. With the average, I should say, the fear lasts about a month."

And this man stated—as did almost every railroader I talked with—that, although he knew it was safer to get on a car or engine at the side, he always stood in the middle of the track. "Why," he said, "one reason we do it is that it's easy and simple and takes less effort than getting on at the side. You just put your foot on the run-board and the force of the car coming toward you throws you right up on."

There is no puzzle about this recklessness among brakemen, nor about any similar recklessness. If a hundred times a day a man is required to take necessary risks, it is not in reason to expect him to stop there and never take an unnecessary risk. Extreme

caution is as unprofessional among the men in dangerous trades as fear would be in a soldier.

The reckless workman, then, is a man whose naturally daring temper has been selected, and then encouraged and accentuated, by an occupation involving constant risk.

But as has been said, there is almost always another element in recklessness,—a desire to save time and avoid effort. This is an even more common human tendency. No one will take the slow, hard, safe way of doing a thing if there is a quick, easy way which is not too dangerous. This universal tendency is heightened in workshops. Sometimes, as in piece work, it is encouraged by the worker's direct financial interest in the output. Oftener it is intensified by the pressure and speed at which the whole plant is run,—an expression of the employer's direct financial interest in the output. One of the older and wiser mill superintendents in the Pittsburgh District told me that the one greatest cause of danger in the steel mills is the tremendous rush of the work.

"In the mills in England," he said, "they begin to work about 6, stop at 8.30 for forty-five minutes for the men to get breakfast; stop again at 1 for an hour for the men to get dinner, and stop again at 5.30 for half an hour. At these periods everything stops. The machinery is quiet. This is the reason why the English mills do not produce as much steel in the same length of time as the American mills. Here the machinery never stops. Another shift is always ready and waiting to step into the place of the shift that is leaving. Not a moment is lost. If a mill stops three minutes for repairs, or for any other cause, a detailed report of this must be made by the men in charge. If this happens two or three times under one man, the matter will be taken up with a question as to his efficiency. Under this kind of a drive, how can anybody be careful?"

When we read, then, of a man who went up to make repairs without stopping the crane, or of a man who tried to throw a belt on without slowing down the shaft, we must not lay the resulting accident unquestioningly to his own personal, ill-considered haste. Perhaps he was but a part of a great machine going too fast for safety. Every man in the process must keep the pace of the whole.

He can no more go his own gait than a spoke in a wheel can go its own gait.

The analysis of those accidents which are commonly spoken of as due to the "carelessness of the man injured" is now completed. Instead of 95 per cent, only 32 per cent* of the fatal accidents can be laid in a measure to the responsibility of the victims. And dissecting this 32 per cent, we find 11 per cent not due to carelessness, strictly speaking,—5 per cent being due to ignorance, 3 per cent to youth, 1 per cent to physical weakness, and 2 per cent to drunkenness. This leaves but 21 per cent of the fatalities actually due to carelessness. A study of this 21 per cent of men whose deaths were due, wholly or partly, to their own carelessness, reveals that some of these men were heedless, some inattentive, and some reckless.

For the heedless ones no defence is made. For the inattentive we maintain that human powers of attention, universally limited, are in their case further limited by the conditions under which the work is done—long hours, heat, noise, intense speed. For the reckless ones we maintain that natural inclination is in their case encouraged and inevitably increased by an occupation involving constant risk; recklessness is part of the trade. Not all accidents due to inattention and recklessness can be thus defended, but speaking generally, these two kinds of carelessness cannot fairly be called faults of the workman.

Those accidents which involve the responsibility of a fellow workman of the man who is hurt, are subject to a similar classification. In 56 out of 410 fatalities, we had indications of some responsibility on the part of the fellow workman; in 28 fatalities some act or omission on the part of fellow workmen was the sole cause. Several of these were cases of ignorance or incompetence. For instance, William Wintors, crane operator at Dilworth and Porter's, ran his crane into an open switch and it fell to the ground; the switch had been left open through the mistake of a foreigner who did not understand English. In the other cases some one of

* It must be remembered that this 32 per cent includes all cases in which the evidence indicated responsibility of victim. In over half of these cases there was indication also of the responsibility of others, *i. e.*, fellow-workman, foreman or employer.

the three forms of carelessness are found. Five men were run over because an engineer or fireman failed to give warning with whistle or bell. A train clerk was killed because an engineer started before he had received the signal. Adam Yaworski was crushed by a scrap box, which slipped from the crane chains because it had been insecurely fastened by a fellow workman. A careless crane man allowed his empty crane hooks to hang too low; he also forgot to give any warning to the men below. One of the big iron hooks struck Julian Romanofski in the back of his head, killing him instantly.

Often an accident results from a lack of co-operation; a failure on the part of both the man hurt and a fellow workman. Thus it was with the death of Bogata. He was oiling one of the great collapsible iron buckets operated by a crane in the ore yards. The crane man, not knowing he was there, started to manipulate the bucket, and Bogata was crushed. Both men had failed in care.

In the carelessness of fellow workmen the same elements exist in about the same proportions,—ignorance, youth, weakness, drunkenness, heedlessness, inattention and rashness. Yet when the death of another results it is hard to look upon any of these without unreasoning condemnation.

Probably, in modern industry, more actual responsibility for safety rests upon the foremen and under superintendents, those immediately directing the work, than upon any one else. For this reason we must make a sharp distinction between those who are in positions of authority and the workers. There were indications of some responsibility on the part of the foreman in 49 out of 410 fatalities; of his sole responsibility in 19. There are all kinds of foremen: foremen so cowardly that they will send men into danger where they would not go themselves, and foremen so brave that they will order their men to stand back while they go in themselves. There is the story of an Irish foreman who ordered a lot of Italians to work under a dangerous overhanging bank while he stood clear of the hazard. The bank fell and one of them was killed. And there is the story of an Italian sub-foreman, in charge of sixteen men, who, when he had waited five or ten minutes for a charge of dynamite to go off, warned the

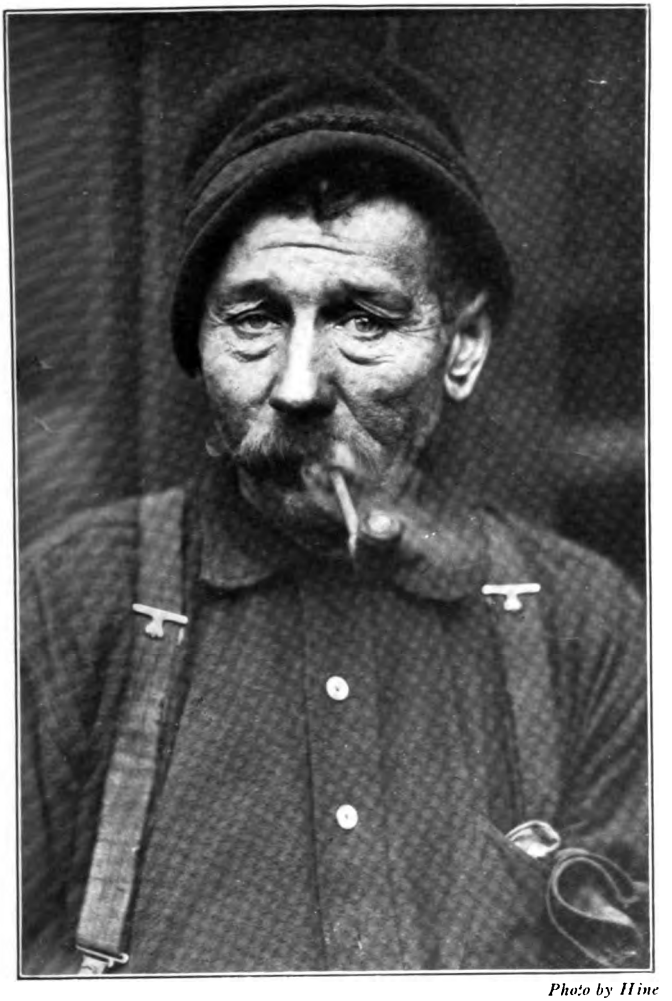


Photo by Hine

IRISH IRON WORKER

men to keep out of the way and got down into the ditch to see what was the trouble. Just as he got there the charge exploded and killed him.

More common, however, is the foreman who, through hurry, indifference, or thoughtlessness, sends "green" men into positions which mean danger to them, or stands by and allows incompetent people to try difficult and risky operations. Such is the mine foreman who allows two "greeners" to work in a room together without an experienced man. Such was the foreman or "boss" who regularly allowed Alfred Hopkins, a boy of fourteen, to adjust the belt on a shaft. On October 17, 1906, the belt slipped off the main shaft when Hopkins was alone in the room. He started to adjust it, as usual, was caught in the belt and carried round the shaft. When they took him down he was dead.*

The enforcement of rules for safety must, of course, lie with those in authority. Often serious accidents occur from a violation of rules. Often, too, a violation of rules is regularly ignored by foremen and superintendents. Here are two cases illustrating the point, one of which was described in the chapter on mine-workers.

> Fritz Collins had occasion to go up on a crane to make repairs. Instead of going up the pole, he signaled to the crane man, and rode up on the spreader of the crane. The spreader in going up hit the cage and Collins was knocked off, the spreader falling on top of him. The testimony revealed that rules were posted forbidding the men to ride up on the crane in this way, but that it was a customary performance with which the foremen were familiar and which they did not prevent.

> John Muschenitch, a dumper at the tipple of the Oakdale mine, was working overtime one night on the stock pile and rode down to the tipple in an empty coal car. These cars are run by electricity, the trolley being only seven and one-half feet above the rails. As he started to get out of the car, Muschenitch happened to touch this trolley with his neck

* From the company's office in answer to a question with regard to the cause of this accident, there came this statement: "Deceased was running a chaplet machine and got caught in the belt, swung to shaft above, and killed. Shaft was between eight and nine feet above the floor, so accident must have been due to carelessness." This is typical of the unintelligent way in which accidents are disposed of by the word "carelessness."

and was electrocuted. The significant thing about this incident is that, although it was against the rules to ride in the empty cars, Muschenitch's boss, the weighmaster, not only let him ride but got in and rode with him.

Many accidents for which a foreman is partly or wholly responsible are simply the result of mistakes on his part. Where several people are working together in a series of somewhat complicated operations, the first necessity is co-operation, perfect "working together." In many cases where a man is sent into a dangerous place to make repairs, it would seem that the foreman or superintendent should look out for his safety. At Rankin the ore is brought up from the ore beds to the "kipping buckets" in a chain of cars moved by an electric motor. One day the coupling between two of these cars broke, and George Schustic was sent by his foreman to fasten them together with a chain. Meanwhile the motorman, who had not been told that a man was working between the cars, started the motor which moved the chain. Schustic was killed. The foreman's responsibility seems unmistakable.

But it must not be forgotten that the foreman is human; his recklessness is largely the result of his environment; his powers of attention are often taxed beyond their endurance by the tension of work, by noise and heat, and by weariness. Moreover, the foreman is always under the greatest incentive to increase output. Pressure is brought to bear upon him in various ways. In the steel mills, for instance, bonus schemes, emulation, fear of discharge or desire for preferment, are constantly driving him. All this results in tremendous accomplishment, but it does not tend to make the foreman careful.

Referring back now to Table 13 (page 86), we find that there was indication of some responsibility on the part of the employer in 147 of the 410 fatalities; of his sole responsibility in 94 cases. Here again we do not mean that each accident was caused by a personal conscious failure on the part of the employer; but rather that the accident can be traced, in whole or in part, to an inadequacy in that part of the productive machinery which the employer furnishes, and for which he, if any one, is responsible. Thus an accident which occurs because a chain breaks is checked in the

"employer" column, although it is not possible absolutely to insure the soundness of chains, just as an accident which occurs because a workman is ignorant is checked in the "employe" column, although it is not possible for a workman to guarantee his own quick-wittedness.

For an intelligent understanding of the "careless employer" one must consider not only his mental attitude, but also the actual mediums through which his intentions, good, bad or indifferent, must operate. In the first place, he does not exercise care directly, but through an army of superintendents, inspectors, foremen, etc. In the second place, his provisions for safety must very often depend upon the sufficiency of material things which, as we have suggested, it is always difficult and sometimes impossible to guarantee. The employer's "carelessness," then, is a matter not only of his own mental attitude, but of that of his agents, and sometimes of the "perversity of inanimate things."

Most of these 147 instances of negligence in employers come under failure in the "first duty"—to provide a safe place to work. They divide themselves into two main groups. In the first come those accidents which are due, strictly speaking, to defects; namely, some condition of plant or appliance which was not planned or intended.

Among the fatalities resulting from such defects, there were a few where the defect was perfectly plain, and a few where the accident was necessary to reveal it. But most of them can be laid to imperfect inspection. One story of a breaking scaffold has been already told; in another case four men were killed because a platform, ladder, or plank gave way under them. Twenty-two men were killed because something over their heads gave way and a heavy object fell upon them. The commonest instance of this is the breaking of crane chains. One man was killed by the falling of a coal trestle, another crushed by the collapse of the floor above him. A cracked grindstone, a steam-pipe valve which would not work, an electric wire with the insulation worn off, etc.—these are some of the other defects from which death resulted.

In railroading the defects are of a different order. A broken link in a brake chain, couplers that are out of order, three cases of an old "weak" car which gave way in a slight collision, an engine

sent out for yard work without foot board and grab irons, a piece of iron left sticking in the guard rail, etc.

Some of these defects, by the mere recital of them, prove inexcusable neglect. But most of them are explained, just as the workman's disregard of his own safety is chiefly explained, by the pressure and speed of work. There can be no absolute standard of safety, for no employer can keep his equipment in perfect repair every day in the year. The classification of this sort of carelessness is a matter of degree. One can simply say that more attention given to increase of output tends to lessen attention given to increase of safety.

The second group of failures in "the employer's first duty," is of a very different nature from these "defects" we have considered. Reasonable provision for safety in the construction of a plant, or in the organization of the work, should be part of the employer's deliberate plan, and it is hard to find excuse for the lack of it. Under this heading come a large number of fatalities.

As has been stated, the law of Pennsylvania requires that "all vats, pans, saws, planers, cogs, gearing, belting, shafting, set screws, grindstones, emery wheels and machinery of every description shall be properly guarded."

> Andrew Jubreed,* on April 19, 1907, was caught in a shaft around which there was no railing, and killed. This was in the Twenty-ninth Street Works of the Carnegie Steel Company.
>
> On October 19, 1906, Gusatija Kosanovich was lifting something under the direction of a foreman when his foot slipped and got caught in the uncovered cogwheels of a roll table. He died in twenty minutes. This was at the South Side Plant of the Jones and Laughlin Company.
>
> On August 21, 1906, Walter V. B. Calhoun was painting the iron work above some shafting at the John Eichley, Jr., Company's Works at Twentieth Street. His coat got caught in an uncovered set screw, he was carried round the shaft, and killed.

* In these paragraphs the actual names are given, the evidence having been secured solely from the coroner's records.

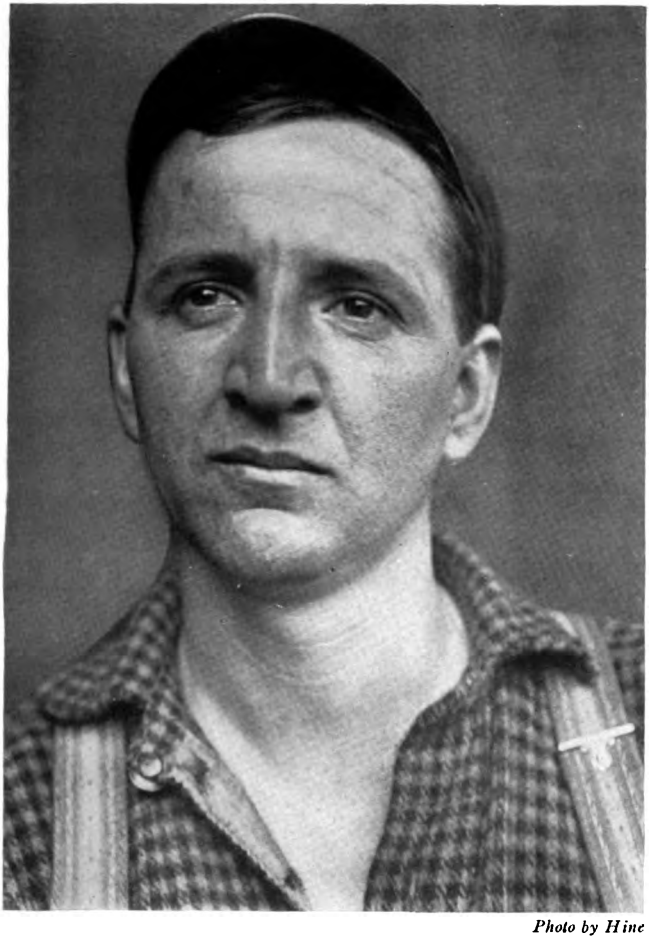


Photo by Hine

STEEL WORKER—A GENUINE AMERICAN

Each of these fatalities resulted from a violation of the Pennsylvania law.

George Romonofsky was crushed while making a chain coupling on the Union Railroad, August 5, 1906.

Anthony Gallagher fell from a five-foot platform at the top of a furnace at Jones and Laughlin's. The platform had no railing.

On March 14, 1907, Frank Shellaby was killed by falling against an uncovered switchboard at the Westinghouse Air Brake Company.

In each of these cases, and many others like them, reasonable provisions for safety had not been made, although no requirements of the Pennsylvania law had been violated.

Many an accident happens because of the crowding of machinery into a small space.

Clifford Rea, a boy of eighteen, was oiling machinery for the Union Storage Company. In order to oil one machine he had to go into a space thirteen inches wide, between a heavy sliding door and a revolving flywheel. While he was there the door was suddenly opened; Rea instinctively leaned back a little, and was instantly caught in the wheel.

Insufficient lighting in the mills at night, and the absence of warning signs in foreign languages, are causes of accident too frequent to be ignored; but even more amazing are the hundreds of inquest records of men who were killed because of the inadequacy or the total absence of signals, warnings, or signs of immediate danger. This kind of accident is found in every line of work.

John McCaffrey, motorman in the Bridgeville Mine of the Pittsburgh Coal Company, was coming out of the mine with a train of loaded cars; a collision occurred, and he was thrown off and killed. And we read that there was no trip-rider on the rear of the forward train to keep watch; the foreman stated that they had not been using trip-riders.

A car cleaner was working under a coal car on a siding when an engine ran some other cars in on the siding without warning. They struck this standing car, and the man

underneath was killed. The superintendent testified that he didn't know whose duty it was to warn men underneath cars.

Frank Stanko, employed at the Pressed Steel Car Company, was killed in a similar manner while working under a car, and the foreman testified that he had no one to give signals.

Accidents such as these, resulting from a lack of the most obviously necessary signal systems, are so common that one is forced to consider them due not to an occasional incompetent foreman, for whose failures the employer may be often only theoretically responsible, but to a lack of provision for safety in the plan and organization of work. This kind of carelessness is as inexcusable in an employer as deliberate indifference to safety in the construction of the working place.

There is a final class of accidents for which, regardless of the immediate cause, the employer must be held responsible. There were killed, in the year's industrial accidents, ten children who had not yet reached the age of sixteen. In three cases the accident was not due to any danger inherent in the child's work; in seven the accident was a direct outcome of unsuitable employment. For the deaths of these seven we must primarily blame the respective employers, because they were in a position to prevent the employment of children in such work.

Several of these accidents have been already described in another connection. Two more need telling:

William Röck, fourteen years old, employed by the Pittsburgh Brewing Company at Duquesne, on November 14, 1906, while trying to put a belt on a pulley, was caught up in the machinery and killed.

Frank Lenox, thirteen years old, employed in the C. M. Harper Brick Works at Elizabeth, on September 17, 1906, while coming down a narrow stairway from the "screens," slipped and fell into a tempering machine. He was killed before the machine could be stopped.

It should be borne in mind that this inquiry has been a study of industrial fatalities rather than of establishments. Conceiv-

ably, some Pittsburgh employers, through either good luck or unexampled precautions, might have had no casualties whatever during the periods studied and their records would not have come within our notice. We have not attempted to appraise the efforts of some superintendents to prevent accidents any more than we have analyzed the psychology of the careful workmen who during long service in dangerous occupations have escaped injury. We have limited our analysis to the facts at our command; that is, to the accidents which happened during the year studied.

In so far as the employer's relation to industrial accidents is revealed by the history of this year's fatalities, we have found much deliberate disregard for safety in the construction of plant and equipment, and in the organization of work; we have found a long list of defects, not all of which the employer could have avoided, but most of which careful inspection would have revealed and immediate repair have rendered harmless; we have found those directly representing the employer in positions of authority often neglectful of safety; we have found cases of children regularly employed in work or in surroundings dangerous to them on account of their youth.

TABLE 14.—INDICATIONS AS TO RESPONSIBILITY FOR 377 INDUSTRIAL ACCIDENTS RESULTING IN DEATH*

Causes Attributed	*Number of Accidents*	*Per Cent of Total*
Cause attributed solely to employers or those who represent them in positions of authority . . .	113	29.97
Cause attributed solely to those killed or their fellow workmen . .	105	27.85
Cause attributed to both the above classes	60	15.91
Cause attributed to nether of the above classes	99	26.27
Total	377	100.00

To sum up, the indications in regard to responsibility may be classified in a way which separates the two main agents of production,—the employer and employe,—with respect to accidents. We find (Table 14) that in 29.97 per cent of the fatalities of the

*Notice that this is a table of accidents, not of fatalities. In 410 fatalities out of 526 our data was sufficient to show indications as to responsibility. These 410 fatalities, however, resulted from 377 accidents.

year, such indications as we have attribute the cause solely to the employers or to those representing them in positions of authority; in 27.85 per cent solely to those killed or their fellow workmen; in 15.91 per cent jointly to these two classes; in 26.27 per cent to neither.

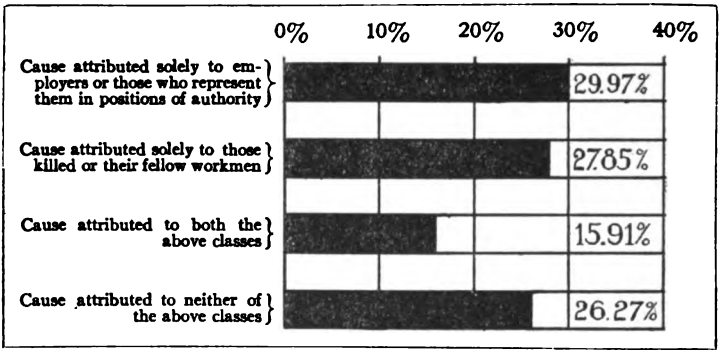
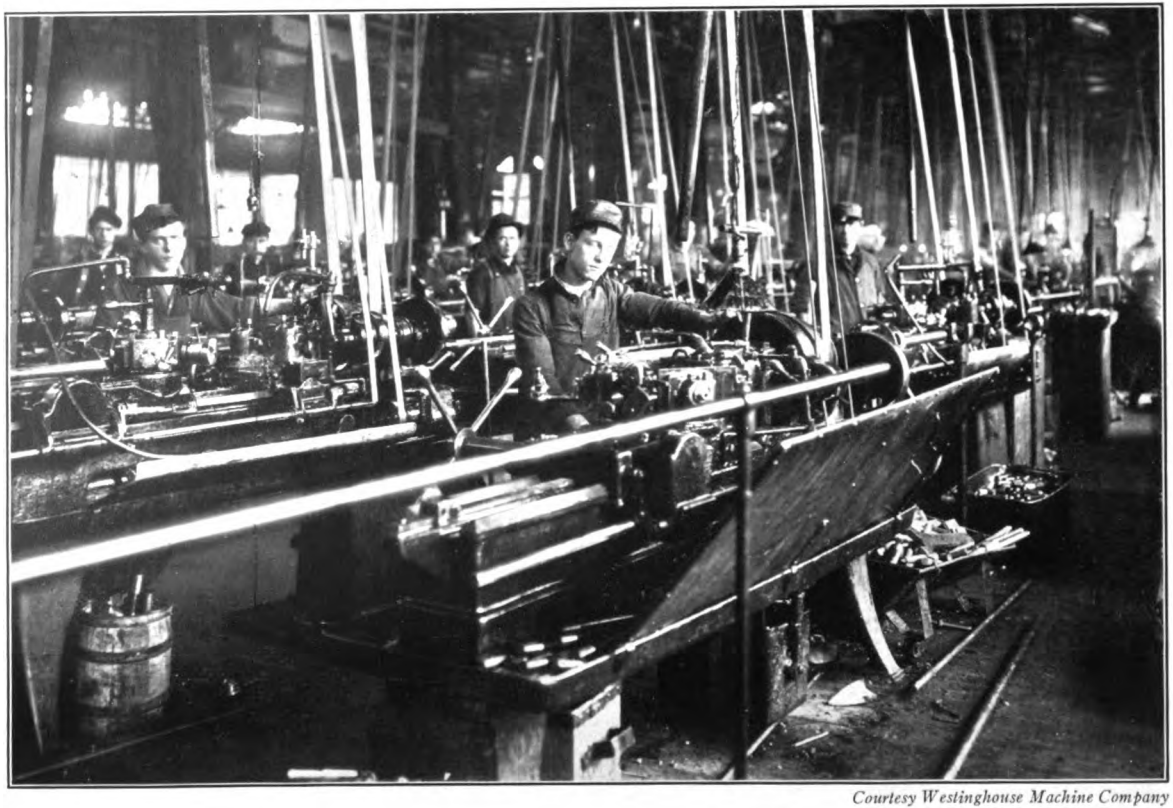


DIAGRAM 6.—DIVISIONS OF RESPONSIBILITY FOR 377 INDUSTRIAL ACCIDENTS RESULTING IN DEATH



Courtesy Westinghouse Machine Company

MACHINE ROOM SHOWING INTRICACY OF EQUIPMENT. GEARS GUARDED

CHAPTER VII

SUGGESTIONS FOR PREVENTION

IN the foregoing chapter the attempt has been made to show the relation of workmen, superintendents, and employers to the happening of accidents, and to search out and define the various elements in the so-called negligence, or "carelessness," of each. Leaving out, for the time being, all question of blame, such an analysis must inevitably throw some light upon the problem of preventing accidents.

Take first the 29 per cent of fatal accidents attributable solely to employers, or those who represent them in positions of authority. Deaths due to lack of provision for safety in the original construction of the working place, and in the general plan of work, might have been avoided by expressly providing for safety in such construction and plan; those due to the employment of children at unsuitable work might have been avoided by not employing children; most of the deaths caused by defects in plant or equipment could have been prevented by a more frequent and careful inspection and by immediate repair; many due to incompetence, indifference, etc., in superintendents and foremen, might not have occurred if these men had been made to feel that, without exercising skill and care in safeguarding the workers, they could not "make good." In short if, by any form of persuasion or compulsion, it could be brought to pass that the prevention of accidents should be a motive with employers at all times,—present at times of construction, present at times of engaging and organizing and changing the force, present through every day of operation,—the larger part of this first 29 per cent of fatal accidents would be done away with.

For the second group, the 27 per cent attributed solely to those killed or their fellow workmen, we must go back to our analysis of the "careless workman" in order to suggest the lines

of possible prevention. Where "carelessness" is youth, or ignorance, or weakness, there is a remedy. Minimum requirements of age, experience, or physical fitness, can be established for certain dangerous occupations. Yet the enforcement of such tests would be very limited, and to do away entirely with accidents of this class, the "prevention motive" in the employer must again be so strengthened that no hope of profit will induce him to employ boys in the mills, no stress of competition, no emptiness of the labor market, induce him to employ newly landed foreigners in positions where, through their ignorance, their own lives or the lives of others are endangered.

The man who goes to his work intoxicated, the heedless fool—in dealing with these also the employer is the only agent through whom society can act. Discipline alone can prevent their being dangerous to themselves and to others.

As for that "carelessness" of workmen which is mere human rashness,—here we cannot say, "Create a motive for carefulness in those who lack it," for the very strongest motive is already present, the care for life and limb. But the employer has considerable opportunity to modify the natural tendency to recklessness in his workmen by establishing a different attitude toward safety in the conduct of his plant.*

The long hours of labor, which cause so much of the "carelessness" that is inattention, are not an inevitable condition of production; here at least the state can act directly, if it will. The high speed, and unremitting tension, characteristic of all our industrial activities, which are the other great causes of inattention, and which are also the means of encouraging and increasing recklessness in the workers, can be lessened, but the state can do little toward this end in a direct way, so long as competition inspires, creates, and rules these industrial activities. The only way is to make the lives and limbs of his employes as important to an employer as the output.

In short, we find that in the prevention of the accidents of almost all these groups the will of the employer is pre-eminently important. Abandoning earlier classifications, it may be stated

*Note campaign of education and co-operation described by Mr. Beyer in Appendix III.

that the chief preventable conditions from which work-accidents result are:

1. Lack of provision for safety in construction.
2. Long hours of work.

. . . . .

3. Too great speed maintained in many lines of work.
4. Inadequate plant inspection.
5. Failure to remedy known defects.
6. Inadequate warning and signal systems.
7. Inadequate instruction and direction of ignorant workers.

I have separated the first two conditions because they indicate the public's chief lines of direct attack through prohibitive legislation. The industrial accident rate can be reduced by better factory acts, making safety requirements that shall be more definite and capable of enforcement than the present ones, and extending those safety requirements so as to cover, for instance, the stringing of electric wires in mills, the placing of hand rails along crane runways. The mining law could also be improved in the matter of safety requirements. A state safety appliance act for railroads, bringing requirements up to the standard set by the federal act, could be enacted. Provisions of this kind are not impossible to enforce. But if direct protective legislation is to be effective, within the limited field in which safety rules are practicable, inspectors must possess a technical mastery of the industry they deal with, inspection must be thorough and frequent, and the penalty for failure to comply with orders must be swift and sure.

As we shall see, in discussing the means by which public opinion may reach the employer, the state authorities in Pennsylvania do not even require reports of all accidents: much less are they charged with the duty of supervising all industrial occupations in which accidents happen. We discovered, moreover, many instances of unguarded set-screws, unprotected gearings, etc., which were clearly contrary to the law of the state, and therefore fell within the scope of the factory department. In regard to the present status of factory inspection in Pennsylvania, Mrs. Florence Kelley, formerly chief factory inspector of Illinois, who made a general report on the situation for the Pittsburgh Survey, writes:*

**Charities and the Commons*, March 6, 1909.

In Pennsylvania there is no civil service law applying to the positions of the factory inspector or his deputies. These are and always have been purely political appointments. They are not even "labor" appointments. Faithful inspectors insistent that the law should be obeyed, may be removed at will in the interests of powerful employers. This places a premium upon making friends with powerful interests, winking at violations of law, avoiding prosecution, publicity and everything that might provoke hostility either to the department or to the individual deputy. . . .

The number of inspectors is sadly insufficient. An important part of Allegheny County was for years entrusted to the inspection of a man who lived at Altoona.* This district included Braddock, Homestead and McKeesport, with their highly developed and unusually dangerous industries.

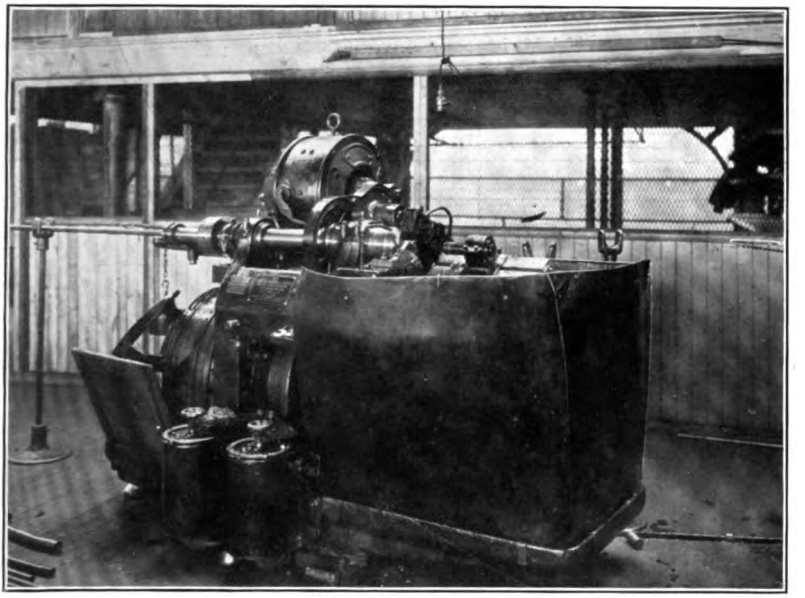
If the statute were as effective as the best law of any state, and if the chief inspector were inspired by modern ideals of labor legislation, competent and enlightened, it would still be true that the present staff of five in the Pittsburgh District could not cover the ground by reason of its insufficient numbers. . . . The wording of the Pennsylvania statute is so vague and broad that under its provisions intelligent and zealous inspectors might greatly reduce many forms of present danger except those arising from cold, glare, darkness and speed.

There is, however, no comprehensive attempt to do so. In a cork factory I saw scores of insufficiently guarded saws of a highly dangerous type. The deputy inspector who accompanied me had no eyes for these sinister objects, but confined all observation to children and their certificates. We passed a boy working at an insufficiently guarded saw, whose hand was bandaged after being hurt at that same saw. When I called attention to this, the deputy said that there was a specialist on the staff who devoted himself to machinery and safeguards. Persistent inquiry covering a month failed to identify him. He appears never to have existed.

State inspection at best is ineffective unless backed up by rigorous prosecution of flagrant offenders. On this point Mrs. Kelley says:

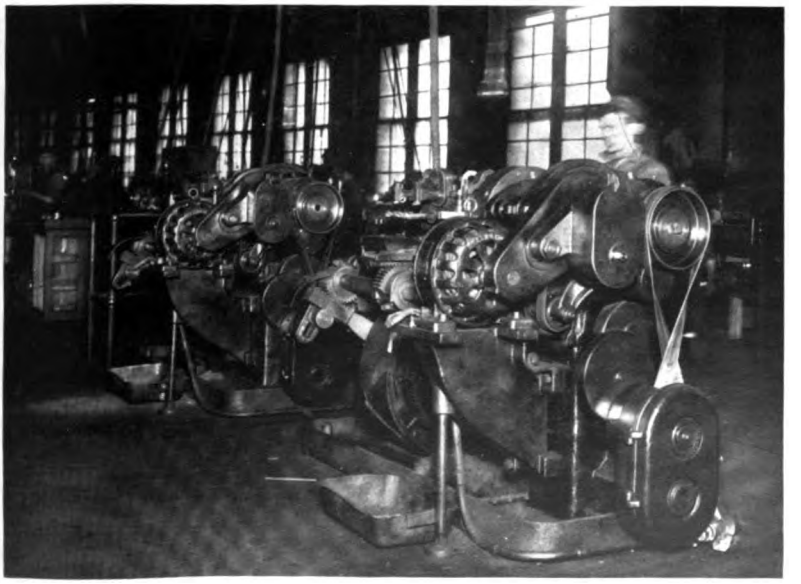
Current publication of the exact details of all prosecutions begun for violations of labor laws has a two-fold

* 113 Miles from Pittsburgh.



Courtesy Westinghouse Machine Company

AUTOMATIC SCREW MACHINE ENCASED AND GEARS GUARDED



Courtesy Westinghouse Machine Company

TURRET LATHES, ALL GEARS GUARDED

value. It is the best deterrent, for employers dislike to have the community know that they are accused of breaking the law. Full publicity in this regard is also the best assurance of the integrity of the inspection staff. Every prosecution of an employer is incidentally a trial of the inspection force. For when inspectors must constantly appear as witnesses in court and endure cross examination by able lawyers such as employers commonly retain, this in itself is a permanent stimulus to careful, accurate work and a safeguard against temptation to blackmail or to accept bribes.

Where, however, mystery enshrouds the procedure of a department in relation to violations of the labor law, an inquiring public tends to make sinister inferences. Why is there no record of prosecutions in the report of the factory inspectors of Pennsylvania for 1907? Were there no prosecutions? Or was none of them successful? Are the courts so clogged that suits are brought with difficulty? If so, why does not the department make known this extenuating circumstance?

This concealment of violations of the factory laws is fortunately unique in the practice of state departments of factory inspection. Where bona fide enforcement of the laws is achieved, the particulars are published, and publicity helps to deter other potential offenders. The omission of information about prosecutions is, perhaps, the most self-condemning item in the whole disgraceful report of the Pennsylvania State Department of Factory Inspection for 1907.

The factory inspection headquarters of such a great industrial district as Pittsburgh could well be an office where technical experts would constantly be studying the work processes of the district, with laboratory facilities for experiment and demonstration of protective devices calculated to reduce accidents. The factory inspector's office in Birmingham, England, for instance, which is in close co-operation with courts, employers and workmen, reduced the annual number of crane accidents due to one variety of crane from 21 to three. How far the state inspection agency in Pittsburgh falls short of this standard is indicated by Mrs. Kelley. The recent establishment of the mining experiment station by the Federal Government offers a practical example of a similar sort, and offers it, by chance, in Pittsburgh itself.

Directly, by means of statute, then, if made effective by

honest and efficient factory, mining and railroad departments, the public could do much to reduce those accidents due to lack of provision for safety in construction.

Furthermore, a shorter work day in all employments where accidents are common, could be secured directly by legislation. This, if established and enforced, might be expected to decrease greatly those accidents due to inattention on the part of foremen and workers.

But all the other preventable conditions named must be dealt with for the most part *indirectly*, through the will of the employer. The law can, under good administration, actually bring to pass such mechanical protections as railings and guards, and it can prevent men from working twelve hours in twenty-four. But it can much less effectively prescribe how often chains are to be inspected, or at what stage a defective car is to be retired from use, or what signaling system is to be inaugurated for the protection of men in defenceless positions, or what part of the work is to be done by ignorant foreigners, or at what speed work is to be carried on. Many of these things are too intricately connected with the special problems of different industries to be reached by law. Moreover, they are the details of daily management in each particular enterprise, and must depend upon the will of him who directs it.*

To reach this group of causes, therefore, the prevention of accidents must be made of primary importance to each employer. How can the motive for prevention be strengthened in him, urged as he is by all the forces of a competitive industrial society to make economy and rapidity of production his controlling motives?

In the first place employers will reckon with this responsibility for the prevention of accidents just about as fast as the conscience of society is aroused on the subject. A striking sign that this kind of civilization has begun is the recent rapid extension of safety inspection by many large companies.

For instance, in April, 1908, a "Committee on Preven-

* Illustrating this point, Dr. Frankel in his book entitled "Workingmen's Insurance in Europe," cites the statement that the private mutual organization of employers for the prevention of accidents and the introduction of safety devices in Milan called the Associazione degli industriali d'Italia per prevenire gli infortuni di lavoro, has been more effective in reducing accidents than all other influences combined.

tion" was appointed in the United States Steel Corporation, composed of five members, including the prominent casualty managers* of the constituent companies. Special inspectors are selected by this committee to go through the plants of companies with which they have no interested connection, and make recommendations for increasing the safety of the men. These recommendations, if backed by the committee, are carried out. In addition to this system of mutual inspection, which has many valuable features, the Carnegie Steel Company, the American Steel and Wire Company, the National Tube Company, and possibly others, each now employs at least one man to devote his entire time to studying their mills with the purpose of preventing accidents. The Carnegie Steel Company's inspector told me in the spring of 1908, that he had made 2000 recommendations in seven months.

An effective public opinion would develop more quickly in industrial communities if a complete report of all accidents were required. The present factory law provides a fine or imprisonment for the owner or superintendent of any industrial establishment who fails to report a serious accident, but while the state factory inspector's report for 1907† shows that only 295 fatal accidents were reported for the whole state of Pennsylvania, there were in the year covered by this study (six months of which coincide with the year covered by the factory inspector's report), 260 fatalities from work-accidents in and around the industrial establishments of Allegheny County alone. A greater discrepancy could undoubtedly be shown in the non-fatal accidents, if we had the year's list of injuries in Allegheny County. Thus the inspector states that 2364 serious non-fatal accidents were reported to him from the industrial establishments of the state for the year 1907. Using the accidents of April, May, and June as a basis for calculation, and counting every accident serious which disabled a man for four weeks or more, we conclude that there were probably 1500‡ serious non-fatal

* The chief of the claim department is usually called a casualty manager.

† Report for 1908 gives 114 fatal accidents and 336 serious injuries.

‡ Among one-half the hospital cases for three months, there were 187 such serious accidents in and around industrial establishments."

accidents in the industrial establishments of Allegheny County alone for the year 1907.

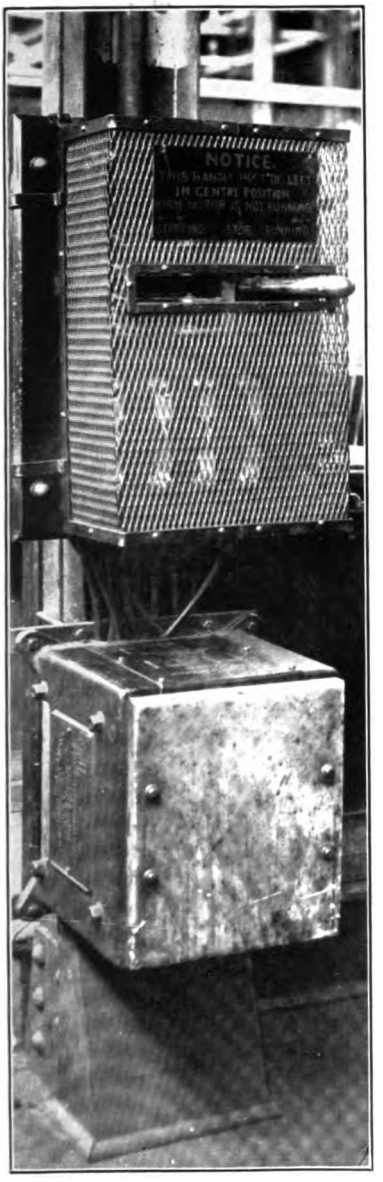
The factory inspector's report further states that of the 295 fatal accidents reported to him, only 59 fell within the jurisdiction of his department and that of the 2364 non-fatal accidents reported only 689 fell within his jurisdiction. Apparently it is the business of factory inspectors to investigate only those accidents which might have resulted from a violation of the factory law. Thus crane accidents, "dinkey" accidents, falls, etc.,—the most common kind of serious accidents in the steel mills,—are quite outside the province of the factory department. And finally, of all those work-accidents which have nothing to do with railroads, mines, or industrial establishments,* namely, accidents which happen to line men, gas men, structural iron workers, carpenters, painters, etc., not even a report is required.

To recapitulate: First, the commonwealth of Pennsylvania, so far as we know, does not keep records of serious accidents to the employes of railroads. Second, its record of accidents to employes of industrial establishments is of little value; because, as the law is now enforced, but a small proportion of these accidents are actually reported, and because, of the number reported to the department, less than one-third come under its jurisdiction. Third, the state makes no provision for recording serious accidents in other employments.

Whether the jurisdiction of existing departments should be extended to cover the work-accidents of which the state now takes no notice, or whether a new department should be created whose whole business should be the recording, investigating, and preventing of accidents in every employment, I am not prepared to say. But no one will deny that with so grave and serious a problem before us, a complete public record of each death and serious injury is an obvious and primary necessity. Sound and effective public opinion must be based on facts.

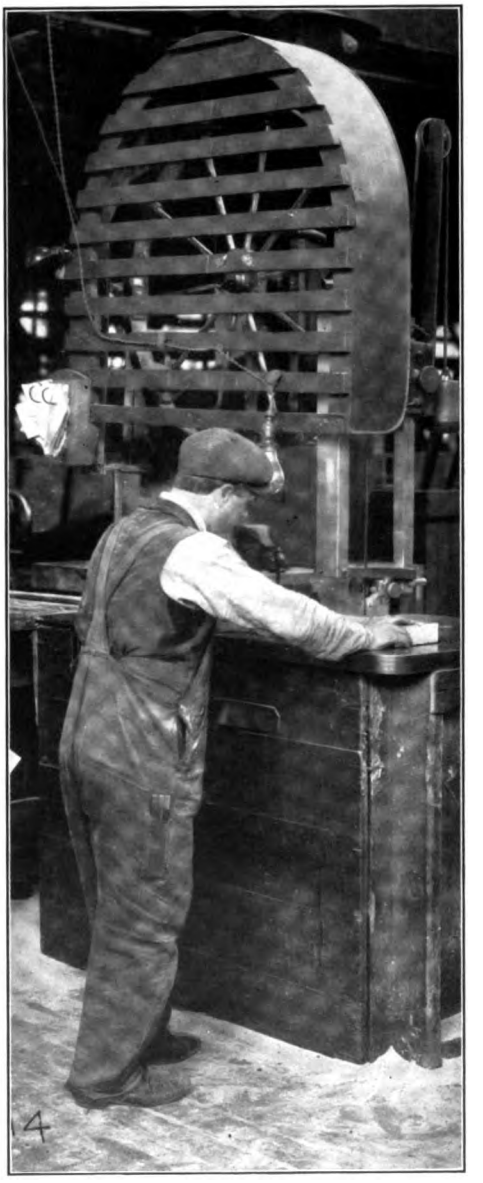
"We can at least be sure," a Pittsburgher may say, "that the coroner's jury passes upon every fatal accident in Allegheny

* Among the year's industrial fatalities in Allegheny County, there were 70 which fall outside of these three groups.



Courtesy Westinghouse Machine Company

WIRE GUARD OVER ELECTRIC SWITCH



Courtesy Westinghouse Machine Company

GUARDED BAND SAW

County." This is probably true, but it amounted to almost nothing during the period of this inquiry. Once during the year, when 14 men had been killed by a blast furnace explosion, the coroner appointed a jury of practical furnace men, engineers, and other experts, the inquest lasted several days, and was a matter of serious public interest. But the inquest over an ordinary mill, mine, or railroad accident was concluded in about half an hour, and the almost unvarying verdict, "accidental," was returned by a sorry-looking crew,—experts at nothing but sitting patiently in the jury box at $2.00 a day. A rule existed as to the number of inquests in a week on which the same juryman might serve, but the whole matter was in the coroner's hands, and the rule was not followed. Of those who commonly served the worst was a dilapidated individual, selected " because he hung around the office and did errands for the coroner's deputies;" the best was a thin, mild-faced old man of clerical experience, selected "because he knew enough to write the verdict."* Such were the men chosen by the coroner from the citizens of Allegheny County to inquire into the causes of more than 500 industrial deaths a year.

The essential weakness in the inquest system, however, lies deeper than this. According to their time-honored function the coroner's jury in Pennsylvania can return but one of two verdicts, "accidental" and "murder." A jury of the wisest men might fail to be useful in an industrial accident inquest if their only function was to pronounce one of these two words. An indictment for criminal negligence against an employer is almost unheard of in Allegheny County. So far as these accident cases go, then, the coroner's inquests are a waste of time and money. There is not even a full public record of the evidence in each case kept on file. The stenographer takes the evidence in shorthand, and keeps it in her possession; whoever wishes to see it must pay her to transcribe it for him. The only really available public record of evidence is the incomplete longhand account, written by the clerk while the witness was speaking.

* The "qualifications" of these two jurors I have direct from two important members of the office force.

How can the coroner's inquests be made effective in arousing public opinion in regard to the accident situation? It can not be expected that verdicts of "criminal negligence" will multiply. Modern industrial concerns are so large and complicated in their management that it is almost never possible to locate the "criminal." The usefulness of the inquest could be developed in another direction. Occasionally at present the coroner's jury escapes its dilemma by returning a verdict "accidental," with recommendations to the employer for protecting the lives of his employes. This gives us a suggestion. With an intelligent jury, composed of a practical railroader, a miner, a steel-worker, and three engineers, such recommendations could be frequent and valuable. If, in addition, a voluntary safety committee of citizens were to take up the recommendations and urge employers to carry them out, the coroner's inquests would be of great service in the community. Furthermore, the coroner might be required to issue an official statement with regard to all accident inquests, including the name of the employer, the nature of the accident, and the recommendations made. Such a statement, if published regularly once a week in the newspapers, would furnish reliable information to the public upon the subject of accidents.

Were employers stimulated by a public opinion aroused in these various ways, they would more generally exert that determination to prevent accidents without which, as we have seen, the majority of accidents cannot be eliminated. And yet, in the face of the unremitting pressure for output, the motive for prevention can never be compelling until to each injury and death is affixed a uniform and unescapable penalty. If accidents became a heavy and determinable cost to the business not dependent upon the cleverness of lawyers, the leanings of judges, or the sympathies of juries, but directly proportioned to the number of deaths and the number and seriousness of injuries among the men on the payroll, then the prevention of them would become of direct economic interest to the employer. One economic motive would be set off against another. If safe, slow ways of producing involve a reduction in profits, we must see that the human waste resulting from dangerous, quick ways shall involve a greater reduction in profits. This is not because the employer

is wicked and must be punished, but because he, like most of us, is held closely in the grip of economic motives.

Better factory and railroad acts, the public records of accidents, an intelligently aroused public opinion, a law making every serious accident a direct and unmistakable expense to the business,—these are some of the means of improving the employer's motive. Yet, with all these means, we shall not be able to make the protection of workmen his first interest, for clearly his first interest must be production. Herein lies the strong argument of the socialists. It will be impossible, they say, materially to modify the employer's motive so long as industry is carried on under a regime of competition; the law of the competitive struggle will prove stronger than any statutes which society may seek to superimpose upon it; legislation will, they maintain, make an employer stop for a moment to take thought for safety, but the force of competition will soon drive him on.

But the way is open for democracy to bring all these forces to bear upon the motives of the employer before accepting the conclusion that modern industry cannot be carried on under a competitive regime without the present wholesale destruction of the workers.

PART II

ECONOMIC COST OF WORK-ACCIDENTS

CHAPTER VIII

DISTRIBUTION OF THE BURDEN OF INCOME LOSS

IF we were to regard the year's industrial fatalities in Allegheny county as one overwhelming disaster in which the dead numbered 526, its most appalling feature would be that it fell exclusively upon workers, bread-winners. Among those killed there were no aged helpless persons, no idle merry-makers, no unresponsible children. The people who perished were of those upon whom the world leans. The burden of poverty, therefore, which follows all great calamities was here so especially dire, that we can for a time forget the burden of grief and view the problem from a purely economic standpoint.

TABLE 15.—ECONOMIC RESPONSIBILITIES OF 467* PERSONS KILLED IN WORK-ACCIDENTS IN ALLEGHENY COUNTY, JULY, 1906, TO JULY, 1907

Married				Single				
A *With 1 or More Children Under 16*	B *Without Children Under 16*	C *Age of Children Unknown*	*Total Married*	D *Sole Support of Family*	E *Chief Support of Family*	F *Regular Contributors*	G *Non-Contributors*	*Total Single*
206	49	3	258	19	20	90	80	209*
297						90	80	..

Of the 526 people killed, 258, almost one-half, were married men; 265 were single men or boys; and three were single women.

* In 59 cases of single men the economic position of the deceased could not be learned.

In 59 cases of single men it was impossible to learn whether they contributed to the support of a family or not. Among the remaining 209 single persons whose economic responsibilities were learned, 39 were the sole or chief support of a family, 90 had regularly contributed in various lesser degrees to the support of a family, while 80 had been quite without dependents.

Among 467 cases of death by industrial accident, in which the economic position of the deceased was learned, therefore, we find that while 80, or 17 per cent, meant no economic loss to the survivors, 90, or 20 per cent, meant the reduction of a family income, and 297 (Table 15, columns A, B, C, D, E), or 63 per cent, whether in the case of married or unmarried men, meant the sudden cutting off of the sole or chief support of a family. In 206, or 44 per cent, this family included one or more children under sixteen.

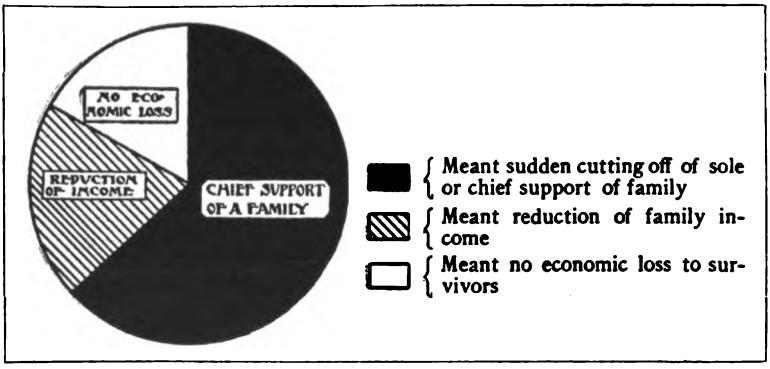


DIAGRAM 7.—ECONOMIC SIGNIFICANCE OF 467 WORK-FATALITIES

Was the burden of income loss left wholly upon these families, or did the employers of the workmen killed share it? This is the first question, and we have figures with which to answer it.

In 23 of the 258 married cases nothing could be learned concerning compensation. From Table 16 we see that among the 235 remaining cases of married employes killed at work, 10 were settled for an unknown amount; and in 13, suits were pending. Let us assume that the plaintiff will win in seven of these suits,

and will recover $5000.* Let us assume also that five, or one-half, of the unknown settlements were comparatively large, *i. e.*, over $2000. Adding these 12 cases to the eight cases in which compensation of over $2000 is known to have been paid, we have among 235 cases of married men killed, only 20 cases, less than 10 per cent, in which compensation of more than $2000 was paid to their dependents. Starting at the other end of the table we see that 59 of the 235 families received not one dollar of compensation; 65 families received $100 or less, a sum which would cover reasonable funeral expenses, but would not replace any of the lost income; 40 families received something more than funeral expenses, but less than $500; while 40 families received more than this, but not over $2000.

TABLE 16.—COMPENSATION PAID BY EMPLOYERS TO DEPENDENTS OF 235 MARRIED EMPLOYES† KILLED IN WORK-ACCIDENTS

Total Cases	Compensation Paid by Employer								
	None	$100 *or Less*	$101–$500	$501–$1000	$1001–$2000	$2001–$3000	*Over* $3000	*Suit Pending*	*Amount Unknown*
235	59	65	40	30	10	4	4	13	10
235	124		40	71					
Per cent	53		17	30					

To sum up: in 53 per cent of the industrial accident fatalities considered, the widow and children were left by the employer to bear the entire income loss, and even assuming that all the unknown amounts were large and that all suits pending would be de-

* This is a more than liberal estimate of the plaintiff's chances. Decisions of the Supreme Court of Pennsylvania in employers' liability cases in 1904 were 7 out of 24 for the defendant. Verdicts in Pennsylvania courts in damage suits for the death of a married man in the prime of life, approximate $5000. From 30 per cent to 50 per cent goes to the plaintiff's attorney for contingent fees and costs.

† In 23 of the 258 married cases (Table 15) nothing could be learned concerning compensation.

cided for the plaintiff, in only 30 per cent of the cases did they receive more than $500, a sum which would approximate one year's income of the lowest paid of the workers killed.

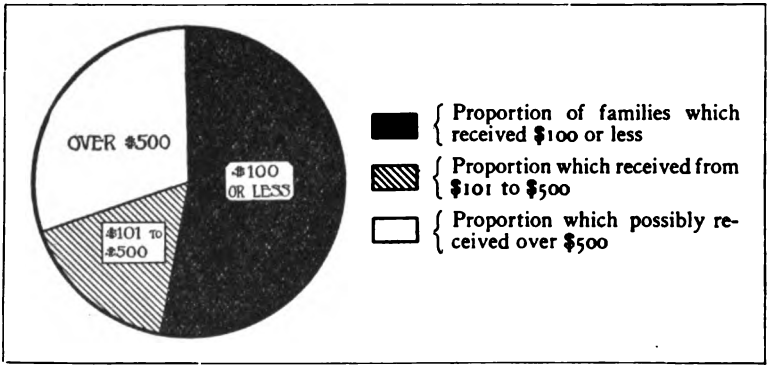


DIAGRAM 8.—COMPENSATION PAID BY EMPLOYERS TO DEPENDENTS OF MARRIED EMPLOYES KILLED IN WORK-ACCIDENTS

The compensation paid to the dependents of single men is considerably less.

TABLE 17.—COMPENSATION PAID BY EMPLOYERS TO DEPENDENTS OF 120 SINGLE EMPLOYES* KILLED IN WORK-ACCIDENTS, WHO WERE CONTRIBUTING TO THE SUPPORT OF OTHERS

Total Cases	COMPENSATION PAID BY EMPLOYER								
	None	$100 *or Less*	$101–$500	$501–$1000	$1001–$2000	$2001–$3000	*Over* $3000	*Suit Pending*	*Amount Unknown*
120	30	48	21	11	1	..	..	4	5
Total	78		21	21					
Per cent	65		17.5	17.5					

In 65 per cent of such cases considered, nothing above funeral expenses was paid, while, again including cases in which the

*In 9 out of 129 cases of single employes (Table 15, Columns D, E, F) nothing could be learned concerning compensation.

amount is unknown and cases in which a suit is pending, only 17.5 per cent of the dependent families received more than $500.

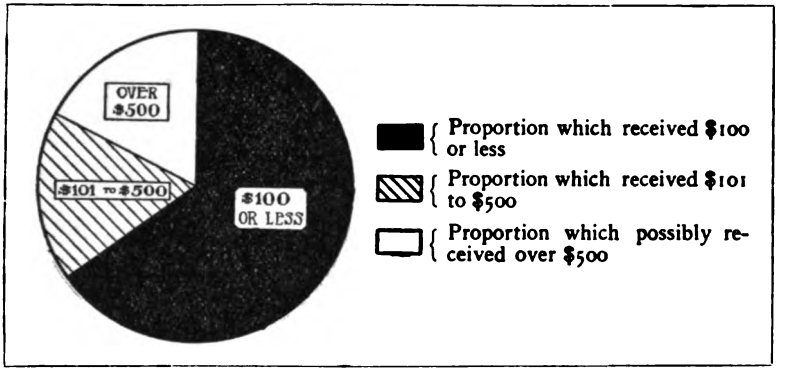


DIAGRAM 9.—COMPENSATION PAID BY EMPLOYERS TO DEPENDENTS OF SINGLE EMPLOYES KILLED IN WORK-ACCIDENTS, WHO WERE CONTRIBUTING TO THE SUPPORT OF OTHERS

The unknown thousands of men injured in the course of a year's work-accidents are also largely family income providers. Among 262 such cases whose circumstances could be learned,* 57 per cent were married and only 20 per cent wholly without dependents. In considering the lost income in injury cases we may not disregard those without dependents, as we may in death cases, for the problem of existence for a single man disabled and deprived of income is a serious one, even though there be no family to complicate it.

Hospital charges in 84 per cent of these injury cases were paid by the employer.† Frequently some outside medical expense was also met by the employer, as the examination by a specialist or the purchase of an artificial limb. We are considering, however, not the immediate expense of the accident, but the loss of the worker's income resulting from the accident. The proportion of this income loss borne by employers in injury cases does not differ

* The injury tables to follow include in each tabulation all cases taken to the Allegheny County hospitals during the three months studied, in which the amount of compensation could be ascertained.

† Aside from emergency hospital service, which many large companies maintain as a part of their plant equipment, regular hospital charges for the care of injured men amount to a heavy expense. See page 144.

greatly from that in death cases. Thus, 88 out of 158 married men injured received no compensation for lost income; 41 out of 62 single men contributing to the support of others; 37 out of 53 single men without dependents.

TABLE 18.—PROPORTIONS RECEIVING NO COMPENSATION AMONG 273 INJURED MEN *

Married men	56 per cent
Single men contributing to the support of others	66 per cent
Single men without dependents	69 per cent

Among those who were compensated in some degree for lost income due to injury, thirteen (5.4 per cent of the whole number of injured) received full pay during the time that they were disabled. Compensation in the other cases varied without any constant relation either to need or to the period of disability. The relation between income loss suffered and restitution made can be best understood by dividing the 262 injury cases in which both income and compensation could be learned, into three groups: those totally disabled for life, those partially disabled for life, and those only temporarily disabled.

In the first group we have six men to consider; one lost an arm and a leg, one is paralyzed, and four will walk on crutches the rest of their lives. Three of these men received no compensation. The highest amount received by any one of them was $365.

TABLE 19.—COMPENSATION PAID TO SIX MEN TOTALLY DISABLED FOR LIFE. APRIL, MAY, JUNE, 1907

No. of Men	*Amount Paid*
3 men	0
1 man	$30
1 man	125
1 man	365

In the second group, those partially disabled for life, we have 27 men. These are men who lost an eye, or a foot, or an arm, for instance, but in spite of it were able to get work. The earning power of each one has been in some degree permanently reduced on account of the injury received. The average reduction in income in

* In only 273 out of 509 injury cases found on the hospital records, April–June, 1907, could compensation be learned, largely because names and addresses are inaccurately recorded in the hospital books. In 11 of these 273 cases, the weekly earnings of the man injured could not be ascertained, leaving 262 cases in which complete information could be tabulated for our later tables.

all 27 cases is 29 per cent. Of these men 12 received nothing to set against this loss, and only two received more than $500.

TABLE 20.—COMPENSATION PAID TO 27 MEN PARTIALLY DISABLED FOR LIFE. APRIL, MAY, JUNE, 1907

No. of Men	*Amount Paid*
12 men	0
7 men	$100 or less
6 men	$101 to $500
1 man	$673
1 man	$2,600

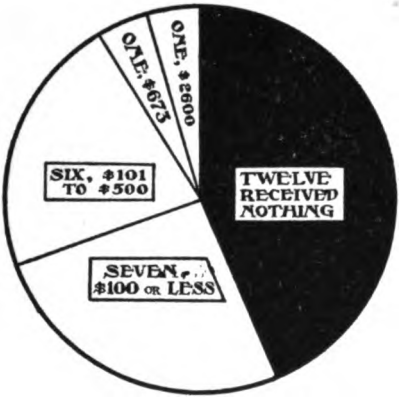


DIAGRAM 10.—COMPENSATION PAID TO 27 MEN PARTIALLY DISABLED FOR LIFE

All men in Tables 19 and 20 suffered permanent disability, either total or partial. In the third class, the 229 persons only temporarily disabled, many received nothing whatever, but the average compensation is not so completely disproportionate to the average loss. The total loss of income (weekly earnings multiplied by weeks of disability in each case), for the 229 cases amounts to $37,677, while the total compensation is $6,719, about one-sixth of the loss.

Permanent injury and permanent disability are not always the same thing. Many men who sustained serious permanent injury such as the loss of an eye, were able to go back to the same work or to work equally well paid. But because such permanent injury is in many ways a grave and irretrievable loss to a man, and because it may at any time, through a necessary change in his employment

or through after-effects, become the cause of income loss to him, it is worth while to reconsider separately the compensation received by men permanently injured. For illustration, take the compensation paid to men who lost an eye, an arm, a leg or two fingers. Among the 262 cases for which we have complete records there were in all 27 men who suffered such injury:

TABLE 21.—COMPENSATION PAID FOR THE LOSS OF AN EYE

No. of Men	*Amount Paid*
3 men	0
1 man	$ 48
2 men	$ 50 each
1 man	$ 75
1 man	$100
2 men	$150 each
1 man	$200

TABLE 22.—COMPENSATION PAID FOR THE LOSS OF A LEG

No. of Men	*Amount Paid*
1 man	0
1 man	$ 55
1 man	$100
1 man	$150
1 man	$175
1 man	$225

TABLE 23.—COMPENSATION PAID FOR THE LOSS OF AN ARM.

No. of Men	*Amount Paid*
2 men	0
1 man	$100

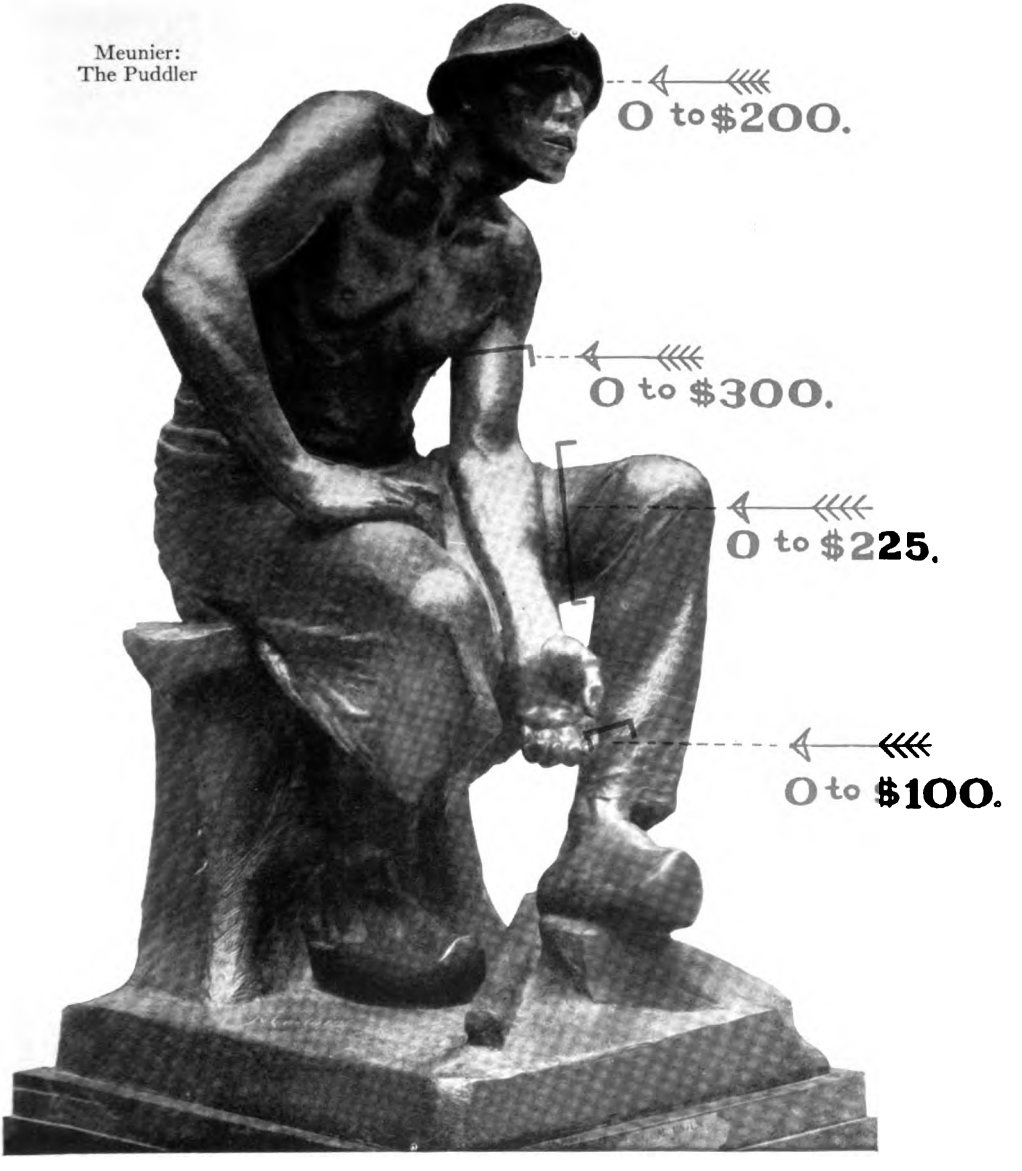
TABLE 24.—COMPENSATION PAID FOR LOSS OF TWO FINGERS*

No. of Men	*Amount Paid*
5 men	0
2 men	$100 each

Thus for the loss of an eye, only one man out of 11 received as much as $200. For the loss of a leg, $225 was the highest amount paid in six cases. For the loss of an arm two out of three men got nothing. Among seven men who lost two fingers, five received nothing.

Tables of figures are, as a rule, wearisome and confusing. Perhaps it will be sufficient to note and remember that the proportion of accidents in which no compensation whatever was received

* Of two men who lost half a hand (three or more fingers) one received $15 and the other $250.



VALUATIONS PUT ON MEN IN PITTSBURGH IN 1907

Actual amounts paid as compensation by employers to twenty-seven workmen permanently injured in Allegheny County, April, May, June, of that year

For loss of an eye,.....	$200,	$150,	$150,	$100,	$75,	$50,	$50,	$48,	0,	0,	0.
For loss of an arm,.....	$300,	0,	0.								
For loss of two fingers,....	$100,	$100,	0,	0,	0,	0,	0.				
For loss of leg,.....	$225,	$175,	$150,	$100,	$55,	0.					

[For relative significance of these figures see Chapter VIII.]

from the employer to take the place of lost income, is, in case of both injuries and deaths, including both married and single men, considerably over 50 per cent. Thus, for the death of 53 per cent of the married men, and 65 per cent of the single men contributing to the support of others, no compensation above reasonable funeral expense ($100) was made; in the injury cases, 56 per cent of the married men, 66 per cent of the single contributing men, and 69 per cent of the non-contributing men, received nothing to make up for lost income.

For our present purpose this fact is significant enough: In over one-half of the deaths and injuries resulting from a year's work-accidents in the Pittsburgh District the employers assumed absolutely no share of the inevitable income loss.

Social workers will be quick to conclude that a great share of this burden must eventually have been borne by the community through some form of charity, public or private, organized or individual. On this point the Pittsburgh study resulted in some significant and rather astonishing figures. Out of 526 workmen killed, the city had the expense of burying six. Apart from this there were, out of the cases studied, so far as we could discover, only seven in which any demand had been made upon organized or institutional charity, and in all of these seven the items of relief were very small. For instance, two orphan children were being cared for in an asylum; one blind old man, whose son was killed, received $1.50 a month from the county for a part of a year.

The list of those aided by private individuals outside the immediate family, is a little longer. Thirty-eight funerals were paid for by collections among friends, neighbors, or fellow workmen. Nineteen families received other help from such private sources. These instances range from that of a man who was boarded free while he was disabled, to two instances of systematic begging as a source of income. All this private, individual aid came direct from the working people. Even the two who beg, do so from their own class. One, a widow with four children, begs at the Slavic Church door; the other begs at the mill-gate on pay day.

Adding these two lists together we have 44 funerals paid for by charity, and 26 cases aided in other ways by those outside the immediate family.

This situation is partly explained by the fact that the dependents of 149 of the men killed were in Europe, and in 19 other fatal cases the family went back to the old country soon after the funeral. In other words, 43 per cent of the fatal accidents in the Pittsburgh District leave a poverty problem, not in America, but in Europe.

This statement as to the amount of relief given must be further qualified by the statement that we ascertained the history of the family for only about one year after the accident. Undoubtedly some of these families will become a burden upon the public. How great the burden, can only be surmised.* From the pride and self-respect found among the people we visited, from the energy and resourcefulness they exhibited in the first year's struggle, and from their generosity and family loyalty, their willingness to help each other, I judged that few of them would ever become a burden upon American institutions for relief.

It has been seen that in the great majority of cases compensation from employers covered an exceedingly small part of the income loss from work-accidents, that in over 50 per cent of the cases it was nothing at all, and that the community, so far as the indications of this study go, bore an inconsiderable share of the loss. There are but three parties concerned, and it needs no further reasoning to show that the income loss from industrial accidents in the Pittsburgh District falls directly, almost wholly, and in all likelihood finally, upon the injured workmen and their dependents.

There are only two grounds on which such a distribution of the burden can be defended: (1) On the ground that the men injured in the great majority of these accidents, are themselves personally and solely responsible for the accidents by which they are injured; (2) on the ground that in all employments which

* A case-study of 750 institutional children, involving 250 families of the Pittsburgh District, was made by the Russell Sage Foundation in 1909. One hundred and forty-six of the 750 children, involving 66 families, were dependent as the immediate result of an industrial accident, or series of such accidents, to the breadwinner. These figures furnish no basis for estimating what proportion of the total accident loss in a given year is ultimately shifted upon the public in the form of care for dependent children. They are significant, however, in indicating that the constant burden borne by the community as a result of industrial accidents is considerable.

involve danger, the workman's wage is large enough amply to cover his risk.

Certainly the facts brought out by the foregoing study of accidents do not uphold the first contention. According to our table of indications on page 86, only 32 per cent* of fatal accidents involved the victims' responsibility to any degree. Subtracting the 39 cases where the victim's "fault" was ignorance, extreme youth, or physical unfitness, we find only 22.5 per cent caused wholly, or in part, by his negligence—less than one-fourth. This final percentage of fault, as has been seen, is in large part not deliberate heedlessness, but rather inattention and recklessness induced or aggravated by the conditions of modern industry. A more exhaustive study might result in considerable modification of these proportions, but it is inconceivable that it would result in the conclusion that the great majority of work-accidents can be laid solely to the personal responsibility of the victim.

Considering the second ground upon which the present distribution of industrial accident losses might be defended: Are the wages of those in dangerous occupations adjusted to cover their risk? Here again we have figures:

TABLE 25.—WEEKLY EARNINGS OF 440 MEN KILLED IN WORK-ACCIDENTS†

Weekly Earnings	*Number*	*Per Cent*
Under $10	71	16
$10.00–$11.99	71	16
$12.00–$14.99	89	20
$15.00–$19.99	158	36
$20.00–$29.99	44	10
$30.00 or over	7	2
Total	440	100

Over half of these men (52 per cent) were earning less than $15 a week. That much income, $2.50 a day for a six-day week, is necessary in the Pittsburgh District,‡ according to Miss Byington's

* It is significant that a study of the causes of accidents to workmen in Germany attributes nearly the same proportion to the workers—29 per cent. Hartman, K.: German Workingmen's Insurance, Part III, p. 7.

† In 86 cases earnings could not be ascertained.

‡ Homestead: The Households of a Milltown, By Margaret F. Byington, a companion volume of the Pittsburgh Survey series.

study, to secure for a typical family of five the minimum provision of clothing and shelter that will maintain physical efficiency. On $15 a week it is possible, but often at the sacrifice of recreations, to carry a small insurance at ordinary rates. But many of these men are obviously in the class of greatest risk, and their occupations, which make insurance especially necessary to them, make insurance also especially high.

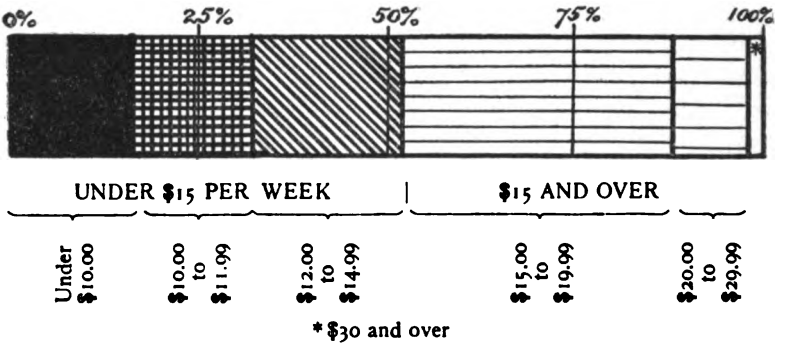


DIAGRAM 11.—WEEKLY EARNINGS OF 440 MEN KILLED IN WORK-ACCIDENTS

There are other ways in which it may be shown that wages do not cover risk. The simplest and most convincing is merely to call attention to the fact that an unskilled man who starts to work in a steel mill, begins at the wages of common labor, although he may be put in a most dangerous place; and his wages are gradually raised, not as he goes into more and more dangerous work, but as he becomes more and more skilful and experienced. Hence at no time is his wage fixed by the danger of his occupation. "Wages cover risk," therefore, is not the statement of a fact, but the statement of a convenient legal theory.

Considering then the two arguments upon which the situation set forth might be defended, it has been found: (1) that the workmen injured were in only a small proportion of the cases personally responsible for the accidents which caused their injury, and (2) that their wages were not adjusted to cover their risk. We can assert, therefore, without qualification, that the distribu-

tion of the economic loss from industrial accidents revealed by this study,— which leaves the injured man and his dependents to bear the entire burden in over half the cases and relieves them only in rare instances of an appreciable share of it,—is on the face of it unjust.

CHAPTER IX

THE EFFECT OF INDUSTRIAL FATALITIES UPON THE HOME

IT has been shown that a grave injustice exists in the distribution of the industrial accident loss in Allegheny County. We must know what manner and measure of actual hardship this injustice brings to those who suffer it. The public's concern lies not only with abstract justice but with economic welfare.

One hundred and forty-nine of the men killed left dependents in Europe; the families of 19 others went back to the old country soon after the funeral. Of the fate of these families, nothing is known at first hand,—only here and there a friend's statement based on a letter, that "the widow begs, and the children are in rags," that the woman "works in the fields," or "has gone out to service," or that they have all gone back to the grandparents "who are old and have nothing."

We were able to follow the fortunes of 132 families of married men killed, for about eighteen months after the accident. In some instances there was no deprivation yet felt. This was the case in four families to whom compensation of over $3,000 had been paid. Next in good fortune came the families of six men who were insured for over $3,000,—the insurance of one running as high as $5,500. Three of these left widows with children grown, so that the insurance was sufficient. The fourth man was an engineer earning $32 a week. He left $5,500 insurance, but the oldest of his three boys is only eleven, and the family expenses have already been cut down. They lived with the wife's parents and paid $32 a month rent. After the father died, they took six rooms for $20. There will be other economic problems before these three boys come to a working age, even with the wisest use of $5,500. In the other two families the loss was more

A Breadwinner of Three Generations Taken

seriously felt. Robert Merritt, a man of 49, who earned $27 a week, left $4,000 insurance. This was used to pay off the mortgage on the home, and his two sons of sixteen and nineteen years, who had been in school, went to work. Another man of thirty-eight, a brakeman earning $20 a week, left $3,350 insurance, but his two children were only four and five, so his widow put by the insurance for a future need and took boarders, while the niece of fifteen whom they were bringing up was taken out of school to help in the housework.

It is significant that these six out of 132 married men, who at their death left over $3,000 as provision for their families, were receiving exceptionally high wages, and that they were nearing or past middle age.

TABLE 26.—AGE AND INCOME OF THE SIX OUT OF 193 MARRIED MEN KILLED, WHO LEFT OVER $3,000 TO TAKE THE PLACE OF LOST INCOME

Weekly Income	*Age*	*Provision for Death* *
$20	38	$3,350
$27	49	4,000
$32	39	5,500
$36	51	4,500
$40	48	5,000
$50	61	4,000 (or more)

This brings up the point made in the last chapter that the majority of workmen in dangerous trades have no opportunity adequately to insure against their special risks. What light do our facts throw upon the question "Would they do it if they had the opportunity?" Up to the $15 income no steady relation between income and savings appears in Table 27, due possibly to the small number of cases. Beyond that figure the percentage making no provision whatever decreases rapidly, and the percentage making provision of over $500 increases with equal rapidity. This is brought out more clearly in Table 28.

* This provision includes all insurance or benefits carried, and also savings in the bank.

TABLE 27.—214 MARRIED MEN KILLED, CLASSIFIED BY WEEKLY INCOME AND BY PROVISION FOR CALAMITY

Weekly Income	*Aggregate*	Amount of Provision for Calamity, Including Insurance Carried, Savings, etc.*						
		None	$100 *or Less*	$101–$500	$501–$1000	$1001–$2000	$2001–$3000	*Over* $3000
Under $10 . .	34	17	5	9	2	1	..	..
$10–$11.99 . .	31	17	2	7	4	1	..	..
$12–$14.99 . .	34	27	1	3	2	1	..	..
$15–$19.99 . .	79	29	12	14	10	11	3	..
$20–$29.99 . .	32	3	2	5	7	8	4	3
$30.00 or more .	4	..	..	..	..	..	2	2
Total . .	214	93	22	38	25	22	9	5

TABLE 28.—PER CENT DISTRIBUTION OF 214 MARRIED MEN KILLED, CLASSIFIED BY WEEKLY INCOME AND BY PROVISION FOR CALAMITY

Weekly Income	*No Provision Per Cent*	*Provision over* $500 *Per Cent*
Under $15	61.0	11.0
$15 but under $20	36.0	30.0
$20 " " $30	9.3	69.0
$30 or over	0	100.0

To return to our study of economic effects among the 132 families who suffered the sudden death of a father: In a third fortunate group of families there were grown sons, unmarried, living at home, so that a fair family income remained even after the husband and father was killed. Here are two typical cases:

> Frank Castelli, an Italian miner who was crushed by a fall of slate, left a widow, two sons, aged twenty-two and twenty-three, and a daughter aged eleven. There was no compensation in this case, but the income of the two sons, who were also miners, and unmarried, has kept the family.

* Those leaving a home or property of unknown value, and no other provision, not included. To those leaving a home or property of unknown value, in addition to known provision, no credit for former is given in table.

> Harry Merton, a labor foreman, left a widow and six children. The company gave $100 in this case, and the man had $100 insurance. Three sons, aged twenty, nineteen, and seventeen, were already working, and a fifteen-year-old boy left school and went to work. Including the earnings of all these four sons, the family income was but one-third reduced by the father's death.

In almost all of the cases, however, where the family seems to have been able to adjust itself easily to the loss of income, one can see, with a thoughtful look into the future, that the greatest hardship is to come. It must not be expected that grown sons will always remain at home to take the father's place, or if they do so, that this in itself is not a hardship.

Some widows meet the problem of lost income by taking another husband. Out of 258 widows left by the year's accidents, 16 had remarried. Only one of these was an American woman. But remarriage is not so easy and complete a solution of the difficulty, even in the case of Slavs, as it at first seems to be. It is usually the widow with the smallest burden who quickly finds a man to share it with her. In only three cases did the new father take up the burden of a large family of small children. In four cases, including that of the one American woman, the widow who remarried had no children, in five cases only one child. These 16 cases show that there is after all little comfort to be found in the vague notion that the widows (of foreigners at least) can avoid all hardship by remarrying.

Let us look now upon some of the harder struggles. In 55 out of the 132 families whose stories could be ascertained, the "industrial accident widow" went to work within the year after her man was killed. In rare cases this meant no hardship. Mrs. Snyder, for instance, a railroad conductor's widow, takes five or six railroaders to board. This enables her to keep the same house, for which she pays $16 a month rent, without touching the $2,000 that her husband had in the bank. This she is saving in order to educate her ten-year-old daughter for a higher grade of work. Another woman, Mrs. Hartmann, a brakeman's wife, had unusual ability and training. When she was left with a child of five, fate was kind to her. She received $1350 from the Brother-

hood, and $1500* from the railroad company, and, through the effort of the company's claim agent, she got a position as proof reader in a newspaper office, where she makes almost as much as her husband did. Furthermore, she had a sister who was glad to look after the little girl in her absence.

Usually, however, when the widow goes to work, it is cleaning offices, taking in washing, keeping boarders, starting a little store, clerking, or working in a factory. She takes anything that comes "quick and easy." It almost invariably means hard work, long hours, poor pay, and in most cases children neglected. It is the bitter, unequal struggle of one person trying to do the work of two.

Among our 132 families, 22 children were taken out of school and put to work as a result of the accident, 15 of them being under sixteen. The youth of many more children will be cut short as soon as they reach a possible working age, because of the continuing absence of normal income. More than 470† children were left fatherless by the year's industrial accidents in Allegheny County.

A reduction in the standard of living is the surest sign of real deprivation. But it is impossible to make an accurate statement in regard to this without a comparative study of family budgets. Often the lowered scale takes the form of extreme economy in food and clothes and recreations. Often it means the giving up of cherished projects,—the daughter's music lessons must stop, or the home they have been struggling to pay for must go. In 19 cases there was a material reduction in rent for reasons of economy. An extreme instance of this was the case of the Puzic family. The widow and six children were found living in one room, for which they paid $4.00 a month, while before the accident they had lived in a $12 four-room house. The average reduction in rent in these 19 cases was $5.00 a month.

* This was probably to avoid suit. Hartmann was making a chain coupling on shop cars, which had been sent down the hump.

† This number is not given exactly because in three cases it was impossible to find out whether there were children, and in two cases where it was known that there were several children the exact number could not be learned. Under "children" are included all from the unborn infant to the boy or girl who had not reached their sixteenth birthday before the father's death.

The Problem of a Railroad Widow

One of Six

A few histories,—not extreme cases,—will best illustrate what industrial fatalities entail in the homes of the workers:

John Lyman, a spike maker who had worked four months for Jones and Laughlin, was thrown off a car and run over in a slight collision. He left a wife and two children, aged nine and four. His earnings had been from $8.00 to $15 a week, and he carried no insurance. The Company gave her $100 toward the funeral, which cost $135. She consulted a lawyer, who told her that she could not get anything by suing. Fortunately, Mrs. Lyman had a father and mother living, who owned a small house in Mt. Washington. She left the three rooms for which her husband had paid $9.00 a month, and moved with her children into two back rooms of her father's house. Then she got a job cleaning offices at a dollar a day. She must pay her car-fare —ten cents a day—out of this, so that, although she works* six full days a week she makes but $5.40. On this she must support her family, for the father is not able to help her financially. In another way, however, her parents are a great help, for they look after the children while she is at work. This is important, because she has to go to work a little after five in the morning, and sometimes does not get home until nine at night.

Pasquale Cavaliere, an Italian laborer, was killed by an explosion of dynamite left too near the fire by another Italian. His widow got $150. Thirty dollars of it she used on the funeral. Mrs. Cavaliere has five children,—a daughter aged seventeen, and four younger ones, twelve, ten, eight, and one. Soon after the father's death the oldest daughter married. Mrs. Cavaliere then reduced her rent $3.00 by moving into a three-room house. They live at Bandy Farm in West Liberty. The only work she could find to do was washing and mending for the laborers who live nearby. Of this work she does all she can get to do, but earns only two or three dollars a week. For the rest she and her family depend on the young son-in-law who lives nearby. Mrs. Cavaliere still hopes that something will be done for her.

Mrs. August Stanley, widow of a Pennsylvania Railroad brakeman, who was struck by an engine in the yards at night while on his way to the bunk room after work,

* As these stories are taken from the investigator's cards, the present tense is purposely retained.

has four children, the oldest 14, and all in school. As a brakeman her husband earned from $20 to $22 a week, and they paid $10 a month rent. Up to seven months after the accident they were living in the same place. The expenses of the accident were not heavy. She spent $155 on the funeral, of which sum the company paid $141. Mrs. Stanley makes $3.00 or $4.00 a week by washing and sewing, and her thirteen-year-old boy carries papers before and after school, earning $2.00 a week. Thus with the $750 from the Relief Association to which her husband paid $2.75 a month dues, and $1350 from the Brotherhood, they will get along for a while, if no more disasters befall them. But it will mean a pinching economy for a family accustomed to a $20 income.

At the time when Samuel Yohovich was killed, his wife and three children were in Croatia, visiting the grandparents. He sent them money regularly, and they were about to start back when the news of his death came. Mrs. Yohovich then decided to leave the two youngest children with her parents, and come back to America with the four-year-old child, in the hope of getting some help from the company. She asked for $1,000, and got $450. This she keeps in the bank and from it sends $15 every month for the support of her children. For a while she "lived round" among friends. She asked the company for a job, but they do not employ women and had nothing for her. She asked them for coal for the winter, and it was refused. Finally she got a place at a cheap hotel in Sharpsburg. Here she got $9.00 a month besides board for herself and the child. She is a good worker, according to the proprietor, but on account of the hard times and the expense of boarding two, they are going to keep her only two weeks longer. For the weeks and months and years to follow Mrs. Yohovich has no plans.

Patrick Feenan, a laborer, killed at Jones and Laughlin's after 19 years' service there, left a wife and five children under fourteen. The company paid the funeral expenses and gave the oldest boy a job. He is thirteen, and earns $6.00 a week. An old uncle of Mrs. Feenan lives with them, and his earnings with those of the boy made up the family income until the hard times came, when both were thrown out of work.*

* In relating these histories an effort is made to give a true picture of the family struggles. Incidents are related, both fortunate and unfortunate, which have no direct relation to the accident.

Thomas J. Barton, employe of Jones and Laughlin, working at night with a wrecking train, was run down and killed. This man was fifty-one, and earned $9.50 a week. He had two sons working, one an electrician and one a machinist, besides five younger children in school. They owned their own house of six rooms and had but $1,000 more to pay on it, but they carried no insurance. Mrs. Barton did not try to get money from the company,—even for funeral expenses, which were $195,—and they did not offer her anything. The oldest son soon married. This left the family dependent on an eighteen-year-old machinist making $12 a week. So the next boy, aged sixteen, left school and became an apprentice, adding $4.50 to the weekly income; and finally the fourteen-year-old boy left school and brought in $3.60 a week as a special messenger.

William Brown, crane director at the Pressed Steel Car Company, on October 25, 1906, was struck by a truck attached to a crane. It was at 5:30 A. M. and the lights in the mill were not lighted. The foreman testified at the inquest that the crane man could not see below on account of the darkness, and probably for the same reason Brown did not notice that the truck was so near him. This man was taken to a hospital and lived for a month after the accident. The company paid all but $8.00 of the hospital bill, and gave his widow $150. Brown was a man of forty-five, earning $20 a week. He belonged to the Maccabees, and was insured for $2,000 in that society. There are seven children in the family, the oldest a rather sickly little girl of fourteen. In spite of her home cares, Mrs. Brown has been able to get work to do. She washes curtains and gives a few music lessons at fifty cents a lesson. She was making in these ways from $5.00 to $8.00 a week. Her relatives help her in clothes and food once in a while. Once she has had to ask money from the city for shoes and coal.

Mrs. Joseph Gikovitch, widow of a Slavic miner who was crushed by a fall of slate, was visited ten months after her husband's death. She has left a four-room house and is occupying one room in a basement with her five children (oldest a daughter of thirteen years). The Carnegie Coal Company, by which Gikovitch was employed, gave nothing, but Mrs. Gikovitch received $1,000 from a Slavic benefit society to which he had belonged, and $75 from the Miners' Accident Fund, to which he had contributed 50 cents a

month. After spending $150 on the funeral, she is apparently trying to save the rest of this money. She keeps a cow and sells milk, and this is apparently her only source of income. As the Slavic investigator put it, "She and the children are living in an evident misery."

Albert Owen was a car repairer on the Pennsylvania Railroad, making $12 a week. On October 5, 1906, he was jerked off the foot-board of an engine and run over. Owen was insured in the relief association for $500. For some time after the accident Mrs. Owen and the three boys, twelve, ten, and four, lived on this sum with great economy. The oldest boy is lame and very small for his age. Some one from the railroad company promised to give him a job as messenger, but when he appeared at the office he was told that he could not pass the physical examination. Finally, after more than a year, through the efforts of a minister, he got a job as messenger boy in an electrical company and earns $4.00 a week. This lame, undersized boy, not yet fourteen, is bringing in the family's only income.

In 13 cases the widow took her children and went to live with her parents. This is but a shifting of the burden within the family. It means often a lowered standard of living for two families. It means often the crowding of a large family into small quarters. It means often the burden and anxiety of providing for a young family put upon old people who should be letting go the struggle. Here are three typical instances:

Harry Crindle's widow with her two small boys left her four-room rented house, after Crindle was killed, and became a part of her father's family. There were already five in this family,—one boy working besides the father, and three children in school. The family income was about $23 a week. Both father and son were carpenters. When the widowed sister and her two children came back, she was able to add $2.50 a week to the family income. She had, besides this, $500 from the National Tube Company, by which her husband was employed, but in order to get it she was obliged to employ a lawyer and his fee came out of the $500. The rest of it she must save for a more severe need. Thus before the accident there were two families:—Crindle's family of four, living on his earnings, $25 a week, and occupying a four-room rented house; and his father-in-law's family of six,

One of the Mothers

living on the combined earnings of himself and oldest son, about $23 a week, and occupying a home of their own. After the accident we find one family of nine, occupying one house, and living all together upon an income of $25.50.

Arthur Link was a foreman for the same company. He fell from a ladder during the night turn, and was killed. The company gave Mrs. Link $85 toward the funeral and she never tried to get any more because she had no one to help her. She had two small children, aged five and three. She owned her own home, except for an $800 mortgage. She rented it for $11 a month, and went to live with her parents. Her father is a laborer, making $9.60 a week. Mrs. Link leaves the children with her mother, and goes out by the day; she does housework in a saloon kept by her cousin, and makes at best $3.00 a week. When this family was visited in February, 1907, Mrs. Link's house had been empty for four months and her father had not had work for two weeks.

William Evans, miner for the Pittsburgh Coal Company, was a widower. When he was killed, there was left a family of six, his oldest daughter with a baby, a boy of sixteen who had been Evans' helper in the mine, a girl of thirteen, and two boys eleven and eight. There was nothing for this family to do but scatter. The sixteen-year-old boy went off and took care of himself by working in a glass factory. The grown daughter took her baby and youngest brother and went to live with a sister. This left the two children of thirteen and eleven, for the grandparents, Evans' father- and mother-in-law, to take care of. They lived in a small house, and were supported by an unmarried son of twenty-three, a miner earning $15 a week. The old man is crippled with rheumatism, and his wife who is sixty-two, after a long hard life, had given up going out to work, and settled down to look after her husband and son. When the two children came back upon her, she began again going out by the day to do washing for her neighbors. After the first winter the little girl, then nearly fourteen, got a place to work in a family for her "keep." This made things easier for the grandmother. (In this coal company there is a relief association. The men pay 40 cents a month and this provides $75 benefits if one is killed. To this the company adds $75, making $150. In Evans' case $90 was used in the funeral.) As a result of this one accident, then, we have the standard of living of one family lowered by the addition of three

dependent members, we have a boy of sixteen left to look out for himself, a girl barely fourteen gone out to service for her "keep," and an old grandmother doing other people's washing.

In 35 cases the widow and her children received substantial help in other ways from her family, or from the family of her husband. Very often a sister will take one or two children, thus leaving the widow freer to work. Sometimes the married sisters or brothers will help by giving money, or food, or clothes when they cannot help in any other ways. In several instances, unmarried brothers assumed the entire support of a family. Almost always this involved hardship because the aid was given not from surplus, but by sacrifice.

Such are some of the individual and family hardships that resulted from the loss of income in 132 fatal accident cases, in which the man killed was married. But it is not only the families of married men killed who feel the loss of income. Among those single men whose fathers were living, we should perhaps expect to find the son's contribution to the family merely incidental, not depended upon for livelihood. And in perhaps half the cases, this is true. But 15 out of 54, or 27.7 per cent, of the fathers in these cases were not able to work. One was crippled, two were blind, one had dropsy, one was a hard drinker, the rest were too old. Moreover, in many cases where the father was still working, his earnings were those of a common laborer, while the son's were about twice as much.

On the earnings of Frank Schmidt, a miner of twenty-two employed by the P. F. Hornell Coal Company, lived his blind father, his sister who kept house for them, and two brothers twelve and seven. Another brother, fifteen, was a trapper in the mine, making $7.00 a week. The other two were in school. The winter after Frank was killed they had a hard time to get along on the trapper boy's wages, reduced to $4.80 because of less work. For a few months they had to get $1.50 a week from the county. In June the sister married, and now her husband is the main support of the family.

Joseph Koprivia, one of the boys killed in the Homestead works at night while asleep, although only fifteen,

was earning as much as his father, a laborer of fifty. The mother is nearly blind, and there is a sister unmarried, and a boy of five, in the family. They still owe $400 on their house, and they are anxious about the future. They counted on Joseph's help. The Carnegie Steel Company gave the boy's mother $100, which she spent on the funeral.

We have the records of 33 single men, whose mothers were widows, one whose father had deserted the family years ago, and two whose parents had both died leaving an orphan family. In 12 of these 36 families the son killed was at the time the only wage-earner; in nine he was the main support of the family. The death of a man so situated leaves almost as serious an economic problem as the death of a married man.

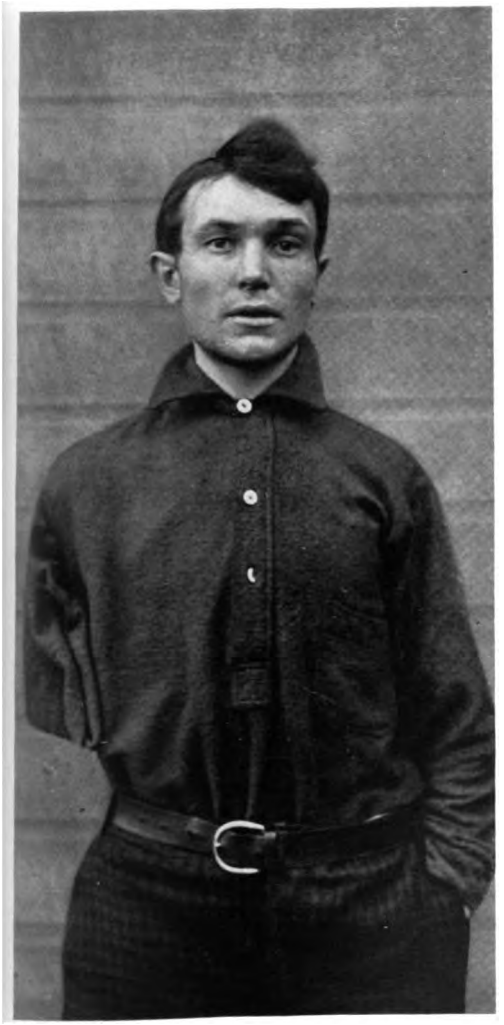
CHAPTER X

PROBLEMS OF THE INJURED WORKMAN

WHEN a working man is disabled, the problem of lost income is usually one of weeks instead of years, but while it lasts it may involve a more exhausting struggle with poverty than is caused by the death of a wage-earner. When a man dies as a result of injury there is at least one less consumer in the family. When a man is disabled by injury, the number in the family remains the same, and their situation is further complicated by the presence of a sick man to be fed and cared for,—an invalid whose recovery is delayed by the very conditions of increasing poverty and anxiety which his injury caused and which his recovery alone can terminate.

For families suffering from temporary injury to the wage-earner, the burden of loss is often lightened in various ways. In the first place, hospital and medical care is usually paid for by the employer. In 295 cases of workmen injured and sent to hospitals we were able to learn who bore the hospital expense. The employer paid the charges in 253 cases, amounting in all to $7,714. In eight cases the hospital bill was over $100; in one it was $420. Hospital care for the injured workmen thus amounts to a considerable sum in the course of a year, the major part of which is borne by Pittsburgh employers. The family of the injured man is therefore relieved of what otherwise would be a serious expense in addition to the cutting off of his wages. Moreover, the size of the family is reduced during a part of the time of his disability.

In the second place, temporary injuries are the ones most likely to be generously compensated by the employer. Many things account for this fact. If disability is short, the sum is small. If the man is a valuable one, who will come back to the same work, it is worth while for the company to make it up to him. Thirteen men received full wages while they were disabled.



AN ARM GONE AT TWENTY
This young brakeman when last seen was studying telegraphy in order to stay in the service

Photo by Hine

THE WOUNDS OF WORK
When a man's hand is mutilated he keeps it out of sight

Some city employes, as policemen and firemen, regularly receive full wages in case of temporary disability. Superintendents and men in important positions of authority, who perhaps need the compensation least, are very likely to receive full wages, or one-half. Occasionally such good fortune comes to others. John Koroshic, one of several men badly burned in the May 21 explosion at Jones and Laughlin's, was in the hospital two months at a cost to the company of $67, and received also his full wages,* $224, for the sixteen weeks he was unable to work. Fifty dollars more came to him from a Slavic benefit society to which he belonged. Allowing $75 for his living during two months after he came from the hospital, he still had $200 clear. With this he sent to the old country for the girl he had left behind, and got married. Even in a blast furnace explosion, "it's an ill wind that blows nobody good."

In the third place, through the benefit societies so common in the Pittsburgh District, a man can by monthly payments provide a small but sure and regular income for his family in case of his temporary disablement. For instance, in the National Croatian Society, one can, by paying $ .56 a month, provide a sick or accident benefit of $5.00 a week for nine months, and a death benefit of $800. Obviously $5.00 a week for a family whose wage-earner is only temporarily laid off is a much better provision than $800 for a family whose wage-earner is altogether lost. Between death and injury benefits secured through relief associations, the contrast is even greater. That of the McIntosh Hemphill Company is typical. Fifty cents a month in dues secures a man $5.00 a week for 26 weeks of disability, but provides only $100 in case of his death.

Thus, Morritz Frederick, a German painter, employed by the Pennsylvania Railroad, who was disabled 20 weeks with a compound fracture, received no help from the company, but he drew $5.00 a week for seven weeks from the Painters' and Decorators' Union, and $5.00 a week for 17 weeks from the Ormsby Benefit Society of which he was a member. Peter Lilya, a Swede who cut his ankle on a sheet of tin, also fared pretty well.

* All the men injured by this second explosion received full wages for the weeks of their disability.

He had a wife and six children, and was unable to work for many weeks, but he belonged to two benefit societies from which he received together $11 a week. The company paid all his medical expenses and gave him $60 besides.

Many, however, even of those but temporarily injured, fare differently. John O'Toole, an iron worker, supporting a wife and child and a father of seventy-two, was employed on construction work at the Westinghouse Electrical Manufacturing Company. A plank broke in a riveting scaffold, and O'Toole fell. He was laid up for 17 weeks with a broken leg and a dislocated shoulder. During this time another child was born to his wife. The family lived on his small savings, and $25 from the company (as against $420.15 which he would have earned had the plank held). Then followed three weeks when he had to take light work at $12 a week instead of his usual work at $24.75.

Temporary disability,—injuries from which a man fully recovers,—can never be the hardest problem to face. Out of 299 injury cases visited, 76 resulted in serious permanent injury. This does not always mean permanent disability, however. Many of these men went back to the same work and pay. Laborers who lose an eye, for instance, can often earn as much afterwards. One man who lost a hand was able to go back to his old work, because he was a foreman. Once in a while a man will be forced by a permanent injury into a new occupation in which he earns as much as he did before. Thomas Johnston, a young negro laborer at Jones and Laughlin's mill, whose arms were broken by a fall of steel laths while he was loading a crane, was totally disabled for 11 weeks. At the end of this time, learning that his arms would be permanently too crooked and weak for any kind of mill work, he got a job as cook in a private family for $7.00 a week and board, practically the same income he had had in the mill.

But among the 76 men seriously and permanently injured, 10 were totally disabled* for life and 33 were partially disabled for life. Here we found some of the most hopeless economic

* We used "disabled" with strict reference to earning capacity. "Totally disabled"=unable to earn anything, "Partially disabled"=unable to earn as much as before accident.

problems. Disabled foreigners, particularly if they get a little money from the company, usually go back to the old country:

> George Salkach, after seven weeks in the hospital with a compound fracture of his leg, went to his employers, the Rosedale Manufacturing Company, while still on crutches and tried to get something. He was not satisfied with what they offered and through the agency of a foreign banker and steamship agent on Penn Avenue, he secured $125, $25 of which went to pay the agent. In addition to this he had $27, a gift collected among his fellow workmen. Thus he was able to live for two months and pay $10 to a doctor. But four months after his accident, he spent what was left of his money on a ticket home. The men who said good-bye to him, say that he still used crutches and would probably never get well; he was fifty-three years old when the injury occurred. In Hungary he has a wife and an imbecile daughter to support, but fortunately a small land holding to live on.
>
> John Tunay, with other men, was raising a heavy timber by means of rope and tackle; the rope broke and Tunay was struck by the falling beam. He was three months in the hospital at his employer's expense. When he came out he was a paralytic wreck. Six months later he tried for two days a job of cleaning bricks which the company gave him, but he had to give it up. They saw that he could never work again, and so they gave him $365 and started him off for Europe. It is confidently asserted by some claim agents that a sum like this will keep a family for an indefinite time in the "Old Country."

Among those disabled by injury, of course the single men without dependents have the lightest burden:

> Raleigh McGee was struck by a timber falling from the fourth story of a building in process of construction. He was laid up for 21 weeks, four of which were spent in the hospital at his employer's expense. During the other weeks he lived on $64 which was due him from a benefit society, and his $150 savings. Then he tried to go back to his old work, but he had to give that up in five days. The climbing was too much for him. He got a job firing boilers for $13.50 a week, which was just one-half of his former earnings. But then, no one was dependent upon him.

Edward Keane, an independent single man of sixty-four, who lost his leg as a result of an injury at Jones and Laughlin's, is pretty well provided for. The company bought him a wooden leg and gave him a watchman's job. The same fate seems harder in case of a young man.

Samuel Jones, a negro hook-on at Homestead, whose foot was run over by a dinkey and crushed so badly that he had to lose his leg below the knee, was also given $150 and a watchman's job. His earnings were cut down from $16.25 to $9.90 at the age of twenty-two.

There were several married men permanently injured, whose problem also for one reason or another was comparatively easy:

Lewis Pressman, fireman for the Penn Salt Company, was disabled eight weeks and lost an eye, as a result of a bursting water-glass. Of his seven children only two were working, but he belonged to two lodges, which paid him $4.00 and $5.00 a week, and the company in addition to paying his hospital expenses, gave him half-pay throughout the two months. Apparently this is the regular custom of this company in injury cases.

Andrew Fuller, whose left hand was rendered useless by an injury, received $673 from his employer, although there was apparently no chance of damages. In addition he was given a watchman's job at $10.80 per week. (Formerly he was a carpenter earning $18 to $21 a week.) Here there are six children and only one working. The wife took in washing for several months.

Dominic Thomas, a Slavic miner, crushed by a fall of slate, still uses a crutch and cane, but he has two boys, seventeen and sixteen, also miners, who support him. For three months he received $7.50 a week from the relief association and for one month $5.00 a week, in all $115, but $65 of this went to pay the hospital bill. His employer, the Monongahela River Consolidated Coal and Coke Company, is one of the few who do not pay the hospital expenses of injured workmen. It shares in the relief association benefit, however, paying everything above $5.00 a week. In this case its share was $30.

Photo by Hine

WIFE AND SIX CHILDREN IN THE OLD COUNTRY

THE OLDEST OF FOUR CHILDREN. FATHER A CAR REPAIRER KILLED AT WORK

We have been speaking of the more fortunate of the injured workmen. Here are some tales of the less fortunate:

Sam Hilton was up on a ladder putting on a belt when the ladder slipped, and he fell and broke his leg. For seven weeks he and his wife, his two small children, and his mother-in-law, had no income, except $4.00 or $5.00 which the mother-in-law earned by working, and the $5.00 a week which a brother paid for board. Hilton's wife went to the company's office, but they gave her nothing. The family moved to a smaller place, drew on their few savings, and finally Hilton went back to work too soon, so that he still suffers pain in his leg.

Andrew Antonik worked in the Homestead Steel Works at a "skull-cracker,"—a heavy iron weight which is allowed to drop from a height to break up pieces of scrap. When it falls big chunks of scrap fly in every direction, and one must be quick to dodge them. On the night of April 29, 1907, "Andy" failed to dodge in time. (Perhaps his 24-hour shift the day before had something to do with this lack of agility.) His leg was crushed and had to be taken off below the knee. A year later "Andy" was found sitting in the back yard of the house where he boarded. He had called at the company's office the October before with an interpreter and received $150, and the promise of an artificial leg and light work as soon as he should be able to get round. Fifty dollars he sent to his wife in Europe, for she has five children to take care of, the oldest a deaf and dumb girl of thirteen. The rest he had used to pay his board and lodging, $15 a month, for the seven months since he had come from the hospital. Now there was nothing left. His wife, he said, was doing housework at $ .72 a week, which was not enough to keep the family.

Joseph Sadonski,—another man who lost his leg,—after going three times to the company's office (Crucible Steel Company) secured $100, an artificial leg, and promise of work for life. He was made a watchman, working 12 hours for $1.00. This makes an income of $6.00, whereas formerly he had made $10.80. He and his wife and child manage to get along by living in one room and taking a boarder. But "the promise of work for life" means of course only while the mill runs full. For two months during hard times he had no

work, and when we saw him he was working only two or three days a week.

George Hampton, another employe of the Crucible Steel Company, lost his leg below the knee. The company paid his hospital expenses, and gave him $55 "as a present." Up to two months after the accident he had not been able to get any work. At first he used to beg from his fellow workmen on Saturday—and get often $11 or $12 a week. He used this carefully and was able to save up and buy himself a wooden leg for $70. But for many months the mill had been closed and the men had nothing to give. He has no children, and his wife occasionally gets a day's work. They moved to cheaper rooms, saving $2.00 a month. There is a sister-in-law who works as a domestic, leaving her baby in the care of Hampton's wife. When we found them, they had had no money for a week but $1.25 which Mrs. Hampton had earned by a day's work in Wilkinsburg.

Antonio Tcherkes, "roller off" on No. 3 lap weld furnace, in the Continental Department of the National Tube Company, grabbed a red hot pipe with his hands one day in order to save his life. The pipe had struck another pipe which had got caught in the guard and was thus shoved out against Tcherkes. He was five weeks in the hospital and seven weeks disabled at home. During this time he could send nothing to his wife and two children "on the other side." He did not go to the office to ask for compensation, because he could not talk English and had no friends who could. He said "it seemed hopeless to go." Tcherkes' hands are permanently disfigured and weakened so that he can never do hard work. He secured a very good job, operating the levers in the same mill where he had worked before. He makes a little less, but it is easy work and not nearly so hot. Yet he has no contract with the company which will make his continued employment secure.

Henry Fisk, a water tender for the Pittsburgh Railway Company, lost his eye; a glass tube in the engine burst. He was disabled for two months. The company gave him work as a laborer at $9.60 a week, but no money compensation. This means a reduction of $6.15 a week for Fisk, his wife, and three small children. More recently he scalded his foot, because he could not see well. This lost him two weeks' time.

John Karlich, laborer for the Carnegie Steel Company, while loading a crane, caught his arm between a steel cable and a wheel. (Some one failed to wait for the signal and began to hoist too soon.) The arm was all but wrenched off. Karlich has been married ten years and had five children, the oldest six. When he went to settle with the company, they offered him $100 and an artificial arm. Not satisfied with this he engaged a lawyer who got $300 for him but took $100 as his fee. He went back to work for the company as a labor foreman, making $10 a week instead of $13 as he had before the accident.

Alfred Putnam, employed by the Pennsylvania Railroad, was working on a freight train at night. Either the brake chain or the shaft broke, and Putnam was thrown between the cars. He lost his right arm and his left leg. He was a man of twenty-three, with a wife and two children looking to him for support. The Pennsylvania Railroad Company makes no direct compensation for injuries to its workmen. But it pays the running expenses and deficit of a relief association. To this Putnam belonged. He was in the third class, paying $2.25 a month dues, and when injured his benefits amounted to $10.50 a week for a year, and $5.25 a week afterwards. Putnam had earned $21 a week. His wife now adds a little to their $5.25 benefit by taking in sewing.

At the end of this long recital it may be said, "There is nothing unique about these sufferings. You could tell the same tale if you should follow up the after-effects of disease in working people's families. A widow whose husband is killed in the mill is no worse off than one whose husband dies of typhoid fever. Why should society concern itself with the economic after-effects of one disaster and not of the other?" For answer let us see where we stand. In the last two chapters it has been shown that the undistributed economic loss from work-accidents in Allegheny County means hardship, struggle, and defeat to those upon whom it rests,—that it amounts to a serious drag upon the prosperity of the community's wage-earners. This in itself is perhaps an insufficient ground for social action. But in the earlier chapters it was pointed out that this loss is suffered by the injured workmen, without relation to their individual responsibility

for it. Not hardship alone, but hardship an outcome of injustice, —that is the situation.

Consider the matter in another light. In work-accidents we have a peculiar kind of disaster, by which, roughly speaking, only wage-earners are affected, and which falls upon them in addition to all the disasters that are the common lot. A special cloud always threatens the home of the worker in dangerous trades, because his daily work involves physical risk to him, and on his life and strength depend the comfort and happiness of his family. What is his "work" then? Is it any concern of society? First of all, to be sure, it is his way of making a living, but it is also necessary to his employer's way of making a living, and finally it is necessary to society's way of making a living. In other words, the wage-earner's work, however individually managed and controlled, however competitively bargained for, is a part of a great undertaking in which society as a whole shares and by which it profits. If in many of the fundamental operations of this undertaking there is constant danger to life and limb, it is not just that those whose lot falls in this part of the work should endure not only all the physical torture that comes with injury, but also almost the entire economic loss which inevitably follows it. It is not just that the wives and children, mothers and fathers, of those who do this part of the work, should not only bear the constant dread, the shock, the grief and longing, but also pay in their own harder struggles, and lesser opportunities and narrowed lives, the money-cost of the tragedy. The physical suffering of the injured we cannot share. We cannot satisfy the longing or lessen the grief. But the economic loss we can share. Our failure to do this is an injustice to the wage-earner; and the outcome of this injustice is misery.

Photo by Hine

One Arm and Four Children

CHAPTER XI

POLICY OF CERTAIN COMPANIES

THE facts set forth in the last three chapters bring us to the conclusion that a new adjustment of the work-accident loss is demanded. Before concluding that legislation is necessary to accomplish this end, however, let us consider whether there are in the situation today any hopeful elements which promise a voluntary solution. So far as the Pittsburgh District is concerned, the hopeful elements fall into three groups: (1) The more or less consistently generous policy of certain companies in making individual settlements; (2) the establishment of relief associations; and (3) the existence of the Carnegie Relief Fund. These will be taken up in their order.

While it is true that certain employers in Allegheny County consistently assume no responsibility for the families of their injured and killed employes, and are guided in making settlements merely by the legal risk involved, it is equally true that some employers voluntarily assume a limited responsibility for these victims and aim at a certain consistency in carrying it out, regardless of liability. Foremost among those who meet this voluntarily assumed responsibility by making a settlement separately in each case that comes up, stand the Pittsburgh and Lake Erie Railroad Company and the American Steel and Wire Company. In the accompanying tables, giving the disposition of all the cases of injury and death among the employes of those two companies during the periods covered, a certain consistent policy is observable.

There were, as we have pointed out in a former chapter, several cases of injury and death in Allegheny County for which higher compensation was received than in any of these cases. But so far as could be discovered, among those employers in the Pittsburgh District who have to deal with a large number of

TABLE 29.—AMOUNTS PAID BY PITTSBURGH AND LAKE ERIE RAILROAD COMPANY

A. In 13 Cases of Death of Employes, July, 1906, to June 31, 1907

To Widows of Married Men

1.	$1,500	
2.	625	
3.	715	
4.	50	(a foreigner; relatives in Europe).
5.	400	
6.	320	
7.	500	
8.	3,500	(suit likely)

To Dependents of Single Men

1.	$50	(a foreigner; relatives in Europe).
2.	77	(a foreigner; relatives in Europe).
3.	250	
4.	300	
5.	167	(Aunt only relative).

B. In Five Cases of Injury to Employes during April, May, and June, 1907

	Amount Paid	*Extent of Injury*
1.	$25	12 wks.' temp. disability.
2.	100	6 " " "
3.	125	10 " " "
4.	50	8 " " "
5.	50	17 " " "

TABLE 30.—AMOUNTS PAID BY AMERICAN STEEL AND WIRE COMPANY

A. In Eight Cases of Death of Employes, July 1, 1906 to June 31, 1907

To Widows of Married Men

1.	$250
2.	475
3.	375
4.	500
5.	540

To Dependents of Single Men

1.	$200	(a foreigner; relatives in Europe).
2.	400	(a foreigner; relatives in Europe).
3.	400	(a foreigner; relatives in Europe).

B. In Thirteen Cases of Injury to Employes during April, May, and June, 1907

	Amount Paid	*Extent of Injury*
1.	$200	16 wks.' temp. disability.
2.	50	5 " " "
3.	20	2 " " "
4.	25	4 " " "
5.	20	3 " " "
6.	40	14 " " "
7.	15	4 " " "
8.	100	Eye lost
9.	150	" "
10.	50	Sight injured.
11.	250	Three fingers lost.
12.	673	and watchman's job. Left hand useless.
13.	2600	49 wks.' total disability; unfitted for heavy work for life. (Case of probable liability).

accidents, and who make direct settlements, there were no other companies which made a regular practice of sharing some part of the income loss caused by each accident. Of these two companies the Pittsburgh and Lake Erie Company average the more liberal payments for English-speaking families. The American Steel and Wire Company's policy was the more consistent, however, because to the non-resident relatives of foreigners killed it paid practically the same compensation as to dependents who are in the United States. The Pittsburgh and Lake Erie Company paid only funeral expenses in such cases, largely, it was said, because of the difficulty of getting the money into the right hands in Europe. Both companies will go far above their usual range of payments in order to avoid a possibly successful suit against them, but not in order to avoid the cost and annoyance of defending an ill-advised suit.

The policy of these two companies represents the most that was being done in the year studied by those employers who dealt directly and separately with each accident case; and considering the law on this subject, it is a comparatively broad and generous policy. In the seven "temporary disability" cases of the American Steel and Wire Company, there is a fairly reasonable relation between the weeks of income loss and the compensation received. But the compensation made by these companies to the widows of married men killed is not in reasonable proportion to the loss. Leaving out the two extreme cases (the $50 given for the funeral of an Italian whose relatives were in Europe, and the $3500 given to avoid suit), the average of all 11 cases of married men killed is $552. It is not necessary to point out that this amount is hardly a considerable portion of the loss suffered by the widow and children of a wage-earner killed in the prime of his working life,—yet it represents the height to which Pittsburgh employers had gone in regularly sharing the economic burden resulting from fatal accidents to their employes.

By way of comparison, as shown in Table 31, we found the Jones and Laughlin Steel Company giving no more than funeral expenses to over one-half of the families (17 out of 28); the Pressed Steel Car Company giving no more than funeral expenses to over one-half of the families (six out of 10); the National Tube Com-

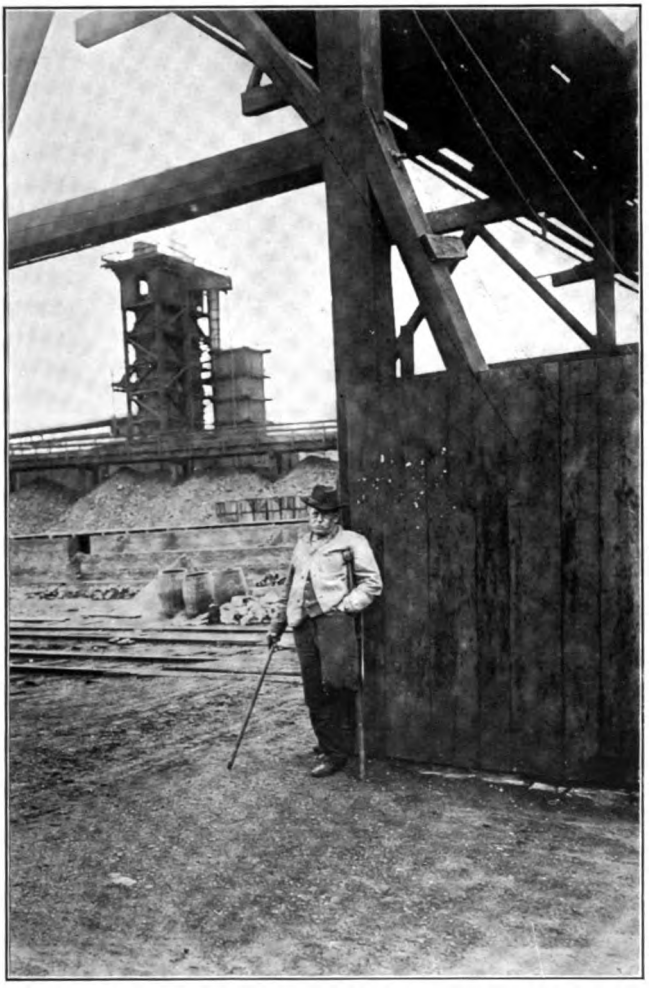
pany giving more than this to only seven out of 13 families. The record for the smaller companies as a whole was even less encouraging. In nearly 43 per cent of cases they did not even give funeral expenses, and in only 24 per cent did they give more than funeral expenses. Taking all these companies together, it was ascertained that to 82 out of 121 families of married employes killed, or to 67 per cent, these employers gave nothing more than funeral expenses. These figures are in marked contrast to those given above for the American Steel and Wire Company and the Pittsburgh and Lake Erie.

TABLE 31.—COMPENSATION TO THE DEPENDENTS OF 121 MARRIED MEN KILLED IN WORK-ACCIDENTS PAID BY EMPLOYERS OF ALLEGHENY COUNTY, NOT INCLUDING PITTSBURGH AND LAKE ERIE RAILROAD COMPANY, AMERICAN STEEL AND WIRE COMPANY, OR CARNEGIE STEEL COMPANY

Name of Employer	Compensation Paid*									
	Nothing	*$100 or Less or Funeral Expenses*	*$101–$300*	*$301–$500*	*$501–$1000*	*$1001–$2000*	*$2001–$3000*	*Over $3000*	*Amount Unknown*	*Total*
Jones and Laughlin	7	10	4	..	3	..	2	..	2	28
National Tube Co.	..	6	2	1	1	1	..	..	2	13
Pressed Steel Car Co.	3	3	2	1	..	..	..	..	1	10
Other companies	30	23	9	5	1	..	..	..	2	70
Total	40	42	17	7	5	1	2	..	7	121

This first "hopeful feature," then,—the voluntarily generous policy of certain employers in making individual settlements,—indicates that the injustice of leaving the whole burden of accidents upon the workmen is beginning to be realized; and for this reason it is important. But dependence cannot be placed upon the development of this policy to bring about a proper distri-

* This table is based largely on statements made by dependents. We were not accorded access to company records for verification in the case of the companies whose names appear.



THE CRIPPLED WATCHMAN—A TYPE

bution of the loss. In the first place, where it prevails the amounts given are not adequate, especially in cases of death. It is not to be anticipated that by any immediate legislative adjustment of this burden, the employer would share each loss equally with the family of the employe killed. But on the other hand, we must not be satisfied with $500 as the employer's share of a loss borne by the family which may be estimated at $14,271.* In the second place, this comparatively generous policy is, as has been seen, far from general.

Another group of employers has been spoken of who voluntarily assume a limited responsibility for the victims of accidents in their industries, by establishing relief associations to which they regularly contribute.

About 23 per cent of the men killed and injured by industrial accidents in Allegheny County belong to some relief association. Relief associations are primarily organizations for mutual insurance, in which the members pay dues, entitling them to benefits in case of injury, sickness or death. They differ fundamentally from other such societies in the fact that their membership is limited to the employes of one company, also usually in that they are started on the initiative of the employer, and that they nearly always receive contributions from him. Reference will not be made to those few associations in which the employer has no part, because we are concerned primarily, not with the workman's methods of insuring himself against accident losses, but with the method and extent of his employer's sharing in those losses. Nor shall we take up in this chapter those relief associations which require a contract of release secured from the employe. The establishment of such associations is not properly a policy adopted by an employer in spite of the existing law, but rather an adjustment to the present law, a method of escape from it.

In no two relief associations are the employers' methods of contributing exactly the same. Thus, the United Coal Company gives a lump sum of from $100 to $500 to start each branch. The New York and Cleveland Gas Coal Company pays $25 a

* This is an average reached in 193 cases of married men killed, by multiplying the yearly income of each man by his expectation of life, and subtracting $300 for each year to cover the amount which would have been expended on his own maintenance.

month to each branch. The Pittsburgh Coal Company pays one-half of the death benefits, and all over $5.00 a week of the injury benefit. The McIntosh Hemphill Company gives $100 a year. The McClintic Marshall Construction Company guarantees deficiencies in the fund.* See Table 32.

The Westinghouse Machine Company Mutual Aid Society, organized in 1884, can be considered typical of those in which the employers' contribution is comparatively large. Each member of this association pays $ .50 a month in dues, and in return is entitled to $5.00 a week in case of disability from sickness, and $7.50 a week in case of disability from injury, with a six months' limit in each case. There is also a death benefit,—$100 if the member dies from natural causes, and $150 if the death is caused by accident. At its organization the Westinghouse Machine Company gave $250 to this association, and in addition it contributes one-third of the injury benefit and one-third of the accidental death benefit.

Relief associations of this simple type do much good. Employes are encouraged to be provident, and employers, through their contributions, voluntarily assume a share of each accident loss. It must be remembered, however, that the employers' share of the loss thus voluntarily assumed is exceedingly small. In the best associations of this type the employer contributes about one-third of the benefit. This does not mean that he makes good one-third of the income loss in case of accident, for benefits are but a fraction of wages. In injury cases, it means, roughly, one-third of one-half of the income loss so long as benefits continue,—six months at the most. In death cases it most commonly means one-third of the funeral expenses. The compensation paid by employers through their contribution to such relief associations, though more uniform and consistent, is considerably less in amount than the average settlement made by the Pittsburgh and Lake Erie Company or the American Steel and Wire Company. Here again, then, we find an important acknowledgment of the principle that an employer should share the accident loss, but in practice the assumption of an inconsiderable portion of it.

* The 23d Annual Report of the U. S. Commissioner of Labor contains a detailed study of Workmen's Insurance and benefit funds in the U. S.

TABLE 32.—DUES, BENEFITS AND CONTRIBUTIONS FROM EMPLOYER IN EIGHT RELIEF ASSOCIATIONS NOT FOUNDED ON CONTRACT OF RELEASE.*

Company	*Dues Paid by Men*	*Contribution from Company*	*Death Benefit*	*Sick and Accident Benefit*	*Possible Total for Temporary Disability*
Pittsburgh Railroad .	$1 a month	$1000 to start; 50 cts. for every $1.00 given by men	$300	$1.50 a day 6 months; 75 cts. a day 6 months; 37½ cts. a day 1 year	$540
Westinghouse Machine Company	50 cts. a month	$250 to start; $2.50 a week for accident benefit; $50 for accidental death benefit	$100–$150	$5–$7.50 a week 6 months	$195
McClintic, Marshall Company	2 cts. every working day	Makes up deficiencies	$100	$3–$5 a week 26 weeks	$128
McIntosh & Hemphill .	50 cts a month	$100 a year	$100 ($50 for death of wife)	$5 a week 26 weeks	$130
Pittsburgh Coal Company . .	40 cts. a month	½ of accidental death benefit. All above $5 a week of disability benefit	$100–$150 ($25–$100 for death of member of family)	$5–$10 a week; 28 weeks	$190–$280
New York & Cleveland Gas Coal Company	50 cts. a month	$25 a month	$75	$5 a week 26 weeks	$130
Monongahela River Coal & Coke Company	50 cts. a month	½ of accidental death benefit. All above $5 of disability benefit	$100–$150 ($25–$100 for death of member of family)	$5–$10 a week 28 weeks	$140–$280
United Coal Company	50 cts. a month	$100–$500 to start	$100 ($25–$75 for death of member of family)	$5 a week 26 weeks	$130

* Credit is due Mrs. D. Lucile Field Woodward for the preparation of this table and the table which appears as Appendix VIII.

In considering the policy of different employers the Carnegie Steel Company so far has been purposely left out. In a study of accidents this company warrants special consideration, not only because, with its enormous pay-roll, it has more employes injured and killed than any other company, but also because of the Carnegie Relief Fund. The existence of this fund we have called the third "hopeful feature" in the situation. From this fund a certain uniform compensation is paid to employes of the Carnegie Steel Company and its constituent companies injured while at work, and to the dependents of employes killed while at work. The sum paid to a widow is $500, with $100 additional for every child under sixteen. To the family of a single man killed, $500 is paid if it can be proved that he was a regular contributor to the support of the family. Thus benefits are based not upon earnings, but to a certain extent upon need.

Payments made from this fund were included in the tables on page 121, showing "Compensation paid to the dependents of men killed." But strictly speaking, the benefits paid out of the Carnegie Relief Fund are not part of the compensation made by the Carnegie Steel Company to its employes for injury. The fact that benefits are paid from the fund, even in cases where a law suit has been brought and won against the Carnegie Steel Company, makes clear the separateness of the two institutions.* The fund was established and is administered as the personal gift of Andrew Carnegie. It is no more a part of the policy of the Carnegie Steel Company than is the wholesale endowment of libraries.

TABLE 33.—COMPENSATION PAID BY CARNEGIE STEEL COMPANY TO WIDOWS OF 42 MEN KILLED

Number of Families	*Amount Paid*
10	0
17	$ 100 or less
8	101 to $500
3	501 to 1000
2	1001 to 2000
2	Over 2000

* These benefits are not paid until the suit is determined. Hence the fund is never put in the position of aiding the injured employe in a suit against the company.

TABLE 34.—COMPENSATION RECEIVED BY THE 42 WIDOWS ENTERED IN TABLE 33, PLUS CARNEGIE RELIEF BENEFITS

Number of Families	*Amount Received*
1	0
5	$100 or less
5	101 to $500
20	501 to 1000
8	1001 to 2000
3	Over 2000

From these tables it is clear that the Carnegie Steel Company, considered separately from the Relief Fund, is not in the class of consistently liberal employers. To the families of only 15 out of 42 married employes killed, did it give more than funeral expenses. This is a smaller proportion than in the case of Jones and Laughlin, The National Tube Company, or the Pressed Steel Car Company.

But, with the addition of the Carnegie Relief benefits, the families of men killed in the employ of the Carnegie Steel Company are on an average better off than those men killed in the employ of any of the companies we have mentioned, including the Pittsburgh and Lake Erie Railroad Company and the American Steel and Wire Company. For, including Relief Fund benefits, while there were six out of 42 Carnegie Steel Company families who received no more than funeral expenses, 31 out of 42, or nearly 74 per cent, received more than $500.

This relief fund is of practical benefit to so many families affected by fatal industrial accidents in the Pittsburgh District that it deserves our special consideration. In 1901 Mr. Carnegie gave $4,000,000 in trust "to provide for the employes of the Carnegie Company,....injured in its service and for those dependent upon such employes as are killed."* To quote further from Mr. Carnegie's letter creating the trust, "This fund is not intended to be used as a substitute for what the company has been in the habit of doing in such cases—far from it—it is intended to go still further, and give to the injured and to their employes who are needy in old age, through no fault of their own, some provision against want as long as needed, or until young children can become self-supporting.

"I make this first use of surplus wealth upon retiring from

* The fund also provides for a small pension in case of retirement because of old age or incapacity.

business as an acknowledgment of the deep debt which I owe to the workmen, who have contributed so greatly to my success."

To administer this bequest the "Andrew Carnegie Relief Fund," later changed to the "Carnegie Relief Fund,"* was established January 1, 1902. Over a million dollars interest from that fund has since been paid out according to the scheme of benefits already described. Roughly, 40 per cent has gone for pensions, 50 per cent for death benefits and only 8 per cent for injury benefits. That part of the original plan which provided benefits for all injuries causing disability of more than two weeks, at the rate of $1.00 a day for married men and $ .75 a day for single men, had to be abandoned because the injuries proved so numerous that the fund would not hold out.† Since July 1, 1905, benefits have been paid from the fund only in case of the most serious injuries, those resulting in disability for more than one year. In such cases benefits are paid only until the injured man can get work. Thus, if a man who has lost a leg can secure a job as watchman, either with the Carnegie Company or with some other, his benefits cease.

Injury or death must result from "accidents or cases of sunstroke or heat exhaustion, occurring during, and in direct and proper connection with, the performance of duty in the service of the company," in order to make the victims eligible for benefits. Accidents due to an individual's "physical condition or tendency (except in cases of sunstroke or heat exhaustion), to intoxication, to the use of stimulants or narcotics, or while engaged in any unlawful or immoral acts," are expressly excluded in the rules for administering the fund. Benefits are denied in few fatal cases, however. The wife and children of an immigrant workman are not discriminated against if they are living abroad. Out of 42 cases which we investigated, of married employes killed, the regular benefits had been paid to all but 10 of the widows at the time of our inquiry—eighteen months after the accident. One case was still unsettled because of the difficulty of establishing the identity of foreign dependents. In another case the widow had been denied benefits because she had no marriage certificate,

* The Carnegie Relief Fund has now been consolidated with the U. S. Steel Corporation's Pension Fund. See footnote at end of chapter.

† This suggests the obvious limitation of a fixed fund in providing compensation for accidents among a constantly increasing labor force.

and did not establish by proof a common law marriage. Benefits were refused in a third case "because the deceased had unnecessarily exposed himself to danger." A fourth case was that of a man named Andrew Semik who died in the hospital three days after his eyes had been injured by an explosion of lime. The hospital surgeon and an oculist both stated that they could not say that, had he not died, he would have lost his sight,—that he was an alcoholic subject and his death was due to delirium tremens. Benefits were therefore refused to his widow. Of the other cases, the officers of the Relief Fund had never received notice from the responsible companies.

Granting that the Carnegie Relief Fund, in spite of its limitations, is a most beneficial institution, does its establishment suggest a solution of our problem? In the spirit of the gift, and in the method of its administration, lies a recognition of the principle of compensation for the accidents of an industry out of the gains of the industry, quite apart from any question of the employer's negligence; this, as a voluntary step in the direction of industrial justice, is of great significance. It is hopeful. But there is no reason to think that this principle will rapidly become popular among retired capitalists. The fund has been in existence six years, and there are, as far as I know, no others like it. We cannot wait until wealthy men, generally, see fit to turn some of their gains back to make up for death and injury in the industries by which they have grown rich.

We have considered the generous policy of certain employers in settling with injured employes, and of other employers in contributing to relief associations, and we have dwelt upon the benefits of the Carnegie Relief Fund, to determine whether the solution of our problem lies in any or all of these somewhat hopeful indications. And we are brought to the conclusion that these features of the situation are hopeful, chiefly because in each of them lies the recognition of a certain principle—the principle that an industrial enterprise should regularly share the economic loss resulting from accidents to its employes in the course of their work. We do not belittle the significance of that recognition. But, as we have seen, it did not lead these employers to assume a large enough share

of the loss to remedy the inequality of its distribution. The bulk of the burden still fell upon the injured workman and his family. So long as the employer's sharing in the accident loss remains merely a voluntary matter, only the largest and most prosperous employers can afford to assume more than a small share. For, no matter how generous he may be, the stress of competition will prevent the average employer from unnecessarily incurring a large cost which his competitor does not incur.*

Moreover, there is no reason to believe that this limited recognition of the principle will soon become general. Policies such as those of the American Steel and Wire Company and the Pittsburgh and Lake Erie Railroad Company are not common enough to be said to represent a tendency among Pittsburgh employers; the type of relief association we have described in which the employer makes a small contribution to the insurance of his workmen without gaining anything in return, is not on the increase in the Pittsburgh District; the Carnegie Relief Fund is a genus by itself.

*On May 1, 1910, the United States Steel Corporation introduced for one year's trial a plan of relief for injured employes, which provides for regular uniform payments in case of injury and death by accidents of employment. To carry out this plan the Steel Corporation has established a fund of $8,000,000 which is to be consolidated with the $4,000,000 Carnegie Relief Fund. The whole will be called the U. S. Steel and Carnegie Pension Fund. This may be considered a striking development of the generous policy of certain employers in making accident settlements where the present law recognizes no liability. In this plan, too, there is the advantage to the workman of knowing definitely what he can expect. The "relief," of which the company bears the whole expense, is roughly from 18 months' to two years' wages in case of death, and from 35 per cent of wages up to $2.00 per day in case of disability, limited to one year. (See Appendix VI.) These rates are much higher than those regularly paid by any employer in the Pittsburgh District whose policy in dealing with accident cases was revealed by our study. The adoption of this plan is significant, not only as a further important recognition of the principle that an industry should regularly share the economic loss to employes injured by its accidents, but also as showing the extent to which the largest corporations can go in adding to their costs of production without regard to the action of lesser competitors. It does not, however, invalidate our conclusion as to the inevitable limitations of voluntary compensation schemes with respect to the average employers.

The compensation plan of the International Harvester Co., which provides rates of compensation decidedly higher than those provided in the Steel Corporation plan, is printed in Appendix VII.

CONCLUSION OF PARTS I AND II

THE facts set forth in Part I concerning work-accidents in Allegheny County in the year July, 1906, to July, 1907, have revealed that while roughly one-third of the accidents are unavoidable, and one-third due to the human weaknesses of the workmen, often accentuated by their occupation and environment, about one-third are due to an insufficient provision for the safety of workmen on the part of their employers. The facts set forth in Part II have revealed that the inevitable economic loss resulting from these accidents rests in the great majority of cases almost altogether upon the workmen injured or the dependents of those killed, and that this burden is disastrous to the welfare of their families. The facts set forth in Parts I and II, taken together, have revealed that the economic loss is neither distributed so as to furnish the strongest inducement for the prevention of accidents in general nor adjusted according to the "fault" of the parties concerned in each accident.

Our facts therefore, in so far as they are representative, reveal a two-fold wrong serious enough and of sufficient extent to justify legislative interference.

Considered in the light of social economy, these facts again justify such action. The continuing recurrence of preventable work-accidents is not only an injustice to the victims but also clearly a tremendous social waste.* One need not argue that it would be good social economy to check it. It is almost equally clear that in the distribution of the accident loss, the public welfare is concerned. We have seen that in Allegheny County the bulk of it falls in the shape of lost income upon the injured workmen and their families,—those least able to bear it. It is distributed so that it means the greatest possible amount of hardship.

It is not necessary to point out that such individual hardships as we have described are a tax upon a community's real prosperity. Every child robbed of free growth and education, compelled to go to work too soon, is a loss to the community, a

* For a money estimate of this social loss, see Appendix IX.

loss of possible, vigorous, thinking citizenship. Every young family, whose income-provider has been taken, whose children are left neglected, while the mother, overburdened with care and anxiety, struggles to do the work of two,—every such thwarted family represents a social loss. Every mother left to an old age of bitterness and hard work, unaided by the income of the strong son who knew her worth, represents a loss to the community. Every helpless cripple left an unwilling burden on those who can ill afford to support him is a burden upon society. Every serious injury to a bread-winner, with weary weeks of sickness passed in a scene of increasing poverty, with recovery retarded by anxiety, with savings dwindling away and debts looming bigger and bigger, the courage and cheer of the two homebuilders finally lost in the long disaster and perhaps never to be regained—every such instance is a community loss. A law which leaves the economic burden of work-accidents wholly upon the workers, then, not only does them an injustice, but makes out of a largely necessary loss an absolutely unnecessary amount of privation.

In social economy therefore, as well as in simple justice, there is reason for legislative interference to prevent work-accidents, and to effect a more rational distribution of the loss entailed by them.

PART III

"EMPLOYERS' LIABILITY"

CHAPTER XII

THE LAW

IN this study, from a legal point of view, the cart has been put before the horse. We have set forth the actual economic results of a law before stating what that law is, because it is easier to pass judgment upon facts before the mind is confused with theories. It has been seen how the work-accident loss in Allegheny County, Pennsylvania, is distributed, and what actual hardship results. The principles of law which account for, and (presumably) have been held to justify, that distribution must now be examined and judged.

Up to 1907, the rules governing an employer's liability to his workmen for personal injury in Pennsylvania were merely rules of the common law. In order to understand them we must begin with a word or two about the law in personal injury cases generally. If one person injures another unintentionally but through want of due care (and due care is what the average prudent man would use in similar circumstances), he is civilly liable to the injured one for the amount of harm, estimated in money, which his want of care has caused. This seems a natural and fair adjustment of burdens. When one is unduly careless, and thereby hurts another, he should make up for it in so far as money can.

There are three important additional features of this law:

First, contributory negligence on the part of the injured person defeats recovery.

Second, as a rule of negligence,—and it is important to bear this in mind,—a master is responsible for the negligence of his servant while engaged in the master's work. This is on the principle of "respondeat superior." It is the master who is having the work done; he must insure its being done with reasonable care. Whether he does the work himself, or through an agent, the burden of responsibility is manifestly well placed. It all goes

back to the fundamental principle that each must exercise his own rights in such a way as not to impair the rights of others; and when one delegates the exercise of his rights to an agent, they are none the less his rights that are exercised, and he should be and is responsible for the manner in which they are exercised.*

Third, the burden of proving negligence is upon the plaintiff; of proving contributory negligence upon the defendant.†

Now, in the application of this general law to an employer's liability for negligence which results in injury to his employes while they are carrying on his work, some rather material modifications and changes occur. All these modifications are based on one idea. The law holds that the employer is in a different relation to his employes because they have made a contract with him in which certain elements are implied. The law assumes that the two parties are free and on an equal footing in making this contract. It is the contract of hire. The servant is not obliged to work for the master, he can take work or leave it as he likes; but if he takes the work he makes a contract in which the law implies that he assumes certain risks. (1) He assumes the risk of all the ordinary dangers of the employment. (2) He assumes the risk of all extraordinary dangers, such as those which arise from defective machinery and an unsafe place to work or from hasty and dangerous methods, if he knew about these, or might reasonably be expected to know about them and accepts the work in spite of them, or, if he finds out about them, or might have found out about them with the exercise of ordinary care, and continues working in spite of them. (3) Finally, he assumes the risk of all dangers arising from the carelessness, ignorance, or incompetency of his fellow employes.

Thus we see that the general principle of individual responsibility for negligence has been pretty well modified in respect to the relations of employer and employe. Now let us take up these assumed risks more in detail, showing by actual illustrations just what they mean.

* This principle does not, of course, exclude the agent or servant in question from liability also.

† In most states the burden of proving the absence of contributory negligence on his own part as well as the burden of proving negligence on the part of the defendant rests upon the plaintiff.

(1) The first is simple, and, comparatively speaking, reasonable. In a large number of modern industries certain accidents are inevitable. It is not as safe to mine coal, make steel rails, or manufacture explosives, as it is to practice law or dig potatoes. If a man chooses one calling rather than another, the danger is his own lookout. An employer does not insure the lives and limbs of his employes, and the law takes it for granted that for the extra risk involved in some occupations ample compensation is furnished in an extra reward stipulated for in this very contract of hire.

However, it is not merely the risk of accidents happening in spite of every safety precaution and protection, which the employe assumes; he assumes the risk of the work as it is ordinarily carried on. Thus, a telephone lineman gets a shock from an uncovered electric light wire that he touches in passing, and this is an incident of his employment. (15 Dist., 323.)* Or a laborer working in a quarry is badly injured by a heavy stone falling on him; this is a risk which a quarry workman assumes. (215 Pa., 34.) But again, the handle of a bucket hauling 4,000 pounds of iron out of the hold of a vessel, pulls out, letting the whole mass of iron fall on a workman in the hold. Upon this bucket, which had been used for eighteen years, the handle was merely clamped, while upon newer buckets the handle is forged. Nevertheless, since the plaintiff cannot show that the old and less safe buckets are not still in common use, he cannot hold the employer liable for his injury. He has suffered from an ordinary danger of his employment, and he took the risk. (McGeegan and Hughes, 15 Dist., 249.) So much then for this first exception; —the employe undertakes to suffer all the risks of his employment as it is usually carried on.

(2) The second exception goes farther. The employe assumes all extraordinary and unusual risks, not incident to his employment, if he knew or could reasonably be expected to have known of the danger, and continued working. He assumes all patent risks and all latent risks of which he is informed. For instance, a seventeen-year-old girl working in a laundry called

*All cases used in illustration are taken from Pennsylvania decisions of recent years, which pretty fairly represent the common law rules of employers' liability in all the states. Modification of the common law by statute will be considered later.

the attention of a foreman to a loose board in front of the rolls where she was working. She said it interfered with her work, but made no definite complaint with regard to its danger, and she went on working. Nothing was done. Finally, while she was cleaning the machine, the loose board flew up and threw her hands between the rolls, where they were crushed. She could not recover damages for this injury, because she had assumed the risk of a condition which she ought to have known was dangerous. (Henderson *v.* Hogentagler, 9 Dauph., 246.) Or again, a man working near a defective crane is injured by its breaking. There is no evidence that he knew of the defect, but it had been plain for three months. "He ought to have known of it." (Lindberg *v.* National Tube Company, 213 Pa., 545.) In this case, as in many, we see how the very obviousness of the defect, which it seems should fix the responsibility upon the employer, is a means of his avoiding responsibility.

There is, however, one exception to this rule of the law. If an employe, when he sees a defect or a possible danger, complains of it to his employer or to his superior who is directing the work, and if the employer or his superior promises to repair it, and if the employe relies upon the promise, and if the danger is not imminent,—then the servant is relieved of his assumption of risk even though he continues to work; provided, however, that if the employe continues to work after a reasonable time has passed without the promise to repair being carried out,—then he is deemed to have "waived" his objections, and "assumed the risk" again. (4 Super., 621.) This valuable exception is well hedged about with "ifs." For example: A bolt protruded near an elevator shaft; the plaintiff complained of it to the foreman. Later he stumbled over it and fell down the shaft, but his complaint to the foreman was immaterial in fixing liability, since the foreman had not promised to change it. (Moudy *v.* The Penn Steel Casting Company, 10 Del., 14.)

(3) Finally the employe assumes all risk due to the negligence of fellow employes. This is the most vital distinction between the general law of negligence, and the law of negligence as between master and servant. "A master is responsible for the negligence of his servants in course of employment without

regard for their reputation except in case of fellow servants." (77 Pa., 238.) As between the master and a servant injured, it is only demanded of the master that he shall have taken due care in employing fellow servants of ordinary skill and carefulness. To illustrate: Suppose a yard master in Philadelphia, by reputation a reasonably careful man, puts a car of dynamite at the end of a train of cars instead of in the middle, as the rule of the company requires, and because of this carelessness the dynamite car is blown up in a collision many miles from Philadelphia. A cow browsing in a field near the track and a station agent keeping his lonely post in a small country station next to the field, are both blown to pieces. Now, in such a case the farmer could recover for the loss of his cow; but the station agent's widow could not recover for the loss of her husband because he was a fellow servant of the man whose mistake or carelessness caused the accident. Yet he had no more to do with that fellow servant's act, or with the employment of him, than the farmer's cow had.*

This famous fellow-servant rule, which, except where limited by statute, prevails in all the states, is comparatively recent in origin. First came the English case of Priestly *v.* Fowler in 1837, in which Lord Abinger held that a master was not liable to his servant for injuries received as a result of the breaking down of a van on which the servant was riding, the van having been carelessly overloaded by another servant. In this case the injured servant was apparently in a position to know of the overloading. This decision is not based upon a clearly conceived principle. Lord Abinger begins by stating that there is no precedent for such an action by a servant against a master, and goes on to show to what a "ridiculous extreme" such a liability if once admitted might be carried. "A master would be liable to a footman for drunkenness, neglect, or want of skill in a coachman, for the upholsterer's negligence in sending in a crazy bedstead, for the negligence of a cook in not cleaning the copper vessels

* To show that this hypothetical case is not extreme I need only refer to Reiser *v.* The Pennsylvania Railroad (152 Pa., 38), which held that a telegraph operator and a fireman on an engine are fellow servants; or to Kennelly *v.* Baltimore and Ohio Railroad (166 Pa., 60), which held that the brakeman of one train and the engineer of another are fellow servants.

properly, and for the butcher's negligence in supplying the family with meat of a quality injurious to health," etc. He concludes that, "the inconvenience and absurdity of the consequences is a sufficient argument against this principle."*

The only tangible arguments put forth in this opinion are these: That the servant was at liberty to take the risk or not as he chose; that he was just as likely to know of the danger as the master, and would often be more so; finally, that to allow such actions would discourage the servant's diligence in protecting the master against the negligence of other servants, which diligence affords also a better security to the servant than any action against the master for damages could possibly afford.

The first American case in which the rule was laid down was Murray *v.* The South Carolina Railroad,† decided in 1841. Here the plaintiff was a fireman, injured when his engine was thrown off the track as a direct result of the engineer's negligence. The latter had refused to stop the engine when his attention was called to an obstacle on the track. In the argument with which the court supports its decision, denying the liability of the railroad company in this case, there is the first rather unconvincing statement of the principle on which the fellow-servant rule has come to rest. It is pointed out that this would be a new order of liability, which if allowed, must rest upon the contract of hire, since an employe is neither a passenger nor a stranger. "But," says Judge Evans, "is it incident to this contract that the company should guarantee him against the negligence of his co-servants?" It has long been established that the servant takes upon himself the ordinary risks of his vocation. "Why not the extraordinary ones?" It is further suggested in a concurring opinion that the servant's reward is designed to cover the unusual dangers.

It is interesting to note that in this case there is good reasoning as well as common sense to be found in the dissenting opinion of Judge O'Neall, who holds fast to the general rules of negligence, which make a man liable for the negligence of his servants. He

* This curious mingling of the cook and the coachman, who serve the master, with the upholsterer and the butcher, with whom he trades, is enough to show that the learned justice had not worked out clearly in his own mind a principle upon which to base a fellow-servant rule of wide application.

† 26 Am. Dec., 268

says: "If it arose out of any of the old-fashioned modes of conveyance, managed by the defendants themselves, could there be a doubt that they would be liable if the injury resulted from negligence? Suppose it had been a stage coach driven by the owner and the plaintiff was hired as a guard?" He maintains that the risks assumed by a servant on entering his employment do not include negligence, either on the part of the employer himself, or his agents. And finally, "But if we are to look to policy, then I should argue that the more liability imposed on the railroad company, the more care and prudence would be thereby elicited. This result is what the community desires." (36 Am. Dec., 268.) It would appear that this wise judge overestimated the good sense of "the community," for from that day to this we have desired speed rather than safety, large output rather than careful processes. And the courts, in hesitating to hamper the rapid development of our railroads and industries by imposing more liability, have but reflected our spirit.

It remained for a New England case to establish definitely and finally the basis of reason on which the fellow-servant rule was to rest. In the case of Farwell *v.* The B. and W. Railroad Corporation (4 Metcalf, 49), the plaintiff, an engineer, was suing the railroad because of injuries received as a result of the carelessness of the switchman in not changing a switch. On the one hand, the switchman had been long in the employ of the company and was generally regarded as a careful and trusty man. On the other hand, the engineer was evidently in a position where he could not possibly know of or guard against the carelessness which resulted in his injury. Hence this case presented the question squarely: Is an employer to be liable to one employe for the negligence of another employe, when neither the employer nor the injured employe could reasonably have been expected to foresee that negligence? The gist of Chief Justice Shaw's argument in deciding this question is as follows: The employer can not be liable to his own employe in tort, as he would be ordinarily in case of the negligence of an agent of his, because "the employe does not stand towards him in the relation of a stranger. The employe is not a stranger but one whose rights are regulated by contract, express or implied." If then the employer is liable,

his liability must depend upon the implied contract made when the employe entered his employment. So far it is easy to follow his legal reasoning. But he goes on to assert, "This implied contract between master and servant does not extend to indemnify the servant against the negligence of anyone but the master himself." It is on this assumption that the fellow-servant rule rests. We naturally ask: Why does the law assume this, rather than the equally possible and plausible assumption, that the implied contract between master and servant indemnifies the servant against the negligence of the master and any of his agents while engaged in his work? There must be good reasons for making the former assumption, because it involves a radical departure from the accepted rules of negligence which the latter assumption does not involve. The reasons advanced by Chief Justice Shaw seem to be these: (1) That justice and policy demand it, because in a large number of cases where fellow employes really work together, the employe is in a better position to look out for, guard against, or prevent such negligence than the employer; (2) that such negligence of a fellow workman is but one of the ordinary risks of a dangerous calling, which are assumed by the employe with full knowledge and with freedom to choose, and that in legal presumption higher wages compensate him for the greater risks involved.*

This fellow-servant doctrine, finally established by Chief Justice Shaw in the Massachusetts case we have just considered, is, except for some special statutes to be mentioned later, in a whole and flourishing condition in the United States today. In applying this rule, the question who are to be considered fellow servants is of paramount importance.

The question naturally divides itself into two parts:

(1) Is there to be any limitation of the rule on the ground that men are employed in different departments, at different kinds of work, and situated at great distances from one another? Are these nevertheless fellow servants? Generally speaking they are. Thus, railroad trainmen are held to be fellow servants of a car

* (1) is admitted to be a secondary consideration on which the rule can not rest; indeed the case he is deciding is quite outside it; (2) is but another assumption. Thus the argument comes dangerously near to being "the law assumes this because it assumes it."

repairer. (17 W. N. C., 73.) A station master and an engineer are fellow servants. (21 W. N. C., 45.) Track hands and train hands are fellow servants. (197 Pa., 384.) Brakemen, conductors, engineers, and firemen, on the same or different trains of one road, are fellow servants. A girl in the tailoring department of a store has been held to be a fellow servant of the boy who runs the elevator in the store. (198 Pa., 112.) In Pennsylvania, and in most of the other states, all who work for a common employer and in pursuit of the same purpose, are fellow servants, whether they work side by side or miles apart.

(2) Is there any limitation to the fellow-servant doctrine on the ground of difference in rank, authority, etc.? Here we touch upon a difficult and much discussed feature of the rule. In Pennsylvania, up to the passing of the Casey Act, June 10, 1907, foremen, bosses, and even superintendents, have been as a rule considered fellow servants of the men under them or in the same employ. Even though an accident happened to an employe as a direct result of a negligent order from his superior, the employer was not liable because the superior was held to be a fellow servant of the injured man. There has grown up, however, a certain limitation of this wide application of the rule in what is called "the vice-principal" doctrine. It is this: A superior is either a fellow servant or a vice-principal; in the latter case he directly represents the employer and the employer is responsible for his acts. Now suppose that an injury has been caused by the carelessness of a "superior servant;" the plaintiff, in order to establish the negligence of the employer and thus fix liability on him, must prove one of two things: Either (1) that the superior was, in the very act in which he was negligent, performing one of his master's "absolute personal" duties (these duties will be mentioned later); or (2) that he, the superior, was in control of the entire business, or a direct branch of it, and that the employer exercised no direction or control.* In (1) the superior is held to represent the employer because of the nature of the act he is

* It is worth while to note that there is a hole on the other side of this rule where the employer may slip out. For in many cases where the employer exercises no "direction or control," the "superior servant" is really an independent contractor, and in such a case the employer is again not liable for his acts, provided he was not negligent in selecting the contractor. (91 Pa., 183 and 198 Pa., 586.)

performing. In (2) it is his regular position which makes him vice-principal. The case of Lewis *v.* Siefert (116 Pa., 628) is one of the most liberal applications of this vice-principal doctrine. There a train despatcher was held to be a vice-principal and the railroad was held liable to an employe for his negligence. On the other hand the case of Spancake *v.* The Philadelphia and Reading Railroad (148 Pa., 184) is typical of a large number of cases which the vice-principal rule would not touch. In that case a track foreman was in charge of half a dozen men repairing the road bed. It was his duty to warn the men of an approaching train. As a result of his failure to do this one of the men was run over and killed. This man's widow was not allowed to recover against the company because the foreman was a fellow servant of her husband.

But this will no longer be the rule in Pennsylvania. The Employers' Liability Act of 1907 has apparently removed managers, superintendents, and foremen from the class of fellow servants and made them vice-principals, for whose acts the employer is responsible. It further provides that when an injury is caused or contributed to by "the negligence of any person in charge of or directing the particular work in which the employe was engaged at the time of the injury," the defence, "negligence of a fellow servant," shall not avail the employer. While the Casey Act has thus done away with the most unreasonable applications of the fellow-servant rule, we must remember that it still leaves the employe assuming the risk of the carelessness or incompetence of all mere employes like himself, whether they are working shoulder to shoulder with him or a thousand miles away.

These three modifications in the case of master and servant of the general law of negligence (the assumption on the part of a servant of the ordinary risks of the trade, of special risks of which he has notice, and of risks from the negligence of fellow servants), are often spoken of as the "assumption of risk rule" and the "fellow-servant rule," but it seems logically a little more correct to put them all into one group as designating what is meant by the implied assumption of risk in the servant's contract of hire. It is this three-fold assumption which makes the employer's lia-

bility for negligence to his employe quite different from his liability for negligence to the public at large.

Now, there is another way of stating the liability relation existing between employer and employe. Perhaps it is a fairer because a positive way. It is often said that the employer has three "absolute duties" to perform with regard to his employes: to exercise due care in furnishing (1) a safe place to work and safe appliances; (2) a sufficient number of competent and careful employes; (3) instructions and warning when they could reasonably be regarded as necessary. Thus, where the plaintiff was injured by an explosion of gas in a mine and it was shown that the employer had failed to furnish lumber to board up the "cut-throughs," although the superintendent had notified him, and that the explosion was due to this lack of the customary boarding up, the employer was held liable. (31 Super., 447; Saylor *v.* The Coal Company.) And again, where the foreman of a shop, with the approval of the president of the company, left a heavy door leaning up in a dangerous way against the wall so that it fell on a boy who came to work before daylight the next morning, knowing nothing about it, the company was held liable. (Delaney *v.* Penn Steel Casting Co., 30 Super., 387.) These cases illustrate the interpretation of the employer's duty to furnish a reasonably safe place to work.

In the case of Huntingdon and Broad Top Railroad *v.* Decker (84 Pa., 419), an engineer of one train had been killed in collision with another. The plaintiff, his wife, in suing the railroad for damages, proved that the conductor of the second train was habitually intemperate and unfit for service; that the collision was wholly the result of this conductor's carelessness and incompetence; and that his bad habits were known to the superintendent by whom he was employed and retained in the service of the company. She won her suit, on the ground that the employer had here failed in the second duty,—he had not been duly careful in furnishing competent fellow workmen.

To fulfill the third duty the employer must warn all employes of hidden dangers, and instruct very young employes in regard to all dangers that would not be obvious to them. For instance: A thirteen-year-old boy was, without instructions, set to loading

dynamite into a hole, and through a consequent explosion he was made totally blind. The company was held liable. (White and Northwood Cemetery Co., 15 Dist., 358.) Also, where a girl, seventeen years old, was put to work at a mangle in a laundry without instructions as to its danger, and where the customary guard-rail was absent, and as a result of her ignorance of the machine and this defect her hands were caught and crushed, the company was held liable. (Greenan *v.* Eggeling, 30 Super., 253.)

Now that these three absolute duties have been stated and examples of their positive application considered, let us study carefully their limitations, in order to find out how far they would actually operate in most cases to safeguard or compensate the employe.

(1) Take the first duty, to provide a reasonably safe place to work. It cannot be too emphatically insisted that the test of safety is not, according to the law, danger, but always ordinary usage. Suppose, for instance, that a man has been injured as a result of the giving out of some mechanical appliance at a critical moment. It is not enough for him to show that the use of this appliance was dangerous and likely to result in accident; that there was a newer and safer appliance in use at the time; that the use of this appliance was a direct violation of a statute expressly designed to protect employes.* These things, though they may be evidence of negligence, do not necessarily constitute negligence. The plaintiff in order to show that his employer has violated his duty toward him, must show that the unsafe appliance which caused the accident was of such kind or in such condition that it would not be commonly used in such work. Ordinary usage then,

* In 1894 a man was killed by falling through the joists and girders of a building, which were not covered as required by a statute of 1893, expressly intended to prevent such accidents. His wife brought suit, alleging that the employer had been negligent in not complying with this statute. She was nonsuited because no other ground of negligence was alleged. (Mack *v.* Wright, 180 Pa., 472.)

That the violation of a statute is not in itself proof of negligence in most jurisdictions, is evidenced by the fact that in many of the safety appliance acts passed by different states there is included a special provision that a violation of the act shall be prima facie evidence of negligence or negligence *per se*. This point has been much discussed. The true view would seem to be that where the statute itself furnishes a test of negligence one should not be required to go back of that to the usual uncertain test of usage.

is the only and final test. Now, suppose the plaintiff had proven that the appliance in question would not bear even this test. Then, his employer could still defeat his recovery, by showing that the defect or bad condition was plain, that the employe ought to have seen it, and that in continuing to work there he assumed the risk.

(2) Next, in regard to the duty of providing competent fellow workmen. The employer fulfills this duty completely by using ordinary care in selecting and discharging workmen. Thus a plaintiff, if his injury has been caused by an incompetent employe, must show that the employer employed or retained him, actually knowing him to be incompetent, or that the employe in question had a reputation for incompetency which the employer with the exercise of due care should have known. To illustrate: While a woman employed as a car cleaner was working in a car in the yards, a shifting engine struck that car with such force that she was thrown and severely injured about the face and head, and that she partially lost the sight of one eye. This was due to the carelessness of the engineer on the shifting engine, who, the plaintiff maintained, was an intemperate person and unfit for his position. She proved that he had been drunk three times within a few weeks, the last time on the night before the accident. But she was non-suited because she could not show either that this was actually known to the employer, or that the engineer had a reputation for intemperance, which the employer should have known. (49 Pitt. L. J., 84.)

On examination these first two duties appear to be qualified and limited rather than "absolute." The law furnishes to the employe no insurance against injuries arising from an unsafe place to work or incompetent fellow workmen. It merely requires the employer to exercise that degree of care which is customary in providing against such dangers.

(3) As to the third duty, to give proper instruction, we find it most often resorted to in cases where very young employes have been injured. The rule seems to be that young children should always be instructed with regard to their particular task, but this is narrowly interpreted. In a recent case, a boy of thirteen was instructed about his task in respect to a certain

machine, but not told how to stop it. In some way a nut got caught in the cogs and he tried to poke it out with a stick while the machine was running, because he did not know how to stop it. As a result his hand was drawn in between the cogs. It was held in this case that he had gone outside of his line of employment; that his hand would not have been caught if he had stuck to the job assigned him. No recovery was allowed. (Michalofski *v.* Pittsburgh Screw and Bolt Co., 213 Pa., 563.) If the rule could be applied with such severe literalness in the case of a small boy, it is easy to see how little this duty of instruction would avail a grown man. Furthermore, the law assumes that a man in seeking a certain employment represents himself as reasonably familiar with it.

For the sake of clearness the question of an employer's liability for negligence to his employe has been examined from two standpoints: First, by showing how the ordinary liability for negligence is modified in this relation by a three-fold assumption of risk implied in the servant's contract of hire; second, by setting forth the three duties of care which the employer owes his employes, and showing that each duty is limited by the standard of performance which in all cases is but the customary practice. Let it be clear, however, that the duties set forth from the second standpoint are always qualified by the servant's implied assumption of risk set forth from the first standpoint.

Returning again to the first statement of the law, we found that the assumption of risk implied by law in the contract between them, furnishes the master with three possible lines of defense to an action brought against him by his servant on the ground of negligence. It must now be added that there is still another defense open to him,—contributory negligence. The master escapes the penalty of his negligence if he can show that the servant, by his own negligent act or omission, contributed to the accident which caused his injury. This is true with regard to negligence in general. But in these master and servant cases the defense of contributory negligence, although perhaps theoretically reasonable, may well work injustice oftener than justice. For we have seen that most of the "carelessness" of workmen,*

* Part I, Chapter V.

which is not the stupidity and awkwardness of ignorance, or the inattention inevitable in the conditions under which the work is done, is a kind of freedom and fearlessness which goes with rapid and dangerous work and is necessary to it. Imagine a structural iron worker who was "careful of himself." How long would he hold his job?

The test of what constitutes "contributory negligence" is vague; *i. e.*, "what an ordinarily prudent man would not do under the circumstances." It is practically impossible to apply such a test justly to workmen engaged in hazardous occupations.

In the legal significance of a written release we find another general rule of law which has an especially important bearing on employers' liability cases. A release is a written contract. And in any action for damages, if the employer can produce a document signed by the plaintiff, in which he agreed for a consideration to relieve the employer of all liability in connection with his injury, this is a perfect defense, and it cannot be set aside unless the plaintiff can offer "clear, indubitable and convincing" proof that he did not know what he was signing, or that the release was obtained by fraud or false representation. It is apparent in the statement of this rule that it is open to serious abuses, especially in the case of ignorant workmen and foreigners. Nor is it hard to imagine that a corporation's claim agent, coming upon a family in the first confusion of a disaster and offering ready money for their immediate needs, might often secure a release hastily considered and only half understood, even among intelligent American working people. Once having signed a release the injured man has lost his chance to recover at law. This rule in regard to releases is a consistent following of the law of written contracts, but in cases of this kind, considering the relative situation of the two parties, its rigid application is not calculated to promote justice.

In addition to this usual rule with regard to releases, there is a special ruling in Pennsylvania, which has become famous. Many railroads and some other corporations maintain a relief association, supposedly voluntary, but to which the men must belong if they wish to hold their jobs. To this the men are required to contribute monthly from their wages. In the Pennsyl-

vania Railroad system the company bears the expense of management and guarantees the benefit. In other systems the company sometimes contributes a definite amount, or a certain proportion. The most ardent advocates of such a relief association agree that it is not a benevolent scheme on the part of the railroad, but rather an association for mutual benefit. In return for its comparatively small part of the contribution, the company feels relieved of all financial obligation toward the men injured in its service and also secures a comparatively steady force of employes, since men who leave the service must forfeit all right to the benefits for which they have paid dues. The employe on his part is insured against accident or death at a rate considerably lower than a man in his occupation could get with an insurance company. In these associations the employe signs an application when he joins, in which he agrees that the acceptance of benefits in case of death or injury shall act as a release of all claims against the company, and that he will sign the necessary papers to execute this release when he "accepts the benefits." It is well known that a contract whereby the employe agreed beforehand to exonerate his employer from liability for negligence, would be void as against public policy, but this contract made on joining the relief association has been held valid in Pennsylvania on the ground that the employe in making it does not actually bargain away a future right, because he does not make his choice until after the liability, if any, has arisen. "The party retains the right of action until after knowledge of the facts and an opportunity to choose." (Ringle *v.* The Pennsylvania Railroad, 164 Pa., 529, and Johnson *v.* The Baltimore and Ohio Railroad, 163 Pa., 127.)*

An important point apparently has been overlooked in this reasoning. There are two future "rights" concerned. If a man pays dues to an association for the purpose of insuring himself in case of injury, he has a "right" to some return for these payments when the injury occurs. Also, quite apart from this,

* Iowa, Montana, Nebraska, Nevada, Texas, North Dakota, South Dakota and South Carolina provide by statute that no such contract of "insurance, relief, benefit, or indemnity, entered into prior to the injury, nor the acceptance of such insurance, relief, benefit, or indemnity, shall constitute a bar or defense." Most of these statutes refer to railroads exclusively. The Federal Employers' Liability Act of 1908 contains a similar provision.

if a man is injured through the negligence of his employer he has a "right" to bring suit for damages. These two "rights" exist side by side; there is no reason in justice why the exercise of one should preclude the exercise of the other. Yet the man who joins a relief association and begins to pay dues, at the same time promising that if he accepts benefits in case of injury he will relieve his employer of all liability, actually bargains away *one* of these rights before it has arisen. The fact that he does not say which he will give up until they have both arisen, is immaterial.

Another unusual feature of the employers' liability situation in Pennsylvania should be mentioned here. Under the common law, there was no recovery in case of death, on the general principle that an action for injury dies with the person. But in 1855 a statute was passed in Pennsylvania providing that certain persons shall be entitled to recover damages for an injury causing death,—the husband, widow, children, or parents, of the deceased. Similar statutory provision for the survival of this action for death has been made in all the states. But in Pennsylvania the statute has been declared by the courts to be for the benefit of citizens only; a non-resident alien has no rights under it. (Deni *v.* the Pennsylvania Railroad, 181 Pa., 525, and Maiorano *v.* Baltimore and Ohio Railroad, 216 Pa., 402.) Thus if a Polish or Italian laborer, supporting a family in the "old country," is killed, his family though they may have been utterly dependent on him, have no right of action for the injury causing his death. In a recent disaster in a steel mill at Butler, Pennsylvania, 14 foreigners were killed. All of them were married, but only two had wives in this country. Here, whatever the negligence may prove to have been, the company is relieved of all but one-seventh of its actual liability under this interpretation of the statute. This seems to put a premium upon killing outright.

The error of such exclusion of non-resident aliens from the statutory right of action for death, comes home to us most strongly from the standpoint of prevention. It is comparatively easy to forget the destitute widow and children, or the old mother, in some unheard-of region in Croatia. But when we consider that in over 25 per cent of the fatal accidents in the great steel industry,

the law of Pennsylvania furnishes absolutely no incentive to prevent future fatalities from the same cause, we can not treat the error lightly.

Finally, in all consideration of the employers' liability law, we must remember that the burden of proving negligence is always upon the plaintiff. This is a fundamental principle. The occurrence of an accident does not raise a legal presumption of negligence on the part of the employer. The injured employe must give evidence which tends to show negligence in order to get his case before the jury. If he fails in this he is nonsuited. We hear on every side that if one can get a case of this kind before the jury, say a case of an injured man, or a widow and children, against a corporation, the jury is always on the side of the injured. This is probably true, but it is more than offset by the power residing in the judge to keep the case from going to the jury by a nonsuit or to set aside the verdict.

If, thus far, the rights of the parties at law in cases involving the question of an employer's liability to his employe for negligence have been fairly set forth, all will agree that at some points the law unduly favors the employer, although there will be much difference of opinion as to what features are unfair.

But, quite apart from the law, there are inequalities in the actual situation of the parties. First comes the matter of delay. The courts are so behindhand that in congested districts it is usually two or three years after an action is commenced before it is tried, and if an appeal is taken it is sometimes five years before the case is settled. Two or three years means nothing in the life of a great corporation. Indeed, its case is likely to gain rather than lose by the delay, since the burden of proof rests on the plaintiff, and the circumstances of the accident become less distinct in the minds of the witnesses with the lapse of time. But what does this delay mean in the life of a working man whose earning power is diminished or perhaps entirely lost through the very accident in question, or in the lives of the widow and children left helpless by the sudden death of their provider? The immediate need here is so great, the delay of trial so long, that it is not astonishing that most cases are settled out of court.

Another respect in which the parties in these cases are on

an unequal footing, is the matter of obtaining witnesses. The burden of proof, as we have seen, rests upon the plaintiff. He can do nothing without witnesses, and his only witnesses in the majority of cases are his foreman and his fellow workmen, employes of the same company. It stands to reason that they will not as a rule testify freely against their employer. It would take a large-minded employer to retain in his service a man who had deliberately and knowingly spoken against his interests. And even though it is true that in some large concerns an employe who thus testified would not actually be discharged, nevertheless the fear of dismissal would be likely to keep his mouth shut.

Here let us sum up the whole situation. On the one side are the so-called absolute duties of the master: to furnish a reasonably safe place to work, reasonably competent employes, and instructions when they are reasonably necessary, the test in all cases being ordinary usage. On the other side, in the first place, the burden of proof in showing that in a given instance the master failed to fulfill one of these duties (the only way in which his negligence can be shown), rests upon the plaintiff, or servant. In the second place, the following defenses are available to the master in such an action: (1) "Assumption of risk,"—that the injury which the plaintiff suffered belonged in the class of risks which he assumed; namely, that it was caused by an ordinary danger of such work, or by a danger which the plaintiff knew about, or should have known about, and that he continued working in spite of it. (2) "Negligence of a fellow servant,"—that the negligence resulting in the servant's injury was not a failure on the employer's part, but on the part of a fellow servant of the plaintiff, and therefore that he, the employer, was not liable since this too was a risk assumed by the servant. (3) "Contributory negligence,"—that the injury was caused in part by the plaintiff's own negligence. Finally, in the actual working out of the course of justice, we find: (1) that the rule in regard to setting aside a written contract, as applied to the releases in master and servant cases (while theoretically logical and consistent), considering the actual relative situation of the two parties clearly protects the strong against the weak; (2) that there is an unavoidable delay in bring-

ing the case to trial, and that this delay means poverty and anxiety to the employe, but a mere postponement of annoyance to the employer; and (3) that it is usually to the economic interest of the witnesses necessary to prove the plaintiff's case to stand by the defendant, their employer.

Almost every element of unfairness in this law arises, I think, from one misconception; namely, that the two parties are on an equal footing. In the eyes of the law every working man, from the trained American locomotive engineer with a strong union behind him, to the newly-landed "Hunkie," tongue-tied and bewildered, is on an equal footing with the United States Steel Corporation in all its masterfully concentrated power. In the contract of hire, the law assumes that the workman is as free to accept or refuse a job as the employer is to take or drop him. In the matter of the release, the law assumes that the stricken and terrified widow of an ignorant laboring man is in a position of equal understanding and enlightenment in regard to the respective interests of the parties, with the hardened claim agent employed by the corporation. The law is behindhand, and the law makers have been blind. With their minds thoroughly steeped in old ideas of theoretical equality and freedom of contract, they have gone on, content with the "logic of the law," oblivious to actual facts.

"But," says one of them, almost stirred out of this mental satisfaction, "what can be done about it? We must have a rule. There cannot be one law for large employers and another for small employers. You cannot have one law for the skilled mechanic in demand and another for the day laborer looking for a job." It is true, there must be one rule. And all that can be hoped for is a rule that is fair in the average case. For all these years we have read into the unwritten contract of hire by the courts' decisions, a broad and unlimited assumption of risk on the workman's part. Thus, where justice and public policy demand it we might with reason read into the contract of hire, by statute, an equally broad but wisely limited assumption of risk on the employer's part. Surely if we depart from certain ancient legal precedents, if we keep our abstract theories of right merely as a framework for our thinking, if we frankly consider the economic forces that

govern the employment of labor, and take into account the high degree of organization, the extreme division of labor, the speed and intensity, which characterize modern industry, then it should be possible to work out a law of employers' liability which will approximate justice in the existing industrial world far more closely than does the law just examined.

CHAPTER XIII

BY-PRODUCTS OF "EMPLOYERS' LIABILITY"

IF its operation in Allegheny County is typical, the employers' liability law of Pennsylvania is of little positive value. It does not to any large extent encourage the prevention of work-accidents, nor does it greatly aid those who suffer economic loss from them. Yet it determines the system by which restitution is or is not made to the victims of such accidents, and this system, considering its small accomplishment, is amazingly complicated and expensive. So complicated and expensive is it, that one might condemn the law, almost without considering its purpose or results, for the method in which it operates.

The root of this evil is the uncertainty in its operation. From an examination of the law one would conclude that it would allow recovery in but few accidents, and our study of actual cases bears out this conclusion. But the application of the law to a given case is not a matter of certainty and the amount of a possible recovery is undetermined. Consequently every serious accident means to the injured party the hope of recovering a "big verdict," and to the employer the fear of such a recovery. Out of these expectations arise long and costly law suits. Let us consider how such proceedings serve the plaintiff.

In the first place, there is a protracted delay between the injury and a recovery at law. If a suit is brought in a United States court, it may be determined within a year. If it is brought in Common Pleas, it must wait often more than two years on account of the crowded court calendars, and if a verdict is rendered for the plaintiff the case will almost invariably be appealed by the defendant employer, because he always has hopes of getting a different application of the law. In those rare cases in which

damages are recovered, therefore, the suit may last from three to five years.

Such delay is of course a serious disadvantage to the plaintiff in many kinds of litigation, but in employers' liability cases it is particularly disastrous, because the earnings of the "plaintiff" family, seldom large enough to provide a considerable reserve, have either been cut off or seriously reduced. An immediate living income is what the widow and children of a workman need,—not $3,000 at the end of a five-year fight.

In the second place, the economic helplessness of the plaintiff in cases of this kind, makes it absolutely necessary to bring the suit on a contingent fee basis. While the exacting of a contingent fee is not necessarily grasping and unscrupulous, as some people think, nevertheless the practice has its abuses. If a man without property or money comes to a lawyer and asks him to sue another party for negligence, the only possible contract the lawyer can make with him is: "If I lose, it's my loss; if I win, you pay me a certain percentage of the recovery;" and it is obvious that that percentage must be large enough to allow the attorney to make up his losses on unsuccessful suits out of his gains in successful suits. Plenty of honest lawyers make such contracts, reserving perhaps a third or a fourth of the recovery as their contingent fee. But another class of lawyers—graphically called "ambulance chasers"*—seek out the injured and persuade them to bring suit without considering the opportunities they may have of a peaceful settlement, and at the same time exact an excessive contingent fee, 40 per cent to 50 per cent, or even more. Lawyers of this type are of course encouraged by the uncertain application of the liability law, and their activities are often a distinct disadvantage to the injured party.

A form of insurance is offered by the Employes' Legal Security Corporation, recently established in Pittsburgh, through which a workman can keep out of the hands of unscrupulous

* As a matter of fact we found the typical ambulance chaser engaged to only a small extent in employers' liability litigations in Allegheny County. Decisions for the plaintiff in these master and servant cases have been so rare in Pennsylvania, that there is little encouragement for him. Street railway accidents involving passengers and way-farers have furnished a more profitable field for his activities.

contingent fee lawyers. For one dollar a year this company will furnish a workman legal advice at all times, and if he is injured, will send a representative "to the scene of the accident to interview the witnesses, secure signed statements and affidavits, take photographs, and procure such other evidence as is necessary to protect his legal rights." If the injured man wants to sue for damages, the security corporation will take the case on a contingent fee of 25 per cent. If a union joins as a body, the corporation will furnish attorneys without cost "to defend the union, its officers and members, in suits, civil or criminal, growing out of strikes, lockouts or injunction proceedings." This corporation is a private venture for profit. Certain trade unions have established a legal department of their own which performs the same service. If all workingmen could protect themselves in some such corporate way against their own ignorance and against the expert methods of claim agents and ambulance chasers, much would be gained. But suing for negligence would still be a costly method of securing compensation for injury.

Turning to the defendant's side of the situation, we find that the operation of this law, which means such small gain to the injured workman, means, nevertheless, a considerable expense to employers. Although recoveries are actually secured in but a small proportion of the accidents that occur, the employer, because of the uncertain and unequal application of the law, must be prepared to fight a suit over every accident. The always threatening possibility of having to pay heavy damages as the result of an accident, puts him to the expense of maintaining a special claim department and hiring expert attorneys, although he rarely pays a verdict.

To a small employer confronted with this expensive uncertainty, employers' liability insurance* is of great advantage.

* Most employers' liability insurance companies issue also what is called a "workmen's collective policy" by which they agree "to indemnify the assured against bodily injuries sustained by any person while employed by the assured." This form of insurance was not common enough in the Pittsburgh industries at the time of our investigation to warrant discussion in the text. Such a policy really insures the workman against accident in a limited amount (half wages during disability, usually up to 26 weeks, with 52 weeks' wages for death or loss of both hands, both feet or both eyes), but the premiums are not paid by the employer; they are deducted from the monthly wages of his employes. Moreover, an em-

The operation of the law does not mean a regular and certain expense to an employer; it is an incalculable risk. The cost of each accident hangs upon a number of "chances"—the circumstances of the accident, the intelligence of the plaintiff, the cleverness of his attorney, the leanings of the judge, the mood of the jury. It is an opportunity to secure himself against all these chances that the liability company offers to an employer. He takes out a liability policy with premiums based upon his payroll and the risks of his work. In return the insurance company completely takes over his legal liability* in connection with accidents to his employes. When an accident happens, the employer sends in a full report of it to the insurance company, and then he is done with it. If there is any question of liability the claim agent of the insurance company looks into the case and settles it if possible. If a suit is brought which cannot be settled satisfactorily, the insurance company defends in place of the employer. Thus the employer not only provides against the risk of occasional recoveries, and avoids the constant expense of maintaining a claim department, but secures a further ecomonic advantage—he has an excuse† for denying all appeals for compensation on grounds merely of sympathy. He may say to a faithful employe who has been injured, or to the widow of one of his old workmen killed in an accident, "I have nothing to do with this. I refer you to the insurance company."

William Day, an iron worker employed by one of the large construction companies, which carries liability insurance to cover accidents to its road men, stumbled over a pile of iron, broke his leg, and was disabled ten weeks. His wife had given birth to a third child two days before the accident. The other children were two and four years old. There was no insurance, they had

ployer usually secures a release of liability from employes covered by the policy and thus secures his liability policy from the same insurance company at very low rates. The collective insurance policy may have been devised by the insurance companies as an encouragement to the employers' generosity, but it has not worked out that way.

* There is a limit to the amount of risk assumed by the insurance company—usually $5,000 in any one injury, and $10,000 in any one accident.

† Sometimes liability companies require that an employer shall not interfere or make any settlement at his own expense because such action might be interpreted as an acknowledgment of liability.

heavy doctor's bills to pay, and were in great need. Day finally wrote to his employers saying that he had heard that they carried insurance for their men,* and if so, would they please send it to him right away. "It is now that I need help," he wrote. "My family would be hungry today except for our friends." In reply to this letter he was referred to the liability company with which his employer was insured. This company, of course, paid no attention to his appeal as there was no legal liability in the case.

Manifestly the injured workman loses, rather than gains, when his employer takes out a liability insurance policy. He loses, to begin with, his chance of appealing for compensation on other than legal grounds. For by the terms of its policy the insurance company contracts only to assume the employer's legal liability, not to underwrite his moral responsibilities, or carry out the promptings of his sympathy. In the second place, if the workman has a claim and commences a suit, he must fight the insurance company, a powerful organization equipped with system, money, skill, and experience—in all likelihood a bigger legal person, a more formidable antagonist, than his employer.

Employers' liability insurance is moreover necessarily expensive, because under the present law the risk insured against is practically incalculable. On account of the high rates and because liability insurance hurts their relations with their employes, many of the large companies in the Pittsburgh District, which carried these policies, have given them up. They find it better in the long run to maintain their own claim departments, and hire their own attorneys.

Liability insurance, then, while it solves a difficult problem for the small employer, probably does not lessen the cost of accidents to employers as a whole, and undoubtedly reduces the injured workman's chances of compensation.

We have seen that the employers' liability law, which only occasionally and after long delay secures restitution to the victims of accidents, means, nevertheless, a considerable expense to employers,—to which we must add that it burdens the state with the cost of much fruitless litigation. This wastefulness in

* This is a common mistake; employes often think that an employer is insuring them against injury by taking out liability insurance.

operation makes a strong indictment against that law. There are, however, more serious charges against it.

First, it destroys good will between employes and employers. Often a workman who had struggled through weeks of disability without help, told me that he had not gone to the company about it because he thought it was their business to send some one to him. Later, in interviewing the claim agent of that company, I would very likely learn that they never went to see their injured men, because they did not believe in "hunting trouble," or because the workmen were suspicious and would think that they had come to force an unfair settlement. Often, too, an employer told me that he had meant to make a generous settlement in a certain case, but was irritated by the intervention of a lawyer for the plaintiff, and had determined to fight the case to the bitter end.

More important even than this loss of confidence between employer and workman, is the direct inducement for the attorneys of both sides to wrongful practices. Many cases are conducted honestly. But the contingent fee lawyer who hastily visits an injured man in order to urge him on to litigation, is well matched by the claim agent who hastily visits him in order to urge him to a settlement.* The plaintiff's attorney who "manufactures" a witness to fit his case, is no worse than the defendant's attorney who bribes a witness to disappear. The employers' liability law is an encouragement to dishonesty, and both sides play the game.

Most large employers are well aware of these evils in the liability situation. Some, as has been explained, seek to escape the uncertain cost and the annoyance involved in settling their own accident cases, by shifting the whole responsibility to an insurance company. Others attempt to get rid of all the evils of the situation, both for themselves and their employes, by contract. They establish relief associations similar to those described in Chapter XI but make membership in them practically a condition of employment, and secure from each employe a signed agreement that if he accepts benefits from the association in case

* An ignorant man is helpless in the hands of either. He becomes the victim of the one that gets there first. It is indeed an ungrateful nation that continues to turn over the men who are injured in the interests of industrial progress, to the tender mercies of the "ambulance chaser" and the typical claim agent.

of injury, he will relieve the employer of all legal liability in connection with the accident, and that he will sign a full release of his claims.* Relief associations of this type are a direct outcome of the liability law, and therefore merit a careful discussion here. The advantage of such contracts both to employers and employes should be considered with a view to determining whether they furnish a satisfactory escape from the evils of the system we have just described.

In this undertaking we can do no better than describe the Pennsylvania Railroad Voluntary Relief Department.† Its remarkably successful operation for 23 years makes it worthy of our special study. This relief association is in fact as well as in name a "department" of the company. It is in the executive charge of a superintendent whose directions are subject to the control of the general manager of the company. The general manager and ten contributing members of the relief fund, make up the advisory committee, the superintendent acting as secretary. Of the ten members, five are actually elected representatives of the men, and five are appointed by the board of directors of the company. Thus, to begin with the company has a majority of one in the committee. It stands to reason that "if any member of the committee shall cease to be employed by the company, or shall for any reason cease to be a member of the Relief Fund he shall cease to be a member of the committee," and there is also a provision in the constitution, that "to fill vacancies occurring on the advisory committee," the members to represent the contributing employes shall be designated by the general manager. Finally, the control of the company is made absolute by a provision that amendments proposed by the advisory committee do not become operative unless adopted by a majority of the whole committee and approved by the board of directors of the company. Thus it is clear that the Pennsylvania Railroad Relief Department is not a democratic organization‡ controlled by its members.

* This contract applies to the beneficiaries in case the member is killed.

† For detailed study of this Relief Association and others, see 23d Annual Report of the U. S. Commissioner of labor.

‡ It is difficult to see how any organization representing one employer and his employes, and limited to them, could be in a real sense democratic, because one "interest" would always be in a position to arbitrarily end the term of office of the representatives of the other "interest."

Employes who join this association are classified according to their earnings. The dues and corresponding benefits in each class are given in the accompanying table:

TABLE 35.—DUES, BENEFITS,* ETC., IN PENNSYLVANIA RAILROAD RELIEF DEPARTMENT, 1909

	Class I	*Class II*	*Class III*	*Class IV*	*Class V*
Monthly pay	Any rate	$35 or more	$55 or more	$75 or more	$95 or more
Monthly dues	$.75	$1.50	$2.25	$3.00	$3.75
Weekly sick benefit	$2.80 for 52 weeks $1.40 after	$5.60 for 52 weeks $2.80 after	$8.40 for 52 weeks $4.20 after	$11.20 for 52 weeks $5.60 after	$14 for 52 weeks $7.00 after
Weekly accident benefit	$3.50 for 52 weeks $1.75 after	$7.00 for 52 weeks $3.50 after	$10.50 for 52 weeks $5.25 after	$14.00 for 52 weeks $7.00 after	$17.50 for 52 weeks $8.75 after
Death benefit	$250	$500	$750	$1,000	$1,250

The accident benefits paid by the association are roughly: for injury, two-thirds of regular wages during disablement up to one year, after that one-third of regular wages; for death, one year's wages.

The company makes no regular contribution to the fund, but guarantees the payment of benefits and pays all the operating expenses. From February 15, 1886, to February 15, 1909, contributions from members to this fund amounted to $17,685,137.58. During the same period the company contributed altogether, $3,311,538.40 (operating expenses $2,686,908.27, deficiencies $624,630.13).† Thus, considering the fund as a mutual insurance association, a little more than five-sixths is contributed by the dues of its members, the employes, and a little less than one-sixth by an outside party, the employer who controls it.

* In 1904, a superannuation fund was created from the surplus of contributions over benefits, from which a small allowance is paid to members retired on account of age, who are not already receiving disability benefits. The company guaranteed their allowance up to January, 1907.

† These figures were furnished by the Pennsylvania Railroad Company. In addition to this contribution to the relief department, it is the custom of the company to furnish to all injured employes surgical and hospital service, and artificial limbs, free.

TABLE 36.—BENEFITS PAID BY PENNSYLVANIA RAILROAD RELIEF DEPARTMENT, FEBRUARY 15, 1886, TO FEBRUARY 15, 1909

For sickness death benefits . . .	$5,101,133.26	
For sickness disablement benefits . .	6,767,349.31	
		$11,868,482.57
For accident death benefits . . .	$2,016,829.65	
For accident disablement benefits . .	3,548,747.19	
		5,565,576.84
Aggregate		$17,434,059.41

It is important to notice, however, that from this fund benefits are paid for sickness and natural death, as well as for injury and accidental death. It is with the scheme solely as an *accident* insurance fund that we are concerned here. If we subtract from the sum total of members' contributions ($17,685,137.58), the $11,868,482.57 paid out in benefits for disability and death from natural causes toward which the employer may not be expected to contribute, we have left $5,816,655.01, which we must properly consider the contribution of the employes toward insurance against accident. In considering this relief department as an arrangement by which the employer agrees to contribute to his employes' insurance against accident, we shall set off his entire contribution, $3,311,538.40, against this $5,816,655.01 of the members' contributions which is expended for accident benefits exclusively. Roughly, therefore, the employer contributes one-third and the employes two-thirds. To be accurate, the employer contributes toward the accident insurance provided by the relief association 36.3 per cent.

Another way of estimating the importance of the company's contribution to this department is to compare the opportunities of insurance offered in this association with those offered in unions, benefit societies, and insurance companies. For $36 a year, a Pennsylvania Railroad employe not over forty-five years of age of Class IV who passes the physical examination, can secure in the relief association, as we have seen, reasonable benefits for ordinary disability of any kind and $1,000 for his family in case he dies. Compare this for instance with the following opportunities:

In the Prudential Life Insurance Company, a man in a strictly hazardous trade, if he is accepted, can, at the age of

thirty, by paying $31.63 a year, secure to his family $1,000 in case of death, but no provision for disability. In the "Protected Home Circle,"* a freight brakeman, by paying $45.36 a year, can secure a death benefit of $3,000, but no disability benefits. Through what is known as industrial insurance, in the Prudential Company, by paying $ .35 a week or $18.20 a year, a man of thirty can secure $500 for his family at his death. In the Brotherhood of Railroad Trainmen, $33 a year will secure a death benefit of $1350, a disability benefit of $5.00 for eight weeks, and $3.00 for the next succeeding eight weeks, and a total disability benefit of $1350.

Of these, the opportunities offered by the Brotherhood of Railroad Trainmen are by far the most favorable, yet they are decidedly less favorable than those offered by the relief department of the Pennsylvania Railroad Company. With rates $3.00 a year less, the brotherhood offers a death benefit $350 higher, but its disability benefits are very much less; namely, $5.00 for eight weeks and $3.00 for the next eight weeks, with a positive limit of $1350, as against $14 for 52 weeks and $7.00 thereafter without limit, in the relief department. It is apparent, then, that the Pennsylvania Railroad Company, by establishing this relief department, making up its occasional deficiencies, and meeting its running expenses, enables its employes, by paying only $3.00 a year more, to insure themselves against death almost as well, and against disability nearly three times as well, as they are able to insure themselves in an organization financed entirely by themselves.

In return for this financial contribution toward the insurance of its employes, the Pennsylvania Railroad Company practically gains immunity from legal claims for negligence, with all the attendant expense and friction. In every application for membership in the relief association occurs the following sentence: "And I agree that the acceptance of benefits from the said relief fund for injury or death shall operate as a release of all claims for damages against said company, arising from such injury or death, which could be made by or through me, and that I or my legal

* If a benefit association is not conducted on a strictly actuarial basis there is of course the disadvantage of insecurity.

representatives will execute such further instrument as may be necessary formally to evidence such acquittance." In this agreement we find the true meaning of this relief association. It is an attempt upon the part of employers to get rid, by contract, of the delay, expense, friction, and uncertainty of the employers' liability situation, both for themselves and their employes. And it is a successful attempt. Membership in these associations is in practice made a condition of employment for new men, and hence in time all employes will have signed the above contract. Nearly all of them when injured will choose the certainty of benefits for which they have paid dues, rather than the uncertainty of a law suit with the loss of those benefits. Consequently, a relief association founded upon the contract of release ultimately does away with litigation over accidents.

Why then do not these relief associations, voluntarily established by employers, promise the real solution of the whole problem?

The legal aspects of the contract of release have already been considered. It does, *in effect,* allow the employe to bargain away a right that has not arisen, and the employer to purchase immunity from the civil consequences of a future wrongful act.* These are theoretical criticisms. A more practical objection is that by such a contract with his employes an employer almost altogether frees himself from the deterrent effect of the liability law, which though comparatively ineffective to prevent accidents, is nevertheless better than no law. The eighteen-year-old railroader who was killed on the "hump" during his first night in the yards, as result both of his inexperience and of a defective brake on the cut of cars behind him,† was a member of the Pennsyl-

* It may be worth while to reiterate that the employe does not in so many words surrender his right to sue when he joins the Relief Association. He simply agrees that the acceptance of benefits shall operate as a release of all claims for damages. As it is commonly explained by advocates of the system, he is "perfectly free to sue." But, if he sues he loses the benefits for which he has paid dues. If he takes the benefits he loses his right to sue. The practical effect of the contract is therefore to relieve the employer of liability for negligence, for very few men, when forced to choose between the two rights—the right to benefits to which they are entitled and the right to sue for damages—will choose the latter. See page 184.

† See Chapter II.

vania Railroad relief association. His mother needed money, and she took the $1,000 due her from this association, signing the release according to the agreement. Her son's death therefore cost the railroad company $363.* If that boy had been insured with the Brotherhood of Railroad Trainmen, instead of in the relief association, his mother would have received $1350 in benefits. She would still have been free to sue the company for negligence. No scheme by which employers escape the penalty of the existing law without suffering an equally deterrent penalty, will bring an effective solution of the accident problem.

A second practical objection to relief associations is that in them the workman's own insurance of himself is bound up with his contract of employment. The employer's insurance of his workmen against accident depends upon their continuing in his employ. But the workman's insurance of himself need not and should not depend upon his engagement with one employer. If a man leaves the employ of the Pennsylvania Railroad Company for any reason, no matter how many years he may have paid dues to the relief association, his right to benefits ceases; he is no longer a member of the fund; and he gets no return for his contributions. It may be said that this is no real hardship, because the workman has had the return for his money, the protection of the insurance during the years of his employment. But from the point of view of life insurance, the workman may well question the advantages of a policy for which he may pay premiums from his youth up, only to forfeit it by quitting or losing his job in the fifties, when to secure another policy he must pay very much higher rates.

Another real danger lies in thus making the workman's own provision against accident a part of his engagement with a particular employer, a danger to the workman's freedom. If a man in a certain employment has for many years contributed from $ .75 to $3.75 a month toward a fund for his insurance, he will think twice before he gives up all right to a return on those payments by voluntarily leaving that employment. The certainty of losing the benefit from his insurance dues if he leaves a certain employment gives the workman a strong, practical motive against strikes. The relief association, therefore, tends to injure the col-

* Employer's contribution to fund is 36.3 per cent.

lective strength of labor, which is its only practical security in bargaining with the large corporate employers of today.

While obviously it is sound business policy for a railroad or any other corporation, by schemes of this kind, to make it to the interest of its workmen to stay with the company, and thus secure a steady force of employes, it is by no means clear that it is sound social policy to allow such schemes to operate without regulation.

It is clear then that membership in a relief department, such as that maintained by the Pennsylvania Railroad Company, is not an unqualified advantage to the employes who join it. It encourages them to make provision against disability, and it secures to them a small but certain contribution from their employer in case of accident,—about one-fourth of the monthly wages for injury, and something under one-half of one year's wages for death. But on the other hand, by joining such a relief association employes do in effect free the employer from liability for negligence, thus relieving him of whatever incentive to prevention is furnished by the present liability law and at the same time destroying their own remote chance of real indemnity for injury. They furthermore seriously endanger their own collective strength. A railroader might much better insure himself a little less advantageously in his own union, hold on to his freedom, and retain his right to sue.

Some one may still urge, "Granted that the disadvantages of the release contract often outweigh its advantages from the workman's point of view, still the men are free to make it or not. They need not join the relief association unless they want to—there's no compulsion about it. We find printed upon the cover of the constitution, 'Pennsylvania Railroad Voluntary Relief Association.'" Titles are often misleading. It is significant that those relief associations which employes are free to join or not as they like, do not as a rule make the word "voluntary" a part of their title, while those in which membership is practically a condition of employment, declare the association "voluntary" in large type wherever its title is printed.

It is not seriously claimed that these relief associations are

really voluntary. In regulation No. 17 of the Pennsylvania Railroad Relief we read, "No employe will be required to become a member of the relief fund." This, of course, is literally true. They do not discharge men for not joining the "Relief," but this does not commit them to employing new men who refuse to join it. If a man applies for work and is accepted he is expected to join the Relief. If he refuses he finds that for some reason or other he is not needed. The only exception is, of course, in those comparatively rare cases in which the company needs the workman more than he needs the work. Whenever the company has the advantage in the employment bargain, which it will be easily granted is usually the case, joining the Relief is compulsory; that is, it is a condition of employment. This is expressed in various ways. The secretary of one relief association, when asked if it was voluntary, said, "Well, it is and it isn't, but no man works in the shops of this company who does not belong to the Relief." Another said, "It is voluntary because it claims to be, and compulsory because every man must join in order to obtain work."*

In this compulsory feature of the relief association lies another danger to organized labor. A man who is compelled to join a relief association must often drop the insurance which he carried in his union, because he can not pay dues to both. Mutual insurance is a most important element in the strength of the railroad brotherhoods, and the usefulness of the Relief in drawing men away from union insurance and thus weakening unionism among their employes, was not overlooked by the great railroad companies which established these funds.

* A former Pennsylvania Railroad official writes of the Relief Department as follows:

"I never knew the Pennsylvania Railroad to discharge a person in their employ for refusing to join the Relief. I have known pressure, amounting almost to coercion, to be brought to bear and when it failed to get the employe in, I have known the employing officer to connive at the employe's resignation for some other reason.

"As to new employes, however, the man is asked to join and if he is disinclined they try and make him see the advantages of the scheme. If he declines to join he is told he must be examined physically anyway before he can be given employment, and when he comes back to see if he passed, if he still refuses to join, he is told his 'eye-sight is not good enough' or something like that, and doesn't get the job, unless they need men temporarily and can't get enough who will join."

Let it be understood that the harmful features of the Pennsylvania Railroad Relief Fund, which have been set forth here, are not peculiar to that organization. They are all but essential to any similar organization established under the present liability law. If an employer is to maintain an extensive organization for the insurance of his employes, at considerable expense, he must make membership practically compulsory, and he must exact the contract of release, because he cannot afford to maintain both the relief department and the fighting equipment necessary to meet his liability for negligence. Moreover, the practical and legal difficulties of extending the privileges of the fund to those who have left the service are obvious.

So far we have considered the relief association as an escape from the incidental evils of the employers' liability situation. It is hardly necessary to point out that such an association does not materially affect the distribution of the accident loss. The Pennsylvania Railroad Company by its contribution to the Relief does not lift from the shoulders of its workmen any large share of that burden.

Let us see what proportion its contribution bears to the actual income loss suffered by the injured man. For example, a Pennsylvania Railroad brakeman is making $85 a month. He belongs to the third class of the Relief, paying $3.00 a month in dues. One night he is walking the top of a fast freight, slips and falls, breaking his leg. The company pays all his hospital and medical expenses, and as a member of the Relief in the third class he receives $14 a week while disabled. It has been shown that the company contributes 36.3 per cent of the fund. We may consider that 36.3 per cent of the $14 benefit, or $5.08, is paid by the employer. In other words, the brakeman's income loss is $20 a week and the company makes up to him a little more than one-fourth of it. Now suppose that, instead of breaking his leg, he falls between the ends of the cars and is run over. His widow and children receive $1,000 from the Relief, about what he would have earned in the 12 months succeeding. It is not possible to state what their loss is, but we can estimate it. If the brakeman was killed at the age of thirty, his normal expectation of life was 35 years. But assuming that he would have worked at his trade

but 25 years more, at $85 a month, he would have earned $25,500. Estimating what he would spend on himself during 35 years at $10,500 (or $300 a year), and subtracting this, we have a figure which pretty fairly represents the economic loss to his family by his death at the age of thirty—$15,000. The relief association makes up $1,000 of this. To this $1,000 the employer's contribution is 36.3 per cent, or $363. Thus, upon the death of one of their brakemen by an accident of his work, the Pennsylvania Railroad Company loses $363, while the widow and children of the man killed lose a potential $15,000.*

The proportion which the company's contribution bears to the total income loss suffered by the families of its employes injured and killed by accident can be suggested in another way. The amount contributed by the Pennsylvania Railroad Company to the Relief Association has averaged $143,979 per year. In Allegheny County alone in one year 65 of their employes were killed by accident in the course of employment, 28 of them married, 15 of them single men with dependents. The average wage of these 43 was $16.31 per week, or $848.12 per year. Three years' wages of these 43 men would amount to $109,407.48. Thus the first three years' income loss resulting from a year's *fatal* accidents to their employes in one county of one state, amounted to more than two-thirds of the company's yearly contribution to a relief association covering employes injured and killed over its entire road.

These associations no doubt represent the efforts of employers who in the absence of wise laws are seeking the elements of a rational scheme, and a contract of this kind by the terms of which the employer would assume a fair share of the accident loss is, of course, conceivable. But under present laws the adoption of such a plan would put the average employer at a serious disadvantage with competitors. So long as the institution of such associations is optional with employers and the terms left to their discretion, they promise no satisfactory adjustment of the accident burden.

* I have purposely used instances of unavoidable accidents here—injuries due to the "ordinary risks of the trade." The proportion of loss borne by the railroad, through its contribution to the relief association, would of course be the same, no matter how the accident occurred.

My conclusion with regard to the value of such relief associations as that of the Pennsylvania Railroad is, therefore, that while they encourage the workman to providence and do away with many evils incident to the operation of the liability law, these advantages are largely offset by the fact that, in order to secure them, the workman is practically forced to give up a future right, the employer is allowed to escape from whatever incentive to prevention is furnished by the present law, and the strength of organized labor is impaired. Furthermore, a contract with his employes by which the employer contributes less than one-fourth of a man's wages when he is disabled by accident, and pays out $363 when a thousand dollar man is killed, does not fairly and wisely adjust the burden of accident loss; obviously, therefore, a relief association founded upon such a contract does not go to the root of the problem we have set forth.

To conclude this inventory of "by-products," we may state that the present employers' liability law is not only in many of its principles unjust, but also in its method of operation harmful to the interests of all concerned. To summarize:

1. It is wasteful:
   (a) The statee xpends a large amount in fruitless litigation.
   (b) Employers expend a large amount, as the result of work-accidents, only a small part of which is actually paid in settlement of accident claims.
   (c) The injured employes spend nearly half of what they get in settlements and damages to pay the costs of fighting for it.*
2. It is slow; recovery is long delayed, while the need is immediate.
3. It fosters misunderstanding and bitterness between employer and employes.
4. It encourages both parties to dishonest methods.
5. The institutions which have been resorted to as an escape from its evils, liability insurance and relief associations based upon a contract of release, are often advantageous to employers, but disadvantageous in important respects to employes.

* For estimate of wastes involved, see Appendix IV.

CHAPTER XIV

LEGISLATION

ON the facts set forth, legislative interference is warranted, and the question becomes, How shall we legislate? To which question there are, speaking in the most general terms, two answers offered.

The first is, reconstruct the law, retaining the basis of negligence, but taking away such defenses as now unjustifiably protect the employer. This can be done without departing from any fundamental legal principle. We have seen that all the defenses except one arise from an assumption that certain risks are assumed by the workman in the contract of hire, upon which contract the master's liability and the servant's rights depend. Without in the least attacking this theory, we can greatly modify and limit these defenses by changing our view of what is implied in that contract. And indeed this is a course already begun in almost every state of the Union. Pennsylvania is among the last of thirty states to modify or limit by statute the operation of the fellow-servant rule. Most of these statutes apply only to railroads or mines, but the Pennsylvania act, as we have seen, is universal in its application so far as it goes, while Colorado has abolished the fellow-servant rule altogether, making an employer liable for the negligence of his employes, when the person injured is another employe, just as he would be if the person injured were a stranger.

Another group of statutes has made inroads upon the implied assumption of extraordinary risks by denying its application where an injury has resulted from the violation of a special safety appliance act. A recent statute in Ohio, applying to railroads, goes further, providing that an employe injured as the result of a defect "shall not be deemed to have assumed the risk occasioned by that defect, although continuing in the employment of such railroad company after knowledge of such defect."

Oregon, also, has a statute, applying to railroads only, which declares that knowledge of a defect shall not of itself be a bar to recovery.

The "contributory negligence" defense has been attacked in several states by the introduction of the principle of "comparative negligence," which allows the court, where the employer's negligence predominates, to apportion damages according to the relative degree of negligence upon each side.

Taking all the states into consideration, therefore, we find that some attempt has been made to increase the common law liability of the employer at every possible point.

The recent Federal Employers' Liability Act practically combines all the radical changes that have been made in the laws of the different states. In respect to injuries to employes while engaged in interstate commerce, an employer is by this act held liable, (1) when the injury was caused by the negligence of a fellow servant of the plaintiff, (2) when it was caused by a defect of which the plaintiff had knowledge, and (3) in comparative degree, even when the accident was slightly contributed to by the negligence of the plaintiff. In other words, this act takes from the employer at one stroke those defenses which have protected him for fifty years, but which can no longer in reason or justice be maintained. It abolishes the "fellow-servant" rule, making an employer liable for the negligence of all his agents, to employes as well as to strangers. It denies the extreme application of the "assumption of risk" rule, making it impossible for an employe to assume the risks of his employer's negligence. It modifies the operation of the "contributory negligence" rule, making it possible, in a case where the employer's negligence has been gross and the employe's slight in comparison, for the jury to adjust damages accordingly. If each state should enact a general employers' liability law modeled after the federal act, we should have reached the limit to which laws based on negligence can go in dealing with the industrial accident loss.

In the light of social economy, however, even such a complete development of the first plan is of very limited value; for it would leave the burden of accidents in which negligence plays no part on the individual workman, and by requiring a lawsuit to determine

liability, it would leave the penalty for each accident still an uncertainty. These limitations will be considered later.

The other way in which the rights of master and servant in regard to accidents of employment may be adjusted, is by the enactment of a law which, abandoning altogether the theory of "liability for negligence," should require an employer to compensate all his employes injured in the course of their work according to a limited uniform rate, without regard to the cause of the accident, except where it results from the intended wrongful act of the injured person. Such a law would both extend and limit the employer's liability—extend it to cover practically all injuries to his employes in the course of their work, and limit it to a certain fixed and moderate proportion of the economic loss resulting from each injury. This plan, which is the basis of all modern European legislation upon the subject, is a fundamental departure from the common law principle of negligence. It creates a personal liability where there has been no breach of contract or wrongful act or omission. Whereas court decisions in master and servant cases since 1850 have read into the contract of hire an assumption upon the part of the workman of the risk of all accidents except those due to the negligence of his employer, a law carrying out this plan would practically attach to the contract of hire a promise upon the part of the employer to insure his workman in a limited degree against loss arising from the accidents of his employment.*

This radical departure is variously defended: (1) upon the theory that "when a person on his own responsibility and for his own profit sets in motion agencies which create risks for others, he ought to be civilly responsible for the consequences," but that the law should determine the limit of his liability;† (2) upon the principle that each industry should "bear its own costs in human life as well as in wear and tear on machinery;" (3) upon the practical ground that the compensation required, becoming a regular cost of production, would be transferred by the employer

*The first legislation in the United States to recognize this principle is a Montana statute which goes into effect October, 1910. See Appendix V.

† From the English Departmental Report of 1897. Ernest Freund in his Police Power, says, "The principle that inevitable loss should be borne not by the person on whom it may happen to fall, but by the person who profits by the dangerous business to which it is incidental, emphasizes a very intelligent idea of justice."

to the consumers of his product in the form of a slightly increased selling price, and thus would result in taking a share of the economic loss of each accident in each industry from the worker's family upon whom it is a heavy burden, disastrous in its consequence, and distributing it among the whole body of consumers, upon whom it would be no burden at all.

Germany first, in 1884, then Austria, Finland, England, France, Holland, Sweden, Denmark, Belgium, and Hungary, in the order given, have enacted legislation embodying this idea. Perhaps we are fortunate in being among the last of civilized countries to abandon the old liability law with regard to industrial accidents. While it may be a shame to us to be so far behind, it is a distinct advantage to have the new laws in actual operation before us. Europe can be our laboratory.*

The foreign systems differ greatly in detail, but fall into two general groups—those in which the employer is merely required to compensate his injured workmen on a uniform plan, and those in which he is also required to insure against this indemnity. A considerable confusion of terms has arisen in writing and speaking of these two systems. In the former system, typified by the English law, a workman is assured indemnity from his employer for accidents. In the latter, typified by the German system, this indemnity is doubly assured, because the employer is compelled to insure himself against it. Thus, in a certain sense, both systems may be called "workmen's accident insurance." But to avoid confusion, it is better to call the English scheme "compensation," and the German scheme "insurance."

The German compulsory workingmen's insurance law is elaborate, covering sickness, accident, invalidity and old age. The provisions relating to accidents are briefly as follows:

> 1. Workmen (and foremen with yearly earnings of not more than $714) in manufacture, mining, agriculture, forestry, building, transportation, navigation, and some other occupations, are protected by this compulsory compensation and insurance scheme.

* A report on the European systems of insurance and compensation, made for the Russell Sage Foundation by Dr. Lee K. Frankel (in press), under the title "Workingmen's Insurance in Europe." Charities Publication Committee, New York.

2. *Compensation is due in all cases except where the injury was intentionally self-inflicted.*

3. Employers are required to compensate employes injured, and the dependents of those killed in their employment, as follows:

In non-fatal cases. Beginning with the 14th week* of disability, full medical assistance, and two-thirds† of regular earnings, or less according to extent of disability.

In fatal cases. Funeral benefit, equal to one-fifteenth of annual earnings, and income for dependents as follows:

For widow (until remarriage), 20 per cent of husband's regular earnings; for each child up to the fifteenth birthday 20 per cent; but income of family not to exceed 60 per cent of deceased's regular earnings.

4. Disputes are settled by boards of arbitration from which appeals may be taken to the Imperial Insurance Office.

5. Employers in each industry are required by law to form accident insurance associations to which all contribute (according to payroll and risk of trade) in order to insure the payment to every employe injured of the compensation fixed by law.

6. Right to sue under Employers' Liability Act is not retained for workmen covered by this act.

This scheme has certain striking features. (1) By requiring compensation for all injuries except those intentionally self-inflicted, it altogether eliminates disputes over questions of negligence. (2) By requiring employers to insure, it protects the injured workman, even in case of his employer's bankruptcy. (3) The employers' associations, formed for purposes of insurance as required by law, become agencies for preventing accidents and for securing the best medical help for injured workmen. This comes about inevitably because assessments depend directly upon

* Another general law requires all workmen with an annual income not over $480 engaged in manufacturing or trade, to be insured against sickness in local associations, the workmen to pay two-thirds of the premiums and the employer one-third. During the first thirteen weeks of disability from injury a man is entitled to benefits from this association. Thus the employer is not altogether free from the burden of accidents resulting in short temporary disability, while the benefits in case of serious disability, as well as fatal accidents, are a charge solely upon the employer.

† If the workman injured is so helpless as to require care, the compensation may be increased up to 100 per cent of his earnings. Such cases, however, are exceedingly rare.

the frequency of serious accidents among all the workmen in all the plants in an association, and it is to the interest of all the employers in each association, jointly, to keep down their assessments.*

In England, in 1893, the law and public opinion in regard to employers' liability presented practically the same situation that we have in our states today. England then had the common law of master and servant, modified by the Employers' Liability Act of 1880, which defined the provisions of the common law and limited somewhat the application of the fellow-servant rule. Dissatisfaction with the law was evident on all sides.† After various unsuccessful attempts to increase liability by attacking the "fellow-servant" and "assumption of risk" defenses, the principle already recognized in German and Austrian legislation, namely, "certain compensation, limited in amount, for all accidents of industry," gained the favor of public opinion. As a result, the Workmen's Compensation Act was passed in 1897.

This act was limited in its application to employes on railways, in factories, mines, quarries, in engineering work, and in construction work on buildings above thirty feet. In 1900, agricultural workers were added, and by the Act of 1906 practically all employes were added, even domestic servants.‡

The main provisions of the English law as it now stands are these:

1. Workmen in practically all occupations are protected by the terms of the act.

2. Compensation is due in all cases except when it is proved that injury was due to "the serious and wilful misconduct" of the workman injured; it is due even in such cases *when injury results in death or serious and permanent disablement.*

3. Employers are required to compensate those injured

*These excellent incidental benefits of compulsory insurance in Germany are simply and graphically set forth in an article by William Hard called "Pensioners of Peace," published in *Everybody's Magazine*, October, 1908.

† In America today we have the same rules of common law modified by similar statutes and we have the same dissatisfaction.

‡ By this act also, employers are required to compensate workmen disabled by six specific industrial diseases.

and the dependents of those killed in their employment, according to the following fixed rates:

Fatal cases. Three years' earnings to dependents if there be any. If not, funeral expenses, not to exceed ten pounds ($48.67).

Non-fatal cases. A weekly payment not to exceed 50 per cent of average weekly earnings, fixed according to degree of disability. This payment continues so long as disability lasts.*

4. Disputes arising under the act, if not settled by agreement, are settled by arbitration. The judge of the county court acts as arbiter, or a single arbiter appointed by him may act. An appeal on questions of law may be taken from his decision to the court of appeal, and from there to the House of Lords.

5. The employer may insure, or not, against the indemnity. In case of the bankruptcy of an employer, if he is insured against the liability in this act, the rights of the employer against the insurance company are transferred to the injured workman. An employer may organize a scheme of accident insurance which shall exempt him from the provisions of this act, provided he secures a certificate from the Registrar of Friendly Societies that the provisions of his scheme are not less favorable to the workman than the provisions of this act, and that a majority of the workmen are in favor of the scheme. No scheme can be certified which makes membership a condition of employment, and every scheme in order to be certified must have provisions enabling a workman to withdraw. Complaint can always be made to the registrar by workmen included in such a scheme.

6. An employe injured may claim compensation under this act or sue for damages under previous laws, as he chooses, but may not do both. If, however, he fails in a suit, he may have his compensation awarded under this act, with the costs of his unsuccessful suit subtracted.

The English law has been in operation twelve years. It is no longer an experiment. Accounts differ as to the practical value of some of its provisions and changes will no doubt be made in it from time to time as experience proves their necessity. But the fact that after a nine years' trial in a limited field the law was extended to cover all employments, shows that the compensation principle has become an accepted factor in British industry.

* Details and exceptions omitted.

The French compensation law, enacted for certain trades in 1898, and later extended to include almost all employments, differs in some important respects from both the German and the English laws. Its main provisions are as follows:

1. Workmen in practically all occupations fall within the act.

2. Compensation is due in all cases except where accident was caused intentionally by victim; if due to inexcusable fault of victim or employer, compensation may by a court order be respectively decreased or increased, but never increased to exceed actual earnings of victim.

3. Employers are required to compensate employes injured, and the dependents of those killed by accidents, according to these rates:

Fatal cases. (*a*) Funeral expenses not exceeding 100 francs ($19.30).

(*b*) Annual pensions to dependent heirs not exceeding 60 per cent of annual wages of deceased, distributed as follows: To widow or widower, 20 per cent* until death or remarriage, in which latter case a final sum equal to three annual payments.

To children under sixteen years of age, if one parent survives; 15 per cent if there is but one child, 25 per cent if there are two children, 35 per cent if there are three children, 40 per cent if there are four or more children. To each child under sixteen years of age, if neither parent survives, 20 per cent; total amount not to exceed 60 per cent.

To each ascendant and to each descendant under sixteen years of age dependent upon deceased, if no widow or children survive, 10 per cent, the aggregate not to exceed 30 per cent.

Non-fatal cases. (*a*) Expenses of medical or surgical treatment.

(*b*) If permanently disabled, a pension of 66⅔ per cent of annual wages for total disability and one-half loss of earning capacity for partial disability.

(*c*) If temporarily disabled, an allowance of 50 per cent of daily wages, beginning with fifth day and including Sundays and holidays, unless disability lasts more than ten days, when payments become due from the first day.

4. Disputes as to pensions, or as to sums over 300 francs ($57.90), may be carried into higher civil courts.

* If annual wages exceed 2,400 francs ($463.20), only one-fourth of the excess is considered in computing pensions.

Judgment of local justice of the peace is final in lesser cases.

5. Employers are not required to insure against the indemnity, but they may insure in approved private companies and mutual insurance associations; also, in case of pensions, the state offers them an opportunity to insure. Moreover, *the state guarantees against the loss of pension payments on account of insolvency of employers or insurance organizations*, and is reimbursed by a special tax on employers allowed by this act. Payments in case of death and permanent disability are considered "pensions." Thus temporary disability payments, medical and funeral expenses, are the only forms of compensation not absolutely guaranteed to the injured. For these an injured employe has a preferred claim on the property of the employer.

6. Employes injured in accidents covered by this law do not have recourse to the liability law.

This law has certain distinct advantages over the English Compensation Act.

(*a*) In practically all cases of serious and long extended need resulting from injury, compensation is guaranteed.

(*b*) Compensation for total disability and for death is somewhat higher.

(*c*) Compensation includes medical expenses in all cases.

(*d*) Compensation is more carefully adjusted to need, especially in cases of death. Thus only 20 per cent of wages is allowed to a widow without children, but as much as 60 per cent of wages to a widow with four or more children.

(*e*) By disallowing compensation only in cases of self-inflicted injury, and by abrogating the workman's right to sue his employer for negligence, the possibilities of dispute are reduced to a minimum, while the provision allowing the court to order compensation to be *decreased* or *increased* in cases where the accident was "due to inexcusable fault of victim or employer" respectively, preserves in the new law what was essentially just in the old law.

As to the operation of this law, we have no first-hand evidence to offer. We can, however, quote from a report of the minister of labor to the President of the French Republic, July 25, 1908: "From year to year, the application of industrial accident legislation has become more certain, being victorious over the hesitation, uncertainties, and the errors of interpretation

inevitable at first; it has entered definitely into the economic and juridic life of the country, and the new principles which it has introduced have triumphed with a completeness that deserves to attract attention."

In remedial legislation dealing with the work-accident problem, three chief ends are desired: the prevention of unnecessary accidents, a just and wise distribution of the economic loss, and the elimination of waste in the process of that distribution. In the light of these desired ends let us consider the relative advantages of the two plans described; namely, (1) increasing the employer's liability along the lines of negligence, and (2) requiring limited uniform compensation for all accidents regardless of the cause.

We have found that many preventable accidents occur, some due to the so-called "carelessness" of the workman, and some due to the so-called "carelessness" of the employer and his representatives. Whether the law which determines who shall suffer the cost of accidents has any effect upon either of these groups of preventable accidents, could be positively determined only by a comparative study of accidents under differing laws. It is sometimes argued that if the workman were made sure of compensation for every injury, he would become more careless.* This does not seem true. It is not reasonable to suppose that a railroader, who, when a coupler fails to work, is in the habit of taking his time, signaling the engineer, and waiting for the cars to come together instead of going between them would, under a different law, say to himself "Well, I can make this thing work quick and easy by going in between the cars. It's risky, but if I lose an arm I get something. If the cars come together and crush me, my wife will get three years' wages." If the fear of death or injury does not insure caution in the workman, we can not hope to instil it by holding over him the fear of poverty.

On the other hand, we have maintained that in developing carefulness on the part of employers, the size and sureness of the penalty they must pay for accidents is an important factor. The

* A large steel manufacturer of Birmingham, England, who was opposed to the Compensation Act on this ground, was eager to admit, after the act had been in operation, that accidents had not increased. He is now a thorough believer in the fairness of the compensation principle if applied to all employers in a trade.

employer's "carelessness" is usually of a kind which he could have avoided by deliberate thought. It is involved in the construction of his plant, the selection of materials, the engaging of foremen, the organization of work, and making of repairs. The act or omission which constitutes his carelessness, is remote in time from the risk to life and limb. Nor is it a risk to his own life and limb, but to the lives and limbs of persons with whom he has no personal relation and whom he has perhaps never seen. At the time when he is careless he is in a position to consider the cost.

Which is the more important as an incentive to care in industrial administration, the size or the sureness of the penalty? That is our question. An extension of employers' liability on the basis of negligence would result in comparatively large recoveries against employers in many cases that now cost them nothing, but recoveries depending on a suit at law and therefore full of uncertainties; whereas, the uniform compensation plan would result in limited recoveries, somewhat smaller in amount but absolutely certain.

Suppose, for instance, one of the steel companies in the Pittsburgh District employs several thousand men whose average earnings are $800 a year. Which will be the better inducement to thoughtful, inventive, unceasing vigilance for safety, a law which makes every fatality inevitably and immediately cost the company $2,400 (three years' wages), or a law which threatens it with a possible penalty of $5,000 in about one-half * of its fatalities, a penalty which any number of chances may aid it to avoid —a penalty which in any event it can put off paying from two to five years?

As to the second result to be aimed at by legislation on this subject, a just and wise distribution of the work-accident loss, it is of course clear that no extension of an employer's liability on the basis of negligence could make him liable for unavoidable accidents nor for accidents due exclusively to negligence on the part of the injured. According to our analysis in Chapter VI, 28 per cent of the fatalities studied were unavoidable and 17 per cent

* In Table 13, page 86, we found out of 410 fatalities indications of some responsibility on the part of the employer in 147 cases, of the foreman in 49, and the fellow workman in 56.

were due solely to the responsibility of the victim. Therefore, if our estimate of the causes of accidents is correct, the most radical extension of "employers' liability" for negligence would still leave the injured workman and his family to suffer the entire economic loss in nearly half of all work-accidents.

On the other hand, to greatly extend the employer's liability while leaving the amount of possible recovery unlimited, and dependent as it is today not upon reason but largely upon prejudice and sympathy, might often put an oppressive burden upon an employer. It is the intention of the present law that the damages recovered in a personal injury suit shall equal the economic loss sustained by the plaintiff as a result of the injury, with sometimes an allowance for pain and suffering. Very often, however, the jury, influenced by the pitiful condition of the plaintiff or by an instinctive desire to injure a corporation, allows an excessive recovery. Therefore, a law greatly extending the employer's liability, with the present high and uncertain measure of damages, might prove an excessive burden and in case of small employers sometimes a ruinous one.

In short, to extend liability logically and equitably, we should have to require an employer to make up to a man injured through the negligence of that employer or any of his agents the entire economic loss,—not one year's wages, nor three years' wages, but the potential net earnings of a lifetime cut short; and we should have to allow the injured to suffer the entire loss in all other accidents. By substituting a compensation system, we should require the employer to assume a limited and regular share of the loss in every accident,—assume it as a regular cost in his business to be reckoned in his selling prices. Thus, in every case the employe would still suffer perhaps half the income loss, but the other half would be distributed by way of the employer through the whole body of consumers; in no case would the burden fall in its entirety upon the household of the injured workman. If we were seeking merely justice between individuals in the solution of this problem, there would be room for discussion between these two plans. But we are seeking as well a distribution of the loss which shall be to the best interests of all concerned, the employer, the workmen, and the public.

Considering the two propositions in the light of the third desired end—elimination of waste in distributing the loss, waste not only of time and money, but of good will—it is apparent that a law requiring employers to compensate all employes injured according to a uniform method, would do away with most of the grounds of dispute which make the present law so wasteful in its operation. Once determine that the accident is an accident of employment, and compensation in most cases would follow automatically, based in amount upon wages and extent of disability.

On the other hand it may be said with some reason that the evils and abuses incident to the operation of the present law, would continue and possibly be intensified in the operation of laws extending the employer's liability on the basis of negligence. There would be more litigation; hence more delay. There would be brighter prospects for the ambulance chaser; hence more activity on his part. There would be more chances of recovery against employers; hence greater temptation to fraud in the claim agent. The employer's risk would increase; hence liability insurance rates would go up and the wastes of the present system be to that extent increased. The number of accidents in which recovery is possible would be greater; hence contention between employer and employes, with its trail of bitterness, distrust, and ill will, would increase.

It is not necessarily true, however, that all these evils would increase. It might be that the simplification of the law which would accompany a removal of the illogical and unjust defenses now protecting the employer, would mean a more uniform application of it, fewer possibilities of dispute. We might therefore reasonably expect that direct settlements between the parties would more and more take the place of litigation, and thus lessen rather than increase the waste in the operation of our present law. Nevertheless, it is obvious that a system which requires the personal responsibility for each accident to be proven in order to determine upon whom the loss shall rest, occasions more dispute than one in which, say, half the loss in each case is as a matter of course to be borne by the employer.

It is too early to prophesy how Pennsylvania or the other

American states will legislate for the prevention of work-accidents and for the better distribution of the resultant economic loss. But if this study of the situation in Allegheny County proves to have any constructive value, it will be to suggest that a new law to go to the root of the problem, must meet these three requirements:

I. In order to furnish the most effective incentive for the prevention of work-accidents, it must make every serious accident a certain and considerable expense to the employer.

II. In order to bring about a fairer distribution of the economic loss entailed by work-accidents, it must shift a considerable share of the burden of each accident from the family immediately affected to the business, and thus to the whole body of consumers.

III. In order to do away with the wastefulness, dishonesty, and ill will characteristic of litigation under the present law, it must reduce the possibilities of dispute between the parties to a minimum.

In regard to the existing law of employers' liability and its consequences, our findings, founded on the accident experience of one great industrial district, lead inexorably to certain conclusions. The law in many of its principles is unjust; in operation it uses up time, money, and good will, to little purpose; it furnishes small incentive for the prevention of work-accidents, and leaves well-nigh the whole economic burden of work-accidents to be borne by the injured workman and his dependents, with consequent hardship and privation. It is to be condemned from the standpoints of justice, method, and practical utility.

APPENDICES

APPENDIX I

THE TEMPER OF THE WORKERS UNDER TRIAL*

CRYSTAL EASTMAN
MEMBER STAFF PITTSBURGH SURVEY

TO study industrial accidents from the "home" side has been my business for a year. To acquaint myself daily with households doubly disabled by sickness and loss of income, to see strong men just learning to face life maimed, to visit home after home where sudden death has visited,—a dreadful business, you might say. Yet it has left with me impressions of personality, character, and spirit, which make the year's work a precious experience.

The first thing brought home to me was that working people do not have "the luxury of grief." The daily tyranny of hard work in their lives, leaves little time for pondering the unanswerable "Why?" of sorrow.

For instance, Mrs. Dennison, the widow of a brakeman who was killed on the Pennsylvania Railroad, spent no quiet days of solitary mourning. She was left with six children, the oldest eleven. All the money she had was $500 from the Railroad Relief Association,† to which her husband had belonged, $450 which the men on her husband's division raised, and $30 which his own crew gave. The company gave her $20 toward the funeral.

With some of this money she rented and stocked up a little candy and notion store, using the three rooms in the back to live in. Here she tended store, and cooked, and sewed, and

* Reprinted from *Charities and the Commons*, January 2, 1909.
† The company pays the running expenses of this association.

ironed, for herself and the six. She would have done her own washing too, she told me, but she couldn't leave the store long enough to hang her clothes up in the yard. She made a reasonable success of the enterprise, enough to pay for rent and food, until the hard times came. After that she steadily lost money. So now she has put in her application for a chance to clean cars for the railroad at $1.21 a day. For this privilege she must wait her turn among the other widows; and when she gets it she must leave her children in one another's care from six in the morning till six at night. They are now two, four, six, eight, ten, and twelve, respectively. Mrs. Dennison will not have time to sit down and grieve over the death of her husband for many years to come.

One mother, whose thin face haunts me, has been able to endure her tragedy only through this necessity of work. She had a daughter, just seventeen, who was employed in the dressmaking department of one of the big stores in Pittsburgh. This girl, Ella, was eager and gay, with a heart full of kindness. She was everybody's favorite in the workroom; at home she meant laughter and good will for them all. To her mother, Ella was joy and gladness,—life itself. One morning this little dressmaker, after leaving her wraps on the eleventh floor, found that she was a few moments late. She ran for the elevator to go to her workroom above. The elevator was just starting up, with the door half closed. Ella tried to make it, slipped, and fell down the shaft.

This tragedy demoralized the working force of the store for two days. In the hunted, suffering eyes of the mother one reads that she cannot forget, night or day. She feels that Ella's employers were generous in giving her $500, but it would make no difference "if they gave her the whole store." In the back of her mind are always two visions alternating,—the merry girl who sat eating her breakfast at a corner of the kitchen table that morning, laughing and teasing her mother, and then, as she ran out to take the car, looked back to smile and say good-bye,—this is one. The other,—that unthinkable fall down eleven stories and the crash at the bottom of the shaft. I felt that nothing but the daily insistence of work,—cooking and washing for her husband and

two grown sons, and caring for the two younger children,—had saved this mother's reason.

Another striking instance of the pressure of work in poor people's lives was in the family of Harry Nelson. They lived on the South Side, near the Jones and Laughlin Steel Works, where the father and two grown sons and Harry, who was nineteen, were employed. Two younger boys were in school. One Sunday night, on the way home after his twelve hours' work, Harry said to his father that he'd "give a lot" not to go back to the mill that night. (There was another twelve hours' work to come before he could sleep, for this was Harry's "double shift.") He didn't tell his mother he was tired, because he knew she would beg him not to go back to work. Harry was ambitious; he was an electrician's helper, getting fifteen dollars a week, and he did not want to lose his job. At 7.30 he was back in the mill, and at 8 he was up on an electric crane, making some repairs. When he was through he started along the narrow runway of the crane to a place where he could climb down. The air was full of steam; some say that he was blinded by this; others, that he must have been a little dizzy. At any rate, to steady himself he reached for an electric wire that was strung along there. He happened to touch a part that was not insulated, got a slight shock, and fell thirty-five feet to the floor of the mill.

After Harry was killed, the two older boys left the mill and looked for work in another city. But the father had no choice; he was too old to find new work. His fifteen a week was all the more indispensable now because Harry had given all his money to his mother, and the two older boys had paid generously for board. In three days the father was back in his old place at the cold saw, within sight of the place where Harry fell.

Thus work may be a cruelty as well as a blessing. But in any case it leaves the workers little time to dwell upon their misfortunes. When they do speak of them, it is almost always in a "matter-of-course" way. This is not, I think, because they lack feeling, but because they are so used to trouble that the thought of it has ceased to rouse them.

That poor people are used to trouble is a commonplace. I mean by "trouble," the less subtle disappointments of life,

those which come with disease, injury, and premature death. Of all these rougher blows of fortune, the poor family gets more than an even share. This stands to reason, if experience has not already convinced one of it. To the ordinary causes of sickness,—unsanitary dwellings, overcrowding, undue exposure, overwork, lack of necessary vacation, work under poisonous conditions,—to all these, poor people are much more constantly exposed than others. To injury and death caused by accident they are also more exposed. Poor people's children play in dangerous places, on the street, near railroad tracks. The poor man's dwelling is not often fireproof. Poor people do most of the hazardous work in the world, and the accidents connected with work form the majority of all accidents.

Moreover, the poor family is, in a material way, less able to meet these disasters when they come than the well-to-do family. This is in some degree due to ignorance, for ignorance, whether as cause or result, almost always goes with poverty. In a very large degree, however, it is due to poverty itself. It is because they have no reserve fund to fall back on in emergencies. Suppose a young steel worker with a family gets a long, sharp chip of steel in his eye. He cannot go to the best specialist, to the man who knows all that anybody knows about saving eyes. Through ignorance or lack of interest on the part of the doctor who treats him, he loses his eye. Thus an injury which might mean but a few weeks of fearful anxiety to a well-to-do man, may result in lasting misery to a poor man. In the same way, too, what might often be in a well-to-do family a short struggle with disease, crowned with success, is more likely to be in a poor family an unrelieved tragedy.

Thus are the poor, by reason of their very poverty, not only more open to attack from these bodily foes, but also, and again by reason of their poverty, less equipped to fight and conquer them. "St. George killed the dragon; St. George wore the finest armor of his day and his sword was tested steel."

With these workers whom I met,—poor people, not as the charity visitor knows them, but poor as the rank and file of wage-earners are poor,—misfortune is almost part of the regular course of things. They are used to hard knocks, if not yet in their own

lives, then in the lives of their relatives, friends, and neighbors. Consequently, there is often in their attitude toward trouble a certain matter-of-fact calmness which looks like indifference. Thus, I have had a mother tell me about her sixteen-year-old son's losing two fingers in the mill. She couldn't remember exactly how or when it happened; she thought he had lost only a week's work; and she had no comment upon it but that it might have been worse. An old steel worker whom I questioned about his injuries answered, "I never got hurt any to speak of." After persistent inquiry, however, he recalled that he had once fractured his skull, that a few years later he had lost half of a finger, and that only three years ago he was laid up for nine weeks with a crushed foot. Troubles like these are the common lot; they are not treasured up and remembered against fate.

Often I have found in young women a surprisingly "middle-aged" way of looking at trouble. I remember, for instance, Mrs. Coleman, whose husband was a freight conductor. They had been married nine years, and had made out pretty well up to the last two years, although the wife, as she somewhat proudly explained, had had three children, two miscarriages, and an operation during this time. On Christmas night, 1903, Coleman had his arm crushed in a railroad accident. He was disabled for three months, and went back to work with a partially crippled arm. Three weeks later, as he was numbering cars, an iron bar rolled off the load and broke his nose. This laid him up again for five weeks and left his face permanently disfigured. He has been troubled ever since with nose-bleeding, so that he has to lay off every little while, and the doctor says he must have an operation before he can be cured. Since this second injury a fourth child has come. When I saw her, Mrs. Coleman was just recovering from a bad attack of grip, which had increased their expenses. To help along in this hard luck time they took two railroad men to lodge and board in their three-room flat; one of these men had been killed on the road the week before I called. Here are troubles enough, and yet this young woman had no special complaint against fortune.

"Yes," she said, as she rose to open the door for me, the last baby dangling over one arm, "we've had a bad time these last

two years, and now with him only working two or three days a week, I guess it'll be worse. But then,"—with a smile, "what can you do about it?"

On the same day I talked with a much older woman. She was too worn out to smile at her troubles, but she had the same "everyday" attitude toward them. Ten months ago they had been doing well. Her husband was earning ten dollars a week at odd jobs; two sons, twenty and seventeen, were getting fifteen dollars a week each as lead buffers in a coffin works; she and her daughter kept house and did a little sewing; and they all lived happily together. Then one day her husband was brought home with a smashed foot and a leg broken in two places, as a result of a bad fall. He had been on a ladder, painting, when the cornice gave way and he jumped to save himself. For five months they kept him at the hospital free of charge, and for four months more he went back on crutches for treatment. Finally they told him to come back for an operation, but on the day after the operation they sent him away again with a bill of three dollars for the time he had been there. His wife had to help him home, and he was in bed when I called. The doctor had said it would be better for him to stay at the hospital, but the superintendent decided that they could not treat him in the ward for nothing any longer. The wife laughed a little grimly when she told me this.

"Why," she said, "I can't pay a dollar and a half a day to that hospital. Ever since he got hurt I've been cleaning offices. All I can make is six dollars a week and I have to pay car fares out of that."

"Well," I said, "how about your sons? They are making good wages."

"Oh, they were," she answered, "but Harry, the oldest one, has been home for five months. He's got gastritis, and the doctor says it's from lead poisoning. You know he's a lead buffer on coffins. He don't seem to get much better."

"And the other boy," I said, "does he go right on doing the same work?"

"Yes, Charlie,—I don't know what we'd do if he lost his job. He's been on half time now for three months, and that means only $7.50 a week."

To add to the general desolation in this home, the flood had been in and covered the lower floor, leaving everything smeared with a dry, muddy paste. In the midst of it all sat this tired woman of fifty, who had just come home from her five early morning hours of office scrubbing; and she was less concerned with the bitterness of her struggle with life than she was with the immediate problem of how to get her maimed old man up to the hospital every other day for treatment.

This unquestioning acceptance of misfortune does not often amount to either a commendable cheerfulness or a deplorable apathy. Occasionally, however, it approaches heroism. I think the most courageous person I met during the year was Mrs. Herman Baum, a German woman of forty-five or thereabouts, who, after nine years of disappointment and defeat, still meets the days as they come with an unbroken spirit. She came to America as a girl of nineteen and went out to service. At twenty-three she married. Her "man" turned out ugly; he drank and was always mean to her. His parents, who thought he had married beneath him, took a dislike to her and joined him in making her unhappy. They lived along in this way for fifteen years, during which time she bore him seven children. One day, in his work as a moulder, he received a slight injury, from which blood poisoning set in. After this his mind was affected; be became silent, morose, and uglier than ever, giving his wife hardly a moment, day or night, when she was not in fear of him. After a year or so during which he grew steadily worse, he shot himself one night, leaving her with the seven children, another one coming, and no resources except a heavily mortgaged house and $800 insurance. She had no relatives; her father had been run over by a train, soon after coming to America, and her only brother had been drowned in river work a few years before.

It was in August, 1906, that Mrs. Baum's husband killed himself. In September a baby was born, only to die before winter. The two older children got work and brought in ten dollars a week between them, while Mrs. Baum took in washing and made two or three dollars a week. Thus things went pretty well until June, 1907, when the second boy, Harry, the jolly one, who "kept all their spirits up with his jokes," was all but killed in an

elevator accident at the box factory where he worked. When, after four months at the hospital, he came home with a permanent lameness, and strict orders never again to do heavy work, he turned to selling papers, and is now making about $1.40 a week. After half their small income was cut off by this accident, Mrs. Baum tried to run a grocery store in the front part of her house, but she lost money at it and was forced to give it up. When I saw her, she was hanging somebody's washing up in the yard. She took me into her spotless kitchen and told me this story, not eagerly, as if pouring out her troubles, but only after many questions, rather reluctantly, and with sometimes an apologetic smile. Here, I thought, is a heroine of modern realistic tragedy; the dramatist would have her lost in bitter retrospect. But she was not; she sat there smiling a bit ruefully, and wondered whether she must put aside her sturdy German pride next week, and go to the Poor Board for help.

Some people, especially the Irish, even get amusement out of the number and variety of their troubles. This is true of the Learys, whose six years of married life have been crowded with disasters. To begin with, Andy, the husband, who is a brakeman, has had nine accidents on the road in five years, so many that his wife could not distinguish in her memory the one of a year ago which I had come to inquire about. Twice he has been near death. Once the priest performed the last offices, but Andy pulled through after all. Besides all these injuries, none of them less severe than a broken bone, he accidentally shot himself one day and nearly died from that. "And look at him now!" said Mrs. Leary. (Andy is a handsome Irishman, and the picture of health.) In addition to all this, they have lost two children by diphtheria. Mrs. Leary's outlook on life seems to be a mingling of humor and superstition. She told me, with incongruous awesomeness in her Irish brogue, how she had heard the "death whistle" outside the door three times on the night that her little boy died. And one night, when Andy had to stay at home to take care of her, the brakeman sent in his place was killed. She thinks this is a "sign," and has no doubt of Andy's ultimate fate.

"Oh yis," said she, "the docthers say ye can't kill Andy,—but I know betther. He'll be a-comin' home dead soon. Ivery

time I hear a knock at the dhoor, I thinks to mesilf, 'There now,—it's thim, comin' to tell me Andy's kilt.' Andy, he jokes about it. Ony this marnin' afther I'd been givin' him his breakfast, he starts to go to work out the back dhoor, an' I says, 'Andy, why don't you niver go out the front dhoor?' 'Oh, Leary,' says he, —(that's what he calls me—Leary) 'Leary,' says he, 'the back dhoor's good enough for me. I'll be a-comin' by the front dhoor soon enough, an' I won't be walkin'.'"

With so many misfortunes the Learys have not been able to save anything. Four times Andy tried to join the Brotherhood of Railroad Trainmen, but each time after his papers were made out and he had paid down his dollar, and the day had come to join, he couldn't get together the necessary nine dollars for the first payment. With all this, there is an unfailing humor and philosophy in the Leary household which is irresistible.

Among railroad men generally there is a certain laughing, soldier spirit. It is part of the faith; no true "railroader" is without it. Perhaps this spirit leans to recklessness with some of the younger ones, but I believe it is just as essential to the running of a railroad as is the executive skill of the Hills and Harrimans. This spirit stands by the men in danger and makes them meet death bravely. It stands often a harder test; you will not break the spirit of a railroader by cutting off his arm or giving him a wooden leg. Out of fifteen railroad men I visited, who had received permanent injuries, all but four have gone back to the road. Two of the four are totally unable to do work of any kind. Another has gone home for a few weeks until he can "get used to his wooden leg," when he will be ready for any job the road will give him. The other, a twenty-year-old boy who lost his right arm at the shoulder, has learned to write with his left hand and is studying telegraphy as hard as he can, in order to stick by the railroad.

Of the eleven who are back on the road, nine were able to go into the same work and pay, but two had to take lower jobs on account of partial disability. This meant in each case five or six dollars a week less, but neither man complained; he took it as part of the day's work. What the railroader dreads is having to quit the road altogether. A watchman's job will be accepted

with a good deal of cheer. Notice the spirit of the one-legged watchman at your crossing, who is very likely a man dropped from an active, exciting occupation at eighty dollars a month to flagging a crossing for forty. He is still in the game. But try to retire a railroader on a pension while he is able to work, and you will break his heart.

To a large extent, the railroaders' wives reflect this spirit. They are quite resigned to the risks and dangers of the "mister's" trade. But with the mothers, especially those whose husbands have followed more quiet callings, it is different. They lead an anxious life.

In every dangerous occupation there is not this sustaining common courage to help a man endure gaily a lifelong deprivation. A certain degree of independence and fraternity in a group is necessary to bring it about. Many go forth from the steel mills maimed for life, who have no such spirit to uphold them. I remember one night in Homestead seeing a boy on crutches, with one leg gone. He was about nineteen, with blue eyes and a shock of yellow hair falling down low on his forehead. In his face was that desperate look of defiance which comes with a recent deformity. He was trying with all his young will to be indifferent to the stares of the crowd, while in every nerve he felt them. All this and a weary hopelessness were written in his sullen child-face.

I have shown how grief is crowded out of the lives of working people, and how their frequent experience of trouble gives them an ordinary manner in speaking of it. These things largely account for the opinion held by many, that working people do not feel their sorrows as keenly as others do.

Furthermore, I found among working people almost no pretence of feeling where none exists. This too, might give rise to such an opinion. Where the death of a husband has meant merely a loss of income, with the attending problems of struggle and adjustment, there is no effort to have it appear otherwise. Where it has aroused only a feeling of bitterness toward the employer, this is not concealed either. But where the death of the bread-winner has meant not merely an economic problem, not merely a legal battle, but heartache and emptiness,—that is

written, real and unmistakable, in the faces of those left. And in the case of sons, where there may be no question of income, it is often possible to tell in the first glance at the mother whether this boy who was killed was "one of her children," or the child of her heart. There is an outspoken genuineness about these people which allows them neither to make a show of grief where there is none, nor to hide real suffering even from a stranger.

Mrs. Leary took the accidents of "Andy" lightly. If he should happen to be killed some day her heart would not be broken. She spoke of the death of her baby three months before without feeling, mentioning the doctor's bills. But when I asked her to tell me about her oldest boy who died two years ago of diphtheria, I could see at once that I was on different ground. Her eyes filled with tears, and there was grief and longing in her voice as she talked about him. You see he was only five, but they understood each other. When she was unhappy he knew it. He would climb up in her lap, she said, and put his arms around her neck and say, "Don't cry, Mommy; I love you."

Mrs. Burns, a pretty Irish widow, whose husband was crushed while coupling cars, is obviously well satisfied with the $4,000 insurance he left. She takes boarders and is carefully saving the insurance money for her little girl's education. Her affections are set on this child. She has a tender memory of her Tom as he started off to work whistling that last morning, but she makes no pretence to mourn for him. She frankly admits that her marriage was not successful enough to make her risk it again.

Thus it is with Mrs. Andrews, a woman whose husband was killed in the mill. I found her smiling and contented a year later. Her man had been good and faithful while he lived, but after he died, her brother came to live with her and help her raise her two boys. He earned just as much, and she was perfectly satisfied with the situation.

On the other hand, I knew of a six months' bride who shot herself three weeks after her husband was killed. And a young German woman, whose father had been run over by a dinkey engine in the mill, said to me in a choking voice, "Oh, when it comes to tellin' how he died, it breaks my heart." I have seen mothers and fathers in middle life who had become broken and

old in a year after the death of a son, and a few women whom I visited eighteen months after such a tragedy were literally unable to speak of it.

There was one wild-eyed little Scotch woman, Mrs. Mac Gregor, who refused to talk with me at all. I learned from a neighbor that she had twice been insane. Some years ago, when they had lived near the railroad, a little three-year-old girl of hers, who was playing before the house, ran in front of a train. The mother reached the child just in time to touch her dress as the engine tore her away. The mother lost her reason and was sent to an asylum. After six or eight months she recovered and came home. Then, one morning two years later, she got word to come at once to the hospital, that her son was dying. He was a lineman at the Edgar Thomson works, and had left home to go to work as usual two hours before. In some way,—no one ever knew how,—he had fallen from a ladder and broken his skull. After this second blow the mother was again insane.

Then there was an old father, Macdougal, who had had three sons. One died of smallpox, and one was killed in a steel mill. The third was a railroad engineer. On the night of March 13, 1907, he was taking a heavy freight across a bridge at Deer Creek, Harmarsville. The creek was high and the pier gave way; the engine and first cars went crashing into the water below, carrying three men to death. The bodies of the fireman and conductor were recovered next day, but young Macdougal, the engineer, was never found. They say the old man's hair turned white in twenty-four hours, and that he can still be found on fair days walking along the banks of the creek, looking for his son. But for the most part mothers and fathers do not lose their hold on things. Their lives go on as before. You can know perhaps only from a weary sadness in the mother's eyes that the light of their lives has gone out.

Death does not always mean sorrow, and these working people, it seems to me, feel no pressure of convention upon them to appear sorrowful when they are not. But where affection is strong and love is deep, tragedies are as real with them as with any people I have known.

Wherever love is found there is the chance of grief; there is

potential tragedy. And it is in poor families, I think, that one finds the most close and lasting affection.

So often, in looking up a fatal accident case, I would come upon an intimate and devoted family group. The case of Will Gordon, for instance,—there was a holiday drama I shall not soon forget. The Gordon family was a large one. Father and mother were living, and three working sons lived at home, besides four younger children. Then there were two married daughters, who lived near by and kept in close touch with the family. Will, the oldest son, although he was twenty-eight was the greatest "home boy" of them all. He still handed every pay envelope over to his mother, unopened, as he had done when a child. His working life had been varied. First he tried the railroad, but he was slight, and the work was too much for him. Then for a while he did river work with one of his younger brothers who was on a government job. But in this he soon developed a chronic cough, and his mother was afraid of consumption. So finally he got a job with the Pressed Steel Car Company, as a pipe fitter's helper. Here the work was lighter and seemed to agree with him. Every two weeks he brought home twenty-five dollars and handed it over to his mother. Meanwhile his father, who was fifty, had taken a job at the Oil Refinery, firing boilers at night.

The boys considered this a dangerous job for the old man, and almost every night one of them would go with him. Will felt most strongly about it and was always begging his father to give it up. On Christmas evening, 1906, the son's arguments prevailed and his father promised to give up the job. This made them all especially happy on the next day, when the two married daughters came home with their families to celebrate Christmas. During the day they planned that the whole family should gather at the oldest daughter's house for New Year's. All the boys were to have a holiday except Will, and he promised to get off at noon, if he could, to eat the New Year's dinner with them. The day came, the family was gathered and the dinner was ready. With much joking and laughter and good-humored impatience, they were waiting for Will. In the midst of it came a boy with a scared face to say that Will had been killed at the works. He had been sent to repair a leak in a pipe. The steam was left on;

the pipe burst; and he and Wilson, the pipe fitter, were scalded to death. The father put on his coat and hurried down to the mill to keep them from sending his boy's body to the morgue.

This family affection shows its true nature in times of trouble. Barring what seemed to me an unusual number of deserting husbands, I was impressed with the faithfulness of these people to one another in struggle and distress. There was Mrs. Frederick, for instance, a Swiss woman whose husband was killed in a runaway, while driving for a wholesale liquor dealer. Just a week before the accident they had bought a small house with a $600 mortgage on it, and Mr. Frederick said to his wife, as they were looking over the deed: "Now we can begin to get along, and lift up our heads, and stop worrying."

Since her husband's death, even with the $1,000 insurance, it has been hard to keep things going and continue payments on the house. There are four children and only one is old enough to work. Just in this troublous time, too, the family burdens have increased. Mrs. Frederick's mother has come from Switzerland, old, feeble and without income; and her step-daughter, who had been away from home and independent for years, after lying in a hospital six weeks with a fever, has now come home, weak and helpless, to stay until she is able to work. Mrs. Frederick does not for a moment question the rightfulness of these burdens. The old grandmother and the convalescent daughter help her around the house; she takes in washing; the boy's wages are good. On the whole she is cheerful. The last thing she said to me, as she stood in the open door, was, "Oh, we'll get on somehow. We'll all work together, and if we have to, we'll starve together."

Another pathetic and almost humorous instance of family loyalty is the case of a man named Benson. I was hunting for the wife of a brakeman who had been killed in the same wreck with the engineer Macdougal of whom I have spoken. I was told that I could learn about her at this Benson's house. I went there and found it a tumble-down, three-room shanty with a small shed for a kitchen, crowded in between brick tenements. There was no carpet on the floor and only a bare table and two kitchen chairs in the living room. The man's wife was unspeakably slovenly and, I think, half-witted.

When Benson came in, however, I could see that he was different. He was only twenty-six. His father had been a riverman, and he himself was born in a "shanty-boat." Owing to his mother's early carelessness he had lost one eye. When he grew up, he left the river and became a teamster, and in good times he made a living. At the time I saw him, however, he had had only one or two days' work a week for four months. The hard times, and the wife, I am sure,—not any natural shiftlessness in the man,—accounted for the desolation of his home. There was something fine in Benson's face, a certain modest look of steadfastness and pride,—the pride of the "family protector." This protectorship extended even to the remote connections by marriage of the miserable creature who was his wife, for I found that the brakeman's widow, whom he had taken in and cared for after her husband's death, was his wife's sister-in-law. Further questioning revealed that this widow had an old mother who had also been dependent on the earnings of the brakeman.

"And what has become of the mother?" I asked.

"Oh," he said, "she lives here, too. She makes her home with me."

There he sat, this one-eyed teamster, in his barren, rented, three-room castle, and told me in a simple, serious way, as though it were to be expected in good families, that his wife's sister-in-law's mother "made her home with him."

It is not uncommon to find a loyalty like this in relations where one would least expect it. I have quite lost faith in the unkind stepmother of fairy-tale tradition. It is a stepdaughter whom Mrs. Frederick, the Swiss woman, is caring for in the midst of her struggle. Three or four times I found a woman utterly uncomforted after the loss of a stepson. There was Conley, for instance, a car inspector who was killed in a wreck. A stepmother had brought him up since he was ten years old, loving him as few mothers love their own sons. And he gave her back a real devotion. When his friends would ask him why he didn't have some fun with his money instead of giving it all to his folks, he used to say,

"Well, fellows, home ain't a boarding house."

It is not unusual to find young men giving up their own

prospects, to take up the burden of the family at the sudden death of the father. But the most memorable instance I remember of self-sacrifice on the part of a son was that of James Brennan, a switchman, who was killed on the Baltimore and Ohio in November, 1906. He, too, was only stepson and stepbrother to the family he fathered. Thomas Brennan, an Englishman, had married in the seventies and come to America, where his wife bore him two sons and then died. Soon after, he went back to England and married a sister of his first wife and brought her here to take care of his children. He soon proved worthless as a provider. He lived off and on with his family, but contributed less and less to their support, and finally left them entirely. The second wife was not strong, and after the birth of her last child, became an invalid. The burden of the family thus fell upon the shoulders of the two boys, her nephews and stepsons. They went to work at eleven and twelve. Arthur, the younger, was drowned at eighteen, leaving James, the older son, as the only support.

This young man never deserted his post. During the later years his burden increased. His stepsister made a runaway marriage at eighteen and in two years was deserted by her husband and came home with a child. A feeble old grandmother of eighty-eight came over from England to be taken care of. His stepmother became crippled with rheumatism and lay in bed for two years. In June of the year he was killed, he sent her away to a sanatorium to get well. She had been there for five months, had gained twelve pounds and was doing well when the telegram came to tell her of his death. She came home to face the struggle of life without him,—an aged mother on her hands, a boy of ten, and an inconsequent daughter with a baby,—and she herself an invalid, suffering constantly. One would say that the mere problem of existence would be all-absorbing for that woman. Yet, when I found her a year later, it was the emptiness of her life without this stepson rather than the loss of his income that was her tragedy.

There are all kinds of people everywhere. This is the only final conclusion. It is not easy, therefore, to describe the spirit in which the working people meet trouble. They meet it in all the ways there are. But most of those I met had an "every-day" attitude toward misfortune. This seems to support the opinion

many hold, that poor people do not feel their tragedies deeply. But I think it is to be explained rather by the fact that they are too busy to entertain grief, that trouble is too common among them to arouse exclamation, and that they make no show of feeling where there is none. That they know the deepest sorrow is obvious to one who has seen the loyalties and lasting affections which make up so much of their lives. I found usual in families, a generous affection which could rise to self-sacrifice and devotion in time of trial; and sometimes between two members of a family, a rare love, exclusive and complete, so that the death of one left the other in an empty world.

Tales of trouble like these are worth listening to, chiefly as they reveal the spirit of the people who suffered. It is with this thought that I have told them. But if by revealing a dreary recurrence of the same kind of misfortune in home after home, these stories have roused in the reader's mind a question, perhaps a protest, this too, is worth while. By a study of these work-accidents in their happening, by a counting of the cost to the worker and his family, to the employer, and to society,—as at present the cost is distributed,—we hope to answer that question. Possibly we shall justify that protest.

APPENDIX II

THE PROCESS OF MAKING STEEL*

JOHN ANDREWS FITCH

THERE are three separate stages in the process of manufacture before a bank of red iron ore is transformed into a pile of steel rails or of steel beams for a skyscraper. There is the reduction of the ore to pig iron, the process of changing the pig iron into steel, and finally, the rolling of the steel to bring it to the shape desired.

Blast furnaces are hollow, barrel-shaped structures of masonry and steel, eighty-five to one hundred feet in height, and twenty to twenty-five feet in diameter at the bulge. Alternate loads of ore, coke and limestone,—the latter as a flux,—are run in little cars up an inclined track and dumped into the top of the furnace. The heat is introduced through a dozen or more pipes called tuyeres (pronounced "tweers") which penetrate the walls of the structure at points encircling its circumference about seven feet from the base or hearth. Through these tuyeres air is introduced which has been heated in one of the stoves,—the immense boiler-like structures set on end, usually four in a row, which accompany every blast furnace. The temperature of the air is somewhere near 1,000 degrees Fahrenheit as it enters the furnace, and it is driven at a pressure that forces it through the whole mass above, igniting the coke and creating such heat that the material in the stack becomes molten just above the tuyere level. The feeding of the furnace at the top never ceases, day or night, and every four hours the men knock the fire clay out of the tapping hole at the hearth, letting a hundred tons or more of the liquid pig iron flow out and down a runner, and empty

*Reprinted from *Charities and the Commons*, March 5, 1909.

itself into brick-lined ladles that stand waiting on a railroad track.

The iron at this point may be run into molds, hardening into the pig iron bars about two feet long to which the steel worker of a dozen years ago was accustomed. Today, however, in the operation of blast furnaces that serve steel works, it is not often that the product is allowed to cool before it is transformed into steel. A locomotive couples onto the train of ladles with their seething contents,—wicked little blue flames leaping up here and there on the surface,—and delivers them at the Bessemer or the open-hearth departments of the steel works.

The Bessemer process,—so called from its discoverer, Sir Henry Bessemer,—consists in blowing air through a quantity of molten iron and changing its constituents of silicon and carbon by oxidation. A Bessemer converter is like an immense egg-shaped barrel hung on axles placed at the middle point. There is a double bottom. The upper one is perforated with many little holes a quarter to a half inch in diameter. The space between the bottoms is an air chamber and into this space air is driven which is forced on through the perforated bottom and thr ugh the eighteen inches or so of molten iron, freeing it from its impurities, and issuing at the converter mouth in a roar of flame.

The spectacular Bessemer converter is now giving way to the open-hearth furnace, which is more prosaic and more dependable. An open-hearth furnace is a structure of brick-work resembling an oven. Through the oven's door, the molten iron direct from the blast furnace is poured from a ladle, or pig iron bars are dumped from boxes which are thrust in by the mighty arm of the charging machine. Intense heat is made to play upon the surface from a gas flame which is admitted now from one end, now from the other, and the change to steel is effected by boiling six or eight hours.

The steel, whether made by one process or by the other, is poured into a ladle which will hold fifteen to twenty tons. This ladle is swung by a crane around to a position just above a train of ingot molds which stand waiting on little trucks on a narrow gauge railroad track. Through a hole in the bottom of the ladle the steel is poured into each mold, filling it to the top.

When the steel has cooled sufficiently to stand, the molds are stripped off and the ingot stands exposed,—a massive block of steel, six or seven feet high, a foot to two feet thick and glowing red.

At this point the steel is still soft in the hot center of the ingot, but too hard on the outside for rolling, so the train is hauled by the puffing little "dinkey" engine, over to the soaking pits. An overhead crane with a pair of jaws like ice tongs, seizes each ingot and lowers it into a pit where a gas flame keeps the surface at the right temperature while the heart is cooling down to a condition such that it may be worked. In other words, the heat is equalized, or, as the steel workers say, the ingot is thoroughly "soaked."

The block of steel is then ready for the blooming mill. The overhead crane seizes it again and sets it on end in a sort of dump cart, which, when all is ready, tips over and deposits it on a roll-table, a succession of steel rollers, so arranged that they revolve and carry the ingot forward or backward at the will of the man operating the lever. These roll-tables extend on each side of the blooming mill itself which is made on the principle of a clothes wringer. Two huge rolls of steel are placed the right distance apart, the roll-table is set in motion, and the ingot dives between the rolls with a bang and a shower of sparks. The engines are reversed, the rolls are brought a little closer by the deft movement of a lever, and the slightly flattened ingot comes back through on a second pass. From time to time great iron fingers reach through between the rolls of the roll-table and tip the ingot one-quarter way over, so that it may receive pressure on all sides.

This process is kept up until the ingot has become an elongated bar, many feet long and reduced in thickness according to the shape that it is finally to have. By the time the blooming mill has done its work, the steel is too cold for further rolling, and it is cut into lengths about six feet long. These are taken to the reheating furnaces to be brought to a temperature sufficient for the final working.

All mills that work the steel over into marketable shapes are called finishing mills, and there are different kinds, according

to the article produced, as structural, rail, or plate mills. In these mills, the rolling process corresponds to that of the blooming mill, but the rolls are generally shaped differently. The rolls of a plate mill are similar to those of a blooming mill because a flat surface, only, is desired; but in a rail mill, for example, there are a series of rolls or "trains" of rolls through which the bar must pass. The space between the first two rolls is so shaped as to indent the bar as it passes through. The next rolls make this indentation more distinct, and so on until the perfect rail emerges. In other special mills a similar process is followed. The final step is the straightening, cutting and piling of the stock, before the shipment.

APPENDIX III

SAFETY PROVISIONS IN THE UNITED STATES STEEL CORPORATION*

DAVID S. BEYER
Chief Safety Inspector, American Steel and Wire Company

AT the outset, it should be explained that this article is not intended to be either "popular" or "technical," in the accepted sense of these terms. If it were framed on purely technical lines, it would presuppose a thorough knowledge on the part of its readers, of power generation,—of machinery,—of industrial organization,—and would resolve itself largely into a statement of rules, specifications, methods, and appliances, that would be both uninteresting and incomprehensible to any one who did not have this knowledge. On the other hand, to explain to an outsider the mechanical construction and operation of, for instance, the different types of electric cranes, with the accidents which may occur on them,—and to make clear the value of the rules and safety devices which have been worked out to prevent such accidents,—might readily fill the entire space allotted to this article. The attempt will be, rather, to touch in a general way on some of the principal features of safety work in its present stage of development in the United States Steel Corporation, and to give some impression of the problems encountered, and how they are being solved in a practical way.

This work is a logical outgrowth of association with the accidents which must inevitably accompany the use of machinery. It is probably safe to say that the "casualty" or "accident" department has always preceded the "safety" department; that dealing with the men who have been injured has brought about a

* Reprinted from *The Survey*, May 7, 1910.

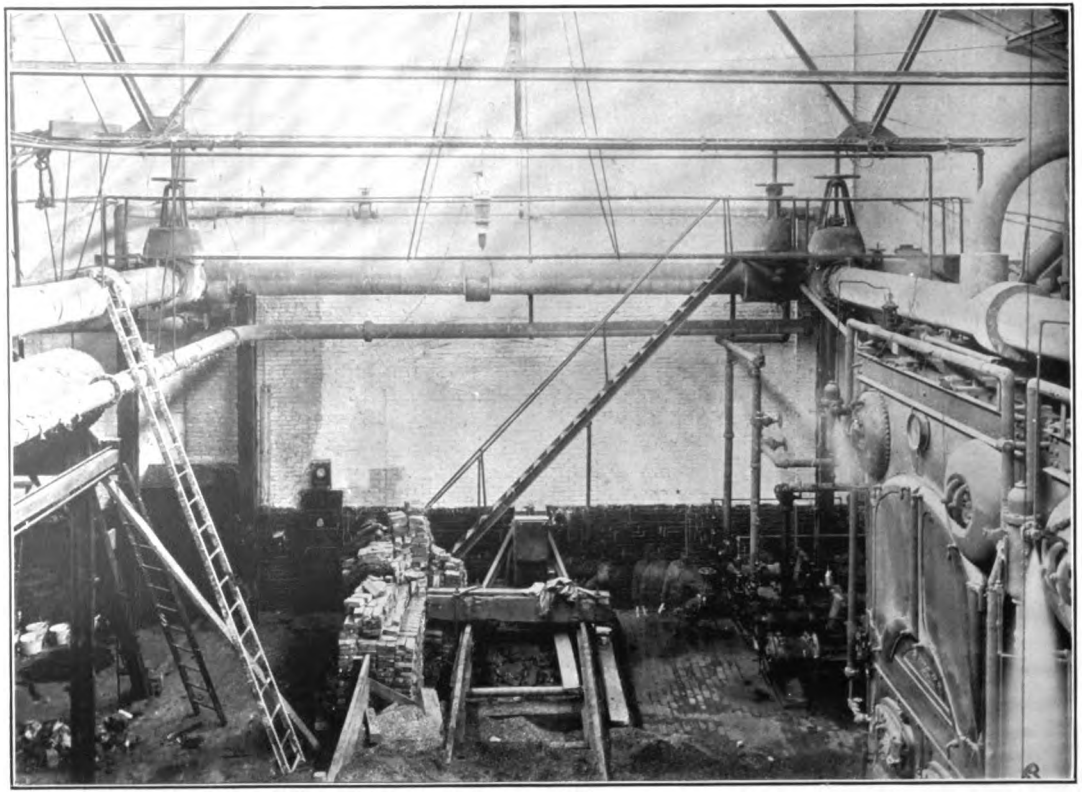


PLATE 1.—STAIRWAY FOR REACHING OVERHEAD VALVES AND PIPING IN BOILER HOUSE
The old method of doing this is indicated by the ladders on the left

PLATE 2.—ANOTHER VIEW
This overhead cross walk of steel grating extends along the top of the boilers and gives access to each of the main valves

desire to prevent the recurrence of accidents. From the first scattering efforts in this direction have grown more systematic methods, until accident prevention has developed such a variety of detail and such breadth of possibilities, that it is fast becoming a technical branch of itself. What was originally a species of self-defense, has broadened out into more humanitarian lines, until at present it is being taken up on a scale that would not have been dreamed of in this country a few years ago. Safeguards once considered entirely satisfactory are being replaced by others of improved construction. New forms of protection are constantly being devised.

In some of the companies which were brought together in 1901 to form the United States Steel Corporation, organized safety departments have existed for the last fifteen years; in all of them more and more attention has been given to safeguarding employes, until at present each of the main constituent companies has a corps of trained specialists who devote their time to studying the causes of accidents and to devising means to prevent them. New impetus was given this work by the interest manifested in it, and the policy adopted toward it by the officials for the steel corporation. Every year all the men in charge of these matters for the several subsidiary companies have been called together at the general offices in New York for discussion of the problems connected with their work, the first general meeting being held in May, 1906. At these meetings the officers of the corporation have given assurances of support to the subsidiary companies in every practical undertaking for the prevention of accidents. This resulted in the formation in April, 1908, of a central committee of safety.

THE CENTRAL COMMITTEE OF SAFETY

This committee is composed of five members representing subsidiary companies operating the largest plants and mills, with an officer of the United States Steel Corporation acting as chairman. It was empowered to appoint inspectors to examine the various plants and equipment, and submit reports of safety conditions, with suggestions for improvement. The committee was further requested to record and disseminate data on regulations,

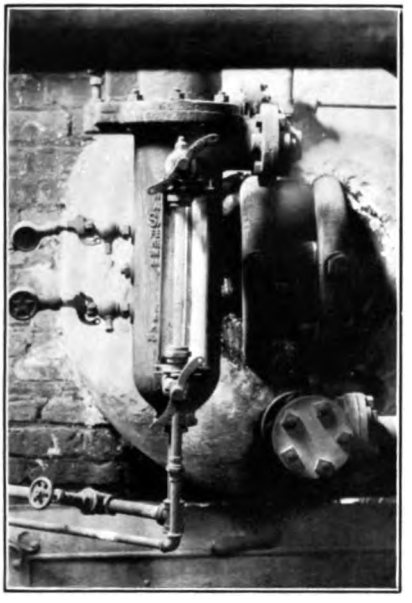
rules, devices, etc., tending toward safer working conditions in the plants.

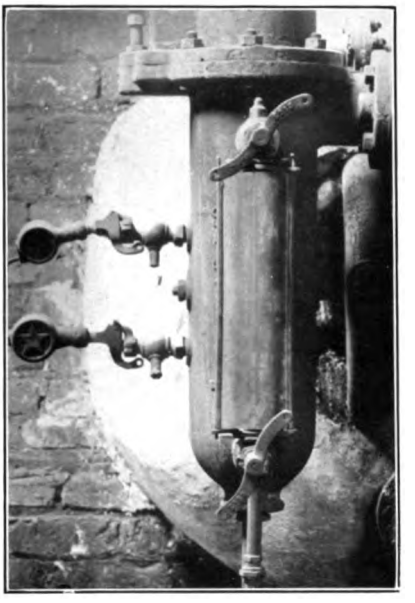
Some idea of the breadth of the field before the new committee may be gained from the fact that it includes 143 manufacturing plants, in addition to mining and transportation properties, employing in all approximately 200,000 men.

The committee has selected as its inspectors men already engaged in safety work in the subsidiary companies;—in other words, the matter has resolved itself largely into a system of intercompany inspection, which gives the plants inspected the benefit of new viewpoint and varied experience and at the same time enables the inspectors themselves to see what is being done elsewhere, and to carry back new ideas and devices to their own plants. The plan has worked well and has been of great assistance to the several companies, who hitherto had been coping with their own safety problems without definite knowledge of what other members of the great corporation family were doing.

Meetings of the committee are held about once a month, when arrangements for inspection are made, and reports considered. Drawings, photographs, rules, specifications, etc., are submitted for consideration, and such as seem desirable are sent out to all the companies. During the two years since the instigation of this central committee of safety, its inspectors have reported to it, in round numbers, 6,000 recommendations for increasing the safety of employes in the plants, mills, mines, and on the railroads and steamship lines of the organization. Of these recommendations ninety-three per cent have been adopted by the committee and carried out by the subsidiary companies. New appliances, guards for the protection of machinery, and other means for safeguarding the workmen, to the number of one hundred or more each year, have been submitted for the consideration of the committee, and through the committee have been brought to the attention of and adopted by the subsidiary companies.

There has been no attempt to establish a uniform safety organization in each of these companies, since the conditions vary so greatly that this would be impracticable; the Carnegie Steel Company has twenty-seven different plants, the Illinois Steel Company, six, the National Tube Company, thirteen, the American





PLATES 3 AND 4.—GAUGE GLASS FOR INDICATING HEIGHT OF WATER IN A BOILER

This is equipped with a semicircular steel guard which is shown in its normal position in the small view on the left; when steam is being turned into a new glass the guard is revolved to the front, as is shown at the right, to prevent injury in case the glass should burst

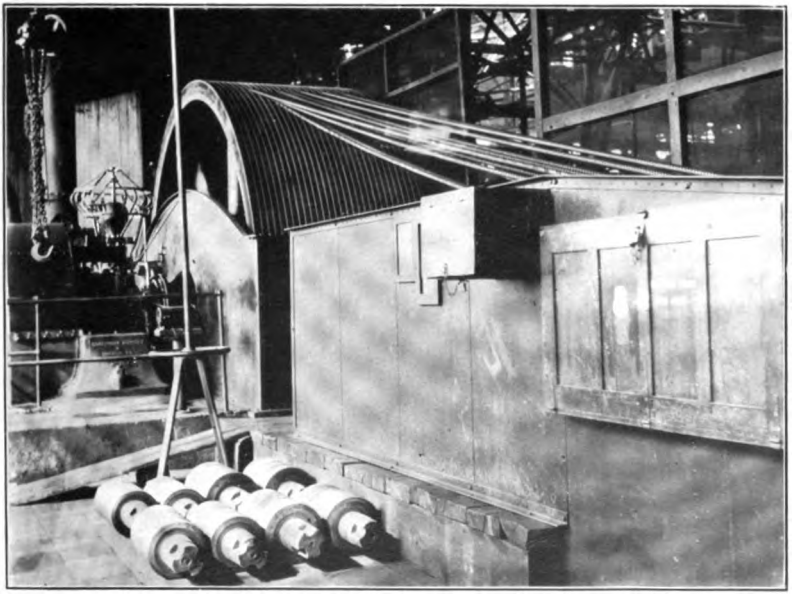


PLATE 5.—VIEW OF ROPE DRIVE FOR ROD MILL, SHOWING STEEL PLATE ENCLOSURE

Sheet and Tin Plate Company, thirty-four, the American Bridge Company, sixteen, the Tennessee Coal, Iron and Railroad Company, seven, and the American Steel and Wire Company, thirty-two. In some cases the plants of a company are grouped within a radius of a few miles, in others they are located in as many as ten or twelve states. While each company thus has its own safety organization, which has been evolved during a period of years, there are many features common to all. The following pages treat particularly of the organization and methods used in the American Steel and Wire Company, but it should be borne in mind that many of the devices and ideas found in its plants were secured from some of the other companies mentioned, through the central committee of safety and the system of inter-company inspection.

The American Steel and Wire Company has plants in Worcester, Mass.; New Haven, Conn.; Trenton, N. J.; Pittsburgh, Donora, Allentown and Sharon, Pa.; Cleveland and Salem, Ohio; Anderson, Ind.; DeKalb, Joliet and Waukegan, Ill.; San Francisco, Cal., and Hamilton, Canada. Its equipment includes docks and ore handling machinery, blast furnaces, open hearth furnaces, Bessemer converters, blooming mills, plate mills and rod mills; finishing departments for making nails, fence, market wire, etc., as well as specialty departments for springs, electric cables, rail bonds, wire rope and flat wire. It unloads a boat of ore from the Michigan mines at its docks in Cleveland, reduces this to pig iron in its blast furnaces, converts the iron into steel ingots in open hearth or Bessemer departments, rolls these ingots out into billets in a blooming mill, reduces the billets to a quarter-inch rod in the rod mills, and draws this rod down into the wire from which your watch spring is made, or your telephone connected up.

To do this there is a great variety of machinery, and the problem of bringing this equipment up to approved standards of safety, and maintaining it in this condition, is complicated by the widely separated locations of the plants. The logical outcome has been to place the responsibility largely in the plants themselves, with such oversight and assistance as are necessary to obtain satisfactory results. Accordingly, special inspectors have been appointed and local inspection committees organized.

There are two of these inspection committees in each mill, one called the "foremen's committee," and the other the "workmen's committee."

LOCAL COMMITTEE

The foremen's committee usually includes the assistant superintendent of the plant, the master mechanic, chief electrician, and a department foreman or two. Some of these members are retained permanently on the committee, so that they may gradually become educated to the full scope of the work. By changing one or two members at intervals, numbers of foremen receive the benefit of this experience. It is the duty of the foremen's committee to make an inspection of the plant either semi-monthly or monthly, and turn in a written report; furthermore, they go over the recommendations of the workmen's committee, which reports weekly.

The workmen's committee is entirely distinct, and is taken from the rank and file of our mill employes; for example, there may be a machinist, an electrician and a wire drawer,—or a roller, a millwright, and a carpenter, etc., etc. These men are selected by the superintendent in consultation with the foreman from whose department they are taken, workmen of good intelligence being chosen, who will take an interest and be able to make their work count. There are from two to four men in this workmen's committee, depending on the size of the plant; they serve on the committee for a month, making one inspection a week, each inspection consuming about a day. At the end of the month an entirely new committee is appointed, and both the incoming and outgoing committees meet with the superintendent who explains to them something of the object of their committee work. Those who have completed their term of service are told that they are to consider themselves permanently on the safety committee, and to feel free at any time to mention anything which they think conducive to their own safety or that of their fellow employes. The men, pleased, of course, at the opportunity to meet the head of the plant, take considerable pride and interest in the safety work, and are coming to realize more fully its importance. Several superintendents state that the early members of these committees are

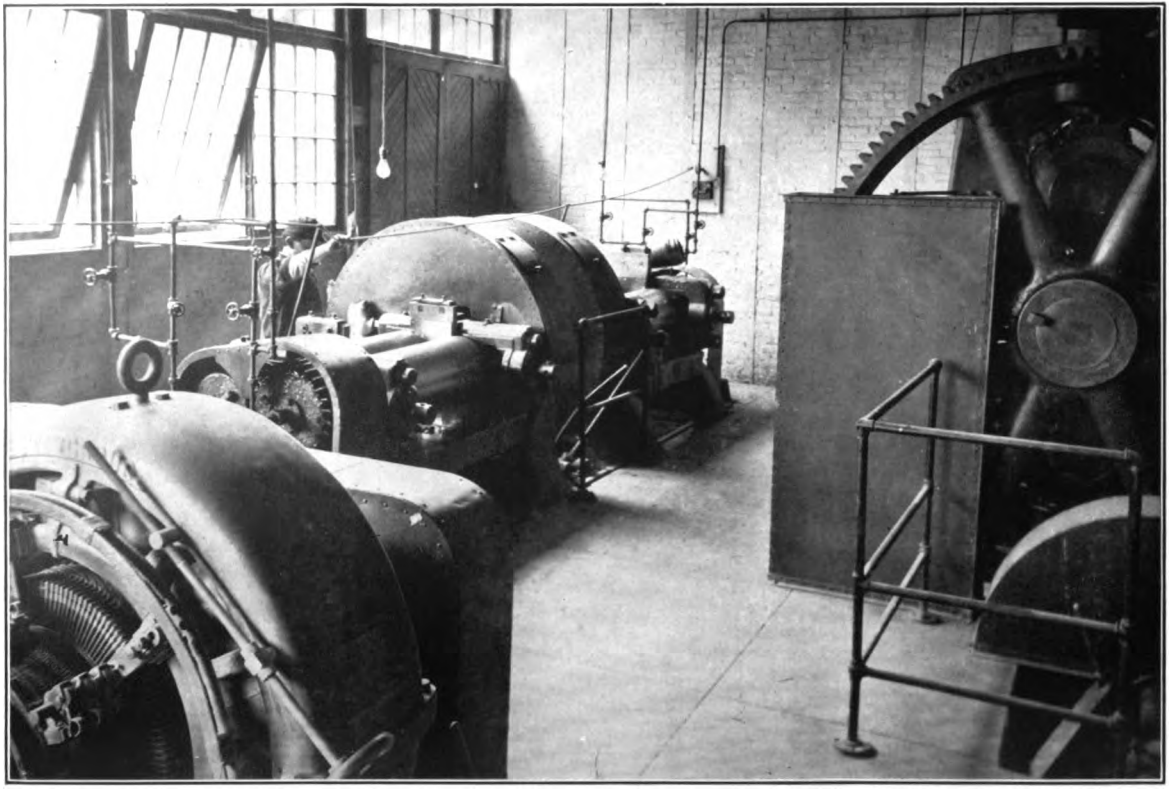


PLATE 6.—STOP ARRANGEMENT OVER ROLLING MACHINES

By pulling the rope which the operator is holding, the switch is thrown out and the motor driving machinery is instantly stopped

still making suggestions, and they undoubtedly bring up many things that otherwise they would not mention at all.

The details of the committee organization are left largely to the local managers, who adapt the scheme to local conditions and bring some of their own ideas into play. One superintendent makes out the lists of workmen's committees for several months, and posts them in the mill so that the men will see them and know some time ahead that they are to serve on the committee. He says that they like to see their names used in this way, and "load up" in advance for the time when they are to begin this service. At another plant it is customary to have one member of the foremen's committee go about with the workmen's committee, to explain and discuss any problems which may come up. While there are these local variations in the different plants, the plan and scope of the work are the same in all: each committee makes a written report of its inspection, the recommendations of which are numbered, and the numbers of any incomplete items are all shown on a monthly statement until they have been carried out, as mentioned later.

Our experience with these committees has been uniformly satisfactory; benefits accrue both from the actual recommendations, and from the enlivened interest which the men are taking in safety appliances. A master mechanic of one of the large plants said a few days ago, that he can notice a decided change in the attitude of the men toward safety matters since these committees were established; that where he used to have difficulty in keeping any safeguards in place, the men are now looking out for them and helping keep them up. Some of the things they bring to light are such as might escape an outside inspector in a dozen trips through the mill. For instance, one of the workmen's committees recently called attention to a platform which was so placed that when it rained the water deflected back into the "mixer building" where melted iron is constantly being handled; this water lying in pools on the floor would cause a serious explosion if hot metal were spilled into it. Other items refer to gear covers which have been taken off and not replaced; to steam which forms in cold weather and obscures an open reservoir; to elevator gates which have been tied up so as to make them ineffective; to places which are poorly lighted at night, etc., etc.

MILL SAFETY INSPECTORS

There are certain classes of equipment that require thorough inspection at frequent intervals by men of special training, who can go over them in greater detail than is possible for the mill committees. In this class are electric traveling and locomotive cranes, engine stops, elevators, shop equipment, cars, locomotives, etc., and for them special inspectors have been appointed, who make a weekly report on a printed form. At present we have nine such forms in use, similar in arrangement to the crane report

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AMERICAN STEEL & WIRE CO.

_____ WORKS

SAFETY INSPECTION OF CRANES. DATE_____

CRANE No.												
Drums, Chains, Cables and Hooks												
Wheels and Flanges												
Brakes and Bells												
Sweep Brushes and Bumpers												
Track Clamps												
Draw Bars and Push-Poles												
Motors, Generators, Electric Wiring, etc.												
Foot-Walks and Railings												
Warning Signs												
Any Other Part Not Specified Above												
Does Operator Consider Crane Safe? Should Crane be Shut Down Immediately Until Repaired?												

Designate Parts Inspected and found O. K. by "X."
Designate Defective Parts by a letter, using A, B, C, etc., and give explanation of Defect in Blank Space Below

Form used for weekly inspection report of special machinery; these forms (5 x 8 inches with wide margin at bottom for memoranda) are filled out by the local safety inspectors in each plant.

shown above. It will be noted that the important parts are all specified, and each part is checked off on the form as the inspector goes over the cranes; one of the headings requires the man who is operating the machine to state his opinion as to its safety, and there is a provision for stopping it at once if any serious defects

PLATE 7.—ELECTRIC TRAVELING CRANE BOUGHT ABOUT TEN YEARS AGO
This shows open gearing, overhung gears, exposed couplings, etc.; the foot-walk on which the men are standing was placed on the crane after it had been installed

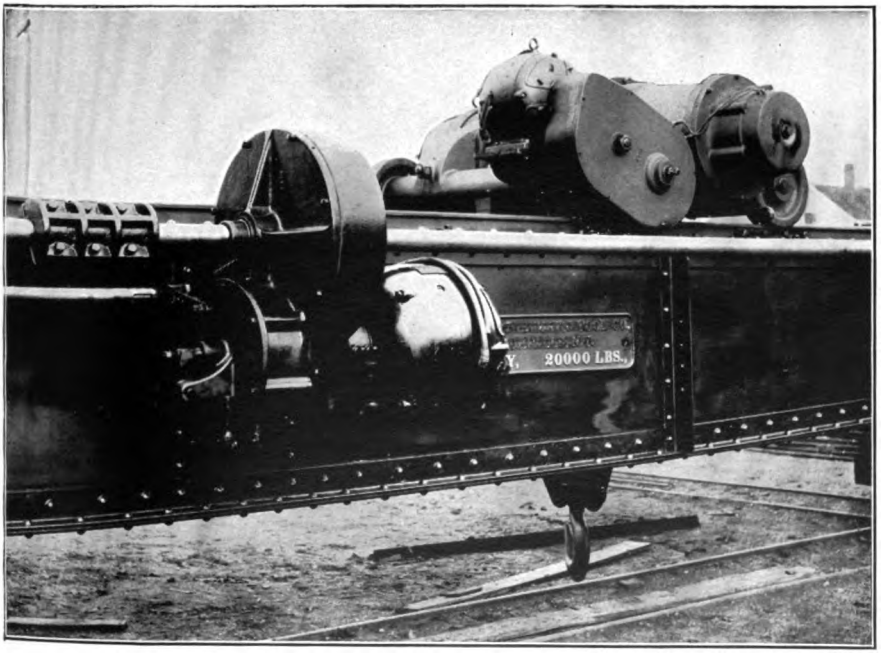


PLATE 8.—ANOTHER CRANE, SHOWING WHAT CAN BE DONE IN PROTECTING GEARS
It is practically impossible for anyone to be caught in the gearing of this crane, or for any of the parts to work loose and drop

are found. There are at present 28 men engaged in such special inspection in the American Steel and Wire Company plants, aside from the local committees. In the larger works this takes all of one man's time, while in smaller ones, two or three days per week may be sufficient, the inspector working as a machinist, electrician, etc., the rest of the time.

The reports of foremen's committees, workmen's committees, and safety inspector, are compiled once a month, and copies sent to the general offices of the company. These statements include all new items, and at the end of each report, show the "Recommendations Completed During Current Monthly," "Previous Recommendations Incomplete," "Recommendations Objected To." This gives a monthly survey, from which a good idea may be obtained of the general condition and progress at each plant, and additional pressure may be brought to bear where the progress is not satisfactory.

Aside from the practical value of the recommendations secured, there is a moral effect in this varied inspection which must not be overlooked. The foremen, millwrights, and repair men—all who are in any way responsible for the condition of the machinery—are stimulated to greater care and attention in keeping everything in good shape. The knowledge that any defects will be mentioned on an inspection report (sometimes on two or three), each week until the defect has been remedied or the delay investigated, undoubtedly does much to prevent tardiness in carrying out this work. During the month of January, 1910, there were approximately 1,500 specific recommendations made by these different inspectors and inspection committees in the American Steel and Wire Company's plants. Of these over 500 had been entirely completed before the end of the month, with material ordered and work under way on a great many more.

BOILER PLANTS

In mills driven by steam engines the boiler plant is the primary source of power. It generates steam which is piped to the engines, and is a storehouse of energy so great that when any mischance releases this energy in the form of an explosion, buildings are demolished and lives endangered. The possibility of

such catastrophes has been so emphasized by repeated boiler explosions, that most states and municipalities have laws requiring a systematic inspection of boilers by authorized inspectors. In the United States Steel Corporation this is done by an outside inspection company which makes a specialty of boiler insurance, each boiler being thoroughly inspected at least once in six months.

In addition to this inspection, which is directed mainly to the detection of corrosion or defects which might lead to an explosion, many minor arrangements can be made to contribute to the safety of men whose duties require their presence in and about boiler plants. The failure of a part in a boiler or steam pipe, insignificant in itself, can instantly involve men and machinery in a cloud of blinding vapor, so that ladders and passages that would be safe under normal conditions, may bring misfortune upon the workmen groping about with ineffective vision. Under such conditions prompt and unimpeded access is needed to overhead valves and connections, stairways being preferable to vertical or inclined ladders, and all stairways, walks, tops of boilers, etc., across which it is necessary for workmen to pass, should be thoroughly protected by hand rails, and well lighted. Plates 1 and 2 show stairways in one of our boiler plants.

The arrangement of piping may be such as to form what is known as a "water pocket," that is, a place where water gathers from the condensation of the steam. The opening of a valve will shoot this water forward with sledge hammer effect, bringing disaster to the piping system or the machinery to which steam is furnished, and endangering the lives of all who may be near. Water pockets should be guarded against in designing a system of steam piping, but where oversight or necessity has brought about such a form of construction, the danger has been obviated by placing a "drip" in the water pocket, that is, a small drain with a valve through which the objectionable water may be allowed to flow from the pipe before a main valve is opened.

Many plants are provided with a tunnel underneath the boilers, through which, where coal fuel is used, the ashes are removed; not infrequently these tunnels are so arranged that there is a "dead end," from which there is no means of egress. A break which would let steam or hot water flow into the tunnel and

PLATE 9.—WIRE DRAWERS AT WORK

The pipes suspended over the men are connected to a central ventilating system. In the center are shown the automatic stop levers. A tangle at the reel throws the lever forward automatically shutting down the block affected. The lights on the columns mark push buttons by which the engine driving the entire department may be stopped. In three instances in the last year these push buttons have checkmated what would have been, probably, fatal accidents.

cut off escape by the one outlet provided, would be liable to scald or suffocate any workman who happened to be in this section of the tunnel. Six cases of tunnels with "dead ends," which have come under our observation in the past two years, have been corrected by providing additional doors, ladders, or other outlets.

Every boiler is equipped with a gauge glass, that is, a vertical glass tube about three-quarters of an inch in diameter, by which the height of the water in the boiler can be known. These glasses frequently break, as they are subjected to the same steam pressure as the boiler itself, which may be from 100 to 150 pounds per square inch, with a temperature of from 300 to 350 degrees Fahrenheit. When a boiler tender opens the valve after putting in a new glass, it is liable to explode before his face like the cannon cracker which the boy celebrating the Fourth of July holds too long after lighting, and the results are much the same—more or less severe cuts and burns, and possible destruction of his sight. Danger from this source has been eliminated by using the gauge glass guard shown in Plates 3 and 4. This guard is made of sheet steel and can be turned in front of the glass when anyone is working about it; after the work is done it is swung around back of the glass so as not to interfere with the view of the water.

A number of our boiler plants have been equipped with non-return valves, which only come into play in case of an accident. There may be 10,000 H.P. of boilers connected into one piping system, so that if any part of a boiler or main steampipe fails this stored up energy will be released with terrific force at the point where the break occurs, until valves can be closed or fires drawn and the boilers cooled down. The non-return valve closes automatically in case of accidents of this sort, and thus brings the system under control without the risk which must be taken by men going in to close the valves by hand.

Three connections are necessary for each boiler—one through which water to be evaporated is admitted; a connection from the boiler to the main piping through which the steam is carried away; and a connection to a system of "blow-off" piping, so that the sediment which settles from the water can be blown out at intervals. Entrance to a boiler is obtained by means of a "manhole," which is just about large enough to enable an average sized man to

wriggle through comfortably, a process which cannot be accomplished very quickly. Thus the workman who enters a boiler, while other boilers of the same plant are in use, is necessarily at the mercy of the men outside, as the accidental opening of a valve might result in his serious scalding. There are long rows of these valves exactly alike and mistakes are liable to occur; to guard against this the valves have been numbered and red warning signs marked "Danger—do not move," are hung on them when anyone is in a boiler. Wherever practicable, it is made the duty of the man doing the work to place these warning signs.

ENGINE INSTALLATIONS

The power which turns the shafting and drives the machinery in our mills, is furnished chiefly by large steam engines. These engines have fly-wheels weighing from twenty-five to seventy-five tons each, running at a rim speed of five or six thousand feet per minute. The energy stored in one of these wheels when operating is about equivalent to an average sized passenger locomotive, running at the rate of sixty miles an hour. If an engine is allowed to speed up, additional energy is imparted to the fly-wheel until it bursts from centrifugal force, unloosing a power which might be likened, roughly, to a locomotive and a train of several cars, ploughing their way through the mill at the rate of "a-mile-a-minute." This terrific force is controlled and held in check by the "governor," which is usually an arrangement of two fly-balls revolving at a speed proportionate to that of the engine, and automatically reducing or increasing the steam supply. Certain parts of the governor may break and cause the engine to "race," and if the engineer cannot get a valve closed quickly enough the fly-wheel will "explode."

There is a safety attachment on the governor, which is intended to stop the engine in such emergencies, but engineers frequently allow this attachment to become ineffective. On a single inspection trip, this was the case with ten out of sixteen engines observed. In one instance a roll of waste was placed under the governor bracket, in another a wood block was used, in others the bolts were clamped so as to produce the same result, in two or three cases the man in charge simply said he had "forgot"

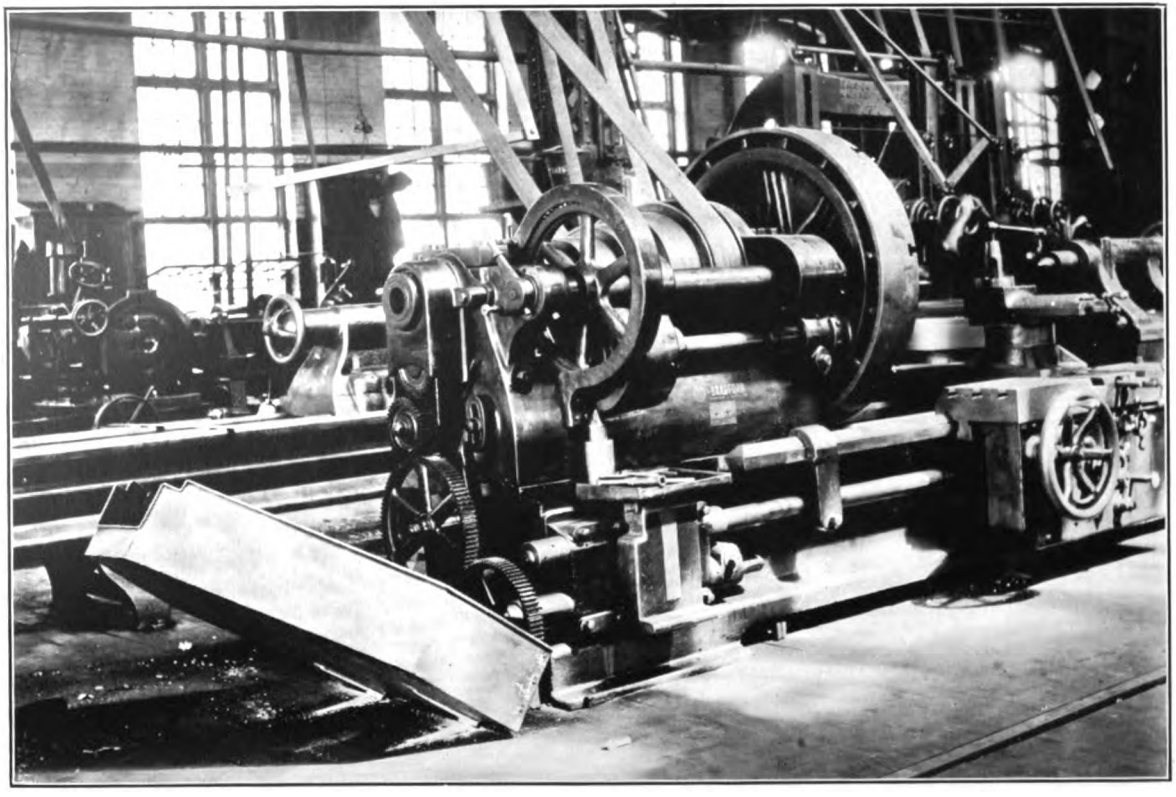


PLATE 10.—A STEEL GUARD FOR THE END GEARS OF LATHES

This can readily be swung out of the way for changing gears, and it is a good expedient for protecting gearing of a machine which was not covered by the maker

to fix it up after a shutdown. One grayhaired engineer of perhaps fifty years to whom I spoke about this condition, minimized the danger, saying, "I have been running this engine now for six years and have never had an accident," and yet on further questioning he admitted that such an accident might occur at any time, due to that insignificant handful of waste, and that probably he would be the first man injured. Each of the men running these engines realized what might result from their interfering with the action of the governor, yet they all took the chance, because it never had happened in their experience.

To improve matters we are having counterweighted brackets placed under the engine governors, so that they will drop out automatically when the engine is running, without any attention from the engineer, and a written report is made weekly on one of the inspection blanks previously mentioned, which shows whether this safety feature is being used or not. As an additional safeguard, practically all the large engines in this company have been equipped with automatic stop valves having a speed limit attachment. These are intended to shut the engine down automatically when it exceeds a certain safe speed, and the valve may be closed also by pushing an electric button in various parts of the mill. At intervals here and there in the different departments there are little blue lights, each of which marks the location of a push button for the engine stop system. Sometimes they are on a column, sometimes suspended over a machine, and there are anywhere from five or six up to forty or fifty of them in each system. If a man is caught in the machinery, or there is a breakdown of any sort, one of these buttons is pushed, which shuts off the steam and stops the engine. Nearly one hundred of these stops have been installed in plants of the American Steel and Wire Company.

The push buttons operate by electricity, and the small wires which carry the current to the engine room may be broken, the push buttons may get out of order, or the batteries develop defects; here, if anywhere, "eternal vigilance" is the price of safety, and we have arranged that the daily shutting down of the engines shall be by means of these buttons, and that once a week each button shall be pushed with a man at the engine throttle to see that it works properly,—the speed limit tried, the voltage

of the batteries taken, and the lines tested for breaks; all of this being reported on a printed form. In several places butterfly valves have been placed in steam lines to engines, that is, a valve which closes instantly by pulling a lever, and chains or wire ropes are carried from this lever to convenient points for stopping the engine from a distance.

MOTOR STOPS

In departments driven by electricity, we have motor stops corresponding to the automatic engine stops described. In some cases these are arranged to operate by push buttons, and in others a rope is carried directly from the machinery to the switch controlling the motor, so that the switch can be pulled by means of the rope in case of emergency. Plate 6 shows a series of machines having a stop of this sort. There is an operator at each set of rolls. Recently when one of them had his hand caught he cried out, and several of his fellow operators pulled the rope with such vigor that the switch was torn bodily from the board. The motor was stopped so quickly that only the tips of the injured man's fingers went into the rolls, whereas his whole hand would undoubtedly have been crushed but for this safety stop.

ELECTRIC CRANES

Electric cranes have been called the "giant laborers" of the mills. They pick up a ladle weighing twenty tons, with fifty tons more of molten iron inside it, carry, and pour it as readily as if it were a cup of tea. Heavy rolls and housings used in the mills are lifted out and replaced by them, and in many departments all of the daily tonnage is handled one or more times by cranes. They are excellent servants, but sometimes they blunder, and a ladle of steel upset may mean disaster to a dozen men. There are gears and wheels which mangle; and twenty, thirty, forty feet of space underneath the man who falls from a crane bridge.

Some one has said that the education of a child should begin with its grandparents; certainly the best time to safeguard a crane is before it is bought. This method can be used when new machinery is being obtained, and in order to insure

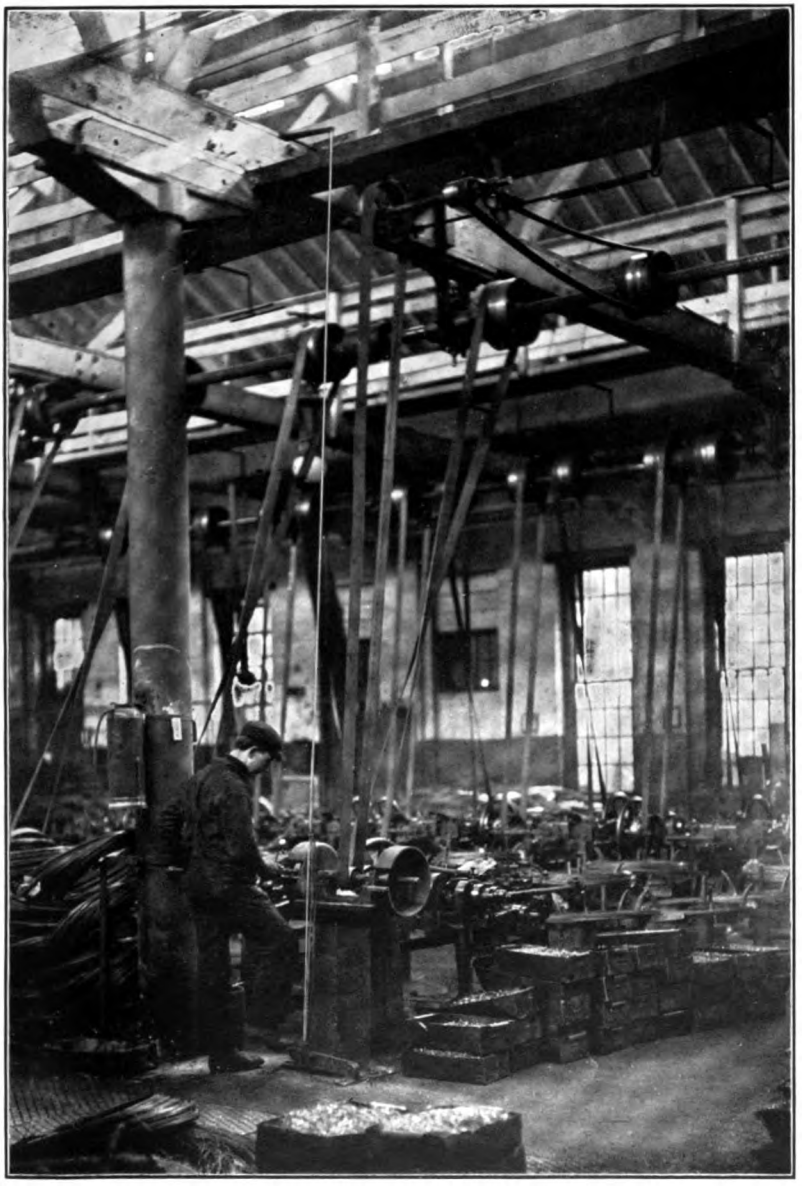


PLATE 11.—VIEW IN NAIL MILL SHOWING SAFETY HOODS OVER EMERY GRINDERS, WHICH ARE FLANGED OUT OF A SOLID PIECE OF STEEL PLATE

The foot treadle must be held down while the grinder is being used; as soon as the treadle is released a spring throws the overhead belt on to the "loose" pulley, stopping the grinder automatically. Walks for oilers will be noted in the trusses at the top of picture; in this case they are fenced in with boards, although pipes or structural railings are frequently used

proper attention to these matters by crane builders, standard safety specifications have been prepared for use in ordering new equipment for the American Steel and Wire Company. These specifications provide for a foot-walk on the side of the crane bridge, with a toe-board along the edge of this walk; exposed gears are to be covered and overhung gears eliminated. (Examples of these conditions are shown in Plates 7 and 8.) Limit switches are required to prevent a load being lifted too high and breaking away from the drum; a safety switch is to be placed on the upper part of the bridge so that a workman can throw out this switch and prevent anyone starting the crane from the cab while he is at work; safety couplings, brakes and bumpers are specified; also a gong which the operator can ring to warn anyone underneath of the approach of the crane; a brush or prong is required which moves along the track in front of the crane wheel, and would push aside a hand or foot resting on the rail of the runway before it would be crushed by the wheel. Wire ropes are also specified for hoisting purposes instead of the chains which have been used largely in the past; the failure of a single link in a chain means dropping the load, while several members of a wire rope may be broken without interfering with its service, and the broken strands give warning of weakness which would not be apparent in a chain.

One of the most important safety provisions for a crane is a foot-walk on the bridge (see Plate 7), for the use of the crane operator, who must go all over his crane every day or two to oil and inspect it, and for the repair men, who must handle tools and remove and replace parts of the crane. Where a foot-walk is not provided, it is necessary to walk on the upper edge of the girder, the surface of which is bisected by a rail, and broken up by rivets and bolts, and is, moreover, frequently slippery with grease or oil which drips from the bearings. If mention is made at the time the order is placed, any of the standard crane builders will furnish a foot-walk on the crane; but of course it adds slightly to the cost, and in view of the competitive bids on such work, it is only natural that the foot-walk should be omitted if it is not distinctly specified.

Where these general matters have not been considered in designing and arranging the different parts of a crane, it is difficult, and sometimes impossible, for an operating company to make all

of the above safety provisions, but whenever practicable they are being installed on our old equipment.

FOR WIRE DRAWING EQUIPMENT

Plate 9 shows the arrangement of a modern wire mill. A coil of rods or wire is placed on a reel, from which it is drawn through a die to a revolving block, the opening in the die being smaller than the original wire, so as to decrease its diameter. It is possible by this process of cold drawing to reduce a quarter-inch rod to the thickness of a hair, that is, one or two thousandths of an inch.

There are several things which may occur to endanger the wire drawer. If the wire does not uncoil freely the reel may be dragged forward and crush him against the frame of the machine; a loop may spring over the top of the reel and catch his arm or foot, so that if the block is not stopped promptly the loop will tighten and lacerate, or even cut off the member; or the wire may break, and the flying end put out an eye, or cause a scratch or puncture wound from which blood poisoning may result.

In the center of Plate 9 is shown a battery of levers sticking up from the floor. Each of these levers is arranged so that when it is thrown forward it automatically stops one of the drawing blocks. All that is necessary for the wire drawer to do is to place the wire through the eye in the upper end of the lever, and any tangle or flying loop will shut off the power without further effort on his part; or he can push the lever forward by hand and thus stop the block without going any nearer to it, thus eliminating the danger of being struck by the end of the wire.

In all of our wire mills some form of this stop has been put in. A number of different applications of it were assembled on one drawing and prints sent to each plant. It is simple and effective, the only objections to it being the amount of floor space it occupies and the second's time it takes to place the wire through the lever. It may save an arm, an eye, or even a life—and yet some of the workmen have broken them off, others have refused to use them, and after a campaign of several years along this line, one never goes into a mill without seeing some places where the operators carry the wire past the safety lever without using it.

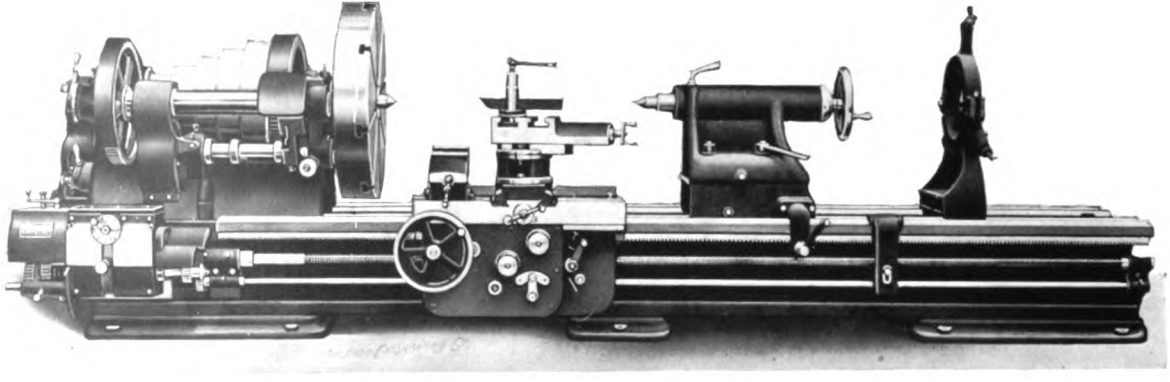


PLATE 12.—LATHE OF RECENT DESIGN; THE GEARING IS SCARCELY VISIBLE

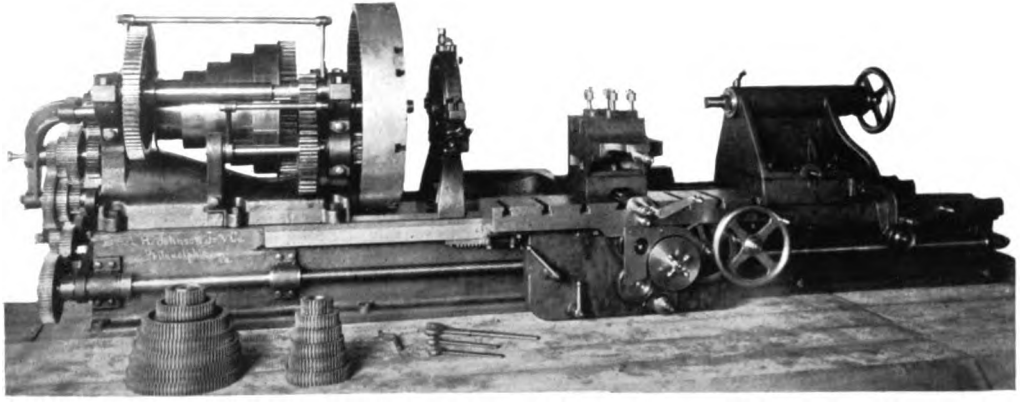


PLATE 13.—LATHE BUILT TWELVE OR FIFTEEN YEARS AGO

A little attention has been given to protection, as the plate over the front gears shows; the remaining gears are entirely exposed

MISCELLANEOUS SAFETY PROVISIONS

In addition to the more common forms of protection, such as the elimination of projecting set-screws, covering of gears (Plate 10), erecting of railings, etc., there are a great many provisions which could not be described in detail in an article of this sort. One of the dangerous occupations in the mill is that of oiling shafting and machinery. Wherever practicable, arrangements have been made to do this while the equipment is not in operation; in some cases oil cans are used having light spouts ten or twelve feet long, which enable a man to oil overhead shafting without leaving the floor; in other cases railed walks have been erected along lines of shafting, so that the bearings may be reached without unnecessary risk or inconvenience.

Standard scaffolds with handrails are provided for the use of painters, riggers, etc., and a "painter's chair" has been designed which has a safety belt so that if a man were to fall out of the seat the belt would still hold him. Rules regarding the construction, inspection and testing of this equipment have been posted in all of the shops where such appliances are used.

Counterweights are being boxed so that they cannot fall on anyone in case a rope or chain breaks; covers and shields are provided for emery grinders (Plate 11); safety stops of various kinds are arranged to enable machines to be shut down quickly in case anyone is caught; blacksmith's tools are inspected to see that the edges are not allowed to "mushroom" until some one is struck with a flying chip; storage yards are inspected to see that material is not piled too close to the tracks; planer beds are covered in the machine shops and safety cylinders provided for all jointers in carpenter shops.

Accidents which occur are studied with a view of determining means for preventing similar accidents, and a constant effort is made to anticipate danger in any form before it results in an accident.

General specifications, rules, drawings and photographs of standard appliances, are being compiled in a handbook, which it is intended shall be to the safety inspector what the standard reference books are to the engineer; these handbooks will be

furnished to those who are responsible for the design, installation and maintenance of equipment in our mills.

NEW PLANTS

In erecting a new plant or in making extensions to an old one, much of the machinery is bought in practically completed form from outside manufacturers. When gear covers, etc., have to be adapted to old machines the results are always more or less unsatisfactory; the arrangement may be such as to afford no adequate means for attaching a guard, or a cover which protects one part of the machine may interfere with some of the other working parts. These difficulties can all be avoided if sufficient thought and attention are given to safety considerations when new machinery is being designed, as the different parts can then be arranged most advantageously. In planning a new plant, the drawings are all checked over to see that the latest safety provisions have been included; the following note was inserted in a contract prepared recently for a mill to be erected by the American Steel and Wire Company:

> Safeguarding of gears, spindles, couplings, collars, set-screws, keys, etc., will be covered as fully as possible in the drawings which we furnish, but it is understood that these features shall be subject to the approval of our inspectors, who shall have free access at all times to the machinery while it is in process of construction and erection.

In addition to the detailed specifications for various classes of equipment, each of our purchasing agents has been supplied with the following stamp, with the object of further stimulating interest in safeguards on the part of machinery builders.

Provisions for safeguarding workmen should be brought to our attention, as we will consider them in selecting new machinery and equipment.

This notice is stamped on correspondence, and the results which are already in evidence show that it is having a beneficial effect, from which other companies will profit as well as our own.

The demand for more thorough safety precautions is be-

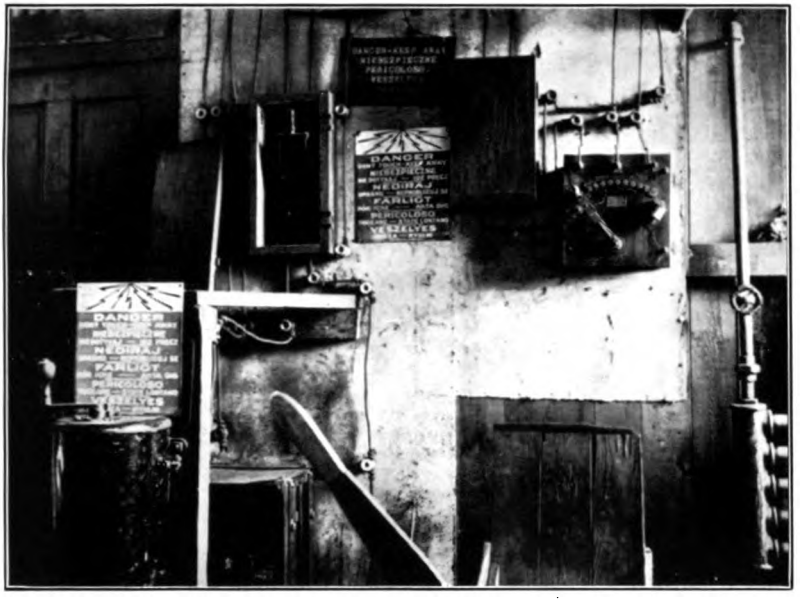


PLATE 14.—MILL SWITCH BOARD SHOWING METHOD OF MARKING ELECTRICAL EQUIPMENT

The small sign at the top of the picture reading "Danger—Keep Away" is made of non-conducting fiber and is hung over a switch when anyone is working on the machinery it controls

PLATE 15.—PROTECTIVE DEVICE FOR TRAP DOORS

The guard rods rest on ledge of door frame when the cover is raised, and drop down out of the way when it is closed

PLATE 16.—WARNING SIGN TO ATTRACT ATTENTION TO WORKMEN OVERHEAD

Intended to prevent injury from falling tools or material

coming recognized by manufacturers generally, and when requested most of them will furnish very good forms of protection. Plates 12 and 13 illustrate the improvement which is being made in machine tools and crane design; where open gears were the rule a few years ago, everything is now smoothly covered, and the gearing is practically invisible.

THE HUMAN ELEMENT

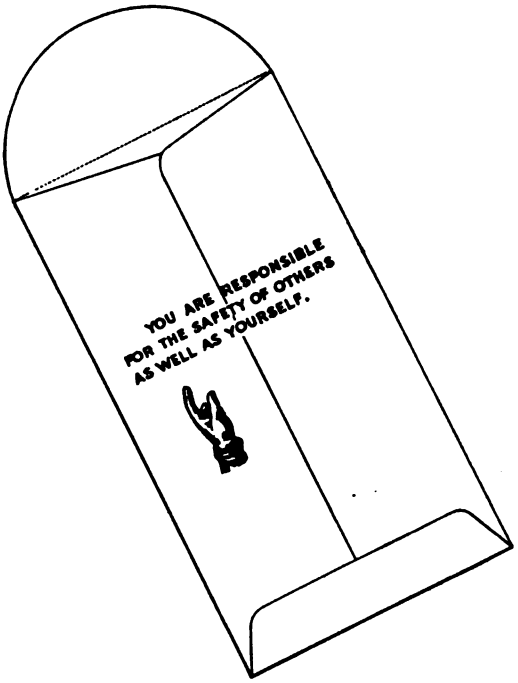
From statistics which have been prepared both in this country and in Germany, it would appear that about one-third of the total number of industrial accidents are attributable in whole or in part directly to carelessness or negligence on the part of the workers themselves. In other words, a considerable percentage of the accidents which occur can be charged to the human element and cannot be prevented by mechanical safeguards. If they are to be materially reduced they require other treatment.

The problem here is largely a psychological one, and we are working on it in a number of different ways. Men are prone to take chances, and it is not surprising if the same spirit which causes one man to ignore a cold until pneumonia succeeds it, or to risk his home in the stock market, causes another to take reckless liberties with a red hot rod. Anyone who has watched a gang of structural workers twenty stories in the air scaling the steel columns of a new building, must be impressed with the needless risks that these men take.

We are endeavoring to bring about a change of sentiment among the workmen; to make them realize that it is quite as worthy and honorable to be careful and not to take such risks, as it is to assume the reckless, dare-devil attitude that is often found. There are dining rooms in practically all of our plants where the foremen assemble for lunch, with a more or less informal business meeting after the meal. Reports of accidents are discussed here, letters of instructions and general safety recommendations are taken up; talks are given; and a constant effort is made to impress upon the foremen their responsibility in warning the men in their charge, or cautioning them when they see them in any dangerous practice.

When the men receive their pay envelopes, they find little

"sermonettes" printed on the back of the envelopes, urging them to take care for the safety of themselves and others. These are placed also on certain printed forms which are used largely in the mills, such as the sheets on which the time distribution of the men is recorded, and those on which requisitions for material are filled out. The following wordings are a few of these which have been used for this purpose:



"The exercise of care to prevent accidents is a duty which you owe to yourself and your fellow employes."

"Always be careful and take no risks."

"Carelessness as to the safety of yourself or others will be sufficient cause for dismissal."

"The more you insist upon carefulness on the part of others, as well as exercise it yourself, the safer it will be for all."

"Report all injuries however trivial; blood poisoning is the result of neglected wounds."*

Realizing that what is sometimes classed as carelessness may be merely thoughtlessness or lack of understanding, signs are posted in the mills which are intended to keep the necessity for caution fresh in the mind. Following a newspaper account of an

* This is intended to encourage the men to make use of the hospital facilities described later.

PLATE 17.—GUARD FOR FROGS MADE OF STEEL PLATE

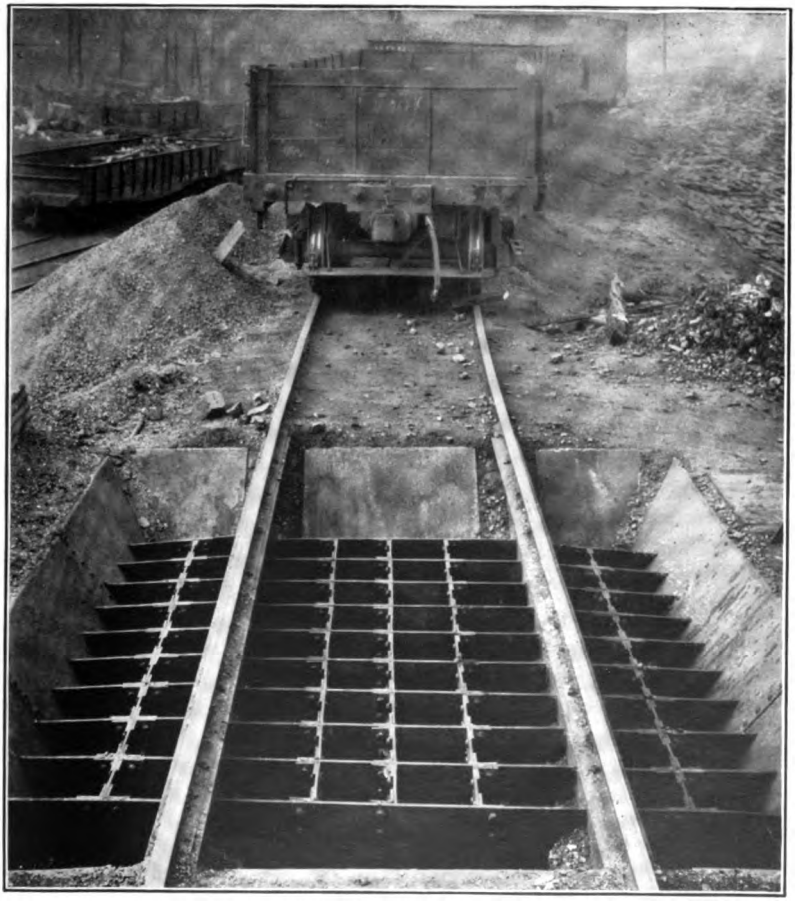


PLATE 18.—GRILL WORK PROTECTION FOR BINS AND HOPPERS
Sometimes a workman falls through a car of coal or ore, into the bin underneath the track, where he is liable to be suffocated if not gotten out promptly

accident in an outside company, where three men were crushed to death in the air cylinder of a blowing engine, this notice was posted in each of the blowing engine rooms of the American Steel and Wire Company:

> NOTICE.
>
> ALL PERSONS ARE POSITIVELY FORBIDDEN TO ENTER AN AIR CYLINDER OF A BLOWING ENGINE UNTIL FLY WHEELS HAVE BEEN SECURELY BLOCKED, TO PREVENT POSSIBILITY OF ENGINE TURNING OVER.
>
> _____
> Supt.

Signs are placed at ladders or passageways leading to crane runways, instructing men to notify the crane operator before doing any work on a crane; warning signs are hung on valves, switches and controlling levers of various kinds of machinery to guard against their being started while the men are working where they might be injured; notices are placed at railroad crossings and along tracks, in freight elevators, and in other places where they will attract attention to possible dangers.

Plate 14 shows the warning sign which is used for marking electrical equipment. It is printed in six languages and is surmounted by branching lines of "red lightning" which ought to make it universally understood. The smaller sign at the top of the picture, marked "Danger—Keep Away," is made of non-conducting fibre and is hung over the controlling switch to show that it should not be operated.

It is difficult to get the men to exercise the continued care which is necessary to guard against accidents; it has been said that "familiarity breeds contempt," and this is nowhere more strikingly demonstrated than in the mills.

While investigating a case recently, where the general foreman of a rod mill was injured, one of this man's assistants took me to the location in the mill where the accident had occurred, stepping over running lines of red hot rods to reach the exact spot.

He explained that a guard of wire netting had been placed at the rolls, which was supposedly fine enough in mesh to prevent a rod going through it. By a peculiar chance, however, a rod which was exactly the same diameter as the opening in the mesh struck the screen fairly and went straight through it, injuring the man standing in front. With this catastrophe thus vividly before him, my guide started to show me another part of the mill, but instead of going round about somewhat as he might have done, he went directly along a line of guide pipes through which hot rods were running at the rate of 1,100 feet a minute. In doing so, he said apologetically, "We'd better hurry here, as a rod sometimes jumps from the pipes." If a loaded rifle were mounted in a mill and arranged to discharge at uncertain intervals, a man who passed in front of it would be considered foolish, and yet this is practically what some men are doing daily in the mills.

I later talked to the injured foreman and he assured me that he had been positive that the screen was fine enough to stop anything which would be rolled there, and had been greatly surprised to find that the rod could get through; he saw it coming and tried to "dodge" it, but was not quick enough. As it was, he escaped very fortunately from what might have been a fatal injury. Although the hot rod practically passed through his body, penetrating a lung in its course he was in the hospital but two weeks, and was back at his regular duties in the mill four months later.

Anyone who is familiar with mill conditions, or, to put it more broadly, who knows something of human nature, realizes how difficult it is to change the accustomed method of doing things. When a safety appliance is installed it may involve some inconvenience to the workmen, it requires adjustment and repairs, at least it is something new, and the man who has been getting along without it for several years is generally against it. If he has never seen an accident of the kind in question it seems a very remote possibility to him.

It is a slow process of education, but by continued agitation, by thorough inspection in which officials and workmen join for the common good, by commending what is good and holding it up as a model for all, the standard of safety conditions is being steadily raised.

PLATES 19 AND 20.—WORKMAN EQUIPPED WITH SAFETY HOOD, READY TO ENTER A GASEOUS ATMOSPHERE

This is a type of equipment which is used largely for rescue work in mines, and has been provided for our gas engine plants. The same air supply is breathed over and over again, being constantly purified and supplied with the necessary oxygen

PLATE 21.—TYPICAL VIEW OF EMERGENCY HOSPITAL IN ONE OF THE MILLS

RESULTS

In considering the results of this work, a comparison of the number of accidents occurring in the different mills shows much irregularity. A large percentage of reduction was made in some plants in 1909, as compared with the preceding year, but very little change appeared in others where an equal effort was made to improve conditions. The total number of accidents, however, is a very indefinite standard of comparison for several reasons. Slight injuries, of which no notice was taken a few years ago, are now reported; a particle of emery dust in the eye, or an insignificant scratch on the hand may become infected later and develop serious complications, so that greater emphasis is placed on having all such cases reported promptly so as to have proper attention given them, even though no time is lost by the man affected.

One is impressed with the capriciousness of fate when confronted with the peculiar ways in which accidents occur. An engineer had started home one evening at the end of the turn, but stopped for a moment to explain to the night man why he had been five minutes late in going on duty that morning; in doing so he placed his elbow on the end of the engine cylinder; and just at that moment the connecting rod broke and the cylinder head was knocked out, injuring him fatally. In September, 1909, there were three isolated fatal accidents in one of the Pittsburgh mills, while there was none in all of the other thirty odd plants of the American Steel and Wire Company; in the succeeding month two men met fatal injury in one of the Cleveland mills, while, as before, these were the only fatalities for the entire company.

On the other hand, there are quite as striking instances where what might have been serious catastrophes have resulted in no harm. In one of our plants there is a group of machines in a building adjacent to the boiler plant. A couple of years ago the main belt furnishing power to these machines broke about midnight, and it was decided that it was useless to try to repair the belt that night, so the men were sent home. A little later a high wind which was blowing tore down the boiler stacks, and they fell over the building in which these men had been employed a short time before; parts of the wall were knocked down and a section of the roof fell in. The next morning the heavy beams

and timbers which were lying over these machines indicated what might have resulted if that main belt had not snapped and the men had remained at work. Notwithstanding the fact that two buildings were wrecked, and a sixteen-inch steam main was broken in the boiler plant, no one was injured.

Such occurrences introduce a large element of chance, which tends to invalidate any comparison from month to month, or year to year, and the plants are being constantly extended, giving an increasing number of employes to be considered. With these varying factors it would require a detailed study and analysis of classified injuries extending over a period of years, to give any convincing statistical information as to the decrease effected; and so far we have been concentrating on the active work of accident prevention, rather than on theoretical research of this nature.

We are very certain, however, as to the results, and numerous specific instances which might be cited give definite clues as to what is being accomplished. In one of our eastern plants, power is furnished to three floors of a wire mill by a motor located in the basement. We planned an installation of push buttons for stopping the motor from the different floors, but had considerable difficulty in getting a safe arrangement on account of the fact that a high voltage current was used. For several months experimental work was conducted and various devices and expedients were tried, until finally a satisfactory arrangement was secured. Shortly after the installation was completed an operator was caught, on the second floor of the building, and was drawn to the block; his assistant pushed a button and stopped the machinery almost instantly, preventing any serious injury. Without the stopping device this man would probably have been killed, as it would have been necessary to go from the second floor to the basement to shut down the motor. There have been three specific instances in the last year where these motor stops have been similarly effective.

There have been several cases during the same period, where accidents have occurred in places covered by recommendations of safety inspectors, before these places could be safeguarded, showing conclusively that it is possible to anticipate trouble of this sort. During an inspection tour of a plant outside the American Steel

and Wire Company, the writer went over various features of the electrical installation with the chief electrician of the plant. Among other points which were mentioned was the provision of sweep brushes in front of the crane wheels, as some of the cranes had these while others did not. The electrician acknowledged the value of this device, and said that it would be placed on all cranes as promptly as possible. The day following a man had his arm cut off by one of the unprotected cranes. He was holding to the girder with his arm across the track while adjusting an electric wire, and had failed to notify the crane operator that he was there. If the crane had been equipped with brushes, the most serious result, regardless of his lack of ordinary precaution, would have been a fall of about six feet to a platform. Numerous instances of this sort could be cited, and while it is generally impossible to point out a particular safeguard and say it has prevented an accident, it is obvious that the thousands of protective devices which have been installed in the various plants of the company, must frequently prevent injuries which would otherwise occur.

CARE OF THE INJURED, BENEFITS, PENSIONS

In concluding it might be well to mention briefly the methods used by the American Steel and Wire Company in caring for injured men, and those who are incapacitated by sickness or who have reached the age limit for retirement.

There is an emergency hospital at each plant to give prompt aid to the injured; these hospitals are fully equipped with surgical instruments, dressings, beds, etc., and each is in charge of a competent surgeon paid by the company. In the larger plants, where circumstances warrant, nurses are in constant attendance. Very serious cases are sent to the public hospitals at the company's expense, and all injured men are cared for until they have fully recovered, irrespective of the manner in which their injuries were received. In cases of prolonged disability financial assistance is given to the injured man, according to the merits of the case, based on his age, family relations, and record as to term of service and faithfulness. These injury benefits are dispensed equitably without consideration as to whether the company is legally responsible for the injury or not.

In each plant there is a "mill committee" composed chiefly of foremen, whose duty it is to seek out and visit faithful employes who may have become sick and destitute. This committee investigates such cases and makes recommendations for financial relief for those whom it considers deserving. During the year 1909 more than $7,000 was distributed gratuitously in this way by the American Steel and Wire Company.

There is, in addition, a pension department, which was established in January, 1902. Pensions are granted to employes who have reached the age of sixty-five and who have been in the service of the company, or any of its predecessors, for ten years; also to any who have reached the age of fifty-five and are physically disqualified for further service, providing they have been employed the preceding ten consecutive years.

The following uniform method is used in computing the amount of these pensions: For each year of service, one per cent of the average monthly pay for the ten years preceding retirement, is allowed; for example, a man who has been in the service of the company for forty years, and has drawn an average of seventy-five dollars a month for the last ten years, would be given forty per cent of seventy-five dollars, or thirty dollars a month pension. Pensioners are allowed to seek employment elsewhere if they desire, and the utmost freedom of travel and residence is given them. In 1909 the American Steel and Wire Company had 419 retired pensioners, some of them being located in England, Ireland and Sweden, besides various parts of the United States; they received in pensions during the year a total of $56,712. The pension fund is maintained entirely by the company, without assessment or contribution from the employes.

APPENDIX IV

QUOTATIONS FROM FIRST REPORT OF NEW YORK STATE EMPLOYERS' LIABILITY COMMISSION

EMPLOYERS' LIABILITY

THE Commission is strongly of opinion that the present legal system of employers' liability in force in this state (and practically everywhere else in the United States) in industrial employments is fundamentally wrong and unwise and needs radical change.

The workman injured in his employment must of necessity bear the burden of his injury. The pain and suffering are his, and no system of law can change or shift that burden. But if that injury be not one which he has wilfully brought on himself, but has arisen from the hazard of his work, we are unanimously of opinion that the workman should be so placed by the law that he shall have the right to call for and receive such prompt and certain compensation as will keep him and those dependent on him from destitution. We are further convinced that in industries in this state as they now exist, the workmen are not able to solve this accident difficulty for themselves. Were the *laissez faire* system of political economy working without friction, a workman engaged in hazardous employments would command and receive wages high enough to enable him to carry the risks of trade accident and insure them—and there would be no problem. The accident relief burden reflected in wages would be an element in the cost of the industrial product which the consumers of that product must pay. But that theory does not work out. Wages are not relatively higher in the most dangerous trades. The

accident risk is a minor element in fixing wages, and the workers in dangerous trades are in the majority of cases not able to carry adequate insurance, and in a large proportion of cases seem to carry no insurance. In view of that fact, we are convinced that the wise policy for the state should be to throw the burden of accident relief in dangerous trades on the industry in another way. Though the workman cannot shift this accident burden upon the cost of the product or upon the trade, the employers can through their power to fix the selling price of the product; just as employers now fix their selling price with reference to the cost of replacing and repairing machinery, so we would have them make an element of the price of the product the cost of relieving the injured workers of hazardous industry.

Our present system of dealing with this question in New York (and the same system prevails in all the United States) is to make no such provision, to require that the workman assume the risks of the trade, and to give him a right to sue his employer at law only when the accident is due to fault of the employer and to recover from his employer such a sum as shall compensate him for the damage suffered. That system discarded in almost every other industrial country, we regard as inherently unfitted to modern industrial conditions in dangerous employments, and grossly unfair to workmen injured by trade risks. In practice our system with its lawsuits is so uncertain, so full of vexatious delays and so wasteful and extravagant, that as a whole it is satisfactory to no class in the community. Moreover, no change in it can cure its greatest defects unless the change amounts to abandoning the theory that the employer shall pay only when the accident is due entirely to his negligence or fault. . . .

Serious as are the theoretical objections to our system of employers' liability, they are less important than the objections to the way the system works.

. . . . . .

It is apparent that there is general dissatisfaction with the present system of employers' liability.

The objections which have been urged before us and brought out by our detailed investigations are as follows·

1. That only a small proportion of the workmen injured by accidents of employment get substantial compensation, and, therefore, as a rule, they and their dependents are forced to a lower standard of living and often become burdens upon the state through public or private charity.

2. That the system is wasteful, being costly to employers and the state, and of small benefit to the victims of accidents.

3. That the system is slow in operation, involving of necessity great delay in the settlement of cases.

4. That the operation of the law breeds antagonism between employers and employes.

These four objections will be discussed in their order.

FIRST OBJECTION: UNCERTAINTY

The first objection to the operation of our liability system is that under it only a small proportion of the injured workmen get substantial damages. This is brought out by the results of the special investigation by this Commission of fatal accidents of employment in Erie County in 1907 and 1908, and in Manhattan borough in 1908.

In 115 cases of married men killed by accidents of employment in Erie County, the total compensation paid to the dependents by employers (with or without suit) was as follows:

0 in	38 cases	81 out of 103, or 78.6 per cent of closed cases.
$100 or less in	9 cases	
$101 to $500	34 cases	
$501 to $2,000 in	14 cases	
Over $2,000 in	8 cases	
Suit pending in	11 cases	
Total number of cases	114	

The average earnings of these men was $15.22 per week or $791.44 per year. As yet only eight of the 114 families considered have recovered as much as three times the average yearly earnings ($2,374.22). Eleven have suits pending against the employer. Eighty-one, or 78.6 per cent of the families whose cases are concluded, got no substantial recovery—compensation in these cases ranging from $0 to $500.

In 67 similar cases of married men killed in Manhattan borough, compensation was as follows:

0 in	18 cases	39 out of 48, or 81.2 per cent of closed cases.
$100 or less in . . .	3 cases	
$101 to $500 in . . .	18 cases	
$501 to $2,000 in . .	5 cases	
Over $2,000 in . . .	4 cases	
Suit pending in . . .	19 cases	
Total number of cases	67	

Barring the fact that more lawsuits are pendingin New York City (the courts are slower), the workman's chances would seem from these figures to be about the same as in Erie County. Only four families have recovered an amount equal to three times the average yearly earnings of the men killed; while 39 families, or 81 per cent of those whose cases are determined, got no substantial recovery.

In the cases of single men killed, the proportion, where not even funeral expenses were paid by the employer, is considerably higher—38.1 per cent in New York and 43 per cent in Erie County.

There were in all 279 fatalities of employment about which we obtained full information. Omitting the 43 cases in which suits are pending, we have 236 completed cases in which the item of compensation is determined. In 125, or considerably more than one-half of these cases, nothing more than funeral expenses was paid by the employer to the dependents of the workman killed.

The Barnes Act,* making railroad companies liable for the negligence of many employes who would be considered fellow servants under the common law and under the general Employers' Liability Act, might be expected to have considerable effect upon the amounts recovered in cases of railroad employes injured. The following comparison between recoveries in case of railroad fatalities and other fatalities of employment, among the accidents investigated by the Commission, gives some indication of what this effect has been:

* 420 of the New York State Railroad law; Chap. 757, Laws of 1906.

TABLE I.—COMPENSATION PAID TO DEPENDENTS OF MARRIED MEN KILLED IN RAILROADING AND IN OTHER EMPLOYMENTS IN ERIE COUNTY, 1907–1908. (NEW YORK STATE EMPLOYERS' LIABILITY COMMISSION)

Railroading			Other Employments		
Compensation	*Number*	*Per cent of Settled Cases*	*Compensation*	*Number*	*Per cent of Settled Cases*
Nothing	17	37.8	Nothing	21	35
Funeral expenses only, average amount, $193.57.	8	17.7	Funeral expenses only average amount, $91	5	..
Settlement without suit; average amount, $581.25.	12	..	Settlement without suit; average amount, $483.70.	26	..
Settlement out of court after suit; average amount, $2,991.66.	6	..	Settlement out of court after suit; average amount, $579.17.	6	..
Damages recovered by judgment; average amount, $9,675.50.	2	..	Damages recovered; average amount, $2,050.	2	..
Suit pending . . .	2	..	Suit pending . . .	8	..
Totals . . .	47			68	

It appears from this table that higher amounts are recovered where successful suits are brought in railroad cases—the average settlement after suit in the railroad cases being nearly $3,000, in the other cases less than $600. It also appears that a substantial recovery is secured in a larger proportion of cases. But, so far as the results of the above investigation go, it appears that the increase of employers' liability where the employer is a railroad, accomplished by the Barnes Act of 1902, does not materially modify the most serious economic effect of our liability system, *i. e.*, that in the majority of accidents of employment, the injured workman and his family get no substantial recovery.*

* The testimony of representatives of railroad trainmen appearing before us gave testimony apparently quite opposed to this result. This testimony and the figures are probably quite consistent because the main application of the Barnes Act has been to those railroad employes actually employed on trains, who are relatively a small part of the total number of railroad employes.

The figures resulting from the study of accidents made by the Labor Department lead to the same conclusion. Among 1,040* accidents of employment, in which total losses and receipts could be ascertained, 902 were found to have resulted in but temporary disability,† for periods ranging from one week to over a year. In many of these cases there was permanent injury, such as the loss of an eye, which did not prevent the man suffering it from taking up his work at the same wage he earned before the accident. In 404 of these cases, or 44 per cent, nothing was paid by the employer, not even medical expenses. In 304 cases the amount recovered from the employer was less than 50 per cent of the money loss of wages and expenses.

Seventy-one accidents resulted in permanent partial disability; *i. e.*, each of these employes was able to go back to work but, on account of the injury received, could not earn as much as before the accident. Compensation in these cases was as follows:

0 in	18 cases	54 out of 60, or 90 per cent of closed cases.
$100 or less in	22 cases	
$101 to $500 in	14 cases	
$501 to $2,000 in	5 cases	
Over $2,000 in	1 case	
Suit pending in	11 cases	
Total number of cases	71	

Assuming that $500 is not enough to make up for a permanent loss of earning power, we must conclude that in 54 of these 71 permanent partial disability cases, or 90 per cent of determined cases, no adequate recovery was secured.

Ten accidents resulted in permanent complete disability, *i. e.*, the workman was left in a totally helpless condition, unable to earn anything for the rest of his life. Compensation in these cases was as follows:

0 in	3 cases
$70 in	1 case
$100 to $500 in	5 cases
Suit pending in	1 case
Total number of cases	10

* Forty per cent of the persons injured were the sole support of a family; 11.3 per cent the main support.

† "Disability" and "injury" must be distinguished. Throughout these tabulations the word "disability" means inability to work. Thus, permanent "injury" may mean temporary "disability."

Obviously $500 is inadequate compensation for a total loss of earning power for life. Therefore, nine of these 10 totally disabled employes got no substantial recovery, and the remaining one has but a chance of such recovery.

Finally 57 of the accidents investigated by the Labor Department resulted in death. Compensation was paid to the dependents as follows:

0 in	10 cases	35 out of 49, or 71.4 per cent of closed cases.
$100 or less in	10 cases	
$101 to $500 in	15 cases	
$501 to $2,000 in	12 cases	
Over $2,000 in	2 cases	
Suit pending in	8 cases	
Total number of cases	57	

In 35 out of 49 of these fatal accidents, 71.4 per cent of closed cases, the recovery was no more than $500. In 20, or 40.7 per cent of settled cases, nothing more than funeral expenses was secured.

A comparison between the total loss and total receipts from employers in the accident cases investigated presents the situation in a different light, but does not alter the general conclusion.

For 902 temporary disability cases we get the following figures:

TABLE 2.—COMPARISON OF LOSSES AND RECEIPTS IN 902 TEMPORARY DISABILITY CASES WITH COMPLETE INFORMATION. (NEW YORK STATE DEPARTMENT OF LABOR)

Losses	*Amounts*
Wages	$66,853.53
Medical expenses	20,023.03
Total	$86,876.56
All receipts from employers	$25,338.87
Per cent of receipts to losses	29.2

Cases in which nothing was received, 404, or 44 per cent.

For 61 permanent partial disability cases, making no allowance for permanent reduction in earning power, we get the following figures:

TABLE 3.—COMPARISON OF LOSSES AND RECEIPTS IN 61 PERMANENT PARTIAL DISABILITY CASES WITH COMPLETE INFORMATION. (NEW YORK STATE DEPT. OF LABOR)

Total loss until return to work	$32,727.04
All receipts from employers	11,048.81
Per cent of receipts to losses	33.8

Cases in which nothing was received, 23, or 37.7 per cent.

For ten permanent complete disability cases, including only three years' wage loss, we get the following figures:

TABLE 4.—COMPARISON OF LOSSES AND RECEIPTS IN 10 PERMANENT COMPLETE DISABILITY CASES WITH COMPLETE INFORMATION. (NEW YORK STATE DEPT. OF LABOR)

Losses	*Amounts*
Medical expenses	$2,574.75
Wages for three years	15,475.20
Total	$18,049.95
All receipts from employers	$1,749.00
Per cent of receipts to losses	9.7

Cases in which nothing was received, two, or 20 per cent.

For 53 fatal cases including only three years' wage loss, we get the following figures:

TABLE 5.—COMPARISON OF LOSSES AND RECEIPTS IN 53 FATAL CASES WITH COMPLETE INFORMATION. (NEW YORK STATE DEPT. OF LABOR)

Losses	*Amounts*
Medical and funeral expenses	$9,329.75
Wages for three years	104,590.20
Total	$113,919.95
All receipts from employers	$25,960.53
Per cent of receipts to losses	22.8

Cases in which nothing more than funeral expenses ($100 limit) was received, 20, or 37.7 per cent

For 111 fatal cases (married men) investigated by the Commission,—including only three years' wage loss, we get the following figures:

TABLE 6.—COMPARISON OF LOSSES AND RECEIPTS IN 111 FATAL CASES (MARRIED MEN) WITH COMPLETE INFORMATION. (NEW YORK STATE EMPLOYERS' LIABILITY COMMISSION)

Losses	*Amounts*
Medical and funeral expenses	$21,537
Wages for three years	278,364
Total	$299,901
All receipts from employers (net)	$51,957
Per cent of receipts to losses	17.1

Number of cases in which nothing was received, 48, or 43.3 per cent.

A comparison of total losses and total receipts here means very little; these figures, however, strengthen our conclusion that the bulk of the accident loss is borne by the injured workmen and their families. They emphasize also the fact that the results of the present law are arbitrary and unequal, that a few of the injured get large verdicts while many get nothing. Thus, in the temporary disability cases a comparison of totals shows that employers paid nearly one-third of the loss, but yet in 44 per cent of these cases they paid nothing. In permanent partial disability cases, payments from employers averaged one-third of the loss until return to work, and yet over one-third of these disabled men received nothing. In the 111 fatal cases compensation averages 17.1 per cent of the first three years' loss, but nearly half of the dependents got nothing.

This inequality is doubtless due largely to the fact that the law allows recovery in only a small percentage of cases. It may also in some measure be accounted for by the uncertainties of the jury system. Undoubtedly also the fact that the injured workmen are at so great a disadvantage in litigation with their employers, is important in causing this unevenness; their own ignorance, the long delay, the technical mysteries of the law, the fact that the witnesses are as a rule in the defendant's employ —all these factors lessen the workman's chances even when he has a good case.

These figures result from a study of only about 1,200 accident cases. Those investigated by the Commission were taken as they came from the inquest records. Those investigated by the Labor Department were taken consecutively from their own records for

certain industries, omitting only the obviously trivial accidents. No similar examination has been conducted in America covering so large a field. But the results of such inquiries as have been made in Pennsylvania and Wisconsin do not differ greatly from the result of this study.

The investigation recently conducted in Allegheny county, Pennsylvania, under the direction of the "Pittsburgh Survey" showed that . . . . (Quotation omitted.)

The Wisconsin Bureau of Labor and Industrial Statistics reports as follows on the matter of the great financial loss borne by the workingman:

"The following shows to what extent this is true in 306 non-fatal cases in which reports were received by mail from workingmen injured while at work:

TABLE 7.—DISPOSITION 306 NON-FATAL CASES. (WISCONSIN BUREAU OF LABOR AND INDUSTRIAL STATISTICS)

	Cases	*Per cent*
Received nothing from employer	72	23.5
Received amount of doctor bills only	99	32.4
Received amount of part of doctor bills only	15	4.9
Received something in addition to doctor bills	91	29.7
Received something, but not doctor bills	29	9.5
	306	100.0

"Put in words, we may say that in two-thirds of the cases a part or all of the doctor bills were paid, but in less than a third was anything more paid, and in about one-fourth of the cases nothing whatever was paid.

"In 131 non-fatal cases in Wisconsin concerning which reports were secured by factory inspectors, the following disposition was made:

TABLE 8.—DISPOSITION 131 NON-FATAL CASES. (WISCONSIN BUREAU OF LABOR AND INDUSTRIAL STATISTICS)

	Cases	*Per cent*
Received nothing from employer	28	21.37
Received doctor bills only	56	42.75
Received something besides doctor bills	10	7.63
Received something, but not doctor bills	34	25.96
Not settled	3	2.29
	131	100.00

TABLE 9.—FIFTY-ONE FATAL CASES, OF SETTLEMENTS REPORTED BY FACTORY INSPECTORS. (WISCONSIN BUREAU OF LABOR AND INDUSTRIAL STATISTICS)

Compensation from Employer	*Number*
Under $100	16
$100 to $500	18
$500 to $1,000	9
$1,000 to $3,000	8
Total	51

Finally all of these results are confirmed by the reports made to the Commission by insurance companies writing employers' liability insurance in New York State and keeping separate records of such experience. As shown in the following table, 414,681 accidents were reported to these companies during the periods covered, and payments had been made in only 52,427 of these cases.* In only one in every eight accidents reported is any payment made.

TABLE 10.—PROPORTION OF PAYMENTS MADE TO NOTICES OF INJURY RECEIVED FOR VARIOUS YEARS UNDER EMPLOYERS' LIABILITY POLICIES. (NEW YORK STATE EMPLOYERS' LIABILITY COMMISSION)

Name of Company	Percentage of Payments to Injuries				*Per cent Equivalent to*
	Years	*Injuries*	*Payments*	*Per cent*	
Aetna Life Insurance Company	1906–7–8	130,635	14,986	11.46	or 1 in 8.7
Fidelity and Casualty Company of New York	1897–8–9	56,380	8,633	15.31	or 1 in 6.53
Frankfort Insurance Company	1906–7–8	31,690	3,000	9.46	or 1 in 10.56
General Accident, Fire and Life Assurance Corporation	1902–3–4	9,875	1,070	10.83	or 1 in 9.22
Standard Accident Insurance Company	1906–7–8	39,685	3,076	7.75	or 1 in 13.22
United States Casualty Company	1900–1–2	17,616	5,185	29.43	or 1 in 3.39
New Amsterdam Casualty Company	1904–5–6	8,046	1,291	16.04	or 1 in 6.23
London Guarantee and Accident Company	1906–7–8	61,651	7,393	11.99	or 1 in 8.33
Ocean Accident and Guarantee Corporation	1906–7–8	59,103	7,793	13.18	or 1 in 7.58
Totals	..	414,681	52,427	12.64	or 1 in 7.99

* These figures include every notice of accident and doubtless many are trivial, but they serve to check up the results of the detailed study. Significant

At the public hearings held by the Commission ample testimony was brought forth to substantiate these conclusions. Dr. E. T. Devine, general secretary of the Charity Organization Society of New York City, said:

> "About two years ago Mr. F. H. McLean, who was for some years in the Brooklyn Bureau of Charities, presented a paper to the State Conference of Charities and Corrections in which there were some suggestions to which I might refer. I have before me here some original records that were used on that occasion. There were collected from some six different societies facts about 386 cases of this kind.
>
> "One of the things that Mr. McLean was to find out about those cases was what compensation had been received. It was possible to find out anything about that, in only 223 cases, and of those 223 cases some kind of a settlement or donation was made in just 47 cases; that is, 20 per cent of the whole. In 80 per cent of the 223 cases, about which we could get facts, there was no compensation whatever, and no expectation of any, and among the 47, in which there was a settlement, there is an extraordinary crazy-quilt of absurdity as to what those settlements were. They are typical and we cannot get any line from any source that will show precisely what those figures are, and I gave them for this reason because I believe them to be thoroughly representative of the settlements made in the cases of this kind."

Hon. P. T. Sherman, ex-commissioner of labor, testified:

> "Now, our law is based on the theory that the employer should pay the full damages when he defaults, and the employe should suffer the damages when he defaults. That is necessary. Then our law goes on to say that the employe shall assume the ordinary risks of his business. Those ordinary risks are 75 per cent of the accidents; and it is a terrible burden, and it is a burden that the employes cannot bear. There is no use to say they ought to, but they cannot;

in this connection are the German official tables and the tables of the Wisconsin and Minnesota Labor Departments, which ascribe 40 to 50 per cent of all industrial accidents (on the average) as due to nobody's negligence, but to trade risks. The Austrian tables show 70 per cent attributed to this cause.

so it simply transfers it over to the public and the public who are not interested in these industries bears this burden, or friends bear it; it comes back to the public."

From our detailed investigation, borne out as it is by the results of similar studies in states where the same general law prevails, and strengthened by testimony given before us, we are brought to the conclusion that under our employers' liability laws, a large proportion (over 50 per cent) of the workmen injured by accidents of employment and the dependents of those killed get nothing or next to nothing, and that only a very small proportion recover an amount that is in any way commensurate with their loss.

WAGES IN DANGEROUS TRADES

We are further convinced that the compensation paid to men employed in dangerous work is not usually high enough to enable them to insure against this risk. In the industrial fatalities investigated by the Commission 58.1 per cent* of the men killed were earning less than $16 a week. In 78 per cent of these cases some insurance was collected. Among the cases investigated by the Labor Department 928, or 62 per cent, were earning less than $15 a week. In 29 per cent of these cases some insurance was collected.†

The total amount of insurance collected was as follows:

In 902 temporary disability cases—total insurance recovered	$9,406.65
In 60 permanent partial disability cases—total insurance recovered	1,478.00
In 10 permanent complete disability cases—total insurance recovered	78.00
In 48 fatal cases—total insurance recovered	13,177.30
In 111 fatal cases (all married men) investigated by the Commission—total insurance recovered	49,874.00

* Under "insurance," as the term is used throughout the present discussion, benefits in fraternal organizations, trade unions and other associations are included

† Many of those who received no insurance in temporary disability cases, probably had some insurance against death. The following table shows that insurance against death is much more common than insurance against disability.

The following table shows the amount of insurance* in 211 cases according to wage groups:

TABLE 11.—MEN KILLED IN INDUSTRIAL ACCIDENTS, ERIE COUNTY, DURING 1907 AND 1908, AND IN MANHATTAN BOROUGH DURING 1908, CLASSIFIED ACCORDING TO WEEKLY EARNINGS AND INSURANCE RECOVERED. (NEW YORK STATE DEPT. OF LABOR)

Weekly Earnings	*Aggregate*	Insurance Recovered							
		Nothing		*$1 to $499*		*$500 to $999*		*$1,000 and over*	
		Number	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*
Less than $9.	13	7	53.8	5	38.4	1	7.7	..	..
$9 to $11	37	17	45.9	13	35.1	6	16.2	1	2.7
$12 to $15.99	77	48	62.3	16	20.7	3	3.8	10	12.9
$16 to $20.99	44	16	36.3	17	38.6	4	9.0	7	15.9
$21 and over.	40	9	22.5	17	42.5	5	12.5	9	22.5
Totals	211	97	45.9	68	32.2	19	9.0	27	12.7

	Temporary disability	*Permanent disability*	*Fatal*	*Total*
(1) Total cases investigated	1,301	115	71	1,487
(2) Number in which some insurance or benefits were received	367	21	40	428
3) Per cent of (2) to (1)	28	19	56	29

It does not by any means appear from these figures that none of the workmen engaged in dangerous occupations are in a position to carry insurance, but it is apparent that the majority of them are not earning enough to enable them adequately to

* Total number of cases in which wages were known, 224.

insure against accident at the high rates necessitated by the nature of their occupation. That wages are not adjusted "to cover risk" in the actual industrial world of to-day is a matter of common knowledge.

The testimony before the Commission of those familiar with the condition of the working classes also brought out the fact that the risk of the industry is not considered in determining a man's wages.

If then the industrial accident loss rests almost altogether upon the workman, and he cannot as a rule adequately insure against that loss, the result must be disastrous for him and his dependents. With the major part, and in many cases the whole, of their income cut off, the injured workman's family, especially in case of serious and fatal accidents, must depend upon the work of women and children, or upon the assistance of relatives and friends, must reduce their standard of living to the detriment of health, and must often become destitute and dependent upon charity.

EFFECT ON FAMILIES

That these are the actual results of the situation, our inquiry has proved. Among 186 families of married men killed by accidents of employment, which were investigated for the Commission, 93* of the widows had gone to work to support their families; in nine families children under sixteen had gone to work; in 37 families the rent was reduced; 10 families were found destitute; 33 families had received aid from fellow workmen of the deceased, from relatives and friends, or from charity.

Among 186† accidents resulting in death or permanent disability, investigated by the Labor Department, the known economic effects were as follows: 33 wives had become wage-earners; 13 children had left school to go to work, in 16 cases house rent had been reduced and in 62 cases aid had been received.

These are the known effects of 372 serious industrial acci-

* In 14 cases the widow was an invalid or too old to work.

† Accidents to single as well as married men are included here, which accounts for the comparatively small number of families in which definite economic results were traceable.

dents upon the lives of the families concerned. During the year 1908 there were 13,929* accidents of employment reported to the Commissioner of Labor, 251 of them fatal; 3,204 of them serious and permanent; 10,474 of them slight. During the same year, 6,261† accidents of employment were reported to the Public Service Commission of the First District, 2,532‡ to the Public Service Commission of the Second District, 344 of them fatal.§

These figures do not cover accidents of construction, excavation, tunnel work, teaming, freight handling, and other such occupations. No report is required of such accidents|| and we have therefore no means of knowing how many there are. Some idea of their number, however, can be obtained from an examination of the coroner's inquest cards and the records of emergency hospitals. Thus the Commission found that of the 250 fatal accidents of employment reported to the four coroners of Manhattan borough in 1909, 9 had been reported to the Commissioner of Labor; 44 had been reported to the Public Service Commission and 197 had not been reported to any state department. Of the 304 fatal accidents of employment reported to the Medical Examiner of Erie county in 1908, 73 were found in the records of the Commissioner of Labor, 103 were accidents which should have been reported to the Public Service Commission¶ and 128 had not been reported to any state department. The Commission also examined the records of the Bellevue Hospital for 1908. Four hundred and fifty-one persons injured by accident of employment

* This figure is exceptionally low. During 1907 there were 19,206 accidents reported. During the first three quarters of 1909 there were 17,846 accidents reported. The exceptionally low figure for 1908 is accounted for by the financial depression of that year.

† Accidents to employes are not classified separately according to their seriousness by this department. Such a classification is made for all accidents reported, however.

‡ Figures for the second department are approximate only. They are for the year ending June 30, 1908. The system of reports and filing is such that it is impossible to determine the number of accidents reported by the calendar year.

§ Under "fatal," as used by the Public Service Commission, only deaths occurring within twenty-four hours of the accident are included.

|| Fatal accidents are, however, reported to a coroner or a medical examiner.

¶ The Public Service Commission of the Second Department does not require the name of the person injured or killed to be reported. Hence it was impossible to determine what proportion of these fatalities had actually been reported.

were received there during the year. Of these, 52 were accidents* which should have been reported to the Labor Commissioner, 4 were reported to the Public Service Commission, and 395 were unreported accidents.†

In short, the Commission learned that among 553 fatal accidents of employment, but 229, or 41.4 per cent, had been reported. Among 451 non-fatal accidents of employment, but 56, or 12.4 per cent, have been reported. We must conclude then that the 22,722 reported accidents of employment in 1908 were but a small proportion of the total number of such accidents occurring during the year. With such a yearly accident rate in the employments of the State, it is clear that the harmful results found in the cases of the 372 accidents studied, must be repeated in a large and steadily increasing number of families, and thus seriously affect the public welfare. . . . . .

We must conclude that only a small proportion of the workmen injured by accidents of employment, and the dependents of those killed get substantial damages; that comparatively few of the workmen in occupations which involve special hazard are earning enough to enable them to provide adequate insurance against it; that, therefore, through accidents of employment, thousands of working men's families are brought to extreme poverty and deprivation, the state suffers through the lowered standard of living of a vast number of its citizens, and the public is directly burdened with the maintenance of many who become destitute. This then we find to be the most serious objection to our present system of employers' liability.

SECOND OBJECTION: WASTE

The second important objection to the law we find to be its enormous wastefulness.‡ The application of the rules defining

* Accidents are filed according to the name of the employer in the Labor Department. Since the name of employer is not given in the hospital records, it was impossible to determine what proportion of these injuries were actually reported.

† A detailed study of unreported accidents appears in Appendix XI hereto.

‡ By "waste" in this section is meant all expenditure that fails to accomplish its social purpose of providing for injured workmen or their families when their earnings are suspended. A perfect system of accident indemnity would enable

an employer's liability is extremely uncertain. Therefore, while, as has been shown, there are very few accidents in which a recovery is actually secured, there are a great many accidents in which there is a chance of recovery. With so vague a test of liability, almost every lawsuit is turned into a race to get before the jury. This uncertainty arises partly because juries are apt to be swayed by prejudice, and set the most diverse values on human life. The machinery of our legal system is complicated and easily put out of joint. An injured workman must have not only a cause of action, but the proof of it, and legal proof of fault is often almost impossible to obtain, particularly when the accident may itself blot out the proof. The vagueness of the legal test of due care and the uncertain qualities of juries, and the difficulties of proof are such that an accident suit against an employer degenerates into a game of hide and seek with justice. . . . And again the uncertainty in the application of the law is an encouragement to both sides to prolong the contest to the last court. As a result of all this uncertainty, to begin with the state is taxed with a large amount of litigation from which, since recoveries are rare, small positive good results. Representative lawyers before us, basing their opinion on their experience, estimate that employers' liability cases take up almost one-fifth of the time of all our courts in the State. There is no method of estimating the time of witnesses and jurors spent in connection with such litigation. Much more serious than this, however, is the fact that employers pay out large sums for defense, only a small portion of which is actually paid out to injured workmen in settlements and damages.

The following table shows the expenditures for accidents in 1907 in 327 New York State firms employing in all 125,995 men. The total expense for all these firms was $255,153.17, $13,365.01 of which was contributed to employes' benefit associations, and $49,250.12 of which was expended for funeral and medical expenses, wages, and other compensation, paid direct to injured em-

workmen or their representatives to get compensation to which they were entitled as regularly and easily as they got their wages before the accident. Such perfection is, of course, impossible in mundane affairs, but the conception of it supplies a standard by which degrees of wastefulness may be measured.

ployes. These two items represent no waste. The $192,538.04 remaining, includes premiums paid for liability insurance, and the cost of claims and suits. It is possible to determine with a fair degree of accuracy what proportion of that sum was used to pay the costs of avoiding and defending suits, and how much actually reached the injured employes concerned.

TABLE 12.—SUMMARY FOR FIRMS HAVING EXPENDITURES ON ACCOUNT OF ACCIDENTS IN 1907. (NEW YORK STATE DEPT. OF LABOR)

Items	Firms With Expenditure for			
	Liability Insurance only	*Liability Insurance and Other Expenses*	*Other Expenses. (No Insurance)*	*Total*
Number of firms	190	111	26	*327
Number of employes	47,177	48,789	30,029	125,995
Expenditures on account of accidents, total	$45,924 92	$121,871 44	$87,849 44	$255,645 80
Aggregate for liability insurance	45,924 92	69,770 35	..	115,695 27
Contribution to employes' benefit association	..	11,724 72	1,640 29	13,365 01
Aid to injured employes, including medical expenses, wages, pensions, funeral expenses, etc.	..	27,594 53	21,655 59	49,250 12
Cost of claims or suits	..	12,781 84	64,553 56	77,335 40
Claims or damages paid	..	5,295 72	57,482 44	62,778 16
Legal expenses or cost of maintaining claim department	..	7,486 12	7,071 12	14,557 24

First, $65,881.50 of it was spent by firms which carried no liability insurance as follows:

In settlements and damages	$57,504.44
Legal expenses and cost of maintaining claim department	8,377.06

Second, $11,453.90 of it was spent by firms carrying liability

* In addition to these firms with expenditures, there were 26 others covered by the investigation which reported no expenditure for accidents in 1907. These firms had a total of 5,689 employes, with total payroll for the year of $3,191,800.30.

insurance, in addition to the amount paid for their premiums as follows:

In settlements and damages	$5,273.72
Legal expenses and cost of maintaining claim department	6,180.18

Third, $115,202.64 of it was paid by 299 firms in premiums to liability insurance companies.*

Of this amount it is impossible to say exactly how much was actually paid to the injured employes, but we can make a fairly accurate estimate. The total amount of gross premiums received during 1906, 1907 and 1908, by ten insurance companies authorized to write employers' liability insurance in New York State, was $23,523,585.† The total amount expended in the actual payment of claims to employes injured was $8,559,795. In other words, the percentage of payments to premiums was 36.34. This proportion, the insurance companies agree, is fairly representative.

We may assume then that 36.34 per cent of the $115,202.64 paid for liability insurance, or $41,864.64, was actually paid out in settlements or damages to injured workmen and their dependents. The rest of it went to costs of defense, administration expenses, profit, etc.

Now, if we add to this $41,864.64, the amounts given in the first two groups covering settlements and damages ($57,504.44 and $5,273.72) the sum, $104,642.80, is the part of the $192,538.04 paid out by all these employers in connection with accident claims which was actually paid to the men injured in those accidents.

Thus, almost half of what the employer pays out is spent in the business of defense, *i. e.*, to avoid having to pay more.

But there is further waste. It must not be supposed that the injured workmen and their dependents actually received the whole of the $104,642.80 recovered in settlements and damages. The plaintiff has his fighting costs too, and they are heavy. We do

* In these liability insurance policies the insurance company agrees to assume the employer's liability in connection with accidents to his employes to a limited amount—usually $5,000 in connection with any one injury and $10,000 in connection with any one accident. Thus the liability company stands in place of the employer, defending, settling, and paying damages in his place.

† See table, p. 31 *infra*.

not know the plaintiffs' attorney's fees in these cases. But in 151 accident cases investigated by the Labor Department the total amount of plaintiffs' fees and costs amounted to 22.7 per cent* of the total gross receipts from employers.

Assuming that this is a fair average of the amount spent in costs, we must subtract 22.7 per cent of the $104,642.80 paid out to employes in settlements and damages in order to arrive at the net amount actually received by the employes. This leaves us $80,888.88 as compared with the original $192,538.04 which the employers paid out. In short, less than half of what is expended by employers on account of accidents to employes actually reaches the workmen injured by those accidents.

One of the most frequent and bitter complaints made by the employers of the present system of liability in this State is as to the attitude and tactics of the plaintiffs' lawyers who work up negligence cases. It is claimed by the employers that injured workmen immediately after injuries are besieged by "ambulance chasers" and "shyster" lawyers, who obtain contingent fee contracts and then stir up strife, antagonism and perjury in the legal game of getting to the jury.

The answer made to these complaints is that the plaintiffs' lawyers are no worse than the tricky claim agents of the large corporations and insurance companies, and that under the present system the happening of the accident is a signal for the suppression of evidence and a race between a plaintiff's lawyer with a contingent contract and an equally obnoxious claim agent with a form of general release to impose on ignorant workmen. That this picture has a large element of truth, no lawyer in active practice in these cases can doubt. That it is a condition which is a disgrace to the bar, this Commission does not doubt. The situation is one of the most distressing results of our present system. But it must not be forgotten that under the present system the injured workman must have a lawyer, and a competent one, to protect his rights, and usually can get one only on a promise to share in the results of the recovery.

* Ninety-seven cases settled directly between the parties are included here. Of course, the average contingent fee is much higher. It averaged 26.3 per cent in 46 fatal cases investigated for the Commission tabulated below.

Our investigation of the lawyers' fees paid in cases of workmen killed in Erie County, as shown in the following tables, bears out the contention that the plaintiffs' lawyers in employers' liability cases often obtain an unfairly large share of the recoveries.

TABLE 13.—MEN KILLED IN INDUSTRIAL ACCIDENTS IN ERIE COUNTY DURING 1907 AND 1908, AND IN NEW YORK CITY DURING 1908. TABLE OF TOTAL FEES PAID TO LAWYERS AND NET COMPENSATION IN ALL CASES IN WHICH FEES WERE KNOWN TO HAVE BEEN PAID. (NEW YORK STATE EMPLOYERS' LIABILITY COMMISSION)

How Compensation Was Paid	*Aggregate Number Killed*	*Total Compensation from Employer*	*Total Lawyers' Fees*	*Net Compensation Remaining to Family*	*Percentage of Total Lawyers' Fees to Total Compensation*
Settlement without suit . . .	26	$28,008	$4,802	$23,206	17.1
Settlement out of court after suit.	17	22,858	6,858	16,000	30.
Damages recovered	3	21,951	7,514	14,437	34.2
Total	46	$72,817	$19,174	$53,643	26.3

Lawyers' fees unknown in 20 cases.

No lawyers' fees paid in 79 cases in which compensation was paid. Of these, 78 cases were settled without suit, in 34 of which funeral expenses only were paid; the remaining case was settled out of court after suit.

Nothing could more strikingly set forth the waste of the present system than the figures on page 291 collected by the Commission from nine insurance companies which keep separate employers' liability records.

From this table it is clear that on an average only 36.34 per cent of what employers pay in premiums for liability insurance is paid in the settlement of claims and suits. In other words, for every $100 paid out by employers for protection against liability to their injured workmen, less than $37 is paid to those workmen; $63 goes to pay the salaries of attorneys and claim agents whose

business it is to defeat the claims of the injured, to the costs of soliciting business, to the costs of administration, and to profit.

TABLE 14.—PERCENTAGE OF ACTUAL PAYMENTS AND GROSS PREMIUMS RECEIVED FOR EMPLOYERS' LIABILITY INSURANCE FOR THE YEARS 1906, 1907, 1908. (NEW YORK STATE EMPLOYERS' LIABILITY COMMISSION)

Name of Company *	Totals		
	Premiums	*Payments*	*Per cent*
Ætna Life Insurance Company	$5,417,444	$2,145,928	39.61
Employers' Liability Assurance Corporation	4,216,608	1,595,126	37.82
Fidelity and Casualty Company of New York	3,010,497	1,186,991	39.42
Frankfort Insurance Company	1,321,775	490,015	37.07
General Accident Fire and Life Assurance Corporation	506,031	196,929	38.91
Standard Accident Insurance Company	1,502,985	683,973	45.50
United States Casualty Company	1,332,060	472,783	35.49
New Amsterdam Casualty Company	606,195	205,040	33.82
London Guarantee and Accident Company	2,739,036	695,487	25.39
Ocean Accident and Guarantee Corporation	2,870,954	887,523	30.91
Totals	$23,523,585	$8,559,795	36.34

The waste on the plaintiff's side is well illustrated by the following table of contingent fees in 51 cases investigated by the Commission:

Size of fee	*No. of cases*
Less than 25 per cent in	14
25 per cent to 34.9 per cent in	16
35 per cent to 49.9 per cent in	7
50 per cent and over in	14
Total number of cases	51

In all consideration of this second important practical objection of the employers' liability law, we cannot over-emphasize the point that in our judgment, it is not the introduction of lia-

* Figures were also received from the following companies: People's Surety Co. of N. Y.; Philadelphia Casualty Co.; Travelers' Insurance Co.; Maryland Casualty Co.; Casualty Co. of America. But since the figures returned by these companies cover all classes of liability experience, they are not included here. They are tabulated separately in Appendix II of the report.

bility insurance, not the contingent fee system, but the *nature of the system itself*, which is responsible for this waste.

If the system of liability be not changed some remedy lies in supervising the liability insurance companies and limiting their activities. It is true as reported to us that the supervision of the State Insurance Department over the business of these companies is practically limited to investigation of their solvency. It is true that the policy of the Superintendent of Insurance as to these companies and some method of standardizing their policies and forcing detailed statements of their risks and their payments may better these conditions, but such measures can accomplish small benefit for the injured workmen.

THIRD OBJECTION: DELAY

A third practical objection to the law is the delay which is incident to its operation. In those few cases where the injured workman gets a recovery or a settlement at all commensurate with his loss, it is often only after a protracted lawsuit. Such cases last from six months to six years in this State. For a workingman's family deprived of its usual income by the death or disability of its chief wage-earner, it is almost as disastrous to wait several years for a recovery as to get no recovery. They usually stand in immediate need of funds, and the deprivation of those years during which their suit is being fought out may well mean lasting harm, which no ultimate recovery can make up to them.

Such is the almost unanimous opinion of the witnesses before us. The injured workman is driven to accept whatever his employer or an insurance company chooses to give him or take his chance in a lawsuit. Half of the time his lawsuit is doomed to failure because he has been hurt by some trade risk or lacks the proof for his case. At best he has a right to retain a lawyer, spend two months on the pleadings, watch his case from six months to two years on a calendar and then undergo the lottery of a jury trial with a technical system of law and rules of evidence, and beyond that, appeals and perhaps reversals on questions that do not go to the merits. Who shall say that is justice—or wisdom, or good government? If he wins, he wins months after his most

urgent need is over. It needs no investigation to show that a system which pays only at the end of months and years of poverty, and then pays in a lump sum, is not justice to the workman.

FOURTH OBJECTION: BREEDS ANTAGONISM

The fourth and from many points of view the most deplorable result of the employers' liability law in operation is that it breeds antagonism between workman and employer. The workman, injured while serving his employer, through no fault of his own, reasons instinctively that he should get some compensation. If his employer does not offer to help him, or does not make what he considers a fair offer, he is glad to listen to the hopes held out to him by the contingent fee lawyer. The employer, on the other hand, instinctively reasons that he ought not to have to pay for an injury to another man which did not result from his fault. He may through generosity or sympathy, offer to give the injured workman something to help him out, but if an outside party appears for the injured man, or if the employer is threatened with a suit, that puts an end to his feelings of generosity and sympathy. He resents the claim as an unjust one, and with visions of the jury awarding a large verdict against him, gets ready to fight. From that time on the injured workman and his employer are enemies. A peculiar bitterness seems to enter into these contests, as both parties are convinced of the injustice of the law and the prejudice of court and jury.

Where an employer gets rid of all this annoyance and risk by taking out a liability insurance policy, the situation is by no means improved. An injured workman who has been referred by his employer to the claim agent of a large insurance company with whom he must deal on strictly a legal and business basis, comes out of that experience with no kindly feelings for his employer.

A large proportion of the employers of labor in the state (excepting the very largest) now take out insurance against liability to respond in damages to their injured employes. Under the ordinary form of insurance written in this state the insurance company takes over all charge of relation between the injured

man and his employers. From the date of the accident the employer notifies the insurance company and takes no further steps. The insurance company treats the accident as a purely business proposition, settles for as little as it can at once, or if that does not work it forces the employe to sue, makes use of every possible delay, uses acute lawyers and takes advantage of its full legal rights.

It is asserted that in many cases the injured workmen are represented by lawyers who, preying upon clients and insurers, are a disgrace to the profession of the bar. Doubtless there is ground for objection in the conduct of both sides in many cases. The point to be emphasized is that under our present system of employers' liability and its necessary concomitant, liability insurance, there is of necessity a violent antagonism between the injured employe and the insurance company (which represents the employer) that leads to sharp practice, delay, perjury and needless hostility. That deplorable condition of affairs as testified to by the insurance officials themselves* has seemed to us a necessary result of two things: first, a system in which every injured workman is thrown into the lottery of a lawsuit as his only remedy, and second, the intervention of the insurance company which is fighting lawsuits and settling claims as a business. Here again the situation seems to be the inevitable result of our legal system.

That the present law, with its uncertain and uneven chances, promotes distrust and ill-will between employers and employes to a serious extent we are convinced from the testimony of both. In our public hearings and in the replies received to our inquiries this was a very frequent complaint. . . . . .

Our conclusions concerning the working of the employers' liability law in New York State, based upon testimony given at our public hearings and upon the results of our inquiries and detailed investigations, have been set forth under the four objections above discussed. These objections may be summed up as follows: Our present system leaves the injured workman to stand the greater part of the industrial accident loss, and because his income is not equal to it, he and his dependents undergo extreme poverty

* Testimony of Messrs. Cowles and Brossmith. See also testimony of Messrs. Clark, Strong, Stillwell, Noyes, and Robinson, Parsons, and others.

and often become a burden upon public or private charity; on the other hand, because of the uncertain and arbitrary chances of recovery under our system, the state is put to the cost of much fruitless litigation and employers pay out enormous sums to protect themselves against liability on account of industrial accidents, from all of which the victims of those accidents reap little benefit; finally the system is slow in operation, is an encouragement to corrupt practices on both sides, and is a great source of antagonism between employers and employes. . . . . .

APPENDIX V

ACCIDENT INSURANCE ACT OF MONTANA

THIS recent act of Montana is the first state law in which liability to employes is based on the hazard of a particular employment. It goes into effect October 1, 1910. It is reproduced here not as a standard but as a matter of record and information.

ACCIDENT INSURANCE ACT OF MONTANA

LAWS OF MONTANA—1909. CHAPTER 67, PAGE 81.

AN Act to create a State Accident Insurance, and Total Permanent Disability Fund, for coal miners and employees at coal washers in the State of Montana, and providing for the maintenance and management of the same; extending and defining the duties of the State Auditor; and fixing penalties for the violation of the provisions of this act.

BE it enacted by the Legislative Assembly of the State of Montana:

Section 1. All workmen, laborers, and employees employed in and around any coal mines, or in and around any coal washers in which coal is treated, except office employees, superintendents and general managers, shall be insured in accordance with the provisions of this act, against accidents occurring in the course of their occupation.

§ 2. All corporations, partnerships, associations or persons engaged in the business of operating any coal mine or coal washers in the State of Montana shall pay to the Auditor of the State, within five days after the monthly wages at the particular mine shall have been paid, one cent per ton on the tonnage of coal mined and shipped, or sold locally, or having been mined is ready for shipment or sale during the month for which the wages were paid; and all persons mentioned in section 1 employed in and about coal mines shall allow to be deducted from their gross monthly earnings one per cent thereof, the deduction to be made by the agent, manager, or foreman of any corporation, association, partnership, person or persons engaged in the business of operating any coal mine or coal washer, and paid to the State Auditor within five days after such monthly wages have been paid.

§ 3. The agent, manager, foreman or accountant of any corporation, partnership, association, person or persons engaged in mining coal in Montana, shall on or before the fifth day succeeding the pay day at his respective mine, make report

under oath to the State Auditor as to the tonnage mined and subject to the payment of one cent per ton thereon; and stating the gross earnings subject to the one per cent deduction as provided in this act, accompanied by a certified check in full for the amount of the tax provided in section 2 of this act. It shall be unlawful for any person, employer, employee, corporation, partnership, association or union to make any contract waiving, avoiding or affecting the full legal effect of this act.

§ 4. It is hereby made the duty of the State Auditor to receive all moneys as provided for in this act, and to send the proper acknowledgment to the person making such remittance. The auditor shall pay all moneys so received by him to the State Treasurer, who shall keep such sums in safe custody in a distinct fund to be known as the Employers and Employees Co-operative Insurance and Total Permanent Disability Fund. The State Treasurer must invest the surplus of this fund in safe and convertible State, county or city bonds, or bonds of the United States. All interest accruing from such investments shall be accredited to this insurance fund. The bond of the State Treasurer shall be liable to such funds, and it shall be his duty to keep accurate account of the receipts and disbursements of such money.

§ 5. The Auditor of State shall keep full statistics of the operation of this function of his department in the event of death by accident, of any employee insured under this act, who shall have come to his death in the course of his employment and by causes arising therein. The Auditor of State upon being satisfied by adequate evidence of such death shall issue a warrant upon the State Treasurer to persons dependent upon the deceased, these warrants to issue in the following order: (1) To surviving wife and child, or children, in equal shares, and if neither wife or child, or children be alive, then (2) to surviving parents who are dependent, or partially so, upon the deceased; if none, then (3) to such other relatives of the deceased as survive him and are dependent upon him, in the sum of three thousand ($3,000) dollars.

A workman receiving injuries which permanently incapacitate him from the performance of work shall receive a compensation monthly, not to exceed one dollar ($1) a day for each working day. Compensation for permanent injury shall not be allowed until after the expiration of twelve weeks from the time such injuries were sustained, provided that the medical practitioner examines and pronounces the injury as being permanent, compensation may then be allowed from commencement of disability. The Auditor of State, however, may, when in his judgment he deems it advisable, use so much of the funds as is necessary in the procuring of a medical practitioner, for the purpose of examination or treatment under this act, for such injuries as herein mentioned compensation shall continue during disability, or until settlement is effected as provided for in section 9 of this act. Total or permanent disability shall consist of the loss of both legs or both arms, the total loss of eye sight or paralysis, or other conditions incapacitating him from work, caused by accident, or injuries received during employment as specified by this act; provided, that if death, as a result of the injury, ensues at a period not longer than one year from date of accident the sum of three thousand

dollars ($3,000) shall be paid the deceased workman's dependents as hereinbefore provided. The representatives of a foreigner, except the widow or dependent children, who were not living within the country at the time of the accident, shall have no claim for the compensation provided for in this act. Such foreign person shall file their foreign address, if married, with the office of the employer with whom they are employed and duplicate thereof with the State Auditor, giving their wife's name and dependent children, and such other identification as may be required by the Auditor of State. Loss of limb, or eye, caused by accident to a workman while employed as provided for in this act, shall be compensated for in the sum of one thousand ($1,000) dollars, provided, that in the event there shall be no funds available in the fund to pay the Auditor's warrant when drawn the same shall draw interest out of the fund at the rate of ten per cent per annum until such warrant is called for payment by the Treasurer which shall be as soon as the fund is sufficient to pay the same with its interest then due.

§ 6. Where a workman is entitled to monthly payments under this act, he shall file with the Auditor of State, his application for such, together with a certificate from the county physician of the county wherein he resides, attested before a notary public.

§ 7. If any person or persons, company or corporation who is then paying into this insurance fund shall believe that any person or persons are obtaining, or having made application to obtain benefits hereunder improperly or fraudulently, and shall file his written request that such person's claim be investigated, the State Auditor must, upon the receipt of such request, request the secretary of the State Board of Health to make an examination for the purpose of this act and his certificate as to the condition of the person or persons with reference to their rights to benefit under this act shall be conclusive evidence as to his condition.

§ 8. If the workman refuses to submit himself to such examination, or in any way obstructs the same, his right to compensation under this act shall be suspended until such examination takes place, and shall absolutely cease unless he submits himself for an examination within one month after being required to do so.

§ 9. When any monthly payment has been made to a workman for any period whatever, the liability under this act, may on the application by, or on behalf of the workman, be redeemed by the payment of a lump sum, which in no instance shall be in excess of the amount specified as death indemnity, and all monthly payments made prior shall be deducted from such settlement.

§ 10. The Auditor of State shall report in January of each year to the Governor of the experience and business of this function of his department, and shall have plenary power to determine all disputed cases which may arise in its administration not herein provided for, and to recommend in his report the rates or premium necessary in order to preserve such fund, and shall order paid such indemnification as herein provided. He shall have power to define the insurance provisions of this act by regulations not inconsistent therewith and shall prescribe the character of the monthly or other reports required of the parties liable hereunder and the character of the proofs of deaths, or to total permanent disability, and shall

have power to make all other orders and rules necessary to carry out the true intent of this act.

§ 11. No money paid or payable in respect of insurance or monthly compensation under this act shall be capable of being assigned, charged, taken into execution, or attached, nor shall the same pass to any other person by operation of law; and the acceptance of pecuniary benefit under the provisions of this act shall operate to release the person or persons, corporation, partnerships, or associations causing such injuries or death for which benefits are so claimed, who shall have paid the assessment provided in section 2 of this act, and also the employer, officers and agents thereof from all liability and claim arising from such injuries or death. The commencement of a suit to recover for such injuries or death shall operate as a forfeiture of the right to benefit under this act.

§ 12. A manager, agent, foreman, accountant, person or persons who represent any corporation, partnership, association, person or persons, engaged in the mining or managing of any coal mines or coal washers in Montana, or person or persons liable for the payments herein provided for who shall violate the intent of this act by inaccurate reports of tonnage of coal produced by them, or the earnings of employes in their employ, or who in any manner hinders or obstructs the Auditor of State in ascertaining facts bearing upon any case provided for in this act or who may refuse correctly to make out such reports as are required by this act, or as requested by the Auditor of State, or submit to its provisions, when liable therefor, or who shall fraudulently obtain benefits hereunder shall be fined for each offense the sum of not less than one hundred ($100) dollars nor more than five hundred ($500) dollars and imprisonment in the county jail for a period of not less than one month nor more than six months, or by both such fine and imprisonment.

The proceeds of all fines shall be forwarded to the State Treasurer and by him credited to the Insurance Fund.

§ 13. This act to be in full force and effect from and after the first day of October, nineteen hundred and ten, benefits to commence four months thereafter.

Approved March 4, 1909.

APPENDIX VI

UNITED STATES STEEL CORPORATION VOLUNTARY ACCIDENT RELIEF PLAN

PROVIDED BY SUBSIDIARY COMPANIES FOR EMPLOYES INJURED AND THE FAMILIES OF EMPLOYES KILLED IN WORK-ACCIDENTS (April 15, 1910)

ACCIDENT RELIEF

1. This plan of relief is a purely voluntary provision made by the company for the benefit of employes injured and the families of employes killed in the service of the company and constitutes no contract and confers no right of action. The entire amount of money required to carry out the plan will be provided by the company with no contribution whatsoever from the employes.

2. Where the word "manager" appears in this plan of relief it means that official of the company who has charge of this relief for his company.

3. The decision of the manager of this relief shall be final with respect to all questions arising under this plan of relief, and he shall have full discretionary power in paying relief to meet any conditions which may arise and may not be covered by this statement.

4. The privilege of this relief will take effect as soon as an emyloye enters the service of the company, will continue so long as the plan remains in operation during such service, and will terminate when he leaves the service.

5. Payment of this relief will be made only for disablement which has been caused solely by accidents to employes during and in direct and proper connection with the performance of duties to which the employes are assigned in the service of the company, or which they are directed to perform by proper authority, or from accidents which occur in voluntarily protecting the company's property or interests. Relief will not be paid unless investigation of the causes and circumstances of the injury show that it was accidentally inflicted and that it renders the employe unable to perform his duties in the service of the company or in any other occupation.

6. No relief will be paid for the first ten days of disablement nor for a period longer than fifty-two weeks.

7. No employe will be entitled to receive relief except for the time during which the surgeon certifies that he is unable to follow his usual or any other occupation.

8. Employes will not be entitled to receive disablement relief for any time for which wages are paid them.

9. The company will provide treatment by surgeons and hospitals of its selection.

10. The company will furnish artificial limbs and trusses in cases where these are needed.

11. All men injured in the service of the company must obey the surgeon's instructions in reporting for examination, using the remedies and following the treatment prescribed, and going to the hospital if directed. No relief will be paid unless these instructions are obeyed. All employes who are disabled but not confined to the house must report in person at the surgeon's office, from time to time, as reasonably requested, and must keep any other appointments made by the surgeon.

12. All employes who wish, while disabled, to go away from their usual place of residence, must first arrange with their employing officer and with the surgeon in charge as to the absence and the evidence of continued disablement to be furnished. Such employes must report as often and in such manner as may be required of them.

13. No relief will be paid to any employe or his family if suit is brought against the company. In no case whatsoever will the company deal with an attorney or with anyone except the injured man or some member of his family in the matter of relief to be paid under this plan, because it is part of the plan that the whole amount paid shall be received by the employe and his family.

14. No relief will be paid for injuries caused or contributed to by the intoxication of the employe injured or his use of stimulants or narcotics or his taking part in any illegal or immoral acts.

15. All employes of the company who accept and receive any of this relief will be required to sign a release to the company.

TEMPORARY DISABLEMENT

16. Under the terms and conditions stated here, employes shall be entitled to the following temporary disablement relief (but no relief will be paid for the first ten days nor for longer than fifty-two weeks, as stated in paragraph six):

Single Men: Single men who have been five years or less in the service of the company shall receive thirty-five per cent of the daily wages they were receiving at the time of the accident. Single men of more than five years' service shall receive an additional two per cent for each year of service over five years. But in no case shall single men receive more than $1.50 per day.

Married men: Married men living with their families who have been in the service of the company five years or less shall receive fifty per cent of the daily wages they were receiving at the time of the accident. For each additional year of service above five years two per cent shall be added to the relief. For each child

under sixteen years five per cent shall be added to the relief. But in no case shall this relief exceed two dollars per day, for married men.

PERMANENT DISABLEMENT

17. The amount of relief which will be paid to employes who have sustained some permanent disablement, such as the loss of an arm or leg, will depend upon the extent to which such disablement renders it difficult for them to obtain employment. The kinds of disablement that may occur and the extent to which each interferes with employment differ so greatly that it is impossible to provide any adequate schedule of relief which will be paid in all cases of permanent disablement. The amounts which will be paid in cases not specifically mentioned here must of necessity be left to the discretion of the manager; but it is the intention of the company that this discretion shall be so exercised in all cases as to afford substantial relief corresponding as far as possible with the amounts stated below, considering the special circumstances of each case and the character and extent of the injury.

(a) For the loss of a hand, twelve months' wages.
(b) For the loss of arm, eighteen months' wages.
(c) For the loss of a foot, nine months' wages.
(d) For the loss of a leg, twelve months' wages.
(e) For the loss of one eye, six months' wages.

DEATH

18. Relief for the families of employes killed in accidents which happen in the work of the company will be paid only where the death of the employe is shown to have resulted from an accident (or sunstroke or heat exhaustion) in the work of the company during and in direct and proper connection with the performance of duties to which the employe had been assigned in the service of the company or which he had been directed to perform by proper authority, or from accidents which occur in voluntarily protecting the company's property or interests.

19. Death relief will be paid as soon as possible after the required proof of cause of death is obtained and a satisfactory release given.

20. The company will pay reasonable funeral expenses, not to exceed $100.

21. No relief will be paid for death caused or contributed to by the intoxication of the employe killed or his use of stimulants or narcotics or his taking part in any illegal or immoral acts.

22. No relief will be paid to the family of any employe if suit is brought against the company.

23. In no case will this relief be paid until the receipt by the company of a satisfactory release properly executed.

24. Under the terms and conditions stated here, the widows and children of the employes killed in accidents which happen in the work of the company shall be entitled to the following death relief:

In the case of married men living with their families, who have been in the service of the company five (5) years or less and leave widows or children under sixteen (16) years of age, the company will pay relief to an amount equal to eighteen months' wages of the deceased employe. For each additional year of service above five years, three per cent shall be added to this relief. For each child under sixteen (16) years, ten per cent shall be added to this relief.

But in no case shall this death relief exceed three thousand dollars ($3,000.00).

26. This plan of relief will be in operation for only one year from May 1, 1910. If the plan meets with success, it is hoped that some similar plan may be put in operation for succeeding years.

APPENDIX VII

INDUSTRIAL ACCIDENT DEPARTMENT OF INTERNATIONAL HARVESTER COMPANY AND ASSOCIATED COMPANIES

THE International Harvester Company, International Harvester Company of Canada, Limited, International Flax Twine Company, Wisconsin Steel Company, Illinois Northern Railway, Chicago, West Pullman & Southern Railroad Company, The Owasco River Railway, and Deering Southwestern Railway, have associated themselves in the administration of an Industrial Accident Department.*

1. Membership

Employes of the above named companies, who are employed in the works, twine mills, lumber mills, steel mills, mines, and on the railroads, are entitled to the benefits of this plan.

2. Purpose of Plan

The purpose of this plan is to insure to employes at the works, twine, steel and lumber mills, mines, and on the railroads, prompt, definite and adequate compensation for injuries resulting from accidents occurring to them while engaged in the performance of their duties; and also to provide compensation to the widow, children and relatives who may be dependent upon any employe whose death results from such accident.

The benefits provided for by this plan will be paid regardless of legal liability on the part of the Company, and no injured employe will require legal assistance to collect the money to which he is entitled. All necessary blanks and information will be fur-

* Plan effective May 1, 1910.

nished, and settlements will be made as far as possible directly with the person entitled to receive the benefits.

The Company will make an earnest effort to see that every dollar which becomes due under this plan is promptly paid, and to save its employes from the delays and expenses of litigation.

3. Amount of Compensation

The Company, without any contribution from the employes, under this plan will pay:

In case of death: Three years' average wages, but not less than $1,500 nor more than $4,000.

In case of loss of hand, foot, or eye: Special benefits as hereinafter stated.

In case of other injuries: One-fourth wages during the first 30 days of disability; if disability continues beyond 30 days, one-half wages during the continuance thereof, but not for more than 104 weeks from the date of the accident. Thereafter, if total disability continues, a pension will be paid.

4. Contribution by Employes

The one-fourth wages paid by the Company during the first thirty days of disability, will be increased to half-wages in favor of employes who make the following contributions:

Employes earning $50 a month, or less, six cents per month; more than $50 and less than $100, eight cents per month; more than $100, ten cents per month.

It is estimated that these contributions, together with the one-fourth wages paid by the Company, will be sufficient to provide half-pay for all injured employes during the first thirty days of disability. If experience shows that the employes' contributions are more than sufficient for this purpose, then the employes' contributions will be reduced accordingly.

5. Payment of Contributions

Deductions to cover the employes' contributions for benefits during the first thirty days of disability under this plan, will (unless the employe gives to the Works superintendent or Board of Management written notice to the contrary) be made from the

employes' wages on regular pay-days on the following basis: Employes earning $50 or less per month, 6 cents per month; earning more than $50 and less than $100 per month, 8 cents per month; earning more than $100 per month, 10 cents per month.

6. Co-operation with Company

The Company earnestly desires the co-operation of its employes in the payment of benefits for the first thirty days of disability, because it wishes every employe to assist in the prevention of accidents. The Company has expended large sums in safeguarding machinery and in the effort to protect its employes from injury, but without the active co-operation of the employes many accidents cannot be avoided. Under this plan the Company and the employes equally divide the payment of benefits during the first thirty days of disability, and thus every employe becomes financially interested in guarding against accidents and in seeing that his fellow workmen are equally careful. It is hoped that this mutual interest will lead to active co-operation on the part of the employes and that thereby accidents will be reduced to a minimum.

7. Management

This Department will be managed by a Board of Management composed of five members appointed by the associated companies.

All employes necessary to conduct this Department shall be appointed by the Board. The Board may arrange to have the benefits paid and the necessary medical examinations made through the organization of the Employes' Benefit Association. Should this be done, the Employes' Benefit Association will be reimbursed for all expenses incident to the work of this Department.

8. Operating Expense

All expenses of this Department shall be paid by the companies associated in the administration thereof. No part of the contributions from employes shall be used to pay expenses, but such contributions shall be used solely to pay one-half of the disability benefits for the first 30 days.

9. Annual Report

The fiscal year of the Department shall be the calendar year. A detailed report, including all receipts and disbursements, shall be printed annually, and employes may procure copies thereof on application.

10. Medical Examiners

The medical examiners shall be appointed by the Board of Management. In every case of injury they shall make an examination of the injured employe; shall decide when an employe is disabled, and when able to work; and shall perform such other duties as shall be required of them by the Board of Management.

No bills for medical or surgical treatment shall be paid by the Company unless the medical examiner or the Works physician finds it necessary to provide additional or different medical or surgical treatment, or to remove the patient to a hospital in order to aid prompt recovery.

11. Disability Benefits

Benefits under this plan will be paid for personal injuries to employes caused by accidents arising out of and in the course of their employment at the works, twine, lumber and steel mills, mines, and on the railroads.

(a) For each working day, or part thereof, during the continuance of disability:

During the first 30 days of disability one-quarter of the employe's average daily pay, and an equal amount paid out of the fund contributed by the employes, if the injured employe is a contributor to such fund;

After the first 30 days, half-pay during the continuance of disability, but not for more than 104 weeks from the date of the accident.

These disability benefits shall be payable every two weeks, and, in no case, shall exceed $20 a week.

(b) An employe who has received disability benefits under this plan for the period of 104 weeks, and who is then totally disabled, shall, so long as his total disability continues, be paid an

annual pension equal to 8 per cent of the death benefit which would have been payable had the accident resulted in death. Such pension shall not be less than $10 per month, and shall be payable monthly.

(c) Disability benefits shall be based upon the average daily wages received during the 60 days worked preceding the accident. If the injured employe has not been in the Company's employ for 60 days prior to the accident, then upon the average daily wages received during the period he has worked.

(d) No disability benefits shall be paid unless written claim therefor be made to the Board of Management within thirty days after the date of the accident.

12. Special Benefits

Loss of Feet and Hands: (a) If the injury causes the immediate severing of, or (in the opinion of the medical examiner or Works physician) necessitates the amputation of a hand or foot at or above the wrist or ankle:

One and one-half years' average wages, but in no event less than $500 nor more than $2,000;

(b) In case of the loss of both hands or both feet, or one hand and one foot, as aforesaid:

Four years' average wages, but not less than $2,000.

Eyes: (a) In case of the total and irrecoverable loss of the sight of one eye:

Three-fourths of the average yearly wages;

(b) In case of the total and irrecoverable loss of the sight of both eyes:

Four years' average wages, but not less than $2,000.

Payment of Special Benefits: An employe receiving special benefits shall not be entitled to any other benefits except as hereinafter stated:

If an employe entitled to special benefits dies before the payment thereof, no special benefits shall be paid, but his dependent relatives shall be entitled to death benefits as hereinafter provided. If an employe who has received special benefits dies as the result of the injury within twelve months from the date thereof, then death benefits shall be paid, but there shall be de-

ducted from such death benefits all sums theretofore paid as special benefits.

No special benefits shall be paid on the basis of annual wages exceeding $2,000; nor unless the loss of foot, hand or eye shall occur within twelve months after the date of the injury and shall be the direct result of the injury, nor unless written claim therefor be made to the Board of Management within thirty days after the loss of the hand, foot or eye.

13. Lump-Sum Settlements

In case of serious injury, where the employe desires to accept a lump sum in lieu of weekly disability benefits and pension, the Board of Management has authority to make full and final settlement with such employe on such terms as may be agreed upon in writing.

14. Death Benefits

The amount of compensation for death resulting from accidental injury arising out of and in the course of employment shall be:

If the employe leaves a widow, child or children, or other relatives, dependent upon his earnings for their support, benefits shall be paid as follows:

(a) If death results from such accident before the expiration of 16 weeks from the date thereof:

Three years' average wages (but not less than $1,500 nor more than $4,000).

(b) If death results from such accident between the end of the sixteenth week and the end of the fifty-second week after the date thereof:

Two years' average wages (but not more than $3,000), less all disability benefits paid.

If the employe leave no widow, children or other relatives, dependent upon him for their support, then reasonable hospital and medical expenses, and a further sum for burial expenses not less than $75 nor more than $100.

All death benefits shall be paid to the administrator or exec-

utor of the deceased employe, in trust for his widow, children, or relatives, who were dependent.

No death benefits shall be paid if death result more than fifty-two weeks after the date of the accident, nor unless a written claim therefor shall be filed by the executor or administrator of the deceased employe with the Board of Management within three months after the employe's death.

15. Average Yearly Wages

"Average yearly wages" as used herein with reference to special and death benefits shall be computed as follows:

The employe's average daily wages during the year of his employment preceding the date of the accident shall be multiplied by the number of working days in that year. If the injured employe has not been employed for a whole year, then the average yearly wages shall be computed by multiplying such employe's average daily wages, during the time he has been employed, by the number of working days in the year preceding the date of the accident.

16. Notice of Accident

To entitle an injured employe to benefits, he must immediately give notice, or cause notice to be given, to his timekeeper, of the time and place of the accident, the nature and cause of the injury, and of his residence address, and must submit immediately to a physical examination by the medical examiner or Works physician, or other physician designated by the Company, and strictly follow the directions given by such medical examiner or physician.

The payment of benefits shall cease if the injured employe refuses to follow the directions of the medical examiner, Works physician, or physician designated by the Company, and shall cease when the medical examiner or Works physician reports an employe who has been injured as able to work.

17. Disability Defined

The word "disability," whenever used in this plan, means inability to work at any gainful occupation whatsoever, whether

of the kind the employe was engaged in at the time of the injury, or not.

No benefits shall be paid unless the injury or death is caused, directly and solely, by an accident arising out of and in the course of the employment. Benefits shall not be paid for any injury or death caused by accident unless there shall be external and visible marks upon the body of physical injuries, which, in case of death, must have been sufficient to have caused such death. Benefits shall not be paid for any injury or death resulting from or caused, directly or indirectly, wholly or in part, by the intoxication or partial intoxication of the employe, or by his failure to use the safety appliances provided by the Company, or by his gross or wilful misconduct.

No benefits shall be paid for injuries resulting from accidents due to causes beyond the control of the employer, such as riots, conflagrations, lightning, cyclones, hurricanes, storms, floods, earthquakes, or any acts of God.

18. Meaning of Word "Company"

The word "Company" whenever used in this plan, shall mean the company for which the employe is working when injured.

19. Adjustment of Claims

The decision of the medical examiner or Works physician as to the existence and duration of disability shall, subject to the approval of the Board of Management, be binding upon all employes. The decision of the Board shall be final in regard to all questions arising in connection with the administration of the Department and the payment of benefits; provided, however, that any employe dissatisfied with the decision of the Board of Management, may take an appeal, in writing, to the Trustees of the Employes' Benefit Association. Such appeal shall be taken in the same manner, and upon the same notice, as is required by the Rules of the Benefit Association in the case of appeals from the decision of the Superintendent of said Association to the Trustees thereof.

20. Acceptance of Benefits

The acceptance of any of the benefits herein provided shall operate as a release and satisfaction of all claims against the Company, and all other companies associated in this Department, arising out of the injury or death for which such benefits are paid. All persons accepting benefits shall give a written receipt evidencing such release. No death benefits shall be due or payable unless such a release shall have been duly executed by all persons who might legally assert any claim growing out of the death of the employe. The commencing of any legal action whatsoever against any of the companies associated in this Department on account of such injury, by the employe, or in the event of his death, by his executor, administrator, or personal representatives, shall be a bar to the recovery of any and all benefits herein provided; but in such event the employe shall be entitled to have refunded to him any contributions paid since the receipt by him of disability benefits, and no more.

The benefits of this plan are offered upon the express condition that all the rules and regulations herein contained shall be faithfully and strictly obeyed by the employes, and a complete compliance with each and all such rules and regulations shall be and is a condition precedent to the right to receive any benefits whatsoever.

21. Amendment of Plan

The Company reserves the right to change, alter or modify these regulations at any time. Notices of all changes shall be posted at the works, mills, mines and railroad stations at least thirty days prior to the date the same become effective. Such changes shall not apply to cases of injury occurring prior to the date when the change becomes effective.

Note: If the person entitled to receive death benefits so desires, the Company will pay the amount of death benefits in monthly instalments of not less than $20 each, and allow 4 per cent interest upon all unpaid balances.

APPENDIX VIII

DUES, BENEFITS AND CONTRIBUTION FROM EMPLOYER IN FOUR RELIEF ASSOCIATIONS FOUNDED ON CONTRACT OF RELEASE

OPERATING IN 1907–1908 IN ALLEGHENY COUNTY, PENNSYLVANIA

CLASS I

Wage Limit, Dues and Benefits	*Pennsylvania Railroad*	*Baltimore and Ohio Railroad*	*Westinghouse Air Brake Co*	*Westinghouse Electrical Mfg. Co.*
Wage limit	$35 a month	Less than $35 a month	Less than $35 a month	Less than $35
Monthly dues	$ .75	$1.00	$ .50	$ .50
Death benefit	$250	Accident, $500; natural, $250	$150	$200
Sick benefit	$2.80 for 52 weeks; $1.40 after	$3.00 for 52 weeks	$5.00 a week 39 weeks	$5.00 a week for 39 weeks
Accident benefit	$3.50 for 52 weeks; $1.75 after 52 weeks	$3.00 for 26 weeks; $1.50 after 26 weeks	$5.00 a week 39 weeks	$5.00 a week for 39 weeks

CLASS II

Wage limit	$35–$55 a month	$35–$50	$35–$55	$35–$55
Monthly dues	$1.50	$2.00	$ .75	$ .90
Death benefit	$500	Accident, $1000 natural, $500	$150	$250
Sick benefit	$5.60 for 52 weeks; $2.80 after	$6.00 for 52 weeks	$7.50 for 39 weeks	$7.50 for 39 weeks
Accident benefit	$700 for 52 weeks; $3 50 after	$6.00 for 52 weeks; $3.00 after 52 weeks	$7.50 for 39 weeks	$8.25 for 39 weeks

CLASS III

Wage Limit, Dues and Benefits	*Pennsylvania Railroad*	*Baltimore and Ohio Railroad*	*Westinghouse Air Brake Co.*	*Westinghouse Electrical Mfg. Co.*
Wage limit	$55–$75	$50–$75	$55–$75	$55–$75
Monthly dues	$2.25	$3.00	$1.00	$1.20
Death benefits	$750	Accident, $1500 natural, $750	$150	$300
Sick benefits	$8.40 for 52 weeks; $4.20 after	$9.00 for 52 weeks	$10 for 39 weeks	$10 for 39 weeks
Accident benefits	$10.50 for 52 weeks; $5.25 after	$9.00 for 26 weeks; $4.50 after	$10 for 39 weeks	$11 for 39 weeks

CLASS IV

Wage limit	$75–$95	$75–$100	$75–$95	$75–$95
Monthly dues	$3.00	$4.00	$1.25	$1.50
Death benefits	$1000	Accident, $2000 natural, $1000	$150	$300
Sick benefits	52 weeks; $11.20 after 52 weeks $5.60	$12 for 52 weeks	$12.50 for 39 weeks	$12.50 for 39 weeks
Accident benefits	$14 for 52 weeks; $7.00 after	$12 for 26 weeks; $6.00 after	$12.50 for 39 weeks	$13.75 for 39 weeks

CLASS V

Wage limit	$95 or more	Over $100	$95 or more	$95 or more
Monthly dues	$3.75	$5.00	$1.50	$1.75
Death benefits	$1250	Accident, $2500 natural, $1250	$150	$300
Sick benefits	$14 for 52 weeks; $7.00 after	$15 for 52 weeks	$15 for 39 weeks	$15 for 39 weeks
Accident benefits	$17.50 for 52 weeks; $8.75 after	$15 for 26 weeks; $7.50 after	$15 for 39 weeks	$16.25 for 39 weeks
Contribution from employer	Expenses of management and guarantees fund	$6,000 per year	Expenses of management and guarantees fund	Expenses of management. Guarantees deficiency. Pays ½ death benefit

APPENDIX IX

A CALCULATION AS TO THE SOCIAL LOSS INVOLVED IN ONE YEAR'S WORK-ACCIDENTS IN ALLEGHENY COUNTY

THE accident loss for an industrial district can be estimated from the standpoint of social economy. Frederick Hoffman, statistician of the Prudential Insurance Company, estimates that the net economic gain to society from the life of a male wage-earner in mechanical and manufacturing industries averages $300 per year,* his normal period of industrial activity extending from the fifteenth to the sixty-fifth year. This net gain to society varies extensively throughout the working life. According to Mr. Hoffman's tables it is but $75 at the age of fifteen, while at thirty-two it reaches $400, where it remains until the forty-eighth year, after that rapidly declining so as to be only $175 at the age of sixty-five. Multiplying the net economic gain for each working year by the probable length of life according to mortality tables, we may roughly calculate what is the net economic loss to society involved in the death of a wage-earner at different ages. Thus the death of a boy at fifteen means a direct loss of $15,000, the death of a man at thirty-two

* Hoffman, F. L.: Physical and Medical Aspects of Labor and Industry. Annals of the American Academy, Vol. 27, 1906, No. 3. By this $300, Mr. Hoffman means to represent the selling value of each worker's product, minus the cost of materials and wear of machinery, and minus what is consumed by the worker and his family. Thus suppose a worker produces goods to the value of $1,200; his wages are $600; the cost of materials and the use of capital in tools, etc., involved is say, $250. This leaves $350 which is the surplus wealth produced by that worker after the cost of maintenance of himself and his family, and the cost of raw materials, are taken out. This is not nearly all profit, for much of it is lost in the machinery of distribution; but it represents roughly the surplus which goes to increase materially the wealth of society. Hence Mr. Hoffman holds it is the "net economic gain."

means a loss of $11,595, and the death of an old workman of sixty-four means a loss of only $170.

Applying this method of calculation to the actual ages of the 526 men killed in Allegheny County during the year under consideration, but using $200 instead of $300 as the yearly economic gain, we find that the net loss to the community at this reduced estimate was $3,828,090.

In a similar way we may sum up the net economic loss to society from non-fatal injuries. According to our estimate 2000 men injured in industrial accidents were sent to the hospitals of the county during that year. Of these roughly 60 were totally disabled for life; 192 were partially disabled for life, their earning capacity reduced on an average 29 per cent; and the rest were totally disabled for periods ranging from one week to one year. Reckoning the loss to society from the total or temporary disablement of all these workers on the same basis, but including the cost of their maintenance during disability, we get an additional social loss of $1,320,636.

Loss to society from men totally disabled for life .	$734,928
" " " " " partially disabled for life .	372,708
" " " " " temporarily disabled . .	213,000
	$1,320,636

To this we must add what it cost the community to care for all these cases of injury and death. Here, however, we are dealing with an unknown quantity. The hospital charges for the year's industrial accident cases would amount to about $80,000,* which we accept as the minimum of known cost for the medical care involved in a year's industrial accidents. While every year 2000 wealth producers are withdrawn temporarily from any occupation, and 500 more permanently, as a result of industrial

* Most of the hospitals of Pittsburgh charge $1.00 a day for ward patients, none more than $1.50 a day. It is well known that this charge does not meet the cost of a surgical case. It is intended to cover bed and board, supplies, and the simplest service. Accident cases, requiring surgical care, frequent dressing, etc., cost the hospital much more than $7.00, or even $10, a week. Moreover this $80,000 does not include the cost of doctor's services and medical expenses after these 2,000 injured men were discharged from the hospitals. Whether these expenses were met by the employer, or by the public, or by the injured man's family, they are a social cost.

accidents in Allegheny County, a number of other possible wealth producers are thus permanently occupied, non-productively, in the business of patching up, repairing, putting in order, those who are injured.

By such a method of estimate the net economic loss to society from one year's work-accidents in Allegheny County would be as follows:

LOSS TO SOCIETY FROM ONE YEAR'S WORK-ACCIDENTS IN ALLEGHENY COUNTY

	Social Loss
From deaths	$3,828,090
From disablements	1,320,636
Hospital charges	80,000
	$5,228,726*

* This estimate takes no account, it should be noted, of the loss involved in the continuous succession of small injuries not serious enough to be taken to a hospital, nor of injuries more serious, but occurring too far away from a hospital to make the trip advisable, nor of injuries, often very serious in the matter of disablement, but not of a nature to require hospital care.

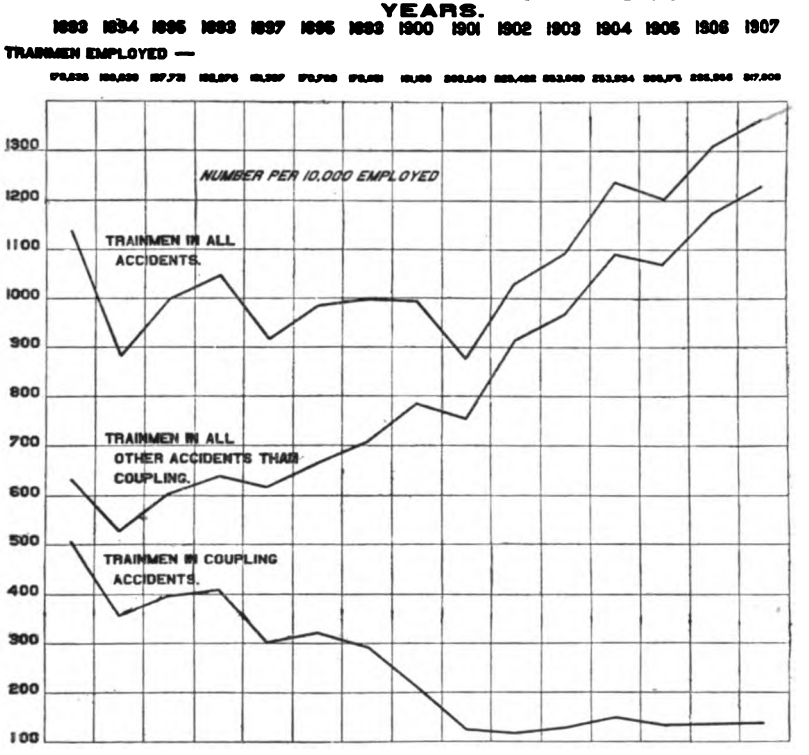
APPENDIX X

DATA AS TO RAILROAD ACCIDENTS (UNITED STATES INTERSTATE COMMERCE COMMISSION)

NUMBER OF TRAINMEN EMPLOYED, WITH NUMBER KILLED AND INJURED COUPLING AND UNCOUPLING CARS FOR THE YEARS ENDING JUNE 30

Year	*Number Employed*	*Number Killed*	*Number Injured*
1893	179,636	310	8,753
1894	160,033	181	5,539
1895	157,731	189	6,077
1896	162,876	157	6,457
1897	161,397	147	4,698
1898	170,708	182	5,290
1899	178,851	180	5,055
1900	191,198	188	3,803
1901	209,043	163	2,377
1902	225,422	141	2,457
1903	253,660	211	3,023
1904	253,834	269	3,506
1905	265,175	217	3,316
1906	285,556	266	3,590
1907	317,808	272	4,062

The accompanying figures and chart prepared by the Interstate Commerce Commission indicate the vast benefit which the safety appliance law has been to railroad employes. If the accidents due to coupling and uncoupling cars had increased in the same ratio as the number of men employed has increased since 1893, in the year 1907 there would have been 548 men killed and 15,485 injured, instead of 272 killed and 4,062 injured; or a total killed and injured of 16,033 men as against 4,334 actually killed and injured in 1907 in this hazardous occupation.



"TRAINMEN" INCLUDES ENGINEMEN, FIREMEN, CONDUCTORS, BRAKEMEN AND OTHER TRAINMEN.

DIAGRAM 12

APPENDIX XI

RECORD SYSTEM EMPLOYED

IN general it may be said that in devising a method for accumulating and registering work-accident data for the Pittsburgh Survey, the case record system employed by charity organization societies was used. Especially suggestive were papers by Sherman C. Kingsley, superintendent of the Chicago Relief and Aid Association, presented to the National Conference of Charities and Correction in Minneapolis in the spring of 1907, which gave the facts about a small group of families, pensioners of that society, who had been brought into destitution through industrial accidents. Equally suggestive was a paper by Francis H. McLean, then superintendent of the Brooklyn Bureau of Charities, presented to the New York State Conference of Charities and Correction in the fall of 1907, giving the facts as to 365 cases cared for by charitable societies in New York and Brooklyn. With these suggestions in hand, rough blanks were blocked out and submitted for criticism to Mr. McLean, Mr. Kingsley, Prof. John R. Commons, University of Wisconsin, Mr. Frederick Hoffman, Statistician of the Prudential Insurance Company, Professor Charles R. Henderson, a member of the Illinois State Industrial Commission which had made the first public report on this subject in this country, Miss Lilian Brandt, statistician of the New York Charity Organization Society, Miss Kate Holladay Claghorn, statistician of the New York Tenement House Department, Mrs. Florence Kelley, formerly State Factory Inspector of Illinois, and others. The blanks, revised in line with these suggestions, were tried out on a month's cases and the results resubmitted for criticisms before they were adopted in their final form. Upon adjoining pages are published:

(A.) Coroner's record blank.

(B.) Family Record blank, fatalities, providing for economic facts.

The first step was to fill out blank A, in so far as the inquest files supplied data as to the men killed from July 1, 1906, to June 30, 1907; the second, to visit their homes. The industrial towns in Allegheny County are spread over a wide area. Railway and street car connections are not of the best. Tenants are constantly shifting, and a year had elapsed in some cases since the death of the man. Families of deceased foreigners go back to the old country. Half a dozen races and tongues were represented. It was no easy matter to get the information called for, but this was done in a majority of cases.

The third step was twofold; first, to secure from the employer his statement of the accident; and, second, to check over our facts as to wages, payments, etc., with the records of the claim agents and legal departments. Here we were only partially successful. The items were furnished by a number of large concerns; they were refused by others. The final step came in analyzing statistically the data thus gathered, and interpreting them with illustrative instances from the case records.

A similar plan was employed with respect to hospital cases. Through the interest of Mr. Francis J. Torrance, President of the Pennsylvania State Board of Charities, we were able to secure access to the registers of the public hospitals of Allegheny County and transcribe the hospital records for three months' injury cases. A card similar to Card A was used for this purpose, and a special family record card (Blank C) was devised for recording the further facts secured from the injured men or their families.

The staff included Miss Crystal Eastman, responsible investigator; and as visitors, Mrs. D. Lucile Field Woodward, Cornell, A. B., later investigator for the Federal Immigration Commission; Alexis Sokoloff, civil and mining engineer; Alois B. Koukol, secretary, National Slavonic Society; and Joseph Stella, artist. Herbert S. Brown, electrical engineer, was called in consultation with respect to some of the technical problems. Acknowledgment is due to Mr. John Koren, United States Census Expert, and Miss Lilian Brandt, for criticisms and suggestions in regard to statistics.

No. .....

1. NAME 2. ADDRESS 3. DIED ,19

4. Sex 5. Age 6. S. M. W. D. 7. Country of birth Race 8. How long in U. S.?

9. Occupation 10. Employer

11. Nature of Accident

12. Place of Accident 13. Hour (A. M.)(P. M.) Day Month ,19

14. Hospital 15. Undertaker Address

16. Witness for identification Address

17. Witnesses at Coroner's Inquest. Sup't. Foreman Fellow-workmen Official Inspector

18. Character of Coroner's Record Verdict No. Term, 19

INDICATIONS WITH REGARD TO CAUSE AND RESPONSIBILITY.

19. Any evidence of intoxication? recklessness? disobedience of orders? violation of rules? failure to report defects?
(Record other indications)

On part of Deceased

20. Any evidence of intoxication? recklessness? incompetence? disobedience of orders?
violation of rules? failure to properly instruct? failure to remedy known defects?

On part of
Sup't. .....
foreman .....
fellow-workmen .....

21. Any evidence of extreme heat? poor light? unprotected machinery? structural defects?
crowded place to work? defective appliances?

22. No indications?

23. How many hours had deceased been at work? 24. Length of regular working day?

25. How long had he been in this occupation? 26. How long in this particular position?

27. How long with this employer?

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A—Coroner's Record Blank

NAME | Present location of family | No.

1. CONDITION OF FAMILY JUST BEFORE ACCIDENT

Members	Age	Occupation	Weekly Earnings	Contrib. to Family
Deceased				

——MONTHS AFTER ACCIDENT

Occupation	Weekly Earnings	Contrib. to Family

PROVISION FOR ACCIDENT

5. INSURANCE (Life) (Ac.)
How long ins? Rate Amt. Rec'd.
6. RELIEF ASS'N. (Vol.) (Compul.)
How long a member? Dues Amt. Rec'd.
Contrib. by Employer?
Release given?
7. UNION. Ins. dues Am't. Rec'd.
Other Ass'n.
How long a member? Dues Am't. Rec'd.
8. SAVINGS Property

Other Source of Income (Amt.) | Amt.

Number of Rooms (Rent) | Rent

COMPENSATION FOR ACCIDENT

9. VOLUNTARY. Am't When rec'd.
Release Obtained?
10. SUIT COMMENCED , 19..... for $
Name of Liability Co.
Name of Lawyer
Suit settled , 19..... for $
Damages recovered , 19..... for $
Lawyer's fee
Suit lost , 19..... Suit pending
11. CARNEGIE RELIEF $ Rec'd. , 19 .....

2. Expenses due to accident
Hospital, $ How met?
Doctor, $ How met?
Funeral, $ How met?

3. AID—Public Relief
Private Relief
Church
Relatives
Other Sources

4. REMARKS

GEO. H. ALEXANDER & CO. 4-90-10

B—FAMILY RECORD BLANK FATALITIES

No. .....

1. NAME 2. ADDRESS 3. DIED ,19

4. Sex 5. Age 6. S. M. W. D. 7. Country of birth Race 8. How long in U. S.?

9. Occupation 10. Employer

11. Nature of Accident

12. Place of Accident 13. Hour (A. M.)(P. M.) Day Month ,19

14. Hospital 15. Undertaker Address

16. Witness for identification Address

17. Witnesses at Coroner's Inquest. Sup't. Foreman Fellow-workmen Official Inspector

18. Character of Coroner's Record Verdict No. Term, 19

INDICATIONS WITH REGARD TO CAUSE AND RESPONSIBILITY.

19. Any evidence of intoxication? recklessness? disobedience of orders? violation of rules? failure to report defects?
(Record other indications)

On part of Deceased

20. Any evidence of intoxication? recklessness? incompetence? disobedience of orders?
violation of rules? failure to properly instruct? failure to remedy known defects?

On part of
Sup't. .....
foreman .....
fellow-workmen .....

21. Any evidence of extreme heat? poor light? unprotected machinery? structural defects?
crowded place to work? defective appliances?

22. No indications?

23. How many hours had deceased been at work? 24. Length of regular working day?

25. How long had he been in this occupation? 26. How long in this particular position?

27. How long with this employer?

GEO. H. ALEXANDER & CO. 4-90-9

A—Coroner's Record Blank

NAME | Present location of family | No.

1. CONDITION OF FAMILY JUST BEFORE ACCIDENT

Members	Age	Occupation	Weekly Earnings	Contrib. to Family
Deceased				

——MONTHS AFTER ACCIDENT

Occupation	Weekly Earnings	Contrib. to Family

PROVISION FOR ACCIDENT

5. INSURANCE (Life) (Ac.)

How long ins? Rate Amt. Rec'd.

6. RELIEF ASS'N. (Vol.) (Compul.)

How long a member? Dues Amt. Rec'd.

Contrib. by Employer?

Release given?

7. UNION. Ins. dues Am't. Rec'd.

Other Ass'n.

How long a member? Dues Am't. Rec'd.

8. SAVINGS Property

Other Source of Income (Amt.) | Amt.

Number of Rooms (Rent) | Rent

COMPENSATION FOR ACCIDENT

9. VOLUNTARY. Am't When rec'd.

Release Obtained?

10. SUIT COMMENCED , 19..... for $

Name of Liability Co.

Name of Lawyer

Suit settled , 19..... for $

Damages recovered , 19..... for $

Lawyer's fee

Suit lost , 19..... Suit pending

11. CARNEGIE RELIEF $ Rec'd. , 19 .....

2. Expenses due to accident
- Hospital, $ How met?
- Doctor, $ How met?
- Funeral, $ How met?

3. AID—Public Relief

Private Relief

Church

Relatives

Other Sources

4. REMARKS

GEO. H. ALEXANDER & CO. 4-00-10

B—FAMILY RECORD BLANK FATALITIES

NO._____

NAME

PRESENT LOCATION OF FAMILY

1. CONDITION OF FAMILY JUST BEFORE ACCIDENT

Members	Age	Occupation	Weekly Earnings	Contrib. to Family
Person Inj.				

Other Source of Income (Amt.)

No. of Rooms (Rent)

_____MONTHS AFTER ACCIDENT

Occupation	Weekly Earnings	Contrib. to Family

Amt.

Rent

How met?

2. Expenses due to Accident. (other than hospital charges) $

3. How long totally disabled?

4. How long partially disabled?

5. During latter period what decrease in wages per week? $

6. Total financial loss so far sustained ? $

7. Any permanent Injury ?

8. Nature of it.

9. AID Public Relief. Private Relief

Church Relations

Other Sources

10. What other injuries suffered by this man in course of work?

11. How long totally disabled? 12. Partially?

PROVISION FOR ACCIDENT.

13. INSURANCE

Rate Amt. Rec'd. $

Rate of payment.

14. RELIEF ASS'N. (Vol) (Compul.)

Dues. Amt. Rec'd. $

Rate of Payment

Contribution by Employer.

Release given?

15. UNION

Dues: Amt. Rec'd. $

Rate of payment.

16. OTHER ASSOCIATION

Dues. Amt. Rec'd. $

Rate of payment

17. Savings $ 18. Property

COMPENSATION FOR ACCIDENT

19. WITHOUT SUIT. Amt. Rec'd. $

How soon Rec'd?

Rate of payment.

Visited by Claim Agent?

Application made by pers. inj.?

Release given?

20. SUIT COMMENCED.....,19.....for $

Name of Lawyer.

Suit Settled.....,19.....for $

Suit pending? Lawyer's fee.

C.—FAMILY RECORD BLANK, INJURIES

APPENDIX XII

DATA SECURED CONCERNING ALL CASES OF MARRIED MEN KILLED IN WORK-ACCIDENTS IN ALLEGHENY COUNTY, PA., JULY 1, 1906, TO JUNE 30, 1907

Number of Case	*Occupation*	*Manner of Injury*	*Compensation Paid by Employer*	*Yearly Wage**
33	Brakeman	Crushed between cars	$1500	$ 988
51	Laborer	Fell from bridge	625	832
56	Engineer	Run over by engine	715	1872
206	Track walker	Run over by train	50	780
229	Section foreman	Struck by engine	400	832
323	Brakeman	Run over by train	320	832
504	Brakeman	Fell from car—run over	500	1040
563	Conductor	Killed in wreck	3500	2080
104	Conductor	Run over by train	Nothing	1300
243	Conductor	Crushed between cars	Nothing	1040
312	Brakeman	Fell off car	Nothing	1040
344	Section hand	Struck by train	Nothing	572
375	Laborer	Struck by train	Nothing	572
70	Fireman	Killed in wreck	$3800	936
71	Fireman	Crushed by engine	3600	780
37	Brakeman	Crushed between cars	1275	624
305	Engineer	Scalded to death	800	1040
404	Brakeman	Run over by train	875	1092
470	Brakeman	Crushed between cars	675	988
36	Conductor	Crushed between cars	200	1040
120	Laborer	Run over by car	Nothing	504
467	Brakeman	Run over by engine	$150	1144
203	Fireman	Run over by train	500	780
471	Brakeman	Struck by engine	400	936
76	Brakeman	Run over by car	158	988
351	Brakeman	Crushed between cars	Nothing	1144
337	Laborer	Crushed between cars	$100	364
377	Brakeman	Fell off trestle	Funeral expenses	1144
317	Conductor	Fell from train	Nothing	1040

* Weekly wages multiplied by 52.

Number of Case	*Occupation*	*Manner of Injury*	*Compensation Paid by Employer*	*Yearly Wage**
413	Laborer	Crushed between cars	$75	$780
518	Laborer	Run over by car	Nothing	416
352	Engineer	Crushed under engine	Nothing	1664
451	Engineer	Crushed under engine	Suit pending	1300
498	Brakeman	Crushed between cars	Suit pending	780
77	Brakeman	Run over by train	Nothing	1040
126	Car inspector	Run over by engine	Nothing	624
150	Conductor	Crushed between cars	Unknown	1300
165	Brakeman	Crushed between cars	Unknown	?
179	Brakeman	Crushed between cars	Nothing	1040
212	Flagman	Run over by cars	Nothing	884
223	Brakeman	Run over by cars	$40	936
237	Switchman	Run over by engine	Nothing	936
240	Laborer	Run over by train	Funeral expenses	390
247	Car cleaner	Struck by train	$41	780
289	Brakeman	Killed in wreck	Nothing	910
299	Fireman	Killed in wreck	Suit pending	936
308	Laborer	Struck by train	$50	650
333	Conductor	Struck by train	Nothing	1092
353	Track walker	Struck by train	Nothing	572
370	Signal fitter	Fell from bridge	Nothing	1040
374	Brakeman	Struck by engine	Nothing	988
395	Carpenter	Struck by engine	Suit pending	936
415	Car repairer	Struck by jack lever	Nothing	?
432	Track walker	Struck by train	$40	572
443	Signal repairman	Struck by train	40	780
455	Engineer	Struck by passing pole	Nothing	1300
488	Brakeman	Fell from car	$20	1092
523	Brakeman	Run over by train	Nothing	936
528	Brakeman	Run over by train	$41	1092
536	Conductor	Run over by engine	150	1300
558	Brakeman	Drowned—train ran off bridge	Suit pending	780
136	Section hand	Run over by train	Nothing	499
187	Motorman	Fell from car	Suit pending	832
391	Coal miner	Electric shock	Nothing	780
28	Coal miner	Struck on head by slate	$75	780
74	Coal miner	Struck by slate	75	780
44	Miner	Electrocuted	75	832
122	Coal loader	Crushed by motor	75	468
273	Coal miner	Crushed by falling slate	75	780

* Weekly wages multiplied by 52.

DATA CONCERNING MARRIED MEN KILLED

Number of Case	*Occupation*	*Manner of Injury*	*Compensation Paid by Employer*	*Yearly Wage**
477	Coal loader	Crushed by falling slate	$75	$780
489	Coal miner	Crushed by falling slate	75	780
224	Coal miner	Crushed by falling slate	75	780
438	Coal miner	Crushed by falling slate	75	780
41	Coal miner	Crushed by falling slate	75	624
38	Coal miner	Crushed by falling slate	Nothing	780
27	Coal miner	Crushed by falling slate	Q.	780
263	Coal miner	Crushed by falling coal	Nothing	624
389	Coal miner	Crushed by falling slate	Nothing	780
196	Coal dumper	Electrocuted	$100	624
474	Coal miner	Crushed by falling slate	Nothing	780
259	Coal miner	Crushed by falling slate	Nothing	780
135	Miner	Crushed by car	Nothing	780
446	Miner	Crushed by falling slate	Nothing	780
358	Coal miner	Burned by powder explosion	Nothing	780
192	Coal miner	Crushed by falling coal	$630	780
32	Miner	Crushed by falling slate	700	780
476	Coal miner	Crushed by falling slate	Nothing	780
73	Coal miner	Crushed by falling slate	Nothing	780
108	Coal driver	Fell from car	Funeral expenses	780
64	Coal miner	Fell down mine shaft	Nothing	780
414	Coal miner	Crushed by falling slate	Nothing	780
90	Miner	Crushed by falling slate	Nothing	780
78	Miner	Crushed by falling slate	Nothing	780
372	Elevator operator	Crushed by elevator	$75	624
521	Tank inspector	Killed by tank exploding	4550	936
464	Laborer	Crushed by electric crane	Nothing	468
381	Foreman	Electrocuted	2350	1456
197	Laborer	Run over by train	60	676
96	Laborer	Electrocuted	150	499
181	Crane hook-on	Struck by steel billet	100	?
440	Crane hook-on	Crushed by steel plates	275	468
390	Laborer	Struck by steel beam	35	499
540	Laborer	Crushed by steel plates	55	468
533	Riveter	Crushed by iron plate	118	832
379	Laborer	Crushed in machinery	Nothing	468
158	Lineman	Electrocuted	$399	936
492	Lineman	Electrocuted	Amount unknown	1040
454	Laborer	Asphyxiated	$198	572
58	Engineer	Caught by shafting	215	1300
348	Laborer	Crushed by iron box	Nothing	468
153	Grinder	Crushed by glass frame	$500	572
85	Laborer	Caught in belting	75	520
496	Pickler	Crushed by iron pipes	Funeral expenses	572

* Weekly wages multiplied by 52.

Number of Case	*Occupation*	*Manner of Injury*	*Compensation Paid by Employer*	*Yearly Wage**
500	Laborer	Crushed by wagon	$87	$572
417	Painter	Struck by broken crane pivot	Unknown	728
445	Laborer	Struck by falling carriage	Suit pending	468
134	Laborer	Struck by swinging bucket	Nothing	390
232	Bricklayers' Helper	Fell from stack	Nothing	?
92	Carpenter	Fell from building	$500	1248
110	Bricklayer	Crushed under falling bank	Nothing	1456
149	Carpenter	Crushed by timber	$50	702
394	Painter	Fell from scaffold	75	858
53	Iron worker	Fell down elevator shaft	Suit pending	1404
169	Laborer	Killed by dynamite explosion	Nothing	780
174	Laborer	Killed by dynamite explosion	$150	832
407	Laborer	Crushed by falling bank	Nothing	624
329	Laborer	Crushed in cave-in	$100	884
479	Laborer	Struck by train	Unknown	728
301	Teamster	Struck by car	Nothing	468
502	Driver	Run over by wagon	Nothing	780
532	Driver	Fell from wagon	$125	780
497	Engineer	Fly-wheel burst	Amount unknown	1144
516	Lineman	Electrocuted	Suit pending	884
184	Shipping clerk	Fell down elevator shaft	Nothing	780
250	Watchman	Fell down elevator shaft	$10	624
268	Butcher	Crushed by elevator	Nothing	676
463	Watchman	Crushed by elevator	Amount unknown	?
545	Laborer	Fell down elevator shaft	Nothing	884
435	Iron worker	Struck by elevator	$350	572
11	Manager (Laundry)	Fell	Suit pending	1300
106	Foreman	Struck by iron rail	Nothing	780
484	Rubber—(Bath.)	Scalded and burned by steam	Suit pending	780
137	Laborer	Crushed by falling floor	Nothing	520
295	Laborer	Crushed by falling box	$41	676
232	Bricklayers' helper	Fell from stack	Unknown	?
416	Laborer	Struck by falling stone	Nothing	520
364	Fireman	Fell from ladder	$1000	1144
543	Electric craneman	Electrocuted	Nothing	468
43	Crane operator	Crushed by crane	$200	520
431	Laborer	Crushed by crane	Nothing	499
291	Laborer	Struck by crane handle	Funeral expenses	390
5	Laborer	Burned by steel hopper	$40	468

* Weekly wages multiplied by 52.

DATA CONCERNING MARRIED MEN KILLED

Number of Case	*Occupation*	*Manner of Injury*	*Compensation Paid by Employer*	*Yearly Wage**
186	Chief engineer	Crushed by broken crane	$324	$1404
157	Electrician	Burned by steam	Nothing	1040
287	Machinist	Slipped in belt	$200	936
343	Mill worker	Crushed by wire coils	129	624
115	Millwright	Run over by crane	Unknown	?
180	Hammerman's helper	Struck by steel crucible	Unknown	?
233	Laborer	Crushed by dump cart	Unknown	520
258	Laborer	Struck by furnace door	Unknown	468
326	Superintendent	Fell on ice	Nothing	2600
346	Laborer	Crushed by steel billets	$100	390
491	Steel melter	Crushed by coal trestle	Unknown	780
506	Laborer	Burnt by bursting steampipe	Funeral expenses	499
86	Laborer	Struck by lump of coal	$250	624
272	Laborer	Fell in scale pit	475	520
376	Laborer	Struck by falling post	375	520
401	Craneman	Fell from crane	500	832
505	Laborer	Struck by falling chain	540	936
19	Carpenter	Fell from building	Nothing	1300
68	Carpenter	Fell through skylight	$100	832
159	Carpenter	Struck by a car	Unknown	1300
205	Crane director	Struck by truck	$150	1040
262	Pipe fitter	Scalded—bursting steam pipe	Suit pending	?
335	Car builder	Crushed between cars	$75	780
355	Truck planer	Crushed by falling pulley	Nothing	780
405	Laborer	Crushed by falling car	Suit pending	468
40	Millwright	Caught in belting	$500	?
101	Wiper	Crushed by exploding cylinder head	325	572
102	Engine wiper	Crushed by exploding cylinder head	150	572
170	Laborer	Fell from pipes	140	520
109	Laborer	Struck by spreading pipes	Funeral expenses	624
156	Oiler	Struck by broken cable	Suit pending	624
231	Laborer	Crushed by falling iron plates	Funeral expenses	520
238	Rougher	Struck by Rougher's hook	$1125	780
246	Laborer	Crushed by crane shovel	Funeral expenses	520
253	Laborer	Struck by crane hook	$75	520
256	Machinist	Fell from ladder	85	728
357	Laborer	Struck by sledge	100	1040

* Weekly wages multiplied by 52.

Number of Case	*Occupation*	*Manner of Injury*	*Compensation Paid by Employer*	*Yearly Wage**
428	Laborer	Struck by falling pipe	$94	$728
487	Millwright	Fell from crane	575	1300
495	Crane man	Crushed by crane	Amount unknown	?
3	Laborer	Struck by iron bar	Funeral expenses	520
23	Helper	Fell from scaffold	Amount unknown	676
57	Furnace keeper	Asphyxiated	Nothing	884
59	Brakeman	Run over by train	$100	624
60	Furnace keeper	Asphyxiated	600	884
61	Pipe fitter	Asphyxiated	700	624
112	Laborer	Killed in collision	275	728
144	Laborer	Crushed by rollers	Nothing	936
225	Laborer	Fell down hoist shaft	70	884
275	Laborer	Killed by bursting furnace	Nothing	624
276	Pipe fitter	Blast furnace exploded	Nothing	728
281	Laborer	Blast furnace exploded	$75	468
282	Laborer	Blast furnace exploded	Funeral expenses	520
283	Laborer	Blast furnace exploded	Amount unknown	520
284	Hoisting engineer	Blast furnace exploded	$2150	624
296	Laborer	Blast furnace exploded	40	546
300	Laborer	Blast furnace exploded	65	520
303	Laborer	Blast furnace exploded	800	780
313	Laborer	Burned in building	Nothing	468
418	Laborer	Burned by hot iron	Funeral expenses	598
430	Laborer	Electrocuted	Funeral expenses	572
531	Laborer	Struck by engine	$100	520
551	Laborer	Furnace exploded	2500	2600
555	Laborer	Furnace exploded	Funeral expenses	728
561	Carpenter	Nail scratch—blood poison	Nothing	936
30	Laborer	Fell into hot ashes	$675	546
45	Laborer	Struck by engine	250	624
62	Laborer	Run over by train	75	728
65	Wiper	Electrocuted	2500	728
67	Laborer	Crushed between cars	675	676
84	Laborer	Struck by hot iron rail	500	624
114	Laborer	Crushed between cars	700	520
118	Electric craneman	Run over by crane	800	?
124	Laborer	Crushed by falling crane	800	520
130	Laborer	Run over by ladles	700	520
132	Laborer	Struck by train	800	520

* Weekly wages multiplied by 52.

DATA CONCERNING MARRIED MEN KILLED

Number of Case	*Occupation*	*Manner of Injury*	*Compensation Paid by Employer*	*Yearly Wage**
152	Laborer	Run over by engine	$875	$936
166	Brakeman	Run over by car	1075	780
171	Laborer	Fell from scaffold	500	572
182	Blacksmith	Struck by crane bucket	1700	520
193	Laborer	Fell from girder	500	884
213	Carpenter	Fell from scaffold	800	936
216	Laborer	Burned by hot cinders	75	728
228	Laborer	Caught by belting	700	624
235	Laborer	Struck by falling box	600	624
270	Hooker-on	Run over by steel buggy	1775	?
293	Laborer	Burned—hot metal exploding	1075	780
310	Laborer	Fell	1200	520
342	Laborer	Crushed by falling ore	Unknown	520
365	Laborer	Struck by skull cracker	$75	624
400	Laborer	Crushed by falling beams	1000	468
406	Laborer	Burned by lime	175	624
409	Laborer	Crushed by car	575	624
422	Laborer	Struck by pick	75	572
423	Laborer	Struck by car	1075	572
426	Laborer	Crushed by crane	575	468
442	Laborer	Caught by shafting	975	520
444	Laborer	Crushed by falling ingot	75	780
456	Boiler maker	Struck by iron pipe	675	936
458	Boiler maker	Fell in pit	500	624
461	Machinist	Run over by engine	675	832
524	Laborer	Struck by hammer	Nothing	728
527	Laborer	Electrocuted	$825	676
542	Laborer	Crushed by machinery	825	572
546	Laborer	Crushed by steel billets	875	520
548	Laborer	Crushed by falling pulley	790	884

In the 139 cases where both compensation and yearly wages are known, total compensation equals $74,305; total yearly wages equals $109,262. Thus the total compensation paid to the families of these 139 married men killed amounted to less than three-fourths of their first year's income loss.

* Weekly wages multiplied by 52.

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