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Wartime factory: sociological story of an industrial plant, its background and experiences during the last part of 1941 and the first part of 1942

Melvin Harvey Ruder

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WARTime FACTory

(Sociological story of an established capital goods industrial plant; its background and experiences during the last part of 1941 and the first part of 1942.)

A Thesis
Presented in Candidacy
for the Degree of
Master of Arts

- by
Melvin Harvey Ruder

Sharon
Pennsylvania

June 1, 1942.
This thesis is presented to partially fulfill requirements for a Master of Arts degree at the University of North Dakota.

approved:

Chairman

[Signature]

Director of the Graduate Division

[Signature]
Acknowledgements

There were many occasions to "think" while this thesis was being written. To the two men who first lead me to social-minded thinking, I humbly express my indebtedness: President John C. West and Dr. J.M. Gillette.

In Sharon there was fortune in finding a man who stimulated this mental activation to the industrial environment: J.T. Burke. Then there is Edward X. Hallenberg, the North Dakota engineering graduate who brought me to Sharon, explained the new way, and did much to make the transition easier.

There is a sincere thank you to R.C. Brannon who helped me tremendously in the quest for information on transformers. Not one stumbling block - except too full days on a growing job - interfered with the preparation of this thesis. Sharon Works and all employees concerned were most cooperative. Remembered is Lenora Larson, back at UND, who pitched right in with the typing, and in Sharon, a good critic, Charles Webb.

Whatever the impression from this thesis, let one idea stand. Westinghouse is a good Company to work for.
Sharon, Pennsylvania with its Westinghouse-operated largest American transformer factory is 1,400 miles from North Dakota's Standing Rock Indian reservation where Sitting Bull is buried.

On Sunday, February 2, 1941, I was taking pictures of poverty on the Standing Rock reservation for the Associated Press and a North Dakota legislative committee, made up mostly of farmers and headed by a country editor. No sooner back at the University, then a job with the Westinghouse Company opened, and 10 days after photographing Mrs. John Iron Boulder and Bessie Big Horn, I started to work in America's largest transformer factory.

The middle of the afternoon on February 12, 1941, I entered an American factory for the first time in my life. There were Vuchevitches, Poprockys and Milanos; back home it was Johnsons, Petersons and a few Gerhardts. The mill here had nothing to do with wheat. It was steel. A mill could likewise be where blueprint-reading artisans evolved complicated electrical mechanisms called transformers.

From a state whose biggest National Defense contract had been $381 for dehydrated potatoes to the billion dollar steel and electric center of America is a big jump.

That smoggy afternoon in February, I walked into Westinghouse's Transformer Division completely unbiased. Not once in my previous life had there been a direct economic motive for my taking sides with industrial management or indus-
trial labor.

The combination of being young in years and coming from a western and agrarian state, definitely shapes my reasoning and sympathy toward social progressiveness. But progressiveness has not, nor should be limited to management or labor. When my superior, J.T. Burke, Transformer Division supervisor of Industrial Relations, reads this completed and bound manuscript, he will find some situations lacking his full picture. His industrial experience covers this century. My industrial contacts will be one and a half years-old on July 12, 1942.

Accuracy and fairness were guides in writing this thesis. There was no influence or censorship as to contents. Serious intention is that it be devoid of soaring half truths. This is the more difficult since it is a contemporary, sociological study in an emotional time.
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Introduction

- Setting: Sharon and the Shenango Valley

Halfway between Lake Erie and Pittsburgh, in Pennsylvania but lapping over the Ohio line, is the city of Sharon, heart of the three-mile-wide Shenango valley. Here in adjacent cities of Sharon, Farrell and Sharpsville together with their suburban attachments live 60,000 people. Steel mills and Westinghouse's Transformer plant make the Shenango valley, the most highly industrialized district between Pittsburgh and the city of Erie. It is 75 miles mostly south to Pittsburgh and 75 miles mostly north to Erie. Over the Ohio line, 15 miles from Sharon is the metropolitan steel center of Youngstown. But Youngstown could be 75 miles away just as is Cleveland. Pittsburgh has more influence on the Shenango valley than does Youngstown.

George Washington was serving his second term as president when Sharon was first settled by William Budd in 1796. By 1840 a canal connecting the Ohio with Lake Erie was nearly completed, and the first boats went through Sharon. Population of the town was then 400. Today it is 25,600, excluding suburbs. Coal had been discovered near the city in 1835, and in 1845 the steel history of Sharon begins. Vincent Himrod built the Clay blast furnace with a capacity of three tons a day. Coal discovered in 1835 was especially suited for iron manufacture. Today steel still is the principal concern of the Shenango valley. In the middle is a transformer factory.

Retail sales in Sharon were $2,847,000 in 1941. In this same year the city did .42 per cent of Pennsylvania's business, though its population is only .26 of the whole. Per capita income for the city was $995, ahead of the $773
for Pennsylvania and the $693 for the nation. It is well to remember that the neighboring cities of Farrell and Sharpsville provide buying power as well as less highly developed shopping centers.

Sharon businesses are divided as follows:

<table>
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<th>Business Category</th>
<th>Number</th>
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<td>98</td>
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<td>Service stations</td>
<td>50</td>
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<td>Auto accessory shops</td>
<td>9</td>
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<td>Auto wrecking concerns</td>
<td>4</td>
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<td>Garages with 13 selling new cars</td>
<td>19</td>
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<tr>
<td>Beer parlors, not including a number of private clubs</td>
<td>20</td>
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<tr>
<td>Restaurants, also see dairy stores</td>
<td>19</td>
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<tr>
<td>Firms selling building supplies</td>
<td>18</td>
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<td>Selling home supplies</td>
<td>10</td>
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<tr>
<td>Furniture stores</td>
<td>7</td>
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<tr>
<td>Department stores</td>
<td>3</td>
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<tr>
<td>Women’s apparel and millinery</td>
<td>19</td>
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<tr>
<td>Men’s clothing</td>
<td>10</td>
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<tr>
<td>Shoestores</td>
<td>9</td>
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<tr>
<td>Shoe repair shops</td>
<td>8</td>
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<tr>
<td>Drug stores</td>
<td>11</td>
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<tr>
<td>Notion stores</td>
<td>2</td>
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<tr>
<td>Jewelry stores</td>
<td>8</td>
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<tr>
<td>Dairy, quick lunch spots</td>
<td>13</td>
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<tr>
<td>Beauty shops</td>
<td>20</td>
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<tr>
<td>Confectionary and news depots</td>
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<tr>
<td>Radio and electric shops</td>
<td>9</td>
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<td>Laundries</td>
<td>4</td>
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<td>Hardwares</td>
<td>4</td>
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<tr>
<td>Coal dealers</td>
<td>7</td>
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<tr>
<td>Pool rooms</td>
<td>4</td>
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<tr>
<td>Office suppliers</td>
<td>4</td>
</tr>
<tr>
<td>Wholesale houses</td>
<td>3</td>
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<tr>
<td>Theaters</td>
<td>4</td>
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<td>Florists</td>
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From the list of business places in Sharon, it is apparent that there are an abundance of such places as beer parlors. One would expect this in a town that has periods of "easy" money. A luxury index for Mercer county (Sharon) in 1941 shows that the sale of new passenger cars was 58 per cent ahead of the 1940 figure, compared to an increase of 31 per cent nationally. Notice the concentration of automobile concerns in the city.

Sharon is essentially a steel city, though the Transformer Division with its 5,500 employees is the largest plant in the district. Next largest plant in the Shenango valley is the Carnegie-Illinois steel mill with 4,000 employees in the neighboring city of Farrell. The steel mills maintain five-day working weeks for the individual employee. With a six-day week and time and a half, a higher base pay rate coupled with cleaner working conditions, Westinghouse is generally preferred by the working men.

In all community drives for funds during the past year, the Westinghouse plant leads. Just completed is a $297,000 hospital addition campaign with H.V. Putman, Transformer Division manager, serving as chairman. Another factor that puts the Transformer Division in the forefront of all fund drives is the Westinghouse Company practice of matching employee contributions dollar for dollar. This applies to the Red Cross, U.S.O., Community fund and the hospital.

The Transformer Division, having no retail sales, has no reason other than good will to advertise in the local newspaper. In addition to covering the metropolitan press, the Westinghouse general advertising department in Pittsburgh usually sends the same ad copy to all papers in towns where it has plants. For further good will reasons, the Transformer Division always participates in all ad promotion pages in The Sharon Herald.

The plant enjoys excellent relationships with the paper. Much the same as do most big universities with their local press. A fatal accident in the plant is usually played down in The Sharon Herald. When management and labor are at odds over some issue such as the seven day week and double time, the paper will tend to give management good or better space to allow it to tell its side.

* Statistics in this chapter, mostly from Sharon Herald, Aug. 25, 1941.
Since the Westinghouse plant is the source of many good stories, there is further reason for cordial relationships. The Sharon Herald is interested in Westinghouse stories, because many of its readers work in the plant. The paper has a middle of the road attitude in disputes between management and labor, though it has lashed out at labor strikes during war time. The steel mills are completely CIO. A newspaper today is an established, highly capitalized institution. A vested interest, if you will. One should not expect them to have the crusading air that characterized some of the press a century ago. In a non-mechanical day, Horace Greeley had $500 to start The New York Tribune. Today a healthy newspaper in a trade center city of 25,000 is worth $500,000 and employes just over 100 persons.

The Westinghouse Company held some notes owed by the Savage Arms Corporation which had a small plant in Sharon. In 1922, to settle the obligation, Westinghouse took over the Savage Arms plant which with additions became the Transformer Division. Operations started in 1923. A number of skilled men moved to Sharon from the East Pittsburgh Westinghouse plant.

Westinghouse men are encouraged to become members of local service clubs, and to participate in civic affairs. The Company does not officially favor any candidate in an election. Candidates are usually solicitous of Westinghouse votes; they are aware of the large number. The Westinghouse police force and maintenance men work in a cooperative manner with the Sharon police and street departments. There have never been any labor disputes that resulted in physical violence at Sharon Works. Men have never been clubbed, picketed or subjected to tear gas. It is the unusual Sharon Works plant policeman who talks roughly to an employe. Orders are to never lay a hand on a man unless an unusual situation occurs. Many of the plant police customarily use the word, "sir,"
when talking to the men. This courteous treatment somewhat alleviates the natural dislike that all industrial workers have toward factory police.

Bank debits in Sharon during June, 1941 totaled $2,721,922 as compared to $1,991,645 for June, 1940, an increase of 35.5 per cent. During the first six months of 1941 payrolls totaled $9,400,883 as compared with $5,031,519 for the same months of 1940. Average number of hours worked in a week using 9,189 workers during 1941 as a base, and 6,912 for 1940, climbed from a low of 26.64 in February, 1940 to 42.17 in April, 1941. Carloadings for the first six months of 1940 were 36,773 and climbed to 73,185 for the same months of 1941.  

Within the city limits of Sharon are 5,200 single family homes, or 79.5 per cent of all the buildings in the city. There are less than 20 apartment houses. Industrial buildings number 66, about one per cent of the total, but take up 19 per cent of the city's area.

During the 1920-30 period when Westinghouse was established in the city, 25.4 per cent of all the town's residential structures were built. This was the city's biggest building boom. About 17 per cent of the homes are valued at less than $2,500; 48 per cent between $2,500 and $5,000; 26 per cent between $5,000 and $8,000, and 9 per cent over $8,000.

It is estimated that 40.9 per cent of Sharon owner-occupied homes are encumbered by mortgages. During the depression there was a huge increase in delinquent mortgages. The F.H.A. has seen 2,200 properties built in Sharon and Mercer county. Sharon has a fourth of the people in the county. Six-room dwellings predominate in Sharon, 36.2 per cent being of this size; five rooms are next with 23.2 per cent, and about 11 per cent are seven room houses.

2. Figures from Sharon Herald, Aug. 25, 1941;
Average rental for six room houses are between $30 and $40 a month. It is $25 to $30 for five rooms. Rents average about $5 a room per month, according to this estimate by Sharon city officials (engineer's office). Their estimates are too low. There is a serious housing shortage in Sharon.

Established business interests in Sharon do not want a federal housing project. This is no particular secret. There are Westinghouse men who are unable to bring their families to Sharon for lack of available homes. The Company assists men in locating homes. It has at times not one available house listed, though it keeps contact with all real estate agents. Property owners in Sharon fear that a federal housing project would decrease the value of their investments now, and also after the war is over result in an added number of vacant residences. In spite of the official city figures for average rents, the fair rents section of the price control administration has singled out Sharon as a spot where rents have increased too rapidly. The local association of real estate men and large property owners has just protested the findings of a government survey which show rents up nearly 20 per cent in less than a year.

There are no sizeable numbers of trailers or other temporary residences setup in or near Sharon. Rather employees have been commuting. Many come from or find homes in the neighboring agricultural towns.

Of an estimated 6,900 houses in Sharon about 47 per cent contain children. An F.H.A. survey shows that more than 2,000 or approximately 30 per cent of the dwellings are inadequate. Of this sub-standard type, 37 per cent are occupied by owners, 61 per cent by tenants. In 1934 only one new home was built in Sharon. Seventeen were built during the first six months of 1941. This does not include the rush of suburban building which is at least triple that in the city.
Sock with KVA

This cartoon was drawn for the plant newspaper by Danny DeBonis, 19-year-old storeroom attendant at Sharon Works.
Chapter 1
National Emergency and the Association of an Electrical Capital Goods Factory With the Defense Program and the War Effort

Rubbing a cat's fur and watching lightning flash were the two most common contacts men had with electricity at the time this nation was born.

One hundred years later in the days after the Civil War there appeared on the American scene, men who put electricity, the most fluid form of energy known to man, into everyday use. Thomas Edison developed the incandescent lamp and brought the electric light out of the laboratory. George Westinghouse, young inventor of railroad brakes, signal systems and switches, and early promoter in the electrical field, sponsored and developed A-C current and the transformer that makes lighting of homes and world-wide use of electricity practical.1

America remained a land of gas jet and kerosene lamps during the War with Spain, and electricity during the World War was for lighting, motor-driving machines, and a little transportation. Some electrical factories turned their machinery and men over to the making of shells and ordnance material, and the manufacture of electrical equipment was only better than usual.2

The American public has yet to realize that today's war is electric. It is a battle of turbines, generators, transformers and hydro-electric systems. The side that has the most electrical producing capacity and can use it most efficiently will have the best chance to win.3

2. Interviews with veteran workmen, etc.
A bomber for MacArthur requires at least 1,000 pounds of magnesium, electrically produced metal. It requires 12 kilowatt hours of electrical energy to produce a pound of magnesium from sea water, its principal source. This is enough current to keep a 50 watt light bulb burning for 10 days and nights.\(^4\)

Magnesium is a bright white metal, one-third lighter than aluminum and pound for pound withstands more pull than steel. When it and its alloys are substituted for other metals, America builds airplanes that are just as strong but much lighter - hence carry a bigger payload of gasoline and bombs.

In 1940 American output of magnesium was 12 million pounds; by 1942 it must jump 33 times to 400 million pounds. Difficult metal to extract, magnesium is obtained from sea water or from an earthly clay-like ore.\(^5\) Dow Company national advertising during the early months of 1942 stated that the average fighting airplane required 1,000\(^6\) of magnesium.

Aluminum is recovered from bauxite ore by an electrical process, and it requires 30 million watts to produce one ton of the vital metal. It is estimated that as much as 10,000 pounds of aluminum are necessary to the construction of a modern U. S. bombing plane. American aluminum production must soar from 413 million pounds in 1940 to 2 1/2 billion pounds in 1943.\(^6\)

After one runs the gamut of magnesium and aluminum, it becomes apparent that electricity is a tremendous key to America's problem of planes and more planes. For detailed information on power and the light metals see the last part of this chapter pp.16

This sociology theses is a brief and sketchy story of a medium-sized American industrial plant. A specialized electrical factory whose management,

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4. Brannon, R. C., Sharon Application Engineer.
5. Barron's, Mar. 30, 1942; Magnesium, reprinted pp.18 this thesis.
6. Aluminum Company, Figure and Commercial Report, Westinghouse and Pittsburgh Post-Gazette, Feb. 27, 1942.
employees and the labor union anticipated Pearl Harbor. A factory that put working 40 hours a week on the shelf in January 1941 instead of January 1942. And a plant that in its 18 years of existence has not burdened or worried society with slow-down, sit-down or walkout strikes.

Prior to the outbreak of the war in Europe, Sharon Works of the Westinghouse Electric and Manufacturing Company was a plant of around 3,000 employees making approximately one-third of the larger transformers; the General Electric factory at Pittsfield, Massachusetts manufactured 45 per cent; Allis Chalmers, 11 per cent, and what was left was split up among small concerns.

Sharon Works left the 40-hour week in January 1941, and by March 1, 1941 was operating six days a week, 24 hours a day. Best indications are that General Electric's Pittsfield plant started the six-day week on December 8, 1941, and by this time Sharon Works had started continuous 'round the clock seven days a week operations in vital sections. Allis Chalmers reached the five-and-a-half day week, two turns a day.

As a result of this increase of Westinghouse labor and management energy, Sharon Works during 1941 made half of the transformers manufactured in the United States. (In 1940, it built only a third.) The plant definitely forged ahead of competition to take a bigger slice of the transformer market, and America got urgently needed transformers for new plants and processes. American transformer business increased 98 per cent in 1941 over 1940, Westinghouse's Sharon Works went up 166 per cent.

So far this year (April 10), Sharon Works has booked more than seven million dollars worth of transformer orders for plants that obtain metals through electricity (excepting steel). The total for all of 1941 was three and

7. Sharon Works lead the Westinghouse Company in hours worked per man.
a half million dollars.

Then there are distribution transformers, comparatively small units, the kind you see on the light poles in your alley. Underneath the streets in the big cities are larger distribution units. General Electric was the mogul in this field, followed by Westinghouse, Allis Chalmers and a host of smaller fry. Again Sharon Works didn't wait for Pearl Harbor, and indications are the plant lead the field. Distribution (small) transformer production was four times greater at Sharon Works in October 1941 than in March 1940. In March 1942 it was about the same as for March 1940. The answer — simply the War Production Board under Donald M. Nelson will no longer allow copper and steel for anything but war transformers or necessary civilian replacements. Some transformers manufactured 40 years ago are still in use.

Sharon Works of the Westinghouse Company is completely devoted to the manufacture of transformers. The plant was established in the Mercer county city, 70 miles north of the mother plant in Pittsburgh 18 years ago. During these years Sharon Works has never had a strike or labor bickering that resulted in noticeable inefficient production. At this precise moment it is difficult to give a complete picture of why this is one among the few industrial plants that escaped the labor management ills that splotched American factories during the past few years.

Certainly during its 18-year history Sharon Works has had intelligent management, and workmen who appear and demonstrate a collective sense of responsibility. There is little on either management's or labor's side during these years that did not live up to the better American way of deciding the issue. Set in the midst of a district crammed with steel mills and receiving the highest wages especially during recent years, Sharon Works employees knew they had

8. No toy train, small radio units made here.
a good thing and gave some thought to the cost of industrial strife. Most of
the employees are home owners and family men, born in the immediate area, and
the majority have had at least two years of high school.

Sharon Works today is the only one of the 24 Westinghouse divisions that
is not CIO or AFL organized. Yet the labor relations history of the Westing-
house company ranks among the best. Roots of this good feeling go back to
George Westinghouse, the man whom Samuel Gompers, founder and first president
of the American Federation of Labor, described as, "I will say this for George
Westinghouse. If all employers of men treated their employes with the same
consideration he does, the American Federation of Labor would have to go out of
existence."

When steel mills were working their men 14 hours a day, and often seven
days a week, George Westinghouse in 1881 became the first American industrialist
to give all his employees Saturday afternoon off. From the start of presenting
each employe with a turkey on Thanksgiving, Westinghouse started a Company re-
lief association, a true forerunner of social security.

The transformer was George Westinghouse's first real product in the
electric field. At the age of 23, he had been a successful factory owner, for
he invented the railroad airbrake that is still used today. In the 1880's,
Westinghouse became interested in electricity, and he sent to England and
France and bought American rights to the Gibbs and Gaulard secondary generators,
ancestors of the modern transformer. Thomas Edison believed in direct current;
George Westinghouse in alternating current; and this difference in belief be-
tween two strong men ranks among America's biggest industrial feuds. Alternat-
ing current has apparently won, but Thomas Edison never fully admitted its

9. Canton Naval Ordnance plant is only AFL unit. Reason, Canton AFL town.
10. American Society of Mechanical Engineers, Westinghouse Commemoration, p.49.
superior merit.* See page 23 this chapter.

A simple transformer is a series of copper wire windings around a magnetic iron or steel core. The transformer makes practical the transmission of electric power. Electric current flows much like a stream of water, but infinitely faster. Voltage is as pressure. 110 volts of electrical current put into a copper wire would drop down to 105 volts 300 feet away,11 and would not reach the end of about a mile-long wire. Hence the City of Los Angeles procured a 220,000-volt transformer, which stood 36 feet high and weighed 200 tons, as much as an ordinary steam locomotive, in 1935 to pipe power from Boulder Dam, 250 miles distant.

There are two prime functions for transformers. They either serve to step-up or step-down electric current. In the ordinary residential district are found smaller transformers on poles. These units are connected by wires to the larger transformers at the power stations. The wires in the residential districts usually carry 2,300 volts, the lines coming into the homes are stepped down through a transformer to 110 or 120 volts.

At the power station or at Boulder Dam it is not practical to operate generators that produce more than 15,000 volts. Hence there are step-up transformers to boost the electrical pressure so that it will carry the current over long distances to the customers.

In the United States there are an estimated three million distribution transformers in residential districts. Perhaps an additional half million on the farms and in the business districts, or for that matter Army camps and wherever electric lights are used.12

But the transformer in war is primarily the power transformer necessary

11. Ordinary house wiring, etc., and current (estimate).
12. Estimate by A. O. Farmer, Sharon Assistant Supervisor of Sales.
* Also direct current requires a much larger conductor (wire) for the same voltage when compared with alternating current.
to obtaining and refining vital light-weight metals such as aluminum and magnesium. Again the power transformer is on the "must" list for factories that fabricate metals, and wherever there are metal-working machines.

In 1939 Sharon Works manufactured 15 million dollars worth of transformers; in 1941 it was 43 millions. In 1939 it was 21 million; in 1937 and 1940, 26 million. Today the plant makes 10 times as many transformers for the electrical steel industry as it averaged during the past 15 years. These transformers are medium-sized units with average ratings of 3,000 kva and cost ordinarily about $11,000 apiece. Approximately 25 per cent of Sharon Works' business today is manufacturing transformers for the electro-metal industries. In pre-war days it was less than five per cent of the total business.

America's highest type machine tool steel, ship castings and ball bearings are usually made by using electricity and Sharon Works supplied 63 per cent of the transformers used for this purpose in America since 1927.\(^{13}\) Transformers for electric furnaces were first put out by Westinghouse in the years immediately preceding World War I, but their adoption was comparatively slow. Westinghouse does not build the furnaces.

Profit on large transformers exceeds at least 25 per cent; taxes trim this down to around five per cent. On the smaller distribution units, in a competitive field, it is not quite as bad as selling butter in a grocery store, and volume is important. Some of the individual big units made at Sharon Works sell in the neighborhood of $100,000. The plant has filled million dollar orders for new factories.\(^{14}\) Also manufactured at Sharon are instrument transformers and AC arc-welding units.

Westinghouse's South Philadelphia Works where steam turbines and ship-driving mechanisms are made has a backlog variously reported as between two and

\(^{13}\) For more on electric-steel furnaces see page 31 this thesis.
\(^{14}\) See pages 31-35 this thesis.
three years. Using October 1941 as 100 per cent, Sharon Works was nine months behind in the manufacture of large power units, practically all urgently needed for some phase of the National Defense effort. Priorities had resulted in the plant being forced to center its productive capacity toward National Defense at least a year before Pearl Harbor. The nine-month backlog of October 1941 dropped in November and by December was 73 per cent of October, and by February 1942, only 52 per cent. In short the plant's backlog for large units had dropped down to seven months.

During this time plant efficiency and capacity had accounted in the four-month period for a gain of approximately 25 per cent in production of the big units. With the organization of the War Production Board headed by Donald M. Nelson, there has been a great increase in the contemplated number of new plants. Sharon Works' backlog for large transformers during April will probably reach the nine-month stage.

By July two million dollars worth of new buildings will be completed at Sharon Works; these will further increase plant capacity.

Following is an outline of need for transformers:

A. Metals
   1. aluminum
   2. magnesium
   3. considerable steel
   4. various steel alloys
   5. copper
   6. considerable zinc
   7. new process of electro-plating with tin
      a. uses one-third as much of scarce metal

B. Fabrication
   1. It requires as much electrical energy to roll and fabricate aluminum and magnesium as it does to produce it.

15. Prepared with R. C. Brannon, Sales Engineer.
Sales tactics were not needed as much during the past year. The customer rushing through a plant expansion or new factory is interested in delivery dates. Yet the purchaser keeps in mind that he can't afford transformer breakdown once his factory starts operating.

It appears that Westinghouse outdistanced competition when it comes to recent developments in the transformer field. Manager of Sharon Works, H. V. Putman can aptly be called "a brilliant and aggressive engineer." His encouragement and knowledge had much to do with three recent Westinghouse Transformer Division developments. They are: Hipersil, forced oil cooling and operation by copper temperature.

These developments are especially important at the present time when more and more transformers are needed yet there is a shortage of essential copper and steel. It has been estimated that during 1941 at Sharon Works enough copper and steel was saved by using Hipersil to manufacture 10 million bullets and 400 small tanks.

16. Competition is being licensed to use some of these developments.
Hipersil, new electric steel for transformer cores, has been under development by Westinghouse engineers and American Rolling Mill Company technicians for 10 years. In 1941 Hipersil was introduced into many power units and practically all small distribution transformers.17

Characteristic of this new steel, which makes it possible to build a transformer with a smaller core, is its ability to carry one-third more magnetic flux. Since the core is smaller in cross-section, the amount of copper required in the coils to surround the core is correspondingly less.

Second important Westinghouse innovation which also results in transformers of smaller weight and dimensions, is the practical development of forced oil cooling. By forcing oil through the coil windings at relatively high speed, cooling is greatly improved and a larger load current can be carried through the copper windings, thereby increasing the output of a given-sized transformer. This equipment for forced oil cooling was first developed for Pennsylvania Railroad high speed electric passenger locomotives where weight and dimension were of utmost importance.

Third important innovation which contributed to increased load carrying ability of Westinghouse transformers, is a new principle known as "operation by copper temperature." It is impossible to burn out a transformer equipped with this control which provides a signal in case of excessive temperature as the result of overloading, and finally if the high temperature continues, the load is removed by a circuit breaker being tripped. With copper temperature control it is practical to utilize a much larger percentage of a transformer's inherent overload capacity.18

17. Hipersil cores, partially because the steel is newly developed, are more expensive. The Company is spending considerable money to perfect this new material.
18. This material obtained from H. V. Putman, Transformer Division Manager.
Built for the City of Los Angeles and Boulder Dam, this 200-ton transformer is as heavy as a steam locomotive. One of the largest units manufactured at Sharon Works. Notice the man, a six-footer.
Inside the steel transformer tank.
Cutaway model of a distribution transformer.
- the transformer near your home -
Where "big" transformers are built.
Through the far doors are shipped each month
up to $3,000,000 worth of large power units.

The New T-bldg.
Half for torpedoes - Half for transformers.
**War Increases Demand for Arc-Welders**

With Pearl Harbor and the war, manufacture of electric arc-welding units at Sharon Works increased ten-fold. Sharon Works builds eight different sizes of AC arc-welders from 100 amp to 2,000 ampere giants. In addition to shipyards, the units are on the job where armor plate is welded for tanks, and gun mounts roll down assembly aisles for the army and the navy. Most dramatic use for the Sharon built product is on U. S. fighting vessels for emergency repairs.

Andy Hollabaugh tightens bolt on 300-amp welder minus case.

Al Nissery and Zygmunt Gursky adjust portable units.

500 amps on the job for John Benic.
Please Note

The remaining pages in this chapter (up to page 36) are necessary background for this thesis. It is suggested that the casual reader just glance at them.
Following is the article, "Have We Enough Power" by Keith Hutchinson in The Nation magazine, February 7, 1942:

"Among the basic factors of our war potential, electric power ranks with steel-making capacity, oil resources, and the supply of skilled labor and machine tool equipment. Nor does its importance nowadays lie only in our dependence on it to turn the wheels of industry; more and more the metal and chemical industries are absorbing huge amounts of power in electrolytic processes. Aluminum is extracted from bauxite by these means, magnesium conjured out of sea water. The normal method of producing chlorine gas, an essential raw material for a host of industries, is by passing an electric current through cells containing brine. Important by-products of this process are caustic soda, which the rayon industry uses in large quantities, and hydrogen. Tinplate can be manufactured electrolytically, and since this method economizes the use of tin it may be widely substituted for the usual hot-dip process.19

"It is fortunate that in the matter of electric power we have a big edge on our enemies. Just how big this is, it is difficult to say, however, as the last reliable figures of German, Italian, and Japanese installed capacity are for the year 1936. Since then, information on this subject has been treated as a military secret. The United States today has something over 44 million kilowatts of installed capacity in public utilities, and industrial undertakings possessing their own power plants account for at least another 10 million. German capacity in 1936 was a little over 15 million kilowatts, Italian 5.36 million, and Japanese 5.77 million. Both the Germans and the Japanese are known to have made very considerable additions since, but allowing generously for this expansion, the total capacity of the three Axis powers is almost certainly less than 40 million kilowatts.

The question can also be approached from the angle of total annual power production. In this country in 1941 total production was in the neighborhood of 205 billion kilowatt-hours, and if we add estimates for Canada and Britain we have a figure for three of the United Nations alone or 273 billion kilowatt-hours. Here again figures for the Axis nations can only be guessed at on the basis of very incomplete data. But giving them the benefit of every doubt, and including a very substantial amount for the power output of the occupied countries, we arrive at an estimate of 200 billion kilowatt-hours.

"The fact that we can outdistance our enemies in the matter of power does not mean, however, that the needs of our gigantic armament program are amply covered. For some months the Federal Power Commission and some OPM experts have been warning that a power shortage is on the horizon. In a report issued last September the Federal Power Commission pointed out that peak demands for power were proving well above anticipations and continued: 'It is significant that the major part of these underestimates occur in important war-material areas. Since capacity additions are scheduled on the basis of forecasts made two or more years in advance of experienced loads, it is obvious that serious power shortages may develop in some areas if the longer-range forecasts contain cumulative errors of the magnitude that have occurred for three-month periods.'

19. Now starting to use electric method, requires third less tin.
After the United States entered the war and the greatly expanded production program was announced, Thomas R. Tate, director of the National Defense Power Staff, told a Congressional subcommittee that there would be a power shortage of around two million kilowatts this year and between three and four million in 1943. As a remedy he proposed reconditioning existing equipment, expediting of new installations and rapid construction of inter-connecting transmission lines so that resources can be pooled and no capacity allowed to remain idle while other plants are overburdened.  

This expectation of shortage is not shared by the electric-power industry, whose spokesman C. W. Kellogg, president of the Edison Electric Institute, stated on January 22 that the outlook was reassuring with a present surplus of nine million kilowatts of generating capacity above the greatest demand for power and with the construction of an equal amount in prospect during the next three years. In support of this view Mr. Kellogg quoted a recent report of the Federal Power Commission which found that the energy consumed in the filling of government orders during 1941 totaled 7, 267, 913, 975 kilowatt-hours while the total disbursements for national defense were $12,531,000,000. This indicates a ratio of six-tenths of a kilowatt-hour per dollar of defense expenditure. Thus, assuming total war expenditure reaches the budget figure of 36 billion dollars in 1945, the increase in electric output directly for the increased war load should run from 32 to 35 billion kilowatt-hours.  

One possible objection to this calculation is its underlying assumption that the ratio of energy consumed to war goods produced will remain unchanged. This seems unlikely. During 1941 a great deal of our defense expenditure was for building new plants and new camps. Now those plants are getting into production, and it seems probable that a million dollars spent on manufacturing shells or tanks or planes is going to give rise to a greater consumption of energy that the expenditure of the same sum on building, where the ratio of labor costs to total value is high. Moreover, a significant part of the new production will be in industries employing electrolytic processes with a larger than average consumption of power. It takes 10 kilowatt-hours to produce a pound of aluminum, 12 for a pound of magnesium. With aluminum now costing 15 cents a pound, the production of one dollar's worth of this metal requires 662/3 kilowatt-hours. A total production of 200 million pounds, the latest program, will call for 20 billion kilowatt-hours annually.  

It is certain, in any case, that last year the percentage growth in output of energy for public use was more than twice the percentage increase in installed capacity. For the twelve months ending November 30, 1941, total production was up 15.5 per cent over that for the twelve months ending November 30, 1940. Installed capacity in publicly and privately owned electric utilities rose last year by 2,850,000 kilowatts, according to the Wall Street Journal, or an increase of under seven per cent. Scheduled construction of new capacity for 1942 is somewhat greater, but unless there is a sharp reversal in the present trend of consumption, the industry's reserve margin will be much narrowed, if it does not disappear altogether. Already there is talk of rationing domestic and trade consumers, and should this become necessary the private utilities are going to feel the effect in their earnings, for while the wholesale users of

20. Now building aluminum plants near big cities to use excess power producing facilities.
current may provide their bread it is the householder and shopkeeper who spread the butter and jam on it."

---800---

Phenomenal, describes America's new magnesium industry. Starting almost from scratch, production of this essential metal is heading toward the 700 million pounds mark. Every cubic mile of sea water contains 5,700,000 tons of magnesium. The supply is inexhaustible, electrical power is the answer.

The following article, "Growth Prospects of Magnesium," is from the March 30, 1942 issue of Barron's. The author, Michael Fescatello. His story of magnesium is considered by the interested Sharon Works engineers as the best overall picture of a war-needed metal.

Growth Prospects of Magnesium

"Magnesium metal, when ignited, burns at 1300 degrees centigrade, giving off terrific heat and intense light. Pour water on the ignited metal and the result is a violent explosion which scatters the flaming metal in the surrounding area. If carbon tetrachloride, the compound which is used in most fire extinguishers, is applied to burning magnesium, the reaction produces one of the most deadly poisonous gases - phosgene. If magnesium powder is ignited, it explodes.

"Incendiary bombs, which have been used constantly in the present war, have magnesium as one of their important constituents. A two-pound incendiary, for example, consists of a shell of magnesium alloy. This shell is filled with a thermite mixture of granulated iron oxide, granulated aluminum, and magnesium powder. The thermite burns at 3000 degrees centigrade and ignites the magnesium shell casing which burns at 1300 degrees centigrade. It is difficult to extinguish. A large bomber can probably carry some 2000 of these bombs. In the first World War, use of magnesium was applied to star shells, flares, tracer bullets and bombs.

"But since the World War, magnesium has come a long way. At the present time it is one of the most strategic of all war materials. Commercial production of the metal in the United States did not begin until 1915, when the war cut off German supplies. In that year, our domestic production, totaled 87,500 pounds and its price was quoted at $5 a pound. By 1918, production had increased to 264,118 pounds. After the war, demand dropped off until 1925, when there appeared to be a revival of interest. The price then was about $1 a pound. Magnesium itself, the free metal, does not occur in nature. In this respect it is similar to aluminum. The richest bearing magnesium ore is
brucite, or magnesium hydroxide. It is prevalent in large quantities in Nevada. Magnesite, another ore of magnesium, is found in great quantities in the State of Washington.

"Magnesium's scarcity in concentrated form and the highly technical and difficult process of extracting the pure metal require large quantities of electricity in its production.

"Until last year, Dow Chemical Company was the only domestic producer of magnesium metal. Output for this country in 1940 was less than 13 million pounds. Wartime demand for the metal has brought other companies into the field, and the Government has made large loans to help in this expansion program. The production potential of authorized plants is 190 million pounds.

"Expansion of magnesium production promises to be so great that the question has arisen as to the position of Dow Chemical after the war. This article, however, points out that the metal has a highly promising peacetime future. Furthermore, in the process of producing magnesium, Dow also produces several chemicals for which there is an expanding demand. This would cushion the effect of a reduced price for magnesium.

"There are three principal processes used in the extraction of magnesium. One utilizes magnesium chloride from brines, from which pure magnesium is obtained by electrolysis. Dow Chemical has pioneered in the development of this process to its present state of efficiency. The other is the Hanaging process. And, a third method, just recently announced, is the new ferro-silicon process developed jointly by Ford Motor Company, Union Carbide and Carbon Company, and Dominion Magnesium Company of Canada. The importance of this latter process is that it is said to be foolproof, uses less electricity than the other methods; and plants can be built in a short time at comparatively low cost.

"Dow Chemical Company and American Magnesium Company, a subsidiary of Aluminum Company of America, were the sole producers before the war. In 1927 American Magnesium ceased production and confined its activities to fabrication. From 1927 to August 1941, Dow Chemical was the sole producer of magnesium in the United States.

"In 1933, Dow's sales of magnesium totaled 1,435,000 pounds. In 1940, production of magnesium was almost nine times as great, or 13,524,400 pounds. Expansion in capacity, that is, either being built or authorized up to the end of February, brings the production potential up to approximately 700 million pounds. In addition to Dow Chemical, there are 10 new companies involved in this expansion.

"Magnesium is one-third lighter than aluminum. It is soft and has a silvery luster. In combination with other metals, principally aluminum, zinc, and manganese, it forms an alloy of very light weight and high strength. It is one of the easiest of all alloys to machine. The combination of lightness and strength has made it ideal in the manufacture of alloy structural products for the aircraft industry. Thus, by the substitution of magnesium alloy in place of aluminum for the five-foot landing wheels of large bombers, a saving of over 100 pounds in weight is made. This saving, when translated into increased bomb..."
or gasoline loads, larger cruising radii, or greater maneuverability, assumes great importance at the present time.

"These magnesium alloys are being used for hundreds of items in present aircraft. A few which may be mentioned are - seats, doors, partitions, walls, flight instruments, crank cases, oil pans, control levers, pedals, supercharger castings, pump bodies, blower sections, carburetor bodies, oil tanks, etc. In England there is now in production a forged magnesium alloy propeller, and it has recently been reported that the army has awarded a contract for an all-welded magnesium wing. These widespread uses add up to a total of almost 1,000 pounds of magnesium alloys for the average plane built in the United States; and it is probably considerably greater for the huge bombers.

"When the first World War cut off German imports of magnesium chloride, Dow Chemical utilised its Midland, Michigan brine wells to produce this important material. This led to research on the possibilities of extracting metallic magnesium from the chloride. By 1918, the company considered itself in commercial production of the metal. Its sole uses at that time, however, were in the form of magnesium powder. A metallurgical staff was set up to develop means of alloying, fabrication, and use. The difficulty of this task can be realised from the fact that it was not until the early thirties, or less than ten years ago, that magnesium became commercially acceptable in the form of castings, sheets, and forgings.

"In the Dow process, the raw material at the Midland plant is brine from wells containing 32 per cent magnesium chloride which, in turn, contains less than one per cent magnesium. Bromine, sodium, and calcium salts are first removed from the brine. Chlorine is added; and the magnesium chloride that has been isolated is subject to further concentration. Then the magnesium chloride in liquid form is electrolysed. The end products resulting are pure magnesium and chlorine. At its new Freeport, Texas plant, Dow uses sea water as the basic raw material which contains about one-half of one per cent magnesium chloride, of which something like one-eighth of one per cent is magnesium. Here powdered oyster shells are added to water forming milk of lime, and this precipitates magnesium hydroxide (milk of magnesia) from the sea water. Then it is thickened, filtered, and treated with hydrochloric acid to produce magnesium chloride. From this point magnesium chloride is subjected to the same electrolytic treatment as at the Midland plant.

"Dr. Frits J. Hanasing, an Austrian, originated the process that bears his name. For a number of years he had experimented with the reduction by electricity of magnesium oxide with carbon. By this means the oxygen in the magnesium oxide is absorbed by a carbon such as coke, while the magnesium left in the form of vapor is cooled very quickly with great quantities of hydrogen. Commercial plants using this process were set up at Radenthin, Austria, Konan in Korea, and Swansea, Wales. One of the greatest handicaps in the use of this process, from the standpoint of safety, has been the use of hydrogen which is highly dangerous to work with. It was reported that the Radenthin plant in Austria had an explosion in 1939. Dr. Hanasing supervised the construction of the Permanente Corporation magnesium plant near San Francisco, California. This company was formed by Todd-California Shipbuilding Corporation and Henry J. Kaiser, well-known builder of dams, shipyards and cement mills. Construction of the 12 million dollar plant was started in February 1941, with $9,250,000 of funds borrowed from the Reconstruction Finance Corporation. Batches of
magnesium were in preliminary production by August. During the testing period, an unfortunate explosion occurred resulting in a number of casualties. Whether the process will prove successful is still uncertain.

"Dow Chemical's Freeport plant was started in 1940. Before it was completed the British government asked that its capacity be enlarged. By January of last year, the plant was producing at the rate of 12 million pounds a year. Since that time, the United States government, through the Defense Plant Corporation, had this capacity trebled and the additional facilities were leased to Dow, making a total producing capacity of approximately 54 million pounds. Then, after November of last year, an additional 72 million-pound plant, now building near Freeport, Texas, was authorized. And, finally, in the latter part of February, this year, the War Production Board announced that Dow was to build a new plant in Michigan with a capacity of 144 million pounds. This makes a total capacity for Dow of 270 million pounds.

The War Production Board announced at the same time that authorizations were to be made for the construction of magnesium production facilities that are to use the new ferro-silicon process. This provided for an additional 157 million pounds capacity using the ferro-silicon process, and 34 million pounds using a variation of that process. Six companies involved in this new program are Union Carbide, Ford Motor Company, American Metal Company, National Lead Company, New England Lime Company, and Permanente Corporation. Previous to this most recent announcement, there had been authorizations to increase capacities for magnesium production by companies other than Dow Chemical. Diamond Alkali Company and Mathieson Alkali Works, Inc., each have contracted for the operation of two plants each with a capacity of 56 million pounds; Union Potash for a plant of 24 million pounds capacity; Permanente Corporation for a plant of 48 million pounds; and Basic Magnesium, Inc., a plant of 112 million pounds capacity in Nevada. British interests are understood to be active in this project.

There are numerous companies in the field of fabrication of magnesium alloy. American Magnesium Corporation, a subsidiary of Aluminum Company of America, is the largest and oldest in the field. Its output last year was over 20 times the 1938 output. Dow Chemical is also a fabricator as well as a producer of the metal. The tremendous expansion in production of magnesium, primarily for its use in aircraft manufacture, leads naturally to concern regarding the position of companies producing it, especially Dow, after war ends. It appears almost certain that prices of magnesium metal will be reduced substantially. In estimating the effect on net income, however, there are several important factors that present a more favorable outlook. Dow is a primary fabricator of parts made from magnesium alloys - a business which is likely to find a greatly expanded market in the industrial field after wartime demand subsides. The airplane industry, itself, will use this metal to a much greater extent in peacetime than has been the case heretofore.

But of equal importance is the potential use of magnesium in other industries. The use is almost limitless in view of the demonstrated advantages of the metal. A substantial reduction in price of magnesium in itself will provide a very significant stimulant to its greater use in industry. The housing field provides large additional uses, as do also the automobile, railroad, and electrical equipment industries. The advantages of magnesium for use in portable machines and tools, typewriters, and household appliances like
vacuum cleaners, fans, washing machines, and the like, is unquestioned.

World Production of Magnesium
(in pounds)

<table>
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<tr>
<th></th>
<th>1940</th>
<th>1939</th>
<th>1938</th>
<th>1937</th>
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<tr>
<td>Germany</td>
<td>41,895,000</td>
<td>36,382,500</td>
<td>31,090,500</td>
<td>26,536,400</td>
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<tr>
<td>United States</td>
<td>12,524,400</td>
<td>6,700,995</td>
<td>6,434,190</td>
<td>4,540,095</td>
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<td>Great Britain</td>
<td>14,332,500</td>
<td>11,025,000</td>
<td>6,615,000</td>
<td>4,410,000</td>
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<tr>
<td>Japan</td>
<td>8,320,000</td>
<td>4,410,000</td>
<td>3,207,500</td>
<td>2,646,000</td>
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<tr>
<td>Others</td>
<td>10,407,600</td>
<td>9,316,505</td>
<td>7,016,310</td>
<td>5,426,505</td>
</tr>
<tr>
<td>Total</td>
<td>87,979,500</td>
<td>68,355,000</td>
<td>54,463,500</td>
<td>43,659,000</td>
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</tbody>
</table>

"But the increased competition, both in the magnesium field itself and in the general field of competing metals, after the war is also likely to be of strong character. Dow's position, however, remains unique. Its operations as a chemical unit have not been based on the extraction of magnesium alone from brine wells or sea water. The company's business has been mainly to derive and convert products from brines and sea water, i.e., alkalis, bromine and chlorine, into compounds that are commercially useful. Hence it is not entirely accurate to speak of its facilities as magnesium plants. It was in 1934 that Dow began to utilize sea water, but not for magnesium. At its Kure Beach, North Carolina plant it extracts some 60,000 pounds of bromine per day from the ocean. This bromine is used to make ethylene dibromide. The latter, combined with tetraethyl lead, is the ethyl fluid used in gasoline to increase octane rating.

"The use of bromine has expanded with greater consumption of gasoline. This progressive increase in use has been a result of the greater number of cars and trucks registered each year. There has also been a constantly increasing use of aviation gasoline. A further demand has been created by reason of the use of ethyl fluid in all grades of gasoline instead of only in premium grades. Another factor that has tended to increase the need for higher octane gasolines has been the trend toward higher compression ratios in engines. This trend is still in evidence and calls for larger and larger quantities of bromine. Dow's ocean-extraction facilities produce bromine as an important by-product.

"Iodine is another important and scarce product that is being produced from sea water. Dow started production of this chemical from salt brines at Long Beach, California in 1928. It is important in the manufacture of medicine, dyestuffs, special soaps, and germicides, and in lithography and engraving. Basically important is chlorine which is derived from brine wells and sea water. Probably Dow's most important present and future derivative products stem from chlorine which the company "mines" from sea water. One of these is "Saran", Dow's promising new plastic.

"It is apparent that Dow's technique of production involves a host of derivative products and by-products. The strategy in the Freeport plant, for example, has not confined the company to magnesium alone. It includes among others the products already mentioned. Here is found a combination of raw materials - sea water, lime, and hydrocarbon (natural gas, oil) which when utilized produce a range of important chemical compounds, in addition to the most popularized of all - magnesium, a metal."
"Hence it is likely that the company can utilize its magnesium capacity favorably in view of the prospect of expanded use by reason of lower prices and better appreciation of its qualities. It has, moreover, an important advantage over its magnesium competitors in that there are a great number of products derived from the basic operations of which magnesium is only one. The potentialities of many of these products are very promising for the future."

Re: George Westinghouse

The following article is a publicity release from the Westinghouse Company dated January 16, 1938:

"What man has long had, he takes for granted. To the millions of commuters from Oakland to Osaka, the swift trains that nightly bear them safely homeward are as commonplace as the cheering electric beams from welcoming windows. That these millions owe their enjoyment of safe travel and same lighting to one man in particular few realize.

"There were railroads half a century ago, to be sure; but trains were braked by hand, and hence could venture no more than ten to fifteen miles an hour. To live more than ten miles from business was impractical. And there was electricity half a century ago; but as it was developed by water power and transmitted by direct current, its blessings were confined to areas of a few blocks surrounding the generating stations. Farmers and suburbanites could not afford such luxury.

"In the late 1860's, a young engineer, George Westinghouse, gave the railroads the air-brake which still bears his name. A decade later, the venturesome pioneer who had revolutionised steam travel turned his mind to the problem of bringing the new servant - electricity - into every home.

"But how? To transport electric power over great distances required high voltages. Even after being carried to the desired destination, such power would be far too potent for general use. It would have to be reduced, "stepped down," at the point of application.

"The answer was the transformer and alternating current, both developed through the genius of George Westinghouse. But do not imagine that the world was permitted to accept such a windfall without a struggle. Existing patents and apparatus were for direct current. Joined by no less than the most publicised inventor in the field, all whose stake was in the present joined to fight this genius of the future - even sought to outlaw his alternating current "monstrosity" as a "menace to life and limb."

"Happily for all of us, Westinghouse won. Recently, engineers signalized the victory by celebrating the ninetieth anniversary of the great engineer. This week, the American Society of Mechanical Engineers are bringing out in book form the story of his life and achievements. The book is the work of 20 contributors, among them Dr. James R. Angell of Yale university, Paul D. Cravath.

21. Thomas Edison.
W. L. Batt and Ambrose Swasey, past president of the A.S.M.E.; A. W. Berresford, past president of the A.I.E.E.; Ralph Budd, president of the Burlington Lines; and S. M. Vauclain, chairman of the board of the Baldwin Locomotive Works.

"The author-editor, Charles F. Scott, Professor Emeritus of electrical engineering at Yale University, joined the Westinghouse Company in 1888. He witnessed at close hand the battle for alternating current, the introduction of the great Niagara power station, the coming of the first electric locomotive, and a hundred other amazing advances associated with the name Westinghouse.

"But it was given to Dr. Scott to know more than Westinghouse the inventor and engineer, he became acquainted with Westinghouse the man and humanitarian. For Westinghouse was a pioneer in more than science and invention. Long before such matters became the preoccupation of government, he had blazed a brave trail in labor relations. In 1886 he established the five and a half day week. A few weeks later, he organized technical day and night schools for employees. In 1907 he found the Westinghouse Relief Department which ever since has kept pay envelopes of the sick and injured full. Before the World War, he had set up collective bargaining and retirement pension systems.

"George Westinghouse is dead. His alternating current, his high speed turbines, his air-brake and his enlightened social philosophy are enduring landmarks in a bewildered world."

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High Lights of the Electrical Equipment Industry*

"In keeping with many other branches of the manufacturing community, the electrical equipment industry, under pressure of the defense effort, has stepped up production to the highest level in history.

"Modern mechanised warfare is almost wholly dependent upon electrical equipment - equipment to make the tools of war and appliances to control the finished products in actual combat.

"To supply the growing demand for electric energy in defense industries, the electric power generating facilities are expanding at five times the annual rate during World War I. New power installations are scheduled ahead as far as 1946. Aluminum, copper, and other critical materials require huge quantities of electric energy from the processing of ore to the finished products. Electrical devices play important parts in modern warfare. Naval fighting craft are not only fitted with highly efficient turbo-electric propulsion units but with steering, fire control, direction finding, communication and enemy detection devices - all contributions of the electrical industry. By means of ingenious electrical controls, signaling and communication devices, activities in every part of a battleship can be controlled from the bridge. What has been and is

* Article by W. G. Becker; Domestic Commerce Reports, U.S.D.C., Nov. 6, 1941.
being done to meet this unprecedented demand for military and industrial equipment?

"In 1939 the initial defense demand was for raw materials and machine tools, hence the impact of the program did not reach the electrical industry until late in that year, after plant construction was in full swing and numerous military products began emerging from blueprint into production. Electrical machinery output in 1939 was under $1\frac{1}{2}$ billion dollars, and slightly below that of 1937. In the year 1940 the volume had increased to two billion dollars.

"The present monthly production rate is at approximately 300 million dollars. In the first eight months of 1941, the output aggregated about 2,082 million dollars compared with 1,185 million dollars for the corresponding period in 1940. At the present rate, output in 1941 will probably exceed 3,500 million dollars, which will compare with the previous record output of 2,400 million dollars worth of electrical machinery in 1939.

"The output of but a few electrical products have failed to double in volume over last year, and many have tripled and quadrupled. The principle increases have been in motors, generators, transmission and distribution equipment.

"According to the 1939 Census of Manufacturers, the electrical industry was fourth in value of products and fifth in the number of wage earners employed. The industry is comprised of over 2,000 establishments spread over more than 30 states. ......

"Current new order bookings have reached an all-time high, far exceeding those of 1929. This unusually heavy production stimulus is due to the constantly growing demand for additional industrial electrical energy capacity to supply the increasing defense production, augmented by the huge volume of orders for marine equipment, power and distribution products, as well as industrial apparatus. The unprecedented record backlog in the capital goods line is largely direct and subsidiary defense business, and as the defense program is stepped up to higher levels the amount of new business is expected to increase. ......

"In normal times the electrical equipment industry is the largest consumer of copper, accounting for around 40 per cent of the total consumption. Military requirements will necessitate diversion of a part of the industry's normal supply of copper and other metals to other channels.

"Approximately three-eighths of the electric energy consumed by industry in the United States is furnished by generating equipment located in industrial plants; the rest is purchased from public utilities. Despite the gain in prime mover capacity, the number of establishments using power generating equipment declined from 182,969 in 1929 to 181,000 in 1939, a decrease of seven per cent. About 70 per cent of the present kilowatt generator capacity is driven by steam turbines. Approximately 10 per cent of the prime mover capacity in manufacturing establishments is ordinarily idle by reason of repairs or stand-by service.

"Power equipment and energy consumption in manufacturing establishments
is one index of a nation's productive capacity. The United Kingdom and Canada are the only foreign countries for which comparative data are available. In comparison with British manufacturing industry, the American industry had almost four times the horsepower of prime movers; six times the kilowatt generator capacity and five times the total electric motor horsepower. While the British manufacturing situation has greatly changed in the last decade and especially since World War II began, the relative position is significant of the supreme importance of United States productive capacity to the British war effort. The total horsepower of electric motors in the Canadian manufacturing industry in 1939 was four million compared with almost 46 million in the United States for the same year.

"The value of all products manufactured by industrial establishments in 1939 was 57 billion dollars and the amount of energy purchased was 45 billion kilowatt hours, compared with a product value of 68 billion dollars in 1929 and purchased energy consumption of 37 billion kilowatt hours.

"As an indication of the trend toward greater use of energy in various manufacturing processes, in 1929 for each dollar of production value, .55 kilowatt hours were consumed, while in 1939 energy consumption had reached .79 kilowatt hours per dollar of production.

"The horsepower of electric motors per worker (8,380,536 workers) in American manufacturing industries in 1929 was 4.2 hp., and in 1939 (7,887,242 workers), it had increased to 5.3 hp. In marked contrast the British manufacturing industry had 1.4 hp. of electric motors per worker in 1930 (4,875,333 workers).

"In 1929 total energy generated was 96 billion kilowatt hours, compared with 145 billion units in 1940 and an estimated record high of 166 billion units in 1941. Sales of energy in 1940 were 119 billion units of which amount commercial and industrial establishments consumed about 82 billion units or approximately 70 per cent.

"Revenues from sales to commercial and industrial customers in 1940 were 1,321 million dollars. Increased defense production in 1941 will require up to 75 per cent of total power generation for industrial and commercial establishments.

**Energy Production of Leading Countries, 1938**

<table>
<thead>
<tr>
<th>Country</th>
<th>Kilowatt Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>116,691,423</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>30,700,000</td>
</tr>
<tr>
<td>Canada</td>
<td>25,999,000</td>
</tr>
<tr>
<td>Germany</td>
<td>35,238,000</td>
</tr>
<tr>
<td>Italy</td>
<td>15,108,000</td>
</tr>
<tr>
<td>France</td>
<td>19,300,000</td>
</tr>
<tr>
<td>Japan</td>
<td>26,714,000</td>
</tr>
<tr>
<td>Russia (1937)</td>
<td>36,400,000</td>
</tr>
</tbody>
</table>

"In 1938 total world electric energy production was 483 billion kilowatt hours of which 24 per cent represented the share of the United States."
Comparable details for later years are not available.

"From 1938 to 1940 the United States generator capacity increased seven percent and production of energy moved up 26 percent. Nations at war undoubtedly lost some plants through bombing and new plant construction decreased. Accordingly the United States' share of world power capacity and production has probably increased since 1938.

"Estimates of new generating capacity schedules for installation this year are approximately 3,400,000 kilowatts. Budgeted expenditures for equipment and plant expansion in 1941 are approximately 900 million dollars, an increase of 46 percent over 1940. The Federal Power Commission has developed plans for the largest electric power expansion program ever undertaken in our history. To guarantee sufficient power for future defense needs the proposal contemplates placing orders for approximately $3.5 million kilowatts of new generating equipment for delivery in 1943 through 1946. This equipment is in addition to scheduled orders placed by private firms. The entire program contemplates expenditures of 2.5 billion dollars in public and private funds over a five-year period. Approximately 15,986,000 kilowatts will be added to the nation's generating capacity, which now far exceeds any other country and is above the combined plant capacity of all the Axis and controlled countries of Europe. For initial expenditure the Reconstruction Finance Corporation has allotted 150 million dollars to the Federal Power Commission."

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end of article by G. W. Becker in Nov. 6, 1941 issue of Domestic Commerce published by U. S. Dept. of Com.

**Urgently Wanted - - More Electric Energy**

by Leland Olds, Chairman
Federal Power Commission

"Power has come to be a prime essential in modern industry. It is more important to industrial mobilization today than in the World War. It will become more important as our $36,000,000,000 annual defense effort gets still further into its stride. Already as our estimates of power needs for defense have moved steadily upward we have come to recognize the absolute dependence of industry and the nation upon electric power for total industrial mobilization.

"For in modern war the country or group of countries which can mobilize most completely will gain victory. Power is essential to this mobilization. Today it is estimated that the Axis combination by 1943 will command electric power resources totaling 200,000,000 kilowatt-hours a year. This total is 33 per cent greater than the United States output in 1940. When our defense program reaches the $36,000,000,000 annual rate it will require 100,000,000,000 kilowatt-hours of electric energy of which 56,000,000,000 kilowatt-hours will come from displacement of normal peacetime production. That is the additional

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*Domestic Commerce, publ. by U. S. Dept. of Com., Aug. 18, 1941*
amount needed by the defense program and we cannot add it to our present productive capacity in a month, a year or even two years. But the magnitude of the need is more readily apprehended when it is realized that this year the aluminum and magnesium program alone, calls for more power than the total estimated peacetime load for 1941 for the entire group of electrochemical and electrometallurgical industries. Five years ago these industries used 13,324,000,000 kilowatt-hours of electric energy annually. In a 1938 report entitled "Power Requirements in Electrochemical, Electrometallurgical, and Allied Industries," the Federal Power Commission estimated requirements in 1941 would be 17,781,000,000 kilowatt-hours.

"Today as part of the defense program, aluminum production alone calls for in the neighborhood of 16,000,000,000 kilowatt-hours of electric energy annually. The combined aluminum and magnesium program will absorb a total of approximately 21,000,000,000 kilowatt-hours of energy a year. Even before the defense program was projected, however, the Commission forecast that the electrochemical and electrometallurgical industry would expand considerably. It pointed to areas now under consideration by this committee, where metallurgical ores are close to regions in which comparatively low-cost power could be developed. It is in these exact regions that new metallurgical industries and new power resources are being developed.

"In the north Pacific coast with its large and immediate possibilities of low-cost hydro-electric energy, for example, there is definite possibility of aluminum reduction from foreign ores delivered principally by shipment on the Columbia river or on Puget Sound," the Commission said in the report. The availability of iron ore, or iron and steel scrap, and of coking coal suitable for electric furnace production, and the relatively small local capacity now installed indicate that electric production of iron and steel alloy may be commercially feasible in the near future.

"Widespread deposits of manganese, chromiun, and other ores suggest the possibility of ferro-alloy production. Extensive resources of phosphate rock in Idaho, Wyoming, Utah and Montana are available for the manufacture of phosphoric acid and phosphates. More immediate prospects for the development of sodium chloride and of calcium carbide are also to be noted. In the south-western states, ferro-alloys and especially ferromanganese offer distinct possibilities. Zinc deposits in the region of Pioche, Nevada are favorable for either electrolytic or electrothermal production of zinc and zinc oxides. Magnesites in California and alunites in Utah may be used for the production of electrolytic magnesium and electric furnace potash. The ability to make potassium nitrate from potassium chloride and nitrogen peroxide (derived from ammonia), together with the potential need for additional ammonia for fertilizer use, indicate that new capacity for synthetic ammonia may be expected, perhaps utilizing power from Boulder Dam."

"The cost relationship between use of electric power and production of these materials is apparent from the fact, as shown in the report, that one mill power, i.e. 0.1 cent per kilowatt-hour, represented only six per cent of the price of aluminum, but five mill power represented 30 per cent of the price while at one cent power would have absorbed 60 per cent of the price. One mill power represented only 3.3 per cent of the price of magnesium, but five mill power absorbed 16.7 per cent of the price and one cent power, 33.3 per cent of the price. Similarly one mill power absorbed only 5.3 per cent of the price of
calcium carbide, while five mill power 31.5 per cent of the price charged for the product. Similar relationships exist in the production of ferrosilicon, fused alumina, silicon carbide and anhydrous ammonia.

The vital relationship of aluminum to the defense program is known to all of us. However, the place of power in the defense effort is brought home again by the fact that there are between three and five tons of aluminum on the average in every plane. It takes 24,000 kilowatt-hours to produce one ton of aluminum. Think of the relationship between the cost of power for aluminum in the planes we are building. Remember also that every time the number of tons of aluminum arises the number of kilowatt-hours needed rises tenfold. Thus, when an additional 100,000,000 pounds of aluminum is ordered, 1,000,000,000 extra kilowatt-hours must be used in its production.

In the 17 Western states there are great undeveloped water power resources which could provide low-cost electric energy. There are known undeveloped water power sites with a total capacity of 33,740,000 kilowatts. Properly developed, 204,000,000,000 kilowatt-hours a year could be produced at these sites. Compare this total with the 200,000,000,000 which the German-let Axis will control in 1943 if still in the field. Or compare the total with the 1940 United States output of 145,000,000,000 kilowatt-hours.

The article then has seven paragraphs describing the latent water power resources of the western states and their proximity to mineral resources.

Comparison of prices of power produced by typical private steam and hydro plants reveals that steam power on the average costs approximately five mills per kilowatt-hour and hydro power about 3.5 mills per kilowatt-hour. These power costs include operating expenses, depreciation, taxes and return on investment, and are based on groups of actually operating steam and hydro plants of reasonably equivalent size and operating at approximately the same load factor. Publicly-owned steam plants, however, can produce power at costs ranging from 3.3 mills per kilowatt-hour when using $3 coal to 4.8 mills per kilowatt-hour when using $5 coal, assuming 50 per cent load factor operation.

Estimated hydroelectric power costs in some of the Western states range from .... 1.5 to 3 mills. On larger projects such as Boulder Dam and Grand Coulee as low as 1 mill.

Thus it is apparent that the low-cost power required by the electro-chemical and electrometallurgical industries can be provided most readily by new hydroelectric developments if transportation and other factors are favorable. This does not preclude, however, the use of power from low-cost steam plants in certain areas, and in general, a carefully balanced program of hydro and steam power combined will be found to offer the most satisfactory power supply. It is important in planning for defense production that the long-range view of electric power development be maintained. New water power developments and expansion of existing ones must be undertaken with two objectives in mind: power production for defense as quickly as possible and usefulness after termination of the emergency.

Since the first objective is paramount today, however, we must see to it
that equipment firms are kept working at capacity to produce machinery for power plants that will be immediately useful for defense production."

end of Leland Olds, Chairman of Federal Power Commission, article in Domestic Commerce, August 14, 1941.

"It may be interesting to add, perhaps, that during May 1941, total production of electric energy for public use amounted to 13,290,609,000 kilowatt-hours. Of this amount 4,223,328,000 kilowatt-hours, or 32 per cent, were produced by water power."*

* from article by Dr. H. A. Morgan, chairman Tennessee Valley Authority, in July 17, 1941 issue of Domestic Commerce.
On this and the following pages are photostatic copies which give background information about electric furnaces, and their uses. Also included is "The Timetable of Aluminum in Defense," released by the Aluminum Company of America, and a page from Business Week magazine which shows the great emphasis placed on the "electricity" obtained metals.
In the melting and refining of steel, grey and malleable iron, nickel, chromium and ferrous alloys, electricity is an ideal source of heat as it is clean, easily and quickly controlled and offers advantages in a metallurgical way that can not be had by any other means.

The American Bridge Company, manufacturers of the Heroult Electric Melting Furnace since 1910, have been pioneers in this field and with some two hundred installations have been largely responsible for the development of the electric melting furnace in the iron and steel industry.

In the making of higher grade tool and alloy steels the Heroult Furnace has largely replaced the crucible process. Its advantages over the latter are such that much larger heats can be poured from a single furnace and lower priced raw materials can be used without sacrificing the quality of the finished product. Also the temperature can be so controlled that an ideal metallurgical condition is obtained where the bath may be changed at will and steel free from slag, oxides and gases finally produced. Ingots made by Heroult Furnaces are practically free from segregation; while sulphur and phosphorus can be easily reduced to .005% if desired, with complete removal of oxygen.

In the casting industry Heroult Furnaces are rapidly replacing all other types of melting equipment, and it has been definitely demonstrated that they are superior in every way; and, due to the ability to convert poorer grades of material, the ease by which thin sections can be produced, and to the quality of the castings, a higher price can be obtained for the product, with rejections reduced to an almost negligible quantity.

On a cost basis with the power rates now available the Heroult Furnace will produce high grade metal in competition with any other type of melting equipment with the additional advantage of finest quality.
In 1913, there were only nineteen steel making furnaces in use in America. This number increased steadily until at the present time there are more than 1200 electric furnaces in operation throughout the world making various grades of steel and iron.

During the period of the World War from 1913 to 1917, the LECTROMELT furnace was being developed and introduced and its growth during this time was gradual but steady. Its period of greatest expansion, however, has come since the World War during a period of comparatively slow times where new equipment was bought only after rigid investigation. Today the LECTROMELT furnace stands out as the predominating electric furnace for steel foundry work.

In the steel foundry industry today there are three main types of equipment in use, namely, the electric furnace, the open hearth and the converter.

With the latter operation, there are heavy melting losses met with both in cupola and converter, which run from 18 to 24% depending upon conditions. This process inherently requires the use of expensive, low sulphur, high silicon pig iron. Furthermore, the very nature of this process, in which a blast of air is blown through the metal, results in its conversion into a highly oxidized state, requiring the use of large quantities of ferro alloys as "killers" for the oxides and gases. In contrast, the LECTROMELT furnace has the advantage in that a high cost charge is not required for its operation. It has a melting loss varying from 3 to 6%. It can be operated at reducing or neutral atmosphere as may be desired, with small quantities of alloy additions.

That the LECTROMELT furnace is rapidly replacing the converter is easily understood when one contrasts the methods of melting: the LECTROMELT with its ease and certainty of control and clean hearth, the converter with its air blast, uncertainty and oxidizing conditions.

The open hearth furnace of necessity involves large heats with comparatively slow operation, which in turn means a large investment in equipment throughout the foundry as well as in buildings, together with a very large moulding floor area with its attendant flasks and moulding equipment. Furthermore, it is difficult with the open hearth furnace to get heats hot enough to pour small, thin section castings, which enables foundries to obtain much more economical use of floor space, moulding equipment, etc., with correspondingly lower investments in cranes and buildings.

Space does not permit of adequate discussion of the various steel making processes. Definite statements regarding relative costs in the production of steel with varying types of equipment should be avoided unless a thorough study is had of the local conditions surrounding the particular installation under consideration. Suffice it to say that over the past five years increased capacity in steel casting production in the United States has largely been restricted to an increase in the number of LECTROMELT installations.
COLOR FOR RUBIES . . .

BACKBONE FOR STEEL!

Chromium, the element that imparts precious color to rubies, imparts something more precious to steel. It gives steel incredible hardness and resistance to heat and corrosion. It makes steel strong, yet ductile and shock-resistant.

Chromium is the key that has opened—and is still opening—great new fields of application for steel. Without chromium, the whole wonderful series of stainless steels would not have been possible. From tarnish-free tableware to corrosion-resistant chemical equipment...from strong, lightweight truck bodies to streamlined trains and airplanes...from heat-defiant boiler tubes to high-temperature steam turbines...chromium has made possible a steel with properties of the noble metals.

But the stainless steels are only one great contribution of chromium. This element has also helped to provide hard, shock-resistant armor plate and armor-piercing projectiles; long-wearing engine valves; strong, tough gears, tools, ball bearings, car trucks, shafts, springs, and dies; and hundreds of other improved articles.

We do not make steel of any kind. But for over 35 years, we have made ferro-alloys and alloying metals used in steel-making. Among these are chromium, silicon, manganese, vanadium, tungsten, zirconium, columbium, and calcium.

It was our research and development that made the low-carbon grades of ferro-chromium available commercially. Without these, production of a majority of the stainless steels would have been impracticable. Inquiries about stainless and other alloy steels—their manufacture, fabrication, and use—are cordially invited.

The progress made by Electro Metallurgical Company in the manufacture and use of ferro-alloys and in the development of alloy steels has been greatly facilitated by metallurgical research in the laboratories of Electro Metallurgical Company and Union Carbide Company; by the advances in electric furnace electrodes and techniques of National Carbon Company, Inc.; and by the broad experience in the production, fabrication, and treatment of metals of Haynes Stellite Company and The Linde Air Products Company. All of these companies are Units of Union Carbide and Carbon Corporation.

ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation

30 EAST 42ND STREET NEW YORK, N.Y.
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1938</td>
<td>Munich invaded</td>
</tr>
<tr>
<td></td>
<td>Czechoslovakia invaded</td>
</tr>
<tr>
<td>Oct.</td>
<td>Alcoa inaugurates 26,000,000 expansion program.</td>
</tr>
<tr>
<td>Nov.</td>
<td>Alcoa produces 287 million pounds in 1938; had more than a year's supply on hand.</td>
</tr>
<tr>
<td>Dec.</td>
<td>New extusion and tube mill begins operation at Lafayette, Ind.</td>
</tr>
<tr>
<td></td>
<td>Bohemia and Moravia occupied</td>
</tr>
<tr>
<td>1939</td>
<td>Albania invaded; Congress authorizes Army to acquire 6,000 planes by July, '41, and Navy 3,000 by '44. Aluminum for all these would take about two months 1941 production.</td>
</tr>
<tr>
<td>Sept.</td>
<td>Poland invaded; U. S. Neutrality proclaimed; limited National emergency proclaimed.</td>
</tr>
<tr>
<td></td>
<td>Alcoa authorizes new metal-producing capacity at Alcoa, Tenn.</td>
</tr>
<tr>
<td>Nov.</td>
<td>Finland invaded; Cash-and-carry act signed.</td>
</tr>
<tr>
<td></td>
<td>Alcoa completes 26,000,000 expansion program, begins plans for a larger one.</td>
</tr>
<tr>
<td></td>
<td>New metal-producing plant authorized at Vancouver, Wash.</td>
</tr>
<tr>
<td></td>
<td>1939 production 327 million pounds; 215 million on hand.</td>
</tr>
<tr>
<td>1940</td>
<td>First request for defense appropriation in Budget Message.</td>
</tr>
<tr>
<td></td>
<td>Alcoa announces $30,000,000 more plant expansion.</td>
</tr>
<tr>
<td>Mar.</td>
<td>Alcoa reduces price of aluminum from 20c to 19c, starts construction of Vancouver, Wash., plant.</td>
</tr>
<tr>
<td></td>
<td>Denmark and Norway invaded</td>
</tr>
<tr>
<td>May</td>
<td>Low countries invaded; National Defense Advisory Commission named.</td>
</tr>
<tr>
<td></td>
<td>New metal-producing unit begins operation at Alcoa, Tenn.</td>
</tr>
<tr>
<td>June</td>
<td>Dunkerque invaded; France capitulates.</td>
</tr>
<tr>
<td></td>
<td>Additional metal-producing unit authorized at Alcoa, Tenn.</td>
</tr>
<tr>
<td>July</td>
<td>Congress lifts previous limits on numbers of planes.</td>
</tr>
<tr>
<td>Aug.</td>
<td>Air offensive against England begins; 50 destroyers exchanged for island air bases.</td>
</tr>
<tr>
<td></td>
<td>Alcoa reduces price of aluminum ingot from 19c to 18c; capacity for making alumina increased.</td>
</tr>
<tr>
<td>Sept.</td>
<td>Egypt invaded; Selective Service Bill passed.</td>
</tr>
<tr>
<td></td>
<td>First metal manufactured at Vancouver, Wash., plant and new units for additional capacity authorized.</td>
</tr>
<tr>
<td></td>
<td>Alcoa authorizes another 150,000,000 for expansion.</td>
</tr>
<tr>
<td>Nov.</td>
<td>26 bombers on contract turned over to Britain.</td>
</tr>
<tr>
<td></td>
<td>Alcoa reduces ingot price from 18c to 17c; additional capacity authorized at Badin.</td>
</tr>
<tr>
<td>Dec.</td>
<td>Alcoa 1940 production 413 million pounds; 154 million on hand.</td>
</tr>
<tr>
<td>1941</td>
<td>OPM established; NDAC says aluminum supply adequate to meet October, 1940, estimates of requirements.</td>
</tr>
<tr>
<td>Jan.</td>
<td>Alcoa authorizes additional capacity at Alcoa, Tenn.</td>
</tr>
<tr>
<td>Feb.</td>
<td>Aluminum put on priorities</td>
</tr>
<tr>
<td></td>
<td>Lend-lease bill signed.</td>
</tr>
<tr>
<td></td>
<td>Alcoa produces 44,000,000 pounds of metal this month.</td>
</tr>
<tr>
<td>Apr.</td>
<td>Yugoslavia invaded; U. S. occupies Greenland.</td>
</tr>
<tr>
<td>May</td>
<td>150 million-pound-annual-capacity plant at Vancouver, Wash., completed and operating at capacity.</td>
</tr>
<tr>
<td>June</td>
<td>Crete lost; Russia invaded.</td>
</tr>
<tr>
<td>July</td>
<td>New Government aluminum plants authorized; U. S. occupies Iceland; Japan moves into Indo-China.</td>
</tr>
<tr>
<td></td>
<td>Alcoa produces 53,000,000 pounds this month; Badin unit authorized November, 1940 starts operation.</td>
</tr>
<tr>
<td></td>
<td>Alcoa announces ingot price reduction to 15c, effective October 1, 1941.</td>
</tr>
<tr>
<td></td>
<td>Alcoa and T. V. A. conclude agreement to unify two great hydro-electric power systems in the Tennessee Valley, which will add at least 200,000,000 pounds to America's annual aluminum producing capacity.</td>
</tr>
<tr>
<td></td>
<td>Alcoa produces 54,000,000 pounds of aluminum this month.</td>
</tr>
<tr>
<td>Sept.</td>
<td>Sites selected for one of the Government-owned aluminum plants and for the alumina plant; railroad, water, and sewage facilities provided; construction contracts being executed.</td>
</tr>
<tr>
<td></td>
<td>Excess stock pile of aluminum airplane sheet started in February, 1939, being maintained at 5,000,000 pounds.</td>
</tr>
</tbody>
</table>
Box Score on Financing Major Defense Plant Expansions

<table>
<thead>
<tr>
<th>Project</th>
<th>Date of OPM's Recommendation</th>
<th>Date Contract Announced by RFC or Subsidiary</th>
<th>Capacities Scheduled</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALUMINUM (production, processing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminum Company of America, Alcoa, Arkansas, Bauxite, Arkansas, Magnesia, New York, Troutdale, Oregon, Bohn Aluminum &amp; Brass Co., Reynolds Metals Co., Olin Corp., Union Carbide &amp; Carbon Co.</td>
<td>July 9, 1941</td>
<td>Aug 20, 1941</td>
<td>100,000,000 lbs</td>
<td>$72,000,000 (b)</td>
</tr>
<tr>
<td>MAGNESIUM (metal, alloys, and fabrication)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic Magnesium, Inc. (sub, Basic Refractions, Inc), Dow Chemical, Dow Chemical, International Agricultural Corp, Matheson Alkali Works, Todd—California Shipbuilding Corp (sub Todd Shipyards Corp)</td>
<td>July 14, 1941</td>
<td>Aug 13, 1941</td>
<td>112,000,000 lbs</td>
<td>61,168,790</td>
</tr>
<tr>
<td>PIG IRON</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bethlehem Steel Corp., Carnegie-Illinois (sub U.S. Steel), Colorado Fuel &amp; Iron Corp, Inland Steel Co., Republic Steel Corp, U.S. Steel Corp</td>
<td>July 2, 1941</td>
<td>In negotiation</td>
<td>1,692,000 tons</td>
<td>Not determined</td>
</tr>
<tr>
<td>STEEL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bethlehem Steel Corp. (steel plate), Carnegie-Illinois (sub U.S. Steel) (armor plate, heavy forgings)</td>
<td>July 28, 1941</td>
<td>In negotiation</td>
<td>780,000 tons</td>
<td>23,097,000</td>
</tr>
<tr>
<td>SYNTHETIC RUBBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firestone Tire &amp; Rubber Corp, Goodyear Tire &amp; Rubber Corp, Hycar Chemical Co. (sub, B.F. Goodrich and Phillips Petroleum Co.), U.S. Rubber Co.</td>
<td>May 9, 1941</td>
<td>May 16, 1941</td>
<td>2,500 tons (a)</td>
<td>1,250,000</td>
</tr>
<tr>
<td>TIN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tin Processing Corp. (sub, A.V. Billiton Maatschappij)</td>
<td>Feb 26, 1941</td>
<td>18,000 tons</td>
<td>3,500,000</td>
<td></td>
</tr>
</tbody>
</table>

(a) Synthetic rubber program increased to 10,000 tons and $2,750,000 for each plant subsequent to this initial commitment.
(b) A tin smelter was recommended by the Defense Commission in August, 1940.
Chapter 2
What the Employee Receives Working
in This War Plant

Wages are definitely not the only thing a man works for. But other important factors such as recognition and job pride are more intangible. So this chapter will concern the definite: the amount of money received by Sharon Works employes, the hours worked, adjusted compensation, insurance benefits, the incentive plan, and comparisons with other industries. There will also be several similar additional topics.

During 1941, more than 13 million dollars ($13,000,983.26) was paid to the 5,000 office and shop employes at Sharon Works.1 Of this amount, $2,550,634.11 was paid to office workers, and $10,450,348.15 to men and women "shop" employes.

Transformers are a highly technical product, and the large units are given individual design engineering attention to meet customer requirements. Hence out of the 850 office employes there are 175 engineers and 170 draftsmen. In the shop there are 200 electrical testers who have either electrical engineering or technical school backgrounds.

Sharon Works "shop" jobs are divided into ten classes of skill. Most of the men attain higher skill ratings and hence higher pay through experience on the job. This is aided by the educational mindedness of the management which during 1941 offered instruction and other educational training to 1,100 men and women.

Sharon Works adopted the 44 hour week for men on January 1, 1941; on

1. Total average number of employes at Sharon Works for entire year 1941 is set at 4,000 shop and 850 office; on December 15, 1941 total was 5,500. Westinghouse Company has 78,000 employes. Statistics from E. W. Blair, Payroll Supervisor.
February 1, 1941 it went to 46 hours for men, and on March 1, 1941 to 48 hours a week, six days a week, 24 hours a day.

During the latter part of 1941, many of the more important sections were operating seven days a week 'round the clock. On February 1, 1941, this seven day operation became general in all sections making large power transformers. State and national law prevents working of women more than 44 hours a week.

Men working Sunday, April 19, 1942 were as follows:

- C-bldg. (carpenters and woodworkers) 9
- E-bldg. (machine operators) 119
- F-bldg. (welders and iron workers) 69
- H-bldg. (large transformer assembly) 533
- I-bldg. (transformer coil winders and tool and die makers) 74
- Transportation 7

Average number of hours worked in Sharon Works shop including men and women:

<table>
<thead>
<tr>
<th></th>
<th>July, 1940</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>January, 1941</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
</tr>
</thead>
<tbody>
<tr>
<td>July, 1941</td>
<td>37.05</td>
<td>36.35</td>
<td>35.31</td>
<td>40.60</td>
<td>41.84</td>
<td>40.57</td>
<td>40.12</td>
<td>44.93</td>
<td>46.84</td>
<td>46.89</td>
<td>45.30</td>
</tr>
</tbody>
</table>

(sections of the plant that have more of a civilian aspect are back on 40 hour week since January 1, 1942 awaiting further conversion to war production)
### Number of Employees, Hours Worked, Average Male and Female Weekly Rates and Take (Sharon Works)

<table>
<thead>
<tr>
<th>Month</th>
<th>Total No. Employees</th>
<th>Total Full Time Employees</th>
<th>Total Hours Worked</th>
<th>Total Money Paid</th>
<th>Av. Female Rate(weekly)</th>
<th>Take</th>
<th>Av. Male Rate(weekly)Take</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb. 1939</td>
<td>2,105</td>
<td>1,713</td>
<td>274,112</td>
<td>$224,786</td>
<td>.496</td>
<td>$17.30</td>
<td>.863 $28.18</td>
</tr>
<tr>
<td>March</td>
<td>2,168</td>
<td>2,005</td>
<td>368,900</td>
<td>305,500</td>
<td>.496</td>
<td>18.99</td>
<td>.874 32.26</td>
</tr>
<tr>
<td>April</td>
<td>2,168</td>
<td>1,964</td>
<td>314,184</td>
<td>264,425</td>
<td>.525</td>
<td>17.60</td>
<td>.88 32.16</td>
</tr>
<tr>
<td>June</td>
<td>2,106</td>
<td>1,967</td>
<td>346,114</td>
<td>308,148</td>
<td>.562</td>
<td>19.34</td>
<td>.927 34.85</td>
</tr>
<tr>
<td>Nov.</td>
<td>2,972</td>
<td>2,750</td>
<td>440,035</td>
<td>371,508</td>
<td>.508</td>
<td>18.25</td>
<td>.885 32.89</td>
</tr>
<tr>
<td>Dec.</td>
<td>2,950</td>
<td>2,771</td>
<td>554,305</td>
<td>490,705</td>
<td>.55</td>
<td>18.75</td>
<td>.923 34.45</td>
</tr>
<tr>
<td>Jan. 1940</td>
<td>2,950</td>
<td>2,555</td>
<td>418,418</td>
<td>$381,343</td>
<td>.596</td>
<td>$18.44</td>
<td>.942 $33.91</td>
</tr>
<tr>
<td>March</td>
<td>2,629</td>
<td>2,329</td>
<td>465,845</td>
<td>424,044</td>
<td>.586</td>
<td>15.45</td>
<td>.939 34.58</td>
</tr>
<tr>
<td>April</td>
<td>2,532</td>
<td>2,156</td>
<td>344,963</td>
<td>313,486</td>
<td>.577</td>
<td>15.30</td>
<td>.93 33.35</td>
</tr>
<tr>
<td>June</td>
<td>2,503</td>
<td>2,308</td>
<td>369,412</td>
<td>355,518</td>
<td>.606</td>
<td>18.33</td>
<td>.993 37.32</td>
</tr>
<tr>
<td>Sept.</td>
<td>2,668</td>
<td>2,525</td>
<td>404,128</td>
<td>392,848</td>
<td>.618</td>
<td>20.68</td>
<td>1.003 38.40</td>
</tr>
<tr>
<td>Nov.</td>
<td>2,935</td>
<td>3,083</td>
<td>616,635</td>
<td>624,294</td>
<td>.614</td>
<td>22.59</td>
<td>1.06 44.57</td>
</tr>
<tr>
<td>Dec.</td>
<td>3,103</td>
<td>3,163</td>
<td>505,429</td>
<td>500,353</td>
<td>.612</td>
<td>23.51</td>
<td>1.03 42.00</td>
</tr>
<tr>
<td>Jan. 1941</td>
<td>3,516</td>
<td>3,536</td>
<td>707,103</td>
<td>$700,765</td>
<td>.61</td>
<td>$22.49</td>
<td>1.03 $41.48</td>
</tr>
<tr>
<td>Feb.</td>
<td>3,820</td>
<td>4,312</td>
<td>689,850</td>
<td>674,687</td>
<td>.66</td>
<td>25.51</td>
<td>1.01 45.64</td>
</tr>
<tr>
<td>March</td>
<td>3,923</td>
<td>4,631</td>
<td>740,923</td>
<td>732,235</td>
<td>.62</td>
<td>26.58</td>
<td>1.01 49.26</td>
</tr>
<tr>
<td>April</td>
<td>3,999</td>
<td>4,628</td>
<td>740,491</td>
<td>741,928</td>
<td>.636</td>
<td>27.10</td>
<td>1.02 48.17 **</td>
</tr>
<tr>
<td>June</td>
<td>4,138</td>
<td>4,779</td>
<td>764,610</td>
<td>883,135</td>
<td>.74</td>
<td>31.90</td>
<td>1.17 55.06</td>
</tr>
<tr>
<td>Sept.</td>
<td>4,374</td>
<td>4,898</td>
<td>753,662</td>
<td>869,168</td>
<td>.721</td>
<td>30.95</td>
<td>1.13 54.25</td>
</tr>
<tr>
<td>Nov.</td>
<td>4,424</td>
<td>4,951</td>
<td>792,208</td>
<td>887,134</td>
<td>.7276</td>
<td>31.35</td>
<td>1.14 54.96</td>
</tr>
<tr>
<td>Dec.</td>
<td>4,396</td>
<td>4,781</td>
<td>755,065</td>
<td>876,425</td>
<td>.749</td>
<td>30.26</td>
<td>1.15 54.94</td>
</tr>
<tr>
<td>Jan. 1942</td>
<td>4,316</td>
<td>4,887</td>
<td>977,441</td>
<td>$1,183,402</td>
<td>.754</td>
<td>30.50</td>
<td>1.24 $60.34</td>
</tr>
<tr>
<td>Feb.</td>
<td>4,270</td>
<td>4,783</td>
<td>765,293</td>
<td>928,042</td>
<td>.726</td>
<td>29.15</td>
<td>1.21 56.75</td>
</tr>
<tr>
<td>Mar.</td>
<td>4,265</td>
<td>4,892</td>
<td>782,773</td>
<td>939,171</td>
<td>.733</td>
<td>27.56</td>
<td>1.19 56.27</td>
</tr>
</tbody>
</table>

1. In short it would require 4,892 men working 40 hours a week to equal the hours worked during March 1942 by the 4,265 men and women actually employed.  
   * 10% raise  ** 11% 

2. Right after Pearl Harbor there was an abrupt letdown on all non-war effort manufacture, while production of small distribution transformers was slashed, man-hours and production of big units continued to increase. Women were especially affected; total number of women on the shop payroll during November and December, 1941 was around 325, 250 of these were doing regular shop work. By April 1943 total number of women in the shop had dropped to 229, with the number doing shop work something over 150. Statistics furnished from records of Harry Skinner, Payroll department.
Average weekly earnings of all wage earners in 27 manufacturing industries regularly reporting to The Conference Board were $34.14 in August, 1941, while average hourly earnings amounted to 83 cents. The hourly earnings were the highest in history and the weekly earnings were exceeded only by the $34.29 reported for June, 1941. Weekly earnings received during August in the machine and machine tool industry were greater than in any other industry as a result of a longer work week. Highest hourly earnings were reported in the automobile industry, followed by petroleum refining and iron and steel.

Average weekly earnings are determined by dividing the total weekly payroll in each industry by the number of wage earners, and average hourly earnings by dividing the payroll by the number of man hours worked.
The November 27th, (1941) issue of *Domestic Commerce*, published by the United States Department of Commerce reports the national work week for September, 1941 as follows: machine tools workers averaged 51.5 hours a week; machine tool accessories, 52.9; firearms, 50.1; engines, turbines, etc., averaged 46.6; aircraft, 45.5; shipbuilding, 44.9; brass, bronze, and copper, 43.8; ammunition, 43.7; electrical machinery, 43.5; explosives, 43; aluminum, 42.5; smelting and refining of copper, lead, and zinc, 39.1; blast furnaces, steel works, and rolling mills, 39. Sharon Works was on a 48-hour week at this time with many men putting in additional hours.

Management Record, published by the National Industrial Conference Board, in its April, 1942 issue reports that the electrical industry averaged 45.3 hours a week for February, 1942.

A man in the shop is paid on the basis of skill and working conditions. Hiring is done by the assistant supervisor of the Industrial Relations department. Foremen throughout the shop keep him informed as to the need for skilled and unskilled men. It must be remembered that men who are coil winders and have other narrow but highly developed skills in the electric field must receive all their training at Sharon Works. Most of these skilled men are not available on the open labor market.

Equally important to the manufacture of transformers are electric-arc welders, acetylene welders, structural iron layout men, various machine operators, carpenters and cramenmen in addition to lesser jobs. Men with these skills need not receive all their training at Sharon Works. Then of course there are other jobs like tool and die making where because of their non-availability it has been necessary to train most of these men right in the plant.

When a man applies for a job at Sharon Works he is given an application. It is to his advantage to be recommended by an employe in the shop or office, or to carry the good word of someone who is known to anyone of the plant.
supervisors or veteran employees. Any evidence of mechanical or electrical aptitude received through formal education, practical experience or otherwise is to the man's advantage. He is interviewed, and then if there is a job opening in the shop, he is sent down to the medical department and given a rather strict physical examination. During the past year 3 per cent of the applicants have failed the physical examinations. Most common causes of failure were bad eyes and hernia. Percentage of rejections has been rising though physical standards are lower. The average applicant is definitely less physically fit today than he was a year ago.

Before starting on the job he also receives an I.Q. test, arithmetic aptitude and Minnesota Paper board examinations. His grades in these tests, especially if he has been out of school for a long time, do not have marked bearing on his employment. This will be discussed in a later chapter.

A man starts the job at Sharon Works "on instruction," and receives 80 per cent of the so-called base rate. He is assigned to a group under an instructor, and is taught the job. He may be fitting or assembling parts for large transformers, and will be kept on instruction for a pre-determined time until he is able to do about the average day's work. Instruction periods range from one week on a janitor's job to six months on steel layout work. To be considered separate are the machinist apprentices who require three full years before gaining their trade.

After completing the instruction period, the man is assigned to a group as a full-participating member. The standard wage payment plan "incentive plan" is in effect at Sharon Works for all shop jobs except those of a clerical nature. Under the incentive plan the rate department determines how much work the

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2. From H.G. Lafferty, plant physician.
3. Obvious situation borne out by plant records.
4. Men already on the job have an economic interest in keeping new men on instruction as long as possible. A "green" man usually tends to be less productive than the average worker. In the group once, he shares in the incentive bonus.
average man should do on the job in one day. This amount of work is then established as 100 per cent efficiency. If the man on the job does more than this amount of work, each member of the group gets paid more.

The average group at Sharon Works is now working at 127 per cent efficiency, and the men receive 127 per cent of their base hourly wage. To determine the rates, the time study men do not hide behind posts to observe how much work a man should do. With the introduction of more modern machinery and better methods, newer rates of output are established for the given jobs.

Biggest advantage of the incentive plan is that it gives employees a chance to somewhat determine the amount of money they receive. If they do more work, they get more pay. The idea that their group may be averaging 130 per cent, also gives them job satisfaction. Benefits to the Company are equally obvious.

Objection to this plan is that the groups may be somewhat hesitant about getting the percentage too high, because management may raise the amount of work to be considered as 100 per cent.

Influx of large numbers of "green" men into the groups which range in size from four to seventy, and are headed by group leaders, results in some of the percentages dropping down to 100. To partially remedy this ill, the instruction period for new men has been lengthened where necessary.

Adjusted Compensation has been in effect for Westinghouse plants since 1935. It is popularly called the "bonus". Under this plan each employee in the Company receives an additional percentage of his total income, the amount dependent on the Company's profits. This adjusted compensation is determined by averaging profits for the previous three months, then subtracting a sum of $720,000 for stockholders, and then dividing the balance by a figure based on the total number of employees. The bonus has ranged up to 17 per cent, and
average around 1½. If the Company has good months, the employees get bigger pay checks.

All men who work on the turns that start in the afternoon or at or near midnight get an additional 10 per cent of their base rate. Pennsylvania state law and precedent has resulted in no women working at the plant except on the day turn.

Since March 1, 1941, Sharon Works men have been working a minimum of 48 hours a week, and the women 44 hours a week. Hence Saturday work brings time and a half, and Sunday work double time. Most parts of the shop that are associated with the manufacture of large power transformers have been on steady Sunday schedules since February 1, 1942.

As a result of Saturday and Sunday over-time pay, an office man with a base rate of $150 a month receives approximately $200 a month. (Saturday over-time alone will guarantee this. In addition there is adjusted compensation figured on total earnings for the month. This has been averaging seven per cent.

In the shop, a 21-year-old electric-arc welder may be on 84 cents an hour rate; his group is producing 135 per cent on the incentive plan, and he works two Sundays a month. By the time his adjusted compensation is figured, this man makes at least $250 a month.

Sharon Works has attempted to stagger its shifts when it comes to Sunday schedules. Hence some men are off every day, and they all have a chance to put in an occasional Sunday and get double time. Some of the higher skilled men have been working straight through seven days a week with just an occasional day off.

When the Airbrake Company was less than a year old, George Westinghouse took the entire staff of 15 men out for Thanksgiving dinner. As the plant grew larger, the custom changed to Mr. Westinghouse giving each employee a turkey for Thanksgiving. Finally whole carloads of turkeys were needed. Mr. Westinghouse
then adopted a suggestion that the money used for turkeys be set aside to provide pensions for employes. Francis E. Leupp in his biography of George Westinghouse, comments that these advantages were later duplicated in the main by the Electric and Manufacturing Company.

The Relief department at the Electric Company was established in 1907 with capital advanced by the Company. At Sharon Works 98 per cent of the employes belong to this voluntary insurance organization. The Industrial Relations department assumes responsibility for local clerical details. Monthly dues are divided into four different classes depending on income. For employes making more than $95 a month the dues are $1.50, and for those making $75 but less than $95 it is $1.25. The other two classes are for smaller incomes, hence no one at Sharon is affected. Dues are usually automatically deducted from the paychecks.

Benefits are likewise in four classes. For persons who make more than $95 a month, but who have become unable to work for reasons not covered by workman's compensation, the Relief department pays $16 a week for 13 weeks, and $10 a week for 13 additional weeks. For the $75 a month class it is $13.33. In event of death the Relief department pays $175, which sum is matched by the Westinghouse Company. Benefits are not paid for the first seven days off, unless the illness lasts more than 30 days. If an employe has belonged to the Relief department for more than five years, he will receive illness benefits until he is pronounced cured or able to work.

Office jobs at Sharon are completely classified just as are the jobs in the shop. There is a salary classification book that lists all office jobs, their range of duties, and salary. For example: Office messenger is 1-C-1, and he or she receives between $65 and $83 a month (for 40-hour week, not including adjusted compensation). Duties are "Render messenger service. Run errands. Check, sort and distribute papers. Pull papers from file. Operate mimeo and duplicating"

F.E. Leupp, Geo. Westinghouse, Life and Achievements, pp.249; Little, Brown.
machine. Occasionally attend desk and phone supervisor while he is temporarily absent. Make rush trips." This job pays up to $110 a month on the 48-hour week basis.

Then there is copy typist 1-C-4.5. "Miscellaneous typing from copy, the finished work being simple reproduction. This classification may also be used where required, for individuals receiving instruction as invoice typists, 2-C-2. Pay ranges on the 40-hour week are from $65 to $89 a month. The 48-hour week raises it approximately 30 per cent.

Secretary-stenographer 2-C-10 pays from $95 to $145 for the five day week. "Care of routine of supervisor's office. Take and transcribe dictation. Examine and route correspondence. Reply to routine inquiries. Maintain supervisor's files. Receive incoming telephone calls and personal visits. Prepare and forward routine or special reports. (In addition, the position may require work of the character of 2-C-4, 2-C-1, and 1-C-4.5). Note: This classification is to be used only for secretaries to department heads."

Posting clerk (female) is 2-C-11 and pays between $85 and $122 for the five day week. "Cost simple shipping reports and prepare for posting. Prepare simple routine reports. Help make up monthly statements. Prepare billing and cost distribution. Operate office machines necessary to mechanically post ledgers which are an integral part of the Company's financial control where such operation is mechanized."

Purchase Follow clerk is 2-C-20.5 and pays between $140 and $205 a month for the five day week, and not including adjusted compensation. "Follow purchase orders placed with supplier. Follow clearance through inspection. Clearance of papers for proper approval. Routine correspondence with supplier."

Manufacturing Information writer (class A) pays between $140 and $205 a
month. "This classification applies to work on large transformers, such as: large power transformers, 'GSP' transformers, power regulators, unit sub-stations, tap-changing-under-load equipment. Interpret orders and engineering information. Break down orders into component parts and dispatch parts. Check style records for stock and it's location. Check orders with drawings for correctness of part or material specified. Check instructions issued by Order Service, Shipping, Sales, and Engineering departments to keep abreast with any changes in their routine."

Price clerk (Class B), 2-C-22, pay range from $85 to $122. "Price standard catalog apparatus and simple orders. Price a limited range of product. Price a line or apparatus or material in which the pricing problem is elementary."7

Price clerk (Class B) pay range from $115 to $180. "The duties are similar to those of the junior price clerk, position 2-C-22 except that the pricing work involves complex assembly apparatus, mixed contracts and non-catalog items, etc."

Junior Engineer, 3-E-15, salary range from $150 to $230. "This is the elementary position upon which an inexperienced recent engineering student enters on completion of a formal course or its equivalent. The position applies to Design, Application, Research, Equipment or Materials & Process work. It is a step toward positions 4-E-1, 4-E-2, 4-E-3, 4-E-5, 4-W-1, 4-W-4, 4-W-6, and 4-W-9. The position is applied until the work can be done is beyond the routine day to day technical supervision of an engineer, or until the work can be classified as creative and within Group IV."8

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7. Job held by women.
8. Upon graduating from an engineering college, and hired by the Westinghouse Company, young men are usually put into the Westinghouse graduate course for four months at $180 a month.
Contact Engineer 4-E-6 salary ranges from $200 to $355 base rate. "The position is that of contact between an Engineering department and the Works on manufacturing difficulties. It involves smoothing the way for adjustments, and correcting discrepancies in manufacturing information, drawings, test specifications, and system. Occasionally the work calls for elementary design of parts, especially for renewal parts for non-Westinghouse apparatus. This position requires a higher degree of creative ability in solving manufacturing problems and of responsibilities than 3-E-6."

In all there are already 145 office job descriptions like the above. They pay from $65 to $405 a month for the five-day week. In addition there are the top dozen or so supervisors.

Westinghouse is among the foremost corporations in the nation offering its employees group insurance through the old-line companies. At Sharon Works on February 1, 1942 there was $8,290,795 of insurance on employees (bought through Company auspices) in force. After six-months service an employee automatically receives $500 of free life insurance, the Company paying the entire premium as long as the man is employed. Ninety-eight per cent of Sharon Works employees take advantage of the opportunity of buying additional low-rate life insurance with the individual paying 60 cents a month per thousand and the Company 17 cents. This is deducted from the pay checks.

This voluntary additional life insurance allows a man with $2,000 income from the Company to buy up to $2,500 insurance. The maximum allowed is $10,000. Amount of this insurance that can be carried is in ratio to income.

Westinghouse also encourages group hospitalization insurance which at Sharon is sponsored by the Sharon Westinghouse Employees Association whose benefits are underwritten by the Benefit Association of Railroad Employees.

9. Including the $500 policies bought for all employees with more than six months service, and paid for by the Company.
Here again payroll deductions can be arranged, and 90 cents a month covers a man for hospital care and surgical need. An additional and rather unusual protection allows a man to insure his family and self by paying $2.46 a month.

The Westinghouse Company has had a suggestion plan since employees make suggestions as to better manufacturing procedure or matters effecting general plant efficiency. These are submitted to a committee of three Sharon Works men who discuss each individual suggestion and then turn the ideas over to persons qualified to go into detail as to their worth.

Payments to employees who submit suggestions range from $2.50 up and are based on 10 per cent of the net savings which come from the "idea."

The following stories are from the plant newspaper:

"During 1941 the average suggestion award paid at Sharon Works was $23.80. In all 13 Sharon men received awards of more than $100 during the past year, and one local Westinghouse employee had the 'best idea.' He topped the entire Company and gained $1,070 for a suggestion. Sharon Works' average award of $23.80 was second only to Baltimore which had $24.89. The Transformer Division was ahead of all plants with 60 per cent of its awards above the minimum of $2.50."
"With 65 paid suggestions March (1942) was a record month for the suggestion plan at Sharon Works. Highest individual award was $75. The suggestion committee urges that in this time of war need, men give some thought to better ideas for utilizing machine tools. A new way to show patriotism - get an idea that will increase the output of a machine to help America win."

The Westinghouse Company maintains a savings deposit system for its employees. It formerly paid four per cent on all employees' money left with the Company. The plan is to have the employee arrange to have a fixed sum of money deducted each month from his salary or wages and put into a savings account, (for all practical purposes it works just like a savings account in a bank except for the deduction plan). Interest rates are now three and a half per cent for amounts under $500; two and a half per cent for amounts between $500 and $1,000, and two per cent from one to two thousand dollars, the maximum. A total of 1,370 Sharon employees use this service. It is definitely not profit-making to the Company.

In order that this information may be included in the thesis, the following data on Defense bonds is listed here. During October, 1941 Sharon Works employees started to have regular weekly or monthly payroll deductions for Defense bonds and gave $12,824. Deductions in November were $34,037; December, $34,177.50; January 1942, $35,201.50, and February 1942, $35,549.50. No pressure is put on the employees to buy bonds; it is purely voluntary. Many employees buy their Defense bonds and stamps through their children at school, etc.

The Westinghouse Company grants paid vacations of one week to shop employees and two weeks to office employees after they have completed a year of service. Shop employees with five years of service are entitled to two weeks

paid vacation.

Through agreement with the Sharon Westinghouse Employees Association there is a seniority system in the plant. Exceptions are made in the selection of men for supervisory jobs, or where superior skill or educational training definitely overshadow the matter of length of service.

On March 1, 1942, there were 2,120 men and women in Sharon Works with more than five years service with the Westinghouse Company. Included in this number were two men with more than 50 years service; 13 with more than 40; 168 with more than 30; 745 with more than 15 and less than 20; 451 with more than 10 and less than 15; 756 with more than five and less than 10.

Of the 5,517 employees at this time, 1,017 had less than a year's service; 1,209 had a year's service; 436 had two years service; 324 three years service; 406 had four years.
**Westinghouse Job Application Form.**

<table>
<thead>
<tr>
<th>Name of Concerned Employee</th>
<th>Name of Last Employer</th>
<th>Name of Concerned Employee</th>
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**Employment Application—Hourly Worker**

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** Kind of Work Desired**

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<th>Trade School</th>
<th>High School</th>
<th>College</th>
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**Years of Apprenticeship**

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<th>Years of Special Experience</th>
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**Personal References (Other Than Relatives or Previous Employers)**

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<th>Address</th>
<th>Business</th>
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It is understood and agreed that any misrepresentation by me in this application will be sufficient cause for cancellation of the application and for separation from the Company's service if I have been employed. I also agree to abide by all rules established by the Company.

**Signature**

Space below for interviewer

**Remarks**

**Proof of Citizenship Submitted:**

<table>
<thead>
<tr>
<th>Birth Certificate</th>
<th>Baptismal Certificate</th>
<th>Naturalization Paper</th>
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**Interviewed By**

**Date**
**Westinghouse job application** (back).

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<th>NAVAL OR MILITARY TRAINING OR SERVICE</th>
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<td>REASON SERVICE Terminated</td>
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<td>WHERE WERE YOU LOCATED AND WHAT ACTIVITIES WERE ENGAGED IN DURING THE PERIOD 1914—1918?</td>
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<tr>
<th>TO ASSURE COMPLIANCE WITH DEFENSE LAWS</th>
<th>ARE YOU A MEMBER OF: COMMUNIST PARTY</th>
<th>YES</th>
<th>GERMAN-AMERICAN BUND</th>
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<td>CHARGE</td>
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<td>DO YOU OWN REAL ESTATE?</td>
<td>DO YOU CARRY LIFE INSURANCE?</td>
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**RELATIVES IN THE EMPLOY OF LOCAL, STATE, FEDERAL, OR FOREIGN GOVERNMENT**

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<th>GOVERNMENT</th>
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**NEAR RELATIVES**

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<th>WHERE BORN</th>
<th>PRESENT ADDRESS IF LIVING</th>
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**EMPLOYMENT APPLICATION—HOURLY WESTINGHOUSE FORM 5023 L BACK**
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<th>TO BE USED WHEN CHOOSING THE PROPER OPERATOR FOR THIS JOB WHEN POSSIBLE FILL BY PROMOTION</th>
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<td>AGE LIMIT</td>
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<td>MINIMUM WEIGHT</td>
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- CHECK ONE SQUARE IF QUALIFICATION IS DESIRABLE AND TWO IF ABSOLUTELY NECESSARY.
- TOOLS OPERATOR SHOULD OWN: Rule, square, dividers.
- TYPE AND SIZE OF EQUIPMENT: Steel plate.
- MATERIAL USED: Steel plate.
- NUMBER ENGAGED IN WORK: 
- INSTRUCTION TIME: 
- REMARKS: 

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<th>TO BE USED WHEN CHOOSING THE PROPER OPERATOR FOR THIS JOB WHEN POSSIBLE FILL BY PROMOTION</th>
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- TYPE AND SIZE OF EQUIPMENT: Steel plate.
- MATERIAL USED: Steel plate.
- NUMBER ENGAGED IN WORK: 
- INSTRUCTION TIME: 
- REMARKS: 

Job classification cards for steel layerout men.
DESCRIPTION OF WORK
Lays out tank walls and other parts for subsequent operations, such as drilling, punching and bending. Develops tank walls and parts by means of triangulation. Most accurate layout work in department.

DATE EFFECTIVE 3-30-38

FOREMAN

GENERAL FOREMAN

TIME STUDY SUPERVISOR

SUPERINTENDENT

D. F. R. C.

SKILL & EFFORT

POINTS ALLOWED

BLUE PRINTS 8
SET-UPS 5
DIFFICULTY 4
ACCURACY 5
RESPONSIBILITY 5
VARIATION 6

WORKING CONDITIONS

POINTS ALLOWED

ACCIDENT HAZARD 4
ACIDS 0
DIRT OR DUST 0
FUMES 0
WET 0

METHOD OF PAYMENT

DAY WORK
STD. TIME
INDIVIDUAL
IN GROUP

TOTAL POINTS ALLOWED 46
CLASSIFICATION B-1

DESCRIPTION OF WORK
Assists B-1 layout man in laying out tank walls and other parts. Uses templates. Layout simple parts. This is a beginners classification.

DATE EFFECTIVE 3-30-38

FOREMAN

GENERAL FOREMAN

TIME STUDY SUPERVISOR

SUPERINTENDENT

D. F. R. C.

SKILL & EFFORT

POINTS ALLOWED

BLUE PRINTS 2
SET-UPS 1
DIFFICULTY 1
ACCURACY 2
RESPONSIBILITY 3
VARIATION 2

WORKING CONDITIONS

POINTS ALLOWED

ACCIDENT HAZARD 4
ACIDS 0
DIRT OR DUST 0
FUMES 0
WET 0

METHOD OF PAYMENT

DAY WORK
STD. TIME
INDIVIDUAL
IN GROUP

TOTAL POINTS ALLOWED 24
CLASSIFICATION D-1

DESCRIPTION OF WORK
Straight layout work from blue prints on small tank parts, not head walls and plates for bending.

DATE EFFECTIVE 3-30-38

FOREMAN

GENERAL FOREMAN

TIME STUDY SUPERVISOR

SUPERINTENDENT

D. F. R. C.
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<tr>
<td>F4X</td>
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<td>209</td>
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<tr>
<td>Total</td>
<td>75</td>
<td>158</td>
<td>47</td>
<td>492</td>
<td>135</td>
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<td>160</td>
<td>154</td>
<td>174</td>
<td>84</td>
<td>4294</td>
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</tr>
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</table>

Unc is top skill; E is low for men; dw are women's jobs; ebw are boys etc.
God grants liberty only to those who love it, and are always ready to guard and defend it.

—Daniel Webster

ADJUSTED COMPENSATION

10% for JANUARY

PROFIT (LINE 27 OF STATEMENT 2A)

<table>
<thead>
<tr>
<th>Month</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>$1,919,030</td>
</tr>
<tr>
<td>November</td>
<td>1,840,531</td>
</tr>
<tr>
<td>December</td>
<td>3,497,696</td>
</tr>
<tr>
<td>3 Months’ Total</td>
<td>$7,257,257</td>
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<tr>
<td>3 Months’ Average</td>
<td>$2,419,086</td>
</tr>
<tr>
<td>Deduct</td>
<td>720,000</td>
</tr>
<tr>
<td>3 Months’ Average after Deduct</td>
<td>$1,699,086</td>
</tr>
</tbody>
</table>

Divide by $177,888 = 9.55%

This 3 months’ average brings employes a 10% adjustment in January wages and salaries.

ROSCOE SEYBOLD
Vice President and Comptroller

January 23, 1942
Chapter 3
The Men Who Weld, Fit, Drill, Wire
And Assemble Transformers

At Sharon Works before the National Defense boom the average age was estimated at 35.1 Now on the basis of a 10 per cent sampling of shop men it is 31.62.2 Since the factory is only 18 years old, the average age of men is thought to be five years lower than at the long-time established Westinghouse plant in Pittsburgh.3

Young men apparently acquire skill much faster than do older men. In America's greatly expanded and comparatively new aircraft factories the average ages are reported as in the early twenties. It has been established at Sharon Works that young men require much shorter instruction periods and are able to enter full production sooner than older men. The health and safety factors are also better, and generally the young men will acquire "our" way of doing things faster. To be considered is that "successful" older men are not usually found on the open labor market ready for hire. In short there is not the pick of older men as there is of younger.

Of 889 men surveyed at the Transformer Division, 602 were married and 287 single.4 Of the 602 married men, 433 had children. The average married man had 1.48 children. It should be remembered that the average shop man's age is under 32. Of these 889 men surveyed, 180 listed rural addresses or nearly 20 per cent. Most of these 180 lived in semi-rural residential districts on the outskirts of Sharon. The average married man at the plant is 35.5 years

1. Estimate by J. T. Burke, Sharon Works Industrial Relations Supervisor.
2. Survey by Ruder of 405 men (every tenth card from file).
3. Estimate by J. T. Burke.
4. Survey by Ruder of 889 men (every fifth card in file).
old. The 433 men with families averaged 2.064 children.

In another survey of 204 men with families there were 2.28 children for each family. In this same additional survey the 274 married men averaged 1.689 children.5

About half of the 5,300 shop and office employes or 2,680 live in Sharon or Sharon rural outskirts. The town itself has a population of 27,000 together with adjacent cities the total is around 60,000. In addition to the 2,680 in Sharon, there are 1,500 plant employes living in the immediate adjacent towns of Farrell and Sharpsville, Pennsylvania, and Masury, Ohio. This leaves about 1,000 employes who drive varying distances up to 50 miles each day to reach the factory. Oldest commuter at Sharon Works is Bob McGowan, who has had 42 years' service with the Company. He's commuted since 1924 from a farm home near Conneaut Lake, 40 miles from the plant. At first it was by train, but McGowan has been driving for the past eight years. His 75-acre farm has 12 cows, three horses, one pony, and is completely modernized. This case is not typical. Many of the part-time farmers are men who have mill jobs as they call them, during good years, and an existence on five acres after the layoff comes.

The number of part-time farmers at Sharon Works, other than those who just live in rural districts, is less than five per cent.6 Not included is a somewhat similar percentage of farmer's sons who still stay with the folks, and help out with the work especially during the busy seasons. Outside of the Shenango Valley, Mercer county is agricultural.

5. Survey by Ruder of December 1941 shop census cards.
- WHERE SHARON WORKS
EMPLOYEES LIVE -
A survey of the birthplaces of 438 men (on a 10 per cent sampling basis of the more than 4,000 shop employees) reveals that more than half of Sharon Works shop employees were born within 30 miles of the plant. Such is

7. Survey by Stevens for Industrial Relations department. Also sampling survey by Ruder of 10 per cent of employees.
8. Survey by Ruder of birthplaces.
definitely not the case for the office employees that includes more than 200 engineers, who come from nearly every state in the union.

The survey indicates that 630 shop employees were born in Sharon; 390 in the adjacent city of Farrell; 170 in the adjacent city of Sharpsville; 50 in neighboring Wheatland, and 610 in other parts of Mercer County. This totals 1,850 born in Mercer County. Birthplaces in neighboring Ohio communities account for 110 more, and the nearby Pennsylvania city of New Castle and other close towns another 310.

Considering that Sharon is on the Ohio line, it is noteworthy that only 280 or about one man in 20 gives an Ohio birthplace. Definitely there is little population influx from Ohio back across the Pennsylvania line. Contributions from other states on a 10 per cent sampling basis indicated 100 from New York; 30 from West Virginia; 30, Indiana; 20, Michigan; 20, Kentucky, and scatterings from Texas, Virginia, Massachusetts, Nebraska, New Jersey, North and South Carolina and Connecticut.

There is comparatively little to show Sharon Works shop labor as mobile. The men, in the neighborhood of 75 per cent of them, were born in western Pennsylvania.

At Sharon Works are 269 shop employees and 39 office employees who were born outside of the United States, or about six per cent. The 39 shop employees immigrated at an average age of 18.794 years, and the office men at 15.814 years. The 269 shop persons came over at an average year of 1910, and for the 39 office persons it is 1918.

The 39 office people, including many engineers and draftsmen, some of whom are European technically trained, and a few refugees, come noticeably from Great Britain with 18; Germany with 6; Norway and Denmark 2 each; Sweden

[9. Survey by Ruder; somewhat smaller percentage of foreign born in the offices than in the shop.]
Birthplace of Sharon Works Employees - From 10% Sampling Majority of Shop Employees Born Within 30 Miles of Plant

Western Pennsylvania, Not Including Mercer County, 560

*Butler
4, but only 1 from Italy and none from Czecho-Slovakia.

Among the 229 shop foreign born, 59 are Italian; 45 Czecho-Slovakian, and 58 Austrian, Austro-Hungarian, many of them Slovaks. Definitely the office foreign born come from countries of educational privilege, and the shop foreign born from the lands not so fortunate.

Foreign Born at Sharon Works

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Shop</th>
<th>Office</th>
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<tbody>
<tr>
<td>Italian</td>
<td>58</td>
<td>1</td>
</tr>
<tr>
<td>Austrian</td>
<td>29</td>
<td>2</td>
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<tr>
<td>Austro-Hungarian (incl. Slave)</td>
<td>37</td>
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</tr>
<tr>
<td>Hungarian</td>
<td>26</td>
<td>1</td>
</tr>
<tr>
<td>Czecho-Slovakian</td>
<td>45</td>
<td></td>
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<tr>
<td>Scotch</td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td>English</td>
<td>19</td>
<td>5</td>
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<td>Welsh</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Irish</td>
<td>1</td>
<td>2</td>
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<tr>
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<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Danes</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Norwegian</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Swiss</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Polish</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Yugoslav</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Russian</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Roumanian</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Dutch</td>
<td>2</td>
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<tr>
<td>Greek</td>
<td>1</td>
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<tr>
<td>Chinese</td>
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<tr>
<td>Japanese</td>
<td>1</td>
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<tr>
<td>Finland</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Argentinian</td>
<td>1</td>
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</tr>
<tr>
<td>Canada</td>
<td>5</td>
<td>2</td>
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</table>

There is no accurate data on the national origins of Sharon Works employees. Best that is available gives only the nativity of the parents. However the following sentences are essentially correct. A large group in the plant, though a minority of the total, are persons two and three or more generations

10. Ibid.
from British, Irish and German immigrants, though parents of most men at Sharon Works were born in Europe. There are large numbers of Slovak descent, followed closely by Italians, then Poles, Yugoslavs and others of the old Austro-Hungarian empire, including Hungarians. Undoubtedly half of the shop employees at the Works have some speaking knowledge of Slovak, Italian or Polish. There are comparatively few Czechs.

To a marked degree the office personnel at Sharon Works, especially the college trained men, have national origins in the so-called "A" cultural countries of Europe. The supervisors and foremen in the plant are generally second and third generation British, Irish and German in stock. There is only one foreman among the 35 of Italian descent and not one Slav. There are a few night supervisors and instructors (who rank more or less as assistant foremen) of Czechoslovakian, Polish or Italian origin, but this is the exception. The group leaders include a somewhat larger percentage of men who have their origins in the Class "C" cultural lands of Europe. To a less marked degree this same correlation may be applied to the more skilled jobs.

Among the younger persons in the plant, education and opportunity has broken this. Typists, clerks, draftsmen and machine operators are placed irrespective of national origin, and represent a cross section of the local population. Engineers and other technical jobs adhere generally to those of north European origin. The combination of being an immigrant and less conscious of education results in the south and central European not being college conscious or being able to afford the expensive schools of this area. There is a mill job for the son when he gets through high school, and in poor times when there is no job at the mill there is no money.

Though the tendency is breaking down, girls from the so-called American homes were prejudiced against working in the shop, much more so than the so-called foreign girls. A matter of white collar prestige.
An interesting sidelight is that the supervisors of the feeder and assembly divisions (the two parts of the plant) were both majors in France during the last war.

A thought producing question as to why more Italian-stock men are not used as group leaders and foremen, especially considering their numbers, brings the following answers: Men steeped in the democratic tradition make the best modern day foremen and group leaders, they lead. Men from the autocratic countries of Europe that carry the heritage of being stepped on, are too inclined to order instead of lead.

It must also be considered that the Italians are comparatively recent arrivals to America. The second generation is just approaching the age where they would be old enough to have the experience to become foremen and group leaders. The foreign born and raised Italian does not acquire the mechanical skill or other conditioning factors that will lead to a highly skilled job in this country. At Sharon Works are a number of Scotchmen and English who came over after the World War. One of them is a foreman, and the other a group leader. Mr. MoVey was shipwright on the Clyde.

Nor should one forget the clannishness of men. Natural preferences or prejudices enter into the selection of group leaders and foremen. Taken into account are the likes of the top supervisors and the knowledge of what particular men other men will work with and under.

The Depression and Joe Milanccek were buddies. Not through choosing, but the two got to know each other much as do two gold prospectors winter-marooned in a drafty cabin up in the barren wastes of north Canada. There was little about the Depression that Joe didn't know. He found out the hard way.

Finally during July 1937, he got back to work, and the job became steady. First it was as a resistance welder, and then on a steel processing furnace as
the guy who did the lifting. The jobs paid well enough that is if you didn't
drive a car, but they didn't lead to much. In March 1939, Joe got a break, and
was put on as a slitting machine operator. His pay soon got around $50 on the
48-hour week, and when the draft came along, Joe had one of those comparatively
few jobs in the section with enough skill to be deferred from military service
on an occupational basis.

Joe had been old enough to get married for 10 years; now he had the job
that would make it possible for him to afford marriage. For the first time in
his life there was job security.

But Joe made a slip, it was no more than a pencil-scrawly X, and Joe is
out of a job. Joe's application of 1936 reads birthplace, Breman, Germany,
March 2, 1906. On October 22, 1940 all the fellows in the section were handed
little yellow National Defense cards: "You get things like that pretty often."
There were three questions: "Are You a Citizen of the United States? Are You
a Member of the Communist Party? Are You a Member of the German-American
Bund?" On the back of the card there was a lot of words in small type. It said
something about imprisonment and a fine of $10,000.

For sure it was No for being a member of the Bund. In 1936 it was OK
to be a German. In fact it was apt to be a bit easier getting a job if you
were German-born rather than Polish or Italian-born like most of those who came
over in the last years. But this was 1940 and it was better to mark an X after
"Yes. Are you a Citizen?" Even though your Dad had not got around to taking
out citizenship papers when you were a child, you had been here most of your
life, school and all, and now you just didn't care to have your name listed
among the "greeners" who were taking out citizenship papers, talked broken
English - foreigners.

So Joe may be walking the streets, perhaps he tried to join the army.
The Navy had been investigating the 32 enemy aliens at Sharon Works, and they appeared to be in the clear. Here was the 33rd, a man who had been machining a vital hydrogen-processed steel used for transformer cores, and a man who had falsely claimed American citizenship when he was an enemy alien — and the unusual, a Slav. Joe didn't realize that in a plant that would soon be making electric-driven torpedoes, they weren't taking your word as to citizenship, especially if you were born in Germany.

As contrasted to a steel mill, Sharon Works is a plant with many skilled men. It is a plant of specialized skills. It's fitters are not plumbers, though they work with pipe, and most of the jobs require at least a year's experience. Since the manufacture of large transformers is rather exclusive, most Sharon Works men receive their training right in the plant. With the exception of welders, electricians and a few other fields, the men are "good" only in a transformer plant. A coil winder is of little worth in the skilled labor market, except for winding coils.

The following is a sampling of the jobs men had before they were hired at Sharon Works: also service and present job.11

<table>
<thead>
<tr>
<th>Present Job</th>
<th>Skill</th>
<th>Service Length</th>
<th>Age</th>
<th>Former Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lathe grp ldr</td>
<td>A1</td>
<td>1926</td>
<td>43</td>
<td>truck driver</td>
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<tr>
<td>Material cutter</td>
<td>D1</td>
<td>2/41</td>
<td>38</td>
<td>steel worker</td>
</tr>
<tr>
<td>Layerout</td>
<td>D1</td>
<td>1/41</td>
<td>26</td>
<td>own business carpenter</td>
</tr>
<tr>
<td>Moveman</td>
<td>D1</td>
<td>6/41</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Mounter</td>
<td>D1</td>
<td>1924</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Storeroom attendant</td>
<td>D1</td>
<td>8/39</td>
<td>21</td>
<td>bowling pinboy</td>
</tr>
<tr>
<td>Machine turning</td>
<td>D1</td>
<td>10/40</td>
<td>21</td>
<td>unemployed</td>
</tr>
<tr>
<td>Mounter</td>
<td>C1</td>
<td>4 yrs.(b)12*</td>
<td>28</td>
<td>laborer</td>
</tr>
<tr>
<td>Material cutter</td>
<td>D1</td>
<td>5 yrs.(b)</td>
<td>25</td>
<td>housework (female)</td>
</tr>
<tr>
<td>Coil winder</td>
<td>B1</td>
<td>1923</td>
<td>52</td>
<td></td>
</tr>
</tbody>
</table>

12* (b) stands for broken service — layoff for more than one month.
(b2) for two different layoffs of longer than one month.
Top skill A1 then A2; next D1; lowest skill B1.
Pay correlates with skill; generally A1 men get the highest rate.
<table>
<thead>
<tr>
<th>Occupation</th>
<th>Start</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go11 assembler</td>
<td></td>
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</tr>
<tr>
<td>Elec. tester</td>
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</tr>
<tr>
<td>Fitter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspector</td>
<td></td>
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</tr>
<tr>
<td>Mounter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charge builder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acetylene welder</td>
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<tr>
<td>Coil winder</td>
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<tr>
<td>Coill winder</td>
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<tr>
<td>Tack welder</td>
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welder helper
auto mechanic
college trained
burner helper
store clerk
CWA laborer
factory laborer
apprentice embalser
assistant janitor
country teacher
none
service station and welder
college student
none
service station attendant
truck driver
none
student
clerk
garage manager
factory
telegraph operator
steel mill
none
none
electrician
gas station
coal miner
theatre usher
store clerk
A & F stores
farming
plumbing assistant

welder steel mill
grocery clerk
steel mill
laborer
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<td>12/40</td>
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<td>A2</td>
<td>'37</td>
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**Remarks:**
- Office boy: steel mill
- Auto mechanic: none
- CCC: steel mill electrician
- Crane follower: none
- Trucking: (female)
- Waitress: (female)
- Steel mill: welder steel car co.
- Power company: none
- Janitor: railroad track cleaner
- Steel mill: truck driver
- Steel mill - business self
- Steel mill: clerk
- Dime store: (female)
- Natural gas co.
- Pattern making: none
- Errand boy: none
- Painter - laborer: none
- Steel mill: shoe cobbler
- Farm hand: none
- Machine operator: CCC official
- Steel worker: truck driver
- Salesman: fireman steel mill
Fitter B2 1926 34 burner - laborer
Oxy-acet. burner C1 1/41 39 none
Sheet iron worker C1 1929 40 none
Coil winder EB 10/40 19 none

Very evident is the fact that few men who are hired at Sharon Works have any previous skill that is readily adapted to their new job of manufacturing transformers.

This being a steel mill area, there are large numbers of former steel mill workers.

Shop men over 35 at Sharon Works using selective service questionnaires as a basis, average just over nine grades of schooling. Younger men average 11 grades, and the plant average is 10 excluding the 200 electrical testers in the shop and the office personnel. All of the testers have technical training, many of them are engineering college graduates, and their average age is considerably below the plant average of 31.62.

It is difficult to evaluate a man's education from his application, since the question was grade school ______ High school ______. The applications have since been changed, but formerly the men would often check high school, even though their intimacy with the institution was confined to a few months. Again there is little occasion for checking back on this phase of an application blank, and a man will put his best foot forward.

A more trustworthy source for education are the I. Q. and arithmetic reasoning tests given to persons put to work in the shop during March, April and May, 1942. These show that a sampling of 100 men had an average education of 10 grades, an average I. Q. of 93. Selective service pressure has finally resulted in the hiring of older men, and these 100 individuals averaged years old. Elsewhere in this thesis are figures that definitely indicate that the longer a man is away from school, the lower is his I. Q. At least this holds true for factory labor.
Of course in the offices, almost the entire 850 have a minimum of a high school diploma. In addition there are 300 college graduates, two-thirds of them engineers, and another 150 with some college training, extension courses or otherwise. As to business college, many of the girls picked up their typing and shorthand in high school. There are perhaps 75 business college trained typists, stenographers and secretaries.
Carlton Hutchison has been employed at Sharon Works since 1936. He's 25, and an electrician. Married the daughter of an employee. "Hutch" is his tos and capable. Now he's coordinator for the labor union, and a member of the plant War Production Committee.

Tom McDonough doesn't need a pillow to take the part of Santa Claus once a year at the Social Committee-sponsored party for employe's kiddies.
Half Century Veterans

These three men, each have more than 50 years service with the Westinghouse Co., and are still on the job at Sharon Works. Normal retirement age is 65. With the war and shortage of skill, men who desire, may stay on. And they do; men usually dislike retiring, when the time comes. The three 50-year veterans are all working six days a week, and holding up their end.

Jimmy Burke has 52 years service. At one time he was a foreman; he's now in the large coil assembly dept. Jimmy's face usually reflects his contentment. He has a large yard, a few pet ducks.

Henry Bert is oldest Westinghouse employe in point of service still on the job. Mr. Bert is a group leader in the large coil winding dept. On his lap is his 57th grandchild.

Youngest 50-year veteran is J.R. Stevens, group leader of saw fillers and grinders in the tool room. Jimmy started to work for the Co. in 1892 at 8 cents an hour. He was 14 then, and one of 300 employes. Now there are 85,000.
Chapter 4

The Organized Labor Problem

One of America's greatest losses on the industrial front and something that is plaguing the war effort, is the apparent absence of job loyalty. This evil stems in part from the not-forgotten depression with men haunted by eyes of hungry children, and in addition the large billion dollar and impersonal corporations that dominate the American scene.

Why is it that the industrial worker at a time when America is taking it on the chin with defeat following defeat still appears to quibble over working hours, union jurisdiction, and other (to the non-laboring man) seemingly trivial matters?

Irate editors and pool room assemblages grow apoplectic with self-haloed righteous indignation at this rotten core of America's apple. "The men who place self above an American victory, these labor leaders who fiddle while our Rome burns." The country grew red hot over the labor issue during March 1943, and various polls showed as many as 80 per cent of American editors favoring the abolition of all overtime pay, knocking out the 40-hour week and generally giving labor a good boot. This would be the American public's "something in return" for the "almost senseless" slow down strikes and jurisdictional walkouts that wasted millions of man hours, and dragged down the production of airplanes, tanks and guns.

"I understand that the 4-day strike in captive coal mines cost the nation 80,000 tons of steel - steel needed for defense goods and civilian goods. As a result of the coal strike last April there was lost forever 370,000 tons of steel production. That is enough for 10 battleships; for 800 medium tanks."

1. From address by W. D. Fuller, president, Nat. Assoc. Mfgs. Domestic Commerce, 11/13/41.
By April 1, 1942 the press became strangely silent. The rumbling pot boiling over labor had gone on for months, with the March eruption all became comparatively quiet. Time magazine on April 13 reported: "three weeks ago 79 per cent of United States editors demanded that the 40-hour week be scrapped for the duration. Some editors even came out simultaneously for a profit incentive for industry while arguing that, for labor, patriotism should be incentive enough. For every half-dozen editorials declaring that labor must make sacrifices, only one said that all citizens must share the load alike. But suddenly last fortnight 30 per cent of United States editors piped down on the 40-hour week. Chief reasons: 1) news of the Jack & Heintz profiteering case (Time, April 6) and Assistant Attorney General Arnold's attack on Standard Oil; 2) belated recognition by many an editor that the 40-hour week is not compulsory, that the real issue was overtime pay above 40 hours. Last week a bare 18 per cent of United States editors still held out for a change in the 40-hour week."

When America became a nation of large factories, it lost something. You no longer worked for Jones who made stoves, or for George Westinghouse, young industrialist who gave you a turkey on Thanksgiving. A Westinghouse worker today, you work for a large corporation owned by Marshall Field, Mortimer Schiff and other names identified with the vested family interests. Ask the ordinary man in the shop who owns the company, and he will say "bankers in New York." And this is a man employed in a plant that has been strike and slowdown free for all 18 years of its existence.

In this sentiment is a big reason for lack of job loyalty, and apparent readiness to strike. You didn't strike when you worked for George Westinghouse, the man who gave you a turkey for Thanksgiving. You talked it over (though labor did little talking in those days). Anyway you knew that George Westinghouse, a farmer's kid, had something on the ball. It is different with guys
like the Mellons or Fields, who inherited everything and are living off the fat of the land.

Another prime reason for lack of job loyalty, and perhaps the greatest curse of the American industrial system is the fluctuation of the American industrial market which results in seasonal and periodic layoffs. "After all, they use you as long as they can get something out of you, and then you get laid off, the minute business slows down. Big business uses you for what you are worth. They didn't give a damn when your kids were hungry in 1933; perhaps they couldn't help it. But now when big business is making money, we're going to make some too, and we don't get an extra cent, if we don't go out after it. You'll see big business always takes care of itself, and we don't want the crumbs they'll leave for us. It's our work that makes transformers. Their dollars to keep the wheels turning, come mostly from the government, so it's our dollars that make up a lot of the capital or investment they keep hollering about."

"Sure Mr. Putman wants us to work Sunday for time and a half instead of double time. But if we do it, all it will be is another feather in his hat. After all Mr. Putman works for the Company too. If he gets us to work Sunday for time and a half, it will mean more bonus(money) for Mr. Putman. We're just as good Americans as the other fellow. Our kids are in the army. We'd work 70 hours a week to get stuff to MacArthur on Bataan, but we don't want to work Sundays for time and a half, and have Putman and management take the credit."

"Westinghouse is a good company and Sharon Works a good plant. We get as high pay as any industrial men, and our working conditions are good, but

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2. During depression Company and employes at work contributed $611,000 to aid less fortunate 7,000 Westinghouse families. Through spreading out the work, an estimated 6,000 were kept on the rolls. Westinghouse magazine, Jan. 1936.
3. H. V. Putman, manager, Transformer Division.
4. These preceding paragraphs represent a definite field of opinion. Naturally they are not ascribed to any individual working man.
there's no reason why we should lay down like cattle, and say, 'yes, Mr. Putman, we'll give up our double time.' What's he giving up?"

If Sharon Works were a plant of 2,000 men, owned by Sharon people, it would be paying time and a half for work on Sundays. Old John would have his office in the plant, and the older men, especially, would be dropping into his office to straighten out whatever was bothering the men in the shop. But a man working for a home-owned transformer plant would be receiving a much thinner pay envelope. The home-owned Company would not have the advantages that come to big corporations. For example, capital affords brilliant engineering talent, nationwide sales organization and promotion, hurried expansion when necessary, interchange of techniques, and better procurement of raw materials.

A home-owned Sharon Works would not serve society or men nearly as efficiently as does the banker-controlled Westinghouse transformer factory. The product, efficiency of manufacture, and economic welfare of the men working for a corporation-owned factory making transformers is better than would it be were the plant owned by a paternalistic, wealthy old fellow, who was just one of the boys.

America, a country of 122,000,000, in its industrial growth has left behind the individually owned small factory, and has moved into the area of the large factory with its benefits and ills. The paternalistic old factory owner almost represents the horse and buggy days of industry. The mere size, prosperity and population of the country tends toward mass and large production.

But America has a lot of problems to lick with its mammoth corporations that produce more efficiently. It is just starting to lick the labor situations that are a product of the big factories. Perhaps plants with 2,000 men, still part of large corporations, are the answer. At least with 2,000 men the personnel department and local management would know each individual worker
after he had been around for awhile.

It is apparent that the ill-will felt by the laboring man has been growing even before Carnegie started his big steel mills and men worked in the watery-grave three-foot coal veins of Wales. But until the Roosevelt administration, labor was the underdog. Labor peeped once in a while during the Hoover and Coolidge administrations. Now with labor having a voice, America is the most effective immediate tool he has. And during these past few years, men were striking for something that has been more or less suppressed for generations. America is just finding out the labor ills that come with big business. The Haymarket riots of 1886 that possibly ancestored present May Day celebrations were in the pre-medieval days of American labor.

America is just finding out the labor ills that come with big business. The working man, right or wrong in his various grievances, has just got his voice.

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With the passage of the Wagoner Labor act, there arose competition between two units representing the working man at Sharon Works. On one hand was the successor to the old joint conferences between the manager and employee, the Independent Union, and on the other Local 617 of the CIO's United Electrical Workers of America. It appears that the CIO were late on the starting line at Sharon Works, and before they could get all their guns working, the Sharon Westinghouse Employees association, the Independent Union, was granted sole bargaining rights by the National Labor Relations board.

CIO's United Electrical is not a good loser. They set up headquarters across the street from the plant's main gate, and before Pearl Harbor conducted an intermittent bombardment over loudspeakers and with handbills. All during 1941 at noon hours and changes of shifts in the afternoon, the CIO organizer
with a Brooklynese accent would intone over the loudspeakers "Westinghouse workers." That "void workers" had something to do with the CIO not carrying Sharon Works.

It is fairly certain that parts of the plant favored the CIO. Sentiment for the national union was particularly strong among the structural iron workers and welders. Definitely the CIO never had enough strength to carry the plant and become sole bargaining agents. The plant management felt the CIO pressure, and it is also certain that in their dealings with the Independent Union, they realized that if labor demands were not satisfied, the dissatisfaction would swell the CIO membership. Sharon Works was completely free from the fist fight rivalry that existed in other plants where one union was in, and the other had considerable support. The CIO at Sharon Works grew hot in words, accusing the Independent group of being a "stooge" union. In the saddle the Independent union was smart, and seldom answered CIO blasts. The Wagoner act specifically prohibited the Company from baiting the CIO, or mixing in the tussle. But there is little doubt as to which group the management preferred. Though I have seen men with CIO membership buttons in their caps who had been employed at other factories, hired at Sharon Works.

The rest of this chapter on labor will be taken up with the history of the Sharon Westinghouse Employees association, and a number of interviews with labor leaders on both sides.

In the early part of 1938, a group of salaried and hourly paid employees of the Sharon plant met to discuss and plan the organizing of an Independent Labor Union, in line with the privileges granted workers under the Wagoner Labor Act. At this meeting a committee, called a "nucleus committee," was formed. Its duties were to obtain members and formulate plans for a permanent

5. From S.W.E.A. banquet program, Feb. 28, 1942, etc.
organisation. The committee was successful in its work, and on August 5, 1938, the first election of the Association was held. The men elected to guide the Association through its first year of operation were: Ralph Marble, President; Merle Sutton, vice-president; J. W. Elliott, secretary; Carl Gants, treasurer. Directors elected were Ray Colclaser, B. E. McConahey, Charles Miller, Harry Deal, R. C. Brannon, J. T. Nercereau, Charles Cole, F. J. Callahan, Michael Ferry and William Cameron. Members of the grievance committee were Miss Mary Fabian, C. L. Wall, A. J. Maslin, Glenn Daubach and Sidney Lloyd.

First meeting of the board of directors was held August 10, 1938. Attorney Leo McKay was engaged as legal adviser, and still serves in that capacity. On September 1, a letter was sent to the management of the Sharon Westinghouse plant, asking for sole bargaining rights for all employees. On September 2, an answer was received from M. L. Fawcett, Transformer Division manager, recognizing the Association as bargaining agents for its members only.

From August 5, 1938 to April 15, 1939, the first officers, directors, grievance representatives and committees worked planning for the future of the association. By-laws were drawn up and April 15 was set as the end of the Association's fiscal year. From September 1, 1938, the Association, although not officially certified by the National Labor Relations board, bargained with the Sharon management. On October 25, 1939, the Association petitioned the National Labor Relations board for an election to obtain sole bargaining rights in the Sharon plant. Hearings were held, and the National Labor Relations board set February 6, 1940, as the date for the election. On February 27, 1940, the Association received official certification as an Independent Labor Union winning out over the CIO's United Electrical. Both salaried and hourly paid employees were included in the certification. Since that time, the Association has accomplished much "in the way of benefits for all employees in the Sharon
On June 1, 1940, the Benefit Association of Railway Employees plan of hospitalization was negotiated with the Sharon management by the Association. This plan's biggest advantage is that it provides for single men and married men and their dependents. The hospitalization in force at most Westinghouse plants does not provide for dependents. By June 1, 1942 the Association succeeded in having their B.A.H.E. hospitalization made the only group hospitalization insurance available for Sharon employees. The Company had been sponsoring an "old line" policy protecting just the employee.

Among the accomplishments listed by the Sharon Westinghouse Employees association are the following: Establishment of procedures for salary reviews, by which a study is made every six months, January and July, by the Salary Review Committee, to determine proper classification of employees and to recommend increases where justified. Establishment of an annual rate review for hourly employees.

Establishment of an equitable percentage basis for the shop "X" groups. General wage increase for both salaried and hourly paid employees. This was during April 1941, and was 11 per cent with a minimum raise of $18 a month.

Separate, signed contracts, for salaried and hourly paid employees. Procedure for rate increases. Procedure on transfers of new and old employees. Establishment of a plant rolling lunch-wagon service. (Note: It was more the union's approval.) Efficient handling of grievances, of which 94 per cent have been completed satisfactorily. Establishment of better labor relations between employees and management. Steady increase in Association membership, and purchases of Association office equipment which will help in giving better services to Association members. Participation in various community and national fund raising drives.
It cost 50 to join the Association, and monthly dues are 25. Employees are rather lax in keeping dues up.

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Recently elected president of the Independent Union is D. E. Thomas. His father was a Welsh coal miner who later worked in an American steel mill. Dave also started in the steel mill. Now 42, largely self-educated, and an office worker with 18 years service at Sharon, Dave learned to type by himself and achieved a speed of over 100 words a minute. Definitely not a "buller" he gets to the point quick. He was general grievance representative for the union.

Weaknesses of the Independent, lone, small union "mistakenly called local union" are described by Thomas to include: lack of national lobbying body which brings about favorable labor legislation; lack of capital for education programs to equip and train labor leaders. Perhaps the most immediate difficulty facing the Independent union, Thomas believes, is the need for the closed shop. Union men state that since benefits received through arbitration with management favor both union and non-union employees alike, all employees should contribute to support of the union. As it is now a man will present a grievance to the union, and in defiant mood will say, "if you fellows can't do something about this, I'll go across the street and join the CIO." This happens with grievances that no union, CIO or Independent, would want to take up.

Thomas is of the opinion that the time will come when all labor unions would be nationally organized. His view is that some day management and labor would sit down side by side and formulate factory policy. When this day comes the continual bickering and mutual distrust would greatly diminish.

In an independent union, a dozen or so men give of their time gratis to the benefit of the group this service is not particularly appreciated. In the
CIO men with these duties are paid decent salaries.

Thomas told of organized labor's infancy at Sharon when the plant manager met once a week with a few employees to thrash out mutual problems. The employees had no authority or power whatsoever. With the passage of the Wagoner act, since this group was not a certified bargaining agent, they had to discontinue the meetings. Otherwise the law would be violated; "company unions" are taboo. Hence the organization of the Sharon Westinghouse Employees association in 1938 and 1939 and final certification in February 1940 as an Independent Labor union with sole bargaining rights for the plant.

Thomas views the Roosevelt administration as definitely pro-labor, but says that it is indecisive in its relationships with labor. He holds no grudge against the CIO. Feels that John L. Lewis has his faults, but will go down in history as a "great" labor leader. Lewis has a combination of guts and brains. He sprang from the coal mining industry, full of management abuses. Thomas views I.Q. tests as definitely unfair to new employees. (His reasons agree with mine.)

Though he dislikes the idea that Negroes will be hired into the plant, he said that there's not much you can do about it. He hopes they'll hire the better negroes. Cited the instance of where the R building got a separate toilet for the negroes who completely man the section. This is the cleanest toilet in that end of the plant, and the white men have started to use it.

We discussed the bringing of negroes into this district just after the World War as strike breakers in the steel mills. Their loyalty to the government, service in the army, deservement of the right to live and to work, and general satisfactoriness as employees. Also their lack of independentness toward management in labor disputes. Hence poor organized labor material.

Thomas thinks the months just past were labor's "great days" until after
the war and the coming of another industrial upturn. With the prospect of industrial retrenchment after the war, labor will face severe problems. The only hope is for labor to gain more say in the conduct of the factory. The problem, to keep men on the job when this war boom is over.

He believes that Defense bonds are a good idea and will provide buying power for the procurement of automobiles and conveniences after the war. It may be a big factor in saving the day for the factory worker.

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Secretary of the Independent union is Bill Mack of the receiving floor. With the Company for 17 years, Mack is not as communicative as Dave Thomas. The local union has 4,200 members. Held its annual election at the end of March. This was the first time that the election was held by mail, and brought a larger vote.

Mack's father was a nail maker in a steel and wire mill, but the family was raised by the mother. Conversation covered the advantages of the Independent union including no outside or foreign influence, thus a real democratic organization, and the absence of racketeering and family payrolls that characterized many large labor bodies. There is not one iota of disrespect in Bill Mack's makeup toward the CIO or AFL. Sitting in the receiving floor office, he feels that labor came of age with the Wagoner act. Thus legitimised labor must no longer duck its responsibilities. "It must forego fly by night aspects, and act maturely where damage through work stoppage or loss of material is concerned. If it doesn't, the people will turn against labor just as they have against capital."

A closed shop would help the local union, Mack declared. He agreed with Thomas that a dozen men had to give much of their time to keep the labor movement moving here in the plant.

6. His figures.
Sharon Westinghouse has never had a strike. Bill Mack hadn't thought much about it. Perhaps good working conditions, an intelligent management, the depression and semi-rural location aspects are the causative factors. "The plant started in 1924, kept going uphill until the 1930 depression. In a plant going up and new, with work for everybody, there's not apt to be a strike. A plant that goes downhill fast, with no other places for men to work, also won't be strike-ridden. So it was up the hill with work for everybody at Sharon until 1930, and downhill with not enough work and no other jobs from 1930.

"Most of the labor leaders at Sharon Works have their roots and environments in America. Many of their parents worked in the 'hard and hot' steel mills. A transformer factory was conducive to good working conditions, and skill was more important than a strong back. The plant has also been free of agitators, and management has always been willing to listen.

"The Sharon Westinghouse Employees association is one of the few independent unions in the country. It is the only Westinghouse division with both wage and salary people organized into an independent union. The Sharon group maintains an interchange of ideas relationship with the seven other Westinghouse 'local' unions that represent office employees. The rest of Westinghouse is CIO with the exception of the Naval Ordnance plant at Canton, which being an AFL town, adhered to that group."

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Richard Harriff must have been an all-round American boy. Now at 29, married with two children, he's a handsome specimen of an American industrial worker.

He's been a Westinghouse employe for 12 and one-half years with never a complete layoff. A material cutter (insulation), he has a job that barely ranks as skilled. He makes $50 a week in a section that has few skilled men.
Harriff belonged to the Sharon Westinghouse Employees association until a year ago. Now he's joined the CIO local, and was elected secretary. He thinks well of Dave Thomas and has no particular grievance toward the independent union, but feels that it is not the solution to the labor problem. His reasons for Sharon not voting for the CIO are: the vote came at a time when the CIO was in disrepute for sitdown strikes and general raucity. Working conditions and wages at the Sharon Westinghouse plant were and are relatively satisfactory, the best in the district. At the time the vote was taken, the depression had just terminated and men were glad to get back to their jobs. There was no particular reason for disturbing the status quo so the vote among office employees in the 1939 election conducted by the labor relations board was 430 to 12, and in the shop 1160 to 540 for the Sharon Westinghouse Employees association as the sole bargaining agent. Ray Pope (paternalistic) is his idea of a foreman.

Harriff admitted that the CIO would not carry the plant now or in the near future for the reason that there is no particular issue or dissatisfaction. Sharon management generally has been fair. The present management muffed the opportunity of a seven day week for time and a half instead of double time on Sunday. The suggestion was made by the plant manager, and the employees felt that his main reason for wanting the seven day week was as a feather in his cap since no other Westinghouse unit had adopted it. The proposal also lacked all aspects of salesmanship, and the plant manager, more so than the managers in the past, thinks and is of the office and is not strong on understanding of the shop mind.

Harriff's father was a steel mill worker. Dick was born in Oil City, about 70 miles from here. He's always worked for the Transformer Division ever since graduation from high school.
He has no particular issue with the independent union. And together with the local CIO unit, he believes they both lack leadership. The independent union has had to get its leadership from the office workers. Finally when this became too apparent, the independent union picked an old-time but rather ineffectual shop man as president. Now they've gone back to Dave Thomas, an office man. But the CIO is little better.

To criticism that the CIO brings in outside influence, Harriff replied that at Mansfield's Westinghouse plant, there was a provision that under no circumstances could an outside CIO representative enter into negotiations. The national CIO didn't like this, but it was a way out.

The Roosevelt government is the first pro-labor administration in American history, Harriff believes. The end is to have labor have a definite voice in plant operations with management. Labor is still teething; it does not realize its responsibilities. The ordinary man joins the CIO to gain job security and more money. Most of the so-called agitators at Sharon belong to the CIO, but generally the working man is not fertile with ideas. As long as he is making a living and has a job, he's fairly content. Threaten the job and he becomes union-conscious, but then it's too late, for management is laying off and doesn't fear a strike. The depression with its layoffs made many a man union-conscious.

Again the labor man does not realize the penalty placed on society by a strike and property damage. But then the strike is labor's only weapon. Some day the government will offer constitutional labor arbitration based on study of the cost of living, job worth and precedent.

Education is the hope of labor, but Harriff agreed that education does not give a man the ability to think. Labor unions are sparked by a very few individuals. The mass is doing nothing. The idea of labor's responsibilities
is held by the higher-ups, but not the rank and file. To be effective it must start from the bottom. At labor meetings generally ideas must be planted in order to be carried.

Harriff had no answer to the query that if labor unions were dominated by a few spark plugs, this was not democracy, but rather an approach to fascism. But this same criticism can be leveled against our government groups.

He sees no future for the local independent unions. Agrees that they have no influence on national pro-labor legislation, and would be less potent than a national organization during times of layoff. He counters the argument that CIO men are highly paid. Says UE top men get $4,200 plus mediocre traveling expenses. CIO Sharon dues are $1 a month with a $2 joining fee. All varieties of labor leaders with whom I have talked believe in a closed shop.

Women are OK in the factory as long as they don't leave men out of work. Harriff says he has no anti-negro prejudice, and as long as there is work for everybody, men in the plant would get used to negroes, providing that they were given relatively unskilled and unresponsible jobs that they could do.

Harriff said he used to like his job. Now when he prepares his insulation materials he thinks of everything else. A few weeks back he visited his father-in-law in West Virginia, spotted a Westinghouse transformer on the pole in front of the house, and thrilled, told his father-in-law all about how it was made. A guy does his job in order to live. Under the craft system, he would have pride in a fine piece of work, but this doesn't carry over to 500 stampings of insulation material a day. Just part and parcel of the mass production system which gives us our high living standard.

When the Sharon Westinghouse News came out, the CIO viewed it as balm to the masses when it contained no argumentative material. This was the same view as was had toward the last-spring-started Wednesday noon movies; it was
had 6,000 reprints of this page run off in Sharon and distributed to all employees. This reprint was just considered more "management bull" by Sharon's shop men. After all a foreman is like the boss of a labor gang. The more he can get out of his men, the better his pay and stand-in with the plant owners, commented Harriff.7

Harriff believes that one of management's biggest mistakes is its underestimating the mentality of shop men. They dislike the idea of management telling them what is right, and what to read and think, or that management is gifted with superior talents. Hence the worker's distrust of management's bulletin boards with the "holier than thou" slogans. The workman would like to consider the executive his equal even though he lacks the ability to express himself as well. He's got an inferiority complex toward the boss.

Big block toward friendlier shop-management relationships is the shopman's inability to express himself in the presence of management. He gets tongue-tied and blurs instead of calm reasoning when in the presence of the front office bosses. This will have to be overcome, and the shopman knows it, but he is having a tough time unknottedting his tongue after generations of listening respectfully. Hence the bravery of the individual worker in the presence of his fellows and on the soap box, and his limitations around a conference table.

7. Conversations with Harriff preceded by a few days the expose of Jack & Heintz' bald methods of evading excess profits taxes, "big bonuses".
Harriff had little to answer on the query, now if labor and management share in plant control in order to give labor a larger share of the profits, what will happen to the incentiveness that has been capitalism's best blessing.

Harriff's reason that Sharon has relatively high wages is that CIO-gained wage boosts at the other Westinghouse plants are passed on to Sharon men and women. When East Pittsburgh gets a raise through CIO negotiation, Sharon men and women soon got an up, for management would just as soon keep the independent union in good repute among the employees, and if they did not give the raise the employees would then have "the motive" for going CIO.

There is no trace of female doubting daintiness in the walk of Mary Murphy. She has the apple-cheeked freshness of a husky 30-year-old farm woman; she walks to definitely cover ground, and most of the winter comes to work in a blazer and black woolen skirt. A widow since 1927, and now 42 and a grandmother, she has raised three daughters, two married and one in a sanitarium.

Mrs. Murphy is Sharon Works' outstanding woman. Born in Czecho-Slovakia, and brought to this country when two, Mary has worked most of her life. Her energy is undiminished, and an astrology believer, she calls herself a problem child because she was born under Aquarius.

Mary's first day at Westinghouse was on August 18, 1926. She got a job as a coil winder at 25 cents an hour. From 1932 to 1935 she did a man's work building and lifting heavy transformer cores; she had a family of three to support, and was glad to be one of those fortunate job-holders.

Back in 1936 and 1937 when the transformer division management started and sponsored a recreational program for employees Mary was one of the first committee members and backers. During these same years when a group of employees used to meet with the plant manager once a week in a purely advisory capacity,

8. Everybody calls and refers to Mrs. Murphy as Mary or Mary Murphy
Mary was there and let her opinions be known. With the Wagoner act and the organization of the Sharon Westinghouse Employee association (the independent union), Mary was a prime mover.

Her husband had been a machinist; her education less than eight grades. In 1939, Mary joined the CIO local which was attempting to organize the Sharon plant. She is financial secretary.

There are a number of rumors about Mary. They are persistent enough to be mentioned. One is that she was a woman wrestler in a circus, though the true story appears to be that she accepted a wrestling challenge at a carnival given to all comers. Whatever the stories, there is no fear in the woman, and she has stood for what she believed. Mary left the independent union, because they'd give in to management when it came to a showdown.

She believes the weaknesses of the independent union are first, lack of ideas. The CIO profits from the experiences of membership throughout the electrical industry. A local independent union has no direct way of getting ideas. Also there is a lack of training for independent union leaders, and the independent union has no influence over favorable labor legislation.

Mary absolutely refutes the idea that the CIO brings foreign control. She says that with the CIO, Sharon workers would find themselves having men who knew the whole picture for the industry fighting their battle for wage increases. After all a man who knows prevailing wage scales for the same job of transformer building at General Electric and Allis Chalmers, has something behind him when he sits down with management.

She is critical of management, and has adopted the CIO national policy toward labor representation in sitting in with management on factory control and conversion during the emergency. This with the idea that perhaps this will give labor a permanent wedge in determining policy for the factory.
There have been about 200 persons laid off at Sharon Works because of the limited production of small transformers which up to now have had limited war use. She is critical of Westinghouse's conversion to the war effort. Believes that in this time of national need, the Company shouldn't have any persons out of work. She had just returned from a trip to Harrisburg to see her daughter in the sanitarium, and had talked with several people on the way about the boom aspects of certain Defense towns with no one out of work.

Mary believes that if the 40-hour week is abandoned the battle to get it back will have to be terrific. She is afraid of six days a week now, and in three years after the war, it will be two days a week. Her view of the Roosevelt administration is that it is the first pro-labor government, though she has few ideas on national politics.

She is definitely not communistic. Over near the railroad tracks in Sharpsville, she pointed to her old-fashioned house where she lives with her son-in-law, daughter and grandson. Communism to her meant the loss of that two-story dirty yellow frame house on a cinder street - her home, that would be all hers after eight more years of FHA payments.

Mary is not a thinker. She leads with her chin, and doesn't hesitate to speak. She's not particularly figured out most things for herself, but if they sound logical and fit into the pattern, she sticks by them. In this she conforms to the human race, except unlike most humans she has the mental energy to pick up ideas.

The spot of women in industry is depressing to Mary. That is if she can be depressed. First of all at Sharon Works women work for 80 per cent of what the men get for the same job. Labor unions are dominated by men, and they fear

9. Small transformers (distribution units) may have war use in such areas as the hugh home developments near Detroit for war workers. Primarily used for domestic consumption of electricity.
wider use of women in factories for their own selfish bread and butter reasons. The supply of women is plentiful. Hence management finds itself able to use women on jobs at less pay with the tacit agreement of the labor unions.

Mary feels that at least in Sharon Works much of the work is too heavy for most women. "I know, I did a man's job for three years working with heavy core iron." She also believes there should be a rest period in the morning, and another in the afternoon for the girls. Six days work for an individual is plenty. She reported that the Sharon Westinghouse News is sent in to CIO headquarters. The paper meets with her approval. The CIO thought that the reason it emerged was that the CIO had been having a local paper. She found little fault. Disliked a flag waving article by one of the men in the shop which seemed to have a backhand slur at the CIO and men interested in labor organization even in times of national emergency. Mary believes that the organizer assigned to Sharon by the CIO UE is too dominating, and "he thinks no one but himself can have an idea that's good."

Mary is confident that the CIO will and could carry Sharon Works. But the order came down from national headquarters to not hold a vote during the present emergency especially since the race would be close.

I point blank asked her if she knew or suspected of any place where management had discriminated against a man or woman because they were CIO. She avoided the question. Finally gave me an example of where a high ranking CIO man who got a good promotion. Perhaps in her mind was the problem that the CIO would be harmed if employees felt that joining the CIO would hurt their chances at promotion, training or wage increases. We both realized that such would be against the national labor relations policy.

Her only note of discrimination was that the foremen would tell her and the others to not attempt CIO propagandizing and signing up in the shop, and
the same foremen would stand by and let the independent union men do what they liked.

She told of a case of a foreign girl in B-10 who talked brokenly, was ribbed by the other girls, and in serious desperation made such remarks as "I love the German people, and I am proud to be a German." Finish of this story is that the independent union man got wind of this; quizzed all the girls about the suspected "Nazi spy" (this was last fall). When the girl with the "gejumped" accent found out she was being "gestapoed" she started to cry. The other girls in the section were lead to believe that the independent union fellow was working for management on the case. End was that Edmonds came down, said Mary, and "bawled hell out of the union fellow."

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Labor does not really want a say with management in the conduct of a factory. H. V. Putman, Transformer Division manager, recited several cases where labor men had been appointed to the board of directors of large corporations.

After a year's service on the board, these labor men became aware of management's problems and need for caution. They found themselves becoming sympathetic to the other side, and hastened to rejoin the ranks of labor. A capable labor man on the board of directors soon found himself defending capital, and becoming a conservative.

Mr. Putman gave several examples. He showed where he had sent data each month giving the plant's profits to the labor union heads. This was in response to their demand to know more about the business. When he stopped sending this data on profits, he heard not a word, and assumed that the plant labor men were evidently not interested.

11. W. M. Edmonds, Assistant supervisor, Industrial Relations.
J. T. Burke, Industrial Relations supervisor, remarked that in the days of the old management-labor company union conference, labor representatives averaged less than two years on this board because they became too sympathetic to management.11

Labor is effective opposition to management when it is on the outside. Once it gets its representatives sitting in with management, the leaders become conservative. Often the rank and file of labor disown these leaders. This is not because management has bought them off, but rather it's one thing to say and another to do. The other fellows' problems always seem simpler.

During February Sharon Works paid out $57,000 in Sunday overtime wages.

Mr. Putnam commented that Washington must introduce some wage and price freezing legislation before the war effort would really get into swing. He told that transformer prices were frozen to nearly five per cent below the level of December 1940. Cost of materials had gone up. War Production Board and previous pressure had resulted in seven day operations with time and a half on Saturday and double time on Sunday.

"No business is going to go insolvent for the war effort. What good is a bankrupt business to the war effort, or anyone else?"

Mr. Putman is in favor of giving labor no more than what the 40-hour law calls for. Time and a half for everything over 40, and complete elimination of double time. He also proposed that where Westinghouse now pays more than 75 per cent of its profits to the government in taxes, that with the freezing of wage levels, corporation profits be set at five per cent. He added that was two per cent more than we are getting now. Profits should come out before taxes and not after as they do now.

11. Burke's background includes number of years as a steel mill worker. Definitely has employee viewpoint in mind.
An additional result with perhaps some good would be the lowering of the price of transformers perhaps as much as 20 per cent. For the Company would not be particularly interested in paying a large tax, and would strive to make just five per cent above the cost of the product. As it is now, the sales price must cover cost of the product, immense taxes, and what is left makes up profit. The benefit would be lowered prices for transformers, all for the war effort anyway, and a resultant reducing of the cost of airplanes, etc. Hence the public would have a smaller bill, and have to pay less taxes. This would have definite worth in curbing inflation.

Mr. Putman is not against the 40-hour week, and is perfectly willing to see time and a half for all hours over 40. He prefers this to a blanket raise in wages. For when business ebbs the men will go back to the 40-hour week on straight time; it is harder to take away a raise in wages.

On Mr. Putman's desk was the new War Production Board's program for increasing factory output. He vehemently commented, "we cried our eyes out in Washington for more raw materials, and only had 55 per cent enough for the immediate future. And they want us to increase production. We'll look like damn fools propagandizing for more production on one side, and shutting down the aisles on the other for lack of raw material."

Sharon Works during the latter part of 1941 operated at 225 per cent of rated capacity. Definitely one of the better records among American factories.

Mr. Burke's suggestion for a work week was the Delaware and Lakawanna system of the 1920's where a group of three high type men, trusted by both sides, got together every month or so to determine how many hours should be worked each week in view of existing factors. When there was need for 50 hours a week, men worked 50. When there was less work to do, it was down to 30.
Discussed was the annual meeting between CIO's UE and the Westinghouse Company officials in New York earlier in the month. The CIO demanded a 12½ cent raise on lower incomes; vacation pay each year for men in the armed forces; the establishment of a fund for the army men to be given them when the war was over, etc. W. C. Marshall, Westinghouse vice president in charge of industrial relations, countered with the following: abolition of group insurance, abolition of all double time and the 40-hour week; abolition of holidays except Christmas; dropping the incentive payment plan, and because of existing conditions cease giving a month's pay to Westinghouse men entering the army. Sessions at this New York meeting were secret through mutual agreement.

Labor was shocked at Mr. Marshall's proposals. One of the men termed it revolutionary in a retrogressive way. These were the most reactionary proposals submitted by the Company since Roosevelt came in, but Marshall knew the time was ripe though labor was in the dark.

Thinking the Company would be put on the spot, one of the labor men tipped off a Pittsburgh paper about Marshall's reactionary demands. The labor editor called up the Westinghouse publicity chief who realized that labor just now was in the ill graces of the public with the 40-hour law in the broils of Congress. The Company saw the complete picture, and gave its OK for printing.

The result, the reading public for the most part agreed with Marshall and the Company in the reactionary suggestions. Organized labor just could not figure it out. The public was "agin" them, and it was labor taking the heat for the lack of equipment with which to fight. At this writing, May 11, 1942, two months after the above incidents, the status quo between Company and CIO demands have been maintained, and are apt to continue.
Through these giant transformer bushings will flow huge quantities of electric current that give America such vital materials as aluminum, magnesium and fine grades of steel. On the job are Phil LeDonne and Albert Shields.

"Playing ball;" this opening of the season picture of Sharon Works manager, H.V. Putman, and Frank Callahan, then president of the labor union, had a kickback. It seems that they shouldn't be seen playing ball.

Pearl Harbor was a very fresh memory when Sharon Works hurriedly developed black-out caps for the overloading signal lights on transformers. Irene Hopko and Leona Marek are stamping out the copper shields.

Half a million volts of electricity flashes over this big transformer bushing under test.
In an attempt to again put over the program that would eliminate Saturday and Sunday as overtime days, Mr. H. V. ("High Voltage") Putman was given an emphatic NO by the Wemco Sharon Workers who voted by more than 7 to 1 to reject Mr. Putman's work week plan. At the same time the Wemco Sharon Workers voted unanimously their desire to operate the plant 7 days a week in order to defeat fascism. The meeting also brought out the necessity of getting afternoon and night shifts in operation to the same extent as the day shifts. The meeting pointed out that if the shifts had been made equal months ago, "the large backlog of power transformers urgently needed for the war effort," would not be so acute today.

To the leadership and to the members of the SWEA - You are right, a satisfactory solution should be reached in order that we can give full attention to defeating the enemies of our nation. We have our "High Voltages" in other plants, and they would like to do the same job on their workers, that Mr. Putman is trying to do at Sharon. But these workers organized in the UE have teamwork which commands the proper respect from management. You recognize the need for such teamwork when you say - "Sharon plant shall not be used as an experiment" and "an agreement should be reached for all Wemco plants." We agree 100%.

We of the UE invite and urge you to join with us and become a part of the UE Wemco Conference that represents 55,000 Wemco Workers, so that we can work together and short circuit all those employers who don't care how much lowering employees' standards hurts the nation - or how much it weakens the country in time of crisis.

Together We Will Win!

Wemco Sharon workers, come into the Union with us!

Work side by side with us for that teamwork and cooperation which will mean victory for the United States!

Let us help you to receive those essential wages and working conditions on the job which you must have to contribute effectively to the defense of our Nation.

We need you - you need us.
Don't let it go any longer. The time is right now!
Together, we will win this war!

All together, we will keep our Nation safe from the Fascist Powers that attack us.

We of the UE invite and urge you to join.

Issued by Local 617 United Electrical Radio and Machine Workers of America - CIO
Chapter 5
Negroes in the Factory

Back in 1923, Black Tom Robinson, former Driggs-Seabury machinist, got a boss job with the construction gang that dug ditches, laid foundations and generally prepared for Westinghouse's occupation of the plant. Tom's gang of 14 negroes were promised jobs in the new Westinghouse plant.

Tom was the only negro to get a Westinghouse job. For six years he hauled ashes from the power plant boiler house, was laid off at the start of the depression, and soon died.

In 1937, R. T. E. Bowler, a Virginian and foreman of the E-building (milling machines, copper shop, etc.) hired three negroes including Carl Flemon, former auto mechanic and son of a pioneer negro minister and steel mill worker of the valley. Flemon and his fellows were told that one slip and the negroes might have to go. They were assigned cadmium and silver plating, and caustic soda metal cleaning jobs in a segregated small building. The negroes early adopted a policy of not speaking to anyone until spoken to. They were forced to have their own toilet, which has become one of the cleanest in the plant, often used now by the whites.

In all about a dozen negroes work in this plating and metal cleaning section. The work is not particularly hazardous, and the black men have made good.

With the start of National Defense hiring, Westinghouse Sharon was in urgent need of men to operate machines. Competitive I.Q. and Minnesota Board tests were given prospective young men. Whatever their score, negroes would not have been allowed the opportunity of this training. In all about four young negroes took the tests. I helped give them and aided in the grading.
Management has no reason to dislike colored workers. Captain E. W. Keen, plant protection chief, emphasized that the negro is the least likely saboteur. Labor relations with negroes have been excellent, and generally management has been able to have them do the same job for less money. They are not complaining workmen. The Independent union allows negroes as members, and officially does not bar their entrance as workers, but in the past disliked the idea of their being employed. They got used to them having their own small building.

During February and March, Sharon Works hired three negroes as material handlers and janitors. In April and May a few more were hired. Especially at first they were handpicked negroes. They were automatically assigned to menial jobs.

The Reverend E. F. Flemon, father of the night turn group leader of Sharon Works negroes, is 82. He is a leader of the colored community; came to the district when there were only five negro families. He got a job as yard boss in Buhl's north steel mill. Then the mill workers were Irish and German, clannish, and the negro was seldom given a job that lead to the acquiring of skill. He was always paid less. Yet he had a job. In 1910, 1917 and 1922 negroes flowed into the Shenango valley. First for lack of workers. In 1932 freight carloads of them were shunted in from Georgia to the mills to break strikes. There was bloodshed. Bitterness developed that carries to this day.

The mill worker, chiefly Italian, Pole and Slovak by 1922 (in this district) saw the negro as a competitor. As a result of this the National Malleable plant in Sharon had 1,800 employes and hired its first negro in 1942. The Unions wouldn't go along with negro employes, and mouth-to-mouth orders among Malleable men, reported Reverend Flemon, was to strike with the coming of negroes. No one went out on strike.

Carl Flemon's mother told of her daughter that finished high school and
business college training at the time of the World War. Answered ads. Got cold
replies, finally had to do house work. Carl and his minister father, talked
of Pennsylvania's equal rights' law that would allow colored folk the same
privileges as whites in cafes, liquor stores and hotels. The Reverend said
that in 40 years of living in Trumbull county, a negro had never been called
for jury duty until he complained at the county seat. Immediately his son was
called for jury duty twice in a row. There are between 700 and 800 adult
negroes in the county (across the Ohio line from Sharon).

The negroes view the war as their great opportunity. It's their chance
to get industrial jobs, their chance to fight side by side with the whites.
After all, we're only 80 years from slavery."

Carl Flemon in the four hours of conversation demonstrated the negroes'
value of color. Perhaps the fundamental reason is economic; a whiter negro has
a better chance at getting a job. He is more like the man who has one.

He said, "I could get mad when a white man approaches me downtown and
asks for directions to a dark 'cat' house. What would a white man do if I
asked him for directions to a white 'cat' house? When my kids or myself go
downtown, little white children grab on their mother's skirts and duck. We're
bogey men. Even before they can think, read or write, white children here
learn negro prejudice.

"I was brought up on a farm, and all my friends were white. I played
basketball, and we'd bobsled to games. I'd sit next to white girls. No
prejudice there. Sometimes I'd stay a week with a white friend, sleep with
him and all."

Very evident in Carl's (Bud) makeup was pride that the white men,
especially some white men, accepted him. To him education was the hope of the
black man. He viewed the ignorant black fellow from the South as the race's
greatest curse. His sister had been to college (Wilberforce), and her tinted red-lipped too light photograph graced the piano.

The black man from the South came North and relatively unshackled, burst and became obnoxious. Many instances were present of Bud's pride in being northern born, living among whites, playing as a kid with whites, and his kids playing with whites. A typical second generation complex, though more acute.

All of the Flemons were incensed about the Detroit negro housing riot. White cops never protect the negroes when whites are on the other side. Even in Sharon a negro can expect no justice from a white cop when the other fellow is a white.

The Roosevelts, especially Mrs. Roosevelt, is OK. But they're still Republicans. Voted for Roosevelt once. "All the Democrats are trying to do is to weasel the negro vote with faint promises. After they get us, they'll forget us like the Republicans have. And the whites in the South are Demo- crats, and the negro don't vote there."

I talked with Bud for two hours on a Saturday evening over in the R-building. Work was light, and occasionally he would dip some metal castings into the caustic soda cleaning solution. "See that little skinny Italian fellow. I don't speak to him. He don't speak to me. He's a material handler. He don't like the idea of negroes getting more than whites, on any jobs. Foreigners are our worst enemies, especially the second generation that often is ashamed of their own parents. I've had some whites under me. But I'd never ask a man to do something I wouldn't do myself. If it was dangerous I did it, so we got along. These Italians, Slovaks and Poles came over here. They get the chance to do machine jobs. They can't speak English. We become the janitors, if we can get the jobs. They learn a skill.
"We're healthy men, if we didn't have to live in poverty, we'd outlive the whites. We got to live too, and we want to work to live. There are 15 million of us (his estimate high). If we get educated we can live side by side with the whites. We don't want segregated schools. We want to live and work among the whites. Knew a fellow in Pittsburgh who passed as a white. Got a job in a clothing store. Socialized with the negroes. One day a white fellow spotted him in the store. The negro got fired.

"We have pride. When we buy a suit we have to pay as much as a white man. We like to dress well; it's for our pride. Our homes are just like a white man's. You ever eat in the Sharon Country club? Good wasn't it? Two black men cooked the food.

"Worked as a driver for a private family in 1931 and 1932. Are in the kitchens with the two girls. One of them left, and a foreign girl took her place. This foreign girl told the other one she was making a mistake. So they served me first and ate later. This Purnell Phillips became group leader of our day turn bunch. He carries blueprints from the F-building and some of those 'hunkies' said among themselves 'What's that damn nigger think he is, carrying blueprints.' Purnell has got to watch his step. The rest of us never talk to white girls in the office. Purnell is nice looking, an athlete. Women are always crazy about athletes, and there's something about a black athlete. The white girls will throw themselves at him. Had a case over in Farrell. Valedictorian last year was a negro boy. 'Afore this had a negro star athlete. He courted a white girl. All the neighbors raised hell, but the folks, they used to sit in the parlor with the girl and the negro fellow, and talk. They said it was none of the neighbors' business."

1. 'hunkies' for Slavs like wop is for Italians.
Comment by a white man who has worked for the Company for 15 years:

"That I-35 negro was put to work as a material handler. It's damn degrading for that poor white fellow who has to pull the wagon with bushings from I-35 to the H-building on the other side of the wagon tongue from the colored man. Bad enough to do a job that a negro does."

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W. J. Harrer, who started to work on East Pittsburgh's test floor in the 1890's said that in those days only the Irish, British, American and Germans were considered able to work in an electrical factory. With labor shortage and expanding industry, the Slav was brought in for janitor work, finally emerging into the skilled jobs. Then the negro became menial, but he has not progressed much from there.

---oo0---

LeRoy Green was valedictorian of his high school class of 35 members. He has never been out of a job; is 5' 11" tall, weighs 165 pounds, is 29 years old, and has been married for five years. Green is alert and has an excellent personality. He scored better than average in the I. Q. tests given prospective employees.

Green was immediately given a job; he pushes a broom and cleans men's toilets in the offices. His skin is black.

Born and raised in Darlington, South Carolina, Green was of a family where the father died leaving four children, three sisters and himself when he was two. Green's mother took in washing; all her four children graduated from high school, a colored high school. He topped his graduating class; one of his sisters was second high in her class, and another sister was third.

"We didn't have nothing, but my mother had pride. We were good stock. We mixed only with the right folks. Darlington with a population of just under 10,000 was about 40 per cent negro. There was a cotton mill in the town that
employed negroes only as janitors, and a tobacco factory that had a lot of black people working. Our town wasn't too hard for colored folks to live in.

"When I was in seventh grade, I got a job working as errand boy for a meat market operated by a white man. As I got along in school, I started to do his statements and later his bookkeeping. After a while I made sausage in the back room. When I got to high school the butcher needed more help in front, and I became a meat cutter. Most of our trade was white. At first some of the old white families wouldn't let me wait on them. I was all business, never talked about the weather, and did my job good and fast. They soon didn't mind me waiting on them.

"Down in the South a black man can get a skill, but he don't get paid much for it. Here in the North you won't let a black man get a skill. If he gets a job you pay him pretty good, but he's only a janitor.

"My high school principal told us that whatever you are, be the best. I'm doing my work as good as I can. Some day I hope I get a chance at something better.

"I was cutting meat down in Darlington until I was 24, got married. One day a colored preacher from the North who came from Darlington originally, dropped in. It was Saturday night, and I was moving around pretty fast. This preacher, told me he had a store and butcher shop in the North, and how'd I like to work for him. I thought he was giving me a line, and told him sure enough. He wrote me later, and that's how I got to Farrell where I managed the store for the Rev. Samuel Delano, who has the largest colored-trade store in the valley.

"I put my applications in at Westinghouse and at the Malleable a while back. Got a job at the Malleable the first part of March. Worked as hard as I could. The whites near me told me in a friendly way to 'don't work all the time, screw around a bit.' After I was there three days, got a call from the
Westinghouse. Since I liked the kind of plant better, told the Malleable
people I wanted to quit, and here I am.

"I don't know what the answer to the colored problem is. Sometimes I
think that maybe the colored people should have their own plants, sponsored by
colored capital.

"Almost went to college myself. Had a four year scholarship with a
chance to stay in the dean's house. Didn't have the $50 for clothes, and didn't
like the idea of getting something for nothing. Knew I'd be broke all along.
Many of our boys who came back from college, wear it like a chip on their
shoulder, and are all out for themselves at the expense of the ordinary negro.

"Many of us southern negroes have more education than the negro who
came from the South earlier. These early fellows often came from the back sec-
tions, and a lot of them still can't read and write. In the South today we're
getting more and more educational opportunities. Something the negro who came
North earlier didn't have.

"We think that a white woman who marries a negro is trash, for the same
reason that if you married one of our girls, you'd get the best. I personally
don't go for the 'high yellows.' I'm rather dark, married a girl 'bout as dark
as I am. Went once with a girl that was lighter than you. Her Dad was lighter
than me. Her mother, most folks thought was white.

"You're right about us negroes thinking of our folks as being good look-
ing on the white man's standards instead of our own. I never thought of it
exactly that way, but the negro with thin lips, narrow nose and lighter skin is
usually thought the best looking by our people.

"Many of our rape cases start like this one that happened in Darlington
two years before I left. Some girls chase men, and they'll chase colored fel-
lows. This particular girl got a case, one way or the other, with a black
fellow. He used to come to her house, tap on her window, and spend the night with her. One night he came to her window, tapped, but she didn’t hear him. So he opened it, and went in. She woke up with a start, screamed; he dashed away. But they caught him, and he got life after a short hurried-up trial. Her folks and the whites had it as attempted rape.

"She died about a week after the trial. Had an abortion to get rid of her baby, but it killed her.

"Some white girls - now the cases aren’t all this way - will have their fling with a colored boy, then tire of him, let out a scream, and he’s up for rape. That’s the end. Again you have a case of where white girls are decent to black fellows, and the colored boy misunderstands the attention, and tries something.

"I believe that we’d be better off with our own schools in the North than the way it is. In the South we had our own schools; they didn’t give us as much to run them, but our teachers were black. Here the negroes go to a white school exclusively taught by and for whites."

To me Green didn’t have the inferiority complex that I had found in the few northern negroes I talked with. There was none of that "I live among white folks, my kids play with white kids" stuff about him. Though he declared no particular attraction toward the "high yellows," still his identification badge photograph had come out fairly black, and this concerned him. Green was versed enough to know what was wrong with the picture. He’d figured an under-developed or exposed negative, or perhaps the use of too contrasty paper. There are very few people in this plant that know as much about photography.

I talked with big, 200-pounder R. T. H. Bowler, one-time E-building foreman, who is credited with bringing the first negroes into the plant. With
his Virginian speech, he described how a negro worked. "During the last war, I was at a steel mill. We had Poles, Italians and some other Slavs out in the yard loading the cars with coal and iron ore from the stock piles. Those guys would stretch that work out, and we had to keep riding them to get the material in time. Finally I told the boss, let's get some 'niggers.' We got those black boys on the job, and they'd load the iron and coal in half the time it took those whites. Work like hell, and then they'd all lay down and be sound asleep, snoring away in five minutes. Blow the whistle when we got close to the end of our supply of iron and coal, and those black boys would be back at the job putting everything they had to it. An hour later with the job done, they'd be back to sleep.

"A good negro makes an excellent worker. This young Green is doing the best job we ever had done in keeping the toilets on this floor clean."
Chapter 6
Women in the Factory

Industry is on the receiving end of a high pressure campaign to use more women. Government publications, magazine articles, news reels, the radio and the press are flooding the nation with: "In Caldwell, New Jersey, a miss just out of high school carefully, quickly smooths the edges of brass propeller fittings. In Dallas a bridge champion's wife assembles hydraulic devices which raise and lower land gear. In Fling, Michigan, a Polish girl carefully fastens the bolt of a .50-caliber machine gun in a grinder, adjusts a machine which smooths its face. War fever has removed the social stigma from factory work; many women enlisting for industry are nurses, teachers, saleswomen, even Junior Leaguers, who would not have dreamed of factory work a year ago. White collar girls in plant offices ask transfers to the shop where life is 'more exciting.' "

With the need of an army of from six to ninth million men and huge quantities of equipment, it must be admitted that the greatest untapped labor supply in the country is America's women.

Sharon Works records indicate that the largest number of women on the shop payroll was 326 just before Pearl Harbor. This included about 250 actually engaged in manufacture, the rest were shop clerks, charwomen, etc.

Westinghouse is a pioneer in the use of women in the factory, even in the days when factory girls wore high-necked dresses and a few feet of lace. Many of its plants, for example where light bulbs are made, use more women than men.

In spite of the propaganda flood, rather liked by the public because of

1. Time magazine May 11, 1942.
the novelty of it all, U. S. Labor Department statistics at the time of Pearl Harbor showed only 7.5 per cent female employees in 937 American Defense plants. In Britain at the same time, one large aircraft plant had 40 per cent of its employees women. In two British light caliber munitions plants, almost 90 per cent were women, and in a heavy munitions plant 20 per cent.

Discussing the employment of women last December before a management committee, J. T. Burke, Sharon Works Industrial Relations supervisor, made the following points: "It is a reasonable conclusion that with the increase in our armed forces, industry will have to tap reservoirs of labor heretofore considered impracticable. There are four general groups in this category:

1. Men 35 to 55, who will be displaced by a reduction in consumer goods and service and luxury trades.

2. We shall have to employ larger numbers of the colored group, both male and female.

3. Physically handicapped, whose usefulness will be limited to those jobs in which there is no physical strain or accident hazard involved.

4. A group composed of women, and this group can be utilized to almost any extent that the situation may demand.

"There are special problems involved. Labor codes restrict the hours and stipulate the conditions under which women can work. More hygienic and sanitary equipment is required. There must be sufficient rest room facilities, etc. The problem involves our wage differential. In our present key sheet the minimum wage for women is 44¢ and for men 67¢. We have justified this differential on the basis of the additional expense stated above, and also on the higher labor turnover and expense of additional supervision. However, this has been seriously questioned by labor groups all over the United States and charges of discrimination have been made for a number of years. Any widespread..."
induction of women into men's jobs will bring this controversy prominently into the foreground.

"There is also social and supervisory problems involved. One is our traditional policy regarding married women. Another is the increased health hazards. Our Relief Association has taken cognizance of this matter and excludes married women from membership in the Relief Association. Much closer supervision will be required to minimize emotional problems that inevitably follow larger scale contacts and greater intimacy of men and women. I believe that whatever we do to meet the situation should be done only after sufficient consideration has been given to all factors involved and that a consistent overall Westinghouse policy should be developed."

At the present time (May 15) the number of shop women at Sharon Works has decreased from 326 (Pearl Harbor) to about 250. There are two Sharon Works sections that employ large numbers of women. It is found that women are better than men in winding the smaller coils for distribution transformers, and in preparing of the necessarily small parts for breaker mechanisms. Both these sections are associated with distribution transformers, the kind on the light pole in your alley, and the production has been severely cut with the war. No copper is available for anything but direct war manufacture.

When Mr. Burke mentioned labor codes restricting employment of women, he was referring to the Pennsylvania state law that in effect results in women working only on the day shift. The law definitely forbids their working after midnight, and of course the sections now operate 24 hours. Their employment is also forbidden on such things as electric-arc welding.

Since Pearl Harbor there has been increased use of women in preparing insulation materials for large transformers. And within a few weeks there is apt to be a course for training girls as production clerks.
The distraction created by women walking down the aisles of the plant still holds. No women are or were allowed to visit the shop. But with the introduction of more women this situation should ease itself out. For the moment the biggest obvious change in the women situation at Sharon Works since Pearl Harbor, is that the shop girls have started to wear slacks. This of course presents less of a safety hazard than skirts. Smaller chance for entanglement in machiner.

Undoubtedly Sharon Works will employ more women. They can take over on some of the jobs right now. As the supply of available men diminishes, it will become necessary to break down jobs so that they can be handled by women. Where four men did the job, in the future it will be done by three women and one veteran man, on hand to care for the weight and other elements.

Much of the reason for the absence of women in the Transformer Division is associated with tradition. "Women don't make anything but toy transformers." Of course Sharon Works builds large units that sometimes tower over 30 feet, and with the weight element, mechanical and craftsman requirements, and climbinb, it will not be inducive to the use of women workers. Though their eventual use even on these "big fellows" is entirely possible.

Up until the present time at least, there is no appreciable trend toward hiring more women in this factory. The aircraft factories started from near scratch; some of them employ large numbers of women. But the Transformer Division was an established business before Hitler started building an army. It has 3,120 employes with five years service. There will be no rapid change-over in the hiring of women here. It will come, but it will come slow.

The Company officially does not permit married women to work. If the girls do not announce their marriage, even though it often is common knowledge,

she often continues with her job for a few months before resigning. A few take advantage of the Company's tolerance, and continue on. At the present time the labor union is letting its disapproval of the situation be known. No policy is formulated yet in the matter of young former employees whose husbands are in the armed forces.

Of course there are large numbers of girl clerks, typists and stenographers in the office. No women are draftsmen or engineers.

Men do not particularly care for the employment of women in factories. They view them as economic competitors, and are afraid that after the war when there are not enough jobs to go around, the women will be keeping the men out of work. At Sharon Works there would be little reason for the men to be aroused over the issue, for the employment of women hasn't changed with the war. However, the men are apprehensive; they know that with pressure for increased production and labor shortage, more women will enter industry, and there is little that they can do.
Chapter 7
Management and its Problems

MacArthur takes command in Australia. Washington believes the people asleep, while the becoming indignant populace in frustration of "strategic retreats," storm congressmen with letters, for to them "Washington appears dead at the helm." Both the people and Washington fail to understand that the "hip, hip, hurray" patriotism of 1917 just won't come to the 1940's.

The reasons? "Hip, hip, hurray" patriotism may be out because of the spiritual blight created by the not-forgotten depression of the 1930's, or the most literate people in the world were sombered into the truth that war means sacrifice and misery to millions of rut-loving John Smiths, Mrs. John Smiths, Joe Doaks, Mrs. Joe Doaks and their two and one-half children. Their mental fingers grasped new-found security. They remembered through thin shoe soles that the way of life and living standards that we seek to save had just gone

* that is among major nations.
through domestic crisis. Drowsily aware that 40 per cent of our own people are undernourished, they suspected the right about face that saw billions of dollars worth of material sent to what five months ago was a land of the damned. You could reason it all out, but the logic was hard to follow.

By March 1942, America's frustration at chin-sock after chin-sock needed an outlet. On the surface people were calm, but Tokio had not become a blazing mass of bamboo and paper. Hong Kong followed Pearl Harbor, then came Singapore, Rangoon and Java, while German submarines sank an American cargo ship a day. A people who boo referees when their teams lose were on the lookout for a scapegoat. Mr. Doaks and his neighbor were told to expect losses until snow started to float down in the fall of 1942, and they professed to talk and perhaps believe it. But before they lapsed into the nonchalance of expecting a fallen Corregidor and Mandalay, a cocky people who have never known defeat looked for a referee to boo, and boo good.

The CIO and AFL had waxed big and fat under the Roosevelt labor administration. In the industrial sections labor organizations and their men were supremely self-confident. Though exploited, the farmer has an independent way of life. In the eastern cities it was just yesterday that men were kicked around. When steel mills had 12 and 14 hour days, seven days a week. When the broken man from the mill was thrown onto his children or society for support - pencil sellers. Management felt little responsibility or had any conscience toward sweating men. Only exception was the paternal management (hence master-serf carry over).

Government in industrial areas was for the industrialist, not the industrial worker for all past generations. For ten years of Roosevelt the pendulum definitely swung to the left. Working conditions and wages became the province of the laboring man through his union. But the pendulum reached its
the referee to boo, for the American public is organized labor. A big scapegoat it is.

For the first time since it became legitimized, organized labor is faced by a united front. The issue that the war effort is bogged down because of organized labor's selfish interests. The 40-hour week, backbone of present labor legislation, almost yielded under attack. The people boo, the National Association of Manufacturers boo, and for the first time since Roosevelt entered office, labor is on the defensive. Labor pulls in its horns, voluntarily abandons double time for Sundays and holidays in an appeasement attempt.

Organized labor has never enjoyed any degree of favorable publicity. Its skirts were left smirched by such publicity unwise moves as the split between the AFL and CIO, the stand of John L. Lewis toward Roosevelt's re-election; Lewis' defying the president at the time of the 1941 coal strikes, and the other strikes, especially those of a jurisdictional nature, at the time America knew she was just short of open war. Organized labor had abused their new found and righteous privileges at the expense of the national welfare.

Only the Roosevelt administration retained the look ahead viewpoint, and urged that a free and responsible organized labor was necessary to our way of life. Big business' attitude in the matter was controlled by suspicion toward labor objectives, losing rule of the roost power and the denting of profits. At that taxes, perhaps even more than labor, have cost big business more.

And just as the people found their scapegoat and were bombarding congressmen with anti-40-hour week letters, William H. Nelson proposed joint labor-management committees in all war-producing factories. Nelson's plan was innocent of taking side in the 40-hour issue; it only proposed to provide a medium for reducing suspicions between management and labor for the one purpose of
increasing production.

Nelson's idea was to organize a committee in the factory with representatives from both management and labor. Functioning under these men would be subcommittees who would have charge of posters, slogans, safety, good housekeeping, fire prevention, transportation (save tires), with other similar groups working on the gaining of suggestions from employees on how to increase the yield of machines, etc.

Sharon Works immediately adopted Mr. Nelson's plan. The manager of manufacturing (No. 2 job in the plant) became chairman of the joint labor-management committee; labor representatives were the past president, immediate past president, vice president, and coordinator of the union, while other management members in addition to the chairman were the supervisor of time study, supervisor of industrial relations, and a shop division clerk.

In other centers, Mr. Nelson's plan tossed into suspicious laps, was viewed by big business as an attempt to give labor a control in operating the factories, and by labor as a milksop to their real idea of having joint control with management in all matters affecting the security of individual workers.

Yet Sharon Works' management and labor were intelligent. It took Mr. Nelson's plan for what it was, a means to attain good feeling between management and labor, and boost output. And Sharon Works management realized that it would be "holding the sack." On one hand it was urging increased output, and on the other it knew that the raw material situation was such that man could work themselves out of a job.

Following is Manager H. V. Putman's letter to Donald M. Nelson on March 28, 1942:
"Dear Sir:

A group representing management and labor attended the Cleveland War Production Board meeting on Monday, March 23, to obtain first-hand information relative to the plans of the War Production for the Productive Drive in industrial plants.

On Saturday, March 28, the following permanent committee was established to carry out the Production Drive program:

(names listed and their positions)

The personnel of this committee was selected in a joint meeting of management and labor personnel and has the approval of both groups.

A very complete Production Drive program developed at our Cleveland Works with the aid of Fuller, Smith and Rose, advertising firm of Cleveland, Ohio, will be used in a number of Westinghouse plants. A complete outline of this program will be available to us April 1, on which date the main committee will decide whether this program should be used at the Sharon Works, and will appoint sub-committees to carry out the plan if it appears to meet the needs of this plant.

Our most serious production problem at the moment is the securing of necessary raw materials. The plant priority pattern will give us materials for only 55 per cent of our current production. We have had our representatives in Washington at least once every ten days for the past six weeks trying to clear this situation with WPB, but without definite results to date. Unless this materials situation can be taken care of promptly, it is obvious that our Production Drive program cannot produce the desired results.

"Very truly yours,
H. V. Putman
Manager, Transformer, Division"

So Sharon Works labor-management committee started its activities. Six sub-committees were appointed covering publicity and posters; suggestions; health and sanitation; good housekeeping and safety; fire prevention; and transportation. April passed and May limped along, and to the ordinary workman in the shop there was little evidence that Mr. Nelson had ever proposed such a plan. Of course there were stories in the plant newspaper that the War Production drive front was getting active.

Finally on May 13, the committee and sub-committees were called into a special pep-arousing meeting in the auditorium. A big electric fan stirred a silk flag, too heavy to wave in the artificial breeze. Two super-salesmen from
the Pittsburgh office came up with a typical canned promotion program. "America" and the "Star Spangled Banner" were played over the loud speaker system via phonograph. A 12-minute film of Westinghouse's part in the war effort interspersed with the Arizona sinking and MacArthur pinning a medal was projected on the screen. Every minute or so, a "Let's Show Them" was flashed across the screen. Then "Anchors Aweigh" and "Field Artillery March" were played with Westinghouse pep-talk wording. The shop man's reaction was "who in the hell are they trying to convince. Some day those shiny pantees in the head office will get wise and stop treating us like dumb cattle. Crap, we can think for ourselves."

This is a topsy turvy time. Men are gaining new perspective on production, wages, labor conditions, the national debt, factory expansion.

With the government virtually confiscating all profits above six per cent, it has become expedient for industry to increase its costs. The more money you spend, the bigger the profits. For every dollar you spend, you make an additional 15 cents. Another way to figure it, for every dollar you spend, you spend actually only six cents. Buy 100 too many chairs for the auditorium, buy motion picture equipment, pay $1,000 for a photographic darkroom to develop two negatives a week; buy technical equipment that some day might be used, and anything for the shop that you can get; buy weekly banquets for the supervisors at the country club; never be stopped for want of money.

* In fairness to the plant war production committee, it should be added that on Thursday, June 18, 1942, the war production drive in the plant was formally opened. Though I was back in North Dakota at the time, it appeared upon my return that the opening program was definitely a success. I heard this: "if there had been a recruiting agent there, he could have signed up 150 men."

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Taxes for the Entire Westinghouse Company are as Follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Taxes for the Year</th>
<th>Per Share of Capital Stock</th>
<th>Per Employee (Average Number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1935</td>
<td>$4,937,193</td>
<td>$1.65</td>
<td>$136</td>
</tr>
<tr>
<td>1936</td>
<td>8,946,753</td>
<td>2.36</td>
<td>215</td>
</tr>
<tr>
<td>1937</td>
<td>14,046,475</td>
<td>5.26</td>
<td>269</td>
</tr>
<tr>
<td>1938</td>
<td>7,095,737</td>
<td>2.65</td>
<td>167</td>
</tr>
<tr>
<td>1939</td>
<td>10,390,874</td>
<td>3.89</td>
<td>238</td>
</tr>
<tr>
<td>1940</td>
<td>22,533,313</td>
<td>8.43</td>
<td>427</td>
</tr>
<tr>
<td>1941</td>
<td>61,537,295</td>
<td>19.19</td>
<td>866</td>
</tr>
</tbody>
</table>

Two million dollars worth of new buildings were needed at Sharon Works. Aisles were blocked and steel transformer tanks were rusting in the yard for want of room. No structural steel was available. Finally 25 per cent enough was wangled and reinforced concrete was used.

Sharon Works paid the highest wages in its history. Bolstered by six and a half days' pay for six days' work, Sharon Works men averaged $55 a week during the winter of 1941-42. Prices of transformers were essentially stabilized at five per cent below the December 1940 level. After Pearl Harbor the government and War Production Board took over control of your factory. They told you whose order to get out first, and they allowed you not one ounce of copper to maintain peacetime markets. They demanded and got a complete listing of all your business with the delivery dates.

Aggressive, your plant had the biggest increase in business of any transformer factory in the country. Now the government was slicing your backlog. They were encouraging the movement into large transformer buildings by the third-rate firms that had specialized in small units for toy trains. Before the war there had been only three firms in the big transformer field. After the victory, the new big plants would cut into the pie.

Priorities required one full-time specialist and a secretary in addition to the "best ideas" of a half dozen supervisors. Every order had to be listed, its value, its priority rating broken down to the eight types of business at Sharon Works. You listed your jobs, the material requirements and suggested priority numbers, and sent the data on to the War Production Board in Washington. They always changed it. Eighty per cent of the Transformer Division's business was in the A-1 group down to A-1-j, and 20 per cent in the A-2 group. Rated A-1-A was 34.5 per cent of all business. But even though favorable priority ratings came, prompt delivery was something else.

Westinghouse is a big company, and it has systemized its handling of priorities. True, there was no more aluminum for bushings, but all in all there had been no work stoppages and little delay in shipping because of material shortage - lucky. When there was no one-inch copper wire, they used two of half-inch stuff; it got by the test. But lack of one fitting could hold up shipment of a $100,000 unit for a week, and most of the jobs carried penalties.

Especially during the months before Pearl Harbor, some men got jittery. The rumor of material shortage threatened factory shutdown, they heard, and the CIO snapped up the issue for selfish interest, and men got more jittery.

After Pearl Harbor, no more copper or steel for non-war production. Distribution transformer output was slashed 60 per cent. Three hundred were out of work, and on the other side of the plant there was too much to do.

Management wanted a seven-day week on large transformers, all needed for the war. The backlog was nine months. The factory that could corner the biggest share of the transformer business during the war, would likely have the largest part after the fight was over. Then there was government pressure, pressure from utilities, pressure from steel mills that gave you steel, all wanted transformers.
But the shop man wanted double time for Sunday. He voted five to one for it even after the manager has personally presented the case. But double time costs money, with the price of the transformer stabilized, it would be too expensive.

There was green help. Two thousand men hired in 1941, and this wasn't a steel mill, but a factory where most men had to read blueprints. Mass hiring resulted in you couldn't tell what you brought into the plant, just so they were men. A foreman asked for 20 men, 30 men, 40 men. He wanted them in two days, and another foreman, and still another, wanted 20 men, 30 men, 40 men at the same time.

There was picture taking for identification, finger printing, plant detection, and parking lot overcrowding. And the draft. Three hundred men into the army by May 1, 1941. Many of them with just a year's service; just to the point where after intensive training and breaking in they could do a skilled job. There was plant protection again. But the men wanted overtime to take first aid courses. Only 13 turned out when they found it was on their own time.

Home life was near ruined for men. Working the first or second shifts, they had to sleep during the day. The kids made too damned much noise, no sleep, and everything went wrong that evening in the shop. Sunday work and you even had to give up taking the family out for a ride. You were 23, your pockets full of money and a new maroon Ford, but it was work from 3:30 to 11:30 p.m. six days a week, including Saturday - no dates. Sunday and church, but you opened one eye and went back to sleep, the only morning you could sleep.

There were delegations of negro ladies, dressed in Sunday negro finery, who wanted more colored people in the plant, both men and women. There were sons, daughters, nephews and friends of friends, all wanting jobs.
Sharon living costs were up nearly 30 per cent, but base wage rates only were up 11. Even though their wages topped the district, Sharon men wondered where the money went; their partners at home had housewife's anguish over the phone to one another talking about the cost of beef.

There were Red Cross, Community Fund, U.S.O. and now a hospital drive, all wanting a part of that same dollar. Defense bonds, 10 per cent of your income. And what an income tax.

Then there was plant morale. Navy censorship prohibited stories on products, new buildings or even number of employees. Yet the War Production Board said, pep your men up. Get them to know what part they play in the war effort.

Electrically-driven torpedoes will be made at Sharon Works. It is a secret says the navy. The enemy knows you only as a transformer factory. Mrs. Doaks' husband is working on torpedoes. Everybody in Sharon and Mercer county knows that Westinghouse is making torpedoes. But it's a secret, anyway.

Sharon transformers were put on the refitted destroyer, Kearney; Sharon transformers were shipped over the Burma road to Chungking. Shhhhh. Someone might put iron filings in one of them, and the damage wouldn't be discovered until the unit reached Chungking.

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5. Management Record, April 1942.
6. War plants are divided; Sharon Works is under the Navy Intelligence bureau.
Sharon Works has a well-rounded safety program.

Electric trucks in the plant weigh more than two ton.

Happy goggle wearer is John Wilson. His eye was saved when the safety goggles fended off a bit of steel.

It is not unusual for a section to have all its men wearing steel toe-capped safety shoes.

William Karol, an arc-welder, cleans his goggles at one of the new safety-first stations in the plant. Dirty goggles are an accident hazard.
Chapter 8
Efforts of the War Speedup on Health and Safety

Sharon Works did not need a Pearl Harbor to awaken it to the need for transformers. "Urgent" was the word used for every instrument, distribution and power unit that could be manufactured and carted out the yawning doors.

An aggressive management relatively unhampered by labor problems was able to get men working on the average of 48 hours a week while the rest of the electrical industry hovered around 40. Sharon Works lead the Westinghouse Company and all other major electrical producing factories in this respect.

The National Defense boom had already affected hirings by December 31, 1940 when there were 3,456 Sharon Works employees. A year later, the end of 1941, there were 5,544, a gain of 2,080. Total man-hours worked in 1941 at the plant were 11,496,210 as compared with 1940's figure of 6,729,725, an increase of 71 per cent.

Pressure for production and mass hirings of untrained men has resulted in an increased number of accidents. Lost time accidents doubled at Sharon Works in the one year. The war boom will leave its share of cripples and broken men and women because of the industrial speedup to get production out. Causes for increased accidents during the past year were studied out by A. E. Irons, Sharon Works safety director, as follows:

1. Failure to properly instruct, train and observe new employes, to make sure that they understand and practice the safe way of doing a job. In short, too few trained supervisors.

2. Overcrowding of both work and storage areas.

3. Shortages of proper tools and equipment.
4. Lowering of physical standards for new employees.
5. Substitutions of materials of unknown toxic properties.
6. Taking shortcuts to save time and to make more money on the incentive pay plan.
7. Failure to take time to get and use safe equipment because of increased pressure for production.
8. Drinking alcoholic beverages before going on the job.

Mr. Irons also lists five reasons for increased accidents that should be called "mental."
1. strain due to pressure for deliveries. 2. war hysteria.
3. home troubles and worries. 4. financial worries. 5. more working hours per day or week.

During the winter and spring months at Sharon Works there were at least six known cases of men having to quit their jobs because of mental strain or breakdown.

The rest of this chapter on Sharon Works safety is gathered from the General Safety committee reports, largely prepared by Mr. Irons.

During 1941 there were 39 lost-time accidents at Sharon Works as compared with 17 in 1940, an increase of 129 per cent. Number of employees was up 71 per cent. Four men were injured fatally during 1941, two by electric shock, one by a falling crane block, and one by falling crates. The outstanding disable injuries were as follows: four men each lost half a finger and one man half of two fingers; six men suffered fractured foot bones from falling material; seven had major eye injuries, one resulting partial loss of vision. Twenty-four of the 29 accidents resulted from handling, storing or transporting materials.

Days lost in 1941 due to accidental injury amounted to 25,884 as compared with 3,035 calendar days lost in 1940. Sharon Works was charged with
6,000 days lost for each fatal accident, which accounts for 24,000 days, leaving a balance of 1,884 days charged to non-fatal cases.

The number of employes on December 31, 1941 was 5,544 as compared with 3,926 on December 31, 1940. The average for each month for 1941 was 5,151 and for 1940 it was 3,456, an average increase of 49 per cent. 2,080 persons were hired in 1941. Total man hours in 1941 were 11,496, 210 and in 1940 the total was 6,729,725, an increase of 71 per cent. The total man-hours worked for each accident in 1941 was 294,776 as compared with 395,866 in 1940, a loss of 26 per cent. Minor eye cases requiring first aid attention but involving practically no lost time amounted to 1,775 in 1941 as compared with 725 cases in 1940, an increase of 145 per cent.

Sharon Works has enjoyed a fine safety record in the past years. The plant's 1941 severity rate for accidents for each mishap was 2.2 as compared to .45 in 1940. The 1941 frequency rate was 3.4 as compared to 2.5 in 1940.

State compensation expenditures in 1941 amounted to $19,399.36 and medical and surgical expense to $5,590.90, a total of $25,090.26, or a cost of $.0020 for each $1,000 paid for salary and wages. This is 43 per cent greater than in 1940.

In all 3,248 pairs of safety shoes were sold in 1941 as compared with 1,087 pairs in 1940, an increase of 200 per cent. Actual lost time foot accidents were reduced 100 per cent in one year because of an energetic safety shoe program with sections vying for plaques that designated honor sections with all its men wearing the safe shoes. This reduction of foot injuries through the wearing of safety shoes was also achieved through consistent publicity in the plant. In all 43 Sharon Works men escaped injury because they were wearing safety shoes when heavy materials (some as much as two ton) fell
on their feet. Based on National Safety Council statistics, safety shoes in 43 cases saved the Westinghouse Company $4,988 in compensation costs. Shoes are sold the employees at cost with the Company paying the expense of maintain-
ing the shoe store and salesman.

Even in time of Defense speedup, more employees had lost time accidents outside of the plant than in during the past year. In all 40 Sharon Works employees had lost time accidents after working hours. Eight occurred in the home, seven on the street, and 25 were injured while riding in automobiles. Two of these resulted in death. In addition there is the possibility of a few more non-working hours lost time accidents.

When Sharon Works was in its second year, a safety program was started, and this resulted in reducing the number of lost time accidents from 396 in 1926 to 40 in 1927. The following table tells the story:

<table>
<thead>
<tr>
<th>Average Number Employes</th>
<th>Lost Time Accidents</th>
<th>Number Man Hours Worked per Accident</th>
<th>Total Man Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,775</td>
<td>396</td>
<td>12,800</td>
<td>5,120,000</td>
</tr>
<tr>
<td>2,402</td>
<td>40</td>
<td>137,000</td>
<td>5,480,000</td>
</tr>
<tr>
<td>2,125</td>
<td>29</td>
<td>180,000</td>
<td>5,220,000</td>
</tr>
<tr>
<td>2,703</td>
<td>35</td>
<td>185,000</td>
<td>6,475,000</td>
</tr>
<tr>
<td>2,432</td>
<td>24</td>
<td>205,000</td>
<td>4,920,000</td>
</tr>
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<td>2,034</td>
<td>12</td>
<td>290,000</td>
<td>6,380,000</td>
</tr>
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<td>1,746</td>
<td>8</td>
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<td>2</td>
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<td>1,577</td>
<td>5</td>
<td>549,225</td>
<td>2,746,125</td>
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<tr>
<td>2,193</td>
<td>21</td>
<td>200,897</td>
<td>4,218,837</td>
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<tr>
<td>3,427</td>
<td>30</td>
<td>235,532</td>
<td>6,765,960</td>
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<tr>
<td>2,676</td>
<td>11</td>
<td>390,363</td>
<td>4,293,288</td>
</tr>
<tr>
<td>3,043</td>
<td>12</td>
<td>478,190</td>
<td>5,667,382</td>
</tr>
<tr>
<td>3,456</td>
<td>17</td>
<td>395,866</td>
<td>6,729,725</td>
</tr>
<tr>
<td>5,151</td>
<td>39</td>
<td>294,776</td>
<td>11,496,210</td>
</tr>
</tbody>
</table>

During the 16-year period between 1926 and 1941, 10 fatal accidents have occurred at Sharon Works. One in 1926, one in 1927, two in 1928, one in 1931, one in 1939 and four in 1941. Seven were caused by electric shock, one was due to an overhead crane, one to falling crates and one to a gasoline blow torch.
explosion. Two eyes were lost in 1937 and one in 1940. One hand was lost in 1939. One finger lost in 1936, one in 1937 and one in 1938.

Accident costs, compensation and medical, resulting from lost time accidents in 1939 amounted to $8,160., and in 1940 to $9,381. During 1941 these payments were $25,090.

Compensation payments are divided into monthly allotments of about $18. each for periods that vary from 10 weeks for the loss of a little finger to 175 weeks for loss of a hand, 125 weeks for loss of an eye and up to 500 weeks for a maximum of $7,500 for loss of a life.

Sharon Works has been among the outstanding Westinghouse divisions in low-accident frequency. The safety program is aggressive and continual. Such experiments as free vitamin pill dispensers are attempted, and the medical service provides for at least one registered nurse on duty in the plant hospital at all times. Doctors are on call, and spend at least four hours a day in the plant.
Chapter 9
Selective Service

Members of the four Mercer county draft boards held a dinner discussion meeting with representatives of industry at the Sharon Country club, March 19. Major Dodds, Pennsylvania's State Selective Service authority on industry, was the speaker.

Average age of the assembled was at least 50. Grey heads predominated. On one side the army needed men who necessarily must be able-bodied. On the other, war industries pressured by Washington and public opinion found that young men could fill the bill better in expanding factories. In the middle were the draft boards, men of influence in the cities and interested in disturbing society as little as possible. They realized the demands and felt the pressure for an expanding army. On the other side was local industry, lifeblood of their communities.

Major Dodds outlined the aim of the army to have eight million men under arms. By the end of 1943 to gather in three times as many selectees as heretofore. Yet he was aware that for every man in the fighting line, between 13 and 18 persons were needed on the home front. Since the army could only use the physically desirable, industry must of necessity use more women, older men and the physically unfit. Practically all able-bodied, young, single men would eventually be in the army, the Major said.

Jobs must be broken down, he declared, so that many of the duties could be assumed by women. Aim of the government was similar to Britain where one-fourth of industry was manned by women. Physical standards for admittance to industrial employment must be radically changed. The skill of technical men must be spread thinner. They must use their talent to direct the work of the relatively unskilled.
Major Dodds predicted that within the year there would be relatively few single, physically fit men of the desirable age group left in industry. Only exception would be men with technical educations.

Deferments should only be based on the matter of replacement. If a man could not be replaced without affecting war production, then a deferment should be granted. The law limits this to six months. Every effort must be made to replace this man, and at the end of six months proof of replacement attempt must be made.

The Major also said that an allotment act providing for the support of dependents was before Congress, and would probably provide $40 for a wife. This would mean that all select-aged men with a wife and no children would be called this summer, and before the year is over, men with one child would be called. Industry should feel safe only with men who have at least three children. Of course in the age group over 37, comparatively few men can meet army physical requirements.

In order to win, America must bend every resource and use every available person. To maintain an army of eight million, there cannot be an idle hand, or anyone engaged in production of luxuries. Drafting of skill is not far off. John Jones, the 50-year-old grocery salesman who has a lathe in the basement as a hobby, will find himself in a factory producing war materials.

Industries' faults in connection with the draft is their penchant for hiring young men, easily taught, but also desired in the army. The army must have first choice. But to meet the pressure for production, industry found it could more easily boost output by mass training of young men instead of their fathers. Because of such restrictions as the 44-hour week, no work after midnight, and general antipathy, women have not been used in most Defense industries, the Major stated. Nor by state law are women allowed to do certain
manufacturing jobs. This will have to be changed, and Major Dodds commented that Selective Service officials are taking the matter up with the state labor board. At this writing, May 14 - two months later - nothing has been announced.

The Major added that women were better than men for monotonous jobs such as punch press operators. A woman takes better to simple repetitive jobs. "Can you imagine men enjoying knitting."¹

The industrial representatives wagged their heads on all these points, but each kept in the back of his own mind. That talk was talk, and they were responsible for the labor supply in their respective factories, draft or no draft. The industrial men added in chorus, "What about the 40-hour week that hamstring our operations, makes us pay prohibitive overtime wages? That is the greatest enemy of war production."

The farm situation was touched briefly. Major Dodds said that industry had taken many more farm boys than had the draft. The general rule for farm deferments should be the same as for industrial deferments. "Can the man in question be replaced by hiring a person not fit for military service? That is if additional help was necessary to the farm." The question was asked what constitutes a farm necessary to the war effort. The Major could offer no definite answer. It was up to the individual boards, but it should be a farm that produces enough cash crop to make a living for the farmer.

All during the meeting it was evident that the draft board members sitting in between the army representative and the industrial plants, had in mind that they did not want to see families broken up. This was not a major concern for industry.

Draft board members brought out that they preferred industry to mention

¹. The former King Edward of England did.
in their claims whether the deferment request was one that would be renewed at the end of six months, or whether the time was needed to train a replacement. With six months more experience on the job, and the plant still expanding industry will ask for its skilled men just as long as it can get them.

Also mentioned was the many abuses of the regulation that deferment requests be submitted within 10 days after the questionnaire was mailed to the board. Firms have the legal right to reopen the case if 10 days have not elapsed after the man has been classified IA. In practice many plants wake up about the man being drafted after he has passed his second physical and is the property of Uncle Sam.

Every selective service board seems to have its quota of lawyer-members. It is expected that no draft board member will ever see this page, but on the whole there can be few more conscientious or capable men than has been our experience to find serving in the non-paying and apparently thankless job of sending sons off to fight.

The selective service boards of this district have not been dogmatic in any respect in their relationship with Sharon Works. Generally companies have been lax in their asking of deferments, often late, and most of them lack a system.

One of the members of Sharon board was head of the first tin plate mill in India for 18 years and is now retired. There have been a number of times that this board member has spotted steel mills asking deferments for lesser skilled men and apparently overlooking men who were absolutely irreplaceable. This demonstrates no procedure on the part of the respective mills. Industry in general appears to be guilty of treating deferments haphazardly.

Sharon Works along with the rest of American industry finds the man in
the early twenties the best to break in on the new jobs. The question asked one of our top supervisors this afternoon brought the reply, "it would take us 10 years to break in an older man as a layerout; a kid will learn it in six months." These are the same young men that for lack of dependents and physical disablement make the best soldiers.

Our experience with draft boards is that a man should never appear before a draft board if there is a deferred classification on occupational basis asked. The minute a man goes before the board when there is an occupational request filed, he is stamped as one seeking to keep out of the army. It is very difficult to gain deferments on single men whose cases have been before the board previously on claim of dependents and then turned down. The board is rightly suspicious. Though Sharon Works deferments are not influenced in the least by pressure of individual workmen, this appears not the case in some plants.

Boards formerly asked us if the men in question had exerted pressure in an attempt to gain a letter asking deferment. We have had pressure, but it is of no avail to the individual and usually comes from a man whose skill nowhere justifies any action. Again it is commonly understood by Sharon Works men just what jobs get deferred.

Young men appearing before draft boards to establish cause for deferred classification make numerous slips. Among the more laughable is the following: John Sasbo, 22, had a low-skilled Westinghouse job, hence was not eligible for a Company claim. He appeared before the board asking that he be deferred because he was the chief support of the family. His conversation ran, "my dad don't work steady, and he is an old man, too old to work." The grey-headed board members, including two near 65, were sympathetic, and asked, "and how old

**Class 1** - eligible for service; **Class 2** - occupational deferment;
**Class 3** - dependency deferment; **Class 4** - unfit for service.
is your father?" John replied, "48."

Neighbors are quick to notice deferments and mothers with sons drafted are the watchdogs of the boards. If a deferment is granted on a dependency basis and the factors are shallow the board immediately hears about it.

Occupational deferments are somewhat difficult to obtain for more than one son in a family. For the old rule that one son at least should go off to war holds even though both have needed industrial skill. Some boards have more paternalistic relationships with their people than others. The neighboring city of Farrell with its steel mills and large Slav and Italian populations has a wealth of young men of draft age in proportion to total population. It was not unusual before Pearl Harbor to have the Farrell board tell a young married man, "Now if your wife quits her job, we'll defer you." Often the troubled couple had deemed it best for the wife to continue working because sooner or later he'd be drafted anyway.

Farrell board definitely was against breaking up a home. Long before the national ruling, proof of pregnancy kept the expectant Farrell father home from the army.

Another example of the paternalistic attitude of this board is the typical discussion of a case: "This is a Polish boy who lives up on Idaho street, seven in the family. Father don't make much; mother is sick." The approach is definitely sympathetic. Serving on the Farrell board are two mayors and an attorney. When civic officials who are elected by the people serve on draft boards it can be expected that the boards will respond to public opinion much more readily than would prominent but non office holding citizens. Both types of boards seem to function efficiently.

All the boards in this area have gone through these past months with a minimum of criticism. The only major complaint that industrial plants have of
draft boards in general is that it is not unusual to find "crochety" draft board members, usually an older and hard-headed business man who just can't understand why such and such a job is deferable. He has some inkling of the job, hence considers himself an authority. My own experience has been to keep away from draft boards. At the two local boards the problem was not too apparent, but trips to Warren and Girard, Ohio, confirmed the feeling that industry should be represented at draft boards by grey-haired men, not eligible for army service.

Industrial plants prefer board members who say, "well you're in the business of manufacturing transformers and we'll take your word as to who is necessary. You realize our problems of course."

This placing of responsibility by the boards on the plant has reacted to mutual benefit. Sharon Works gives more consideration to cases that must go before boards that have this attitude than it does to a board with the would-be authorities. In fairness there is no taking advantage or passing the buck to a board that places partial responsibility for whom should be deferred. Were Sharon Works to abuse this privilege and ruin its good name terrific problems would arise.

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Sharon Works has more than 1,500 men between the ages of 21 and 37. During the period between January 1, 1941 and June 1, 1942, occupational deferment requests were filed on 500. Reserved officers in the plant totaled 14; of these two resigned, two more turned down on physicals, and the rest are on active duty.

The early days of 1941, saw Sharon Works management group, including the top supervisors, get together to determine who should be deferred on occupational basis. By this time, the attitudes and problems of the local boards were
fairly well known, and some idea had been gained of the number of men who could be deferred. Naturally the more deferments, the more men that would be left building transformers.

It was decided that all top six jobs on the skill scale of 11 that covered all jobs at Sharon Works should be considered eligible for deferment requests. Generally it required at least six months of intensive training on these better jobs to reach a deferable skill. All men with technical training would be considered eligible for deferment.

To meet Defense needs and take advantage of the booming market for transformers, Sharon Works hired more than 2,000 during 1941. Young men learned faster, and many of these were elite physical material for the army. To get transformers built as fast as possible, Sharon Works hired young men. Many of them acquired draft deferable skill.

When Sharon Works management set up its standards as to whom should be deferred it was based on skill almost entirely. This has been adhered to strictly, and is appreciated by the draft boards. A man is deferred only on his job, not on his length of service, nor his leadership ability, or any other reason. Skill is considered as irreplaceable.

Relationships with the four draft boards in Mercer county as well as the neighboring Ohio boards has been entirely frank and there has been mutual cooperation. Sharon Works with about 20 per cent of the 25,000 industrial war-producing employees in Mercer county, has considerably more than 50 per cent of the industrial deferments. However, one should take into consideration that a transformer factory has a high skill content as opposed to steel mills, and steel is the major industry of the county.

Two of the county boards have not refused a request for occupational deferment made by Sharon Works. The other two boards have never turned the
plant down on a clear cut case, only in a few instances when the skill involved and the case were definitely borderline.

Sharon Works enjoys a 98 per cent record in deferments. It is rarely turned down when requesting deferments and it is careful to maintain the good name and reputation of the Company.

Most of the success with deferments can be attributed to the splendid relationships built up with the boards, the having of set standards for whom deferments are asked, the reputation of the Westinghouse Company, and equally as important - J. T. Burke, Sharon Works industrial relations supervisor, enjoys the confidence of all local and neighboring boards. He is known either personally or by reputation to all the board members.

All men who receive questionnaires are urged to report to the industrial relations department where it is determined whether or not a deferment can be asked. Nothing is hidden from the individual. We have no secrets. All borderline cases are referred to the supervisors of the respective divisions. Generally the foremen, during this time of labor shortage, consider the man whom they are about to lose as a diamond in the rough, one of their best men.

The industrial relations department formulates no policy as to who goes to the army or not. This is a matter for the men who are responsible for production to decide. Top supervisors know the over-all problem. They know that the plant can overdo asking for deferments and kill the goose that lays the golden eggs. As contrasted to foremen, they back away to get better perspective. Though Sharon Works foremen have been no particular problem. The supervisors know that one-fourth or more of all Sharon men work in the local Westinghouse plant. Yet the draft board has to fill a monthly quota that is about the same for less highly industrialized areas.

Deferment requests are filed with the board on a man eligible, within
two weeks of his appearance in the industrial relations department with his questionnaire.

However, in a plant with more than 5,000 men there is a great difficulty of administration. The line must be ever preserved. Never do we contact a man without first working through the foreman. And on deferments, the men must first see their foremen before contacting industrial relations. As a result, additional problems occur. Men are slow in reporting receipt of questionnaires to their foremen, and then to industrial relations. This problem has been almost licked. Close to their men, foremen are inclined to judge deferments on personalities and not on skill. Though in fairness Sharon Works foremen have been excellent on this score.

Exception is the case of Harry Bundage, electric crane operator. Bundage had taken to drink and had used up all of his chances to reform. Finally divorce had marred his home life, and his increasing sprees resulted in his being absent from work days at a time. The man was classified as a skilled crane operator, definitely deferable on a skill basis; he was over 30 and had been employed by the Company for a number of years. His foreman asked that he not be deferred on the basis that he would be fired shortly. Our reply was that as long as he was working on a skilled job, was up for deferment and eligible, he should be deferred even though he'd be fired next week. Bundage was deferred one week, fired the next, and the draft board then informed.

Westinghouse's Sharon plant has adhered to the asking of occupational deferments on a skill basis with almost mathematical precision. As a result the deferment path has been smooth. There is no discontent over deferments in the shop. Any haphazard method of asking deferments on personalities instead of skill would create a serious labor-management problem.

When a man appears in the industrial relations department with his questionnaire he is interviewed and his employment folder brought out. If it
is a clear case for occupational deferment, routine data is gathered as to birth, job and previous experience, and the man is helped with his questionnaire and it is mailed. Within 10 days or two weeks, if the man is single, the draft board receives a request for deferment.

However, if it is a case where a deferment cannot be asked for lack of skill, much more time is spent with the individual. He is helped with his questionnaire; any other possible means of deferment is explored, and many times deferments were gained on this basis. The man was told the rules for a Westinghouse request, the reasons, and the cost to the Company when a man was drafted in terms of month's pay for all who entered the army after a year's service, and the expense of breaking in a new employee. No excuses, of course, will satisfy a man for in his own mind he considers himself almost, if not just as good, as the man who working right by him has a job with just enough skill to merit a deferment. But this taking of time and sincere interest in the fellow cases the situation in 90 per cent of the cases. This aspect of handling deferments involves nothing more than social work technique.

Another group of men with questionnaires are the borderline cases. Wherever you have rules you have borderlines. Perhaps the man has not been on the job long enough to cinch the skill content. So the industrial relations department never decides these borderline cases. They are immediately referred back to the supervisors and foremen. If the man has required skill and there appears difficulty of replacement, and the supervisor gives the go ahead sign, a deferment claim is filed. The top supervisors are extremely cautious in asking for borderline cases, though now with increased government pressure for production, they are letting up with the draft boards on the other hand getting a bit tougher.

Married men with families usually come into the department with their
questionnaires and they are helped. The questionnaire is often difficult for a man who has a shop job and depends on mechanical skill and aptitude for his living, as opposed to clerical. It is expected that Sharon Works will file deferment requested for all eligible men with families early in the fall of 1942.

Very few outright slackers are encountered, but even they are given courteous treatment.

Each of the 500 deferment cases have some difference. There were 500 individuals involved, 500 briefs prepared, and 500 interviews. In addition there were approximately 800 interviews with men not eligible for occupational deferments, many of them wanting a request to be filed. Generally Sharon Works has been asking for redeferments at the end of six months. No interview is had and the records are used to prepare the claim. The plant now has men on their third and possibly fourth deferment; it has not yet started to lose men who were deferred, though after July 1, there will be some losses.

The telephone is often used to gain that personal touch with a board. The clerk is usually the one who is on the other end of the line. A North Dakota board at Minnewaukan has even been called. This shows interest on the part of the Company in keeping the man. Personal appearances on the part of a Company representative are seldom, and no matter who represents the Company they seem to last too long. About one personal appearance in six months before a board which has a large number of Sharon Works cases is sufficient. This serves to clear up any misunderstanding and further impresses the boards that only the skill content of the job counts. This is excellent in the way of convincing them that Westinghouse is fair and has system in asking for deferments. Few industrial plants follow this plan. Naturally a grey-haired representative makes a better impression on a board than a young fellow, who
probably should be in the army.

A typical case is that of William Snell, medium skilled electric-arc-welder. Bill is 26 and this is the first year he has really been making a living. Formerly it would have taken him three or four years to reach the skill attainment in the job he has, but this is war and men are upgraded fast. Bill is going steady with a girl and plans to get married for now he can afford to, and he has been courting her for three years. Bill is patriotic; if he is not deferable, "sure I'll go in the army, have to sooner or later anyway, but I wouldn't mind having a deferment for a few months. This is the first time I've had a real steady job." Bill is deferred and was married this spring. No draft story closes. Bill may have to go eventually. There may be a youngster by that time. But the impression we have is that electric welders are among the most deferable.

Earl Shipton's dad works for Westinghouse and Earl, though only 22, has worked steady for four years. Earl has reached a deferable skill and he is married for over a year with the wife expecting a baby. Hence it is not deemed necessary to file an occupational deferment request at this time (it will be soon). Earl has bought his own home on the FHA plan, paid for his furniture, and has money in the bank. He is thrifty and settled. He does not want to leave his wife or the youngster (born March 27). Earl is not a slacker. He had reached the marriageable age, found the girl he wanted, and had a steady job. Hence Earl married. Now he has and feels family responsibilities. I've heard boards question these young men, "you knew what selective service was for? You had fair warning through the press and otherwise that marriages after October 16, 1940 would not give you deferment."

But a man's desire for wife, home and family is not going to be stopped by the passage of the selective service law of 1940. Especially if that man
has finally after these past years of depression acquired a steady job with financial security. This stimulant to marriage has certainly been lacking during the past decade.

As to the increase in births, there are apt to be just as many people keeping away from having children because of unsettled world conditions as there are men and women attempting to raise the number of dependents. Certainly this is an emotional time. Inception has its associations with emotion, and fertility with young marriages that characterize these war years. The nation's birth rate is up and it is definite that Sharon Works families are also having more babies.

John Joess did not have the skill for an occupational deferment. John was 22 and yes sir-ed one to back shivering. A flat no is never given to a man interested in deferment. The only no that John would have taken would have been something similar to a swift kick out the door. He pestered his foreman, supervisors and friends who in turn passed the buck to us. When John's case was up he ran down to the draft board (made up of smart men) and whiningly asked deferment on basis of job, dependency and wanting to get married. John finally got deferred after the local Catholic priest wrote the board that the boy had been engaged to the girl before passage of the draft law. The board was fed up with the case. This was before Pearl Harbor.

It is hard to tell whether John was a slacker or just love-sick. Now after six months of married life, he may be glad to go. Marriage may have lost some of the intriguing mystery for him. I wouldn't want him in my army.

Fred Higgins, a graduate machinist, was going steady with a girl, and making good money. Fred had a not-interested attitude toward our writing a deferment; one of the very few with this outlook. Within six weeks after the request was written Fred enlisted in the navy as a machinist. He had the "bug."
He has thought the matter over and we respected him for his decision, even though it requires three years to train a machinist, and costs the Company about $4,000.

Gerald Darr, was 24, and today must be a typical daring American pilot. Gerald, six feet tall and handsome in a heine haircut, had owned his own plane. He was employed as an electrical tester, a deferrable job. He preferred the army air force as a cadet and we knew Uncle Sam was getting good stuff for a pilot.

Vernon Schmidt, a 1941 engineering college graduate hailed from Wisconsin. Testing transformers is a monotonous job, yet voltages in excess of 300,000 are used—dangerous. Vernon represented a group of young testers that were stirred by the thought of deferments not holding up, the emotional excitement out in the world, the slowness of wage increases on the test floor, and the attractiveness of jobs with the government. Vernon took a job with the United States government, the army, as a civilian radioman, and he left for Texas. A week later we received a wire, "May I come back?" When he got to Texas, Vernon found that civilian though he was, he would probably be sent abroad. This was not the safe sinecure he had expected. To top it off, we now know that most draft boards, especially in this industrial area, do not consider a man just employed at a government ordnance plant as automatically deferable. Though in view of his education, still Vernon may have eventually been refused deferment on his government job. Boards are suspicious of men who transfer from job to job. A man holding a civilian job in the army or at an ordnance plant does not help fill a draft board's quota.

Patsy White's wife called up one noon with tears literally pouring over the phone. Patsy had been in the army, had been returned on basis of dependency through the Red Cross, and had gone back to work at the plant. Now with Pearl
Harbor, he had received papers to report. Patsy's attitude was that he had better get things in shape and go but six months' deferment would sure help him clean up debts since his folks somewhat depended on him. The army granted a deferment on dependent basis again, for up until recently these cases were not in the province of draft boards. He was not eligible for an occupational request.

In the more than 1,000 cases I have handled, I have found less than six men who did not want to be deferred on occupational basis. One can ponder over this "apparent lack of the good old American spirit." Conclusions might be these: First of all young men have been having a difficult and demoralizing time with nearly a decade of depression. This is "the break," good jobs and fast promotion. Both the plants and the nation have been selling "the man on the factory front is almost as important as the soldier on the battle line." Women do not like to have their men folks - husbands or sons - go to war. No woman wants to be the mother of a dead hero. Now this may all change with America in active battle; if it has, it has been gradual. This is typical, "I'll take this six month's deferment, the Company won't be able to get another, then I'll enlist." Young men view this as a long war. They want to enjoy the new found prosperity and they redeem themselves with a self-promise of enlisting when deferments are no more.

In these first days of April, there is a new problem. Boards are calling up men married after the first draft registration. Many of these men have infants at home or expectant wives. They frankly don't want to go into the army now. Undoubtedly their home life is depressed by tearful, inclined to be hysterical women in the last days of turgid pregnancy.

2. Approximate number who were single or just recently married. Had an additional 400 04 500 men with good dependency claims.
3. Late in April national ruling results in deferment of expectant fathers.
Johnny Finell got the Purple Heart in France. Of smallish size, Johnny is an energetic soul with some of that righter than thou complex. He is a group leader in the machine shop. He can not understand the Company asking deferment on medium skilled men. He has to be dealt with tactfully or he'd openly buck the Company's deferment system. Once in a while a young fool in the machine shop brags about being deferred and at first Johnny was all set to sick the American Legion on us. Almost the forgotten men, the American Legion before Pearl Harbor were at least thinking of becoming the watchdog of deferments. Somebody must have slapped their wrists for we have heard no more. It's the neighbor women, and not the Legion, that are the watchdogs of the community to see that the other woman's son goes too.

Unfortunate in some cases, Sharon Works deferments are asked on practically a mathematical basis involving skill only. Personality has no direct influence, nor does service. There is the case of Kenneth Fryts. Unskilled workmen have group leaders just as well as skilled, but they don't get deferred. Slow-spoken and balding Kenneth had been on the job for five years. He was the essence of the conscientious and loyal worker and had been serving as assistant group leader. He came up to the office with his questionnaire.

It's tough to tell a man who had just been given the foreman's tap of "you are a good man, and will represent the Company and be sort of an assistant foreman in this group of men." Kenneth was being made a group leader, the highest type of recognition and ego satisfier that a shop man gets. Yet we had to tell Kenneth that his job was not deferrable, and here he was just getting the "break" but instead into the army as a buck private.

This is an example of mathematical rules not taking into account the human variables. But in a large factory it is dangerous to decide major issues on individual basis. The best compromise seems to be exact rules, but be human in all relationships and contacts.
Kenneth was told the truth. Now there were already other Westinghouse group leaders serving in the army. That the fairest was was to defer on the basis of skill only and this was the draft board's preference. From the Company's standpoint his loss was great, much more than the month's extra pay he would get, for we were short of good men to supervise and help break in the green fellows.

Kenneth understood this but it is not human nature to be tapped on the head with a picked Company job and the next minute be not considered valuable enough for deferment. It don't make sense.

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The following data is from a survey made March 15 to determine the draft status of all Sharon Works men on the basis of age, marriage and dependency. Not much attention was paid to skill in this survey.4

Section H-20 (for the most part men with skill who build and assemble large power transformers).

Number of men surveyed 5 .......................... 80

1. Safe men (over 37, married (and or) children ........... 11
2. Safe men (over 37, single) .......................... 1
3. (Under 36, married before draft, and children) ........ 36
4. ( " " " " no children) ............................. 15
5. (Under 36, married after draft, and children) .......... 0
6. ( " " " " no children) ............................. 5
7. Under 36, married after Pearl Harbor ............... 0
8. Under 36 and single ................................ 12

Of the men in 7 and 8, all have deferrable or near deferrable skill; 5 are in Class 1 in the draft; 3 in Class 2; 2 in Class 3, and 4 are either too young or have just registered.

4. Survey by Roder.
5. Includes almost all men in section.
Section A-80; electrical testers (one of two groups - these are somewhat less highly educated than the other testing section)

Number of men in section ........................................ 93
1. Safe men (over 37, married (and or) children .......................... 12
2. Safe men ( " " single) ............................................. 2
3. (Under 36, married before draft law and children) .................... 26
4. (Under 36, " " " " no children) .................................... 11
5. (Under 36, married after draft law and children) ..................... 2
6. (...) " " " " no children) ......................................... 4
7. Under 36, married after Pearl Harbor .................................. 1
8. Under 36 and single .................................................. 35

Of the men just married or under 36 and single, 3 are in Class 1 in the draft; 7 in Class 2; 3 in Class 3; 1 in Class 4, and 14 have just registered or are too young. Eleven of these men in question have a job with skill content too low to justify deferment requests.

Section I-35 is the shop of the tool and die makers.

Number of men in the section ....................................... 117
1. Safe men (over 37, married (and or) children .......................... 48
2. Safe men ( " " single) ............................................. 4
3. (Under 36, married before draft law and children) .................... 18
4. (...) " " " " no children) ......................................... 8
5. (Under 36, married after draft and children) .......................... 0
6. (...) " " " " no children) ......................................... 7
7. Under 36, married after Pearl Harbor .................................. 0
8. Under 36, single .................................................. 32

Of the single men under 36, 5 are in Class 1 in the draft; 11 in Class 2; 3 in Class 3; and 3 in Class 4. Six have either just registered, or are too young. Seven of these single men do not have the skill to merit deferment; 11 have enough skill to merit deferment, even though the war situation becomes much more acute.
Section A-20; prepares insulation materials for small transformers. The skill element is rather meager in this department.

Number of men in section ........................................... 125

1. Safe men (over 37, married (and or) children .................. 23
2. Safe men (over 37, single) ...................................... 1
3. (Under 35, married before draft law, and children) ........... 32
4. ( " " " " " no children) ........................................... 4
5. (Under 35, married after draft law, children) ..................... 0
6. ( " " " " " no children) ........................................... 6
7. ( " " " " Pearl Harbor, no children) ............................ 2
8. Single and under 35 .............................................. 57

Of the 57 single men, 42 were too young to be registered before March 15, 1942; hence, 18, 19 and 20-year-olds; 10 were in Class 1 in the draft; 1 in Class 2; 5 in Class 3, and 1 in Class 4. Fifty-seven did not have the skill that justified occupational deferment.

Surveys like the above have been made of all Sharon Works sections, and the compilations will be completed early in June. The conclusions are already evident: the tool makers, a highly skilled group, are older men; the insulation makers, that require little training or skill, are young. Generally at Sharon Works a man doesn't attain a high degree of skill such as associated with tool and die making until he has been employed for a number of years. Average Westinghouse service for these men is in excess of 15 years. Many of them are graduates of the Westinghouse machinist apprentice courses at Sharon Works or East Pittsburgh.

The electrical testers are young; their skill is attributed to formal engineering college or technical school education. Many of them will later take jobs with public utility companies; others will enter Westinghouse engineering or sales staffs, and a few remain on the floor. There are a few testers that acquired their education through correspondence courses and burning
the midnight oil.

The welders and fitters have all ages, but the new men in the section are young. It requires less time to get a young man trained to where he produces that it does for an older man. The coil assemblers are in a similar situation. Since Pearl Harbor there are fewer young and more older men employed. But hiring of young men has definitely not ceased. There is too much pressure for production.

It is evident that most of the men married after the draft registration of October 16, 1940, are not fathers. There is a surprising large number of men married before the draft law that have no children.

Data on the five sections listed on these past pages is typical of Sharon Works shop.
Chapter 10

Education at Sharon Works

Practically all skill associated with shop jobs at Sharon Works is of custom and necessity developed within the plant by training courses and upgrading. The plant, partially because of the nature of its product, does not depend on the outside for skilled labor. With few exceptions the man is green when hired. His aptitudes in the line of mechanics and previous experience are considered. Since almost every job of even mediocre skill in the job requires blueprint reading, mechanical drawing is an important high school subject in this district, and is an additional factor toward hiring young men.

Welders are an exception. Usually young, they often have a smattering of the trade when hired. Many are graduates of the "90-day wonder trade schools." They start on simple welding jobs at Sharon Works, and with experience both their skill and jobs usually improve. Other welders come from neighboring factories, and some are former office boys and chippers in the shop who just picked it up.

During 1941, Sharon Works trained 1,100 men. It should be remembered that in addition almost every shop employee goes on instruction from two weeks to six months when he is hired. Instruction and training are confused. Almost everybody goes on instruction to learn the job. In addition he may be enrolled in a training course. On instruction you see how the job is done, and gradually start doing it yourself. There are shop instructors who stand by to give you the fundamentals and help you out, and group leaders also give a hand. Usually when placed on instruction you are teamed up with an experienced employee as his helper. You are paid about 80 per cent of the base rate, and do not participate in the incentive plan which brings the average shop man 127 per cent of his base rate, depending on the output of the group. When you
finally get so you can do the job, you are taken off instruction and put on as a regular man. Instruction periods are generally determined by precedent. A flow of too many green men off of instruction and into the group to participate in the group earnings, results in the incentive percentages going down. Hence the tendency is to lengthen the period of instruction to keep peace in the shop.

Men are picked for training (education) courses taught by the Company when recommended by foremen and supervisors. A class is started when there is the need for one. Mr. Laing, supervisor of assembly, wants more mounters for large transformers. A course is started for 20 men, some of them just hired and others who have been working a few weeks, possibly at menial jobs. They are picked upon recommendation of their foremen and after further culling by means of I. Q., arithmetic aptitude and Minnesota paper board tests.

All of these classes are taught by teachers who are members of the Industrial Relations department.

Choicest of all courses is the three-year machinist apprenticeship that leads to becoming a machinist and eventually a die maker. This course is considered to cost the Company $4,000 to train one man. More than 100 applicants last July took the examinations which lead to the picking of seven men to start as apprentices. They receive about $25 to $20 a week the first year, dependent on hours worked.

This apprenticeship consists of scheduled assignments on various machine tools such as drill presses, engine lathes, turret lathes, planers, milling machines and grinders, also assignments in tool and die making. In addition there is considerable classroom instruction in blueprint reading, shop mathematics, shop analysis, mechanical drawing, tool design, strength of materials, mechanics and industrial history.

There is one full-time classroom teacher for the machinist apprentices
and one and sometimes two for the various blueprint and shop technique courses. The various human relations and supervisor development classes have one teacher from Industrial Relations assisted usually by a foreman from the shop. The Company spends money to buy regularly prepared human relations, etc., course layouts.

Only large group in the shop that have more than a high school education are the 200 electrical testers. Many of them are electrical engineering college graduates; others have completed the one year at Bliss or six months at Coyne technical schools, and a few got where they are by the real hard way, correspondence courses. Though he starts at a lower rate, in general the breaking in of a trade school man is less difficult than a college engineering graduate. Education is only a tool; it's the man who counts.

There are no training courses for office men except for plant sponsorship of University of Pittsburgh and Pennsylvania State college courses. Penn State has extension teachers headquartering in this area, and they teach some of the classes in the plant. Many of the other courses are taught by Westinghouse Sharon Works engineers. There are many of the 300 plant engineers who have done graduate work.

The Westinghouse Company also sponsors hefty engineering college scholarships. Perhaps one Sharon Works son a year gains one of these.

Approximately 375 Westinghouse employees (May 1) are enrolled in the following National Defense courses: Applied Mechanics; Preformanship for Production Supervision; Corporation and Manufacturing Accounting; Die Design; Engineering Drafting; Electric Motor Control; Elements of Radio Communication; Foundation of Engineering; Physical Metallurgy; Process Metallurgy; Operations Inspection; Safety Engineering; Time and Motion Study; Metallurgy and Welding, and Transformer Principles and Practices.
Many of these are taught by Westinghouse men, and they are offered in the public schools as night classes through the Pennsylvania State College - U. S. Office of Education National Defense course setup.
### Summary of Educational Activities

**Sharon Works - Sept. 1941 to June 1942**

Training Programs Conducted on Company Time and Company Property

<table>
<thead>
<tr>
<th>Course:</th>
<th>Number Sessions 9/1/41 to 6/1/42</th>
<th>Hours Per Session</th>
<th>Approximate Number Enrolled</th>
<th>Approximate Average Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Relations</td>
<td>70</td>
<td>1</td>
<td>136</td>
<td>136</td>
</tr>
<tr>
<td>Supervisors Development</td>
<td>12</td>
<td>1½</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>Machine Operator</td>
<td>80</td>
<td>4</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Machinist Apprentice</td>
<td>78</td>
<td>2</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Brazing Course</td>
<td>11</td>
<td>1½</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Power Coil Assembly</td>
<td>48</td>
<td>1</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Mounting &amp; Fitting Distribution Transformers</td>
<td>16</td>
<td>2</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Mounting &amp; Fitting Power Transformers</td>
<td>48</td>
<td>2</td>
<td>(60) contemplated ²</td>
<td>90</td>
</tr>
<tr>
<td>Production Clerks</td>
<td>60</td>
<td>2</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Transformer Fitters</td>
<td>40</td>
<td>2</td>
<td>46</td>
<td>46</td>
</tr>
<tr>
<td>Layout &amp; Constructional</td>
<td></td>
<td></td>
<td>(80) contemplated</td>
<td></td>
</tr>
<tr>
<td>Blueprint Reading</td>
<td>20</td>
<td>2</td>
<td>(60) contemplated</td>
<td></td>
</tr>
</tbody>
</table>

1. These summaries prepared by W. R. Margeaux, Industrial Relations department instructor.
2. Courses contemplated will be started before June 1, 1942.
<table>
<thead>
<tr>
<th>Course:</th>
<th>Number Sessions 9/1/41 to 9/1/42</th>
<th>Hours Per Session</th>
<th>Approximate Number Enrolled</th>
<th>Approximate Average Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blueprint Reading</td>
<td>16</td>
<td>2</td>
<td>259</td>
<td>240</td>
</tr>
<tr>
<td>English for Technical Students (U. of Pittsburgh)</td>
<td>16</td>
<td>2</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Application of Transformer (U. of Pittsburgh)</td>
<td>32</td>
<td>2</td>
<td>38</td>
<td>30</td>
</tr>
<tr>
<td>Electricity and Magnetism (U. of Pittsburgh)</td>
<td>32</td>
<td>2</td>
<td>26</td>
<td>25</td>
</tr>
<tr>
<td>Advanced Calculus (U. of Pittsburgh)</td>
<td>32</td>
<td>2</td>
<td>21</td>
<td>20</td>
</tr>
<tr>
<td>Industrial Psychology (Penn State)</td>
<td>16</td>
<td>2</td>
<td>16</td>
<td>15</td>
</tr>
</tbody>
</table>

**Special Study Groups**

<table>
<thead>
<tr>
<th>Course:</th>
<th>Number Sessions</th>
<th>Hours Per Session</th>
<th>Approximate Number Enrolled</th>
<th>Approximate Average Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Speaking*</td>
<td>22</td>
<td>2</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>A.I.E.E.</td>
<td>9</td>
<td>2</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Education Movies (also entertainment)</td>
<td>every week</td>
<td>1</td>
<td>1,000</td>
<td></td>
</tr>
</tbody>
</table>

* Company pays public speaking critic.
Report of job training activities for Sharon Works during the year 1941 is as follows:

<table>
<thead>
<tr>
<th>Section</th>
<th>Operation</th>
<th>Number of Trainees</th>
</tr>
</thead>
<tbody>
<tr>
<td>P60, Y-61</td>
<td>Layout</td>
<td>35</td>
</tr>
<tr>
<td>B-30</td>
<td>Mounting, fitting distribution transformers</td>
<td>19</td>
</tr>
<tr>
<td>H-10</td>
<td>Coil assembly large power transformers</td>
<td>21</td>
</tr>
<tr>
<td>H-20</td>
<td>Mounting, power transformers</td>
<td>38</td>
</tr>
<tr>
<td>H-30</td>
<td>Fitting for test &amp; ship power transformers</td>
<td>44</td>
</tr>
<tr>
<td>E-10</td>
<td>Machine operators</td>
<td>75</td>
</tr>
<tr>
<td>For Canton Naval Ordnance</td>
<td>Machine operators</td>
<td>42</td>
</tr>
<tr>
<td>B-32</td>
<td>Mounting, fitting instrument transformers</td>
<td>7</td>
</tr>
<tr>
<td>A-40</td>
<td>Assembly of small parts</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Production clerks</td>
<td>14</td>
</tr>
<tr>
<td>B-10</td>
<td>Coil winding, distribution transformers; movies used</td>
<td>120</td>
</tr>
</tbody>
</table>

In addition, 141 men from the feeder sections and 145 men from the assembly sections voluntarily enrolled in blueprint reading courses.

All of the above figures include training programs that began in 1941, and some of them progressed into 1942.

250 Westinghouse employees completed Penn State Defense courses during the year. 300 were enrolled at the close of the year.

75 Westinghouse employees attended Pitt University graduate courses during the January to June semester, 1941. 79 were enrolled in the October to December semester, 1941.

* The above summary prepared by W. R. Margeaux, Industrial Relations department instructor, Sharon Works.
The Employees' Social Committee (day-off) family picnic has become an annual affair at Sharon Works. For 1942 it will be a basket lunch in the town park on a Sunday. Vital production in the plant will keep on.

Prize winners in the boys contests at the 1941 picnic.

Pie eaters' contest.

Girls who won prizes at the 1941 picnic.
Chapter II

Recreation at Sharon Works

Sharon Works was no leader in establishing a recreation and social program for its employees, though it was likely ahead of most Westinghouse plants. It was not until 1936, 12 years after the plant was located in Sharon that a definite social and recreation program emerged.

The year 1936 marked the 50th anniversary of the Westinghouse Company. M. M. Fawcett, division manager, expressed the desire for an employee celebration. An employees' committee of nine was organized and four dances were sponsored during the year. A total of $530 above expenses was gained and this money was immediately used to sponsor a basketball team, the President's Birthday ball, a minstrel show, and promote the first employees' picnic.

On March 1, 1937 the Golden Jubilee committee of nine that had sponsored the activities commemorating Westinghouse's 50th anniversary was reorganized into the Westinghouse Sharon Employees Social Committee of 12 members. There were no set rules; the objective was to assist all worthwhile social and athletic activities. Money was to be apportioned on the basis of the maximum number of employees benefitting from each dollar expended. Groups petitioned the Social Committee for assistance and sponsorship. A committee member was assigned to each activity.

The Social Committee receives its income from the installation of Coca Cola dispensing machines and candy bars, chewing gum and peanuts sold through canteen units. The Committee received 10 per cent of the gross sales, and in a little more than four years derived $10,170.49 from this source. During December 1941 the Factory Stores Company took over the operations of the Coca Cola and

1. From history of Social Committee prepared by A. E. Stevens, Secretary.
Canteen units, and also operated lunch wagons throughout the plant. They pay five per cent of their gross income to the Social Committee each month with a minimum guarantee of 12 cents an employe. Picnic raffles also provide considerable income. Management contributes the prizes for these raffles. The Social Committee had a cash balance of $7,297.14 on January 12, 1942.

The organisation spent $715.78 for baseball during 1941. It also sponsored inter-departmental and inter-works basketball. Bowling has become the great industrial workers' game. The Social Committee pays five cents to each employes league for each member. This money can be used for prizes or to defray cost of using the alleys. There are both men and women bowlers numbering about

During 1941, the Social Committee spent $1,469.87 for free dances. Usually two or three a year. Golf is also a popular sport, and in 1941-42 150 men played in the inter-departmental leagues. One hundred twenty-eight competed in the final tournament of the season.

Musical activities have been growing rapidly and now includes a 20-piece orchestra, a 60-member glee club and a Minstrel show. Outside directors are paid for assisting the orchestra and glee club. The free tickets given employees for themselves and families are at a premium. The Minstrel show this past April attracted 4,200 people on the three nights it was presented. The glee club and orchestra presented two concerts, May 10 and 11 with an audience of more than 2,000.

For softball during 1941, 180 jerseys and caps, bats, balls, mitts, masks and trousers for the all-star team were furnished in addition to prizes.

Best attended of all Social Committee activities is the annual picnic. The 1941 affair was attended by 15,000 employees and their families.

Social Committee sponsorship of an activity includes the buying of
sweaters, equipment, prizes and tournament expenses. It buys music for the
glee club and orchestra, pays the directors, the hall rent and the expense of
programs. Other sports include tennis.

Children of employees are guests each Christmas-time at a holiday party
complete with Santa Clause. Better than 1,000 youngsters turn out for this
affair with its free candy, entertainment and gifts.

The Social Committee also assumes charitable roles in the sponsorship
of the President's Birthday ball and the U.S.C. drive which netted $3,252.45
and was matched dollar for dollar by the Westinghouse Company; thus $6,454.90
was turned over. Most Social Committee functions are free, such as the dances,
and estimated turnouts at these affairs are in the neighborhood of 4,000.
With the 24-hour shift operations, dances are held the first night for day
and first shift employees, and on the second night, usually a holiday, for
second turn men. In all, 16 dances have been sponsored since 1937. The number
of employees when the organization started in 1936 was 1,780; in 1937 it was
3,120, and today in excess of 5,500.

The Committee has attempted sponsorship of a Great Lakes cruise and
other similar ventures. These have not been particularly successful. There
are now 19 men and one woman on the Committee. The plan is to some day have
a recreational building across the street from the factory. Management at
Sharon Works has been cooperative with the Social Committee and the result is
that the plant undoubtedly has a progressive after-hours recreational program.

Motion pictures are sponsored by the Industrial Relations department
each week in the Westinghouse auditorium in the plant. Shows are held each
Tuesday night and Wednesday noon giving all employees the opportunity to see
the picture. The Company has been lavish in equipping this air-conditioned,
modern auditorium that seats 500. The 16mm projection equipment is of regular theatre caliber.

On the average of 1,000 employees see the weekly movies which usually last one-half hour. Best pictures are obtained from large corporations. The Aluminum Corporation of America, for example, has an excellent film, "Unfinished Rainbows" in technicolor. Other sources are the film rental libraries which have travelogues, cartoons and various shorts. Films for a half hour's show can be obtained from a rental library for Tuesday night and Wednesday at a cost of $4.50 and express charges.

Employees prefer films that combine educational subjects with a plot. Popular are shows on diesel motor operation, the manufacture of glass, the railroad industry, an airplane factory, or making of artificial rubber. Cartoons are always well received.

Bulletin boards located near the time clocks have been the chief source of contacting Sharon Works employees through the medium of print. This is not satisfactory. On the bulletin boards are posted notices of general working schedules, coming recreational programs, safety notes and messages from the manager. Rather elaborate glass-enclosed boards were installed during February, 1943 to take the place of the old style boards.

The Westinghouse Company has a monthly magazine published in East Pittsburgh for all of the 24 divisions. Each plant is allowed space for a few paragraphs of personal items. However, the Company has more than 75,000 employees and the magazine can only serve as an inter-plant morale builder.

Pressed by the CIO and realizing the impotency of its present methods of contacting the 5,500 employees, Sharon Works top management decided to publish a newspaper. It was with some urging that management kept from using the paper for tossing back the bricks thrown by the CIO, who of course use all sorts of
printed material and could always go one better. The object of the entire Industrial Relations department was to have the paper build up good will and friendly spirit among employees. No other Westinghouse plant at that time had a local organ. One or two have since started. On October 3, 1941, the first issue of the Sharon Westinghouse News appeared. Total cost of publishing the four-page tabloid-size newsprint paper was $100 for 5,000 copies. There are 25 correspondents in various parts of the plant who submit personal items in the form of columns at the end of every third week. The material is only censored to the extent that people are not held up to ridicule. Stories, headlines, editorials, etc., are prepared in the Industrial Relations department.

The paper has proved to be a success. Plant newspapers in general are usually considered as the most prostituted form of American journalism. Eventually the Sharon paper will succumb to using front page articles and pictures of the $135,000 a year chairman of the board of directors. By that time its principle use will be to wrap the lunches of shopmen.

Top management (and at Sharon Works) believes in putting into the paper what the men should read instead of what they want. This paper's success has resulted in a lessening of management pressure for the time being. Most popular feature in the Sharon Westinghouse News are the "corny" columns that repeat month after month in the same monotonous wording that John Doe is the proud father of a seven-pound baby boy; Henry Smith has taken the fatal step, and our sincere sympathy to Frank Jones in the loss of his mother. In the May, 1942 issue, top management wanted to leave some of this out in order to devote a whole page to a hospital drive for which he was a prime mover. The shop anyway was definitely antagonistic to the hospital drive.

To us who are directly responsible for the paper, the objective is to make Sharon Works men and women conscious that they too are war workers. Perhaps the biggest morale problem in the plant is the situation that finds men
and women considering themselves as just factory workers when compared with the fellow who actually works on a bomber. Yet transformers are a first step to making the aluminum and magnesium necessary for the bombers. Hence the first Sharon Westinghouse News headline was "Transformers Vital to Aluminum."

This type of material can easily be overplayed, and now we give much more space to stories about employee activities such as the Minstrel show.

Most enthusiastic readers are the 300 former employees in the armed forces. To them the paper is almost like a letter from home and each month about 25 "dear editor" letters are received.

Criticism of the paper comes from the sales department where a group favors the use of smooth, book paper and many promotional stories on the excellence of the plant's products. On the whole, up to the present time, the paper has had exceedingly little criticism.

For a plant with 5,500 employees there should be a weekly newspaper and a man whose entire time is given to this purpose. As it is, the Sharon Westinghouse News is entirely an overworked hobby with the editor, and done for the most part during spare time. From the experience here there is ample testimony both written and verbal that a plant newspaper does much to make industrial workers more conscious of one another and prouder of the concern for which they work.

But the policy ingrained in management of giving the men what they should read, instead of what they want to read, will in time rule the Sharon Westinghouse News. No copies of the May issue were distributed to the girl coil winders! Mary Murphy, treasurer of the local CIO, was in the office. She asked for a paper and took a handful down to the girls in B-10. When the paper was started one of the ideas was to quiet the suspicions aroused by CIO leaflets. On the manager's desk is a letter from G. E. Pendray, assistant to the
president of the Company, that describes the plant paper in glowing terms. The manager's reaction was, "not very often that those fellows in the head office don't find at least something wrong with what we do. Got to keep this paper going."
Six Machinist Apprentices To Graduate

Six Sharon Works young men late in July will reach high rank in America's army of skill. To graduate at that time from the plant's three-year machinist apprentice course will be Earl Atkinson, Joseph Bruno, Joseph Weller, Jr., Harry Wilson, Andy Illollabaugh and Zygmunt Gursky. 

The 6,240 hours of apprenticeship requiring three years include such things as instruction on drill press, milling machines and grinders. In addition, there are assignments in tool and die making, and classroom work in blueprint reading, shop mathematics, mechanics and industrial history. The shortage of men with this type of training is nationwide.

The qualifications of machinist apprentices will start this coming April. Apprentices should be obtained from the Industrial Relations department or the trades union in the plants.

To the man or woman employed at Sharon Works who gives the best answer to the question: "What Freedom Means To Me," will go a $50 war bond. The second prize will be a $25 bond. Total amount of bonds needed will not only make this enterprise a success, but will reflect credit on all those connected with it and be an outstanding record of American industry.

War Drive Will Start With Special Program

Under consideration by Sharon Works Suggestion Committee is a plan to give special recognition to men who submit outstanding suggestions concerning conservation of war critical materials. This would be in addition to the cash awards.

Big bottleneck to increased production for the war is the shortage of such vital raw materials as copper and steel. The Committee feels that suggestions from Sharon employees that will conserve these materials are deserving of special recognition.

Magazine Sponsors Freedom Contest

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**Auds and Ends**

*By Ida Fritz*

With an unconditioned last flourish into the same light pail with which we Northerners are loved and loved and loved, Nora Knight developed a new rendition of the 'Singers on their Fingers' group. Her attention is current and things are going quite well—Nellie Miller (in one of her usual charming是一位) and Joan Clarck, who very shortly will be Mrs. Paul M. Miller. One thing to be said for the riding Weight, was a horse a race car?

Ed, I've got to stand up, but a horse a race car?

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**Slip Stickers Vacation**

*By Sally Davis, Harvard Hendrickson, Helen Massaron, Thomas Fittinga and The Special Services*

**Don't Blink**

By Betty Abernathy

“The Eyes Have It!”

If it’s a guide your looking for, I (newlyweds) recently at a party... at the “Big City” and is enjoying a get-acquainted dinner.

---

**By Betty McLean and Dick Beal**

Connor Stanish and John Cor. Conn. have had a busy week on the phone and type regardless of the confusion or noise in the office. Betty McLean and Dick Beal are busy with their small power dictaphones and the lake—Big Wood—after a warm-up session.

Harold Hague, newly returned from a week in Pittsburgh, course, will be looking John Cross down the face of a couple of months. John Cross is back with us after sev- eral weeks, and is enjoying the city and its newspaper.

Now that Mary Bright is in the service, we will see if she can watch the price on gasoline go down. Each department is busy with a gift from the group, be- cause... of Hayden Hughes were sorry to learn that Gus Schroeder did. Bob A. W. Thompson reports that... half a dozen times before deciding to do The Acorn club honored Gus... of the bowling league. Jim... went to the service.

---

**By John Wilenby**

Don Porterfield, third-year assistant, in charge of the A-Bldg. marching band. John Porterfield now is in school, and is responsible for the school spirit songs. He hopes that the training of the band will proceed at a rapid pace. Don Porterfield is a member of the band and is also a member of the股票.
Chapter 12

Conclusions: After the War - What?

During times of modern war a nation expands its productive capacity to the best of its ability. While able-bodied men leave machines the sides of the labor-supplying kettles are scraped to the last man and woman so that production can reach unheard of horizons with the cost in terms of money - no concern. Only the able-bodied, the cream of the physical crop, can wear the uniform.

Abruptly the war is over. There is no longer the demand for unheard of quantities of finished material. With the armistice, factories start their contraction; need for their products disappear over night. Men and women are laid off in droves and into this scene return millions of men in uniform. Men whose minds are obsessed with the idea of once again entering the civilian pattern of wives, families and jobs. But there are no jobs when they come back. People are being laid off. With no jobs there are fewer marriages and families for the single men, and only heartache for the men who return to young wives after marching off to avenge Pearl Harbor.

Sharon Works in line with the rest of the Westinghouse Company policy and the law of the land will rehire all men who enter the armed forces providing there is work to be done after the war is over. Seniority with Westinghouse accumulates while the men are in the service, and definitely many of the soldiers and sailors will get their Westinghouse jobs back. Certainly if seniority is still followed.

Charles Hochadel is one of a dozen $140 a month clerks who left Sharon Works for the air force. Now he gets $245 a month as a pilot, and has all the glory and prestige that comes to the elite of the fighting forces. Charles is now engaged to a girl. When the war is over Charles will return along with
many of his fellow pilots. He will have developed few additional capabilities for a civilian job, and the job will be a monotonous clerkship. There will be a terrific loss of job prestige, and the man who flew for MacArthur will not be of much worth to the manufacture of transformers.

Charles and his buddies will be fertile ground for political and economic malcontents, just as good ground as the men who return to find no jobs.

When America terminated her Civil War in 1865 there was a vast virgin and rich territory waiting for men. This was a most satisfactory solution for returning armies; the best solution that modern society has. In 1919 America, though settled from coast to coast, was able to absorb her returning armies. The war was short. New industries reached maturity (viz: automobiles). Yet World War pensions will drain the public purse for another 75 years. Bonuses are but a sop to malcontents. Will the airplane industry be able to create the same vast fields of employment as did the automobile industry after World War I?

When this long bloodier than World War I conflict is over, and the millions of soldiers return to a shrinking American industry, the country faces a problem as serious as the winning of the battle and the peace. Perhaps we shall have an American Adolph Hitler, ex-soldier surrounded by ex-soldiers Goering, Himmler and "Hangman" Heydrich.

Perhaps the opening of our last frontier land, Alaska, will absorb some men. Compulsory War Bond savings should provide the buying power for after the war and by that time the people will certainly be even more wanting of automobiles, refrigerators, radios, clothes and better housing.

---oo---

From the standpoint of transformers there is no doubt that this war boom is resulting in the construction of enough large units to care for the
country's needs for at least another ten years. Few at Sharon Works feel otherwise. On the other hand there are the small distribution transformers that go on poles in the alley near American homes. Production of these has been slashed down to less than 25 per cent of the 1940 average.

Part of the future of the electrical manufacturing industry is associated with bringing electric energy to the people who still use kerosene lamps. Most of these are in the low income group, and are not particularly good prospects for the purchase of electric refrigerators, washing machines, electric shavers, mangles, and automatic pumps.

Largest group of non-electricity users in the nation are the farmers. In 1923 less than three per cent of the farms had electricity. In 1935 the percentage of users had risen to 11, and today 35 per cent of America's farmers have electricity largely through the R.E.A. Between 1934 and 1941, 1,382,196 farm homes became electricity users. In Massachusetts, Rhode Island, Connecticut, New Jersey and California, five out of six farm homes have electricity. In Mississippi it is one out of ten. Percentage of electrified farms is lowest in the low-income areas.

Self-contained lighting units on farms totaled 179,067. Out of the 6,371,000 American farms, two million now have electricity.\footnote{1. U.S.D.A. Domestic Commerce, Nov. 20, 1941.}

Farms are America's largest field for electrification. Sharon Works must depend on them for a good part of its post-war market. Of course there will also be replacement of equipment that now must last for the duration. There is South America now contacted by Westinghouse International. Electric refrigerators when sold to our southern neighbors are often placed in the parlors. As to how our South American friends will be able to buy $150 electric refrigerators in quantities is a problem, considering their low incomes and
living standards. Before the war, about five per cent of Sharon Works' business was for foreign markets.

When the big depression started in 1929, Sharon Works did not immediately feel its effects. Management and most business felt that the depression would not last long. Many orders were not cancelled and men were kept on the job, with the idea that the economic "Herbert Hoover" corner would soon be reached. Sharon Works kept busy. The stock on hand of small transformers was increased. Finally by 1932 the bottom fell out, and during February 1933, the factory was operating at just under 10 per cent of capacity. With the present war boom it has reached 225 per cent. Business had misjudged the length and severity of the depression. Men with long service were working one and two days a week. Men with short service were on the W. P. A. Just as cotton was plowed under and pregnant sows destroyed, Westinghouse "chopped" up distribution transformers for scrap. Many of the units that the Company had "they thought with foresight" built in 1930 and 1931 were outdated with technological developments of 1934 and 1935. Customers of 1934, 1935 and 1936 had their choice. The transformers of 1934 and 1935 were superior to those built in 1931.

It is certain that when the next depression comes, Westinghouse will not repeat this "chopping" up of transformers. Men will be laid off at once, and management will not do much to cushion the layoff. This spring there was an article in Collier's magazine about the Westinghouse policy of laying aside money each month so that the Company would be ready for the next depression. However, with high taxes and operating costs, the Westinghouse Company is not apt to have a surplus that saw it weather the last depression. To survive the Company will immediately slash its payrolls unless the government steps in.

Of immediate concern is the probable slowdown in manufacture of large
transformers that will come soon after Jan. 1, 1943. America's electrical producing capacity is nearing the point where it can take care of the war effort. The output of large transformers is expected to start downhill by the first part of 1943. There will likely be some layoff at Sharon Works, but the government is not going to allow a large established factory to be idle at this time. Already booked is $11,000,000 worth of orders for electrically-driven torpedoes. This type of manufacture will be in full swing the end of the summer and should employ 500 men. On the day war is over, the manufacture of torpedoes will probably cease for all practical purposes.

Conclusions:

American big business is zealous in protecting its reputation of being efficient. Perhaps the biggest argument that capitalism uses is that big business is efficient as opposed to other forms of production.

I definitely believe that the Westinghouse Company is benevolent in its treatment of employees and is among the more progressive of the big corporations.

It is apparent that many of the bureaucratic curses of government are found in industry. Big business too has duplications and runs around in circles. A young man in industry soon senses that many top executives have lost their touch with the factory men whose hands build the product. Pressure is the secret of big business. It is passed from the very top down to the lowliest office worker.

In the present war production drive, management in general is displaying marked ignorance in its effort to spur the laboring man to increased output. Management persists in treating laboring men like cattle. Management basks in self-acquired glory that it knows what is best for the laborer. No matter
what the camouflage one senses that top management maintains a superior and definitely not democratic attitude toward the laboring mass. Analogies between this and fascism can be easily drawn.

The generation of men that has come of factory working age since 1932 has different attitudes from their fathers. To some extent the laboring man of this generation has lost the respectful "I am inferior to you" attitude toward management representatives. This is not a tangible point, but definitely there is more of a feeling of equality with management among younger factory workers. Causes are associated with the New Deal and the development of organized labor. Though democracy may be bettered by this trend, there are restless effects such as diminished job loyalty. On the other hand it is not expected that young men would have developed the extent of job loyalty as possessed by their elders.

All laboring men in industry have a very real ghost. It is fear of factory layoff or shutdown. Now men work six and seven days a week to produce needed transformers. Three years ago Sharon Works men were being laid off for lack of transformer orders. Three years from now the situation may repeat itself. Every young man, technically trained or otherwise, working for the Transformer Division can expect to be laid off or find himself at best working two or three days a week.

This uncertainty of the future has profound sociological effects. Now in times of easy money Sharon Works men bought new cars and clothes when they were available. Some of the more provident bought new homes; others remembered the men who lost recently-bought homes back in 1934. The insecurity of future income definitely unstabilizes the life of the factory worker and his family.

This insecurity is the working man's biggest problem. To escape it he affiliates with labor unions. Realizing that layoff is bound to come sooner
or later, he has additional reason for being suspicious of his employer. He is more radical in his political views for he knows that there is small chance of his ever becoming a member of society who is one of the "haves."

There was a time when man's needs could be satisfied within a 10-mile radius of his home. In simple society, the wind, sun and rain were the biggest problems.

Today in a complex society of mass production, the matter of distribution has become man's most serious problem. His factories roar full-force for two years and then struggle to exist for the next two. Yet the product continues to be needed but the market cannot or will not buy.

During 1934, 1935 and 1936 when Sharon Works was an operating shadow of its former self, the country was in need of transformers. There were and are millions of Americans without electricity, but the electrical equipment factories were idle. To win a war, America has methods of using electricity to obtain metal from sea water (magnesium). Millions of dollars' worth of transformers now go to these sea water factories. The process was known during 1934, 1935 and 1936 when Sharon Works was limping along. There is work and a living for all Americans, but we have not yet mastered the problem of keeping men working steadily so that they can live sane and average lives. We are worse than an overgrown boy who has difficulty in making his feet go where he wants them to.

So far capitalism has not been able to lick the situation of men too busy one year, and not working the next. There is no practical proof of other economic systems meeting this problem and still maintaining high living standards.

A labor union may give a man job stability, but labor unions are not apt to be very effective in preventing mass layoff or factory shutdown when
the next depression comes. Labor unions when the depression arrives may have the political strength to take over operations of the factory, but they will not solve the problem. The strike loses its effectiveness during times of economic lull, and the strike is organized labor's most effective club.

Sharon Works has no exclusive ills. What affects the electrical capital goods industry or for that matter all industry is felt by the Transformer Division.

The factory of the future is a plant where men will work 30 to 40 hours a week. There will be no such things as layoffs or reduced working weeks. "Living wages" will be paid, and the laboring man will have a steady income much as do civil service employees. Too high wages during booms and nothing at all in the depression will become history. All society is paying a huge price for this waste of manpower during depression and this paying of large "more than they are worth" wages during the boom.

Labor will not run the plant, but labor's interests in continued and increased production will be completely recognized. Undoubtedly the factory of the future will be government controlled, and so will the labor unions at least to the exclusion of racketeer leadership. Plants are now government controlled but for the purpose of maximum war conversion.

The profit system is not likely to disappear from the American scene. The average American, capitalist or working man, is too money and gambling conscious to desire this. We have a high degree of socialism already. The factory of the future will continue its developments in industrial relations and education, and will be social-work minded. Satisfied and happy employes are good employes. Men with complexes create problems.

To completely achieve the factory of the future with its steady employment and forward policies is about as distant - and is definitely associated wi - peace on earth. Hello the year 500,000 A.D.
Back to the factory of today. At this time we are in a transient period of great moment. With few exceptions, business enterprise has been holding the top berth in our society ever since the industrial revolution. With the development of mass production, the gap between labor and capital has widened until today few men are able to jump from labor's ranks to the forefront of capital. There was a time when a bright young laborer could expect to be a capitalist.

Organized and politically effective labor is new to the American picture. Practically every American presidential administration was pro-business. The Roosevelt administration is the first to be pro-labor.

In western Europe with its concentrated populations and lack of new frontiers, there was generally an earlier and more complete association with the industrial revolution. Europe, yesterday, was experiencing the battle between strong business interests and strong labor interests for control of the government. For who controlled the government, controlled the state. This sharp factionalism had much to do with the rise of Nazism, Fascism and the popular front governments.

In America, labor has just recently approached the point where it can challenge business for the dominating position next to the government. Someday this will all be thrashed out, and society as a whole will demand that both business and labor be government controlled, instead of controlling the government. Then each man, woman and child in the country will gain maximum benefits. But there is a rough road just ahead.

- the end -

*There are a number of ideas in this conclusion that had their seed in conversations with J.T. Burke and Dr. J.M. Gillette. If the development of the ideas is somewhat cockeyed, please attribute it to the mental immaturity of the writer.*