

UNITED STATES DEPARTMENT OF LABOR

FRANCES PERKINS, SECRETARY

WOMEN'S BUREAU

MARY ANDERSON, DIRECTOR

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Women Workers in Some  
Expanding Wartime Industries

New Jersey, 1942



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## LETTER OF TRANSMITTAL

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UNITED STATES DEPARTMENT OF LABOR,  
WOMEN'S BUREAU,  
*Washington, June 4, 1943.*

MADAM: I have the honor to transmit a report of the first survey of war's effect on women and women's employment in a cross section of war industries ranging from the manufacture of wool and clothing to the manufacture of explosives and technical instruments. While the survey covers industries in one State, it reflects the changes taking place throughout industry and the effect of good and poor conditions of employment and personnel policies on the morale of women war workers.

During the course of this survey employers were kept informed of conditions found and cooperation in securing corrections was excellent.

The field survey was under the direction of Caroline Manning and the report was written by Dorothy K. Newman and Miss Manning. Margaret Mettert prepared the summary of hazards.

Respectfully submitted.

MARY ANDERSON, *Director.*

HON. FRANCES PERKINS,  
*Secretary of Labor.*

## CONSTRUCTIVE IMPORTANCE OF THE SURVEY

The New Jersey survey here reported was made in the summer of 1942, when firms were experiencing the throes of tremendous expansion to meet the pressure for war production. At that time a few companies had not devoted much thought or effort to the plant conditions that contribute to human efficiency. Since then there has been great improvement in these matters, as evidenced by the following excerpts from letters of employers to the Women's Bureau.

These tell of new buildings occupied, of specific conditions remedied, and of a general understanding of the importance of human satisfactions in a successful prosecution of the war.

You may be interested to know that our new building is in partial operation and we expect to have it in full operation within the very near future.

I am glad to report that our new enlarged hospital-room facilities have been taken care of and have been in use for some time now. Other alterations and extensions under construction and revamping when you were here have also been completed.

A survey of our lunch-wagon service is being made, the results of which will be analyzed and corrective measures taken to insure improvement along these lines.

You may be assured that we are correcting the crowded toilet conditions as rapidly as possible.

The pressure of the war program prevents our complying with many excellent ideas as promptly as we would like, but I am sure you will be glad to know that we are carrying through with the matron suggestion beginning next week.

Most of the unsatisfactory conditions reported have already been corrected.

You will be interested to know that we are going to carry out the constructive suggestions to the best of our ability.

You gave us several very constructive suggestions and it has been a pleasure on our part to follow these instructions. On another visit you will find a marked improvement in the handling of the matters that were brought to our attention.

# WOMEN WORKERS IN SOME EXPANDING WARTIME INDUSTRIES—NEW JERSEY, 1942

## I. SCOPE AND CHARACTER OF THE SURVEY

Army uniforms, communication equipment, chemicals—in fact, myriads of manufactured products—go into battle just as do planes, guns, bombs, and tanks. Many other articles play an essential part behind the lines. Every branch of American industry is contributing directly or indirectly to the war effort either through the continued manufacture of all or part of its peacetime products or by conversion of plant to meet special war needs.

With this in mind the Women's Bureau in the summer of 1942 undertook a survey of women workers in a cross section of industries represented by 137 plants devoting 50 percent or more of their production to war-contract work. All are in New Jersey, and well over half are engaged in war work alone. One of the most highly industrialized and economically diversified States in the country, New Jersey holds fifth place in the employment of women in factories. Woman-employing industries that are especially important there, such as apparel manufacture and the production of electrical equipment and machinery, are now using women in increasing numbers, while industries ordinarily chiefly male-employing are taking women on in jobs they have never before filled. This is in response to the need for meeting war contracts that by June of 1942 amounted in New Jersey to well over four billion dollars, and meeting them in a labor market that is fast losing available male reserves. The New Jersey situation, besides being vital in itself, reflects the important changes that are occurring in industrial employment throughout the country.

The majority of the plants visited had reached volume production before Pearl Harbor and many were manufacturing war materials in considerable quantity even before the fall of 1940, a year after the war began in Europe. Four of the factories were built expressly for war work and in all but 21 of the rest major adjustments had been made in plant or machinery. Most adaptations of plant facilities consisted in the introduction of new machinery or equipment, the addition of a new building or buildings to existing structures, the accession of floor space or full utilization of heretofore idle floor space.

Physical conversions in plant were only occasionally the result of important changes in process requiring different machinery and extensive change-over in technique. Actually, only one in six of the firms visited, more than half of them in ordnance manufacture alone, are now producing materials substantially different from those made before the war.

The plants visited reported the employment in the summer of 1942 of 233,014 workers, 68,607 of them, or nearly 3 in 10, being women. They fall into 14 main industrial classes, as listed in table 1, ranging all the way from the usual civilian activities of textile and apparel manufacture to the production of ammunition, gun parts, and other ordnance accessories.

TABLE 1.—Number of plants visited, number of persons they employed, and number of home visits made by Women's Bureau agents, by industry

Industry	Plant survey				Home visits	
	Number of plants visited	Employees			Number of plants represented	Number of home visits
		Total number	Women Number	Per cent of total <sup>1</sup>		
All industries.....	137	233,014	68,607	29.4	138	696
Aircraft engines and propellers.....	3	37,086	3,314	8.9	2	10
Ammunition, gun parts, and other ordnance accessories.....	15	21,538	5,544	25.7	14	54
Apparel and other fabricated textile products.....	27	7,913	5,451	68.9	31	156
Chemicals and drugs.....	5	9,243	1,296	14.0	5	21
Electrical products.....	37	79,506	30,654	38.6	36	197
Communication equipment.....	18	56,232	26,034	46.3	18	121
Motors, generators, and other electrical products.....	10	10,768	3,217	29.9	10	46
Wire and cable.....	9	12,506	1,403	11.2	8	30
Instruments, professional, scientific, and other.....	9	22,196	7,483	33.7	9	36
Machines and machine tools.....	4	4,664	815	17.5	5	26
Metal parts, small.....	9	12,598	2,030	16.5	7	29
Plastic products.....	3	2,252	572	25.4	3	17
Rubber products.....	4	7,432	1,231	16.6	3	15
Textile-mill products.....	8	13,702	6,983	51.0	9	82
Miscellaneous.....	13	15,184	3,229	21.3	14	53

<sup>1</sup> Percent of women in these industries, especially aircraft engines and propellers, has increased materially between date of survey and that of publication.

The men in the surveyed firms were productive workers in somewhat larger proportions than the women, though even among the latter only 16 percent worked in the office as compared with 84 percent employed in the factory. In the separate industries the proportions in factory and office varied widely. For example, nearly a third of the women in chemicals and drugs, nearly two-fifths in machines and machine tools, and well over two-fifths in the aircraft engine and propeller firms surveyed were office force. On the other hand, almost all the women in clothing plants and textile mills were factory workers. In only four industries were over 10 percent of the men in the office; in the communication-equipment firms, more than 20 percent were office personnel, exceeding even the proportion of women in the office.

To supplement the industry investigation, 696 women workers in 138 factories (most of the plants identical with the 137 surveyed) were visited in their homes. Information was secured from these women concerning conditions outside the plant that influence their effectiveness as employees; for instance, the extent of their household duties and the way in which they provide for their children's care during working hours. Insight was secured also into their attitudes toward such job conditions as night work, overtime, rotation of shifts, the

TABLE 2.—Employment of women and of men in factory and office, by industry

Industry	Total number of plants	Total number of employees	Women				Men					
			Total number	In factory		In office		Total number	In factory		In office	
				Number	Percent	Number	Percent		Number	Percent	Number	Percent
All industries.....	137	233,014	68,607	57,717	84.1	10,890	15.9	164,407	143,769	87.4	20,638	12.6
Aircraft engines and propellers.....	3	37,086	3,314	1,812	54.7	1,502	45.3	33,772	28,043	83.0	5,729	17.0
Ammunition, gun parts, and other ordnance accessories.....	15	21,538	5,544	4,806	86.7	738	13.3	15,994	14,638	91.5	1,356	8.5
Apparel and other fabricated textile products.....	27	7,913	5,451	5,323	97.7	128	2.3	2,462	2,372	96.3	90	3.7
Chemicals and drugs.....	5	9,243	1,296	870	67.1	426	32.9	7,947	7,377	92.8	570	7.2
Electrical products.....	37	79,506	30,654	25,697	83.8	4,957	16.2	48,852	41,160	84.3	7,692	15.7
Communication equipment.....	18	56,232	26,034	21,931	84.2	4,103	15.8	30,198	23,585	78.1	6,613	21.9
Motors, generators, and other electrical products.....	10	10,768	3,217	2,799	87.0	418	13.0	7,551	7,068	93.6	483	6.4
Wire and cable.....	9	12,506	1,403	967	68.9	436	31.1	11,103	10,507	94.6	596	5.4
Instruments, professional, scientific, and other.....	9	22,196	7,483	6,545	87.5	938	12.5	14,713	13,366	90.8	1,347	9.2
Machines and machine tools.....	4	4,664	815	501	61.5	314	38.5	3,849	3,316	86.2	533	13.8
Metal parts, small.....	9	12,298	2,030	1,447	71.2	583	28.7	10,268	9,131	89.0	1,137	11.1
Plastic products.....	3	2,252	572	454	79.4	118	20.6	1,680	1,565	93.2	115	6.8
Rubber products.....	4	7,432	1,231	909	73.8	322	26.2	6,201	5,641	91.0	560	9.0
Textile-mill products.....	8	13,702	6,988	6,703	95.9	285	4.1	6,714	6,400	95.3	314	4.7
Miscellaneous.....	13	15,184	3,229	2,650	82.1	579	17.9	11,955	10,780	90.0	1,195	10.0

lunch period, and the like. The pre-war employment status of these women was obtained, that some light might be shed on the extent of in-migration among women and the source of the expanding woman war labor force in the area.

Employers, especially those hiring women for the first time, were eager for suggestions on specific situations in their own factories. Repeatedly during the plant visits the conversation turned to occupations suitable for women, not only those on which they were already employed or had replaced men, but occupations that offered possibilities of expanding the employment of women. In more than 50 plants jobs were indicated in which women had worked with success elsewhere and in which their employment had already passed the experimental stages.

The following is a summary of topics on which special recommendations with regard to conditions seemed called for and were made:

	<i>Number of plants</i>
Night work; rotation of shifts; hours in general.....	56
Lunch periods; rest periods.....	46
Aisles, stairs.....	19
Ventilation.....	11
Safety.....	20
Safety clothing.....	15
Seats.....	20
Job strains.....	19
Service facilities:	
Wash rooms.....	38
Lunch and food facilities.....	29
Rest rooms.....	27
Matrons.....	10
Drinking fountains.....	6

## II. EFFECT ON WOMEN'S EMPLOYMENT OF THE SHIFT FROM PEACETIME TO WARTIME PRODUCTION

### Changes in the number and proportion of women.

Industrial employment in New Jersey has increased by well over one-half (53 percent) since the beginning of 1940. Women account for an estimated two-fifths of the increase, with approximately 115,000 additional workers up to early in 1943. Some industries, such as automobile, apparel, and textile manufacture, lost personnel, while four industry groups—transportation other than automobile but including aircraft, electrical, machinery, and chemical—absorbed nearly nine-tenths of the new workers. All four of these groups are represented in the Women's Bureau sample.

Firms primarily engaged in war work, such as those covered in this survey, would be expected to show more than the average increase in employment. This is actually the case and to a marked degree. With the use of employment figures published in the Industrial Directory of New Jersey of 1940-41, it has been possible to estimate the proportion of increase in employment of women and of men between 1940 and the summer of 1942 in 128 identical plants. Total employment in these plants increased in this period by as much as 88 percent, women's employment alone by more than 100 percent. Most of the increase in women's numbers, as distinct from the percent of increase, occurred in communication equipment, instruments, ordnance, aircraft engines and propellers, and apparel, in that order. The rise in total women employed in the communication-equipment industry accounted for two-fifths of the entire increase of women in the sample. Though the numbers involved in chemicals and drugs and in the manufacture of small metal parts are not great, it is nevertheless significant that the percentage increases among the women employed there are exceeded only by that in aircraft engines and propellers. These are, all three, industries in which women have made amazing inroads since 1940. Women grinding- and milling-machine operators; store-room clerks; foreladies; and lathe, drill-press, and bench machine workers, show especially marked proportions of increase. Women assemblers, inspectors, and miscellaneous hand workers on process, however, have made the largest net gain in numbers.

Twenty-two of the 137 plants visited are employing women for the first time because of the war emergency. These 22 plants, representing fewer than a dozen industries, alone account for the recent employment of more than 6,000 women in New Jersey.

Though women are making great strides, men continue to predominate in numbers. For example, the men show a net gain in the sample plants more than twice that of women, though their proportion of increase is lower. In aircraft engines and propellers and com-

TABLE 3.—Percent of increase from 1940 to summer of 1942<sup>1</sup> in numbers employed by 128 identical plants holding war contracts, by industry

Industry	Number of plants	Percent of increase in numbers employed		
		Total	Women	Men
All industries.....	128	87.8	101.6	82.7
Aircraft engines and propellers.....	3	171.7	427.7	159.8
Ammunition, gun parts, and other ordnance accessories.....	15	98.6	146.3	86.1
Apparel and other fabricated textile products.....	22	77.9	103.1	40.9
Chemicals and drugs.....	5	85.1	195.9	74.4
Electrical products.....	37	86.8	111.2	74.2
Communication equipment.....	18	107.9	114.0	102.9
Motors, generators, and other electrical products.....	10	137.8	142.8	135.7
Wire and cable.....	9	13.9	36.5	11.6
Instruments, professional, scientific, and other.....	9	100.2	146.0	82.9
Machines and machine tools.....	3	61.8	55.9	62.9
Metal parts, small.....	6	105.0	166.1	96.8
Plastic products.....	3	7.9	38.2	.4
Rubber products.....	4	30.3	72.2	24.3
Textile-mill products.....	8	6.5	7.3	5.7
Miscellaneous.....	13	118.9	111.7	120.9

<sup>1</sup> Figures for 1940 are from the Industrial Directory of New Jersey, 1940-41, compiled by New Jersey Bureau of Statistics and Records, State Department of Labor, Trenton, N. J. Figures are for the average number of employees, adults and minors. For numbers in plants in summer of 1942 figures are those secured by Women's Bureau agents from plant officials.

munication equipment alone, the additional men employed since 1940 number more than the increase in all women together. The percent of gain among the men is greatest in aircraft engines and propellers and in the manufacture of motors, generators, and miscellaneous electrical products.

In spite of their expanding number, men's proportional importance in the firms visited has been declining; in fact, the ratio of women to

TABLE 4.—Proportion of women in 128 identical plants holding war contracts, 1940 and summer of 1942,<sup>1</sup> by industry

Industry	Number of plants	Percentage of women among total employees		
		In 1940	In summer of 1942	Increase (number of points)
All industries.....	128	27.3	29.3	2.0
Aircraft engines and propellers.....	3	4.6	8.9	4.3
Ammunition, gun parts, and other ordnance accessories.....	15	20.8	25.7	4.9
Apparel and other fabricated textile products.....	22	59.6	68.0	8.4
Chemicals and drugs.....	5	8.8	14.0	5.2
Electrical products.....	37	34.1	38.6	4.5
Communication equipment.....	18	45.0	46.3	1.3
Motors, generators, and other electrical products.....	10	29.3	29.9	.6
Wire and cable.....	9	9.4	11.2	1.8
Instruments, professional, scientific, and other.....	9	27.4	33.7	6.3
Machines and machine tools.....	3	15.6	15.0	-.6
Metal parts, small.....	6	11.8	15.4	3.6
Plastic products.....	3	19.8	25.4	5.6
Rubber products.....	4	12.5	16.6	4.1
Textile-mill products.....	8	50.6	51.0	.4
Miscellaneous.....	13	22.0	21.3	-.7

<sup>1</sup> Figures for 1940 are from Industrial Directory of New Jersey, 1940-41, compiled by New Jersey Bureau of Statistics and Records, State Department of Labor, Trenton. Figures are for the average number of employees, adults and minors. For numbers in plants in summer of 1942 figures are those secured by Women's Bureau agents from plant officials.

<sup>2</sup> In this case there was a decrease.

total personnel has increased within the last 2 years in almost every industry group represented. The ratio change has been especially marked in the apparel, instrument, plastic, and chemical firms visited. This trend shows direct and effective adjustment to a male labor shortage that is fast becoming acute.

### **Women as replacements for men.**

By June of 1942, the date of survey, more than 1 in every 9 of the factory women for whom data were available were holding jobs ordinarily filled by men. If the largely woman-employing textile and apparel industries are excluded, the ratio becomes approximately 1 in every 7. Almost half the women in men's occupations are in aircraft engine and propeller firms and electrical plants; yet these 2 industries are very different in the matter of women's employment. The electrical industry is long established and traditionally woman-employing. It is hiring even more women today and in addition is substituting women for men in many jobs. This is to be expected in an industry that is accustomed to women in productive work, unlike the manufacture of aircraft engines and propellers, a comparatively new venture and known previous to this war as an almost exclusively male-employing enterprise. All women working for the three important aircraft engine and propeller firms surveyed are replacing men. In contrast, only 7 in every 100 women in the electrical plants are substitutes; most of the others are in occupations that have always been women's.

Women are in men's jobs to the extent of well over two-fifths of their total in the chemical and drug plants visited, one-third in the machine and machine-tool factories, and considerably more than a fourth in those making small metal parts. The extensive conversion necessary to change over from civilian production affected considerably the occupational alinement in the ordnance plants surveyed, and in 1942 more than twice as many women were employed on jobs entirely new to the establishment as were on jobs formerly held by men. Industrial conversion accounted also for the fact that, except for aircraft engines and propellers, ordnance showed the smallest proportion of women of all the industries covered in jobs women held before the war.

Though the management may be unaccustomed to employing women, and in some cases may have resisted such action, it is interesting that women in the factories visited tended to comprise a substantial proportion of the personnel in productive occupations that ordinarily are men's domain. Except in airplane engine and propeller manufacture, where the ratio was only 1 woman to 10 men, the ratio was never so low as 2 to 10, and in rubber products reached well over 15 to 10. In machine and machine-tool production and in ordnance manufacture, women were half of the personnel in factory jobs where substitution had been made.

### **Women's occupational distribution.**

Almost no discernible change had occurred in the occupations of women in textile and apparel manufacture, in which women have for a long time played an important part. For this reason these industries are excluded from further occupational discussion and analysis.

TABLE 5.—Distribution of women productive workers according to occupational status, by industry

Industry	Total number of plants	Total number of women	Women's employment in—						
			Pre-war occupations		Occupations new to plant		Occupations formerly performed by men only, now performed by men and women		Percent women are of total employees in these occupations <sup>1</sup>
			Number of plants	Percent of women	Number of plants	Percent of women	Number of plants	Percent of women	
All industries <sup>2</sup> .....	93	35,187	75	79.3	26	5.4	67	15.3	17.5
Aircraft engines and propellers.....	3	1,450	—	—	—	—	3	100.0	9.1
Ammunition, gun parts, and other ordnance accessories.....	11	3,387	9	41.2	5	41.5	7	17.4	49.1
Chemicals and drugs.....	5	584	3	54.1	1	3.9	4	42.0	30.0
Electrical products.....	34	18,353	32	91.5	10	1.9	24	6.6	22.9
Instruments, professional, scientific, and other.....	9	6,003	9	88.7	1	.1	6	11.2	18.5
Machines and machine tools.....	4	510	2	52.4	2	14.5	3	33.1	49.7
Metal parts, small.....	9	1,569	6	71.5	1	.4	8	28.1	37.4
Plastic products.....	3	420	3	96.2	3	1.7	1	2.1	( <sup>3</sup> )
Rubber products.....	4	851	4	85.5	1	.1	3	14.3	63.5
Miscellaneous.....	11	2,060	7	75.6	2	1.3	8	23.1	72.9

<sup>1</sup> Based on reports from 51 of the 67 plants.<sup>2</sup> Apparel and textile-mill products excluded, as occupations not comparable with those in other selected industries.<sup>3</sup> Not computed; base too small.

TABLE 6.—Employment of women in their pre-war occupations, in occupations new to the plant, and in occupations previously performed only by men

Occupation	Total number of plants	Total number of women	Women's employment in—						
			Pre-war occupations		Occupations new to plant		Occupations formerly performed by men only, now performed by men and women		Percent women are of total employees in these occupations <sup>1</sup>
			Number of plants	Percent of women	Number of plants	Percent of women	Number of plants	Percent of women	
All occupations.....	398	31,145	75	77.8	26	5.4	67	16.8	17.8
Assembler.....	58	11,122	42	92.1	5	1.7	21	6.2	25.0
Bench worker, hand.....	26	552	17	54.8	4	13.0	11	32.2	32.6
Bench worker, machine.....	33	824	13	56.0	6	11.8	21	32.2	8.2
Draftsman and tracer.....	6	17	1	5.9	—	—	5	94.1	47.4
Drill-press operator.....	46	1,195	17	40.5	—	—	21	54.1	17.3
Forelady.....	7	72	5	51.4	5	5.4	2	48.6	77.8
Gear-cutting-machine operator.....	2	21	—	—	—	—	2	100.0	1.3
Grinding-and-polishing-machine operator, optical glass.....	2	49	—	—	—	—	2	100.0	31.2
Grinding-machine operator.....	15	389	3	8.7	—	—	12	91.3	9.0
Hand worker n. e. c.....	46	2,378	37	74.9	5	15.8	18	9.3	16.2
Inspector.....	66	5,176	48	74.0	9	11.2	24	14.8	25.6
Job setter.....	1	148	1	100.0	—	—	—	—	—
Lathe and screw-machine operator.....	21	428	3	25.2	2	4.9	16	69.9	11.0
Machine operator n. e. c., in electrical products.....	17	1,291	14	87.4	1	.2	8	12.4	27.3
Machine operator n. e. c.....	42	1,469	26	78.1	5	1.8	21	20.1	33.2
Milling-machine operator.....	13	210	3	6.7	1	1.0	9	92.3	11.0
Packer and wrapper.....	35	1,308	25	73.8	3	2.7	11	23.5	42.1
Painter.....	17	322	10	63.6	2	16.5	7	19.9	20.8
Punch- and forming-press operator.....	38	1,305	25	68.9	2	12.2	15	18.9	29.1
Service and maintenance worker.....	14	348	7	48.3	2	1.7	7	50.0	25.1
Solderer.....	14	853	12	96.2	1	.4	2	3.4	100.0
Storeroom clerk.....	9	71	2	4.2	—	—	7	95.8	30.5
Tool-crib attendant.....	7	58	—	—	—	—	7	100.0	20.5
Welder.....	8	89	7	97.8	—	—	1	2.2	33.3
Winder, coil and armature.....	17	1,450	17	93.6	2	.5	7	5.9	60.2

<sup>1</sup> Based on reports from 51 of the 67 plants.

<sup>2</sup> Details exceed totals, as plants report on more than one occupation. Apparel and textile-mill products excluded, as occupations not comparable with those in other selected industries.

When the specific occupations were examined in which women were being employed as replacements in the other industries, some very interesting facts were brought to light. It became evident, for example, that the new occupations for women varied from factory to factory. Actually there were few types of jobs in which women were being substituted for men in some plants that they were not regularly holding before the war in other plants. Only 4 in a group of about 25 factory occupations in which women were employed at time of survey were not represented among those that women held in one or more establishments before the war. And, likewise, except for the job setters in one large electrical firm, each and every one of the 25 jobs was named somewhere in the sample as one that women were filling for the first time in a specific plant. No women were employed before the war as gear shapers, hobbers, and cutters, optical-glass grinders, automatic-screw-machine operators, and tool-crib attendants in the New Jersey firms visited, and few as storeroom clerks and draftsmen or tracers. These more than any of the others seemed to be truly new jobs for women.

Women appeared to be replacing men more rapidly at machines than in any other type of work. Machine operators were less than a fourth of the women in pre-war jobs, but they were half of those who had recently been substituted for men. What is more, women appeared to be making substantial inroads into fields of machine operation different from those to which they had been accustomed. Whereas 3 in 5 of the women in pre-war machine jobs were coil winders or workers on other machines peculiar to the electrical industry, and punch or forming-machine operators, only 1 in 5 of the women substitutes were doing this work. Instead, they were operating drill presses, grinding and milling machines, various bench machines and lathes, in very substantial numbers. Factories making instruments and aircraft engines and propellers alone accounted for well over two-fifths of the women replacements on machines.

After the machine operators, the most important occupational groups from the standpoint of numbers of women in jobs formerly performed by men were assemblers and inspectors. The majority of the assemblers were in electrical firms and the factories making small metal parts. Two aircraft engine and propeller firms alone claimed more than half the substitute inspectors.

Women who were replacing men were still a relatively small proportion of the total workers employed on machines. This is not true, however, of any other occupational group. Women substitutes formed at least a fifth of all the workers in every other job where replacements had been made and in some they accounted for an even greater proportion. For example, they were a fourth of the assemblers, inspectors, and service or maintenance workers, about 3 in 10 of the storeroom clerks, well over two-fifths of the packers and wrappers, and all of the solderers where they had recently taken jobs previously held by men.

An important question arises when the replacing of men with women in factory jobs is discussed: Do the women actually perform the same work as the men before them or has it been necessary to adjust the job in some way? This question was asked of firm officials in the 67 plants surveyed in which women were employed as substitutes. Twenty-seven of the plants, or 2 in every 5, reported no adjustments of any

kind in any of the jobs in which women had been hired to replace men, but changes were made in 40 plants. Men were assigned in 18 of the 40 to set up and service the machines that women were taken on to operate. Men did the heavy lifting for the women on some jobs. In describing others, the management claimed in a few instances that women were given the easier, simpler, or lighter operations to perform. The jigs and dies were modified in one concern and in another a conveyor had been installed. A few firms reported that women did only one operation of a complex job, whereas men performed many.

Though women had been substituted for men on the drill press in 18 firms, in only 7 was it considered necessary to retain men to set up and service the women's machines. Likewise, in the case of lathes, the women performed their own set-up work in 8 of the 11 plants in which they were replacements for men. No adjustments in the job had been made for the newly employed women gear shapers and hobbers, optical-glass grinders, or automatic-screw-machine operators.

As their activities have changed or expanded, a number of firms have altered or added to the steps in their productive process, thereby developing in many cases an entirely new group of jobs. Nearly a fifth of the firms visited reported having hired women to fill such vacancies, well over half as inspectors, assemblers, or punch and forming-press operators, but many in other machine and hand operations. However, ordnance and electrical plants account for nearly all the openings for women in jobs that were new to the plant; these openings, furthermore, occupied but 5 percent of all the factory women employed.

### New sources of woman labor.

From what sources have the many women who have recently entered war industries in New Jersey been recruited? Whether women have been hired for the first time or as replacements and additions to an already existing female staff, they have been secured by the great majority of firms from local inexperienced reservoirs, some never before in the labor force. Of 416 factory women visited in New Jersey who had been with their company 2 years or less, fully half had had

TABLE 7.—*Pre-war employment status of 439 women war workers*

Pre-war employment status	Women with 2 years or less of service in present plant				
	Total		Productive		Clerical— number
	Number	Percent	Number	Percent	
All women.....	439	100.0	416	100.0	23
Manufacturing, productive worker.....	211	48.1	207	49.8	4
Other.....	228	51.9	209	50.2	19
Beautician.....	6	1.4	6	1.4	.....
Clerical worker.....	33	7.5	18	4.3	15
Domestic worker.....	33	7.5	33	7.9	.....
Hotel, laundry, and restaurant worker.....	14	3.2	14	3.4	.....
Housewife.....	87	19.8	87	20.9	.....
Salesperson.....	15	3.4	14	3.4	1
Student.....	11	2.5	8	1.9	3
Teacher.....	5	1.1	5	1.2	.....
Other.....	24	5.5	24	5.8	.....

no experience in industry before taking their wartime productive jobs. One in every five had been recruited from the ranks of the local housewives and almost one in four from such groups as domestic, clerical, sales and service workers, beauticians, teachers, and students.

Rehiring of former employees who had left or been laid off occurred in approximately one-fourth of the plants; one-third reported taking transfers from other local firms. Few establishments were hiring women who had recently migrated from other areas, and in almost every case the proportion of newcomers taken on was insignificant. So far as women were concerned, in fact, in-migration appeared to present no problem in the New Jersey defense area.

It cannot be said from the data that women were not readily available for war work in New Jersey. Almost 2 in every 3 women interviewed secured their jobs by personal application at the plant and most of the others were recommended by a relative or friend. Few answered advertisements or resorted to the use of a private employment agency. Only 60 of a total of 689 women reporting used the public employment service.

### **Requirements for the employment of women.**

The training required of women in the 137 plants surveyed was not then extensive. Well over three-fourths of the employers interviewed required no training of most of their women employees other than simple instruction on the job. In 8 cases, however, Vocational Education for National Defense courses were reported necessary. One ordnance plant required 6 weeks of outside training and in addition 2 weeks in the plant. A clothing factory was demanding 80 hours of outside schooling for machine operators and reported sending back for more instruction some who were inadequately trained in that time. Vocational training in soldering, testing, and assembling was required in one communication-equipment plant. Several firms wanted V. E. N. D. background for some jobs, but for others plant classes were held, or only instruction directly on the job was given.

In 14 factories surveyed, general classes or classes providing training for specific occupations were being held. For example, one plant reported special in-plant training on milling-machine and engine-lathe operation. An apparel plant was planning the training of 10 women as foreladies under the auspices of the "Training Within Industry" program sponsored by the War Production Board. Only two other firms reported training under this plan, and in both cases the emphasis also was on developing supervisory personnel. Vestibule schools were conducted in at least four places.

By the date of survey, however, only 6 women among 439 interviewed had received in-plant class training. A much larger number, comprising 1 in every 9 or 10 reporting, had been through an outside vocational school, but the great majority had had no special instruction except that ordinarily given directly on the job. Most of the women reported their training as having been adequate.

Educational requirements seldom enter the picture in hiring women for factory work, and few women were required to show experience of any kind to get a job in the New Jersey war plants surveyed. Only 19 plants of 132 reporting preferred experienced workers; 19 others

asked for experience in the case of specific jobs, but not generally. Actually, however, among 416 women interviewed and in factory work, at least half had industrial experience before taking their war jobs.

Besides training, experience, and education, requirements made of women war workers in New Jersey had to do for the most part with citizenship, age, race, and marital status. But only in the case of citizenship were definite and restrictive demands generally made. Almost all the employers interviewed except those in clothing manufacture demanded American citizenship or first papers. In most cases where aliens were employed, special investigation into their background, or special permission involving investigation by the War Department, was required.

There was almost no discrimination against married women working. Moreover, few employers set a maximum age beyond which women would not be employed. However, of 9 maximum-age limits reported, 4 were as low as 35; none were over 55. Most plants did not take women younger than 18. A physical examination was required by 24 of the companies surveyed.

It was the expressed policy in only a few firms not to employ Negro women on productive work. In most cases there were no such restrictions, though in a substantial proportion no Negro women actually were employed except in maintenance or service capacities, and the data in general show that Negro women were not doing factory work in significant numbers except in rare instances. Such cases include a large electrical firm in which Negro women were working not only in the factory but in the office. Also 3 clothing plants employed Negroes to the extent of at least 10 percent of the total productive labor force at the time of visit. Excuses offered by plant executives were that trained Negroes were not available or that Negroes were unable to meet health or other work standards; many reported that Negroes did not apply and some feared the result of Negroes working side by side with whites in the factory. In a few cases, companies that were not employing Negro women reported that they were considering taking some on in the future.

### III. CONDITIONS OF WORK

Working conditions were inspected and discussed in all plants visited. In connection with the suggestions made for improvements, bulletins of the Women's Bureau setting forth standards in sanitation and safety were distributed. These standards are based on the proved experience of many plants with women in their employ over a long period of years and represent conditions favorable to maximum output.

The suggestions made on hours of work were in agreement with the standards approved by the War Department, Navy Department, Maritime Commission, Public Health Service, War Manpower Commission, War Production Board, Commerce Department, and Labor Department in the summer of 1942. These standards, based on the results of scientific investigations made both in the United States and in Europe, recommended (1) a weekly day of rest, (2) a 30-minute meal period, (3) an 8-hour day and a 48-hour week, with overtime limited to extreme emergencies, (4) vacations.

Also very opportune was the publication in June 1942 of a report, "Optimum Hours of Work in War Production," by J. Douglas Brown and Helen Baker of the Industrial Relations Section of Princeton University. This too emphasizes the efficiency gained through lunch and rest periods and moderate hours of work.

All told, suggestions for the betterment of sanitary and safety conditions, hours, and industrial relations were made to as many as 136 firms. Usually, even when the general level of conditions was high there were isolated spots that needed attention; especially in large organizations, conditions varied from department to department. Occasionally as many as 8 or 10 suggestions covering specific points in almost the entire range of topics were made in an individual plant.<sup>1</sup>

The sudden demands made upon industry by the expanding war program were great. For example, one firm that had done largely experimental and custom work previous to Pearl Harbor had experienced almost a 100-percent plant expansion and had about 4 times as many employees as before; within a few months they probably would have 6 times the original number. At time of writing the employment is well over one thousand.

Obviously, service facilities were wholly inadequate for the enlarged work force, especially at hours of changing shifts or of rest periods, and a need developed for even an increased janitor force. For those occupying rented quarters these problems sometimes were doubled.

Furthermore, ingenuity was taxed by the increasing difficulty in obtaining material and equipment for service facilities. Much thought was expended in improvising lockers, shifting from metal to wooden seats, buying second-hand lunch-room equipment. Uncertainty as to the continuation of war contracts, as well as material

<sup>1</sup> See Women's Bureau Special Bul. No. 1. Effective Industrial Use of Women in the Defense Program. 1940. 22 pp.

shortages, was responsible in some cases for the delay in furnishing facilities adequate for the increasing number of employees.

Several firms were occupying new modern buildings or expecting to occupy them in the near future, and in such quarters housekeeping worries were at a minimum. But it was not always the new modern buildings where conditions were best; the old ones sometimes surpassed the new ones in housekeeping and comfort details. For instance, in the old building of one firm ventilation was described as "excellent, many fans, and heat not noticeable," but in the firm's new building, which was supposedly the last word, expansion had been so much greater than anticipated that workers were already crowded into dark, close corners originally intended for storage space and the firm was planning improvements in the new structure.

Some firms had been obliged to spread production into four or five scattered buildings and had taken over old manufacturing plants that had long stood vacant. In remodeling what was available they had more often than not done a good job, but they were expending additional effort to maintain uniformly good standards in a group of scattered buildings. Even when so pressed for production space they made room for the installation of service facilities, thereby decreasing congestion and time lost from work.

Of many plants, reports of the Women's Bureau agents contain some or all of the following: Facilities adequate in number, convenient and clean. Hot water, soap, and towels supplied. Comfortable chairs in rest rooms. Cafeteria patronized by production workers on all shifts. Full-time doctor and nurses. High stools for machine operators. Girls rotate on jobs to get change of position and break monotony. And so forth. Or in some cases: Efforts to increase rest-room, lunch, and first-aid facilities have been successful notwithstanding the difficulties involved. New building is fireproof; workroom airy, clean, fluorescent lighting; excellent ventilation. Old building very well kept up. Hot food service all shifts; good washing facilities; electrically cooled drinking fountain.

Much could be written about the model dressing and wash rooms, rest rooms and lunchrooms, or the prevalence of good-posture seats, of the last word in ventilating systems, and of the artificial lighting that was outstandingly good in the vast majority of plants, but the emphasis in this report has been placed rather on the shortcomings disclosed by the plant inspection so that the corrective measures indicated might be given attention as soon as this was possible.

The following discussion of the working conditions that called most loudly for correction is illustrated by extracts from reports of Women's Bureau agents who visited the plants and from the many revealing comments made by employees. In general, names and addresses of employees were furnished by management; trade unions and other public and private organizations contributed a number. In age the employees interviewed covered a wide range, from young girls to old women. About three-fifths were over 25 years of age, and more than half were married or widowed. Of this married and widowed group almost three-fifths had young children.

Frequently almost identical comments were made by several persons, but there has been no attempt to show the extent of such repetition; the quotations are merely samples.

## HOURS AND SHIFT SYSTEMS

Acting on the first impulse to push up production by lengthening the workday, many firms had resorted to the policy of increasing the normal hours of women employees from 40 to 48, to 54, and sometimes to 56 and 60 hours a week, and from 5 to 6, sometimes to 7, days a week.

The New Jersey State hour law limits the employment of women to 10 hours a day and 54 hours a week. In no case did a firm report that the usual work schedule exceeded these limits, but there were individual exceptions where it did so in actual practice. For example, the firm's standard schedule beginning at 8 and ending at 5 had been stretched to begin at 7 and end at 6, making a week of 60 hours; and in some departments this work schedule was followed for all 7 days of the week.

In summary of the hour schedules reported by the firms: Most of the women in the New Jersey war factories surveyed were working more than 40 hours a week, except where clothing and other fabricated textile products and chemicals and drugs were being made. About one-third of the 137 firms visited reported a workweek of 48 hours for factory women; almost one-fourth showed a longer schedule. Twenty-two plants were employing women 54 hours, the full maximum allowed by State law. The longer hours were especially prevalent in ordnance, aircraft engines and propellers, instruments, and small metal parts, industries particularly vital in the war effort. Men's regularly scheduled hours were in many instances longer than women's, and, according to report, men more often than women were called on to work overtime.

An 8-hour day and a 6-day week was the most common schedule for women factory workers in the plants visited. Usually the office was on a different schedule from the factory, the women office workers being employed generally 8 hours or less daily, 5 or 5½ days, and 40 hours or less a week. A 9-to-10-hour day for factory workers was reported in 29 plants, 12 of these in ordnance or instrument manufacture alone. Few firms ran their factory shifts less than 8 hours, and few, other than apparel plants, were on the 5-day week. By and large the apparel factories visited were still operating on a routine of one shift of 8 hours daily and a 5-day week of 40 hours.

In order to legalize the employment of women after midnight, in December 1941 the New Jersey State legislature amended the statute which prohibits the employment of women after 12 midnight and before 7 in the morning. This amendment conferred on the Governor the power to suspend this restriction in time of war. Acting on this provision, numerous firms had applied for this privilege and in due time, after investigation, many had received permits to employ women on their third shifts. When the firms were visited in this survey, 5 of them were employing women after midnight without the permits as provided for in the amended law.

Though New Jersey law also limits employment to 6 days a week, there were occasional instances in which this provision as well was not being observed.

Calling attention to the relation of good hour standards to sustained maximum output, general recommendations were made in many of the plants on the length of the workday and the workweek. Also suggestions embodying standards for employment on night shifts

and rotation of workers from one shift to another were given to several firms.

TABLE 8.—Usual weekly hours of women factory workers, by industry

Industry	Total number of plants	Number of plants reporting weekly hours of—									
		Under 40	40	44	Over 44, under 48	48	Over 48, under 50	50	Over 50, under 54	54	Irregular or not reported
All industries.....	137	2	43	4	9	44	1	3	6	22	8
Aircraft engines and propellers.....	3					2				1	
Ammunition, gun parts, and other ordnance accessories.....	15					5		2	2	6	
Apparel and other fabricated textile products.....	27		22		1	2			2		
Chemicals and drugs.....	5		3		1	1					
Electrical products:											
Communication equipment.....	18		2	1	4	6			1	2	2
Motors, generators, and other electrical products.....	10		3			3	1			3	
Wire and cable.....	9		2		1	6					
Instruments, professional, scientific, and other.....	9		1			4				4	
Machines and machine tools.....	4				1	3					
Metal parts, small.....	9		1			4				3	1
Plastic products.....	3	1		2							
Rubber products.....	4		2			2					
Textile-mill products.....	8		3	1	1	2				1	
Miscellaneous.....	13	1	4			4		1	1	2	

There was no doubt about the attitude of employees as to the lengthened hours. They were most appreciative of the extra overtime pay, but comments, especially of those not new to industry, indicated a growing sense of fatigue, though coupled in many cases with an expression of willingness to try to keep up the pace for the duration. About the 7-day week especially they reported that the pace was exhausting and emphasized the need of recreation and time for their family and household duties. Some said very definitely that their production suffered. Typical statements made include the following:

- No time to do housework, no time to be with family. It is too much.
- Would prefer to work longer than 8 hours other days and have Sunday free. (Wage rate \$22 for a 40-hour week.)
- I take Sunday off occasionally to rest. Have lost weight since working 7 days. Am very tired.
- I could not stand it any longer. (Had worked 10 hours a day, 7 days a week, for a few months.)

Other comments on long hours:

*Working 6 days*

- It is the sixth day that fags me.
- Five days would be better, but you'd not get the extra money.
- It gives you extra money and that is handy, so I don't mind, but I am more tired. The day goes slower.

*Working 9- and 10-hour days*

- You don't want overtime. Eight hours of that is enough.
- Personally I'd prefer shorter hours; 54 hours are too many. You have no time for yourself. I can use the extra money, but it's what it takes out of you.
- I'd like shorter hours, but I couldn't possibly get the work they give me done in 8 hours. I need 10 hours for that.

Only 2,201 women were reported on a night-to-morning shift, practically 4 in every 100 of those in factory jobs. In contrast, nearly 11,000 women were employed on the second or evening shift, and 44,600, or well over three-fourths of the women on production in all 137 plants, were working during the day. This is true in spite of the fact that twice as many factories were visited that operated three shifts as that operated two or only one. Approximately 1 in every 9 workers on the third shift, and 2 in every 10 on the second, were women. There were nearly 3 women in every 10 workers on the day shift. Twice as large a proportion of men as of women were employed on the "graveyard" shift.

TABLE 9.—*Employment of women on the various shifts, by industry*

Industry	Total number of plants	Number of plants employing women on—			Number of plants operating—		
		1 shift only	2 shifts	3 shifts	1 shift only	2 shifts	3 shifts
All industries.....	137	59	51	27	32	35	70
Aircraft engines and propellers.....	3			3			3
Ammunition, gun parts, and other ordnance accessories.....	15	7	6	2		11	4
Apparel and other fabricated textile products.....	27	25	1	1	25	1	1
Chemicals and drugs.....	5	1	1	3		2	3
Electrical products.....	37	12	15	10	4	8	25
Communication equipment.....	18	4	7	7	3	4	11
Motors, generators, and other electrical products.....	10	6	3	1	1	3	6
Wire and cable.....	9	2	5	2		1	8
Instruments, professional, scientific, and other.....	9	2	5	2	1	4	4
Machines and machine tools.....	4	1	1	2		1	3
Metal parts, small.....	9	4	4	1		3	6
Plastic products.....	3	1	1	1			3
Rubber products.....	4	1	2	1			4
Textile-mill products.....	8	1	6	1	1	1	6
Miscellaneous.....	13	4	9		1	4	8

In general, women who have worked on either the evening or the graveyard shift do not like it. The most frequent reason given concerns irregularity in sleeping and eating, resulting in fatigue and sleepiness during working hours on the one hand, and indigestion and loss of weight on the other. Young people complain that the evening shift interferes with recreation and social life. Married women object to being away from their families in the late afternoon and evening, and many perform their household tasks during the day and are tired when worktime comes. Of those who reported that they liked night work, the chief reason given was the fact that they had the daytime hours free in which to take care of their children and do their housework. Not infrequently their husbands were on the day shift and took over the children's care when the women left for work. Some women prefer the night shift because the noise and confusion are considerably reduced, and a few like it in summer because it is cooler.

Married women, especially those with children, were somewhat more numerous than single women among those who preferred to work in the evening, that is, on the second shift. Thirty percent of the 696 women workers interviewed had children. Most of these

mothers had more than one child, and in four-fifths of the cases at least one of the children was under 14 years old. A substantial proportion of the mothers had children under 6. Children in the younger groups require constant adult supervision and care. Those who are attending school should be in a responsible person's charge before and after school hours, yet of 167 mothers with children under 14 years, as many as 38, well over one-fifth, left their children to their own devices while at work. The children simply took care of themselves. More than half the workers left their young children with husband or other relative and some had older children who took care of the younger. Few of the mothers employed help or patronized a day nursery. These data indicate a very real problem in view of the increasing number of housewives who are taking war jobs in industry.

TABLE 10.—*Employment of women factory workers,<sup>1</sup> by industry and shift*

Industry	Total		Women on—					
	Number of plants	Number of women	Day shift		Evening shift		Night shift	
			Number	Per cent	Number	Per cent	Number	Per cent
All industries.....	137	57,717	44,601	77.3	10,915	18.9	2,201	3.8
Aircraft engines and propellers.....	3	1,812	1,033	57.0	440	24.3	339	18.7
Ammunition, gun parts, and other ordnance accessories.....	15	4,806	3,705	77.1	902	18.8	199	4.1
Apparel and other fabricated textile products.....	27	5,323	5,235	98.3	54	1.0	34	.6
Chemicals and drugs.....	5	870	672	77.2	105	12.1	93	10.7
Electrical products.....	37	25,697	20,304	79.0	4,548	17.7	845	3.3
Communication equipment.....	18	21,931	17,204	78.4	3,985	18.2	742	3.4
Motors, generators, and other electrical products.....	10	2,799	2,544	90.9	253	9.0	2	.1
Wire and cable.....	9	967	556	57.5	310	32.1	101	10.4
Instruments, professional, scientific and other.....	9	6,545	4,600	70.3	1,426	21.8	519	7.9
Machines and machine tools.....	4	501	324	64.7	124	24.8	53	10.6
Metal parts, small.....	9	1,447	1,183	81.8	246	17.0	18	1.2
Plastic products.....	3	454	371	81.7	65	14.3	18	4.0
Rubber products.....	4	909	706	77.7	195	21.5	8	.9
Textile-mill products.....	8	6,703	4,609	68.8	2,019	30.1	75	1.1
Miscellaneous.....	13	2,650	1,859	70.2	791	29.8	-----	-----

<sup>1</sup> Excludes women in the office.

Though many of the firms had employed married women and mothers habitually for years, there were evidences that on the whole management was now giving thoughtful consideration to the policy of employing those responsible for young children. Occasionally, however, an employer expressed himself by saying, "It is no concern of mine if the women have children at home." Most felt that during the present emergency it would be more or less necessary to employ these mothers, but that the care of the children and other household burdens were the problem of the individual mother.

Very few of the women visited worked from midnight to morning. Of those who did, the following are typical comments:

Working 12 to 8 a. m. is hard on the nerves. Your vitality is low. You don't get your proper rest. Well, not in this house, with the children to keep you awake.  
Time after 12 midnight is the hardest to work.

Company hired all new women for the third shift because old employees wouldn't do it.

I get sleepy when working nights.

The Women's Bureau recommends<sup>2</sup> that work after midnight be resorted to only as the lesser of two evils in an emergency, the other being long overtime hours for day and evening shifts. Further, measures should be taken when night work is introduced to moderate its difficulties and dangers. One of the methods by which this may be done is the rotation of shifts at intervals long enough to allow sufficient time for readjustment and rest. Rotation should not occur so often as every 2 or 3 weeks nor so infrequently as to develop chronic fatigue on the part of night workers. Though it is difficult to suggest a set rule, since conditions vary widely and authorities differ in their recommendations, the optimum for most cases appears to be between 1 and 4 months. There is universal agreement among authorities that excessive fatigue is engendered in both day and night workers, with consequent lag in production, if shift rotation is too frequent or if night work is continued too long.

In nearly half the plants in which women worked on more than one shift there was no rotation of shifts. Of those that did rotate, three-fifths changed every week and only two firms changed so infrequently as once a month, the longest period reported without a change of shift.

The following summarizes comments made by some of the women visited concerning the rotation of shifts:

*Rotating weekly*

Just get used to it when we change again.

Rotation every 2 weeks or every month would be better, as it would not be quite so upsetting to meal hours.

*Rotating every 2 weeks*

Just get into one routine when you have to break it for another.

No more rotating for me. It had me crazy.

Several, however, felt that rotation was fair, as thus all shared alike. The day of shift changes was difficult for some—arriving home at 1.30 a. m. from one shift and getting up at 5.30 to be at work by 7 for the next day. "That was tough. That kept me tired all the time. When the shift changed you got no sleep."

## LUNCH AND REST PERIODS AND PLANT PROVISION FOR FOOD

With the increasing pressure for sustained effort to achieve high production rates day after day, week after week, and month after month, emphasis on nutrition and health is more necessary now than at any previous time. The importance to war production of rest periods, of an unbroken lunch period, and of hot food or at least a hot drink at lunch time in a clean and convenient place away from the job cannot be too strongly stressed.

<sup>2</sup> See Women's Bureau Special Bul. No. 6. Night Work for Women and Shift Rotation in War Plants. June 1942. 8 pp.

A type of cafeteria that serves the purpose well in one plant may not be feasible in another, but something more than a counter with the usual candy, cake, and "cokes" should be available.

Specific suggestions were made to about one-third of the firms relative to the advisability of allowing at least 30 minutes for lunch and short rest periods in each work spell, and in no less than 29 plants where practically no provision had been made for lunchroom facilities or food definite recommendations were made for such equipment.<sup>3</sup>

Fully aware of these shortcomings, more than one manager discussed the lack of food facilities and their plans for future improvements. They expected to have "better facilities ready by fall," or said "We plan to have a cafeteria in our new building." As already mentioned, difficulty in obtaining equipment was a serious obstacle.

Food was available in 48 (just over one-third) of the 137 plants scheduled. Of this number 30 had cafeterias and restaurants serving a variety of foods, in 9 plants there were lunch counters, food bars, and canteens, and in 9 arrangements could be made with vendors for box lunches. Though lunch facilities in general were inadequate, more than one woman interviewed referred to the fact that in her plant hot coffee was furnished free. Over one-half (73) of the firms provided nothing in the way of lunchroom facilities or food, and more than a tenth of all had only a space with tables and chairs but no food. No firm with fewer than 750 workers maintained a cafeteria or restaurant, and only 4 of the 30 with cafeterias had fewer than 1,000 employees. Though no evaluation was made of the food service given, at several of the lunch counters and canteens little more than a snack—a bit of pastry, a candy bar, or a soft drink—could be purchased, and management assumed no responsibility for the adequacy and quality of such food supply.

Neither were all the cafeteria arrangements perfect. Workshops in some cases were too remote for employees to make use of the cafeteria services in the short time allowed for lunch; others were too expensive; some were too small to take care of the large numbers, even by staggering the lunch periods. A few apparently catered only to office and supervisory help, so were avoided by the production workers.

On the other hand some firms, convinced of the dependence of efficient production on proper nourishment, made every effort to serve good and appetizing food. In addition to central cafeterias a few large firms had service to the workrooms. One such is described as follows: "A large cafeteria, attractive and cool, with excellent and cheap food available for all shifts. There is also an organized routing of wagons from the cafeteria to each workroom, and these carry soup, vegetables, meats, salads, desserts, and beverages, which may be eaten at the workbenches or in rest rooms convenient to the shops."

Another large firm served all employees on all shifts in the cafeteria by staggering the lunch periods. The service was operated at a slight deficit, but the company felt it was worth it and furnished food at cost. Other cafeterias were described as "complete"; one as "furnishing

<sup>3</sup> See Women's Bureau Special Bul. No. 5. Women's Effective War Work Requires Time for Meals and Rest. May 1942. 4 pp.

substantial meals at cost for three shifts." Of another it was said, "Cafeteria available for workers on the first and second shifts, but only canteen with cold food for third shift." Some employee objections to the night shifts were that they could buy no food in the plant on the second shift and at night.

In the plants with no lunchroom conveniences—almost two-thirds of all—thousands brought their lunches from home and for the most part ate at their work benches, many of which were dusty and dirty from the nature of the work.

For the majority the only alternative to eating at their work tables was to "lunch in the dressing room," "in the crowded washroom," "in a corner of the toilet room," "in the warehouse, but if it is nice we go outdoors." Of one plant it was said, "The girls need a place to eat. It is too dirty and dusty to eat in the workroom. It is not pleasant to eat in the toilet room and it is expensive to eat out."

Twenty-six of the firms, including 20 in the apparel group, made no provision for lunchrooms or food but allowed 1 hour for the noonday break so that there was time to go to nearby restaurants and drug stores or to go home. Many of these plants were in small communities and drew largely on the immediate neighborhood for their employees. For the employees who did not live fairly near there was no choice but to eat a cold lunch at the workbench or to go to an outside lunch counter.

Size of plant appeared to have some relation to food service. In numbers employed the plants ranged from less than 100 in a few cases to over 20,000 in two. Of the total 137 firms reporting, more than one-fourth (38) had less than 250 employees; 27 had 250 and under 500; 19 had 500 and under 1,000; and 53, about two-fifths of all, employed 1,000 or more. Of the 53 firms with 1,000 or more employees, 26 had cafeteria or restaurant service of varying degrees of adequacy, but 17 had made no provision whatever for food service though 4 had set up tables and benches. In the others there was some sort of canteen or food bar, a number serving soup, sandwiches, milk, and coffee, but several were very inadequate. Thus two-thirds of the largest plants, in contrast to just over one-third of all plants, provided food service of some sort, in most cases cafeterias or restaurants.

In March 1942 the New Jersey legislature amended the statute requiring at least half an hour for a meal period after continuous employment of not more than 6 hours. The amendment gave the Governor authority to suspend this provision during the present war but only after investigation showed that an order suspending the lunch period would not "in any way impair or endanger the health or productive effectiveness of those affected by such order."

At the time of this survey the half-hour lunch period prevailed in the plants covered and no official permits had been issued that granted suspension of the 30-minute lunch period. In 6 establishments, however, employees were working through the shift without any lunch period and in 11 others employees were limited to 15 or 20 minutes for lunch.

The "work while you eat" plan was limited to the textile and wire industries. It did not affect all departments but prevailed where some of the heaviest jobs were performed, as for example the card, spin and spool, and weave rooms in the textile mills and the braiding and weaving in the wire mills, departments where much of the work

was piece work and the deafening noise and vibration of the machinery never stopped.

This was not a new policy arising from pressure for greater war production, for this generation of weavers had inherited the custom from their fathers. One manager insisted that no official permit was needed to shorten the lunch period, as they had operated this way for years and the workers had always managed somehow to get something to eat while they watched their machines; it was no hardship.

It is noteworthy, however, that in other plants in this vicinity and in other States which were keeping up their production schedules on similar and sometimes identical Government items the power is turned off, the machines stop, and the workers pause for a period of rest and refreshment.

One young woman described her 15-minute lunch period as follows: "Can't leave work until the buzzer rings. Must rush to rest room to eat and rush back. Have to wash up and must choke the food down. Do not have time to eat, for if we get back to work after the buzzer rings they give us an argument and say they'll cut our pay for being late."

Expressions from other women indicate how they regarded the policy of having only 15 or 20 minutes free for lunch, or no time whatever.

Walk and eat at the same time.

Sometimes bring lunch back home with me. Don't have a chance to eat it.

Frequently don't eat because there is too much wool to watch.

Walk all day back and forth; machines never stop.

No time off for weavers. We eat as best we can while machines keep running.

We eat while working. This is no good. At—— (competing company) they have half an hour to eat and make as much in 7½ hours as we do in 8.

Who could get to the cafeteria and back in 15 minutes?

We get indigestion; it is always hurry.

Cannot sit down. Must swallow food while the machine runs.

Operators of machines fitted with automatic stops found it easier to adjust to the no-lunch-time policy, but even so they stood by ready to make the necessary repairs.

The plants allowing only a 15-to-20-minute break represented various industries but were alike in that all were operating 24 hours around the clock with three 8-hour shifts. Further, employees were paid for 8 hours, including the short meal period on the company time. In some cases the union had bargained for this concession by management in recent years and this fact undoubtedly colored the discussions of lunch periods with the employees. While admitting the inadequacy of 15 minutes, one woman probably expressed the attitude of many when she added, "but I prefer 15 minutes with pay to half an hour without it."

Despite the fact that they were paid for this brief lunch period there was evidence that some had not become adjusted to it. An industrial nurse from one of these plants reported several cases of nervous indigestion, thought to be caused by bolting lunches.

Further, of these 16 firms that had either no lunch period or a very short one only 1 provided for a formal rest period at any time during the work shift. In fact, only 25 firms of the entire number

visited were reported as having formal rest periods, customarily from 5 to 10 minutes in each work turn.

## WAGES

Where men and women were on the same job for the first time in the war emergency and worked on a time basis, almost two-fifths of the plants reporting current entrance rates were paying both sexes at the same rate. There was no apparent controlling difference, in the scheduled sample, between the plants that had and those that had not a wage differential based on sex. As might be expected, in jobs where there was no such differential women generally could command higher rates than where a differential existed. Not one of the firms paying women the same hourly rates as men offered them less than 48 cents for any job, whereas there were 11 separate jobs on which women began at less than this figure in plants with a differential.

The principle of the rate for the job, regardless of the worker's sex, has been advocated officially or ordered put into effect by nearly a score of agencies of the Federal Government over more than 40 years. Now especially this principle should prevail in order that the war effort may be strengthened at home through all-round industrial efficiency and democracy. Discrimination in wages paid to men and to women was one of the causes of discontent among the workers in several of the factories visited in New Jersey. To illustrate with two or three cases:

In soldering the same parts, the scale for women ranged from 50 to 53 cents while that for men ranged from 70 to 90 cents.

Men operating the same drill presses on identical parts had a 10-cent higher base rate than women, though women excelled in production.

Women resented the fact that irresponsible young boys were hired as chore boys at a beginning rate of 60 cents while women's minimum was 45 cents and many who had worked for years were still earning less than 60 cents.

None of the 132 plants reporting on entrance rate started women at less than 35 cents an hour; in fact, 6 in every 10 offered women a beginning rate of more than 40 cents. About three-fourths of the factories paying 40 cents or less were in only two industries, clothing and electrical products; almost half were in clothing alone. In 13 of the scheduled firms women were receiving at least 60 cents an hour to begin with, and in 8 of these plants women productive workers were an innovation with the wartime emergency.

Where the minimum entrance rate was less for women than for men, the difference amounted to 10 cents or more in two-thirds of the cases. In well over half the firms where the minimum entrance rate was the same, both men and women were getting 40 cents or less.

A definite wage-progression policy was followed in a significant proportion of the factories in the survey, but especially in those making communication equipment, ordnance, and small metal parts. A popular plan was to raise the worker about 5 cents an hour after a period of service of 3 months or even less. In a number of firms automatic wage raises were spread over two steps and in a few there were three, and even four or five steps, but the total amount of increase seldom exceeded 15 cents an hour. An established wage-progression policy was followed in many firms even where there was

no regular learning period. After the basic rate for the job had been reached in the case of learners or all automatic increases had been earned, further progress depended on skill and seniority.

There were scores of firms, however, in which management admitted during the interview that there was no definite policy of wage progression. "It is pretty much up to the foreman." And in too many companies there was evident need of interpreting to the workers in simple language the company policy in regard to job rates, wage raises, and the production bonus, where this was in effect. Ignorance and confused ideas were expressed repeatedly by the women about the method of computing production-bonus payments.

Well over three-fifths of the women time workers for whom data were available were paid at the rate of at least 60 cents an hour. The 5-cent interval 65 and under 70 cents claimed a very much larger group than any other. (See tables 11 and 12.) Rates paid women time workers differed considerably, however, according to industry. Only two of the industries represented in the survey, electrical products and small metal parts, paid at least 60 cents to more than three-fifths of their women time workers. In the remaining industry groups less than half the women time workers were paid this much; not quite one-third of those in machine and machine-tool plants were so reported. No women were paid at the rate of less than 50 cents in the aircraft engine and propeller plants, and in each of the industries covered few if any had an hourly rate under 45 cents. In instrument manufacture 25 percent of the women time workers for whom data were available, in contrast to 6 percent in all the industries together, were paid 45 and under 50 cents an hour.

According to table 12 the most highly paid occupational group among the women time workers for whom data were reported were the job setters, followed by machine operators in the electrical-products industry, coil and armature winders, and assemblers. Painters and solderers commanded comparatively low rates.

Women who worked on the second and third shifts, and especially those on the third, generally received a wage differential of some kind. In most cases the differential was a percent increase or additional sum

TABLE 11.—Percent distribution of women time workers according to hourly rate, by industry

Industry	Number of women time workers reported	Percent of women time workers with hourly rate of—							
		Under 45 cents	45, under 50 cents	50, under 55 cents	55, under 60 cents	60, under 65 cents	65, under 70 cents	70, under 75 cents	75 cents and over
All industries <sup>1</sup> .....	18,182	1.3	5.7	6.7	23.0	11.1	36.8	7.8	7.7
Aircraft engines and propellers.....	624	-----	-----	12.3	38.3	21.2	-----	6.6	21.6
Ammunition, gun parts, and other ordnance accessories.....	3,245	.8	6.0	19.3	37.7	9.3	10.9	1.1	14.9
Chemicals and drugs.....	154	-----	5.2	41.6	5.8	31.2	3.9	12.3	-----
Electrical products.....	9,779	1.4	3.2	2.8	12.4	4.4	62.9	9.0	4.0
Instruments, professional, scientific, and other.....	577	5.0	25.3	8.0	23.2	13.7	2.4	13.0	9.4
Machines and machine tools.....	306	-----	15.4	-----	52.0	7.5	8.2	-----	17.0
Metal parts, small.....	1,141	3.3	18.0	.9	6.4	37.0	3.2	25.2	6.1
Textile-mill products.....	1,292	.5	8.5	1.5	54.3	27.0	2.8	1.0	4.4
Miscellaneous.....	1,064	-----	.5	9.2	40.6	21.8	6.9	5.6	15.4

<sup>1</sup> Apparel, plastic, and rubber industries not included; too few time workers reported.

TABLE 12.—Number of women on a piece-rate and on a time-rate basis and percent distribution of time workers according to hourly rate, by occupation

Occupation	All women			Women time workers with hourly rate reported								
	Total number	Number on—		Total number with rate reported	Percent with hourly rate of—							
		Piece-rate basis	Time-rate basis		Under 45 cents	45, under 50 cents	50, under 55 cents	55, under 60 cents	60, under 65 cents	65, under 70 cents	70, under 75 cents	75 cents and over
All occupations.....	1 31,495	9,926	21,569	16,183	1.5	5.9	5.7	19.8	10.3	41.2	7.3	8.3
Assembler.....	11,192	2,675	8,517	6,183	0.8	2.2	3.0	11.2	3.8	76.8	( <sup>2</sup> )	2.1
Bench worker, hand.....	552	238	314	114	3.5	1.8	12.3	21.9	37.7	7.0	7.0	8.8
Bench worker, machine.....	824	483	341	249	2.0	2.8	8.0	47.0	2.0	.8		37.3
Draftsman and tracer.....	17		17	<sup>3</sup> 11								
Drill-press operator.....	1,195	482	713	528	2.3	3.4	20.8	13.3	31.1	12.5	11.2	6.5
Forelady.....	73	1	72	<sup>3</sup> 32								
Gear-cutting-machine operator.....	21	21										
Grinding-and-polishing-machine operator, optical glass.....	49	41	8	<sup>3</sup> 8								
Grinding-machine operator.....	389	257	132	117	7.7			43.6	14.5	2.6		31.6
Hand worker n. e. c.....	2,431	855	1,576	1,346	.7	14.9	1.4	36.5	11.1	12.2	7.6	15.7
Inspector.....	5,236	931	4,305	3,190	1.9	11.4	4.2	25.1	13.3	28.0	5.5	10.7
Job setter.....	148		148	148								100.0
Lathe and screw-machine operator.....	428	246	182	70	7.1	2.9	21.4	22.9	18.6	20.0		7.1
Machine operator n. e. c., in electrical products.....	1,291	355	936	901	3.9	3.4	3.9	.3	4.0	2.3	79.0	3.1
Machine operator n. e. c.....	1,568	712	856	457	1.5	14.4	17.9	28.7	5.5	5.7	10.3	16.0
Milling-machine operator.....	210	105	105	98	1.0	2.0	21.4	13.3		28.6		33.7
Packer and wrapper.....	1,317	616	701	572		3.1	16.1	32.2		22.4	13.6	2.1
Painter.....	322	86	236	159		17.6	29.6	30.8	11.9	6.9	3.1	
Punch- and forming-press operator.....	1,347	606	741	635	.3	10.1	2.4	37.8	30.1	1.1	9.1	9.1
Service and maintenance worker.....	348		348	309	.3		27.5	19.1	42.4	4.9	1.0	2.3
Solderer.....	853	431	422	254		.8		79.1	3.5	3.9		12.6
Storeroom clerk.....	71	48	23	<sup>3</sup> 20								
Tool-crib attendant.....	58	19	39	336								
Welder.....	105	15	90	<sup>3</sup> 39								
Winder, coil and armature.....	1,450	703	747	707	5.1		4.0	1.0	7.9	79.5		2.5

<sup>1</sup> Apparel and textile-mill products excluded, as occupations not comparable with those in other selected industries.

<sup>2</sup> Less than 0.05 percent.

<sup>3</sup> Percent distribution not computed; base too small.

above the regular hourly rate. Where the former prevailed, it amounted usually to 10 percent; where the latter, to 5 cents. In a few plants the differential was paid in decreased working hours. For example, in two of the firms visited women on the third shift worked respectively one hour and one and a quarter hours less than the period for which they were paid. In five plants the second shift worked 15 or 30 minutes less than paid for. Seven plants had reduced hours and gave in addition a percentage or flat increase in rate.

Wages had increased since the defense and war periods began. In the plants reporting, the increase amounted to approximately 16 percent; the rise appeared to be even greater in firms then making ordnance. Assemblers had had an increase of about 21 percent, but the rates of coil and armature winders, maintenance and service workers, and machine operators in the electrical-products industry had risen less than 5 percent.

Of the 696 women visited in their homes, 203 reported their present time rate and also the rate they were paid on their present or a different job before the war. The great majority of them, about 9 in 10, had received an increase; 8 women said their rate was the same; as many as 12 stated that their rate had decreased. Several of them commented that, though their hourly rate was less, their weekly earnings were greater because of longer hours and overtime pay. The increases in rates amounted to from 10 to 43 percent, with the higher proportional increases occurring among those commanding generally the higher rates of pay.

Dissatisfaction with earnings was widespread among the women interviewed. The feeling doubtless had been augmented by reports of the high wages paid in some of the newer war plants, and there is no question but that average earnings were lower in establishments that had long relied on female labor than in those where women's employment was more recent.

The experiences of some of the women indicate the reasons for their discontent. In one factory where there was much resentment among the older employees, some who had been with the firm as long as 5 to 8 years were earning 53 cents an hour on final inspection and blueprint reading, which was no more than new girls were earning with only a 5-month service record. "Old girls are quitting because new girls make the same as they do." In another industry older employees were critical because they had worked for 5 years or more without a raise and now were making little if any more than employees hired recently for the same kind of work. An instance was quoted of an inspector who had a higher rate after 7 months than others who had been similarly employed 15 years. "Older ones get no raises. Knowledge and experience of the old girls don't count."

A woman who had operated a drill press for a year was resentful because she was earning only 40 cents an hour. In spite of this she was staying on the job because it was "so near home." Another explained that girls will not pay carfare to come from a distance to work here because the place has a bad reputation for low wages. In the same plant a spray painter was earning 50 cents an hour, and, she added, "I am one of the highest paid there." Still another said, "New girls do not stay very long. They can do better in other places. Only the older women stay."

## EXPOSURE OF WOMEN TO HEALTH HAZARDS

## Effect of war conditions on industrial health.

The increasing diversity of women's work in the war program has implications not only for greater opportunity to use talents and to secure better wages than in more customary women's employment; it also brings about the exposure of women to toxic materials to which they rarely have been exposed in modern American industry.

In the plants surveyed in New Jersey women were at work on a great variety of occupations exposing them to diverse hazards. Not only had the number of hazards and the number of exposed women increased, but exposures themselves were found to be intensified by many factors: (1) Longer hours, (2) shortened lunch periods, (3) pressure for increased production, (4) overcrowding of workers, (5) use of makeshift washing facilities, (6) allowing too little time for washing and cleaning up before leaving work, and (7) increased fatigue because of constant standing, reaching, standing on concrete floors, sitting on backless stools or chairs of the kitchen-chair variety.

Fatigue always lowers resistance to occupational poisons as it does to other diseases. The longer the hours the longer the exposure to the poisons. If washing is not adequate the worker may be exposed for 24 hours a day through her contaminated skin or clothing. The poison may even be ingested with food if hands and nails have not been adequately washed. Doubling and trebling the number of people in the same working space may mean that ventilation adequate for the smaller number needs retesting for the larger number. A final factor is equally important—the difficulty of providing adequate medical care, including physical examinations, coupled with the increasing percentage of applicants who are physically below par.

A great many more or less unfamiliar industrial poisons have come into use with the necessity for accelerated production of explosives, synthetic rubber, and all the numerous articles of Army and Navy ordnance as well as substitutes for civilian consumption.

## Potential exposures of women.

The industries surveyed in New Jersey expose women to a number of harmful materials or conditions. These may be classified as follows:

*Skin irritants:*

Benzol (see also under systemic)

Tetryl

Mercury fulminate

Mica dust

Pyranol

Glass silk

Materials used in manufacture of plastics

Dyes of various kinds

Cutting oils and compounds

*Systemic poisoning:*

Lead oxides

Benzol

Radium

Tetryl

Mercury

Carbon monoxide

*Respiratory diseases:* Silica dust; steel dust; mica dust.*Acid burns*—Nitric acid*X-ray burns*—X-ray*Heat prostration*—Excessive heat

## Systemic poisoning.

There is evidence that most firms recognized the serious possibilities of these exposures and were using approved engineering and

medical methods of control. This was particularly true of the systemic poisons listed. The following brief descriptions indicate this:

*Lead exposures.*—Girls employed on weighing and blending dyes, which consist of lead compounds, are provided with two sets of lockers. Work clothing is placed in one locker, a shower is taken, and street clothing from another locker is put on. Every 3 months a medical examination determines whether the girl is being affected by her work. The company has through its precautions had no case of lead poisoning in 9 years of operation.

A company employing girl inspectors of white tin plate believed that cuts and scratches could result in lead poisoning, so its emphasis was on immediate first aid for the slightest abrasion. Such exposure would be very slight compared to work with lead dust. It has been established that respiration of lead is most to be feared.

*Radium exposures.*—The use of radium in instrument manufacture was under such carefully controlled conditions as have been recommended by the United States Public Health Service. Painting was done on work tables of enameled metal under glass-enclosed hoods equipped with exhausts by girls under constant medical surveillance. Conditions for maintaining their health were prescribed. No personal property was brought into the workroom; the washing routine was rigid and was done on working time. After washing with soap and hot water the radium painter entered a dark room containing mercury lamps which showed up minute particles of luminous material. Further cleansing removed these particles. Check was made on the radon concentration in the workroom.

*Benzol poisoning exposures.*—Women working with rubber cement having a benzol base were inadequately protected, special medical tests indicated. The women themselves reported the fumes so strong they got "drunk" from them. Engineers were working on a means for better ventilation and control under the working conditions necessitated by the job.

*Mercury exposures.*—Girls exposed to mercury in the manufacture of mercury lamps were under medical supervision. Medical examination was made twice a month. Particular attention was given to dental health. A special solution was provided for teeth cleaning. Showers not only were available but their use before leaving the plant was required. Every effort has been made by these plants to have working conditions as safe as possible.

### Dermatitis producers.

*Tetryl.*—Tetryl is a common industrial exposure to women in explosives manufacture. Whether it can be the cause of systemic poisoning as well as dermatitis is a question now before industrial hygienists, who differ in their conclusions. In a report in 1942 on 1,258 cases of illness due to tetryl, its toxicity was said to have both local and systemic effects. General manifestations were described as secondary anemia, headache, irritability, and irregular menstruation.<sup>4</sup> During World War I it was reported by one British industrial physician, Dr. Enid Smith, that constitutional symptoms were slight. An-

<sup>4</sup>Leon J. Witkowski, Carl N. Fischer, and Howard D. Murdock. Industrial Illness Due to Tetryl, *Journal of American Medical Association*, Aug. 22, 1942, pp. 1406-1409.

other physician with women tetryl workers under his care reported disagreeable effects in a watery discharge from the nose, sneezing, and nosebleed. This same physician mentioned as a symptom of tetryl poisoning a cessation of menstruation of 1 to 3 months' duration.<sup>5</sup> Constitutional symptoms are infrequent but operators should be under careful medical supervision.

Tetryl powder frequently gives rise to irritation of the skin partly because of its crystalline structure and partly because of its chemical nature. The dermatitis may be severe, with swelling and intense itching. Workers who perspire freely are more likely to suffer from it.

Important in prevention are a well-ventilated workroom with a dry atmosphere, sufficient clean work clothing, and adequate washing facilities. Workers should be instructed to wash their hands before washing their faces. In addition to a good quality of soap, the use of a 5-percent solution of sodium sulphite will convert tetryl into a soluble compound more easily washed off. A water-soluble skin varnish applied to face and forearms before work has been found useful.<sup>6</sup>

*Fulminate of mercury.*—Another common exposure to women in ammunition manufacture is mercury fulminate. It is rapidly being replaced by tetryl and lead azide. Because of the highly explosive nature of the fulminate, strict observance is given to avoidance of dust, scrupulous cleanliness, and a separation of processes, all of which decrease the risk of exposure. Fulminate of mercury is a very decided skin irritant and may cause a severe case of dermatitis. Particles may get into small cuts or abrasions and cause small, very sore, ulcers. Applicants for such work should be free from skin disease, and workers should observe strict rules of cleanliness.

*Cutting oils.*—A number of metal-manufacturing companies reported cutting oils and compounds as the principal dermatitis exposures to their women employees on machine work. Control of these infections as described to the agents consisted in adding an antiseptic to the oil in one plant; in another to medical check and transfer of affected workers, as well as choice of applicants for such work who have no skin lesions.

Cutting oils are the most frequent cause of dermatitis among metal workers, according to reports of United States Public Health Service. Prevention among women workers merits much attention because of the great increase in woman employment in metal industries. New employees not selected on the basis of susceptibility naturally show a high rate of cases.

The dermatitis may begin with comedones of the hands and arms. Folliculitis of arms and thighs is the common type. Infected follicles may develop into boils and even carbuncles, and infection of wounds of the skin caused by metallic slivers may cause the development of boils. The defatting action of cutting oils on the skin may cause drying, cracking, and fissuring. The open fissures are subject to secondary infection. Dry skins are most likely to be affected in this way. Some of the oils may contain chlorine compounds, the dermatitis taking the form of a typical chloracne. Allergic eczemas occasionally

<sup>5</sup> U. S. Bureau of Labor Statistics, Bul. 219. Industrial Poisons Used or Produced in the Manufacture of Explosives. By Alice Hamilton, M. D. 1917. p. 48.

<sup>6</sup> Journal of Royal Army Medical Corps, Vol. 71, 1938. Treatment and Prevention of Industrial Diseases in Filling Factories. By A. Leigh Silver, M. D.

occur from contact with machine oils. The addition of strong antiseptics to the oil may itself be the cause of such skin infection.<sup>7</sup>

Briefly summarized, prevention should include (1) provision of facilities and time for personal cleanliness, (2) clean work clothes and impervious sleeves and aprons to protect arms and thighs, (3) provision of clean towels for wiping hands, (4) removal of metal slivers from oil, (5) change of oil at least once a week. Re-used oil should be screened to remove metal, sterilized, and neutralized. Of these, personal cleanliness is the most important item.<sup>7</sup>

*Plastics.*—A variety of materials used in the manufacture and handling of plastics and dyes may cause dermatitis among susceptible persons. In plants where such reactions were reported, the control method considered best was transfer of the susceptible worker to another job. When transfer was impossible the affected worker was given time off from work until the skin condition cleared up and on return to the job protective creams or protective gloves were furnished.

*Mica.*—Exposure to mica dust noted in another plant was stated to have caused skin irritation. They tried transferring these girls to other work for 2 weeks, after which it might be 2 months before the rash appeared again. Gloves were furnished by the company.

Mica dust exercises an irritant mechanical action on the skin, the eyes, and the respiratory passages. Authorities refer to cases of eczema and ulcerative lesions among workers making micanite.

It is also said to enter the respiratory and digestive passages, which it impregnates, giving rise to a disease rare in this country, designated as "silicosis universalis." Mica dust should not enter the breathing area of workers but should be controlled by systems of ventilation.

### Respiratory diseases.

In a number of instances women were found needlessly exposed to harmful dusts. In one the women were fettling small porcelain parts without adequate exhaust ventilation. That this operation may cause dangerous concentrations of silica dust is shown by the 1939 study of the pottery industry made by the United States Public Health Service.<sup>8</sup> The study also shows how harmful concentrations can be controlled by down-draft ventilation.

### Other exposures.

Among other exposures noted was X-ray inspection under carefully controlled conditions.

Excessive heat was a problem to be met in certain operations in radio manufacture. Young women were employed on the basis of their greater ability to withstand the effects of high temperatures, though there is evidence that older women withstand fatigue somewhat better than young girls. Protective clothing was provided for the work, including goggles and asbestos gloves. Prevention of heat exhaustion should also include provision of salt tablets and cool water, to replace salt and moisture lost by the body in perspiration. Frequent relief,

<sup>7</sup> Schwartz, Louis, Medical Director, U. S. Public Health Service. Dermatitis from Cutting Oils. In *Industrial Medicine*, May 1942, pp. 228-233.

<sup>8</sup> Women's Bureau Bul. 184. The Occurrence and Prevention of Occupational Diseases Among Women, 1935 to 1938, pp. 87-89. 1941.

perhaps a brief rest hourly, from work in this room is advisable to prevent overfatigue.

The women employees themselves often complained of the hours of continuous standing, sometimes on concrete floors, or the backstrain from sitting all day on backless stools or chairs not adjustable to the individual. Other matters of complaint were the nerve strain resulting from the urging for greater and greater production; the monotony of certain machine operations; fatigue from lifting too much or lifting or holding material at awkward heights; local fatigue from continual use of a certain muscle group or from a peculiar position required by the work.

Some companies had taken steps to counteract the fatigue from strains of this sort. In one where jump presses required constant standing and jumping, the girl operators were given 10 minutes' rest in each hour of work. This company chose tall girls for jobs requiring reaching, to lessen the fatigue resulting from such work.

In many more instances rest periods should be introduced. They are especially necessary in monotonous jobs and jobs causing local muscle strain. Whenever introduced the result has been to increase production. Consideration should also be given to the well-known fact that the properly seated woman worker is a much more productive worker.

Women have been so successful in work with very small parts and in the fine close inspection work necessary throughout war industry, that eyestrain assumes an important health hazard to women war workers. One company devised a method of having the work done under magnifying glass. Necessary precautions include excellent lighting for the work, and provision of good-posture seating. It is especially important that every applicant for close work have a thorough eye examination. Necessary corrections should be made before taking employment.

## PLANT CONDITIONS AND FACILITIES

To achieve good conditions of work, in all respects, in all departments, is a matter of no slight difficulty, but numerous plants in New Jersey rated high in its accomplishment. Of the physical conditions on which recommendations seemed called for, the ones most frequently open to criticism (see list on page 4) were those requiring equipment not easy to procure—washrooms, rest rooms, lunch facilities. Those discussed in the paragraphs immediately following were found seriously below standard in a comparatively small proportion of the plants.

### Ventilation.

Ventilation was a problem in every type of industry, but it was more serious in some than in others. Heat and moisture were reported as excessive and overpowering in many departments of cotton and woolen mills and several employees attributed their repeated illnesses to this condition. Wraps hanging on wall pegs near humidifiers were very damp at the end of the day. Undue dust was reported in some grinding operations, and in ceramic plants also there was unusual exposure to powder and dust. In the use of rubber, in weld-

ing, in soldering there was exposure to fumes, and in a number of instances no really effective measures had been taken to reduce what amounted to hazards in various workrooms.

Lack of good ventilation in other industries was of a different character, as for example in clothing shops or where women were employed in simple bench assembly and inspecting jobs, as indicated by some of the reports:

Windows closed by new building on one side and work piled high in front of those on other side.

Windows do not open. No fans.

Basement workroom, terrifically hot, close, and damp. Few small windows above ground level. No way of heating in the winter.

Crowded loft room under tarred roof. Sun pours down on huge skylight which cannot be opened. No fans. A young floor girl busy here 10 hours a day, 7 days a week, lifting, folding, and carrying heavy bundles of army coats (10 to the bundle), becomes very tired but does not mind this so much as "the terrible heat, and then the odor of camphor is overpowering."

Conditions in some of the ceramic departments elicited many comments:

The dust is everywhere.

Powder makes the throat dry.

Many quit after working 1 or 2 days in the powder-filled air.

Girls from other departments refuse to be transferred here.

We suffocate if we wear those masks.

The heat from the ovens is terrific.

We asked for fans but never got them.

The girls near the ovens say they'll quit unless something is done about the heat.

Skylights, only one of which opened, were the only ventilation for fettlers working in the dust near the ovens.

### Aisles and stairs.

Orderly arrangement of work and work tables is fundamental to the safety of workers. If crowded and cluttered, the value of wide aisles is reduced if not entirely lost, and danger lurks where floors are worn and slippery; yet neglect of such obvious hazards was indicated in several reports.

Aisles were narrow and crowded, floors were covered with litter.

Aisles jammed with goods.

Stairs between cutting and operating floors were steep, narrow, dark, no lights.

Floors rough, uneven, broken, and patched in spots.

Open unguarded window alongside stairs.

### General safety.

As a whole the employers were safety conscious, but here and there careless disregard of some of the essentials was all too evident.

For instance, in an occasional workroom there were unguarded setscrews and belts and in some textile departments there was a maze of overhead shafting and belts. Added to this, many of the floors were oil-soaked and slippery and, as already described, aisles very narrow and congested.

One factory with a bad reputation for accidents was known in the neighborhood as the "slaughterhouse." Comments in the Women's Bureau agent's report read "aisles narrow," "stairs steep, narrow," "machines so close that operators crawl around and under them to

remove containers from back of machines," "some unguarded parts," "no cot, no nurse, first aid in charge of girl worker, sink dirty, bandages exposed on open shelves." Other bad conditions described were "no rest room," "toilets lacked privacy, as compartments had no doors."

Comments from other reports on first-aid provisions indicate conditions more or less typical in 8 firms.

No first-aid facilities.

Employees trained in first aid only persons responsible.

First aid in charge of 3 men only, though vast majority of plant are women.

Nurse on first shift, first-aid worker on second. No one on third shift.

No first-aid room or any place to put an ill or injured person except on a cut of cloth on the floor or on the table.

First aid in charge of girl worker who seems very careless about washing hands, sterilizing, and so forth. The cot is dirty.

In contrast were many descriptions of hospital rooms with modern therapeutic equipment, of clinics conducted for employees, of trained nurses in attendance 24 hours a day, and of preemployment physical examinations followed by regular check-ups.

"Suitable" clothing was the standard in most plants and uniforms of specified style and color were required in very few establishments. The occupations of well over two-thirds of the women employed as inspectors, bench hands, and so forth did not call for any special safety precautions in the matter of dress. However, the attention of 15 firms was directed to the very obvious need of safety caps in machine shops, goggles in some grinding occupations, and the danger of toeless and high-heel shoes.

### Seats.

A seat should be available whether the job calls for sitting or for standing, in order that from time to time the worker may momentarily lessen the fatigue from remaining in the same position. It is a recognized fact that as fatigue increases, efficiency decreases, yet where the most strenuous work was being done by women, inspection reports read as follows:

No seats in weave room.

Only an occasional box in card room.

No seats whatever for mule and ring spinners, spoolers and winders.

Bralders stood as they watched their machines. No seats.

No seats in inlay department or sample room, tube department or packing department.

No seat available for examiners. Manager complained that girls don't last long on this job.

In other cases reports described inadequate seating, and while the work was less strenuous it was most exacting:

Twenty-five assemblers, crowded elbow to elbow, sat on a long bench at a table. When one moved it disturbed all the others.

Girls on assembly were seated on stools too high for work level and knees would not go under table.

There are boxes around and we can sit a moment if work is slack.

If the machines are running smoothly, we combtenders sometimes sit on one of the cans to eat for about 10 minutes while we keep an eye on the machine. Winders also sit on the cans.

Nurses in the textile plants referred to the unusual prevalence of varicose veins among the women, which they attributed in great part

to the constant standing or walking required by their jobs with very rarely a chance to sit down. The women themselves, who were largely middle-aged or older, often discussed it. "Young girls quit; they can't stand it, the heat, the dampness, the aches."

### Job strains.

For the most part work was light and did not require much physical strength, but there were exceptions where a little consideration of easing the job would have decreased fatigue immeasurably. For example, in one factory the agent pointed out that short workers obviously were having difficulty straining to reach parts of the machine. The foreman replied that he always asked for tall girls for those machines but that was all the good it did.

A few women were operating heavy "kick presses" and "jump presses." In one department where the operators were on a production bonus it was the firm's policy to hire only young women for this job, as they considered it too hard for older ones. An operator only about 20 years old already had varicose veins. She said that jumping two to three times on the treadle at each operation was a great strain on feet and back.

Another whose work required continuous standing and lifting a tray weighing about 25 pounds every 2½ minutes commented, "This is a woman's job all right, all work and no pay." (Her average piece-work earnings were about 55 cents an hour.)

In one plant huge pieces of fabric were spread on the floor for the cementing of the seams. The workers had to stoop over on their knees or squat on the floor and slide along as they worked. Every interviewed woman employed here, whether hers was a cementing job or not, commented on the work.

It is very hard on hands and knees.

I can use the money but I'm tired, I'm always tired.

The company hires cheap engineers. We work with a cement that gags us. Fumes from cement make you drunk.

It takes strength; you have to be extra husky to stand it.

The benzol makes us faint sometimes.

Only those who need the work stay.

Many come and leave. They get sick from the fumes.

I used to be polite and ask off, now I stay off.

Very different from the physical exertion required in the heavier jobs was the boring monotony described by a girl in a mending department: "I sit all day and look and look. Most of us wear glasses"; or by the woman who worked as an inspector 9 to 10 hours a day and who commented, "It takes it out of you. You wear your nerves down and it makes you irritable."

A rest period to ease the eyes, a seat for occasional relief from the fatigue of continuous standing, or a simple change in the job operation to lessen the weight and reach would have reduced fatigue and strain in practically all cases.

### Service facilities.<sup>9</sup>

In most cases management realized that with the rapidly expanding force of women there was increasing need of adequate service facilities,

<sup>9</sup> For lunch facilities see pp. 20-24.

often difficult to obtain under priority regulations. In anticipating this expansion many had foreseen the difficulties of coping with the situation of limited supplies and so were ready when expansion came. In other places toilets and washrooms were inadequate to the point of congestion, making it doubly difficult to maintain a satisfactory standard of cleanliness of lavatories and an adequate towel supply. Since most women are more affected than men are by dirty, dark, badly ventilated, and disorderly surroundings, it is important that workrooms and all service facilities be kept at least decently clean.

In 38 plants washrooms were crowded, cluttered, and indescribably dirty, and in 10 plants the employment of matrons was recommended to have the sole responsibility of maintaining high standards of cleanliness and to see that the women employees made the best use of the facilities. Other suggestions made were for providing lights in dark toilet compartments and doors for toilet units in a few mills and factories so as to secure privacy. Where roughly improvised toilet rooms had been constructed in workrooms, with partitions reaching only part way to the ceiling, measures were suggested for completely inclosing such rooms and providing for ventilation other than through the workrooms.

Drinking-water facilities were noted as inadequate in some plants; in one the only bubbler was located at the entrance to the men's room. It was of the insanitary type, with a vertical jet falling back on the orifice, and the flow of water was so low as to be almost nil at times. In another instance there was but one fountain for the entire plant, employing a few hundred, and there was no water supply whatever on the balcony where many worked.

Rest-room conveniences were entirely lacking in a number of factories and in others they were wholly inadequate. Some of the inspection reports on rest rooms read "only benches," "no easy chair," "not a cot in the plant," "guide explained that if a girl isn't well she can lie on a pile of goods (fabric material) on the floor," "in case of illness stretch out on bench." Dressing rooms too needed attention in some places; for example, the one in a textile mill supposed to accommodate 200 women of which the agent reported, "Only 4 lockers and a few wall hooks in very cramped quarters." In contrast the dressing room in another plant is described as "ample, clean, and well kept."

### ABSENCE AND TURN-OVER

Among the topics covered in the plant interviews were absence and turn-over, and it was apparent that the "uneasiness" of the times, coupled with increased difficulties of adjustment to longer work hours and other plant conditions, was reflected in some increase in absences and quits. Expanding employment in many industries gave ample opportunity for job hunting, and when one considers the unfavorable conditions under which many employees were working it is not surprising that they were trying to better themselves.

Amazingly few firms had made any analysis of causes of absenteeism or turn-over or had definite records showing the rates in either case. Most were inclined to dismiss the subject with generalizations. Of turn-over they said, "practically none," "too small to reckon," "very low," "fairly stable," "about average"; or on the other hand turn-

over was reported as "increasing," "higher recently," "very great," "fairly heavy," "losing our best workers," "terrific, for the young don't take their work seriously."

Of the 121 firms that made some statement about turn-over, 95 reported it as "low" or showing "no increase." In other words, it was "no problem," but for the other 26 firms it was increasing and in a few cases badly out of control.

Firms seemed less aware of the problems of absenteeism than of turn-over, and only 90 made any generalizations about it. Of these, 64 said it was "normal," "not noticeable," "nothing to complain of," "no alarming increase," "generally excellent." Twenty-six reported the opposite picture, saying it was "increasing," "becoming a problem," "bad on Monday," "fair but too many off on Saturday," "higher since hiring women." The 26 firms reporting turn-over as a problem were not in all cases those that reported absenteeism as high.

Almost without exception, in those plants where the general impression of management was that turn-over and absenteeism were high, explanation for much of this could be found in work conditions as disclosed either in reports of the factory visit or in interviews with the employees such as have been listed in the preceding pages.

For instance, in a factory where the manager reported turn-over as "terrific," 60 cents an hour was reported as the usual maximum earnings for experienced workers in power sewing and electric fabric cutting.

Another owner said, "Whenever Company X advertises for girls, we can count on losing a lot of ours the next day." Every girl interviewed from this firm was critical of the wages. After working here 2 years, carrying bundles, turning collars, and so on, a floor girl still was earning 40 cents an hour. Others on more skilled operations, as pocket and collar setting, were averaging around \$25 to \$30 a week.

Turn-over was reported as "fairly heavy" by a long-established firm that had expanded considerably for war work. That it was "fairly heavy" was very easy to believe, for of the employees visited, all of whom were selected by the firm, few had been with the company as long as a year. The employment of the others had been limited to a few weeks or months.

The firm's beginning rate was 40 cents an hour and the women's usual rate was 50 cents; a supervisor was earning 55 cents an hour, but this included the special bonus for work on the second shift. The following are some comments made by the employees. They give further indication of why the turn-over was high:

Girls complain more about wages than anything else. They leave after getting experience because then they can make more in other places.

After a few months the new girls make the same as older employees.

We're not complaining of the hours; we have to work all 7 days to make any money. (Work schedule called for 7 days a week.)

Another small clothing manufacturer said he had 50 replacements a month. The report of the Women's Bureau agent who visited his plant, as well as comments of his workers, none of whom had been employed there over 6 months and all of whom had been recommended by the owner for interviews, pointed to conditions which might well have been the cause of his turn-over troubles. They reported a steady grind of 53 hours a week under driving pressure to finish heavy

army coats. Pressers were working under the handicap of antiquated equipment in bad repair and there was no means of escape from the excessive steam and heat which sewing-machine operators working alongside the pressers found unbearable. Sanitary arrangements were limited and roller towels were changed only twice a week.

In summing up the situation in one factory a woman remarked: "This factory is not a sweatshop, but one or two foremen who are trying to make a record for themselves bring undue pressure for production. Mr. ——— is one of the finest employers you would want to have, but the people he hires for bosses are not so good and the girls won't put up with them."

Management had made a few efforts to improve high turn-over with more or less success. One said it was "lower since the second shift was abandoned," employees here being chiefly young women on sewing operations. But the most outstanding example in reducing turn-over was made by a firm reporting that it had been "terrible" for the past year but had decreased noticeably with a recent increase of 50 per cent in the wage scale.

One company that in converting to war products had lengthened its hours to 10 a day and 54 a week reported the increase in absences as "noticeable and serious." Management attributed it to the longer hours.

This year has opened up a picture that is new with the longer hours. Many employees simply cannot work the 10-hour day for any period of time. At present a large number of people are employed who are not physically able to cope with the long hours and the increased rate of production. Saturday absences may be due to an accumulation of weariness from the long days.

This company also attributed some of its turn-over to a general spirit of restlessness that was evident everywhere.

No understanding of absenteeism is possible without some information relative to women's home jobs of housekeeping and homemaking. For this reason, among the questions asked the women interviewed was whether or not they carried the major part of the housekeeping load. Of the married and widowed group slightly less than three-fifths had young children. Many said they had help with the washing, or a relative did the shopping, or a daughter did many of the chores. In fact, others helped to such an extent that many reported they "shared" the household cares rather than carried the major responsibility. Occasionally a woman had "paid help once in a while. I couldn't do my job unless I had some help." However, two-fifths of all the women living at home carried the major load with little or no assistance from others, and about three-fourths of the mothers, not a few of whom had as many as 3, 4, or 5 children, had this heavy responsibility in addition to the factory job. A mother of 3, ages 11, 12, and 14, herself a widow who worked 8 hours a day and 6 days a week, said she had "everything to do—cooking, cleaning, sewing—work all the time—never time to rest." Single girls also had home responsibilities, as in the case of a young woman who was keeping house for her father and brother. She was getting the supper when agent called on her, at 7 o'clock, after she had worked a 10-hour day in the factory. As she described her cares, tears came to her eyes. "No kidding, I'm so tired sometimes I don't know whether I'm coming or going." She cleans and bakes nights and Sundays. "I

don't have any time to go out." Then with more enthusiasm she spoke of her factory job: "It is a good place to work; it is the easiest work I ever had." (She had done housework and laundry work previously.) "My job never makes me tired. I can get out my quota easily."

In one or two firms overworked personnel directors suggested that the Women's Bureau agents visit some of their chronic absentees. Among these and others interviewed were women of all ages, with long and short work histories in various industries. Most of them had heavy duties at home, a condition perhaps contributing as much as the physical requirements of the factory job to the lowered energy and fatigue of which so many complained. The story of one of them is typical of many of the others. In this case a mother of two children aged 5 and 7 had managed to work 2 years in the factory that fortunately for her was within walking distance of her home. Her main problem was securing adequate care for the children 6 days a week and 7 days when she worked Sundays. She explained further that she could make better arrangements if she could "work steady on the day shift," for she was rotating weekly on a work schedule from 7 a. m. to 3:30 p. m. to one from 3:30 p. m. to 12 midnight. Her husband was away from home most of the time and a niece, a high-school girl, and also a brother of 16 years had been "coming to help out." Even when she was on the first shift it was impossible to depend on the day nursery, as it did not open until 8 in the morning. One of her final comments was, "I may have to give up my job."

Another worry of the mothers was the lack of permanency in the arrangements they could make for child care. Even when home affairs were running smoothly, past experience had taught them how temporary the present program might be and how suddenly and without warning it might collapse.

In an effort to overcome the irregular attendance of the work force a number of firms had resorted to punitive measures, some so extreme that they might easily increase rather than decrease the instability. Such was the policy of discharging employees if absent except for illness, reported by a few companies. The policy of others was to remove names from the pay roll after very short absences, necessitating the routine of reinstatement upon return to work and occasionally entailing a physical check-up by plant medical departments.

More effective measures were in use elsewhere. In several firms that realized that illness is the cause of much absence, plant nurses called at the homes of those reported ill, and it was also customary on the worker's return to report to the medical department. Following this policy of investigating each absence, many had effected a marked improvement. The most outstanding change was reported by a large firm employing hundreds that reduced absences by as much as 80 percent by this method.

The interviews do not indicate to what extent transportation was a problem, as addresses for home visits were selected when possible with a view of economizing the time and effort of the visitor. In consequence, over two-fifths of the workers visited lived within walking distance of the factory, but records of others showed the workdays lengthened at each end by interminable car rides and several transfers.

## MORALE

Naturally, the employees were more happily adjusted to the work in some establishments than in others. Judging from the attitude of the workers visited, the morale was very low in some 20 plants. The women from these plants seemed to be unaware of the importance of their jobs to the war effort; they had no enthusiasm for their work and were lacking in respect and loyalty to their firms. Though this extreme indifference was not true of any great number of companies, employees in at least one-third of all the plants had no conception of their job responsibilities; theirs was merely work to be done and they would do it. On the other hand there could be no doubt about the importance of the war effort in the minds of many girls like the one who, after discussing the fatigue resulting from the 9½-hour day on 6 days a week, added eagerly, "But they don't push us and they're so good to us that we're glad to work like that. I would like my Saturdays free but during these times we're all pulling."

As always, there were clashes between personalities. If the difficult person was not the foreman, it was some other of the "bosses."

Some of the bosses holler and talk to the girls like dogs.

Too many bosses put us on edge.

Mechanics do not keep the drills sharp, especially at night.

Not enough supervisors. (By inspectors not sure what "to pass" and what "to throw out." Apparently the tendency was to approve when in doubt.)

An analysis of the standards and policies in the 20 plants with the lowest morale among the workers explained in many cases the unhappy adjustments and this all too evident lack of interest and loyalty. Not all the gains from good ventilation, cleanliness, and adequate service arrangements can be measured directly in terms of production. To illustrate the relation between bad plant conditions and low plant morale, case histories of four plants follow. All represent admittedly extreme situations and are not typical of the group, but they do indicate how great an effort some concerns must make before their employee attitudes can be changed. Use has been made of both plant-inspection reports and employee interviews.

### Plant 1.

Hundreds of women were employed here; in fact, women constituted about two-thirds of the working force. Their occupations were chiefly assembling and inspecting small parts, many infinitesimally small yet vital to the war effort. Nothing could be more "awfully tiresome," more "monotonous and deadening." Those of the workers who were interviewed represent a cross-section of the group and various occupations in all parts of the building. The interviews described the girls who supplied the information as conservative, cautious, fair, reluctant, refined, and only one as aggressive.

The many repetitions in their statements showed agreement not only among the women workers themselves but with the report of the Women's Bureau agent who went through the factory. The low state of morale in the plant undoubtedly was due in large part to the physical conditions throughout the factory. Though complaints were made about wages, which ran around \$17, \$18, and \$20, adjectives sometimes failed the women in attempting to describe their shop environment.

The briefed comments that follow suggest only mildly the actual conditions:

1. From agent's report.

Definite need of paint and repair. Floors unnecessarily filthy from dirt and grease. Toilets inadequate in number and filthy. Cafeteria dirty, dingy. No rest room. Very inadequate cloakroom; nails and hangers in compartment adjoining only 1 of the 5 toilet rooms. Plant unusually hot. Nurse's report shows that many faint from extreme heat.

2. From interviews with women employed.

*General repair and housekeeping*

The roof leaks in many places and the floors are a mess. You should see us fly to pull the work around when it rains. Rats as big as cats run around the workroom and roaches crawl up the walls. The company rents the building and it has not had much repair for 30 years. There just doesn't seem to be anybody there to keep things nice. The whole place is run down.

*Ventilation*

Nothing to blow out the air. Small windows on one side and only a few will open. The heat was terrible. I work next to the ovens. (Had fainted.) It is hot to work there. A fan is brought back and forth; sometimes we have it and sometimes we don't. It doesn't belong to us. The taste of paint is in your throat all the time. (One of the few spray painters. Solderers also complained of fumes.)

*Toilets and washrooms*

They are too dirty to talk about. The floor is cleaned once a week and most of the time it is terrible. Half of them don't flush. Wash bowls don't drain well. The doors are broken and don't fasten. Clean sometimes and sometimes it isn't. Present carelessness of girls due to spirit of revenge for lack of nicer facilities.

*Cloak rooms*

You put your coat where you find a place to hook it up. Hang coat on the pile; not room for all. Can only get a hanger when you duck one so the others can't find it. No place to put anything.

*Rest room*

There is not a chair in the place. If a girl feels sick there is no place to put her. I hear that some places have nice rooms with lockers, chairs, and magazines. There is not a chair in the washroom except a three-legged one that throws you.

*Cafeteria*

It is too dirty for people to eat in. The roaches and birds keep it dirty. Too many cockroaches, rats, and birds.

*Drinking water*

There are bubbler fountains but the flow of water is irregular and sometimes barely comes over the mouth of the fountain.

**Plant 2.**

In another plant, relations between management and labor had been strained almost to the breaking point, but on talking with some of the women employed it was not difficult to discover the causes. In this case also the company cooperated in furnishing names and addresses of employees, and the Women's Bureau, at the request of the company, summarized for it the outstanding comments covered in the home interviews, of course without identification of employees.

Most of the women interviewed, aware of the delicate relations, were reserved in their comments. None were emotional, yet it was apparent that failure in the past to recognize the importance of human relations had left resentment. Few women realized the importance of their jobs to the war effort and, except in a very general way, they did not know the ultimate use of the small parts on which they were working. Their attitude was, "It is cheap stuff. It doesn't matter how many we break." Ignorance of elements used in the composition of the material made it a mysterious evil, a something to be feared and a something much discussed by the employees. It was variously reported by several to have been the cause of bad coughs, of sinus, throat, and eye infections as well as skin rashes, yet little had been done to dispel their fears or to control the hazard, which management claimed was imaginary.

Management agreed that criticism of the inadequacy of job training was well founded, as was that of idle equipment and the very low staffing of the second and third shifts. Under these circumstances, the employees argued, it was no worse for a worker to be absent than for machines to stand motionless. Their references to absences and quitting the job were most frank. The 7-day week coupled with home responsibilities accounted for much of the absenteeism. The 7-day week had been exhausting, and though the work schedule had recently been reduced to a 6-day week they found that it still was necessary to take a day off now and then to keep up with even a limited amount of household duties. The women volunteered the information that, as an absence report was required on return to work, they customarily said their absence was due to illness, regardless of the actual cause.

The workers' repeated references to "wooden benches," "crowded toilet rooms," "no lunchroom," "no rest room" indicated the need of improved plant facilities. Almost all those interviewed referred to the ventilation, complaining not only of the "cold in winter and heat in summer" and "the floors over the ovens too hot to stand on," but "the gas fumes that make us faint; they had to stretch out a dozen of us at once on the grass." Management was said to be working on the problem of fumes but it was a condition of long standing.

Here too, as elsewhere, wages were a cause of much ill feeling. The plant had earned a reputation of paying low wages in the past and had much to live down. Management was aware of the fact that frequently green girls came here to gain machine experience and left for better pay elsewhere as experienced operators.

**Plant 3.**

Excerpts from the agent's report on another plant in the low-morale group indicate especially bad working conditions. "Inadequate means of ventilation. Women have left because they could not stand the

strong fumes from the synthetic rubber with which they worked. Not a seat in some departments. Stools in others, but not adequate. No lunchroom and no provision for food. No dressing room but nails in wall of toilet room 12 inches too high to reach conveniently. No place for shoes. Room disorderly. No space set aside for first aid." But the women workers who were interviewed from this factory stressed chiefly the fatigue, strains, and hazards of their jobs. It is noteworthy that though in practically all plants employees were glad to work overtime for the extra money, in this instance where there was no overtime they expressed relief that the workweek was not longer than 40 hours as their jobs were so very tiring. They had no desire to work overtime in spite of its extra compensation. "I would rather have Saturday free even though I lose the extra overtime money. I get very tired."

They referred to the strain of holding the arms at head level to work. Others had a strenuous and disagreeable job winding canvas from heavy rolls very tightly around large frames and then applying a liquid rubber coating. It was necessary to work in a team of two in order to pass the canvas roll back and forth securely. Everything they moved or handled became smeared with rubber, that ruined coveralls and shoes. To get hot water for washing, the girls carried it in buckets from the boiler room. To cap the climax, the production rate had been doubled but at the same time the piece rate had been cut.

#### Plant 4.

In a plant that had recently converted to war work making very small metal parts, management was much disturbed because their younger women employees were constantly "job shopping" and other firms were pirating their labor by offering better jobs at better pay. They said that girls were absent more now than when they had been on civilian production and that they did not work so hard as they had done in peacetime. They complained that their labor troubles were almost beyond control, and that the grievances usually involved the women and seldom the men. Incidentally, the men as a whole were an older, skilled, and experienced group of workers, holding the key jobs, while the women constituted over two-thirds of the force and were decidedly young, with little or no work experience.

The director of personnel attributed the increasing absences to the fact that the women were making more money now and could afford to take a day off.

But most revealing were the comments of the women whose names and addresses were furnished by the company. The matter of wages was a sore point with them, in spite of the fact that within the year the starting rate had been raised from 35 to 45 cents and most women were now on the 45-cent rate. Further, through recent union negotiations, when girls had been with the firm a year they received an increase from their former 40-cent rate to 50 cents; but girls longer with the firm had not fared correspondingly well. One woman, after 7 years of service, was earning 54½ cents an hour. All realized that many plants had higher wage scales and felt that there was little chance of advancement in the job or wages here.

Another reason why many did not stay was the nature of the work. Those with experience described the starting job as monotonous and

tedious. "The girls don't like the job. It is constant hand rubbing and often irritates the skin." An older woman commented, "If they would stay long enough they'd get used to it."

The plant was operating a 10-hour day and 54-hour week, exclusive of a break at noon of half an hour. A rivet-machine operator complained that it became very fatiguing and she had noted a definite lag in her production toward the end of the day. Another young woman who found the overtime too much felt that the overtime pay could never compensate for the increased fatigue. Other vexing little annoyances were complained of. The women felt that they were "being watched constantly," and as an example of policing they cited the locking of toilet rooms and the need of signing for the key. The girls objected to being "bawled out" if away from the work bench more than 5 minutes. They insisted that management discouraged their washing up even when they did it after the quitting hour on their own time. Though seemingly trivial matters, such things as these point to beginnings of maladjustments that may lead to real issues. Nothing could be worse for morale and efficient production.

