UNITED STATES DEPARTMENT OF LABOR
FRANCES PERKINS, Secretary
WOMEN'S BUREAU
MARY ANDERSON, Director

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Your Questions As To Women in War Industries

Types of Jobs
Replacement of Men by Women
Employment and Unemployment
Attitudes of Employers
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Letter of Transmittal

UNITED STATES DEPARTMENT OF LABOR,
WOMEN'S BUREAU,
Washington, August 12, 1942.

MADAM: I have the honor to transmit a report on the employment of women in war industries. In the coming months the need for women workers will exceed enormously the highest peacetime employment of women this country has ever seen. This report is made in response to an insistent and widespread demand for current information on many phases of this subject, and is issued as the ninth in the series of Women's Bureau special bulletins designed to meet wartime needs. It was prepared by Mary Elizabeth Pidgeon, chief of this Bureau's Research Division.

Respectfully submitted.

MARY ANDERSON, *Director.*

Hon. FRANCES PERKINS,
Secretary of Labor.

Your Questions As To Women in War Industries

What Kinds of Work Are Women Doing in War Plants?

Field investigators of the Women's Bureau of the United States Department of Labor are finding that women workers in war factories now operate some of the heavier machine tools formerly new to them, such as millers, lathes, automatic screw machines, grinders, profilers, and precision tappers. Where conditions warrant, women are setting up these machine tools and working to great precision. Thousands of other women are skillfully doing work requiring a delicate touch, manipulative dexterity of a high degree, as well as extreme accuracy in measurement. In addition, large numbers perform repetitive processes.

Women are at work in Government arsenals turning out small-arms ammunition, in such processes as trimming bullet jacket and case, annealing case parts, and assembling bullet and cartridge. They are doing shell and bag loading in artillery-ammunition plants. They are making gas masks, balloons, rubber life-rafts, and parachutes. They are making blankets, uniforms, tenting fabrics, aircraft instruments, wire for the Signal Corps. They are working as overhaul and repair mechanics, assembling and disassembling machine guns for testing, and disassembling wrecked airplanes. A major airfield is employing them on maintenance work, cleaning spark plugs and painting luminous dials.

In airplane plants women operate hand drills and hand screw machines, turret lathes, power sewing machines, and light rivet guns; at the drill presses they change and sharpen their own drills; they install fittings and equipment in fuselages on the assembly line; they splice and prepare assemblies of light cable, assemble and prepare electrical systems, and install the radio in the plane; in the woodworking department they operate band saws, sanding belts, and do nailing and gluing of small wooden parts; they do wiring, light grinding, profiling, sheet-metal cutting, spot and arc welding, spray painting, and all types of bench work. Several large aircraft companies have women on production jobs throughout the plant.

In plants making lenses, bomb sights, precision instruments, and fire-control instruments, women work as assemblers, grinders, honers, operators of drill and punch presses, solderers, cementers, welders, engravers, polishers, testers, and inspectors. In the making of electrical machinery women are assemblers, winders, inspectors, power-press operators, and X-ray technicians. The Women's Bureau has many further details as to industrial jobs women are doing, and is continually making recommendations in various industries as to particular types of work suitable for women.

Women are performing many technical processes that require considerable training. Some ferry planes from plant to training field;

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at Army training schools they are instructors in flying and ground mechanics. By the end of 1941 there were 92 women journeymen instructors, though women are no longer admitted to Government courses for pilot training. Women are medical-social and recreational workers at United States military hospitals here and with Army units abroad, sailing under sealed orders. A few women are in unique positions, such as testing durability of aircraft paints, testing alloys, directing a corps of women helping to build ship and plane instruments, specializing in X-ray of metals, managing a company making cable grips for battleships, electrical engineering in aircraft.

Are Women Replacing Men?

In the war industries expansion has permitted women to work side by side with men on the same jobs without taking over the jobs held by men. This is true today, though as more and more men go into the specific war services actual substitution of women on men's jobs in war industries is likely to increase. Women have replaced men primarily in civilian services for which men are not deferred from the Army, often in types of work women long have done, though from day to day some new type of work is engaging women.

In large and small places Women's Bureau agents find women at work as elevator operators in hotels, stores, and office buildings; as telegraph messengers and in other messenger services; as clerks, cashiers, soda-fountain girls, and pharmacists in drug stores. Women are serving as taxi drivers and filling-station attendants. They are being hired as men are drafted from shoe, electrical-supply, and food plants. They are replacing men as finger-print classifiers. A large industrial company began to take on a few women technicians in their laboratories, a type of work women formerly have done elsewhere. Women are serving at airports as reservation supervisors, dietitians, passenger-service superintendents, and dispatch clerks. Women are reported as machine-shop instructors, as mechanics, and mechanics' helpers. They service typewriters, act as bank tellers and assistants, and are reported at work in brokerage offices, and as stock-exchange floor employees. They are serving as guards in industrial plants, with police power. At least one of our largest cities has supplemented the traffic police force with women, who direct traffic at school and church crossings and at municipal parking lots, in the latter locations also guarding the parked cars. Another city has a woman managing a municipal airport.

The United States Employment Service has listed over 460 industrial jobs as suitable for women, though 40 percent of these would require some rearrangement of the processes if women are to perform them. At the time this list was compiled women worked in only a small proportion of these occupations.

How Many Women Are in War Industries?

The number of women actually on production lines in war factories is changing continually. If the total could be shown for today it would be different by tomorrow. Over-all figures are largely estimates; sometimes these estimates include the clerical force in the plants and the service employees, as well as production workers.

Many factors enter into the determination of the demand for women workers. The estimated range of from 6 to 10 million men to be included in the armed forces by the end of 1943, the extent to which ships are available to carry finished materials abroad, the distribution of raw material, the changes in the type of equipment made, the shifts in the plans for the use of the armed forces—these and many other factors make careful estimates of actual woman labor for periods of more than a few months obviously unsound.

However, on the basis of the increase of women workers during the first 6 months of 1942, nearly 2 million more will be added during the year, most of whom will be new workers, reaching a peak of over 15 million—far above the highest peacetime employment of women this country has ever known. It is estimated that about 3½ million of the employed women, as compared to 1½ million in the spring, will be on war work.

Important samples show how rapidly women's numbers are increasing in war factories. One good instance is the airplane assembly industry, because the plants are fully engaged in making war products and many of them—at least 40 percent—opened since September 1939. In the principal aircraft assembly plants that were in operation in October 1941 there were about 2,000 women on the production lines; but June 1942 saw about 17 times as many women in such work, some 34,000. This represents the employment of women in new plants as well as the increase in plants that were operating in October. The increase from April to June alone was about 40 percent.

Similarly, in aircraft-engine plants women are fast taking their places. Last December only 4 plants employed women on production and they totaled 600. By June 1942, women were at work in 11 such plants, and the number had increased to more than eight-fold, or by about 4,000.

Will There Be More Opportunities for Women?

There is little doubt that the need for new women workers will continue to increase enormously. However, it is likely that this need will concentrate more especially in some States than in others, since industrial concentration always tends to be spotty in spite of the fact that efforts are made toward placing some war plants in noncongested areas. For example, nearly two-thirds of the new need for workers in late 1941 was in only five of the more important industrial States. Nearly 45 percent of the women in airplane assembly plants in June 1942 were in California.

Experience of the first World War gives some indication of how large a part women are to play. In the iron and steel industry women constituted less than 7 percent of the wage earners before World War I, 16 percent during the war, in identical firms; in other metals the proportion of women was 15 percent before, 21 percent during the war; in chemicals 3½ percent before, 13 percent during the war. In transportation employment alone, over 100,000 women were engaged in that war in such jobs as switch-tenders, car tracers, dispatchers, telegraphers, ticket agents, and streetcar conductors. There shortly will be need for many women in this industry, according to the Director of Defense Transportation.

Current Government announcements call for women workers in an expanding field. Insistent demands are far above the supply of typists, stenographers, and nurses. Some professional, scientific, and administrative work also is now open to women. On the basis of estimates running well into the immediate future, the Civil Service Commission announced last spring that probably some 5,000 young women would be needed in such fields. This would include economists, research chemists, medical workers, and in some cases personnel and administrative employees. For the most part the women's jobs are likely to be in the junior grades; for example, civil service examinations for junior chemist and technical and scientific aide, formerly almost closed to women, now are open exclusively to women.

Reports in the late spring from more than 100 colleges and universities in all parts of the country indicate that women are much in demand and are being accepted for technical and management work formerly the exclusive province of men.

Are There Still Women Unemployed?

With reports on the one hand of enormous increases in employment of women, on the other hand many women have lost their jobs through industrial priorities or transfer of plants to war work and are not yet placed in new jobs.[1] Late in the spring of 1942, a million women were reported unemployed by the Federal Works Agency.

For example, in the full-fashioned hosiery industry, centering to a large extent in Pennsylvania and North Carolina, a major proportion of the 59,500 women workers were affected by the silk shortage. Through vigorous combined efforts of Government, labor, and industry to place these workers, some found employment in parachute or munitions making but this could not take care of all. Many of the 17,500 women who were in silk throwing and spinning mills and 7,000 making silk fabrics also lost their jobs.

The jewelry industry employed over 14,000 women before its metal materials were curtailed. Plants shifted to producing cap and collar insignia, cases for instruments, and small parts for bullets, but by late spring in one of the chief jewelry States a major proportion of the displaced women had not been reemployed and probably could find jobs only with great difficulty.

Shortage of steel needles, as well as of materials, affected the sewing trades early this year, and by the summer further stringencies were estimated to have thrown out 150,000 workers on women's clothing. Three-fourths of the workers in this industry are women. Figures showing the situation as to the usual late summer and early fall upturn are not yet available, but the vigorous efforts to cut use of materials and to cut purchasing power would indicate that the upturn this year would be definitely below normal. Another 30,000 workers making men's clothing were unemployed in the New York area alone.

Another industry whose employees have similar unemployment problems is the making of games and toys, which formerly employed over 10,500 women. Carpet and rug making, with its 9,500 women workers, has been hard hit. It is an industry not easy to convert to a

[1] In Great Britain in the early months of the war, when the production of consumer goods was being curtailed and converted to war manufacturing, unemployment increased markedly among women.

war basis, and the skills of its employees could be transferred to other work only with difficulty. The leather-glove industry, employing over 7,000 women, expects sharp curtailment when its stocks of leather are exhausted this fall.

What Policies Are Best for Fitting Women and Jobs?

The Women's Bureau has developed the following policy as to the order in which women workers should be employed:

First, women with factory experience who have lost their employment because of priorities in materials and plant adjustments to war production.

Second, other unemployed women who are registered with the Employment Service seeking work.

Next, if necessary, the more than 800,000 girls coming from high schools and colleges.

Last, women caring for their homes, particularly those with small children, should not be asked to go into factories and workshops until it is absolutely necessary. They can be much more helpful to the Nation by staying at home and taking care of the children, though it is recognized that in some cases these women find it necessary to work.[2]

The more than 1,500 local offices of the United States Employment Service have the responsibility for placing workers, and women seeking employment should register with them. The United States Civil Service Commission places Government arsenal and depot workers, and the War Manpower Commission has charge of the National Roster of Scientific and Specialized Personnel obtained through the Civil Service Commission.

Some of the women anxious to serve have thought of a general registration of women as a concrete way to express this desire. But women advisers to the Social Security Board, including members of the Women's Bureau staff, have opposed a Nation-wide registration of women while so many women still are unemployed or are being thrown out of jobs by transfer of industry to a war basis. Employment agencies should first make more concerted efforts to place those women who are out of jobs. Employers and training agencies should give them opportunity for work and training. In some particular localities where labor shortages are acute, it may be of advantage to have a local registration of women available for specific needs, and the War Manpower Commission is now formulating plans for national registration of women when and if it becomes necessary.

Early appeals for women proved disappointing in England, since at first many women who were eager to serve found no jobs available; later, when many more women were needed, it was more difficult to get them to respond than if requests had been delayed until the actual need arose. Not for a *year and a half* after England entered the war did the Government institute general registration of women.

Are Employers Eager to Place Women in New Jobs?

Employers have been eagerly seeking information from the Women's Bureau as to the types of jobs women can do, the conditions that should be provided for their effective work, the laws that must be observed where women are employed, and so forth. This includes, for example, makers of aircraft parts, new ordnance plants, and other cases where large numbers of women are being placed on new jobs. Other employers, unfamiliar with women's capabilities, have

[2] Stated policy of Manpower Commission is to call mothers of small children last.

been trying out women in their plants or introducing them into new departments. Employers' organizations have issued advice as to certain of the fundamentals that must be considered in securing maximum production with women workers. For example, the National Industrial Conference Board quotes extensively from the recommendations of the Women's Bureau as to proper health standards for women's best work, processes suited to performance by them, and allied subjects.

This development of particular interest in placing women in new jobs has been a recent one, greatly accelerated since Pearl Harbor and increasing further as new registrations take great numbers of men for the Army away from the industrial labor supply. When Women's Bureau agents visited major aircraft plants in the spring of 1941, a decided preference for men workers was shown. Objections were made to trying out women in new departments, based sometimes on a fear of creating added supervision problems, of having to provide more service facilities, or in general of having to employ women side by side with men. However, when return visits were made in the late fall, women were being put on new work, even by some of the employers who formerly were most hostile to them; and there was in general an attitude of readiness and even eagerness to accept women.

These women workers were justifying the experiment, and the managements were finding that men and women could work side by side effectively. The skill and ease with which women adjusted themselves to drill operation, for example, often were commented on by personnel administrators or supervisors. Foremen would point with pride to successes of individual women: To a young girl who as a spot welder had more than doubled the previous records of boys, or a woman operating a sensitive drill who maintained daily output double that of the man for whom she substituted. Women often were more careful than men of tools and materials, and thus caused less damage and waste. There were instances, too, of notable decreases in both accidents and labor turn-over after introduction of women. (England also has had the experience of decreased accidents with woman employment.) With equal training and experience, women could be transferred to other jobs as successfully as men, even on difficult processes.

On the other hand, there still are employers in all parts of the country who frankly say they will not hire women so long as they can get men. In New York, for example, of 1,400 employers reporting in April, nearly four-fifths did not plan to include any women in their new labor force before the fall of 1942—apparently not until men were no longer available. In the spring also, a United States Employment Service study indicated that employers were opening new jobs to women very slowly in view of the extent of labor demand and the stringency in skilled and semiskilled occupations.

Do Labor Laws Handicap Introduction of Women Into New Work?

On the whole, the work standards required by law are such as experience has proved will best aid maximum output as well as workers' health. The slow process of passing laws ordinarily puts them on statute books only after the principles enacted have been thoroughly tried out.

A policy as to labor standards was announced early in 1942 by a conference between officials of the Navy, War, and Labor Departments, and labor commissioners of 15 important industrial States, who declared that sound labor standards "are the mechanisms of efficiency" and "over any protracted period are essential to the maintenance of maximum production." After a summary statement of the work standards found effective, the declaration continued:

> . . . These standards must be relaxed if and when necessary for total war production . . . At the same time there must be vigilance to prevent any unnecessary abrogation or suspension of labor laws and regulations.

Only 10 States have found need to pass any new laws or to make legal changes affecting women's employment to meet the present war-production emergencies, and a number of these made only rather minor changes. In 17 States, basic laws covering women's work in manufacturing contain elastic provisions allowing for adjustments to meet emergencies; in other States emergency orders or permits have been issued.

In all, 33 States have established exemption procedures, and all the major industrial States employing large numbers of women have made ample provision for emergencies. (For further details see the Woman Worker for May and Women's Bureau Bul. 193—Women's Work in the War.)

Are Women Paid the Same Wages as Men?

In many cases women are not paid so much on a job as men they replace or work beside. In fact, a recent Women's Bureau visit to a large factory found women instructors receiving 60 cents an hour, though the men they instruct are paid 70 cents. In the past the job often was somewhat changed with the introduction of women; but today, in this country as well as in England, women frequently set up and service their own machines, and in many cases these operations are a part of women's plant instruction.

In nearly all the plants making small-arms and artillery ammunition that have been visited by the Women's Bureau, entrance rates for men were found to be at least 10 cents higher than those for women, though many of the jobs done were similar for the two sexes. On the other hand, in the aircraft industry, which is newly putting on women, and in which many plants have opened only recently, entrance rates are the same for men and women in the great majority of cases, and the rate of increase in the first months is the same for both. The job and the work done, rather than the sex of the worker, is the standard for rate fixing as advocated by the War Production Board, the Army, the Navy, and the Department of Labor.

When women are put on work that men have been doing and are paid a lower entrance rate, this amounts to a wage cut. Nor can a decline in output be used as an excuse for this cut in the rate, as women's output compares well with that of men and in some cases exceeds it. This is found now in aircraft, for example, and it was the case in some of the metal and electrical plants in World War I.

In another industry equally new at least so far as woman-employment is concerned, gun manufacture, a lower beginning rate is paid to women than to men, and a sex differential is maintained even for experienced workers. The Women's Bureau has found beginning

rates in various plants ranging from 60 to 74.6 cents an hour for men, but only from 43.4 to 45 cents for women. On each of five types of machines on which experienced women and men worked, the *lowest* rate for men always was at least 10 cents *above* the women's highest. In the same industry this was true also for several types of inspection. That this practice still exists in an emergency when many new workers are needed emphasizes the fact that the protection to wage standards afforded by union action and by minimum-wage laws is vitally necessary—

1. To assure an adequate minimum to women on war jobs.
2. To protect the wage standards of men at a time when many women are being employed, so that women will not be used as a labor force to undercut men.
3. To maintain a bottom for wages that can extend into the postwar period, as one of the factors to assist in forestalling depression at that time.

To What Extent Are Women Being Trained for War Industry?

Training for war industry has been of at least three types: (1) In special defense training classes organized through the school systems at the expense of the Federal Government, (2) in private schools and colleges, and (3) in industrial plants. The National Youth Administration also has afforded training by experience on certain of its projects, and women with such experience have been found effective in war factories.

Training opportunities for women have increased markedly since the Pearl Harbor attack. Most effective is the actual in-plant training now being given to uncounted thousands of women in war factories all over the country. For example, a large aircraft plant in Washington State recently called for 500 women workers to be trained in subassembly of parts for planes. Women are being trained for parachute repair in Salt Lake City, for radio-telephone operating in broadcast stations in New Jersey. In-plant training systems have been installed and aided by the Training-Within-Industry Branch, now of the Federal Security Agency, in more than 3,000 war contracting firms.

To mention only a few of the more skilled jobs, women are being trained as tool and gage makers, as electric welders, as computers and draftsmen. They are being taught to read blueprints, a primary need in many jobs. In some cases they are being taught to set up as well as to operate their machines. Recent data for New York alone show women in training as machine-shop and sheet-metal workers. In some cases women are job instructors in the plants, sometimes also instructing men workers, and there are now a few instances of women training other women to be job instructors.

The most recent reports from the Government training courses show women constituting about 13 percent of the trainees in preemployment training classes; among new entrants to these classes a somewhat larger proportion were women. This is a marked change, since practically no women were taken on for several months after such courses were first organized in the summer of 1940. An example of change after the Pearl Harbor attack is the San Diego school, which called for 500 women for aircraft training, and was asked to train 40 women welders for one plant alon and a "practically unlimited number" for other jobs and plants.

Schools and colleges in all parts of the country are adjusting to war needs their courses for women as well as men. Women are

increasing in proportion among students in special technical war courses at colleges and universities, and these were being given as early as the summer of 1941 at major women's colleges such as Wellesley, Smith, and Bryn Mawr. By January 1942, women were being encouraged to attend the defense classes operated jointly by 8 engineering colleges in Brooklyn, N. Y., since a survey of 12 major defense plants in the area had shown need of women workers. Engineering courses in men's colleges such as Princeton also are opening to women. Business is calling for women from technical schools never before open to them. Particularly in demand is a knowledge of chemistry, of mathematics, of accounting. By the spring of 1942 over 13,000 women were enrolled in courses grouped as engineering, science, and management training. Women constituted 10 percent of these enrollees, the largest numbers taking courses in production supervision, general engineering, or electrical engineering.

What Steps Were Taken for Effective Utilization of Women in British War Industries?

In January 1941, British Labor Minister Bevin stated that the need for more women in industry had become pressing. In March of that year a Women's Consultative Committee was appointed to advise the government on policies as to woman employment (a function similar to that of the Women's Bureau in the United States Labor Department). This committee is nominally an advisory body, but its advice is never disregarded or overlooked. An experienced woman had been appointed earlier to advise the Ministry of Labor on women's training.

In April and May 1941, when the war had been in progress more than a year and a half, women aged 20 and 21 were registered at the time of military registration for a new group of men, and before the end of the year women up to 31 were registered. These women were to be placed in industry. In January 1942, after nearly two and a half years of war, the registration was extended to women up to 40 years. These older women also were to be placed in industry, and meanwhile an act of December 1941 for the first time required the younger groups of women to serve with the armed forces. More women were needed especially in the army camps for clerical work, cleaning, cooking, telephone operation, and so forth. Some degree of choice was allowed a woman as between the auxiliary forces, civil defense, and certain much-needed factory work.

Women's organizations, members of Parliament, and other public-spirited women have constantly insisted on the importance of the government's keeping in close touch with women's groups in all matters concerning women's service. The Women's Consultative Committee has recommended that similar committees be appointed in the Ministry of Health and the Ministry of Food. They have sponsored plans for increasing the numbers of women admitted to government training centers. Women members of Parliament have urged that skills learned by women be fully used; that older women might do effective interviewing of women at the employment exchanges; that women's wage scales should be more nearly in line with those of men.

The district manpower boards, which deal with deferment, have women officers as members. The medical boards for women have women doctors as members, and a girl may request to be examined only

by women. Women also sit on the "hardship committees" that deal with applications to postpone calling up on grounds of exceptional hardship. There are advisory women's panels to consider cases of girls wishing to work near home rather than to be classed as "mobile." Labor Minister Bevin expressed in Parliament the "Government's admiration and heartfelt thanks to the women who have responded so nobly to the Nation's need. . . ."

Other problems touching women's service in industry that are frequently discussed in England include provision of adequate canteens in factories, with hot food (the Minister of Labor now may require this to be done by the management where over 250 workers are employed); more use of part-time workers and of older women; organization of shopping services, or arrangement of time off to enable women to buy family food and supplies; better hostels for those sent away from home to work and experienced persons to aid in solving their problems; and so forth.

Where Can Information Be Had as to the Work of Women and the Standards Important for Their Work?

In the years since World War I the Women's Bureau has investigated women's work and furnished the data that deal with women's hours and wages, their conditions of work, physical requirements, and the legal standards for their protection. These data have been presented continually in addresses, articles, chapters in books, pamphlets, radio addresses, and in other ways, both by Women's Bureau staff members and by many other persons and agencies who use Women's Bureau sources.

Quite recently many other agencies have become interested in this subject and more and more of these are preparing some material along these lines, for their membership or for other uses, employing to a large extent Women's Bureau findings, since the Bureau is the only agency authorized to deal with the employment of women *in all its phases* and for the country as a whole. Valuable data on the employment situation of women are now furnished by the Social Security Board; the Bureau of Labor Statistics, older than the Department of Labor itself, always has reported separate data as to women's wages in its special industry studies where women were an important part of the labor force; and the Office of Education now furnish data as to women's war training, and private agencies including college alumnae associations and women's professional organizations present material as to women, chiefly those in various professional or technical work. For 22 years the Women's Bureau has used experienced industrial investigators to meet the requirements of the Act of Congress creating the Bureau, which defined its duties as "to formulate standards and policies which shall promote the welfare of wage-earning women, improve their working conditions, increase their efficiency, and advance their opportunities for profitable employment."