
UNITED STATES DEPARTMENT OF LABOR

Frances Perkins, Secretary

BUREAU OF LABOR STATISTICS

Isador Lubin, Commissioner (on leave)

A. F. Hinrichs, Acting Commissioner

Improvement of Labor-Utilization Procedures



Bulletin No. 807

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.

Letter of Transmittal

UNITED STATES DEPARTMENT OF LABOR,
BUREAU OF LABOR STATISTICS,
Washington, February 8, 1945.

THE SECRETARY OF LABOR:

I have the honor to transmit herewith a report on the principles which may be used to increase production and productivity through improvements in labor-utilization procedures. This study, written from the standpoint of plant management, is made generally available at the present time because of the immediate importance of the subject in connection with war production. The report was prepared by W. Duane Evans of the Bureau's Productivity and Technological Development Division.

A. F. HINRICHS, *Acting Commissioner.*

**HON. FRANCES PERKINS,
*Secretary of Labor.***

(II)

Contents

	Page
Absenteeism of workers	3
Service for employees.....	6
Labor turnover	8
Full use of community labor resources.....	12
Training and upgrading.....	18
Wage structure	21
Working hours and shift schedules.....	23
Supervision of workers	26
Plant organization	28
Plant methods	32
Working conditions and safety.....	35
Employee morale	38
Appendix	41
Table 1.—Average absence rates in selected industries, in specified months, and first and third quartiles of distribution of wage earners by absence rates in November 1944	41
Table 2.—Monthly labor-turnover rates (per 100 employees) for men and women in selected industries engaged in war production, November 1944.....	42
Table 3.—Women as percent of total wage earners, November 1943 and 1944, and extent of late-shift work, November 1944, in selected industries.....	43
Table 4.—Industrial-injury frequency rates in selected manufacturing industries, 1943 and first three quarters of 1944.....	43
Table 5.—Earnings and hours in selected industries, November 1943 and 1944	44

**Bulletin No. 807 of the
United States Bureau of Labor Statistics**

Improvement of Labor-Utilization Procedures

During the earlier stages of the war, emphasis was placed primarily on the production of needed materials and weapons, irrespective of any considerations of cost. More recently, the need for economy in the use of labor resources has gained increased importance. It is therefore not surprising that the production effort during the past year has been characterized by a growing interest in all aspects of labor utilization. Now that industrial mobilization is virtually completed, it is to be expected that improved efficiency in labor use will be a major factor in permitting increased production of needed munitions and essential civilian supplies.

An extensive library has been written on labor utilization. The purposes of the present discussion are to point out briefly the salient principles in this general field of inquiry, and to indicate methods which may assist in an analysis of the effectiveness of labor-utilization procedures within the individual plant. The text is based not only on published studies dealing with various aspects of labor utilization but also on the actual experiences of a large number of plants during the war period.

Emphasis throughout is on principles to be followed rather than on particular remedial methods, since the latter should be patterned to fit individual circumstances. By way of illustration, a great many different methods and schemes have been successfully used by different companies to combat voluntary absenteeism. Since some of these methods are incompatible with others, there is reason to believe that a particular administrative device, admirably fitted to the situation at one plant, might fail completely when installed at another. Accordingly, it would appear undesirable and probably harmful to recommend that any single scheme or group of schemes be generally adopted.

Good labor utilization requires that satisfactory use be made of all labor resources available to a producing facility. Because of the wide scope of this question, it necessarily includes a great variety of individual subjects.

Where scarcity of labor is a factor limiting production, all the labor resources of the community in which a facility is situated should be fully exploited. This may require an appraisal of hiring practices and employment standards, and an investigation of the

extent to which women, handicapped workers, minority groups, and part-time workers have been drawn into useful employment.

Full labor utilization also requires that all workers who are employed shall contribute an adequate number of hours to production. This in turn demands that the scheduled workweek be of satisfactory length, that turnover and absenteeism be at a minimum, and that wasted time or idle time be reduced as far as possible.

Still another means of improving labor utilization is to direct workers' efforts in such a way as to achieve greater output. Job simplification, adequate training procedures, and improvements in manufacturing methods help to achieve this objective.

It is significant to note that although it is necessary to organize a discussion of labor utilization under a series of headings (such as absenteeism, employee training and upgrading, labor turnover, morale, plant methods, supervision, use of community labor resources, working conditions, and others), these headings are not mutually exclusive. For example, the effects of a single unsatisfactory environmental condition may be reflected in turnover, absenteeism, worker morale, and labor-management relations. A survey of labor utilization is therefore a complex undertaking and the interrelationship of all factors should be kept clearly in mind. It is unlikely that any particular plant will be below standard on all phases of labor utilization, but at the same time it is probable that in nearly every case there will be some aspect in which progress is less satisfactory than in others.

Although many of the problems discussed herein fall within the field of collective bargaining, the present report is concerned with the principles through which plant management should seek solutions rather than with the specific means employed. However, since collective-bargaining agreements cover the vast majority of all workers engaged in war production, the proper functioning of such arrangements is fundamental to good labor utilization. The magnificent contribution to the war effort made by many labor-management committees, with the active sponsorship of labor unions, illustrates the potentialities which may be lost if workers are not given an opportunity to participate in the solution of problems which nevertheless may deeply concern them. In general, joint labor-management action on labor utilization, wherever it is feasible, will enhance the chances of successful results.

The recruitment of new workers to staff expanded facilities or to replace personnel lost to other industries or to the armed services, the training of large numbers of inexperienced employees, the control of absenteeism and turnover, the provision of adequate supervision—all these and many other problems have been thrust before management in exaggerated form by the war. The resolution of these difficulties has called for greater alertness and flexibility from management, but the same methods of attack which have always characterized good management have in most cases proved effective. Even the most difficult problems of labor utilization usually yield to an approach which recognizes the following familiar but fundamental principles:

1. *Means must be established to bring the problem to the attention of management.*

2. *A clear policy for dealing with the problem must be formulated.*

3. *Responsibility for carrying out the policy, with coordinate authority, must be specifically delegated.*

4. *A check on the effectiveness of the policy and the efficiency of those designated to carry it out must be provided.*

Absenteeism of Workers

Absenteeism is potential working time lost because a worker fails to report for work when scheduled to do so. The direct production time thereby lost is important, but it is aggravated by the inevitable disarrangement in working schedules which necessarily ensues. Where work is handled in progressive steps, a single worker's absence may reduce the effectiveness of the labor of many others. Accordingly, good labor utilization demands that absenteeism be held to a minimum.

Absenteeism may be voluntary or involuntary. Both voluntary and involuntary absences are considered in computing an absenteeism rate. This policy is followed not only because of the difficulty of deciding in many cases whether an absence is voluntary or involuntary, but also because both types of absence interfere with production in the same way. Efforts to reduce absenteeism should be directed at absences which are justified as well as those which are not.

The actual causes of absenteeism cover a wide range. At one extreme are involuntary absences caused by physical disability of the worker through sickness or accident. A great many absences are on the borderline between the involuntary and the voluntary. Absences to visit ration boards, cash checks, pay bills, shop for furniture and clothes, seek better housing, and obtain medical, dental, or legal assistance are of this type. Absences in this category are generally under the control of the worker to some extent, but they may be considered justified because of the great personal inconvenience which would be required in order to avoid them. At the other extreme, absences may occur for some wholly frivolous reason.

In dealing with the reasons underlying absences, it is necessary to distinguish carefully between the actual cause of an absence and the excuse which may be given for it by the worker. Unless there is careful verification, a worker who has been absent under circumstances of questionable justification may give as the reason not the true cause, but rather an excuse which he knows from experience will be readily accepted.

ABSENCE RATE

Figures showing the general absence rate of a plant should be regarded as necessary management statistics, not only for showing whether at the moment absenteeism constitutes a serious problem, but also for indicating the trends in absenteeism experience. If absence rates are not regularly available, arrangements should be made to obtain them. In compiling such figures it is probably desirable to follow the definitions and procedures established by the Bureau of Labor Statistics for collecting absence

data from war plants. Not only is it convenient to follow a set of established definitions, but in addition this procedure will permit comparison of the results with figures for a large number of other plants. A copy of the form used by the Bureau of Labor Statistics to collect absence data (B.L.S. Form 1415) will be sent on request.

The best method of determining whether a facility is above or below standard with respect to absenteeism is to compare its absence level with the average for other similar establishments. If the plant's rate is below average, there is probably no problem warranting further investigation. Monthly absence rates for about 30 important war industries, based on reports covering about 5,000 establishments and 5,000,000 wage earners, are available from the Bureau of Labor Statistics for the period March 1943 to December 1944 (see Appendix, table 1).

In all war industries together, absenteeism rates recently have averaged between 6 and 6½ percent. Any company with a lower rate accordingly has a record which is at least as good as that of the average war plant. At the same time, there is in virtually every industry a substantial number of establishments which report rates below 4 percent; the entire petroleum-refining industry usually reports an average below this figure. At the other extreme, the shipbuilding industry usually averages between 8 and 9 percent. The minimum long-term rate for any large establishment is probably in the neighborhood of 2 percent, since sickness alone is likely to account for this proportion of absences.

Late-shift work, long hours, new and inexperienced workers, and large proportions of women tend to increase absence rates, but such conditions in themselves do not explain an unsatisfactory absenteeism record. Many firms, unfavorably situated with respect to the above and other factors, nevertheless have been able during the war period to keep their absence rates well below average.

VOLUNTARY ABSENCES

One of the most important steps in a program designed to reduce voluntary absences is the establishment of a definite policy with reference to unjustified absences. This should make clear the attendance standards which management expects the workers to meet, and the disciplinary steps which will be taken in the case of repeated unjustified absences. It is usually desirable to indicate that violation of attendance rules will be subject to disciplinary action in the same fashion as violation of other company regulations.

A policy on absenteeism must not only be in existence, it must also be known to employees in order to be effective. Accordingly, it should be established whether each employee is fully informed regarding the company's policy. It is hardly necessary to add that *it is important that the company's policy be fair and equitable and accepted as such by the employees themselves.* If employees do not understand or do not approve of the company's policy, disciplinary action instituted under it is likely to cause resentment. To avoid this, many companies have found it desirable to discuss their policy on disciplinary treatment of absentees with employee

representatives, either through their unions directly or through a labor-management committee.

To carry management policy into effect, it is necessary that some notice be taken of each absence. Therefore, workers should be required to account for the periods when they fail to report for scheduled work. Frequently, a written statement giving the reason or excuse for the absence is demanded. This may be supplemented by an interview. As far as possible, the interview should be conducted by an individual who is interested in the work of the employee. The worker's foreman or assistant foreman may meet this description, but in a number of cases committees of fellow workers have been used with success. The control will be ineffective if the requirement to account for an absence becomes merely a routine obligation.

The record of an absence and explanation for it furnish the material for checking on habitual absenteeism. Many companies keep individual files on each worker. Each new entry of an absence is accompanied by a routine check on the worker's past record, and repeated absences become apparent quite readily. A regular program to locate and discourage repeated absences should be based on these or similar records.

The reasons assigned by workers for their absences, even when not verified, may furnish valuable information on the causes underlying involuntary or semi-involuntary absences. This material cannot be fully utilized, however, unless it is periodically reviewed, assembled, and brought to the attention of management at a sufficiently high level to insure that any corrective action indicated can be taken. Some person in the plant should have the specific responsibility for carrying on this work.

INVOLUNTARY AND SEMI-INVOLUNTARY ABSENCES

The main source of wholly involuntary absence is, of course, sickness. Some firms have attempted to reduce sickness absenteeism by various means. Commonly, such programs are instituted under the supervision of the plant medical department and are usually educational in nature, although sometimes they are preventive. Examples of the latter are distribution of vitamin preparations during the winter months in an effort to reduce respiratory illness, and re-examination of workers after absence because of sickness to insure that a communicable disease will not be transmitted to other workers. Special measures are usually taken in departments where the work is of such a nature that sickness hazards are increased. Examples of such conditions are found in forge shops or places where paint or solvent fumes are present.

Many absences are semi-involuntary. In such cases, personal circumstances make it difficult to avoid some loss of working time, but the worker may have partial control of the time when the absence will occur. Absences of this type are caused by the necessity for shopping, getting laundry, having personal automobiles repaired, attending to gasoline, tire, and food rationing problems, seeking adequate housing, providing for care of minor children, and the like. Because such absences are closely related to plant working hours, increases are to be expected during the wartime period. General adoption of a 6-day workweek has reduced those

daytime hours in which workers are free to attend to personal business. Increases are also to be expected because a greater number of families have no adult members who are not working.

Semi-involuntary absences are closely related to labor turnover. The same personal difficulties and inconveniences which cause such absenteeism may eventually move the worker to seek a more permanent solution by changing his conditions of employment. For example, a close relationship between poor housing and inadequate transportation on the one hand and high absenteeism and excessive turnover on the other is fairly obvious.

To reduce absences of the semi-involuntary type, the plant should be aware of the important types of worker problems and should institute any appropriate services and programs which seem to be necessary. Accordingly, if absenteeism at a given facility appears to be excessive, the extent of such activities may profitably be examined. Some of the types of services which may help to reduce absences are described in the following section.

Services For Employees

Unavoidably, a part of the time of every person must be devoted to personal affairs. In the normal course of events, it is expected that an employee will discharge his personal obligations during hours when he is not scheduled to work, but wartime operating conditions have made this more difficult. The crowded and overloaded condition of community facilities in many areas has augmented the worker's difficulties in obtaining necessary services. These factors and the additional responsibilities connected with rationing and Selective Service which have been imposed on him have increased the demands on his free time. Moreover, the longer working schedules now commonly in effect have reduced the number of hours available to the average worker for personal affairs. Finally, the reduction in the number of families with nonworking adult members has made it more difficult for the average worker to shift part of the burden of his personal affairs to another family member. Because of this situation, many companies have established various services to assist their employees in meeting the conditions of wartime living. Such programs may have an important bearing not only on absenteeism, but also on turnover, worker morale, and employee efficiency.

Extra services for workers are, in general, necessary only because of wartime operating conditions, and frequently they have had no counterpart in peacetime. Consequently, the different plans adopted are extremely varied in nature, depending on individual circumstances. Because of their temporary nature they are sometimes administered very unevenly. A few examples will illustrate the types of services which may be rendered.

The necessity for workers to appear at irregular intervals at ration boards has led some large companies to establish branch ration boards at the plant itself, so that such matters may be attended to in a relatively short time during the working day.

Some employees have experienced considerable difficulty in obtaining adequate housing within reasonable transportation dis-

tance of the plant. Accordingly, some companies have listed the available housing facilities, for the benefit of their employees. If sufficient housing was not available, companies have also co-operated with local and Federal Government agencies to provide additional facilities.

Inadequacies of marketing, laundry, and cleaning facilities in crowded war centers have sometimes made it difficult for workers to take care of such things in off-duty hours, especially if women who would normally take care of household tasks have been brought into factory employment. Some companies have made arrangements to permit these responsibilities to be carried out at or near the plant at convenient times. Other companies have joined with community organizations to insure that shopping, laundry, recreation, banking, and medical facilities are open and available to the worker during off-duty periods.

Adequacy of child-care services has an important bearing not only on the ability to recruit for employment women with minor children, but also on the continued and regular attendance of such women. Some companies have been active in seeing that child-care facilities were available in convenient locations.

The activities of different companies in attempts to insure adequate transportation for their employees have been of many different types. With respect to transportation by private automobile, centralized arrangements for the formation of car pools are frequently established. Centralized responsibility for assisting workers through the intricacies of gasoline and tire rationing has also been helpful. With respect to public transportation, some companies have arranged with nearby firms to stagger the shift schedules in such a way as to reduce peak-load demands on limited transportation facilities. Other companies have been able to obtain additional facilities by bringing the problem to the attention of local transit companies or the Office of Defense Transportation.

At many war plants, a large proportion of the employees depends on privately owned automobiles for transportation. The increasing age of these vehicles has made breakdowns and the necessity for mechanical repair more frequent. Since at the same time it is becoming more difficult to get repairs made, some firms have attempted to make central arrangements through which employees can secure repair services.

Arrangements to cash workers' pay checks have in some cases helped reduce absenteeism, and facilities for granting emergency loans have assisted in limiting both absenteeism and turnover. There have been cases in which workers quit their employment because it was the only way for them to secure promptly their accumulated earnings for an immediate need.

Company assistance in meeting the personal problems of workers contributes directly to the reduction of absenteeism; it also limits the number of excuses for absenteeism which might be considered acceptable under an absence-control program, and makes it more difficult for a worker to furnish reasonable excuses for casual absences.

It is important to note that no single company should necessarily engage in the entire series of services mentioned above.

Rather, such activities should come only after the need for them has been established, and the details of any particular plan should be carefully fitted to the particular circumstances. *The lack of any organized program for dealing with the problems mentioned above may, however, have an important bearing on the effectiveness of labor utilization.* The possibility of a joint labor-management approach to problems of this type should not be overlooked. Labor participation should not be limited to bringing the need for specific action to the attention of managements; in many cases a program may be administered most appropriately and effectively by an employee group.

There is danger that management interest in a program may lag after it is instituted, with the result that its operation becomes haphazard and unreliable. Under such conditions an originally sound and well-conceived program may become a liability rather than an asset. *During its life, any program of service for employees should be actively prosecuted;* otherwise it may become a focus for employee dissatisfaction.

Labor Turnover

“Labor turnover” occurs whenever there is some change in the working personnel of a plant. The term covers both accessions and separations, but it is usually the latter phase of turnover which receives principal attention.

A certain amount of turnover is unavoidable, and some should be regarded as beneficial, especially in the early stages of a war production program when turnover is the process whereby new and expanding plants secure a necessary nucleus of experienced workers. However, if turnover represents simply the planless movement of workers from job to job without regard to the needs of the war effort, it may be detrimental. It is always difficult to maintain production at proper levels with a working force which includes a large proportion of new workers. Moreover, excessive turnover needlessly multiplies the costly and time-consuming process of inducting and training new workers. It increases the supervisory work load, since supervisors must usually shoulder a large part of the burden of training new employees. Rapid changes in personnel can quickly disrupt a smoothly operating organization.

The direct and indirect cost of replacing a single employee who quits and of integrating the new worker into the labor force of a plant may amount to as much as several hundred dollars, depending on the training which may be needed. The process is seldom inexpensive. It is obvious that *reduction of turnover by even a few cases each month may result in substantial cost savings; extra time and effort spent on preventive measures may represent a worthwhile investment.*

TURNOVER RATES

In large plants, summary information on turnover should be regularly available to management for control and policy purposes. In smaller plants, because of the more personal setting of employment questions, there may not be an equivalent need for figures.

Statistics on turnover are usually compiled on a monthly basis and are expressed in terms of the number of separations and the number of accessions per hundred employees on the pay roll. When compared with similar data for other plants, turnover figures help to show the magnitude of the problem at a given plant; the trends established by continuing figures may indicate the need for new action on recruitment policies before the problem becomes acute. Tabulation of figures in somewhat greater detail, by departments, shifts, or sex, may point out trouble spots which would otherwise be obscured in the general picture and in which corrective measures may prevent future quits. It goes without saying that *statistics on turnover will be of little value if tabulated merely for purposes of record keeping; they should be used as guides to management policy.*

Current figures on labor turnover, by industry and sex, which may be used for comparative purposes are published monthly by the Bureau of Labor Statistics. These figures, together with descriptions of the methods used in computing turnover rates, may be obtained on request (see Appendix, table 2).

Separations from employment are usually classified, by type, under the following headings: Quits, discharges, lay-offs, military separations, and others. In peacetime, discharges and lay-offs account for most of the separations; in a war period, quits predominate. In 1939, quits accounted for about one-fourth of the average monthly separation rate of 3.14 percent for all manufacturing industries. In 1943, quits represented nearly three-fourths of a monthly separation rate averaging 7.23 percent. At the end of 1944, average quit rates for particular industries varied from less than 3 to more than 7 percent, and the quit rates for individual establishments covered a much broader range. *In general, a quit rate exceeding 5 or 6 percent per month is regarded as a danger signal, although the critical level will vary with the circumstances of each individual plant.* If much casual labor is used, a quit rate of 7 or 8 percent may not be regarded as serious. On the other hand, a rate of 3 percent may cause concern, if experience is an important factor for most classes of employees.

QUITS

Many quits are avoidable. *The process of reducing a plant's quit rates should begin when a worker is hired.* A worker is far less likely to seek other employment if he is placed in a job for which he is physically and psychologically suited. Hiring interviews, aptitude tests, and medical examinations are carried out mainly to insure that the worker will meet the employer's minimum standards for a job, but proper placement from the worker's standpoint should also be kept in mind. A worker placed below his proper skill and wage level may be no bargain if he quits after brief employment.

It is important to help a worker adjust himself to the conditions surrounding his new employment. Company policy with respect to wage payment, promotions, attendance, vacations, safety rules, and the like should be explained to him as soon as possible. He should be acquainted with the details of any grievance procedures or benefit programs. It may be helpful to describe

the contribution of the worker's job toward the final product of the plant, and to relate this product to the war effort. Such instruction is especially important at the present time, when so many persons without previous industrial experience are being employed. The use of a systematic rather than a haphazard induction procedure may pay substantial dividends in sound employee adjustment to new working conditions. It is possible to prevent the many serious misunderstandings which may arise if the new employee must depend principally on fellow workers for knowledge of plant policies and programs. Information obtained in this casual manner is often both incomplete and inaccurate.

Even with due attention to proper placement and induction, it cannot be assumed that satisfactory adjustment will follow automatically. *A systematic follow-up some weeks after entrance on the job may locate potential trouble in time to permit preventive action.* Such a check should cover both the worker and his supervisor, and it should reveal whether the worker is satisfactory in his job and satisfied with it. This period, when the worker has become acquainted with plant routine, but has not yet become fully geared into it, is probably the most critical of all in determining whether the worker is likely to continue in his employment for any long period. Placement at the wrong skill level or in the wrong job, personality conflicts, inconvenient shift assignments, and similar difficulties may be located and remedied at this stage before they cause the worker to seek other employment.

In some war plants it has been necessary at times to assign virtually all incoming workers to departments with acute personnel shortages, irrespective of the capacities or preferences of the individual workers. High turnover naturally accompanies such a practice, but it has been minimized in some cases by an active follow-up program. The promise of more appropriate placement later, plus evidence of real management interest in the worker, has given employees a better appreciation of the emergency nature of the situation and helped prevent separations.

It is usually desirable in any plant to have some person attached to the management to whom workers can go for a sympathetic discussion of personal problems which may affect their work. In large plants, trained personnel counselors may be used. Such counselors should be carefully selected for their ability to inspire confidence among employees, and they should have a feeling of genuine interest in employees' problems. It goes without saying that such persons must also have tact and sound judgment. If their work is to be effective, they should avoid discussing matters which should properly be taken up through established grievance channels.

Exit interviews may help to reduce turnover. Two main objectives should determine the form of such interviews: (1) A genuine attempt should be made to induce the worker to remain on the job. Such an effort will not usually be effective if the person conducting the interview feels that the worker's decision is irrevocable, and therefore permits the interview to become

a mere formality. (2) An intensive effort should be made to discover the true reason why the worker wishes to quit. This may require some time and ingenuity; it cannot be assumed that a worker will state immediately the real cause for his dissatisfaction. The records of termination interviews should, of course, be used systematically to help prevent future quits by improving or correcting conditions which might cause them. If these records are used as guides to action they may be of real value; as papers in a file cabinet, they are useless.

War Manpower Commission regulations concerning granting of certificates of availability for other employment should be followed carefully. In general, these certificates should be given (1) when a worker faces real personal hardship because of continued employment in his present job, (2) when the worker is not being used at his highest skill, or (3) when he is no longer needed. The propriety of granting a certificate should be carefully established in each instance; to issue them in a perfunctory fashion defeats the entire purpose of the arrangement.

It is important to remember that quits may occur for a great variety of reasons. Among the in-plant conditions which cause quits may be mentioned dissatisfaction with the job, inequitable wage structure, unsettled grievances, limited opportunity for promotion, unpleasant working conditions, unsatisfactory relations with supervisors, and unwillingness to be assigned to late shifts. Community factors may also be important. Difficulties with housing, transportation, child care, shopping, and the like are especially likely to cause women to quit. *The most effective means of reducing quits is to discover their basic causes and correct them as far as possible.* All available sources of information which may reveal why workers are dissatisfied with their jobs or why former workers have quit should be exploited.

MILITARY SEPARATIONS

Comparison of the military separation rate with that for similar establishments may indicate that a particular plant is especially vulnerable in this respect. *It is the responsibility of the management of the particular plant to determine whether the withdrawal of eligible men under Selective Service is likely to impair operating efficiency and to institute such steps as may be necessary.* In this connection, familiarity with Selective Service regulations and procedures is important, and, accordingly, it may be desirable to centralize responsibility for dealing with draft boards in the hands of a specified individual. In requesting deferments, it should be remembered that a technical job title will not indicate the importance of an individual's job to a nontechnical draft board. Moreover, where the war use of a plant's product is not obvious, it should be explained carefully in clear and simple terms. The burden of proof that a deferment is necessary to the war effort rests on the employer, and to be successful a request must carry this conviction to the draft board. If numerous draft eligibles are involved, the preparation of a replacement schedule certified by the State Director of Selective Service may assist in the orderly withdrawal and replacement of workers.

Full Use of Community Labor Resources

Because of the great demands of the war program, many companies have found it increasingly difficult to obtain enough workers to man their production operations adequately. To remedy this, they have found it necessary to use more intensive recruitment procedures and to utilize labor groups which were not previously employed. The use of local labor reserves, including women, older workers, boys and girls, racial minorities, persons with physical handicaps, and part-time workers, helps to relieve labor shortages and reduces the need for in-migration of workers, with accompanying additional strain on community facilities.

RECRUITMENT PROCEDURES

Recruitment practices which were satisfactory in the pre-war labor-surplus period may be entirely unsuitable at the present time. The company which still depends exclusively on calls at the employment gate to staff its plant is least likely to meet with success. Some plants in isolated places have found it profitable to move their employment offices to conspicuous locations on main streets and make arrangements by which prospective workers can be interviewed and hired on the spot. Many firms have found it necessary to launch intensive recruitment campaigns, frequently in direct cooperation with the U. S. Employment Service. Some have treated recruitment as a sales problem, and have made use of the abilities of their own sales departments. Carefully prepared newspaper advertisements and appeals on the radio have been supplemented by contacts with local schools and colleges and requests to employees to refer friends and relatives.

It may be necessary to revise employment standards in order to obtain enough workers. Former restrictions on the age, sex, or physical condition of prospective workers may seem less inflexible in the light of an acute labor shortage. Persons who were not previously in the market for jobs constitute the principal labor reserve now available.

Recruiting is likely to be most effective if responsibility for hiring is centralized in a plant personnel department which is thoroughly familiar with total labor requirements of the plant and with the labor supply of the area. Wherever possible, recruitment should be planned in advance of actual need, especially for skilled workers and supervisory and technical employees. The recruitment program should be carefully integrated with production plans. If marked expansion is likely to take place, this coordination is of sufficient importance that responsibility for it be specifically designated. Adequate turnover records may assist in the anticipation of needs for replacements. Plants in increasing number are finding it necessary to depend largely on upgrading for filling quotas of skilled workers, with recruitment plans largely geared to supplying sufficient numbers of inexperienced workers.

Under recent Office of War Mobilization and War Manpower Commission directives, the U. S. Employment Service is the official channel for priority referral of all male workers through-

out the Nation, and for women as well in a number of designated areas. All companies, even in areas where a labor surplus exists, are now required to cooperate with the Employment Service. Priorities are assigned by local, regional or National Manpower Directors for specific numbers and kinds of workers, based on the type of war production in the plant at the time the order is assigned. All other requests for referrals are considered as non-priority orders. The manpower-priority status of any plant may be impaired by failure to observe War Manpower Commission regulations, by improper utilization of labor, or discriminatory hiring practices. *It is important that each company become acquainted with and adhere to all War Manpower Commission hiring and release regulations, and that utilization of labor in the plant meet the standards recognized in the area.* A showing of satisfactory labor utilization is necessary for receiving priority referral in labor-shortage areas. In some areas, representatives of the War Manpower Commission are available for plant surveys of labor utilization, and will make suggestions to aid companies in meeting area labor-utilization standards.

Even in areas where extensive labor controls are not in effect, the U. S. Employment Service plays an important part in recruitment, and is responsible within an area for relating the demand for and supply of labor. Accordingly, it is always desirable for the plant personnel department to maintain close and cordial relationships with the local office of the U. S. Employment Service. That office should be the plant's principal contact with the War Manpower Commission, and it may be in a position to offer valuable services to the plant.

EMPLOYMENT OF WOMEN

Women constitute the only important reserve of full-time workers now available to many establishments. During the present emergency, they have replaced men in many jobs traditionally held by male workers, and experience indicates that they may be equally efficient. On jobs of a repetitive nature or which require considerable manipulative dexterity, women are frequently more productive. The most obvious limitation on the use of women is their lesser average physical strength, but, on jobs within the range of their strength, their physical endurance may equal or exceed that of men. Comparison of the percentage of women in a given plant with the proportion utilized in establishments of a similar type may indicate that full opportunity has not been made of this labor resource. Information on the proportion of women workers in various industries may be obtained from the Bureau of Labor Statistics. (See Appendix, table 3.)

Selection and Placement

A careful and systematic analysis of existing occupations within a plant will usually reveal many which are suitable for women. The physical strength required is usually the most important criterion of suitability. To facilitate the greatest possible use of women, it may be desirable to divide certain unsuitable occupations and regroup the functions into new jobs, some of which are appropriate for women. Consultation with employee

representatives, before regrouping functions, is desirable even if job duties are not covered by collective agreements. The introduction of mechanical handling and transportation equipment may also increase the possibilities for use of women. The Women's Bureau of the U. S. Department of Labor will furnish, on request, information as to particular types of work in which women are being successfully employed in various war industries.

The systematic selection of women for jobs is as important as the selection of jobs for women. Women vary in physical ability as widely as men, and a job which can be adequately filled by most women may be wholly inappropriate for some. Adequate pre-employment physical examinations may be of considerable assistance in preventing poor placement. In the case of women, also, it is more important before making an investment in placement and training, to seek assurance that outside responsibilities or home duties will not interfere unduly with job performance. Pre-employment training which simulates actual job conditions and working schedules has proved useful to some firms in revealing such conflicts.

Induction and Training

It should be kept in mind that many women will lack previous industrial experience and will therefore require extra assistance in adjusting to factory routines. It is usually desirable to provide them with a broad picture of the purposes of and processes used by the establishment, orienting their place in the structure, in addition to the more usual information on rules, regulations, safety practices and the like.

If women have not previously been employed, unusual care should be exercised at the time of initial placement, to insure their acceptance by fellow workers on an equal footing. Special care in selection, placement, and training will help, since full acceptance will usually follow, once efficiency is demonstrated. Because women frequently lack prior experience, detailed training is usually necessary. In such training it should be assumed, until the contrary is demonstrated, that the worker has no previous knowledge of tools or techniques. Each step, from the beginning, should be carefully demonstrated, and additional steps should not be undertaken until it is certain that all previous instruction has been thoroughly understood. Training should be carried on only by persons who have the patience to work with those lacking previous mechanical experience. Continuing sympathy with the problems of the beginner is essential. It may be noted that attempts to bring women into a plant by creating special all-women departments have usually been less successful than when women were employed on the same basis as other workers.

Supervision and Counseling

Supervisors who work well with male workers may be less satisfactory in connection with women. The supervision of women frequently presents different problems in worker psychology, and this should be kept in mind in selecting supervisors. *If numbers*

of women are employed, women personnel counselors should be provided; they are almost universally used to act as liaison between the women workers and management. Women acting in this capacity are usually far more satisfactory than men in handling the special problems of women workers. The number of such counselors will vary with circumstances, but, for full effectiveness, it should be large enough to permit dealing with the worker's problems in an unhurried manner.

Special Considerations Relating to the Employment of Women

Plant environment is especially important in determining the attitudes of women toward their jobs. Special toilets and rest rooms should be installed close to work areas and should unflinchingly be maintained in clean and sanitary condition. The lack of adequate or clean facilities quickly leads to dissatisfaction. Policies with respect to permissible types of work clothing should be decided on and adopted before possibly conflicting habits or customs are formed. Companies usually require women to wear shoes with low heels and closed toes, and frequently recommend slacks. Women working around machinery are usually required to wear some head covering. Information on sanitary facilities, work clothing, and safety practices as they relate to the employment of women may be obtained on request from the Women's Bureau of the U. S. Department of Labor.

In most States, employers of women must observe certain restrictions relating to hours and working conditions which do not apply equally to men. Many of these restrictions, especially those relating to night work, have been relaxed during the war period. Usually an exception to the regulations is granted by the appropriate department of the State government, upon application and a showing that the health of the women involved will be adequately protected. Information regarding the status of such regulations may be obtained from the State government.

It is highly desirable that a company formulate a clear policy on the employment of women during pregnancy. Some plants do not hire pregnant women, and discharge women workers as soon as pregnancy is apparent. Such a policy encourages concealment of pregnancy and frequently contributes to injury of the worker. Moreover, it results in loss of the services of experienced workers during a considerable period when useful work can be performed. Other companies have found it desirable to inform women that they will be continued in employment during pregnancy until it appears that the work may endanger their health. In some cases, the company's policy includes transfer to less strenuous work, if this is feasible, and a guaranty of reemployment rights after conclusion of pregnancy.

It should be remembered that, even though a woman is industrially employed, she may continue to have important household duties. She will usually retain the major responsibility for shopping, care of children, care of the sick, and maintenance of the home. Accordingly, it is to be expected that absence rates for women will be somewhat higher than for men. This need be no drawback, provided absences are kept within reasonable limits,

and the experience of firms which have successfully used women workers for many years shows that this is entirely feasible.

EMPLOYMENT OF PHYSICALLY HANDICAPPED WORKERS

Many physically handicapped persons are efficiently employed in war work today. Experience indicates that such persons, suitably placed, are as productive as those considered unimpaired, and usually they contribute less to turnover and absenteeism than nonhandicapped workers. Full utilization of the handicapped in industry is important not only because it permits the use of a significant labor reserve during this emergency, but also because it provides the only satisfactory solution to a social problem which will necessarily become more pressing as a direct consequence of the war. The attitude and interest of employers will determine whether those injured in the war or in factories become in large measure wards of society or self-supporting, self-respecting, and responsible members of the community.

The principal bar to the utilization of the handicapped has been the indiscriminating physical prerequisites for employment imposed by many employers. *The key to the effective use of the impaired is full application of the principles of selective placement.* This implies that a job which is to be filled will be analyzed in terms of the specific mental and physical requirement and experience that its successful performance entails, and that all workers who meet these requirements will be given consideration. If the job analysis is carried through in these specific terms it will frequently be evident that the possession of certain physical handicaps is completely irrelevant to satisfactory performance. For example, a leg impairment may not preclude efficiency in a sedentary job, but, under the indiscriminating physical standards for employment adopted by some plants, it might prevent the hiring of a highly productive worker. Positions for some handicapped workers may be found by spot placement, but full utilization can be achieved only by a systematic policy of selective placement. Further information on the application of selective-placement principles in war plants may be obtained from the U. S. Bureau of Labor Statistics.

Employers are sometimes reluctant to hire handicapped persons because of fear of higher workmen's compensation costs in the event of a second injury. Many States have made provision for this contingency by limiting the employer's liability to the injury received in his employ. Information on this subject may be obtained from any State workmen's compensation commission or from the Division of Labor Standards of the U. S. Department of Labor.

EMPLOYMENT OF RACIAL MINORITIES

National policy demands that war plants utilize without discrimination all racial groups within the community. The problems encountered in bringing a racial minority into a plant work force for the first time may pose unusual difficulties, but they are similar in nature to those involved in gaining acceptance of other new groups of employees. *Before initial placement, a special effort should be made to insure that the new group will be accepted by*

both workers and supervisors. Points in favor of the step should be carefully explained, and all objections should be met as far as possible at that time. The logical starting point is a discussion of the problem with unions or other employee groups. The cooperation of such groups, if it can be obtained, will vastly facilitate an initial educational effort.

Special attention to the adequate training and proper placement of the first members of a racial group to be added to the work force is most important. Proof of personal efficiency is usually a major element in securing acceptance by other workers. Once some members of a racial group have been accepted, others may be added with a minimum of difficulty. *A proper choice of supervisors during the initial stages must also be given careful consideration.* A supervisor who is unsympathetic to the undertaking may render wholly untenable the already difficult personal position of the new worker, and in any case the supervisor's attitude is likely to influence unfavorably the attitude of other workers. It should also be remembered that members of a racial minority newly brought into a plant will probably be confronted at first with a series of difficult and even embarrassing situations. Accordingly, they may require and should receive extra help in adjusting to the new environment.

EMPLOYMENT OF PART-TIME WORKERS

The employment of part-time workers will enable a company to increase its labor force and to utilize the special skills and training of persons not available for full-time work. The use of two or more part-time workers may release a full-time employee for another job for which split-shift scheduling is impractical. This type of recruitment also reduces absenteeism, since it permits the employees with outside responsibilities to work shorter hours. Many employers use part-time workers in order to provide time off for regular employees. Housewives probably comprise the largest potential source of part-time labor. Other groups include high-school and college students, white-collar workers, handicapped persons, and retired workers. Students used as part-time workers can become an important source of trained and experienced full-time workers during vacations or upon the completion of courses.

In employing part-time workers, the scheduling of satisfactory working hours is of major importance. *The hours during which part-time work is scheduled will largely determine the type of worker obtained.* Housewives are most likely to be available during the daytime. Late-afternoon and evening shifts will attract students and workers who have full-time jobs elsewhere. A few companies have part-time employees working in teams, one worker employed the first half of an 8-hour shift and the other the second half.

Office and clerical work involves many jobs of routine nature which are particularly adaptable to part-time workers. This practice often permits the transfer of regular workers to production jobs.

The recruitment of office workers and businessmen for part-time production jobs has been especially satisfactory in some

cases. Employers report that such workers have lower turnover and absence rates, and in some cases higher rates of production, than full-time employees. The more strenuous production work supplements sedentary office work in a way that seems to be beneficial to the individual. Workers who attempt to carry a part-time job in addition to a physically exhausting full-time activity are usually less satisfactory.

Some additional record keeping must be expected in connection with the use of part-time workers, but this will seldom be an important consideration. The assimilation of part-time workers into regular operations will be most difficult if their use is deferred or is withheld as a last resort. The limited use of part-time workers can provide valuable experience in advance of their possible utilization on a larger scale. *The scheduling of part-time personnel requires as much planning and initiative as for full-time workers.*

Training and Upgrading

Training services must be provided on a far more extensive scale during the war period than has been common in industry during peacetime. The need for preparing personnel quickly for new production routines and for training large numbers of recent recruits, many without previous industrial experience, requires the full utilization of all established types of training—supervisory, pre-employment, on-the-job instruction, and preparation for upgrading. Yet many companies managing large plants have expanded from small-scale operations and have had only limited experience with training. Other establishments which have grown only moderately often do not recognize the need of some training. It is frequently not realized that adequate training programs can be of considerable assistance in combating turnover and poor morale.

Of similar importance, at the present time, is the improvement and acceleration of upgrading procedures. The rapid expansion of establishments in war production, together with losses to the armed forces, creates unusual demands for skilled workers and supervisors. Since new employees with experience are ordinarily unavailable, these jobs in large measure have to be filled by the promotion of those already employed. This necessitates for many plants an advancement of upgrading methods to meet these needs, and enlarged facilities for supplementary training to insure that sufficient workmen will be qualified for promotion when needed. Well-organized upgrading systems also contribute to general efficiency by giving employees an added incentive to do good work and remain at the plant. *An evaluation of existing facilities for pre-employment instruction, job training, and training for promotion is therefore of real importance.*

SUPERVISORY TRAINING

The training of supervisors is probably neglected most, since the effects of inadequate training are often not directly perceptible in plant operation. Actually, poor supervision has many serious and pervasive consequences, ranging from employee dissatisfac-

tion (with its resultant excessive turnover) to production deficiencies. *At the present time, when supervisory work carries additional heavy responsibilities for new processes, new products, and the training of other workers, the adequate preparation of leadmen, foremen, and superintendents is especially necessary.*

A satisfactory basic training for supervisors which demands a minimum of cost and participation from management may be provided by the WMC Training Within Industry courses. Information on these courses may be secured from the nearest War Manpower Commission office or from the Bureau of Training, War Manpower Commission, Washington 25, D. C. Three 10-hour courses are available in Job Instruction, Job Methods, and Job Relations training. The first of these gives the essential points involved in training others, the second covers the improvement of specific production methods, and the third stresses the principles involved in working best with subordinates. The courses are stripped to essentials and geared to the tempo of war needs. Plant officials in charge of training may take 4-day institute courses. These may be supplemented by any variety of additional training developed by the individual company or by private management organizations.

PRE-EMPLOYMENT TRAINING

Pre-employment training may be necessary when large numbers of recruits must be taught certain operating skills or when workmen must be prepared for assignment to relatively complex duties. Procedures for formulating the courses and determining the number of trainees for various jobs are important initial steps in planning such training. Arrangements are often made to carry out this training with the help of outside institutions or Government agencies. Government services are available for the pre-employment training of production employees through vocational schools (the Vocational Training for War Production Workers Program), and for training engineers and other technical personnel in colleges and universities (the Engineering, Science and Management War Training Program). Both programs are administered by the U. S. Office of Education, Washington 25, D. C. Close collaboration between the plant and training agencies is valuable in developing an appropriate program, since pre-employment training is necessarily on a more formal basis than other types of employee training. Such programs, whether inside or outside the plant, are most effective when the equipment and operating methods used in teaching are closely related to those used on the job. *Since pre-job training for most plants will be new, or on a greater scale than before the war, formal provisions by management should cover the entire program of preliminary training.*

ON-THE-JOB TRAINING

Since on-the-job instruction comprises the major part of plant training, the adjustment to wartime training needs will ordinarily be greatest here. Instruction methods vary from plant to plant and are usually evolved from individual technical requirements and the previous experience of the company in job instruction. Nevertheless, substantial modifications or expansions in

training facilities may be necessary. After planning, they should be introduced carefully and reviewed continually for adequacy. The Apprentice-Training Service of the War Manpower Commission may be found useful in connection with on-the-job training and upgrading programs and apprenticeship plans.

An accelerated rate of training may require special help for those who teach, whether these instructors are fellow employees or supervisors, in order to insure a satisfactory level in the quality of instruction. *A common fault is an inadequate number of instructors.* A supervisor heavily burdened with other duties can give only cursory attention to trainees. The training load must be balanced against other responsibilities. *Another fault is inadequate preparation.* Successful teaching, especially under pressure, demands complete familiarity with training materials and methods. *The instructor must know not only what to teach but how to teach.* It is evident that the key point in successful on-the-job training is more likely to be the instructor than the trainee. Use of the WMC course on Job Instruction methods, mentioned previously, may help in improving the results of on-the-job training.

UPGRADING PROCEDURES

A systematic upgrading procedure is an important step in meeting requirements for experienced workmen. *Success in building up working staffs for new plants or for plant expansions will depend largely on the capacity of upgrading methods for developing supervisors and skilled employees.* Although the procedures regularly employed at most facilities may be generally satisfactory, the large scale and accelerated rate at which upgrading must take place will usually require some modifications. These will include a more careful search for ability and skills among workmen, a review of the standards for upgrading to higher jobs, improved rating methods, more effective means of acquainting employees with opportunities for promotion, and supplementary training programs.

The volume of upgrading necessary to staff new facilities and maintain adequate numbers of workers in critical occupations in spite of high turnover rates will demand more elaborate planning to meet the needs of the different departments. An important initial step is the exploiting of every possibility for promotion within the plant. This may require some analysis of the employment backgrounds of all personnel. *The failure to utilize fully the previous experience of workmen is common,* and is revealed by recent studies which show that in many plants, despite shortages of skilled help, significant numbers of employees are working at jobs requiring lower skills than those for which they are qualified. Factors contributing to such situations are hasty placement and failure to review the standards for promotion in the light of changes in job content and the abilities of current labor recruits.

Periodic rating of employees is becoming more essential in larger plants in order to provide supervisors with standards on which to base upgrading. Whether formal ratings are employed or not, extensive upgrading can be attained best when the selec-

tion of men for promotion or for enrollment in upgrading courses proceeds with a minimum of friction. Even in the absence of collective agreements covering upgrading procedures, consultation with employee representatives is important in assuring acceptance of a plan. Employees should be well informed of all possible avenues of promotion open to them. The basis for selection, whether merit, seniority, or some combination of these and other factors, should be applied as objectively as possible to avoid any suggestion of favoritism.

The knowledge that systematic upgrading is practiced, and that promotion from within is an established policy, is a powerful stimulus to morale and an effective means of reducing turnover. In weighing promotion from within against recruitment from without, it should be remembered that the company usually has full knowledge of the weaknesses as well as the strengths of the old employee, whereas only the good points of the prospective worker are usually apparent. The advantages offered by the newcomer should be great indeed to outweigh the accumulated experience of the man on the job and to balance the possibility of damaging worker morale generally.

After selection of workers who may be upgraded, it may be desirable to provide supplementary training. This may be on-the-job instruction of an informal nature, following the idea of providing an alternate for every critical job. In some cases, outside training in vocational schools may be used to advantage. Here again the Vocational Training for War Production Workers Program of the U. S. Office of Education may be of assistance.

Wage Structure

The effect of the wage structure of an establishment on labor utilization is usually somewhat indirect, but it is none the less important. Substandard wage levels encourage turnover and increase recruitment difficulties. Maladjustments in wages within the plant may lead to dissatisfaction, poor morale, and unsatisfactory labor-management relations.

GENERAL WAGE LEVELS

Wage rates which are generally below those available to workers at other plants in the same area will create dissatisfaction, cause workers to seek other jobs, and make difficult the recruitment of replacements. It cannot be assumed that the general wage level is satisfactory simply because there is no direct or organized complaint from the workers. Careful analysis of reasons for quits and a coordinate study of the sources from which new workers are obtained may help in establishing the relative position of a plant with respect to wages.

Arbitrary adjustment of wage rates is counter to the wartime national stabilization policy, but a company may petition the National War Labor Board for permission to correct substandard scales. If the necessary data are not already available from previous studies, such a petition will usually result in a survey to determine if the wage levels of the petitioner are, in fact, out of line, and the results of the survey will form the basis for a deci-

sion. A company which appears to experience excessive turnover or unusual recruitment difficulties as compared with other firms in the same area should examine its wage levels as a possible source of the difficulties. (Figures on average hourly and weekly earnings by industry, and on wage rates in certain key occupations by area, for comparative purposes, may be obtained from the Bureau of Labor Statistics on request. Also see Appendix, table 5. Information on official wage brackets, as distinguished from wage rates, may be obtained from the War Labor Board, Washington 25, D. C.)

WAGE MALADJUSTMENTS WITHIN THE PLANT

Inconsistencies in wage rates paid for similar types of work may easily develop at any time, but they occur most frequently during periods when plants are expanding rapidly or are changing their product lines. Such inequities inevitably produce irritation and discord between employer and employee, and a continuing effort should be made to discover and eliminate them. Simplification and standardization of job titles should be an accompanying objective.

It is essential that any system of wage or job-content review which is adopted be accepted by employees as fair and equitable. Once so recognized, such a plan can smooth and speed collective-bargaining procedures with respect to wages.

PROCEDURE FOR EXPLAINING WAGE COMPUTATIONS

Many workers do not know how their actual take-home pay is computed. This lack of understanding may cause dissatisfaction and disputes. For example, at the time the withholding tax was applied in July 1943, some workers quit their jobs in protest simply because they misunderstood the purpose and effect of the deductions. *It is desirable that the worker be furnished an explanation of the method used in computing his earnings, and a statement of the type and amount of any deductions which are made.* One means of accomplishing this is to include with each payment a slip of paper which indicates the number of hours worked, the amount earned at each rate of pay, total earnings, and any deductions from pay. It is also helpful to indicate a specific place where the worker can go to secure information on wage computations and where any dispute over the amount of pay can be settled promptly.

SHIFT DIFFERENTIALS

Most plants which operate more than one shift have found it desirable to establish some form of wage differential to compensate for the inconvenience of late-shift work. *The lack of an adequate differential may explain difficulty in recruiting sufficient labor to man the late shifts.* The same factor may contribute to difficulties in obtaining adequate supervision on late shifts.

TRAINEE WAGE RATES

Wage payments for pre-employment training must be related to the job opportunities available to inexperienced workers. Some pre-employment training is frequently desirable, especially in

plants where the supervisory staff is overloaded and not able to give sufficient time to training new workers. Wage payments during training should be so adjusted that the necessary balance between pre-employment and on-the-job training is maintained.

INCENTIVE SYSTEMS

Recently, proposals have been considered by many companies for the installation of incentive wage-payment systems. The general purpose of such systems is to provide the individual worker with an incentive to increase his efficiency, by basing his earnings on the amount of production achieved. If piece-rates are in effect, there is, of course, a direct relationship between output and earnings. Most of the newly proposed incentive systems attempt to provide a similar result in situations in which piece-rate systems cannot readily be applied. Incentives are frequently on a group basis, since the output of a group may be subject to measurement although that of an individual is not. In general, the efficacy of such a scheme declines as the size of the group to which it is applied increases.

While the success of incentive wage systems depends to a large extent upon the particular type of incentive plan adopted, even more important is the day-to-day administration of the plan and the degree of its acceptance by the workers and supervisors affected. No incentive-wage plan can succeed if it is not thoroughly understood by those immediately concerned; employees paid on an incentive basis must know how their weekly pay has been computed, if suspicion and antagonism are to be avoided.

Working Hours and Shift Schedules

The effort to obtain maximum production from existing facilities and from a limited labor supply has led to a greater use of extra shifts and to longer working hours for the average employee. However, the goal of full facility utilization is distinct from and may be in conflict with the goal of full labor utilization. The attainment of maximum production from a given plant may easily require an inefficient use of at least some workers. Which of the two objectives receives principal emphasis will depend on the situation at each individual plant.

UTILIZATION OF PLANT FACILITIES

Maximum plant utilization would require that all work stations be manned continuously. This is seldom achieved, even when production demands are heavy and labor is in ample supply. Few plants attain such perfect balance between departments that all can consistently operate at peak levels.

A precise measure of facility utilization would require an actual count of all work stations and a study of the percentage of time each was manned. Beyond the difficulties involved in defining work stations, the time and effort required to obtain such a measure is usually out of proportion to its value; less exact measures are adequate for most purposes. The most common measure of facility utilization rests on the assumption that the

daytime weekday shift is likely to be fully manned. Late-shift and week-end employment is then expressed as a percentage of the number working on the first shift during the week.

Figures on relative shift employment for a number of industries during the period March 1943 to December 1944 may be obtained from the Bureau of Labor Statistics (see Appendix, table 3). These may be used to show the position of a specific plant relative to other similar facilities. However, such comparisons should be made with caution, since in many plants, even in continuous-process industries, it is common practice to schedule during daylight hours operations such as maintenance and repair which do not depend on factory equipment. Consequently, even when equipment is fully utilized, first-shift employment may substantially exceed that on the second and third shifts.

The extent to which plant facilities are used will depend primarily on production demands. Greater facility utilization is of interest in connection with labor utilization mainly as it imposes on management the necessity for scheduling longer working hours or extra shifts in an efficient manner.

LENGTH OF WORKWEEK

Diminishing labor reserves and increasing recruitment difficulties tend to shift the current emphasis to intensive utilization of the existing labor force. Practically all war industries have increased their weekly hours above peacetime levels. By increasing weekly hours, the demand for additional labor is reduced and, to some extent, employment is stabilized, since overtime payments provide an opportunity for higher earnings. (Current information on the average number of hours worked per week for comparative purposes may be obtained from the Bureau of Labor Statistics. See Appendix, table 5.)

As working hours are increased, hourly output tends to decline and absenteeism to increase. Long hours for relatively short periods may not result in lowered efficiency, especially if the urgency of the need for increased production is apparent to the individual worker. However, sustained long hours may reduce efficiency to a point at which total production is actually less than might have been achieved on a more moderate working schedule.

There is no optimum workweek for all workers and all types of jobs. Since heavy work cannot be continued over as many hours as light work, the physical effort required must be considered. On the other hand, many jobs which could not be classified as heavy work require such sustained application, concentration, or mental effort that fatigue develops rapidly. Workers vary in their resistance to fatigue, and this factor is of special significance at present when the labor force is abnormally heterogeneous.

The extra effort demanded of the worker by longer hours is not the only, and perhaps not even the most important, factor influencing his efficiency. Extra working hours reduce the time available to the worker for rest, recreation, and personal affairs. If the hours spent at work, in traveling, and on necessary personal business, taken together, do not leave sufficient time for proper rest and relaxation, the worker's efficiency will almost

certainly decline. *Chronic fatigue of workers must be carefully avoided.*

Experience indicates that a schedule of 48 hours per week, recommended for and adopted by most war plants, does not result on the whole in any serious deterioration in worker efficiency. Some plants have had success with longer schedules and others have not. Even a moderate increase in working hours above the 48-hour level may substantially increase strain, fatigue, accident rates, and absenteeism, and may require great effort from management to prevent what otherwise might be minor difficulties from developing into serious problems.

The length of the workweek is determined both by the number of hours per day and by the number of days per week. If daily hours are set above the customary eight, a policy of organized rest periods at regular intervals during the shift may help to sustain output. Lengthy workdays are especially likely to create difficulties, if the shopping and transportation facilities available to the workers are limited.

The number of consecutive days worked may be even more important than the number of hours per day. *Every worker in a plant should have regularly scheduled days off.* If the facilities are being operated continuously, provision for this may require considerable ingenuity in scheduling. Some plants have adopted a schedule of five 10-hour days in place of the more conventional six 8-hour days, and report that the provision of two consecutive days off, one necessarily a weekday, more than balances the effects of the longer workday. Plants operating on such a schedule and reporting to the Bureau of Labor Statistics have a lower average absenteeism rate than do other plants in the same industries.

SHIFT ASSIGNMENT

If the shifts do not rotate, most workers prefer assignment to the regular daytime shift. Since it is preferable to have employees work the shift of their choice, *late-shift work should be made as attractive as possible.* A bonus or differential in pay is almost essential and will serve as an inducement to some workers. Many of the objections to night work can be eliminated or minimized by providing night workers with opportunities for recreation, shopping, and necessary services. It is important that adequate transportation be available.

Late-shift workers should not be the plant's "forgotten men." They should be able to obtain food and refreshments as readily as daytime workers. The quality of their supervision should be as high. They should be able to present grievances or complaints to responsible quarters with equal convenience. Disregard of this principle will result in dissatisfaction and inefficiency.

Although it is not always possible to have employees choose their shift, it is essential that all workers feel that they have been treated fairly. Workers are sometimes assigned to shifts on the basis of seniority, but this method may not always be satisfactory since it concentrates the most-experienced employees in the first shift and attaches the stigma of inexperience to late-shift workers. In some cases, shift assignments may be made by the personnel

department as workers are hired. Workers will accept late-shift work with a minimum of discontent if it is clear that there is no discrimination or favoritism.

ROTATION OF SHIFTS

If shifts are rotated, there is no basis for employees to feel that they are singled out for unjust treatment. On the other hand, the rotation of shifts itself creates new problems. If shifts are changed frequently, many workers will find the continual rearrangement of hours difficult and tiring, and efficiency will suffer. *It is usually recommended that shifts be rotated not more frequently than every 4 weeks, if that often.* Service groups should rotate with production workers in order to maintain established relationships. Plantwide rotation is important if the workers rely heavily on share-the-ride clubs for transportation.

Certain workers will regard rotating shift work as wholly unacceptable. *Plants employing large numbers of women generally have found that stabilized shift arrangements are preferable.* Women frequently have fixed home responsibilities and will accept employment only if they can make fairly permanent arrangements for working hours.

Supervision of Workers

Foremen and other supervisors are responsible not only for the technical phases of the operations with which they deal, but also, in increasing measure, for the administration of a variety of personnel duties relating to the employees in their charge. In addition to training new employees, they must often help them adjust to their new jobs, explain the importance of their work and its relationship to the rest of the organization, and indicate promotional possibilities open to them. They explain company policies, hear employee grievances in the first instance, check on absenteeism and turnover, and take general disciplinary measures. Besides keeping production and employment records, they sometimes help employees with annuity, tax, and thrift forms. The status of employee-management relations is largely determined by the effectiveness of lower-grade supervisors. The foreman is the representative of management with whom the worker is most frequently in contact, and the employee's relations with the foreman will strongly affect his relations with the company.

Continual watchfulness is required to maintain satisfactory supervision. With the pressure for increasing production, the selection of new supervisors has frequently been made solely on the basis of technical competence. Actually, the ability to lead and develop workers is probably more important. Supervisors themselves have been inclined to devote a great part of their time to output, with insufficient attention to the personnel and morale phases of their work.

MAINTENANCE OF A COMPETENT SUPERVISORY STAFF

In order to maintain an adequate and qualified staff in spite of both turnover and expansion of employment, *systematic plans for anticipating losses of supervisors and for training replacements*

are almost indispensable. Lack of planning will usually result in a series of minor crises and hasty adjustments when changes occur. Plans may take any form designed to suit individual company needs, as long as the nature and extent of forthcoming losses and possible replacements are compared. Replacements and additional supervisors can be provided by upgrading within the plant, new hirings, and transfers from other departments or other plants of the same company.

If a plant has had extensive turnover among supervisors, active training will be necessary in order to maintain an adequate quality of supervision. The kind and volume of training needed will depend on the particular situation. Training programs designed for supervisors differ widely from plant to plant. Some are of a formal classroom type, in which companies present courses of their own in indoctrination, instruction technique, and personnel relations. Others are more informal, consisting of regular meetings in which similar material is presented. All material presented for supervisor training should be prepared carefully as part of a regular program. Many programs include the War Manpower Commission Training Within Industry courses. Even if regular training is not carried on, periodic foremen's meetings can help to bring the knowledge of the more effective supervisors to bear on the problems of those with less experience.

NUMERICAL ADEQUACY OF SUPERVISORS

Plant efficiency will inevitably be less than the optimum if the number of supervisors is inadequate. This condition is more common than might be thought. Efficient ratios of supervisory to operating personnel will vary with the complexity of the work and with the number of new employees who require close supervision or training. The adequacy of given supervisory staffs will also depend, in part, on their technical background and on various subjective factors. Recent experience indicates that about 15 workmen to 1 nonworking supervisor is a valuable rule-of-thumb measure, but ratios may vary from 10 to 1 in cases in which workers require much attention or training up to 20 to 1 if experienced employees carry out routine tasks. At higher levels, each individual tends to demand more of the supervisor's time, and an official may be forced to choose between undue delays and unconsidered decisions if more than 6 subordinates regularly report to him.

AUTHORITY OF SUPERVISORY PERSONNEL

Unsatisfactory supervision may result from indefinite or vacillating company policies concerning the authority of supervisory personnel. In plants in which large numbers of new supervisors have recently been upgraded, managements are frequently hesitant in extending proper authority to supervisors. *If a foreman is not fully informed concerning his responsibilities, he may be reluctant to make decisions or he may tend to overstep his authority; either result leads to inefficiency.* A supervisor will not continue to command respect and confidence if he fails to make decisions or if his decisions are overruled. Whatever jurisdiction is delegated supervisors with respect to promotion, discipline, and

discharge should be made clear both to them and to their subordinates. In situations in which there are many new supervisors, it may be desirable for management to review regularly the more critical decisions, but this can be done without unduly restricting authority. Careful indoctrination of new supervisors can do much to avoid these difficulties.

Full authority over hiring and firing is seldom extended to foremen today. The foreman is usually limited to a recommendation for discharge, with approval from other officials necessary before final action. In many plants, foremen participate even less in the hiring process, and this has some undesirable consequences. A foreman can hardly be expected to feel full responsibility for the workers in his charge if he has had no voice whatsoever in their selection. After initial recruitment and selection by the personnel department, the final approval of the foreman should probably be obtained before a new worker is definitely assigned, except when emergency methods of staffing are necessary. Adoption of this policy not only carries a clear implication of responsibility but tends to build up the foreman's prestige and morale.

The activities of supervisors should be evaluated periodically. A convenient method is the assignment of efficiency ratings, although in small plants informal appraisals are sufficient. As an additional check, management should be alert to indications that workers are dissatisfied with their supervisor. It is important for plant personnel to know what recourse is available to an employee who feels that he has been unfairly treated by a supervisor.

PAY DIFFERENTIALS FOR SUPERVISORS

Rates of pay for supervisory jobs may require periodic revision to keep them appreciably above those for the employees supervised. With the addition of overtime and other allowances to workers' pay, the latter may sometimes exceed or be approximately equal to that of their foremen or leadmen. This will cause dissatisfaction and lead to some deterioration in efficiency, and, if generally known, will to some extent reduce the prestige of the supervisors among the workers. Inadequate differentials between supervisors' and workers' pay are particularly likely to prevail on late or special shifts. In general, a differential of about 25 percent between foremen's and workers' earnings is considered appropriate.

Plant Organization

A heavy additional burden has been imposed on the managements of most war plants by the difficulties of operating under wartime conditions. Old problems relating to production and labor have been intensified and new ones have been created. In many cases the strain has been augmented by substantial expansion, which has required changing from the informal relations characteristic of small plants to the specialized types of administration necessary for large-scale operations.

Because of the unremitting pressure of production schedules, there is frequently a tendency to meet problems on a basis of immediate expediency, rather than of fundamental principles. Under the circumstances, it is not surprising that various deficiencies in

the management structure occasionally develop and even escape attention for considerable periods. Successful administration is, of course, essential to effective labor utilization. The following discussion indicates a few of the points which appear to be neglected most frequently.

GENERAL ORGANIZATION

The basic principles of management organization, although widely understood, are frequently overlooked in the press of events, but always at a price. Ordinarily, at the time an enterprise is created, a suitable system of organization is selected after consideration of the functions to be performed and the scale of operations. Next, functions are grouped into specific jobs, and the requisite responsibility and authority are allocated to each. Too frequently, however, it is assumed that this process, once carried through, is then complete, so that no further attention is needed. On the contrary, both the organization and the situation surrounding it change daily, and unremitting care is needed to insure continued efficiency.

The responsibility for meeting any new problems created by new conditions should be specifically allocated without delay, and any alterations in or additions to the duties of officials thus made necessary should be brought to the attention of others within the organization promptly. Otherwise, personality and policy conflicts will arise if several individuals concurrently assume the authority to take action. On the other hand, failure of anyone to assume responsibility may have even more serious consequences.

An organization chart may assist in keeping lines of responsibility and authority clear, but it can hinder this process if it is not kept up to date. An organization chart is not and can not be a substitute for a detailed understanding, preferably in writing, reached with each official and covering the specific limits of his responsibility and authority. Clarity in the specification of duties is essential if problems of divided authority or failure to fulfill duties are to be avoided. The activities of officials should be checked periodically to make certain that they correspond with those assigned.

Once lines of authority have been established, they should be followed regularly. The development of informal arrangements which tend to circumvent established lines probably indicates either an imperfection in the organizational structure itself or failure of some official to meet his responsibilities, thus requiring others to find some way around him. In either case, a change is indicated. Time and ingenuity are too precious to waste on cutting through unnecessary red tape or deadwood.

It is usually conceded that an organization should be built primarily around the job to be done, with flexibility to accommodate differences in personal abilities, rather than around individuals; under some circumstances, however, adherence to this principle is difficult. If the scale of operations has increased substantially, or if there has been heavy management turnover, there is usually a tendency to load additional jobs on the more competent members of the staff. This procedure has temporary advantages, and it may be necessary in an emergency. However, if it is continued,

it will eventually impair the efficiency of the entire organization. The overburdened individuals will find it possible to deal with many problems only on the basis of inadequate consideration or after unreasonable delay, and the results may be worse than if more details had been entrusted to less-experienced hands.

For reasons similar to those causing uneven distribution of the management burden, it is common to find that final authority for various types of decisions has been moved successively to higher levels. This may be desirable initially when close supervision over inexperienced officials seems required, but it is frequently continued long past the point of necessity. Only through continual insistence that decisions be made at the lowest possible level can it be insured that top management channels will not be clogged with minor detail.

In organizations of the line-and-staff type, expansion may result in the delegation of line responsibilities to staff members. The staff is thus progressively weakened to provide persons of experience and proven ability for operating jobs. Under such circumstances, the officials concerned cannot be expected to retain their staff responsibilities. Adequate replacements must be provided if the efficiency of the organization as a whole is to be maintained.

Another common difficulty in line-and-staff organizations is a gradual increase in the number of steps separating staff and line officials concerned with common problems. Direct rather than indirect contact should be encouraged by every means possible. For example, a personnel interviewer and a foreman may between them settle a difficult placement problem in a fraction of the time that would be required if the departmental heads were also to be involved.

ORGANIZATION AND LABOR-MANAGEMENT RELATIONS

Sound working relations with unions or other employee groups are essential to good labor utilization. Probably a majority of the topics treated in this study are subject to action through collective-bargaining procedures. For example, all questions relating to wages and working conditions obviously fall in this category. With the right to collective bargaining recognized and protected by law, and with the great majority of war workers covered by collective-bargaining agreements, the interest of all managements in this aspect of employer-employee relationships is obvious.

During the war period, labor and management groups in many plants have gone beyond collective bargaining in the narrow sense, and into many fields of cooperative action. There has been widespread recognition of a joint interest in the prosecution of the war, and a realization that a common effort to solve mutual problems is more likely to prove successful.

Where unions have had the opportunity, many have made outstanding contributions to better labor utilization. They have cooperated with management in creating absence-control arrangements, organizing systems for the improvement of production methods, administering employee-service plans, establishing morale-building programs, modifying previously agreed contract provisions, and in many other ways. In most such cases, the man-

agements of these companies have also demonstrated a genuine spirit of cooperation with labor, and have evidenced this by implementing collective-bargaining procedures and by sharing both the right to appraise and the burden of solving problems of mutual interest.

Neither collective bargaining nor other forms of labor-management action can function effectively and to the best interest of both parties unless the principle of continuing consultation and action on joint problems as they arise is fully accepted. This implies that joint panels, groups or committees will be established as needed, and that they will be serviced to the best ability of both parties. It is essential that those representing management in such groups be authorized to make commitments, and be able to guarantee prompt action on points where agreement is obtained, as far as management is concerned. There will inevitably be honest disagreements, but the means to settle them can usually be found if the desire to reach agreement is present. Limited or grudging participation will jeopardize the benefits which may be obtained through collective action, and at the same time will avoid no single problem of employee-management relationships.

GRIEVANCE PROCEDURES

Unsettled grievances, real or imaginary, lower morale and efficiency. It is of great importance to employees to know that they may obtain, without fear of reprisal, prompt and just consideration of any complaints which they may have. Under present man-power controls which limit the freedom of the worker to seek other employment, it is more important than ever that accumulations of grievances do not provide a focal point for discontent. Accordingly, an organized procedure for adjusting grievances is virtually a necessity in any large plant, and formal grievance plans are almost universally incorporated in union agreements. These differ in their specific provisions, but the details are less important than that the established procedures function smoothly and speedily.

A grievance plan is largely what management makes of it. If it is regarded as a troublesome formality, if hearings are permitted to degenerate into long discussions of trivial issues, if delays and postponements are common, the entire purpose of the arrangement may be defeated. Instead of wholesomely clearing the air, the grievance procedure will itself become an additional cause for dissatisfaction. If, on the other hand, management representatives approach grievance questions with a real determination to reach a fair understanding promptly, and with a willingness to go at least half way to seek it, the grievance procedure may have an uplifting influence on all phases of employee relations.

ORGANIZATION RESPONSIBILITY IN CONNECTION WITH LABOR-UTILIZATION PROBLEMS

The experience of most plant managers was mainly acquired during a period when the supply of labor was more than adequate and, consequently, when there was less emphasis on full labor utilization. Perhaps for this reason, many seem to feel that

problems relating to labor are less pressing than others, and accordingly that consideration of them may be safely deferred. In many cases this has resulted in prolonged and indefinite delays in the establishment of comprehensive policies and adequate programs of action on labor questions. More instances of extremely poor labor utilization can probably be traced to such dilatory attitudes than to any other single factor. The broader labor problems should be treated in the same way as other important questions which confront management; they should be carefully considered, and appropriate policies and programs should be agreed to and implemented promptly.

In all but the smallest plants, maximum utilization of employee effort will require specialized attention within the management to various particular activities relating to labor. Among the activities which recent industrial experience indicates are sufficiently important to demand such attention are the following: Recruitment and selection of workers, coordination of production and employment programs, training, personnel counseling, termination interviews, draft-deferment procedures, working conditions, safety, grievance procedures, employee-suggestion programs, and employee-service programs. The clear imposition on an appropriate individual of full responsibility for any of these activities that are carried on is one of the most important steps toward insuring effective administration. The establishment of proper channels of responsibility also facilitates a routine check on performance and helps to avoid indefinite policies and ineffective procedures.

Plant Methods

The amount of production obtained from a particular facility with a given expenditure of labor will depend more directly on operating procedures and manufacturing techniques than on any other factors. At the same time, this phase of labor utilization is one of the most difficult to judge.

The most satisfactory method of appraising the over-all efficiency of plant methods is by direct comparison of records of output per man-hour with similar records for a representative selection of other plants or departments performing substantially the same job. However, such measures are rarely available, and then usually only as the result of special studies. Moreover, it should be remarked that records of man-hour output cannot be used without additional information to distinguish between ineffective use of labor and unsatisfactory manufacturing techniques. For example, an average showing might represent inefficient use of modern equipment or excellent use of less up-to-date facilities. The distinction is important during the war period, because it has been necessary for many plants to use equipment which is not the best for the purpose.

In the absence of comparative records of man-hour output, it is usually necessary to rely on the judgment of men who, through education, experience, and familiarity with current technical literature, are qualified to appraise the relative effectiveness of different materials, methods, and machines which might be used in carrying out the plant's manufacturing functions. The ability

of management to develop such men within the staff has an important bearing on a plant's chances of continued success.

Periodic measurements of output per man-hour for a plant or for departments within it, even if comparative data are not available, may help in establishing and checking unfavorable trends in the efficiency of labor use. Such records are sometimes developed directly and in other cases as byproducts of cost figures. With intelligent use they can become a valuable management tool.

RESPONSIBILITY FOR IMPROVEMENT IN MANUFACTURING TECHNIQUES

In general, specific plant practices can be appraised only on the basis of detailed information obtained on the spot. Inefficient plant methods are in many cases due to lack of the same management follow-through that would be devoted to, say, a sales or financing problem. *For maximum effectiveness, the improvement of production methods must be a continuing job, definitely assigned.* Only unflinching attention can insure that a plant will remain abreast of the improvements which are being made constantly in materials, methods, and machines. The same alertness is required in order to realize upon the possibilities for improvement within the plant itself. Elimination of unnecessary handling of work in process, use of work-holding devices which save positioning time or which permit simultaneous work on several pieces, use of jigs to save time and conserve skills, elimination of unnecessary operations, simplification and rationalization of work procedures, and development of multiple-operation equipment constitute a few of the ways in which plants have reduced their needs for additional workers during the war period.

The function of improving plant practices, sometimes called production or industrial engineering, should be differentiated carefully from production control. The purpose of production control is to insure that the manufacturing process continues smoothly under existing techniques. It should also be distinguished from efforts to improve the design of the product itself. The work of the design department may influence production methods, but this is incidental to the main objective. It is hardly necessary to point out that, although these functions should be clearly separated and responsibility for carrying them out should be definitely allocated, they must at the same time be closely coordinated.

The maximum benefit from courses designed to help supervisors make improvements in work procedures, such as the course on Job Methods training of the WMC Training Within Industry program, can probably be secured when the necessary follow-up is carried out by those responsible for improving efficiency. A production-engineering group also forms the appropriate nucleus for the establishment of effective employee-suggestion programs.

A regular procedure for implementing the work of an industrial- or production-engineering department is necessary if the greatest possible return for this effort is to be achieved. During the earlier stages of munitions production, major emphasis was on manufacture in quantity at any cost. In that period, changes which might have resulted in the more economical use of labor were sometimes rejected because it was felt that they might

interfere, even if temporarily, with regular production. Today, need for economy in the use of labor is clearly evident.

IDLENESS AND LOST TIME

Labor utilization suffers most directly when workers stand idle in the plant. The prevention of lost time must begin with information on its extent and frequency. Some companies depend on knowledge informally conveyed. Others require regular reports to a responsible management official on all time lost by workers, and in some cases it is required that the reports cover idle machine time as well. Such reports should lead to corrective action, mainly to prevent recurrence.

To illustrate, a smoothly operating plant must maintain sufficient inventories of parts, materials, and components to insure that production flow is not delayed by deficiencies. This in turn requires that a company establish a schedule of deliveries in advance of need on all purchases. If lost-time records indicate that production delays are caused by shortages of materials, it should be established whether the situation is due to failure of the company's procurement policy or stock-control system, or to factors beyond the company's control.

Again, it is an accepted principle that maintenance of a reserve of work to be done at each work station is desirable. The amount should be sufficient to prevent minor delays at one stage of production from resulting in idleness of workers at others. Repeated instances of idleness or lost time may indicate inadequate provision for such contingencies, or that production control is not functioning satisfactorily.

A record of frequent machine breakdowns may indicate improper maintenance. The responsibility for maintenance of machinery and equipment should be clearly designated, and whenever possible maintenance should be scheduled during periods when machines are not expected to be in use.

If workers are unavoidably idle, various courses of action are open to management. The workers may be left on the production floor, laid off temporarily, shifted to other work, or given additional training. The last two possibilities will usually require advance planning. Perhaps the worst course is to let it appear that management is unaware of or indifferent to the situation. *The extent of idle time and the company's response to it can have a profound effect on worker morale and the general tempo of production throughout the entire plant.*

INSPECTION

Inspections are made to assure the consumer of a product meeting his specifications, to control production procedures within desired limits, and to prevent the waste of man and machine time through further work on defective parts. The last objective is sometimes overlooked. A check may reveal that inspections are too infrequent between processes, or that existing procedures do not provide means whereby any unusually high proportion of rejected work leads promptly to investigation of the causes and corrective action.

PLANT LAYOUT

It is universally accepted that plant layout should be such as to require a minimum amount of movement of work between successive work stations, and that storage bins and concentration points should wherever possible be located between work stations rather than in more remote parts of the plant. A substantial amount of backtracking in the flow of work usually indicates poor layout.

War production has required expansion in many plants, and it has sometimes been difficult to avoid piecemeal additions and complicated layouts. Correction of major faults in layout may be impractical if substantial alterations are required. On the other hand, a systematic examination may reveal a number of possibilities for smaller but significant improvements which require only minor changes in arrangement.

Working Conditions and Safety

SHOP CONDITIONS

Poor lighting, inadequate ventilation, or excessive noise will cut employee productivity as surely as poor tools, defective materials, or spotty supervision. In many cases, management may be unaware of defects in the working environment simply because no effort has been made to discover them. In others, known defects may be perpetuated because responsibility for their correction has not been allocated. A systematic appraisal of working conditions and a regular procedure for the correction of faults will pay dividends in greater productivity, higher morale, and better employee relations. It is to be remembered that desirable standards of lighting, heating, ventilation, and noise control depend on the type of work being done, and will vary from section to section in the same plant. It is clear that a detailed study rather than a casual inspection is essential. In many cases, union committees or other employee representatives may be most helpful in bringing conditions requiring correction to the attention of management.

A worker uses no tool as often as he uses his eyes. Accordingly, protecting and improving the efficiency of sight must rank high among the objectives of a program for improving working conditions. The proper level of illumination depends on the job. The manufacture or assembly of small parts, for example, demands more light on the work area than does the handling of stock parts in a warehouse. With good lighting, glare is minimized. Deep shadows are avoided, since they cause accidents as well as eye-strain. Because of their large illuminating area, fluorescent-type light sources have been much used recently to prevent glare and control shadows, but the same objectives may be reached with proper use of incandescent sources. Monochromatic lights, such as sodium vapor lamps, may be useful where the highest possible visual acuity is demanded for short periods. In some plants, effective use has been made of contrasting colors to improve visibility. Work areas are painted to contrast with work pieces, and danger spots are marked by bright colors. Light walls in neutral

tints help to maintain high lighting efficiency without distracting the worker's attention. Details of recommended practices with respect to industrial lighting may be obtained from the Division of Labor Standards, U. S. Department of Labor.

Where possible, room temperature should be adjusted in accordance with the physical activity of workers. A strategically placed exhaust fan may substantially reduce discomfort and increase efficiency in "hot spots" near furnaces or high-temperature equipment. Adequate ventilation is especially important where fumes are encountered. Air conditioning, adopted in many plants because of production necessities (for example, in plants making lenses, textiles, and precision metal parts), has been found to yield added benefits in terms of greater worker efficiency. An increasing number of installations because of this latter effect is to be expected.

Loud or monotonous noises cause nervous fatigue, and may contribute to accidents by masking audible warnings. Measures used to reduce unnecessarily high noise levels include cushioning of machines on resilient pads and isolation of exceptionally noisy machines from the main plant area. If the latter is impractical, a similar effect may sometimes be achieved by placing the equipment in soundproofed booths. Application of sound-absorbing materials to walls and ceilings, common in offices, also has a place in factories. Relief of fatigue and nervous tension during rest pauses and lunch periods is an objective which may be defeated by excessive noise. The entire atmosphere of a plant cafeteria has been changed by soundproofing. In some plants, music has been found to increase worker efficiency. Music has been especially useful in countering monotony without adding appreciably to the general noise level.

Many other aspects of the plant environment deserve careful attention. Cafeterias or canteens should be clean and attractive. Sanitary facilities, washrooms and locker rooms should be clean, convenient, and adequate. Neatly kept floors, aisles, and work areas encourage neat work habits and help to prevent accidents. Windows should be washed regularly and replaced promptly when broken. Bulletin boards should be conveniently located and kept free of obsolete material. Since the attitude of the worker will inevitably reflect his environment to some extent, cheerful and efficient surroundings are necessary if maximum efficiency is to be achieved.

Advice or recommended standards with respect to many phases of working conditions may be obtained from the Division of Labor Standards, U. S. Department of Labor, Washington 25, D. C., from the American Standards Association, 70 E. 45th St., New York 17, N. Y.; and from the American Management Association, 330 W. 42nd St., New York, N. Y. Standards relating especially to the employment of women may be obtained from the Women's Bureau, U. S. Department of Labor, Washington 25, D. C.

SAFETY

Aside from humanitarian considerations, accidents interrupt production, cost money, and result in the temporary or permanent loss to the employer of the services of experienced workers. Un-

safe working conditions lower morale and cut productive efficiency, since a worker cannot give his full attention to the job under such circumstances. Accordingly, safety programs have generally become a fixture in company policy. In many large plants, safety programs are maintained by full-time safety engineers.

The safety record of a plant may be judged by comparing its accident rate with the average for similar establishments. Instructions for computing such rates and comparative figures may be obtained from the U. S. Bureau of Labor Statistics. In various war industries, accident-frequency rates have recently ranged from less than 10 to more than 40 disabling injuries per million man-hours worked (see Appendix, table 4).

An adequate safety program should include four principal elements:

1. *Safe plant conditions.*—As far as possible, the plant should be made a safe place in which to work. For example, machines should have safety guards wherever possible. Workers should not be exposed to dangerous fumes or dusts, and should be protected against irritants and poisonous substances. Fire hazards should be eliminated, and adequate fire-fighting equipment should be available. Danger spots should be enclosed and adequate warnings posted. Where necessary, goggles and safety clothing should be provided, and workers should be required to use them. Most companies have issued special safety rules governing the clothing of women employees.

2. *Safety education.*—The employment of large numbers of workers who have had no previous factory experience has made it necessary for management to emphasize even the most elementary aspects of safe work habits. Many companies issue to new workers small booklets which contain instructions regarding the prevention of fire, the administration of first aid, the protection of the plant against sabotage, the correct methods of handling various tools and machines, and general good housekeeping. Usually, management does not rely solely on printed material dealing with safe practices; demonstrations and lectures supplemented with slides and movies are frequently used. Supervisors should be responsible for the proper education in safety procedures of the workers in their charge, and should see that unsafe methods are not followed.

3. *First aid.*—In the event of an accident, it should be possible for the injured to receive prompt and intelligent assistance. Supplementing the plant's medical staff, there should be available in each section of the plant at least one person with accredited first-aid training. First-aid cabinets should be strategically placed throughout the plant. These steps are especially important in plants without a full-time nurse or doctor on each shift.

4. *Accident reports.*—To prevent recurrence, there should be a follow-up on every accident. A responsible official should receive a report on every injury, no matter how slight. It should be his duty to investigate the circumstances and, if the accident appears preventable, recommend steps which will prevent any similar happening in the future. Any other course approaches a deliberate refusal to profit from experience.

Information or advice on many aspects of plant safety or safety education may be obtained from the Division of Labor Standards, U. S. Department of Labor, Washington 25, D. C.; from the National Safety Council, 20 N. Wacker Drive, Chicago 6, Ill.; and from the American Standards Association, 70 E. 45th St., New York 17, N. Y. Assistance may also be obtained from a number of State labor departments through their factory-inspection facilities.

Employee Morale

Morale, or the general attitude of a worker toward his job, affects production in numerous ways. Poor morale may render otherwise good production methods ineffective, while high morale has often resulted in exceptional levels of output under the most difficult conditions. Low worker morale is an important cause of high labor turnover, excessive absenteeism, and unsatisfactory productivity. In general, good morale implies a sense of common interest and common direction of effort among persons at every level who make up the organization.

There is no objective way of determining the status of morale. To reach a well-founded judgment, all possible avenues of information should be exploited. Impressions may be obtained from talks with supervisors, union officials, and employees. The reports of personnel counselors and those who conduct exit interviews may be of assistance.

It is to be remembered that it is possible for the general level of morale to be satisfactory while that of certain groups of workers is low. There may be morale differences between older and newer workers, between office and plant employees, or between workers and supervisors. Women may feel that they have less chance of promotion. Racial or national minorities may have low morale because of real or imagined discriminatory practices. Management should be alert to all such differences as well as to changes in the general level of morale.

Morale affects production, but the reverse is likewise true. Improper scheduling, delays in receiving tools or materials, inefficient production methods and the like may lower morale and create attitudes of indifference. The personal problems of workers will also influence morale. To the extent that these are of a community nature (housing, transportation, child care, shopping) management may be able to assist in their solution.

Morale cannot be built up by a single good practice, but it may be destroyed by a bad one. Grievance machinery, labor-management committees, employee-suggestion systems, vacation scheduling, promotion and upgrading systems, employee-recreation programs—all such activities may contribute to good morale and some may be essential to its existence. The improper functioning of any one, however, may largely invalidate the good effects of excellent administration of all the others. In fact, the smooth and effective operation of a program may be of greater importance than whether it exists. It is also to be remembered that the real usefulness of a practice or an activity may have less effect on morale than does what workers and management believe about it.

Few human institutions operate consistently at maximum efficiency. At the same time, few are wholly inefficient. Thus, it is seldom that the administration of any single activity is so defective as by itself to impair the general level of morale. More commonly, the most troublesome morale problems result from an accumulation of minor irritations. The only remedy is unremitting attention to the small personal details of day-to-day operations.

The above discussion has dealt primarily with factors which may depress morale. The detection and elimination of these influences is extremely important but the mere absence of such factors does not guarantee that morale will be high. There are two general conditions which seem essential to this achievement, and they indicate the lines along which an effective morale-building program may be built:

1. *The employee must be convinced that the plant is doing efficiently a useful job.* It is evident that before the employee can have such a conviction, the plant must really be functioning properly. There are few stockholders as critical of inefficiency as the average worker. Most workers have ample opportunity to observe any malfunctioning, but little chance to appraise the end result of their joint efforts. Many companies have made strong efforts to remedy this unbalance. Employees are informed regarding the job being done by each part of the organization, and the essential character of each unit's contribution is emphasized. Reports on the performance in actual service of the firm's products are secured and widely publicized. Bulletin boards, posters, movies, employee publications, and speeches may be used. Recently, some large establishments have made a regular practice of distributing an annual report on operations to each employee.

2. *The employee must be convinced that he is personally contributing to the joint objective, and that his contribution is recognized.* Any factor which tends to make the worker feel cut off or separated from the rest of the organization will impair his morale. For example, it will tend to diminish the worker's sense of identity of interest if he is not given satisfactory explanations for periods of idleness or for sudden changes in set routines. The same thing occurs if he feels that good work on his part is not appreciated, that his skills and abilities are not being fully utilized, or that favoritism is operating against him. Above all, it must be realized that the important factor is not the actual situation but rather what the employee feels about it. In all the cases mentioned above, the proper course of action is clear. A supervisor should keep the workers for whom he is responsible informed about impending changes which may affect them, as well as about the reasons for changes. He should give ungrudging praise for work well done. He should attempt to adjust cases of malutilization of skills. (The very effort will in many cases prevent discontent.) In general, the extent to which a worker develops a sense of participation will depend particularly on his relations with his immediate supervisor. The supervisor who fails to meet the worker's problems or who does not satisfy the human aspects of these problems will cut the worker off from the organization. Another supervisor may use the same problems as a means for knitting the individual more closely into the organization. An im-

portant part of building morale is to insure that the human aspects of supervision are not neglected at any level. The Job Relations Training courses of the WMC Training Within Industry program, are aimed directly at this problem, and may suggest the outlines of more elaborate company-planned programs.

A business in which an efficient framework of routine obligations and responsibilities has been created and which is staffed by competent persons is said to be well-organized, and it is frequently likened to a smoothly running machine. However, the cogs in a production organization are not machine parts; they are individuals who will function best if treated like human beings rather than as impersonal sections of a mechanism. It is not enough simply to remove morale-depressing influences. Fundamental to high morale and maximum efficiency is the creation of mutual trust, mutual respect, and, if possible, mutual liking between all the individuals who make up the organization.

TABLE 1.—Average Absence Rates¹ in Selected Industries, in Specified Months, and First and Third Quartiles of Distribution of Wage Earners by Absence Rates in November 1944

Industry	Average absence rate			November, 1944: Absence rates		
	1943: November	1944			First quartile ²	Third quartile ³
		September	October	November		
Guns.....	4.9	5.2	5.5	5.6	4.3	6.6
Ammunition.....	6.0	6.6	6.7	6.5	4.9	8.3
Tanks.....	6.4	5.9	6.2	6.6	5.1	7.8
Fire-control equipment.....	5.6	5.3	5.7	5.5	3.6	8.0
Firearms.....	6.4	5.2	5.0	5.3	4.3	6.0
Small-arms ammunition.....	5.3	5.0	5.1	4.9	4.0	4.8
Explosives.....	4.2	6.1	6.3	6.2	4.7	8.0
Petroleum refining.....	3.3	3.8	4.2	4.1	2.9	5.8
Miscellaneous iron and steel products.....	5.6	6.1	6.4	6.7	4.6	9.2
Blast furnaces, steel works and rolling mills.....	3.1	4.2	4.3	4.3	3.4	5.3
Foundries (ferrous).....	6.6	6.9	7.3	7.7	5.7	8.9
Steel forgings.....	6.0	6.2	6.4	6.2	3.5	7.2
Screw-machine products.....	5.4	5.4	5.7	6.0	3.9	7.2
Smelting and refining of nonferrous metals.....	5.6	5.7	6.2	5.9	3.6	7.9
Nonferrous metal products.....	5.7	5.2	5.5	5.7	4.2	7.2
Nonferrous metal foundries.....	5.2	5.5	5.8	6.9	4.6	8.7
Miscellaneous machinery.....	5.6	6.3	6.5	6.4	4.7	7.8
Engines except aero-engines.....	5.7	5.8	5.7	5.8	4.5	6.5
Metal working machinery.....	5.1	5.0	5.3	5.6	3.8	6.9
Electrical machinery except radio and communications equipment.....	5.7	5.7	5.8	5.8	4.3	6.6
Radio and communications equipment.....	5.9	6.1	6.0	5.7	4.4	6.7
Airframes.....	7.2	5.7	5.7	5.7	4.6	6.4
Aircraft propellers.....	6.5	5.8	5.7	6.9	4.7	7.2
Aircraft parts.....	6.3	6.3	6.3	6.5	5.0	7.5
Aero-engines.....	6.9	6.1	5.9	6.1	4.2	7.4
Shipbuilding.....	7.9	9.0	8.2	8.5	6.8	9.9
Automotive.....	5.5	5.8	6.3	6.5	5.0	7.3
Instruments and optical equipment.....	5.8	6.3	6.3	5.8	3.5	8.1
Average, above industries.....	6.0	6.3	6.2	6.3		
Metal mining.....	7.0	6.0	6.2	7.1	3.7	9.5
Anthracite mining.....	5.8	6.7	6.3	7.1	5.0	8.5
Bituminous-coal mining.....	9.4	12.1	12.4	12.5	9.7	16.3

¹ Absence rate is defined as whole days of work lost by wage earners because of absences, whether excused or unexcused, as percent of man-days scheduled. Workers on strike or on a regularly scheduled vacation are not considered to be scheduled to work or as absent. Reports cover about 5,000 establishments employing more than 5 million wage earners. Data are mainly for week ending nearest the 15th of the month, but a few reports referring to other periods are included.

² Establishments employing 25 percent of the total number of wage earners covered in each industry reported absence rates equal to or less than the figures shown in this column.

³ Establishments employing 25 percent of the total number of wage earners covered in each industry reported absence rates equal to or more than the figures shown in this column.

TABLE 2.—*Monthly Labor-Turnover Rates (Per 100 Employees), for Men and Women in Selected Industries Engaged in War Production, November 1944¹*

Industry	Total separation rate		Quit rate		Total accession rate	
	Men	Women	Men	Women	Men	Women
Guns, howitzers, mortars, and related equipment.....	4.8	10.0	2.9	5.8	5.7	9.2
Ammunition, except small-arms.....	7.0	9.3	4.9	7.7	9.7	11.5
Tanks.....	4.9	7.4	3.5	6.1	6.2	7.2
Sighting and fire-control equipment.....	1.8	3.4	1.3	2.7	2.9	4.8
Blast furnaces, steel works, and rolling mills.....	2.7	7.0	2.1	5.6	2.6	5.1
Gray-iron castings.....	6.7	7.1	5.3	5.8	7.9	7.7
Malleable-iron castings.....	5.8	8.6	4.6	4.5	6.1	5.9
Steel castings.....	7.1	7.6	5.5	5.7	7.0	8.4
Cast-iron pipe and fittings.....	3.8	4.7	3.2	3.1	5.9	6.0
Firearms, 60-caliber and under.....	5.0	11.3	2.4	4.0	3.4	6.5
Electrical equipment for industrial use.....	2.9	5.5	2.1	4.4	2.0	4.2
Radios, radio equipment, and phonographs.....	4.7	6.8	3.1	5.1	3.8	5.1
Communication equipment, except radios.....	2.9	4.3	2.0	3.5	2.7	3.7
Engines and turbines.....	3.9	7.1	2.6	4.4	4.3	5.7
Machine tools.....	2.4	5.0	1.5	3.6	2.8	4.6
Machine-tool accessories.....	3.2	5.6	1.9	3.7	2.8	3.6
Metalworking machinery and equipment, not elsewhere classified.....	3.0	4.4	1.9	3.3	3.2	5.2
General industrial machinery, except pumps.....	4.0	6.4	2.5	5.0	3.8	4.0
Aircraft.....	4.5	7.0	3.3	5.8	4.2	6.8
Aircraft parts.....	4.3	8.2	2.6	4.3	3.5	5.2
Shipbuilding and repairs.....	8.8	12.3	5.8	8.7	8.8	10.6
Primary smelting and refining, except aluminum and magnesium.....	2.7	6.6	2.2	5.4	2.6	4.3
Aluminum and magnesium smelting and refining.....	10.7	12.7	5.5	8.1	6.1	5.5
Rolling and drawing of copper and copper alloys.....	3.5	6.2	2.7	5.5	3.7	6.7
Aluminum and magnesium products.....	5.0	6.9	3.3	4.6	4.8	6.4
Nonferrous-metal foundries, except aluminum and magnesium.....	5.0	8.5	3.8	6.3	5.5	7.9
Industrial chemicals, except explosives.....	3.7	5.2	2.7	4.0	3.8	4.3
Explosives.....	5.8	9.0	4.5	7.4	7.7	10.2
Small-arms ammunition.....	4.2	6.0	2.5	4.5	5.8	7.4

¹ Turnover rates for men and women combined are available for about 90 industries.

TABLE 3.—*Women as Percent of Total Wage Earners, November 1943 and 1944, and Extent of Late-Shift Work, November 1944, in Selected Industries*

Industry	Women as percent of total wage earners		Number of man-days of work scheduled per 100 man-days scheduled on first daylight shift, November 1944	
	November 1943	November 1944	Second shift (afternoon)	Third shift (night)
Guns.....	18.5	19.6	36	12
Ammunition.....	40.4	42.7	42	17
Tanks.....	16.2	18.9	43	7
Fire-control equipment.....	35.8	36.6	16	2
Firearms.....	34.8	36.8	24	4
Small-arms ammunition.....	46.8	48.6	51	29
Explosives.....	19.7	29.1	57	46
Petroleum refining.....	7.0	7.7	24	21
Miscellaneous iron and steel products.....	23.1	23.7	24	7
Blast furnaces, steel works, and rolling mills ..	8.2	9.9	51	39
Foundries (ferrous metal).....	7.1	7.5	29	12
Steel forgings.....	11.7	11.2	44	18
Screw-machine products.....	39.9	35.5	33	3
Smelting and refining of nonferrous metals.....	4.4	6.7	27	20
Nonferrous-metal products.....	17.2	19.2	40	19
Nonferrous-metal foundries.....	13.1	20.1	30	11
Miscellaneous machinery.....	16.4	22.0	26	10
Engines except aero-engines.....	12.4	16.6	39	14
Metalworking machinery.....	14.1	15.4	22	3
Electrical machinery, except radio and communications equipment.....	40.0	40.7	30	9
Radio and communications equipment.....	61.8	60.3	16	3
Airframes.....	43.1	39.9	59	8
Aero-engines.....	29.2	28.3	63	17
Aircraft propellers.....	19.3	27.4	65	23
Aircraft parts.....	28.3	30.0	41	9
Shipbuilding.....	11.0	12.7	43	12
Automotive.....	18.6	19.0	27	7
Instruments and optical equipment.....	42.1	44.5	20	3
Metal mining.....			31	11
Anthracite mining.....			23	3
Bituminous-coal mining.....			32	5

TABLE 4.—*Industrial-Injury Frequency Rates¹ for Selected Manufacturing Industries, 1943 and First Three Quarters of 1944*

Industry	First three quarters, 1944	Full year, 1943	Industry	First three quarters, 1944	Full year, 1943
Agricultural machinery and tractors	22.5	19.9	Guns and related equipment.....	17.1	15.5
Aircraft.....	9.3	9.7	Iron and steel.....	9.7	10.0
Aircraft parts.....	12.6	11.7	Machine shops, general.....	23.8	25.3
Ammunition, 20 mm. and over.....	24.8	19.0	Metalworking machinery.....	18.2	19.2
Ammunition, small-arms.....	7.1	5.1	Motor vehicles.....	13.7	13.6
Chemicals, industrial.....	15.4	18.3	Nonferrous-metal products.....	27.1	25.0
Construction and mining machinery	28.3	29.5	Radios and phonographs.....	8.6	7.9
Electrical equipment and supplies.....	11.0	10.9	Shipbuilding.....	24.7	31.5
Engines and turbines.....	12.3	18.2	Sighting and fire-control equipment	8.6	9.3
Explosives.....	6.5	5.3	Small arms.....	14.4	8.6
Forgings, iron and steel.....	35.4	40.8	Tanks, military.....	13.9	12.2
Foundries, iron and steel.....	43.6	43.4	Tools, except edge tools.....	26.1	25.5
General industrial machinery.....	23.4	23.0	Wire and wire products.....	23.5	21.4

¹ The frequency rate represents the average number of disabling industrial injuries for each million employee-hours worked. Similar information is available for about 60 additional industries.

TABLE 5.—Earnings and Hours in Selected Industries, November 1943 and 1944¹

Industry	Average weekly earnings		Average hourly earnings		Average weekly hours	
	November 1943	November 1944	November 1943	November 1944	November 1943	November 1944
			<i>Cents</i>	<i>Cents</i>		
Blast furnaces, steel works, and rolling mills.....	\$51.74	\$54.55	113.9	117.0	45.5	46.6
Gray-iron and semisteel castings.....	49.71	51.52	103.6	109.6	48.0	47.3
Malleable-iron castings.....	49.29	51.88	103.0	107.9	47.9	48.5
Steel castings.....	50.72	52.46	107.8	112.4	47.1	46.7
Forgings, iron and steel.....	60.24	60.57	122.5	127.4	49.2	47.5
Screw-machine products and wood screws.....	50.25	50.25	100.1	104.6	50.2	48.0
Firearms.....	60.34	60.70	124.3	129.6	48.5	46.8
Electrical equipment.....	48.89	50.81	103.3	109.4	47.4	46.5
Radios and phonographs.....	41.04	42.20	87.8	91.7	46.8	46.1
Communication equipment.....	43.08	45.59	92.5	100.1	46.3	45.7
Machinery and machine-shop products.....	52.83	53.84	107.6	111.6	49.1	48.2
Engines and turbines.....	59.31	59.81	118.6	123.5	50.2	48.5
Machine tools.....	55.05	57.97	109.4	114.9	50.3	50.4
Aircraft and parts, excluding aircraft engines.....	52.30	55.71	111.7	118.5	46.8	47.1
Aircraft engines.....	60.64	60.05	128.0	132.7	47.4	45.2
Shipbuilding and boatbuilding.....	65.61	69.13	135.9	141.5	48.3	48.8
Smelting and refining, primary, of nonferrous metals.....	47.95	48.32	104.7	105.5	45.8	45.8
Alloying and rolling and drawing of nonferrous metals except aluminum.....	53.53	54.09	110.9	112.9	48.3	47.9
Aluminum manufactures.....	49.18	49.83	104.6	106.8	47.0	46.9
Chemicals.....	50.40	52.48	108.2	112.1	46.5	46.8
Explosives and safety fuses.....	47.77	46.02	102.8	101.9	46.5	45.2
Ammunition, small-arms.....	42.43	45.29	94.6	97.8	44.9	46.3
Petroleum refining.....	56.20	58.92	122.0	125.4	46.1	46.7
Coke and byproducts.....	44.61	48.08	99.8	103.1	44.8	46.6
Professional and scientific instruments and fire-control equipment.....	54.20	55.03	105.3	113.6	51.5	48.5
Anthracite mining.....	28.02	44.39	111.1	115.6	25.6	38.6
Bituminous-coal mining.....	32.40	49.68	114.4	116.4	28.4	43.8
Metal mining.....	44.12	44.52	99.7	101.4	44.0	43.7
Crude-petroleum production.....	51.77	53.81	112.7	114.6	44.9	45.9

¹ Similar information is available monthly for about 125 additional industries.

BUREAU OF LABOR STATISTICS
REGIONAL OFFICES

REGION I.

Wendell D. Macdonald, Director
Old South Building
294 Washington Street
Boston 8, Mass.

REGION V.

Arthur A. Smith, Director
522 Irwin-Keasler Building
Commerce and Ervay Streets
Dallas 1, Tex.

REGION II.

Charles C. Center, Director
1000 Parcel Post Building
341 Ninth Avenue
New York 1, N. Y.

Kansas City Branch

Odus C. Clark, Regional Analyst
3000 Fidelity Building
Kansas City 6, Mo.

Philadelphia Branch

Kermit B. Mohn, Regional Analyst
814 Widener Building
Chestnut and Juniper Streets
Philadelphia 7, Pa.

REGION VI.

John B. Parrish, Director
302 National War Agencies Building
226 West Jackson Boulevard
Chicago 6, Ill.

REGION III.

Adolph O. Berger, Regional Director
420 Williamson Building
Public Square
Cleveland 14, Ohio

REGION VII.

Louis M. Solomon, Director
406 Burns Vault Building
1536 Welton Street
Denver 2, Colo.

Detroit Branch

Randle E. Dahl, Regional Analyst
1108 Francis Palms Building
2111 Woodward Avenue
Detroit 1, Mich.

REGION VIII.

William A. Bledsoe, Director
643 Furniture Mart
1355 Market Street
San Francisco 3, Calif.

REGION IV.

Harris P. Dawson, Jr., Director
308 Carl Witt Building
249 Peachtree Street, NE.
Atlanta 3, Ga.

Seattle Branch

J. W. C. Harper, Regional Analyst
516 Seaboard Building
Seattle 1, Wash.