

Industrial Nursing

WEDNESDAY AFTERNOON SESSION

October 9, 1940

The opening session for the discussion of industrial nursing problems was called to order by Joanna M. Johnson, R.N., Supervisor, Industrial Nursing Division, Employers Mutuals, Wausau, Wis., and Chairman,

Industrial Nursing Section, N.O.P.H.N., who presided. The Chairman called attention to the importance and breadth of the program that had been scheduled, and then introduced the speakers in order.

New Concepts of Visual Performance in Industry

By HEDWIG S. KUHN, M.D.

Hammond, Indiana

Perhaps the most dangerous person in today's complex economic set-up is the unconscious saboteur. In industry, man or woman, this employee is the eye cripple. His number is legion. His lack of visual co-ordination makes of him an unwitting and usually totally unconscious so-called "fifth columnist."

Industry must give recognition to this employee because he is a potential threat to both safety and progress, as we see it in the effort to obtain maximum efficiency in our national defense effort. He can wreck a re-armament program just as easily as the faulty depth register of his vision can cause him to misjudge the dump spot for a crane ladle of molten metal and snuff out the lives of a dozen workmen.

The enormous complexities inherent in the understanding of the concept—industry—makes necessary great divisions and subdivisions of knowledge and technique. Small worlds have grown to feed the needs of industry. Banking institutions, raw material markets, constant scientific research efforts, transportation experts, technical training centers, great purchasing concerns, gifted leadership in management, new leadership for the guidance of mass labor and skilled labor, organizations to study safety hazards, factories to supply safety shoes, goggles, masks, and nurses and doctors to meet the human needs. Nurses and doctors must seek to accomplish their special technical task expertly, but always seeking to understand

their obligations to the interests of industry as a whole, to develop tact, and adhere to policy and to seek ways and means of adding their special skills to serve the actual practical needs of industry.

The productivity of the individual worker and the increasing complexity of power machinery has forced management to evaluate all factors that contribute or detract from the precision of the human being in the performance of his specific task. Industrial efficiency now demands the utmost of human efficiency.

It is important to have this background in order to understand why medical findings in physical examinations are now seen to have a direct relationship to production and efficiency, as well as to health and safety. Let me outline what is meant by the phrase, "visual performance."

Eye examinations now have to be geared to determine whether a given pair of eyes can meet the requirements of a given job. An overhead crane operator may have to drop a load on an exact spot at an exact moment, 150 feet from where he pulls the levers. To do this he has to have depth perception. A girl at a looping machine in the hosiery industry working at a distance of eight inches from her eyes has to have a perfect binocular coordination, and ocular balance in order to sustain a sharp focus for eight hours. These are examples of two extremes in the demands made on eyes.

How do we analyze an individual's visual

performance in order to determine who can be a crane operator, or a looper, or a stenographer or a machinist?

Whereas the usual industrial eye examination has consisted in the past of vision taken on a wall chart, one eye at a time, it now includes four main factors,—visual acuity taken binocularly, (which after all is the way a workman walks around a plant), measurement of stereopsis, or depth perception, determination of ocular muscle balance, and color tests. A person may have perfect vision and no depth perception—he is not a candidate for the job of crane operator. A girl may have perfect vision and a marked muscle imbalance—she makes a poor inspector and a poor comptometer operator.

A modern visual program and technique of examining eyes in industry, which is based on evaluating these four visual aptitude factors contributes a great advance to safety. (The man on the ground whose shoulder is broken by a crane load dropped on him is studied not only in regard to where he was and what doing, but the man at the levers of the crane is studied also.)

It contributes a new item in the determination of merit ratings, and promotions where qualifications now include physical aptitudes. It contributes a saving of dollars and cents in such departments as inspecting and assorting where *direct* statistical correlations have been shown to exist between visual perfection and accuracy. It contributes to the size of the pay envelope in industries where piece work is done. It contributes information on which to base rehabilitation needs in setting up the great training programs for national defense. The Government will not want to finance the training of an individual who, when trained, will be sure to be rejected by injury.

It contributes directly to safety as we have been able to prove conclusively. In a special study where we analyzed the visual defects in 80 per cent of the men involved in lost time accidents in a very large plant in 1939, we found a *direct* correlation in all five visual defects which make up visual performance and lost time accidents. The plant average of acuity uncorrected was 8.8 per cent, while the acuity uncorrected in the lost time accident cases was 19.2 per cent! Color vision, which means the reading of red-green signals was 3.1 per cent in

the plant as a whole and 9.6 per cent in accident cases.

The rehabilitation programs for employees found defective in a visual survey of a given plant, and for applicants seeking training for skilled jobs in industry, is still another great field of allied service. And rehabilitation does not confine itself to getting an employee to buy a pair of glasses or have a cataract operation performed. Rehabilitation, as well as advance correction of existing defects, has tremendous possibilities in training programs. You can train certain visual aptitudes, just as training departments train other aptitudes. Muscle imbalances and often minor defects of stereopsis can be corrected by orthoptic training.

This can best be illustrated by citing the case of a young crane operator. He came to us with headaches and trouble. He had perfect vision but a marked muscle imbalance, and had just completed a program of orthoptic training on the day before Christmas. He said, "The fellows working under me do not know it but they have a good reason to celebrate. When I started training here, I could not tell within 10 feet of how close I was to the spot where I was to drop my load *except* as I judged by pillars, stationary machinery, windows, etc. Now I can drop my load on a dime without any such assistance." Whenever this story is told to the Safety Directors, their hair rises on their heads, just as yours and mine would if we were flying with a pilot who could not judge how far above a high tension wire he was while landing his plane.

Now, one more vital fact just beginning to seep into the understanding of management. According to recent statistics, if the efficiency of the present *employed* force of skilled labor could be increased 3 to 5 per cent, it would cancel out the present *lack* of skilled labor or the likelihood of such a shortage occurring. Job training inside industry plus the proper type of physical examination (including visual performance, which includes more information than acuity data, as well as other aptitude tests) would accomplish this 3 to 5 per cent increase in efficiency. It would do this without any of the personnel problems arising when it is necessary to displace men now at work, causing grievances and restlessness and strikes. Machine power in industry has been geared to about 90 per cent of its possible efficiency, but to date, human power has only

been geared to 50 or 60 per cent of its possible efficiency.

In closing, may I emphasize the following specific concepts: first, that scientific but practical eye examinations for individual purposes must include testing the entire range of visual functions; secondly, that the data secured from such an examination is basic to the proper placing of employees, to their efficiency and level of production and to their safety; thirdly, that medical and

especially ophthalmological consultants to industry have only begun to see the potentialities of service not only possible and needed, but soon, I believe to be demanded of them by management; and, fourthly, that a program such as discussed is both preventive of trouble, analytical of particular job problems, and also the real basis of rehabilitation objectives inside industry as well as among trainee applicants.

Follow-Up of Findings on Physical Examinations

By O. A. SANDER, M.D.

Milwaukee, Wis.

Physical examinations of industrial workers have been called the keystone of industrial health work. They are beginning to be recognized as a major factor in the improving health of the industrial population.

The guiding principle of any successful examination program is that it must mutually benefit both employee and employer. Its chief purpose must be to prevent accidents and illness. It should never be carried on with the idea of weeding out the unfit or of ridding a plant of undesirable employees. Labor has objected to such motives in industrial examinations, and rightly so. Labor, however, has cooperated and will continue to cooperate with programs that are genuinely based on the idea of prevention. Workers know that they will not be dealt with unfairly or discriminated against when the principle of mutual benefit is rigidly adhered to.

The Wisconsin Industrial Commission has recognized the need of clarifying the purposes and of establishing a more or less uniform method of industrial examinations by issuing a Plan of Physical Examinations in Industry. The Commission realized that engineering methods of preventing accidents have eliminated many hazards which formerly were the source of serious injuries. Moreover, improved hygiene and housekeeping in plants and workshops have considerably reduced the number of general diseases resulting either directly or indirectly from the various occupations. In spite of these preventive measures, too many accidents and too much general sickness still were occur-

ring because of the failure of the human factor.

Accident-prone persons usually are not so because of innate carelessness but because of some physical impairment which prevents the necessary coordination between their mental and muscular functions. Those persons who lose much time from their work because of illness should not be tagged as mere weaklings and discarded. Some physical defect or disease usually can be found as a cause of repeated illness, which when corrected will make such persons just as healthy and efficient as their fellow-workers. There is no more excuse for firing an accident or sickness repeater than there is for scrapping an automobile because one of its cylinders is missing. Unless the source of the trouble is looked for and corrected, an employer has not used his human machinery to the best advantage.

That is the one and only purpose of physical examinations of industrial workers under the Wisconsin Plan of Examinations—to find the physical defects which may be the source of illness or accident, so that they may be corrected before the sickness or accident develops. That necessitates examining all employees in a plant or shop, not merely those who appear to be unhealthy or those who are exposed to special hazards. Unless all are examined, a dangerous focus of infection or a serious physical handicap may be entirely missed. Industrial workers are, after all, no different than other groups of adults. They are subject to the same diseases and infirmities that all mankind is

heir to. Industrial physical examinations are general health examinations which happen to be made on a special group of adults. There is no more reason for examining only those exposed to special hazards out in the plant than there is for examining those working in the shop office. An office clerk with open tuberculosis is a much greater menace because of contact with fellow-employees than is a foundry laborer with silicosis. The fact has too often been overlooked in planning health programs in industry.

Before enumerating individual defects which can be found with the Wisconsin Plan of Examinations, I want to discuss the general subject of correction of physical defects, because, after all, that is where the industrial nurse fits into the picture.

I feel that you are the only ones in your plants who are equipped to properly follow up on examination findings to see that the doctor's recommendations are carried out. Your training in general medical knowledge and in prevention of illness gives you an understanding of physical findings which the layman personnel directors can never acquire. If some of you happen to be unfortunate enough to be working in a plant where the personnel man has assumed the responsibility of such follow-up investigations, I feel it is your duty to point out to your employer the deficiencies in this most important phase of his examination program and to show him how much more effective you could be in getting remediable defects corrected. I have yet to see a plant in which a layman is the follow-up man where there is much follow-up done. Usually the doctor's report is safely tucked away in a file and forgotten—and often has not been read at all. Much of the benefit from such examinations has thus been wasted and very little of constructive value has resulted.

If one of the purposes of the examination of workers is to improve their health and efficiency, then painstaking follow-up of the doctor's recommendations must be made in each case. Experience shows that most unskilled workers and many who have a reputedly higher intelligence level show the greatest unconcern about remediable physical defects. Often, of course, the reason why defects are neglected is an economic one. The bread winner, who theoretically should be the most desirous of maintaining his health, all too often neglects himself and in-

sists that his family's medical requirements be taken care of first. In plants with group health insurance plans, such problems are solved more readily than where no such plan exists. But regardless of the cause, physical defects usually are not corrected in most workers until someone in the plant assumes the responsibility of seeing that they are. The one who is charged with this responsibility must not only have sympathy and understanding but should know the significance of medical findings. I repeat that no one can carry out such a job quite as effectively as the plant nurse.

To you who now have examinations in your plants or who are contemplating such a program, whether or not you are the follow-up worker, I recommend a detailed study of the Wisconsin Plan. The procedure outlined in that plan was designed as a complete health survey to discover most of the major diseases and physical abnormalities. Too many examinations in industry have been too sketchy and cursory to be of any value. Some actually have been harmful because they created a false sense of security in both employee and employer. Every examination should be as complete as is necessary to discover all major abnormalities, yet not too long and detailed to be impractical. In the past eight years I have used the procedures outlined in the Wisconsin Plan in the examination of over 18,000 industrial workers and I am convinced that it is an adequate and practical device for industrial health maintenance.

The best way to study the plan is to see how it proposes to discover the more important diseases or physical defects:

1. *Tuberculosis.* It now is well known that physical examinations alone will not discover more than half of the cases of active tuberculosis. Some special case-finding method is necessary, preferably a 14 x 17 inch x-ray film of the chest. The Wisconsin Plan suggests that every employee be x-rayed regardless of whether or not his work involves a dust or fume hazard. Although the expense of such a program might at first appear to be prohibitive, experience shows that x-raying of large groups can be done at a fairly nominal cost.

Active and open tuberculous persons must, of course, be removed from their jobs and sent to a sanatorium. It is here that a plant nurse can be of tremendous help in solving

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the economic and social readjustment problems in the homes of such persons. Those whose tuberculous lesions are found to be inactive after thorough clinical and laboratory studies are kept at work. Frequently their jobs must be changed, particularly if their regular work exposed them to dusts or fumes and if their work was unusually heavy. Here also the nurse can be of much help in making these necessary adjustments. Such persons are re-examined at rather frequent intervals—every three or six months—so as to detect any reactivation as early as possible. With such a plan the danger of infecting other employees through contact exposure is reduced to a minimum and the incidence of tuberculosis in the industry will drop below that of the general population.

2. Heart Disease, High Blood Pressure, etc. Persons found with heart disease requiring lessened physical exertion require special placement at suitable work. Those with high blood pressure when it is accompanied by a damaged heart must occasionally be shifted to less responsible work where the safety of other employees is not jeopardized. Crane operators often are shifted to jobs on the floor for this reason, usually at a reduction in wage scale. Such adjustments are made with the least feeling of resentment where the plant nurse has collaborated with the doctor in reassuring the worker that the change is necessary in the interest of safety to himself and his fellow-workers. When special treatment is required, nurses can be of invaluable help in steering the patient into competent medical hands and in seeing that the proper treatment is continued as long as necessary. With such control, it frequently is unnecessary to require the worker to lay off during the treatment course.

3. Visual Defects. Under the Wisconsin Plan, the vision of all employees is tested both at 20 feet and at 14 inches. Those with impairment of the vision require special examination by a competent oculist to determine the cause. The practice of allowing opticians to make mass eye surveys in plants is to be condemned. I have seen many eyes fitted with glasses where the defect was due to unrecognized eye disease rather than to a correction error. Others with practically normal vision have had glasses sold to them unnecessarily, a procedure which a reliable oculist would never engage in. The

requirement for wearing glasses should be a flexible one and should depend on the visual acuity required by the job each worker has to do. Obviously, a machinist requires more accurate visual correction than does a general laborer.

This follow-up work on vision is one of the most important jobs a plant nurse can do. Figures are available to show that a visual correction project in a plant will not only result in a reduction of accidents, but will actually speed up production.

4. Teeth and Tonsils. The teeth and tonsils are still believed to be potent sources of infection elsewhere, particularly of the joints and kidneys. Industry generally has paid little attention to the improvement of mouth sepsis as a preventive measure of general sickness. If a reduction of sickness absenteeism is one of the results expected from an examination program, then the eradication of these sources of infection should be part of the general follow-up procedure.

5. Impaired Hearing. This has been known for years to be a source of accidents and should, therefore, be considered in any well-planned health program. The Wisconsin Plan requires only a rough estimate of hearing, but more and more plants are making more thorough tests with an electric audiometer. When appreciable degrees of loss of hearing are found, such workers should be referred to a competent ear specialist to determine if improvement is possible. When it is not, it occasionally is necessary to change the job of such a man, when his safety and that of others depends on his ability to hear well. On the other hand, for jobs not having such a hazard, deaf-mutes may be safely employed, as they are in a number of plants under my supervision.

6. Hernias and Varicose Veins. I am grouping these two defects because they are the cause of more rejections on pre-employment examinations today than any other findings. Under the Wisconsin Plan they are not a cause for rejection and in my experience there is no reason why they should be in most cases. If a hernia is reducible and can be held reduced with a truss, a truss is required for employment. Experience shows that a man with a well-fitting truss can do the heaviest kind of work without difficulty. Moreover, the old

bugaboo of strangulation is largely a myth. Follow-up is necessary with such cases, so that they do not drift into the hands of quacks. Any reliable appliance dealer usually gives a much more satisfactory fit than will a mail-order house.

The same situation holds with varicose veins. If the worker or prospective employee agrees to wear elastic stockings or elastic bandages, he is allowed to do any kind of work. Out of the thousands of varicose veins I have seen, I have still to see the first one break down into an ulcer where bandage or stocking had been worn. Insurance company claim departments have assured me that they are not concerned about liability from either hernias or leg ulcers provided the special preventive measures are carried out. The important thing is to discover them and support them. If that is done, they are not a hazard either from a safety or liability standpoint.

7. *Diabetes.* Although diabetes is not a very common finding among healthy workers, it is found sufficiently often and the complications are sufficiently serious to warrant looking for it in every examination. In my opinion, a routine urinalysis is a necessary part of every health examination and should not be neglected. When even a trace of sugar is found, follow-up analyses should be made. If these are repeatedly positive, the worker should be placed in the hands of his family doctor for control treatment. Here also, there is no need for refusal to hire or for discharge of such an employee, because adequate control of diabetes is such a relatively simple procedure today.

8. *Syphilis.* No health program in industry is complete today without a routine blood test for syphilis. The Wisconsin Plan advises it not only for pre-employment, but for periodic examinations as well. Although it is one of the most valuable procedures with industrial examinations, it can be grossly misused, and has been all too often. In our program, only infectious cases and those with central nervous system involvement are considered unfit for employment. The vast majority of cases found are latent and without any open lesions or late complications. They are asked to agree to carry on a complete treatment regime until they are cured, but they are hired or continued at their work regardless of their positive blood test.

Experience has shown that it is unwise to inform a layman employer or personnel man of such cases, because it is too easy for him to discriminate unconsciously against such an employee. The plant nurse, however, should have this information, because she is ideally fitted to steer the employee into competent hands for treatment and to inquire from time to time how his treatment is progressing. Cures have been much more frequent in plants where the nurse carried on such follow-up work. In plants not having a nurse, it is necessary that the examining physician assume the responsibility of contacting both the employee and the family physician from time to time to determine if the treatment is being given regularly. With the companies whose employees I examine, not one case of syphilis is known to the employers, superintendents or foreman, yet approximately 50 per cent of the positive tests have become negative. I repeat, that if a syphilis program in industry is to be effective, the results must remain confidential and in professional hands. This is more or less true for all physical findings in employees, but is especially advisable for syphilis.

Other diseases and defects might be mentioned, such as the general contagious diseases, bone and joint deformities, etc., but the same general principles apply to them; which is, follow-up on examination findings, have remediable defects corrected, and place on more suitable jobs if necessary.

I want to make a special plea for a more common-sense viewpoint on pre-employment examinations. You as nurses who are serving industry can do much to change the general attitude of employers and employment managers on too rigid employment requirements. Let the hiring depend more on the apparent ability of the man to do the work expected of him rather than on laboratory and clinical findings which are causing no disability and which in all probability will not if they are corrected. Such a point of view is advisable not from humanitarian considerations alone, but also for the very practical reason that too many valuable workers have been unnecessarily discarded for less experienced ones. Such waste of human machinery is costly to industry and would be especially unfortunate now when all available skilled workers are needed in the national defense program.

Moreover, oppressive employment requirements tend to throw all industrial examinations into disrepute. Our experience indicates that no more than 2 per cent of all applicants for work have sufficient abnormalities to warrant their being rejected for work. Any figure appreciably higher than this will eventually break up any examination program, regardless of the good work it may otherwise have accomplished.

The principle of maximum benefit to workers as well as employer must always be strictly adhered to, with new employees as well as old. I recommend to you and to your plant management the Wisconsin Plan of Examinations for its adherence to this principle. With it, any industry cannot help but improve its general employee health, which in turn will result in a general increase in efficiency and production.

Traumatic Neurosis

By LEWIS J. POLLOCK, M.D.

Chicago, Illinois

In America an introduction to a mysterious condition was afforded the medical profession when it was observed that, following railway accidents, many peculiar symptoms occurred in the absence of external evidence of trauma. The condition was then termed "railway spine." Erichsen, who wrote on the subject in 1866 to 1875, later termed it "concussion of the spine." Subsequent observation and study showed that no physical change was present, even on microscopic examination, and it was recognized that the patient presented the same symptoms as in cases of hysteria, at that time remarkably described by Charcot, and in short, suffered from hysteria.

The terms "railway spine" and "spinal concussion" gradually disappeared, and for them was substituted "traumatic neurosis." As the hysterical nature of the disease was recognized, traumatic hysteria was commonly used, as were the terms "traumatic neurasthenia" and "traumatic hysteroneurasthenia."

One might subdivide the neuroses into groups as psychasthenia, neurasthenia, anxiety states, hysteria, etc. The greatest number of post traumatic cases are those of hysteria and in it the conditions of cause and effect are common to all the neuroses.

In the course of association with industrial medicine one becomes familiar with many symptoms following accidents but not associated with evidence of actual injury; pain, spasms, contractures, paralyses, convulsions, etc. It may be said that in hysteria every symptom of every disease or injury may be found. We have loss of memory, delirium, confused states and stupors. We

may have paralysis of one or more of the extremities, spasms, contractures, convulsions, pain or loss of sensation, dizziness, blindness, deafness, loss of speech, vomiting, diarrhea, incontinence or retention of urine, and symptoms without end.

It is natural to ask if one is confronted with one of these symptoms, how can it be shown that it is not due to real injury?

Disease or injury of the body or its organs produces a disturbance of function of that particular part. This disturbance of function presents signs and symptoms peculiar to itself. The signs are constant, and are associated, one with the other, in a consistent and determined manner. For example, a paralysis of the hand due to an injury of some of its nerves shows an atrophy in certain muscles and in these only, a paralysis in only these muscles, a loss of sensation in a certain constant part of the hand and definite changes of response to stimulation with electricity. An injury to the spinal cord produces constant and definite changes of the reflexes, paralysis of a sharply defined part of the body, loss of sensation with certain characteristics, and disturbances in muscle tone and bladder and rectal function. So with every part of the body. In hysteria there will be found absent such as would necessarily be present were the symptoms, such as paralysis, due to an injury or we would find signs and symptoms which are adventitious and could not be associated with such a paralysis as the result of injury.

In short, it may definitely be stated that a careful examination by a competent observer can serve to differentiate an organic

ptoms observed on the battle field itself. Only after some time elapsed did such symptoms appear. In torpedoed vessels when the passengers were removed to rafts amid signs of disorder and carnage, and exposed to extreme hardship and privation, hysteria did not develop. Only when rescued did the passengers develop such a condition. Some illuminating observations were made. Soldiers were more frequently affected than officers. Crack regiments showed fewer cases than others. Men with severe wounds never developed it. Prisoners of war did not experience it. Here, as in civil life, it was seen that the disease was a disorder of conduct. It occurred among those men who were dissatisfied and fearful and who could not be separated from actual warfare by legitimate causes, as capture or injury.

A state of dissatisfaction leads to the illicit motive back of hysteria in civil life; it may be due to unrequited love, marital incompatibility, inadequate efforts to support a family, fear of discovery of crime, etc. In warfare it was due to fear of death and desire to escape. Following injury it may be due to several causes: fear of being severely injured, inability to resume occupation and support a family with ensuing desire for pension; resentment and desire for compensation, and more rarely for causes not associated with either of these two, such as would have produced hysteria had any other "accident" than injury occurred.

Thus, a woman nearing mid-age in charge of a large number of telephone operators working under high pressure with attending fatigue, without adequate social contact or recreation, unconsciously fears incompetency with subsequent financial difficulties and a lonely, single existence in poverty, receives a "crack" in the ear and develops a torticollis; a young girl who, frequently reprimanded by a harsh employer, slips and strikes the back of her head against the floor, develops fugues, finds herself in an unknown part of the town upon a number of occasions when she starts for work, is only running away from her job. A man who prior to a minor injury was fearful of insanity, unconsciousness and of losing control of himself, develops a hysterical paralysis of an arm, throwing upon his wife the responsibility of earning a living because she had been unsympathetic with him when he was earning it.

Is it meant by this that these patients are

faking, putting this on, that they hypothesize their illness? It is not. They suffer just as much as if they were disabled from organic causes. Is the condition imagined? It is not. No more than the hypnotized person imagines that he can feel no pain. He feels no pain. The symptoms are real enough but they occur only because of suggestion, not because of injury or shock.

Usually the patient is injured or is in an accident, he experiences some pain or slight disability, he is fearful lest it be serious, he becomes introspective, attentive to himself, sensations which formerly he would dismiss are now indicative of serious ailment. His friends ask him innumerable questions with entailing suggestions. An enforced period of illness occurs. He is examined by physicians, who, by injudicious questions suggest new symptoms. He is fearful lest he be unable to resume his occupation and support his family. Here in short is a well prepared field for the development of severe signs of hysteria. He seeks compensation and legal advice and forthwith a hysteria develops. It does not occur immediately after accident; it occurs following a latent period during which time suggestion has had an opportunity to act.

It would appear that this description would fit a malingeringer. Are these conditions the same? Emphatically not. A malingeringer is a willful imitator of disease for the purpose of gain. One may not be able, by means at our hands to say that this man is a malingeringer or is a sufferer from hysteria. This inability is our own fault and not the man's. It would be the grossest of injustice to many patriotic and consciously willing soldiers to compare those who developed hysteria to one of the cases I observed in France in a man nicknamed "Bosco." He imitated a case of painful bent back and exclaimed to those about him, "Follow Bosco and go to Hoboken—follow Black Jack and go to Hell." Although back of both conditions is an illicit motive, the hysterical patient is not aware of it. Of course, exaggeration and prolongation of symptoms may occur along with hysteria.

Frequently a malingeringer may readily be detected and the condition at times easily differentiated from hysteria.

What relation does compensation bear to hysteria? It has already been said that desire for compensation induced either by wish

for pension to assist in livelihood or by vengeful spirit, may provoke, engender or prolong a hysteria. How do we know this to be true? German statistics show that in spite of medical and surgical methods progressively improving, the duration of incapacity in some ailments and in accidents is greater than it was in the pre-insurance days. Before the Netherlands adopted insurance, the German working man took much longer to recover than one injured in the same way in Holland. When, however, the Netherlands adopted an accident insurance, the duration of the illness suddenly increased. In Denmark it is the custom to pay insured working men lump settlements at a very early stage of their incapacity and 93.6 per cent recover from what is known as traumatic neurasthenia. In Germany, however, where the injured is entitled to a pension, only 93 per cent recover from the same disease. The introduction of the accident law in England in 1907 saw a marked increase in the number of accident cases. In France accident cases have increased by one-fifth and the duration of temporary disability is decidedly longer than before the operation of the law.

Some illuminating observations relating to these considerations may be mentioned. Five or six months after the Messina earthquake there was not a single person suffering from a neurosis caused by the earthquake. No source of compensation was available. When, some years ago, railroad employees were not compensated for injury, they were eager to return to work following an accident and it was the passenger who was afflicted with a traumatic neurosis. The availability of compensation, however, has caused the employee to develop such states as well. It is a common observation among social workers dealing with the poor, that if following illness, prolonged pension is carried out and return to work not encouraged or enforced, the individual becomes a chronic invalid and a ward of the charities. It has been found that in a certain group of people investigated, some 75 per cent of pauperism resulted from illness and this state was fostered by constant assistance without intelligent direction of rehabilitation by labor. At first assistance is abhorred, avoided, reluctantly received; then the morale weakens and assistance is sought, next it is expected and finally demanded.

Litigation holds out promise of reward

and fosters the neuroses. Prolonged litigation prolongs the duration of a neurosis and prolonged forms of compensation work to the same end. Litigation is productive of ill effects through other causes. The presence of a patient before a board or court while his case is being discussed awakens a sense of resentment or distrust. A feeling that the corporation through its expert is trying "to do him." He develops the conviction that he is very seriously and permanently injured through the histrionic efforts of his counsel and statements of ignorant witnesses. He has suggested to him new symptoms and promptly develops them. Some responsibility therefore rests upon our legal system for the production of these neuroses. It was held by the Fourth Chamber of the Tribunal in France in a certain case, that the incapacity with which the workman seemed to be affected resulted not from the accident, but from the erroneous opinion which the man formed of the rights to which he was entitled by persuading himself that an income was necessarily due him. For this reason compensation was refused.

What is the result following a settlement of the case? Although it is claimed by some that settlement always cures a traumatic hysteria, I believe that there are occasional exceptions to this rule. At times a traumatic hysteria may persist many months or years following such a settlement. This is rare and is always due to such difficulties as would have produced the hysteria had the accident not occurred. Such difficulties may be social maladaptations or deep rooted fears. If judiciously treated these cases may be relatively rapidly cured.

If a case of traumatic hysteria is to receive compensation, some idea of actual disability is necessary. A traumatic hysteria is curable. It does not produce any permanent disability. The severity of the injury has no relation to the type or severity of the hysteria. Severe symptoms have no relation to the duration of the disease nor are they any indication of a lasting disability. A paralysis of all four extremities may be cured in ten minutes, a slight spasm of the eyelids may last a long time. Harrowing experiences and extremes of horror or fright bear no relation to the severity of the illness. A complete paralysis may follow a slight sprain from stumbling and a Messina earthquake produce merely the winking of an eyelid. Whatever the symptoms, a neurosis is neu-

rosis and one case can be cured as rapidly as the others. However, differing in detail, all accidents produce the same type of disability if they produce a hysteria.

Obviously, if compensation is one of the causes, it must either be dispensed with or it must be given in an enormous form. As an indication of this mention may be made of the conclusion reached at a joint meeting of the Neurological Society of Paris and the Chiefs of Military, Neurological and Psychiatric Centers. It was voted that for hysteria, neither dismissal from service nor gratuities were to be given. It has already been shown that early lump sum settlement tends practically to eliminate the long duration of these conditions. If existing laws are such as to prevent such a settlement, refuge may be taken in arrangements between counsels for apparently such a settlement in the ignorance of the patient. Unfortunately owing to the frailties of human nature this is frequently unsuccessful. Prolonged litigation must be discouraged. After all, the important thing is to get the patient well.

A corporation lawyer remarked to me relative to this statement, "Perhaps from the medical standpoint, but not from mine." He was decidedly wrong. As soon as it is recognized that immediate final settlement cures a hysteria, it will be found that the amount of expense, otherwise prolonged, will be reduced. The quicker the patient recovers, whatever the initial cost, the less, in my opinion, will be the expense. Certainly, an early and final settlement is the only just procedure for such a case. In addition to this several essential features in the handling of such a case stand out: an early and correct diagnosis by competent observers, avoidance of careless examinations and ignorant diagnosis and avoidance of prolonged litigation and its ensuing chances for sugges-

tions and fixation, particularly when the patient is an observer of the trial of his case, and a quick return to some form of work.

The necessity for early return to occupation cannot be overemphasized. Facilities should exist whereby a patient may be inducted slowly into normal competition. Under existing conditions many disabled individuals fear to attempt resumption of labor not only because of physical or mental incapacity but because their compensation would be reduced and if then they were unable to continue their work their economic condition would suffer. What is true of spontaneous illness is doubly true of traumatic illness.

The problem of dealing with accidents of industry should be concerned more with the recovery of the patient than the doing out of compensation, awarding, as it were, the patient for continuous disability.

The compensation feature should be overshadowed by that of treatment. It is necessary to provide rehabilitation centers with proper facilities for diagnosis by competent physicians, medical and surgical treatment, physiotherapy and occupational treatment. Workshops under the direction of trained supervisors are necessary. Here the patient may be gradually inducted into normal competition, at first put upon simple tasks for a short time, he gradually becomes reassured and trained to resume his own occupation, knowing that being under kindly and intelligent medical supervision no harm can come to him. By such methods patients may recognize that industries and the corporations employing them are as eager to produce in them a recovery as are they themselves. That they are more concerned with a repair of certain forces, as essential to them as inanimate machinery, than they are to avoid the payment of continued compensation.

THURSDAY LUNCHEON SESSION

October 10, 1940

This luncheon session was called to order by Mrs. Christian Seabrook, R.N., Local Field Supervisor, Metropolitan Life Insurance Company, Chicago, and President Chicago Industrial Nurses' Association, who presided. Chairman Seabrook commented briefly upon the importance of the activities

of industrial nurses and then introduced Dr. E. W. Williamson, Associate Director, American College of Surgeons, Chicago, who, in the absence of Dr. Makom T. MacEachern, read the prepared paper of Dr. MacEachern.

The Industrial Nurse's Perspective

By MALCOLM T. MacEACHERN, M.D.

Associate Director, American College of Surgeons, Chicago

The trained nurse in industry has the same motive as any other nurse—service to sick and injured humanity. Her position as an employee of an industrial concern does not alter that primary purpose, although she enjoys with the public health nurse more possibilities for preventing illness and accident than the nurse who works in a hospital. Also, a financial evaluation is placed on her services that adds to them a direct economic aspect.

In a recent issue of *Factory Management* an article bore a headline in large type reading "Small Plant Hires Nurse—Saves." It continued: "Lost time was cut 90 per cent when this 300-man plant gave up its haphazard first-aid practice, acquired a resident nurse, set up a regular first-aid department. Lost time due to injuries or sickness totaled 23 weeks in the year previous, compared with two weeks in the first year following the acquiring of a resident nurse in the Bull Dog Electric Products Company in Detroit. And this didn't tell the whole story because workers' efficiency was improved by prompt treatment for colds and other minor ailments."

The trend toward appreciation of their value to industry in dollar and cents should remove the feeling that some doctors and nurses might have of being aliens in business, of constantly having to try to justify their presence in the industrial scene. They belong, and are an important aid in gearing industry to maximum efficiency under the demands of periods of national emergency such as we are in at the present time.

Nurses have helped to transform our hospitals from gloomy havens for the sick and dying to cheerful houses of recovery. Chester S. Johnson of the Quaker Oats Company, in a talk at the Safety Congress two years ago said:

"Management of industry believes that the industrial nurse more than justifies herself in the saving of money which results from proper care and treatment of people who are injured or sick. These savings accrue, not only to the employer, but to the employee as well. The industrial nurse's opportunity to take the initiative in carry-

ing on a program of health conservation is unlimited. Management also believes that the nurse has a real function to perform in the modern program of industrial relations. She is important in establishing and maintaining good will toward the employer."

The Nurse's Part

Only in recent years has relationship between management and workers reached the point of systematic organization and planning. Service in this field is a byproduct of the nurse's regular work, but apparently it is a main consideration to the industrial relations department, for someone in outlining an industrial relations program recently listed eight divisions—employment, education, health, safety, welfare, sanitation, recreation and rehabilitation—and the nurse was a prominent figure in every one of them!

In industry it is extremely important *how* the nurse treats the patient, for the employer-employee relationship is affected by her manner, her receptivity to confidences, her ability to allay fear and to give helpful advice, her skill in teaching, and her general exhibition of interest in everything that promises to promote the employee's welfare.

In a talk on the industrial nurse and personnel work at the first annual Symposium for Industrial Nurses, sponsored by the Illinois State Department of Public Health, Mr. George B. Hallett, chief of the hospital department of the Western Electric Company told of experiments with improved lighting. With better light, production rose. But when bulbs were changed with no change in voltage, production rose anyway. The experimenters were forced to the conclusion that the very fact of being experimented upon was the stepping-up influence. There was improved attitude by employees when interested observation was introduced.

This discovery led the company to inaugurate a systematic interviewing system. Trained interviewers encourage employees to discuss their grievances and problems. The interviewing process itself—the relief it affords—is significant in their opinion. Grievances seem to shrink in importance

when communication throws a more objective light on them.

Since the nurse is dealing constantly with people who have some complaint, mental, emotional, or physical, which may either be caused by or be the cause of maladjustment to a work situation, they believe her capable of making an important contribution if she acquires good interviewing technique. Mr. Hallett said:

"Nurses are particularly well placed in the industrial structure to do this because of their professional standing, their non-authoritative relationship with employees and supervisors, and their neutral mediatory position in the complex industrial structure."

That statement leads a doctor to lay greater stress than he otherwise would upon the industrial relations aspect of nursing in industry. The natural inclination of a doctor would be to deprecate the trend toward the nurse scattering her energies by acting as a personnel adviser on all sorts of problems. He might contend that industry hires nurses because they want nurses, and nursing is what the nurse is peculiarly fitted to do. But it may be conceded that her very training as a nurse, and the position in which it places her in industry, should peculiarly fit her for this broader field. Certainly if she can help to relieve employees' mental and emotional, as well as physical, distress, she is thereby also improving their health, and is therefore still within the nursing sphere. We are simply making that sphere more comprehensive.

Specific Functions

Within the scope of the industrial nurse's work, consequently, are functions that directly and indirectly bear on health and safety:

1. Helping the physician in making pre-employment and periodic physical examinations.

2. Rendering first aid and subsequent care of industrial injuries and occupational diseases as directed and supervised by the physician in charge.

3. Rendering reasonable first aid and advice to employees, suffering from non-industrial injuries and illnesses while on duty according to the policies and standing orders for such service. For further professional service employees should be referred to their private physicians.

4. Cooperating with the safety department by

(a) Reiterating safety principles to employees at the time of dispensary visits.

(b) Re-explaining and re-emphasizing to employees the program in plant sanitation when indicated.

(c) Reporting all accidental injuries and occupational diseases that should be investigated from the standpoint of casual relationship and prevention.

(d) Reporting to the physician for examination, and also to the safety director, those employees who are accident repeaters or who seem to be accident prone on account of mental or physical defects.

5. Cooperating in promulgating an acceptable program in health preservation and health education by:

(a) Giving appropriate advice to individual employees.

(b) Giving talks to groups on proper nursing subjects.

(c) Distributing literature on health subjects.

(d) Encouraging workers to have periodic physical examinations where such examinations are not already being made.

(e) Assisting in developing adequate recreational programs and facilities.

(f) Assisting in maintaining certain phases of the sanitation program by inspecting the plant cafeteria and kitchen and other places where sanitation is an important factor.

(g) Cooperating with private physicians and with local health and welfare agencies in activities designed to benefit the health of the worker and of the community as a whole.

6. Keeping adequate records by:

(a) Recording all industrial injuries and occupational diseases.

(b) Recording all employee visits to the dispensary for non-industrial injuries and illnesses.

(c) Maintaining physical examination records as confidential information.

(d) Compiling statistical summaries, at intervals, of the injury and illness experience, and reporting it to the indicated officials.

(e) Computing or obtaining annually the injury frequency and severity rate.

In this list of functions is indicated the limits beyond which the nurse should not go in rendering medical service. It is also indicated that her opportunities are limitless in improving industrial relations, and even public relations, through her health and safety efforts. The public relations possibilities may be realized through the function that involves "cooperating with private physicians and with local health and welfare agencies in activities designed to benefit the health of the worker and of the community as a whole."

The duties of the industrial nurse vary considerably with the size of the industry and the type of community in which it is situated. Some larger plants have nurses exclusively for home calls. In the small plant, these may come under the functions of the same nurse who assists with first aid and other work. In making home calls, it is sometimes possible to aid in improving conditions and attitudes, thus rendering social service.

Qualifications

What qualifications should the nurse have to be successful in industrial nursing? We at the American College of Surgeons have a strong predilection for minimum standards. There should be a minimum standard for nursing in industry, to supplement the minimum standard for medical service in industry. This suggested minimum standard for nursing service in industry is based upon qualifications formulated a year or so ago by the executive and education divisions of the National Organization for Public Health Nursing:

1. Graduation from an accredited school of nursing, as a prerequisite to employment in an industrial medical department.

2. Instruction and experience in surgical nursing, including operating room and first aid, or supplementary instruction in these types of nursing if thorough preparation was not included in the basic nursing education period.

3. At least one year of experience under qualified nursing supervision in a public health nursing service, to succeed an academic year of study in public health nursing in one of the colleges or universities whose program is approved by the National Organization for Public Health Nursing.

4. Registration under the laws governing trained nursing service in the state.

5. For the nurse in a supervisory position, successful experience in industrial nursing, part of which is preferably in the type of industrial work in which the nurse is to act as supervisor.

6. A working knowledge of the principles of teaching, social case work, community organization and resources, public health administration, industrial relations, personnel administration, industrial hazards, nutrition, communicable diseases, mental hygiene, and personal hygiene, as they affect the individual and his family.

7. An interest in and ability to work with all kinds of people; good physical health and emotional stability; initiative; good judgment; resourcefulness.

8. Qualities of leadership, executive and teaching ability, vision and imagination for the supervisor of other nurses.

In addition, a special attribute the industrial nurse needs is responsiveness to the stimulation of industrial activity. Not every nurse would have this. Some feel more responsive to surroundings that reflect the attitudes and ideals of medical science, such as we find in the hospital. Perhaps only by trial could it be discovered whether the reaction to the industrial situation promised to bring out the best that was in a person. And certainly a nurse and every individual should seek a sphere of activity that challenges her or him to supreme effort.

The Organization for Public Health Nursing declares that the number of nurses who through education and experience can meet all of the desirable qualifications is limited. A door of opportunity is therefore open in this field for many who seek a career of service. Replies to a recent questionnaire sent out by the National Safety Council showed that 213 member plants had 565 full time nurses and 58 part time nurses. The Hawthorne Plant of the Western Electric Company, employing some 13,000 people, recently reported a staff of ten full time nurses, two technicians and three clerks, in addition to nine doctors.

Opportunities

Graduation from an accredited nursing school is essential. The next step is special training in the subject, and the National

Organization for Public Health Nursing has approved the programs in certain colleges or universities for courses of study in public health nursing, of which industrial nursing is considered one division. Doubtless some of these courses are so arranged that they can be taken as postgraduate work in spare time without interfering with employment. There has also been some talk of holding institutes for industrial health personnel. Last fall, in Chicago, under the sponsorship of the Illinois State Department of Health, a symposium, the first of its kind for industrial nurses, was held, and nurses from seven or eight states attended.

Nurses should attend as many of the conferences on medical service in industry as they can. They should attend sessions of national and local industrial nursing organizations, or those of sections of nursing and medical associations that concentrate on industrial problems. Knowledge may also be acquired through reading and through cultivation of acquaintance with others doing similar work. Of course, knowledge of industry in general, and of the particular industry and company, will be valuable.

"Who's Too Small for Health Program?" is the name of a pamphlet issued this year by the Committee on Healthful Working Conditions of the National Association of Manufacturers. The implication for the nurse is clear in the statement that the question, "Can we afford a health program?" should be rephrased by the small plant to say, "Can we afford *not* to have a health program?" They have it figured out that even in the smallest plants, a nurse could be afforded by utilizing her part time in other departments where she would still be available in case of emergency. Her salary

would be offset by lower compensation costs and higher production."

Of course, the danger in such a situation is that the nurse may be expected to perform service for which she is neither by training nor by law equipped or authorized. That is a danger against which she must guard, and always be sure to have medical advice before she undertakes any but nursing procedures and ordinary first aid.

Advances in Industry

The industrial nurse's perspective and her prospects depend, however, upon the outlook for medical service in industry as a whole. In 1915—only twenty-five years ago—the average expenditure for medical work in industry was 88 cents per capita. Now it is over \$6.00 per capita.

With the impetus of the new committee which Mr. Beaver heads, the formation this year of the Air Hygiene Foundation, the increasing efforts of the American Association of Industrial Physicians and Surgeons and the National Organization for Public Health Nursing, the continuing cooperation of the National Safety Council and the influence exerted by the many special and local organizations in the field, there is little question but that the next twenty-five years will see even more advance than the past in industrial medicine.

Especially when figures like those given by the United States Public Health Service can be produced which demonstrate that the expenditure by a company of \$8.00 per man per year on a health program will yield a \$12, or 150 per cent, return per year to that company. Industry gives ear to that kind of argument—all of us do in this practical age.

THURSDAY AFTERNOON SESSION

October 10, 1940

The session was called to order by Mrs. Christian Seabrook, R.N., Local Field Supervisor, Metropolitan Life Insurance Co., Chicago, and President, Chicago Industrial Nurses Association, who presided. Chairman Seabrook introduced Dr. Theodore R. Van

Dellan, Instructor of Medicine, Northwestern University Medical School, Chicago, who, in the absence of Dr. J. Roscoe Miller, read his prepared paper before the delegates.

The Heart and Heart Disease in Industry

By J. ROSCOE MILLER, M.S., M.D.

Chicago, Illinois

Heart disease leads all others as a cause of death in the United States. Its morbidity rate can only be estimated but it is, of course, enormous. Cardiac ailments account not only for days lost from industry but also considerable curtailment of activity. The 300,000 deaths recorded each year from heart disease in this country represent countless days of partial or complete inactivity for a much greater number.

These facts are quoted to point out that we are not discussing a rare or unimportant entity but the foremost problem facing medicine today. Despite this dark picture there is a bright side and the cardiac should not be looked upon as a burden on himself, industry or society. We are rapidly learning more about the prevention and management of heart disease and the regulation of those who are so afflicted.

The main reason for the ascendancy of heart trouble in our mortality statistics, is that medicine has not yet understood, and therefore has not conquered the degenerative diseases. We have learned much about their care and methods of prolonging useful life but until we understand the underlying causes we will be unable to prevent them. It is all well and good to say everyone must grow old, but there is a reason why some people age faster than others and why this aging process is more frequently seen in one organ or set of organs than in another. Why do these things occur? The answer is the biggest challenge to medicine today. When it is answered we may again take the ceiling off the life expectancy in man.

A child born a hundred or more years ago had to run the gauntlet of the diseases common to infancy; namely the dysenteries, food and vitamin deficiencies, and the acute infections. Then came childhood with its diphtheria, small pox and meningitis. Successfully through these, the young adult could expect typhoid fever and pneumonia. Only after surviving these and many other acute infections would he enter the degenerative period where heart disease takes such a heavy toll.

Today many of these infectious diseases are either partially or completely controlled. The control of typhoid fever has become an important measure in every community's sanitation program. An enlightened people no longer must fear small pox or diphtheria, and the death rate from pneumonia has fallen to a level undreamed of by our fathers. The result is that people are living to an age where arteriosclerosis and its attending complications are our chief problem.

The causes of heart disease are many and for the sake of continuity it might be well to discuss them from the standpoint of the age at onset. This necessarily makes us begin with congenital heart disease. This phase can be passed over rather rapidly because of the fact that it is relatively uncommon and it does not offer a serious problem to industry. Since the heart is such a complicated structure it is little wonder that defects in development do occur. The wonder is rather that they occur so seldom. If the defect is slight, such as incomplete closure in the septum between the two auricles it may go unnoticed and present no particular problem. If on the other hand the defect is great it is incompatible with life and the child does not survive. Diagnosis is usually easy and is made early. Its treatment can be dismissed from a discussion such as this.

The second large classification which cannot be dismissed is heart disease which results from infection. Since the heart is called upon to propel all the blood circulating through the body it naturally follows that it is particularly susceptible to infections which enter the blood stream, in fact this is practically the only way bacteria may enter the heart. Accidents resulting in penetrating wounds of the chest and spreading infections from the lungs and pleura may and do occur but they are uncommon. Heart infections are usually blood borne, and upper respiratory infections, tonsillitis, bronchitis, and rheumatic fever are the common offenders. Their effect is usually insidious and chronic. The valves separating the chambers of the heart, or the heart and

great vessels, become involved, and the body sets about to heal the damaged member. This it does admirably by forming a scar, much as a scar is formed on the skin after a cut.

This may lead to other difficulties, however. First of all the heart and its lining are thereafter more liable to subsequent infections and secondly a puckering takes place much as it does in scars elsewhere and as a result the valves no longer come tightly together when they close and a condition commonly known as "leakage of the heart" results. In addition the valve no longer is soft and pliable but becomes rigid and consequently the inflowing blood is obstructed. That this obstruction puts an abnormal strain on the heart musculature is obvious. The heart responds to the extra work by dilating and increasing the strength of its muscular walls. This process can continue to be effective only to a certain point, however, and when the time is reached when the muscle can no longer stand the strain, it dilates, often suddenly, and heart failure results.

Now a heart so affected naturally has its reserve diminished, and a patient so afflicted can compare the status of his heart with his bank account. Each day his heart builds up a certain reserve and each day he adds his earning to his account. If his salary is cut the amount he adds to his account decreases and if his heart is damaged his cardiac reserve is likewise diminished. If he lives within his means he will be able to continue a happy existence but if he overdraws, bankruptcy ensues. In a similar sense the patient with heart disease can continue a useful life as long as he does not overtax his heart, but lack of care in this regard will result in heart failure. The treatment then amounts to no more than building up the reserve. The recuperative power of the heart is enormous if it is given half a chance, and if a patient's activities are curtailed and stimulating drugs, such as digitalis, are given an effective heart action can again be obtained.

Now to apply these facts to the workman in industry. There are several ways in which industry can influence the prevention of heart disease due to infection. First by working conditions which help to prevent acute infections and secondly by examination of employees before and during employment. Discovery of hidden or unrecognized

infections at the time of employment may prevent serious consequences later. In the same manner, their discovery by periodic examinations may prevent subsequent cardiac complications.

When a person is found to have valvular heart disease there is no reason why he or she cannot lead a full and useful life, remembering always that the cardiac reserve is diminished and that the heart should not be asked to carry heavy burdens. A sedentary occupation is certainly more desirable for these people, even though they are having no trouble with their heart at the time of examination. Already handicapped, it will perform better and last longer if called upon to do no more than is absolutely necessary. Sudden failure of such hearts is unusual and there is no reason why employees with valvular heart disease cannot be placed in positions of responsibility, even where they are responsible for the welfare of others.

Such is not the case with heart disease due to arteriosclerosis. This form should be differentiated from the foregoing in that its cause and effect are different. It is of course seen in an older age group, usually appearing toward the end of the fourth decade. As has been said the heart's responsibility is the propulsion of blood throughout the body but at the same time it requires a blood supply of its own. This is supplied through a system known as the coronary arteries. Unfortunately in arteriosclerosis, or hardening of the arteries, these coronary arteries are often the first vessels in the body to be affected. If the walls of the vessels become sufficiently hardened the flow of blood to the heart muscle is lessened. Pain is the result. This pain is characterized by sudden onset and is usually located under the breast bone. If it radiates it is usually to the left shoulder and arm. It usually comes as the result of unusual exertion and goes away with rest. This is angina pectoris. It is the heart's way of telling us that it is not getting enough nourishment to carry on the work we are asking of it and when we feel it is time to stop and take stock.

This type of heart disease usually occurs in (1) men who are working under tension and (2) those who are overweight. Therefore a readjustment in their work and mode of living is necessary. The prevention of arteriosclerosis is one of the strongest talk-

ing points for vacations. Freedom from work and worry for a short period of time is a fine prophylactic measure. The most important exercise for these patients is one which is performed three times each day and consists in pushing themselves away from the dinner table some time before they have eaten all they can hold. Reduction of weight is essential and since the heart sufferer should not perform strenuous exercise there is only one way to obtain this reduction and that is by diet.

Now suppose this condition does develop in an individual, does it mean that he is no longer useful in industry?

Certainly not! If he is placed in the proper position he will be useful to industry and himself alike. But his position should not require heavy exertion and he should be under the care of his family physician. In case he is indispensable to his business others must be trained to replace him allowing the patient necessary vacations for proper rest. Lastly, it is unwise to put the physical welfare of others in his hands, since too often this form of heart disease results in sudden failure. If his job is one which requires his constant attention and where any lapse would endanger his life or that of other employees he should be transferred to other work.

Symptoms of coronary heart disease vary and they might resemble symptoms referable to other organs of the body. When a coronary vessel becomes *completely* plugged it is known as coronary thrombosis. Typically there is severe oppressive pain in the chest, frequently radiating down the left arm. This does *not* go away with rest and is accompanied by a fall in blood pressure and signs of shock. This is the usual but by no means the invariable picture presented. Often the symptoms seem to come from the stomach, particularly in mild attacks, or the sufferer may think he has "bronchitis" or gall bladder disease. One must be cautious of the man over 40 who complains of a sudden unusual pain in his stomach. It may be his stomach, but again it may be his heart. An exaggeration which makes this point is the statement that heart disease in young men is usually stomach trouble while stomach trouble in old men is usually heart disease. Overdrawn, of course, but it contains enough truth to make it worth remembering.

What applies to heart disease which is the result of hardening of the arteries is also applicable to that resulting from elevated blood pressure. It occurs in essentially the same age group and its management is essentially the same. The undamaged heart can long withstand moderate elevations of blood pressure unless a sudden undue burden is placed upon it. However if the pressure is sustained for a sufficient period of time and if it reaches an unusually high level the heart may no longer be able to push against this added load and failure results. What has been said about hardening of the arteries may be said also about hypertension. It is compatible with long and useful life, but it does require some curtailment of activity.

As to the type of heart disease resulting from toxins only a few words need be said, as these are more often internal than external. Thyrotoxicosis may result in heart disease but as a rule it is a temporary reaction. As soon as the thyroid is controlled the heart returns to its former state. Drug and chemical injuries to the heart are unusual and present such a rare problem that they need not concern us at this time.

With our modern methods of diagnosis the recognition of the various forms of heart disease important to industry is usually comparatively easy. Despite all the additions to our diagnostic armamentarium there is still nothing to replace a careful history and physical examination. The size and shape of the heart as determined by percussion and the x-ray will in itself give valuable clues as to whether there is any abnormality and what the underlying cause is. Thus, rheumatic heart disease with a mitral stenosis will result in a different contour from that seen in hypertension. The recent increase in x-ray examination of the chest for occupational lung diseases should result in the recognition of more abnormal hearts. The pulse rate itself is often a good guide to the heart's condition.

It can be stated as a general rule that a slow heart is better than a fast one or, to put it another way, when the heart beats 70 times per minute it is working $\frac{1}{3}$ of the time and resting $\frac{2}{3}$ of the time in between beats. When it beats 100 times per minute it can rest only half of the time, and when it increases to 130 it gets only half as much rest as when it beats normally at 70 per

minute. In thyrotoxicosis, one of the cardinal signs is a rapid pulse, and an increased pulse rate when at rest is one of the early signs of heart failure. Palpitation of the pulse will also reveal irregularities. Some of these may be harmless, but they should all be investigated and evaluated.

Examination with a stethoscope may be all that is necessary to determine the presence of a valvular lesion, its location and extent. The electrocardiogram, on the other hand, is of particular value in deciding whether degenerative heart changes have taken place and how far they have progressed. This valuable aid is often discredited unjustly by those who expect more information than it is possible for it to give. To understand and evaluate the electrocardiogram it is necessary to review briefly the conduction mechanism of the heart. This has been likened to a telegraphic system, through which pass electrical impulses which initiate the heart beat. The electrocardiogram measures the amount of this current, the time it takes to pass through the heart and the route it follows. It is at once obvious that it is of inestimable value in such conditions as coronary thrombosis and hypertension where the conduction system may be damaged, but that it might lend little aid in valvular heart disease where the conduction system is intact. It is not an expensive procedure and should be used more extensively in older employees, particularly where heart disease is suspected.

Another procedure of value in making a heart examination is the response of the pulse rate and blood pressure to exercise. It is simply and easily performed. The pulse rate and blood pressure are taken while the patient is in a resting state, and then he is required to do a standard exercise, one of the most common being 25 hops on each foot. Immediately after this exertion the pulse and blood pressure are again taken; both should rise, the former 20 to 40 per cent and the latter from 12 to 30 points. At the end of three minutes rest, however, both should have returned to or below their previous level. In some instances stairs of certain height are used, or the patient is told to blow through an aperture for a given length of time. No matter what method is used it gives valuable information in little time and with very little apparatus. Vital

capacities and circulation times are also used but while of value to the cardiologist they are not as well adapted to routine examinations.

There is a place in industry for those having heart disease. In fact those having an old, healed infection may well be as good risk as their more fortunate colleague. However it is important that the heart ailment be recognized and properly evaluated; and secondly that the sufferer be put at tasks for which he is fitted but which do not put undue stress on the damaged organ. They should never engage in occupations where there is a possibility of lung involvement such as may come from silicon particles, because a heart already damaged will certainly react poorly if the lungs too are affected. Likewise his job should be chosen with regard to the amount of exertion incident to it. And finally periodic examinations of these employees are particularly desirable.

Lastly I want to say a word about the management of acute heart attacks while the patient is at work. These attacks are usually of sudden onset, and whether due to a failing rheumatic heart or a coronary occlusion, the treatment is essentially the same. The first principle is rest, and this means in bed. Strange as it may seem, many patients with an acute failure or a coronary thrombosis are afraid to lie down for fear they will not be able to get their breath. The head should be propped up on two or more pillows for the patient's comfort. Morphine should be administered to these patients, since it stops the pain and relieves restlessness. If an apparatus is available for the administration of oxygen it should by all means be given as it may save the patient's life. Do not under any circumstance allow the patient to walk to the car or ambulance which is to convey him to the hospital or his home. That extra exertion may be more than the failing heart can stand. And as has been mentioned earlier, be on the constant lookout for heart disease masquerading under bizarre symptoms.

Early recognition of heart failure and institution of proper measures of control may save weeks and months of invalidism which result if the underlying condition is allowed to go unrecognized.

Nutrition for Industrial Workers

By MARY I. BARBER

Director of Home Economics, Kellogg Company, Battle Creek, Mich.

An observant personnel manager sizes up applicants at the first glance. Subconsciously his mind registers the presence or absence of good posture, straight legs, skillful hands, bright eyes, white teeth. The lack of any of these qualities may be caused by malnutrition and the reason for it may date back many years. Nothing can be done to correct past mistakes or ignorances, but something can be done to improve them in the future.

The physical examination given to new employees and the periodic check-up will disclose such obvious things as imperfect eyesight, dental caries, goitre or anemia. Many physicians send employees to the dentist or family doctor; but possibly neither may give advice on the improvement in food habits which will mean better nutrition. The nurse has a splendid opportunity to find out about the kind of menus served in the homes which she visits, or if she does not make home calls, she can get this information by talking with the people who come to her office.

People have an instinctive confidence in a nurse. They do not fear her as they do the doctor—he may find out that they need their tonsils out and recommend a painful operation. The nurse does not prescribe. She listens sympathetically. If she is alert she finds out much which is significant and which can guide the doctor in his diagnosis. A patient may be shy about talking to the doctor about being overweight—but not to the nurse. An overweight condition may be a contributing factor to less than 100 per cent efficiency on the job.

Occasionally we find a factory where a nutritionist is employed. She, the nurse and the doctor are a combination ideal for carrying on a nutrition program. One large manufacturing plant has such a set-up. The nutritionist has conferences with employees who have asked for this service or have been referred by doctors or nurses. She directs certain experiments such as the administration of cod liver oil or vitamin tablets to certain groups, comparing their lack of colds to those of other groups not having vitamin therapy. The nutritionist gives special courses for the nurses and helps them

with employees' problems. She acts as adviser to the cafeteria director.

Here is a letter to employees typical of a nutrition program explanation:

To the Vitamin Group

"Our tablets this winter contain vitamins A, B, D, and G instead of the usual A and D of former years.

"Why serve a tablet which contains vitamin B and vitamin G? Because recent studies show that these vitamins, in right amount, help to make us physically fit by keeping the digestive tract healthier, appetite keener, and nerves steadier.

"There are foods rich in these vitamins, but people do not always get the right amount in their food. To make certain that the members of the Vitamin Group are adequately supplied, we include small amounts of them in the tablets.

"We could get the rest from our food. Isn't it fortunate that we can turn to the common foods like milk, green leafy and yellow vegetables, potatoes, oranges, tomatoes, eggs, beef, liver, and whole grain cereals to furnish these vitamins? At the same time, we shall be richly supplied with vitamins A and C, and the best proteins and minerals.

"If your menus for the day include in approximately the quantities suggested the following foods with butter, whole grain cereals, and breadstuffs, you may rest assured you will have better health and greater vigor.

Milk, whole.....	1 pint
Egg	1
Broccoli (or any green leaf vegetable)	1 cup, steamed
Carrots (or any yellow vegetable) 2 or 3 small	
Potato, medium size.....	1
Orange juice (or 2 cups tomato juice) ¾ cup	
Liver, or beef, or pork well cooked	1 serving

"There would be no harm in doubling the amounts of the items.

"If there is any question you wish to ask about your diet, the Medical Department will gladly discuss it with you."

**"Cordially yours
Nutrition Adviser
Plant Nurse"**

It is desirable to have a milk dispenser or snack bar available to all employees. This assures food served and eaten in a sanitary way. Nothing looks worse than people eating while working. Crumbs have no place in a factory work room. One factory which used to have a soft drink dispenser was persuaded to sell bottled milk also, so a refrigerator was purchased. Immediately the workers began to buy white and chocolate milk. Soon the refrigerator (a very large one) was inadequate, so a snack bar was established. This particular plant runs 24 hours a day—4 shifts—with about 1,800 employees. Here are the sales figures for June 1940 on milk products alone:

1,700 to 2,000 persons are served per day.

Milk.....	1,200 half pint bottles
	2,400 pint bottles
Ice Cream.....	1,700 gallons
Chocolate Milk.....	1,800 half pint bottles
Buttermilk.....	180 gallons

Coffee, sandwiches and doughnuts are also available but observation shows that the dairy products are the best sellers. In our own factory the snack bar carries individual packages of our own cereals and interestingly enough, a fairly large number of people who are working with them day after day buy them.

Some public school cafeterias serve a combination of individual ready-to-eat cereal with a one-half pint bottle of milk for five cents. If a whole grain cereal is chosen this is as good value for the money as any combination possible on a counter. Many children eat this as dessert.

I have watched industrial workers go along the line in a cafeteria and often am astonished by the poorly balanced meals they choose—and sometimes pleasantly surprised at wise choices. Perhaps the solution is a combination or plate meal to be played up and made so attractive and priced so reasonably that it will be a voluntary choice. A well trained food service director can see that wholesome, nutritious meals are offered.

Industry feels its responsibility to its em-

ployees and has proved this by providing such things as sanitary working conditions, medical service, recreational facilities, etc., but for the most part a constructive nutrition program has been omitted. Can it be ignored any longer if manufacturers wish to cooperate with government agencies and promote the American Way of living? The strongest argument I can give in urging industry to include nutrition in its thinking for 1941 is to quote Miss Harriet Elliott, Consumer Commissioner, National Defense Advisory Commission:

"We have a job to do. You, and I, and everyone. Our job is this: To make America strong."

"We have our lands to hold, our waters to protect, our skies to guard. We have these, but we have more. We have people."

We are rich in people. People who love and cherish our lands. People who know how and want to work. People who have deep faith that here we have the greatest chance for life, and liberty, and the pursuit of happiness. People who know the fight for this is never won until it is won for everybody.

"Defense is planes and guns. It is equipping an army to man our military weapons. It is this, and more. It is building the health, the physical fitness, the social well-being of all our people, and doing it the democratic way. Hungry people, undernourished people, ill people, do not make for strong defense.

"This, then, is our job, not all of it, but a vital part: Let us make every American strong, stronger than ever before, sturdier in body, steadier in nerves, surer in living."

Out of 130 million people, 45 million live below the safety line because we do not get the food we need. The reasons are because the income is too low; because of ignorance of how to buy, plan and prepare meals; because our interest has not been aroused.

Below the safety line means:

Bodies that tire too easily.

Bodies with minds that are slow to think.

Bodies too weak to fight disease.

On or above the *safety* line means:

Strong, straight bodies that can carry the load of a hard day's work; eyes that are sharp and sure; nerves that are steady, firm and unafraid.

You can help to build a food route to safety by an educational program in your

organization. This can be under the personnel, medical, nursing or home economics department—or better, with the cooperation of all of them. Optimum nutrition for every worker; helps for his family by setting up a food clinic to which problems can be brought; distribution of leaflets which give practical advice on spending money and getting nutritional value for each food dollar; encouraging home gardens, home canning or cold locker-storage of surplus fruits and vegetables; setting up displays of adequate menus for a day; posting on bulletin boards items to stimulate interest in nutrition.

There is some dietitian in every city who will gladly help you with a nutrition program (I am sure that I can speak for members of the American Dietetic Association). The Food and National Defense Issue of Consumers Guide lists city, county, state and government agencies ready to give service on this "Food for Safety" program.

Again let me quote from this same magazine:

"AMERICA can dream that want will disappear. America can hope and live in hope that none will lack the food he needs. We can dream and hope, but we must also work.

"We can work.

"With our lands, and hands, and machines we have built greatly. We have raised from the earth buildings that soar a thousand

feet. We have dammed gigantic rivers and made their waters do the work of millions. We have created cities and highways, factories and machines that are the marvel of the world.

"We have worked at many things. We must do more.

"We must work at this job of getting everybody a chance to earn a livelihood that includes the food he needs. We must make sure that our farmers, the most abundant producers on earth, will have the help they need to keep on raising food and saving soil. We must make our dollars buy the best and safest meals for all.

"This means work.

"We can start in our own homes. Make food do all the job it can do. Make certain each member of the family gets the food that keeps him strong and well.

"We can look at our own communities, discover where meals are poor, why they are poor, how they must be enriched.

"We can banish low incomes and waste, and abolish monopoly that chokes the flow of foods from farms to homes.

"We have the talent to do all this vigorously, persistently, and in the ways of a democratic people.

"We can make America strong by making Americans stronger."

ADJOURNMENT