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PHYSICAL EXAMINATIONS IN INDUSTRY



OCCUPATIONAL HEALTH SERIES
NUMBER 2

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METROPOLITAN LIFE INSURANCE COMPANY
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Exhibit Q

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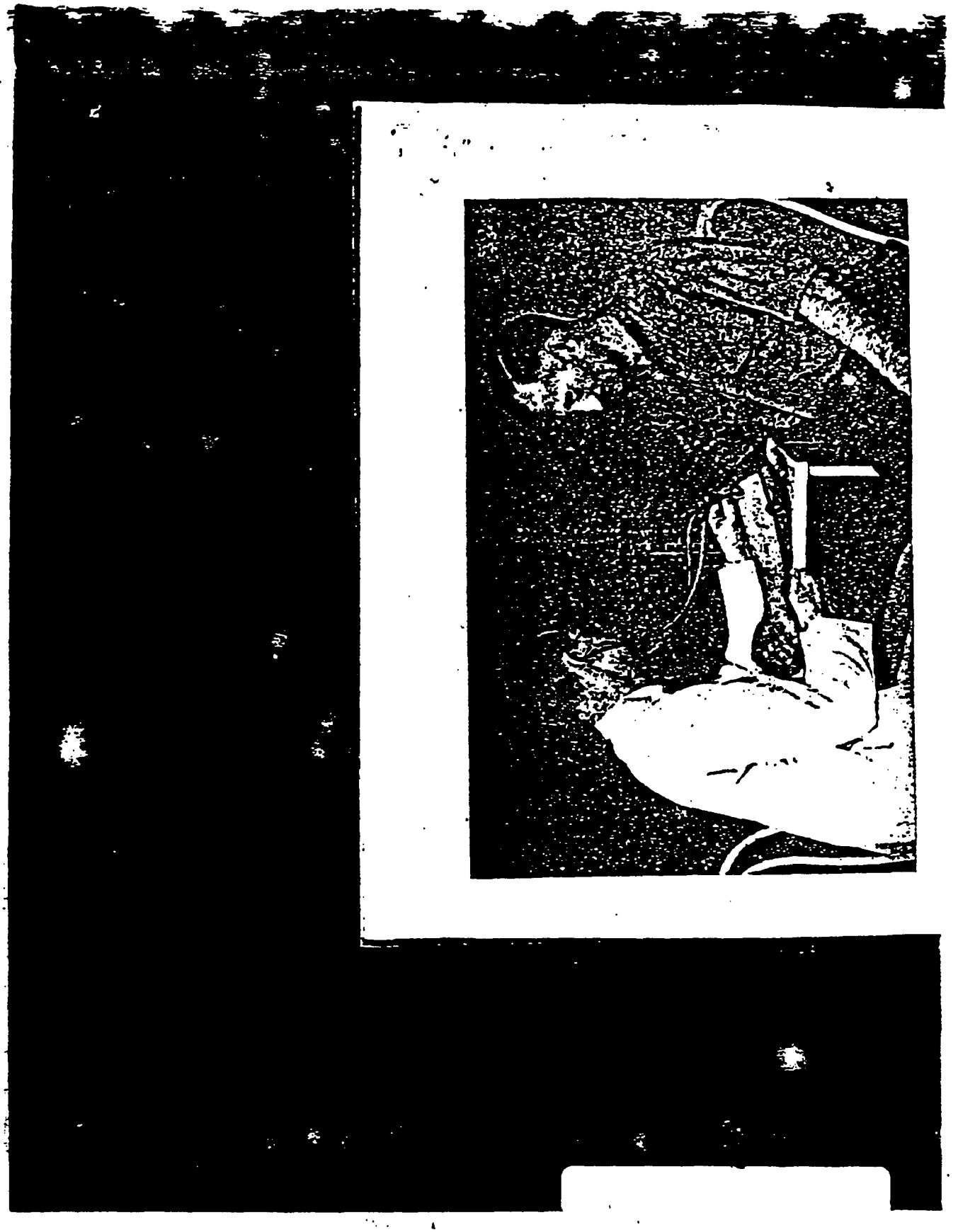

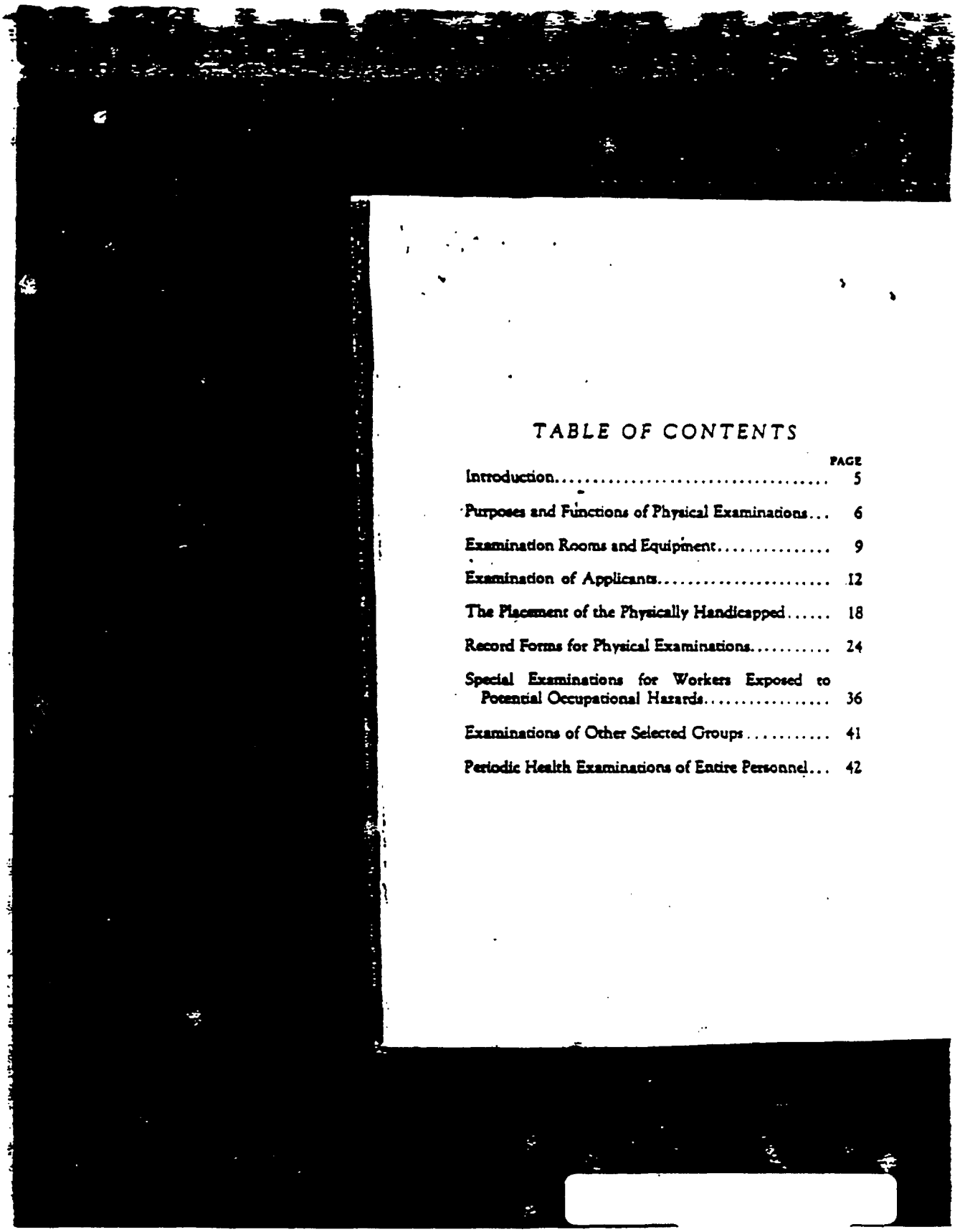

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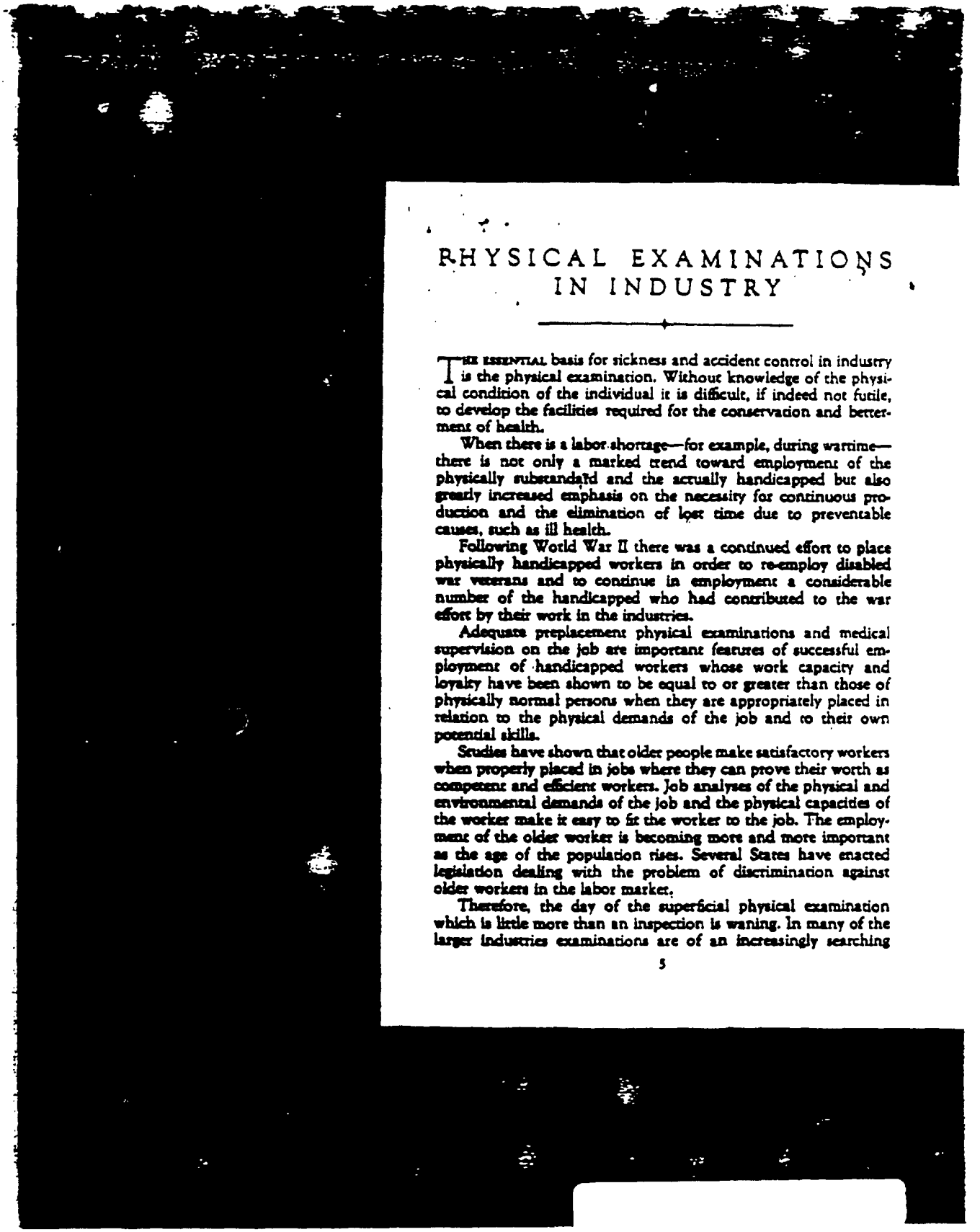


PHYSICAL EXAMINATIONS IN INDUSTRY

THE ESSENTIAL basis for sickness and accident control in industry is the physical examination. Without knowledge of the physical condition of the individual it is difficult, if indeed not futile, to develop the facilities required for the conservation and betterment of health.

When there is a labor shortage—for example, during wartime—there is not only a marked trend toward employment of the physically substandard and the actually handicapped but also greatly increased emphasis on the necessity for continuous production and the elimination of lost time due to preventable causes, such as ill health.

Following World War II there was a continued effort to place physically handicapped workers in order to re-employ disabled war veterans and to continue in employment a considerable number of the handicapped who had contributed to the war effort by their work in the industries.

Adequate preplacement physical examinations and medical supervision on the job are important features of successful employment of handicapped workers whose work capacity and loyalty have been shown to be equal to or greater than those of physically normal persons when they are appropriately placed in relation to the physical demands of the job and to their own potential skills.

Studies have shown that older people make satisfactory workers when properly placed in jobs where they can prove their worth as competent and efficient workers. Job analyses of the physical and environmental demands of the job and the physical capacities of the worker make it easy to fit the worker to the job. The employment of the older worker is becoming more and more important as the age of the population rises. Several States have enacted legislation dealing with the problem of discrimination against older workers in the labor market.

Therefore, the day of the superficial physical examination which is little more than an inspection is waning. In many of the larger industries examinations are of an increasingly searching

type, not for purposes of eliminating those with physical impairments but as a basis for proper job placement.

In 1951 the National Association of Manufacturers[1] made a survey of a large group of manufacturing companies. A total of 3,589 companies employing 3,312,647 workers, including factory, office, and executive groups, responded to the questionnaire. Of these companies, 53 percent employed 250 workers or less.

Out of the total responding companies, 1,893—or 52.7 percent—conducted preplacement physical examinations. These companies employed 2,963,329 workers—89.5 percent of the total employed. Practically all of these companies tested applicants for factory jobs. Less than two thirds of them examined applicants for office positions, and less than half examined applicants for executive positions. The proportion of companies which gave such examinations to applicants for office work and executive positions in addition to factory positions increased with the size of the plant.

Of the 3,589 companies that responded to the questionnaire, 818—or 22.8 percent—conducted periodic physical examinations. These companies employed 1,933,745 persons, or 58.4 percent of the total employed. The usual size-group pattern prevailed.

Purposes and Functions of Physical Examinations

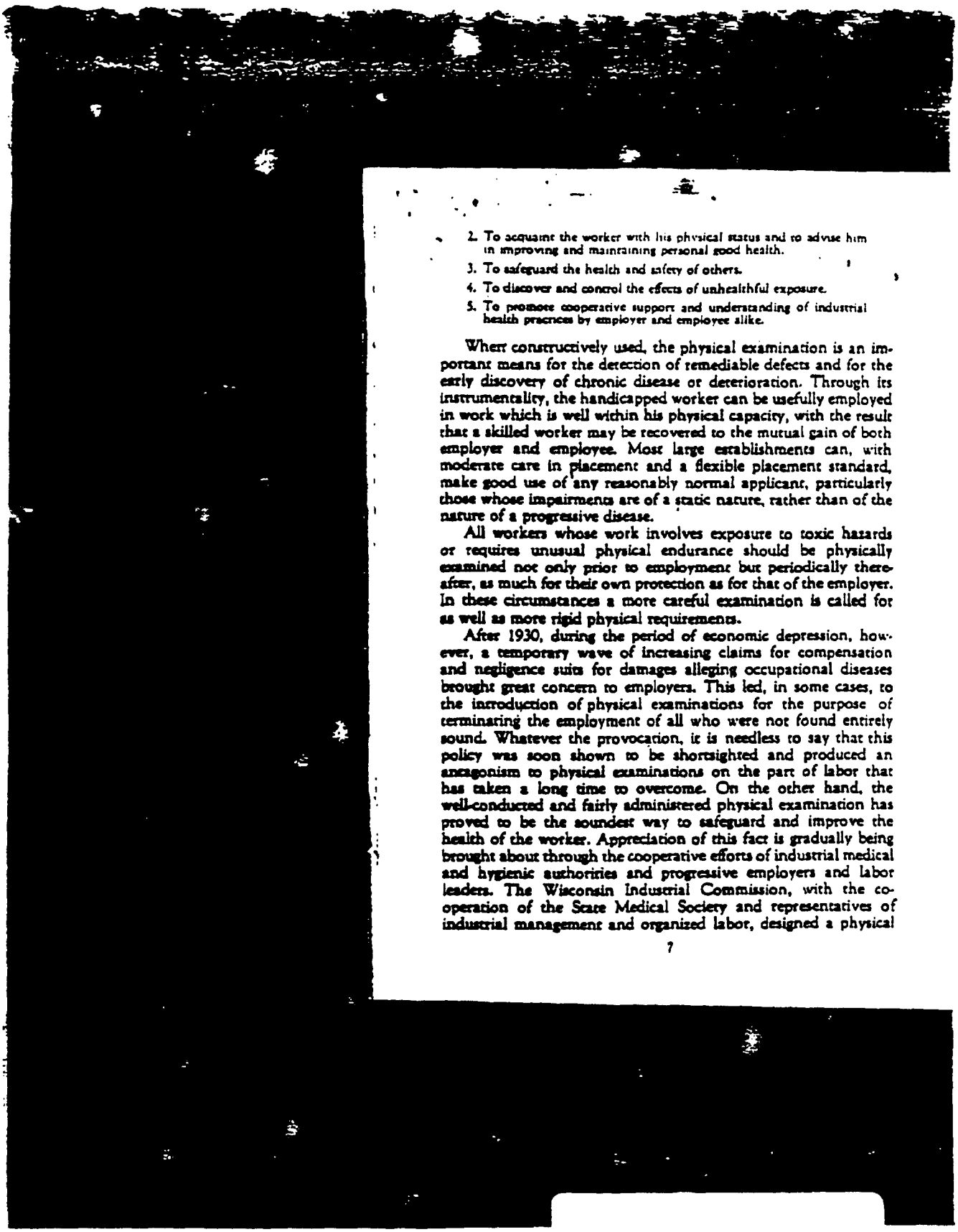
The two classes of physical examinations with which industry is particularly concerned are: (1) the preplacement examination of applicants for employment, and (2) the subsequent periodic examination of some or all workers at regular intervals during their service in the organization. While in many instances both types are utilized, it is felt that they are so different in purpose and method that in any discussion of plans for organizing physical examinations in industry they may, to a certain extent, be treated separately.

The Council on Industrial Health of the American Medical Association defines the objectives of industrial physical examinations as follows:[2]

1. To facilitate placement and advancement of workers in accordance with individual physical and mental fitness.

[1] The Brookings Institution: Health Resources in the United States—"Health Service in Industry, A 1951 Survey by the National Association of Manufacturers and a 1950 Survey by the American College of Surgeons." Washington, D. C. 1952.

[2] Council on Industrial Health of the American Medical Association: "Industrial Health Examinations," Revised, Journal of the American Medical Association, Chicago, Vol. 125, No. 8, (June 24, 1944). Page 569.



2. To acquaint the worker with his physical status and to advise him in improving and maintaining personal good health.
3. To safeguard the health and safety of others.
4. To discover and control the effects of unhealthful exposure.
5. To promote cooperative support and understanding of industrial health practices by employer and employee alike.

When constructively used, the physical examination is an important means for the detection of remediable defects and for the early discovery of chronic disease or deterioration. Through its instrumentality, the handicapped worker can be usefully employed in work which is well within his physical capacity, with the result that a skilled worker may be recovered to the mutual gain of both employer and employee. Most large establishments can, with moderate care in placement and a flexible placement standard, make good use of any reasonably normal applicant, particularly those whose impairments are of a static nature, rather than of the nature of a progressive disease.

All workers whose work involves exposure to toxic hazards or requires unusual physical endurance should be physically examined not only prior to employment but periodically thereafter, as much for their own protection as for that of the employer. In these circumstances a more careful examination is called for as well as more rigid physical requirements.

After 1930, during the period of economic depression, however, a temporary wave of increasing claims for compensation and negligence suits for damages alleging occupational diseases brought great concern to employers. This led, in some cases, to the introduction of physical examinations for the purpose of terminating the employment of all who were not found entirely sound. Whatever the provocation, it is needless to say that this policy was soon shown to be shortsighted and produced an antagonism to physical examinations on the part of labor that has taken a long time to overcome. On the other hand, the well-conducted and fairly administered physical examination has proved to be the soundest way to safeguard and improve the health of the worker. Appreciation of this fact is gradually being brought about through the cooperative efforts of industrial medical and hygienic authorities and progressive employers and labor leaders. The Wisconsin Industrial Commission, with the cooperation of the State Medical Society and representatives of industrial management and organized labor, designed a physical

examination program which was recommended on a voluntary basis to Wisconsin industries in 1939 as one essential in the prevention and control of occupational diseases and accidents. Wisconsin has also adopted statutory provision under the workmen's compensation law for penalties of various kinds for employers who apply physical examinations in an oppressive manner to reject or discharge workers.[1] (For tentative examination forms suggested for adoption, see pages 32-34).

In order to obtain the maximum value from the physical examination of employees, it should be performed in a manner that not only enables management to fit the workman to a suitable job but also reveals the information requisite for guidance of the worker in the maintenance of his health to the end that he may continue on his job effectively. This implies an intimate, first-hand knowledge, on the part of the examining physician, of the actual jobs, methods of work, and conditions surrounding the work throughout the plant for which he is examining applicants and workmen. This aspect of an examination program should be considered carefully by the individual plant management before deciding upon the relative merits of setting aside space and equipment for a doctor to make examinations on the premises or arranging to send prospective workers to the doctor's outside office. The latter system is not conducive to sustained interest on the part of the physician in keeping constant watch over the correlation of the job requirements with the worker's physical condition, although it has its uses on certain types of scattered operations.

The personality, tact, and strictly unbiased attitude of the doctor and other medical department personnel are of crucial importance in industry just as in private practice—perhaps more so, since these services are in some degree urged upon the workers. The wise employer realizes that the work of his industrial physician has far more value if it serves the employees, as well as the management, impartially and scientifically.

With sustained interest on the part of top management and consistent follow-up by the physician of those found physically ill or defective, the physical examination program often develops into a successful, full-fledged industrial medical service. The emphasis in the more inclusive programs is on health maintenance,

[1] Wisconsin Physical Examination Program, Industrial Commission of Wisconsin, Madison, Wis.

assuring that each worker secures remedial medical care from appropriate local physicians or other community health agencies, and that workers with permanent handicaps or impaired health are successfully placed at jobs within their physical capacity and tolerance. Without this sustained interest and effort, the whole physical examination program is likely to deteriorate into a more or less empty routine.

The physical examination program is, therefore, the cornerstone of an industrial health program, the primary purpose of which is to maintain and protect the health and well-being of employees. To be effective, the program must be tailored to serve the needs of the particular plant. For information regarding the functions of a comprehensive industrial medical service, refer to the Metropolitan booklet *Employee Health Service in Small Plants.*[6] This booklet also contains a list of sources on employee health and nursing service.

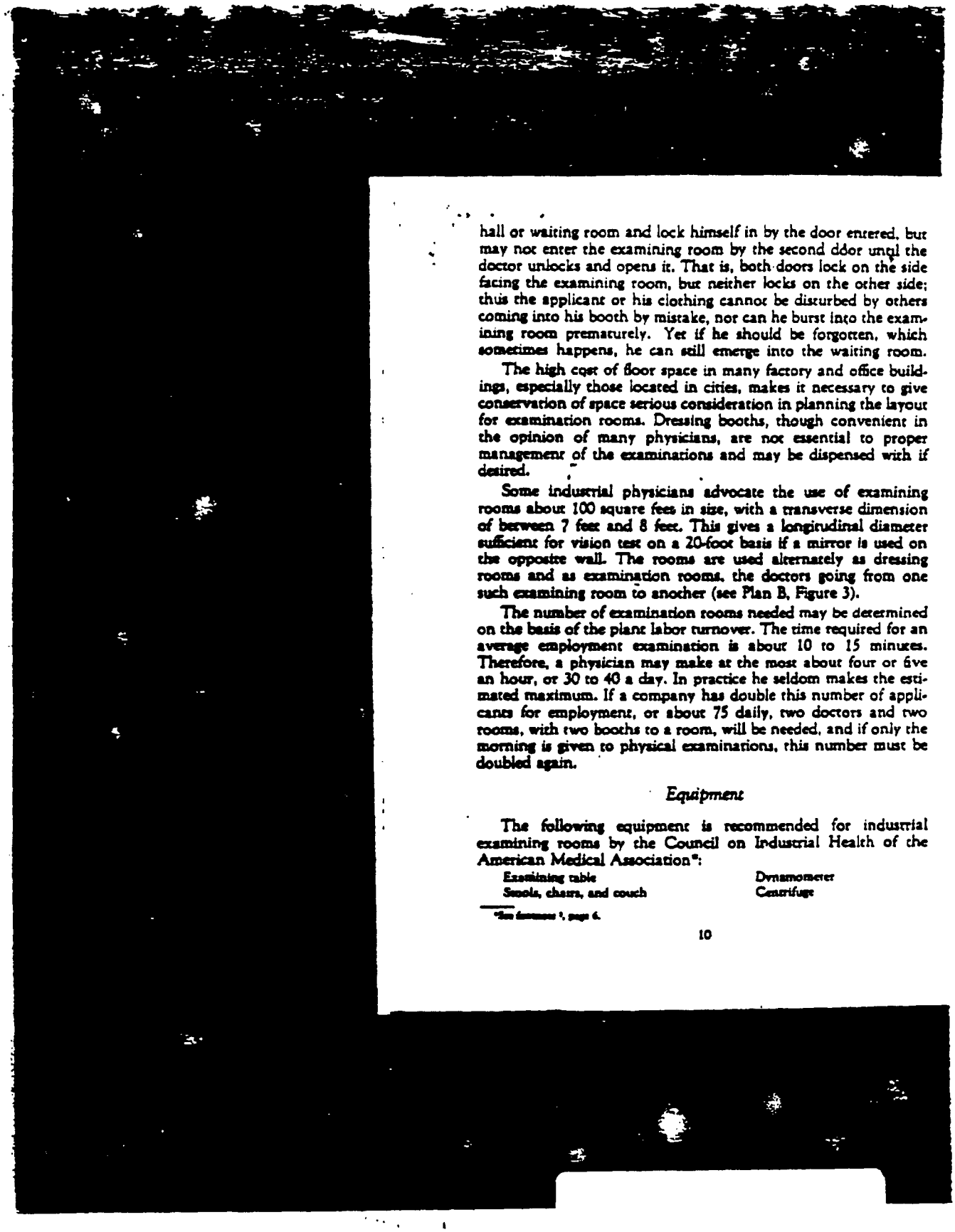
To obtain practical, measurable results from an industrial health program adequate records should be kept, from which data can be tabulated in a form showing exactly what the program is accomplishing or failing to accomplish. The confidential nature of the diagnosis or detailed findings of the physical examination, however, should be rigorously preserved and safeguarded. The form of the records and the uses to which they may properly be put are discussed under record forms (pages 24-35).

Examination Rooms and Equipment

It is generally agreed that if good results are to be obtained from physical examinations, a suitable space with proper equipment and clerical assistance should be provided. The diagrams, Figure 3, on pages 22 and 23 show a good arrangement.

Examination quarters of a type more or less peculiar to industrial plants consist of two or more dressing booths, perhaps no larger than 40 by 60 inches, in which applicants for examination remove their clothes; these booths open into or adjoin an examination room which need not be more than 8 by 10 feet in floor dimensions (see Plan A, Figure 3). In the examining rooms with two or more dressing booths to a room, two doors to each booth may be arranged so that the applicant may enter a booth from a

[6] Safety and Occupational Health Bureau, Metropolitan Life Insurance Company, New York. Employee Health Service in Small Plants. Occupational Health Series Number 6.



hall or waiting room and lock himself in by the door entered, but may not enter the examining room by the second door until the doctor unlocks and opens it. That is, both doors lock on the side facing the examining room, but neither locks on the other side; thus the applicant or his clothing cannot be disturbed by others coming into his booth by mistake, nor can he burst into the examining room prematurely. Yet if he should be forgotten, which sometimes happens, he can still emerge into the waiting room.

The high cost of floor space in many factory and office buildings, especially those located in cities, makes it necessary to give conservation of space serious consideration in planning the layout for examination rooms. Dressing booths, though convenient in the opinion of many physicians, are not essential to proper management of the examinations and may be dispensed with if desired.

Some industrial physicians advocate the use of examining rooms about 100 square feet in size, with a transverse dimension of between 7 feet and 8 feet. This gives a longitudinal diameter sufficient for vision test on a 20-foot basis if a mirror is used on the opposite wall. The rooms are used alternately as dressing rooms and as examination rooms, the doctors going from one such examining room to another (see Plan B, Figure 3).

The number of examination rooms needed may be determined on the basis of the plant labor turnover. The time required for an average employment examination is about 10 to 15 minutes. Therefore, a physician may make at the most about four or five an hour, or 30 to 40 a day. In practice he seldom makes the estimated maximum. If a company has double this number of applicants for employment, or about 75 daily, two doctors and two rooms, with two booths to a room, will be needed, and if only the morning is given to physical examinations, this number must be doubled again.

Equipment

The following equipment is recommended for industrial examining rooms by the Council on Industrial Health of the American Medical Association[6]:

Examining table	Dynamometer
Stools, chairs, and couch	Centrifuge

[6] See footnote 1, page 6.

Mirror	Microscope
Screen	Stethoscope
Scale and measuring rod	Ophthalmoscope
Metal measuring tape	Blood vacuum tubes
Spotlight	Otoscope
Distant and near reading cards	Reflex hammer
Color-sense testing cards	Rubber gloves and finger cots
Nose and throat mirror	Tuning forks
Transilluminator	Hemoglobin outfit
Blood-pressure instrument	Urinalysis equipment
Luer syringes (2 cc. and 10 cc.)	Garment racks
Thermometer	Standard office furniture

In addition there should be washable capes or other covering for examinations of women. The centrifuge is helpful if any analyses are to be completed in the department. If space permits, a writing table and chair in each room are desirable.

For the more complete types of examining procedure, there may be added space and fluoroscopic and X-ray equipment, an electrocardiograph, an audiometer for testing hearing, and a basal metabolism outfit, and, if desired, a completely equipped laboratory with chemical reagents. It is considered preferable to have the preplacement examination rooms and those where periodic examinations are made separated from the rooms where injuries and illnesses are treated so that new employees and those being routinely examined are not mingled with cases of illness or injury. In the small plant, where preplacement examinations are few and the time can be arranged so that the periodic examinations do not conflict or interfere, it may be possible to use the same rooms for both types of examinations. It is convenient, of course, that both rooms should be accessible to such equipment and facilities as may be used in common, such as the X-ray apparatus.

Preplacement visual testing procedure has been rapidly developing in the past few years, and a number of plants have installed equipment for the rapid testing of visual efficiency consisting of a stereoscopic viewing apparatus with a battery of tests calculated to cover the important visual functions, including acuity of distant and near vision, depth perception, ocular muscle balance for near and far vision, color perception, and others if needed. Such apparatus can be handled by the nurse after special training or by other trained technicians, but any and all testing should be under professional guidance.[4]

[4] Hedwig S. Kuhn, M.D., *Eyes and Industry*, formerly *Industrial Ophthalmology*, C. V. Mosby and Company, St. Louis, second edition, 1950. 378 pages.

Dr. J. S. Felton, when he was Medical Director, Oak Ridge National Laboratory, Union Carbide & Carbon Corporation, devised a combination examination-treatment unit.[1] A diagram of this unit is reproduced in Figure 1, page 13.

Cost

According to the Council on Industrial Health of the American Medical Association, industry should supply, without charge, all medical and clerical assistance essential to a health examination program. The cost of examining applicants obviously varies with the conditions of the examination and the locality in which it is undertaken. A general idea of the fees for which a competent doctor can probably be secured to do this work should be obtainable from the Committee on Industrial Medicine of the local State or county medical society. Information regarding salaries for nurses should be sought from the State or local nursing association, the State division of industrial hygiene, or from the State industrial nurses' association, if one exists. Provided that the physician's time is efficiently planned while he is at the plant and adequate assistance is given him, the average cost of the standard type of employment examinations should not, as a rule, exceed $5 per person examined. A thorough, painstaking examination would cost more, depending upon the time and skill required.

Examination of Applicants

As long ago as 1922, Dr. W. Irving Clark, of the Norton Company, Worcester, Mass., suggested a detailed technique for conducting physical examinations for industrial employment.[2]

He advocated that the examination should be given before the employee is actually hired and that it should be conducted in private by the physician. The examination of women, unless done by a woman physician, should be carried out in the presence of a nurse or female attendant. The preliminary part of the examination, such as observing and recording the weight, height, temperature, and the results of eye and ear tests, may be

[1] Mann, Spencer Felton, M.D.: "Space and Labor-Saving Devices in the Industrial Dispensary. I. Combination Examination-Treatment Unit." *Occupational Medicine*, Vol. 3, No. 6 (June 1947), Page 548. Dr. Felton has published a number of papers in this series in the A.M.A. Archives of Industrial Hygiene and Occupational Medicine. "VII. Portable Clinical Laboratory Equipment for Field Use" appeared in the May 1953 number.

[2] W. Irving Clark, M.D.: *Health Service in Industry*, The Macmillan Company, New York, 1922.

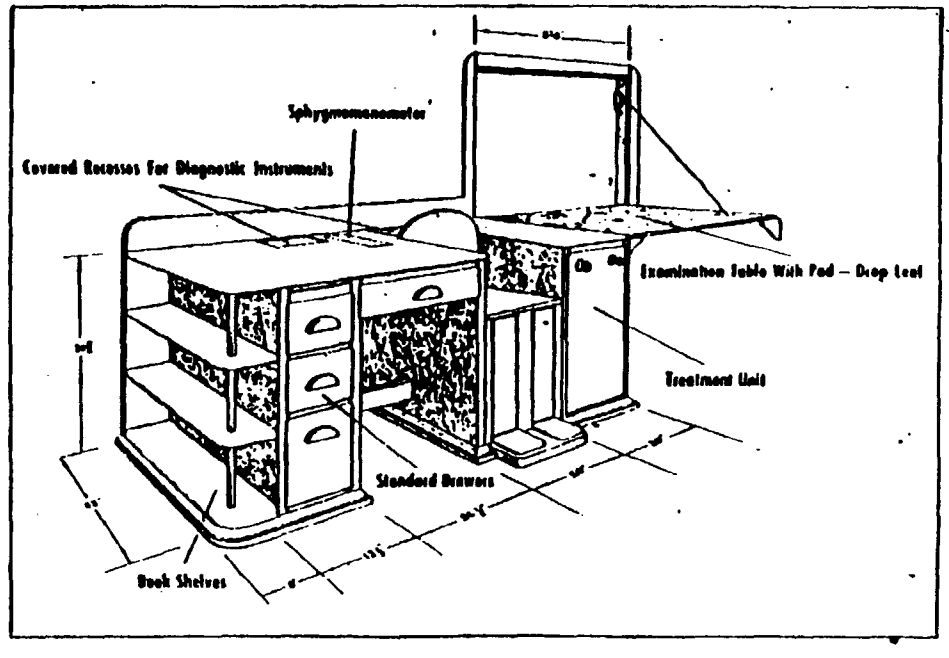


FIGURE 1
Courtesy of Dr. Jean S. Felton
13

made by a nurse or trained layman in order to save the doctor's time.

Since speed is often essential in preplacement examinations to avoid delay in the employment department and undue waiting in the medical department, a definite methodical order of procedure carried out by an experienced physician is highly desirable.

The scope of the examinations, as outlined by the Council on Industrial Health,* includes:

1. Past medical, family, and occupational history.
2. Physical findings.
3. Personality appraisal.
4. Laboratory data.
5. Summary and recommendations.

The first part of the examination, the recording of identification and job data, and the personal history can be taken by a well-trained assistant, either a medical record clerk or a nurse, to save the time of the physician, but under no circumstances should anyone except the physician himself undertake the actual physical examination. The personal and family medical history is frequently unreliable in the case of applicants for employment, not only because of fear of rejection but often because of lack of knowledge; consequently, many industrial physicians feel that an elaborate questionnaire on the subject is of very limited value. On the other hand, the record of past occupations, past illnesses, serious injuries, hospital or sanatorium care, and repeated sicknesses or accidents is very important and should be taken carefully. Women are generally questioned concerning menstrual difficulties, pelvic conditions, and history of pregnancies.

Applicants may be classified as follows into three or four broad groups (see page 24) as a result of these examinations:

1. Applicant physically fit for any work in the plant
   (a) without physical defects or impairments.
   (b) with slight physical defects, insignificant or correctible.
2. Applicant physically fit only for selective placement under medical supervision.
3. Applicant physically unfit for any work in the plant.

When the physically standard applicants, who represent the great majority, are separated from the substandard, the latter may subsequently be given a more detailed examination to discover

*[illegible], page 6.

the extent of their disabilities and their requirements for careful job placement and future medical supervision. It should be clearly understood that the substandard classification does not necessarily imply rejection; but that each applicant in the class should be judged individually by the physician, with the purpose of assessing his working capacity in relation to the jobs available. This is one reason why it is so important for the physician to be familiar with the types of jobs performed in the plant and their respective physical and mental requirements. This knowledge is best obtained by first-hand observation and study, but in any event, a competently prepared job analysis and job classification with emphasis on physical requirements should be made available to the examining physician.

Adequate follow-up of all physically substandard workers placed in industry implies that definite measures will be adopted by the industrial physician to see that remedial treatment is secured for correctible defects, and that those with irremediable defects or chronic impairments not yielding readily to treatment are seen again at suitable intervals to make sure that their jobs are still within their physical capacity and are not aggravating their conditions. All workers classed as substandard should be re-examined or medically approved for a transfer before they are permitted to change to a different job which may be more arduous or more hazardous for them than the one at which they were placed originally.

Physical impairments giving rise to a substandard classification are most frequently due to chronic diseases of the cardiovascular system, pulmonary diseases, diseases or defects of the bones and joints, hernia, defects or diseases of the eyes and ears, and various general diseases such as syphilis, rheumatism, alcoholism, and diabetes. Mental disturbances of varying degrees of severity and epilepsy are also extremely common, and these are not always recognized on preplacement examination. In recent years more stress has been placed upon the need for attention to this point in the examining technique.

As better understanding of the factors which contribute to accidents and ill health among industrial workers has been acquired, the interrelationship of mental health and physical health has become clearer. Wherever possible physical examinations should be performed with this broader concept of health in mind. Even the necessarily brief, rapid preplacement examination can include

some appraisal of the mental and emotional status of the applicant. When this is done there is less likelihood that serious and obvious mental disorders will be overlooked, but, more important, the plant physician may be able to make more intelligent recommendations regarding the job placement of the worker.

In each plant the industrial physician usually develops his own technique or adapts existing techniques to the existing conditions on the basis of his own experience and the industrial management policies involved in the particular industry. Certain general standards have been drafted or suggested from time to time which may be useful for guidance. The earliest standard adopted by the Conference Board of Physicians in Industry many years ago[4] is still in more or less general use by industrial physicians, with various modifications.

The American Medical Association offers helpful suggestions for the procedure of physicians in making physical examinations,[5] though some modification of the standards may be desirable for use in industry.

A careful examination of the chest of each applicant is very important. The technique developed by Clark at the Norton Company Plant[6] was as follows and is still a generally useful method:

> A quick method of determining the functional power of the heart and lungs is to run over the apices of the lobes of both lungs with a stethoscope, telling the patient to breathe in, breathe out, and then to cough. This expulsive cough at the end of expiration is of great service in bringing out rales. In hearts which show enlargement, irregularity, or produce murmurs, a quick test of function is to have the patient hop 25 or 50 times on one foot. Rapidity of expiration, breathlessness, and irregularity of pulse should be noted, and, if marked, indicate a myocardium insufficient for hard work.

The technique instigated by Dr. Clark for conducting preplacement examinations is still carried out at the Norton Company Plant, with the addition of the use of an audiometer for hearing tests and a vision test by one of the binocular screening instruments.

A chest X ray is taken of every worker in the plant in order to maintain a permanent record.

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[4] Medical Supervision and Service in Industry, Appendices D and E, National Industrial Conference Board, Inc., New York, 1931. Pages 116-121.

[5] American Medical Association, Chicago. "Periodic Health Examination, A Manual for Physicians." 1947.

[6] See footnote [3] Page 12.

It will be seen that there is a rapidly growing tendency to include, as part of the routine physical examination, an X-ray examination of the chests of all applicants. This procedure is particularly important in industries where exposure to dusts, which may affect the lungs, is involved. The X-ray examination not only confirms the physical findings of the chest but detects incipient diseases of the lungs frequently before either symptoms or physical signs of disease appear. It protects the employer from hiring a worker whose lungs have already developed injury from industrial dusts in previous employments, and the workmen with injured lungs from being put to work in occupations which will aggravate this condition. It serves, also, as a graphic means of recording the changes that take place in the chest from time to time. Some of the important conditions brought to light through the use of the X ray are: tuberculosis, chest tumors, enlargement or displacement of the heart and its associated large blood vessels, and occupational diseases of the lungs, such as silicosis and asbestosis.

Routine laboratory examination of the blood for syphilis is also being successfully practiced in many plants, with an adequate program of follow-up to see that cases of active, untreated infection are encouraged to obtain competent medical treatment.

Another very important part of the examination is the careful testing of the joints, and Clark recommends the following as a rapid and efficient method long used in a large factory:

1. Applicant stands facing examiner, forearms flexed on arms, hands in supination.
2. Applicant spreads fingers apart and brings them together, closes fists, opens fists, apposes tips of thumbs to little fingers, pronates, and again supinates.
3. Flex forearms acutely until fingers touch shoulders. Raise elbows anteriorly as high as possible.
4. Abduct both arms in this position and rotate shoulders.
5. Raise hands straight up above head as high as possible.
6. Bend over touching ground.
7. Resume erect position.
8. Squat on heels and rise to original position.
9. Abduct first one leg and then the other.
10. Rotate the head from side to side.

If these motions are gone through rapidly, they can be accomplished in about three minutes, and every important joint in the body will have been tested. It has been found that defective joints are more apt to cause trouble than other apparently more serious disorders in other parts of the body.

Two conditions which may be very troublesome from the standpoint of aggravation and disability in some types of work are varicose veins and weak feet. The capacity for standing for long hours, climbing, operating machinery by pedal, and walking may be limited in such applicants, and those having a tendency to phlebitis and varicose ulcers may be severely handicapped and constitute a job placement problem.

A chart prepared by the medical unit of the U.S. Civil Service Commission to illustrate methods of testing for weak feet is reproduced on page 20.

The Placement of the Physically Handicapped

A number of plants have set up special committees or departments to oversee the appropriate placement of rehabilitated applicants, or to aid in rehabilitation job training. Many plans have been developed on a community-wide scale in industrial areas.

For example, under the leadership of the Caterpillar Tractor Company, Peoria, Ill., its own well-organized plan has been extended to the industrial employers of the community and is known as the "Peoria Plan."[1] Other interested groups are represented on the executive committee. A central office has been provided, with a vocational counselor and clerical assistance for the purpose of investigating the case of each returned serviceman and placing him in the appropriate classification for employment. Each interested company contributes by organizing a program, usually with the cooperation of the personnel, training, medical, and safety divisions and supervisors. The first and most important step is a job survey with job analyses drawn up to show minimum physical requirements for each job in the plant, and also the possibilities as to "breakdowns" in processes to permit the use of handicapped workers to advantage.

A useful conception concerning the working capacity of the physically handicapped was presented some years ago by Dr. Henry H. Kessler of the New Jersey State Rehabilitation Clinic at Newark, in which he decried the habit of setting up a more or less visionary ideal of anatomical and physiological perfection as "normal" and pointed out, on the basis of considerable experience, that judgment of physical fitness for work should be based

[1] H. A. Vonachen, M.D.: "A Practical Program for Human Rehabilitation," *Industrial Medicine*, Chicago, Vol. 12, No. 12 (December 1943), Page 807.

on the ability to perform productive work continuously. He divided physical defects into (1) "static defects," such as paralysis of an arm or amputation of a leg, and showed that the majority of individuals with these defects can be adapted to normal productivity, and (2) "dynamic defects," meaning progressive illnesses of an infectious or chronic degenerative type, which may affect productivity through deterioration of mental and motor functions. It is in this latter type of impairment that very th rough physical examinations are of especially constructive value.[11]

An important task has been accomplished along the lines of job classification, based upon direct observation by medical officers of actual employees performing their tasks in approximately 6,160 positions, indicating the types of work which may be suited to individuals having various types of physical impairments. This classification, entitled "A Guide for the Placement of the Physically Handicapped," Fifth Edition, is the work of the Civil Service Commission, Washington, D. C., under the direction of Dr. Verne K. Harvey, Medical Director. It is used by the Commission's representatives in recruiting, training, and employment offices. This Guide is divided into separate parts, each covering a specific industry.

Harvey and Luongo suggest the following preliminary considerations in planning for placement of the handicapped:[12]

> The proper appraisal of physical requirements, the placing of individuals who are impaired physically or mentally, can best be accomplished provided there has been:
>
> 1. A reasonable appraisal of the physical needs of the various positions through job analysis of a limited number of the items of physical or mental fitness.
> 2. Coordination of training, recruitment, and placement programs.
> 3. An intelligent program for the purpose of convincing the employer of the prospective employee's qualifications, expressed in terms of ability to perform in contradistinction to the physical needs of the job.
> 4. Coordination between the medical office, the employment office, and the management heads of the main departments together with their medical and safety advisors.

The general principles recommended by Robert H. Flinn, M.D., of the United States Public Health Service[13] as a basis for solving the problem of selective placement of the handicapped are:

[11] Henry H. Kessler, M.D.: "The Determination of Physical Fitness," *Journal of the American Medical Association*, Vol. 115, No. 19 (November 9, 1940). Page 1591.

[12] Verne K. Harvey, M.D., and E. P. Luongo, M.D.: "The Physically Handicapped in Industrial Establishments of the Government," *Journal of the American Medical Association*, Vol. 121, No. 2 (January 9, 1943). Page 100.

[13] Robert H. Flinn, M.D.: "The Maximum Use of Manpower," *Manual of Industrial Hygiene*, prepared by Division of Industrial Hygiene, U.S. Public Health Service, W. B. Saunders Company, Philadelphia, 1943. Pages 390 and 391.

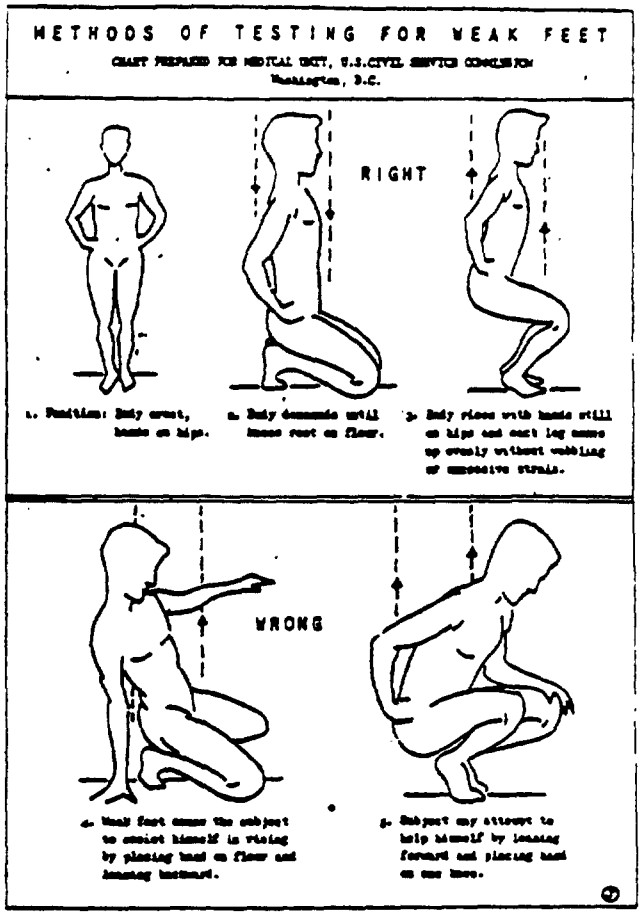


FIGURE 2

Courtesy of Verne K. Harvey, M.D., Medical Director, U.S. Civil Service Commission, Washington, D. C.

1. *Handicaps suitable for immediate placement.*
   (a) Symptomless hernia, varicocele, hydrocele, or varicosities.
   (b) Defective vision due to refractive errors.
   (c) Impaired hearing or deafness.
   (d) Arterial hypertension, asymptomatic.
   (e) Heart disease, compensated.
   (f) Orthopedic defects, including amputations and ankyloses.
   (g) Dental defects.
   (h) Simple glycosuria or albuminuria.
   (i) Blindness.
   (j) Arrested pulmonary tuberculosis.
   (k) Latent syphilis, while taking treatment.

As noted previously, this list comprises the great majority of the reasons for rejection in many plants.

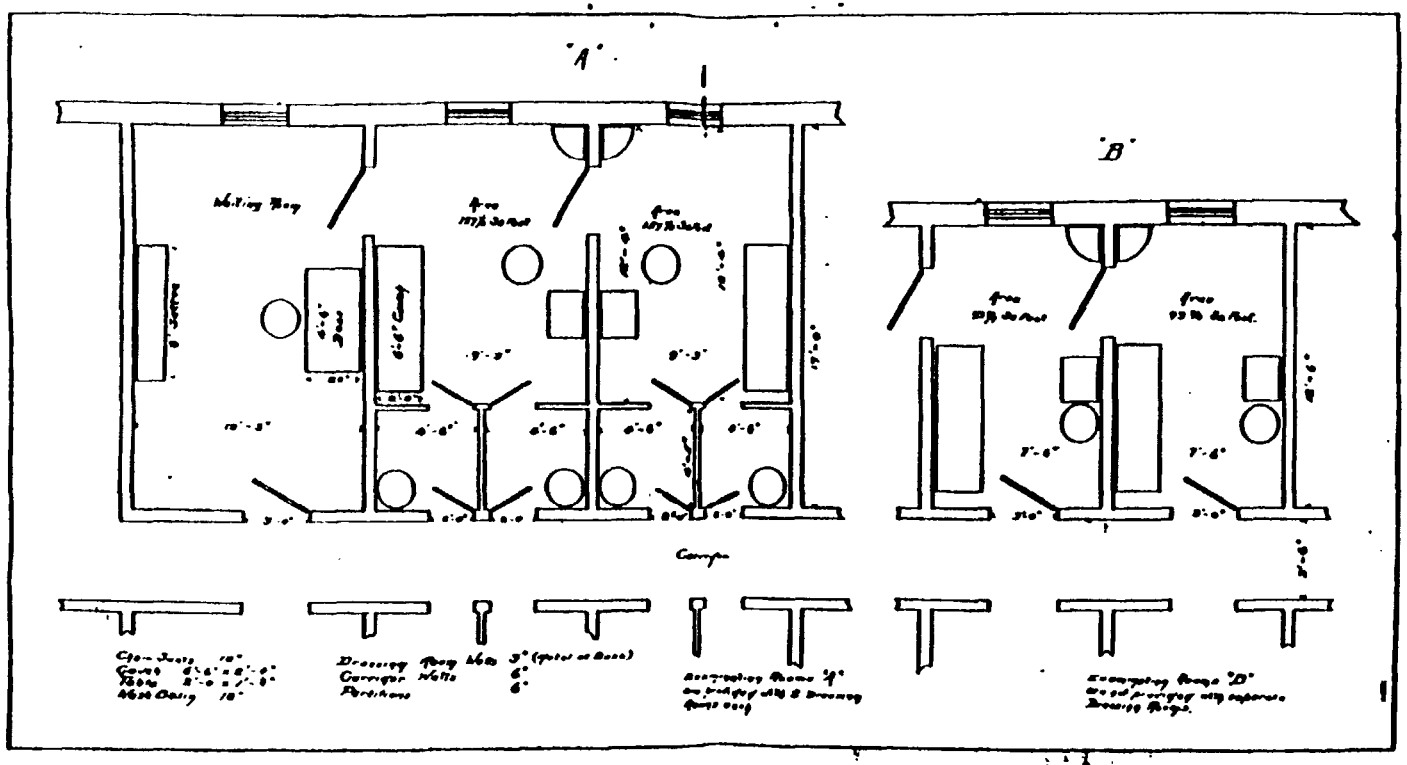
2. *Handicaps calling for temporary rejection until treated satisfactorily.*
   (a) Communicable syphilis, until four injections are given.
   (b) Acute gonorrhea.
   (c) Acute respiratory diseases.
   (d) Irreducible hernia.
   (e) Painful or prolapsed hemorrhoids.
   (f) Painful varicosities, varicocele, or hydrocele.
   (g) Severe refractive errors.
   (h) Symptomatic arterial hypertension.
   (i) Organic heart disease, symptomatic.
   (j) Clinical diabetes mellitus, unless severe.
   (k) Painful, crippling orthopedic defects.
   (l) Severe skin diseases.

These cases should be put to work as soon as the disability is relieved or controlled. Many will require continued medical supervision. All acute, limited diseases should be included in this classification of those temporarily ill.

3. *Unfit for employment.*
   (a) Active tuberculosis.
   (b) Syphilis of central nervous system.
   (c) Frequent epileptic attacks.
   (d) Severe diabetes mellitus.
   (e) Decompensated cardiovascular disease.
   (f) Psychoses.
   (g) Cancer.
   (h) Active, painful arthritis.
   (i) Any serious, active, progressive disease.

Some of these cases could be employed after adequate medical treatment. Others could do work in sheltered workshops or in the home.

PLANS SHOWING EXAMINING ROOMS ARRANGED WITH AND WITHOUT DRESSING BOOTHS



PLAN A

Two examining rooms, connected with each other and with a small waiting room or office. Each examining room has two adjoining dressing booths. The individuals to be examined enter the booths from the corridor and return by the same route. Examiners may remain in the examining rooms receiving cases alternately from dressing booths.

PLAN B

Two examining rooms, connecting with each other and adjoining a waiting room. The individual to be examined disrobes in the examining room. The examiner uses each room in turn. Rooms of this type, even when used to capacity, are not economical of space if many examinations are to be made and more than one physician is employed.

The Federal Government and the States have entered into a partnership for vocational rehabilitation. If the disabled individual can pay part of the cost, he does so. If he can bear the full cost, he pays all. If he can pay nothing, public funds are used to pay the full cost of whatever is needed to put him in condition to work."

Record Forms for Physical Examinations

These forms should be:

1. Simple in arrangement but containing in full detail the questions which must be answered, with ample room for check marks or answers.
2. Made up so that every question which is to be put to the applicant appears on the form, but without superfluous questions which are usually not reliably or properly answered by the examined. Questions in regard to history of venereal and mental diseases, as well as conditions not generally known and understood, may well be omitted, since they are seldom answered accurately.
3. Made of durable material; cards are usually more conveniently handled than sheets of paper.

Supplementary forms consist of the following:

1. A printed slip with a request for a physical examination may be sent with the applicant to the plant physician from the employment department if desired.
2. A printed card, or portion of the examination record that is perforated so that it can be torn off, upon which the doctor can indicate his classification of the applicant when returning him to the employment department.

The results of the actual physical examination should be strictly confidential, and the full record of the examination should never leave the dispensary office. Therefore, the card which is to be filed for view by the employment and other departments usually divides applicants into three classes, designated by code symbols, such as the following recommended by the Council on Industrial Health of the American Medical Association:*

(A) Fit for all work.
(B) Fit for work under periodic medical review.
   1. With limited physical exertion.
   2. In nonhazardous work.
   3. With orthopedic defect.
   4. With defective vision.
   5. With defective hearing.
   6. With neuromental handicap.
(C) Unfit for work at time of examination.

---

*See footnote 1, page 6.

" Office of Vocational Rehabilitation, Federal Security Agency, Washington 25, D. C. "Vocational Rehabilitation for Civilians, A Public Service to Restore the Disabled to Paid Jobs Through Medical Service, Counsel and Guidance, Training, Job Finding." VR-ISC 3 Revised June 1952.

The importance of keeping medical records ascertained at physical examination strictly confidential has often been disregarded. This fact may have contributed to the development of a feeling on the part of labor in some sections of the country that examinations are used for purposes of black-listing. The employer and his representatives in charge of personnel may quite naturally believe that if a worker is declared medically unfit for certain jobs they are entitled to know why. The employer now assumes broad liability for the disabling effects of all sorts of chronic diseases common to life in general on the ground that these have been aggravated by work injury. He feels entitled to know what proportion of workers he is employing present potential liabilities of this sort. He is wise if he requires only information of a statistical type on these points and stops short of insisting upon detailed diagnosis with identification of the impaired worker. With the individual worker's expressed consent, preferably in writing, this information may, of course, be given to an interested employer by the physician. Otherwise the worker's relationship to the doctor should be that of any private patient.

The Council on Industrial Health of the American Medical Association lists the following uses to which the examining physician may properly put information derived from the individual records:*

1. All major findings should be discussed with the worker, with emphasis on the importance of obtaining immediate and adequate medical care.
2. A transcript may be supplied to the employee's personal physician or to other official community health agencies on request or consent of the employee.
3. The employer should be given information in accordance with the rating plan described in this report (see A, B, C, above) to facilitate placement or promotion. A special simple form can be devised for this purpose. The employer should especially be notified of any condition or disability thought to be caused by faulty work environment.
4. Governmental agencies such as courts, workmen's compensation commissions, or health authorities should be supplied with information on legally enforceable official order or when required by law.

Suitable filing equipment should be provided, and all employees of the dispensary should be well trained to observe the rules about the confidential character of the records.

*[illegible], page 6.

The industrial physical examination form suggested by the Council as a sample is shown in Figure 4. This form is now being revised.

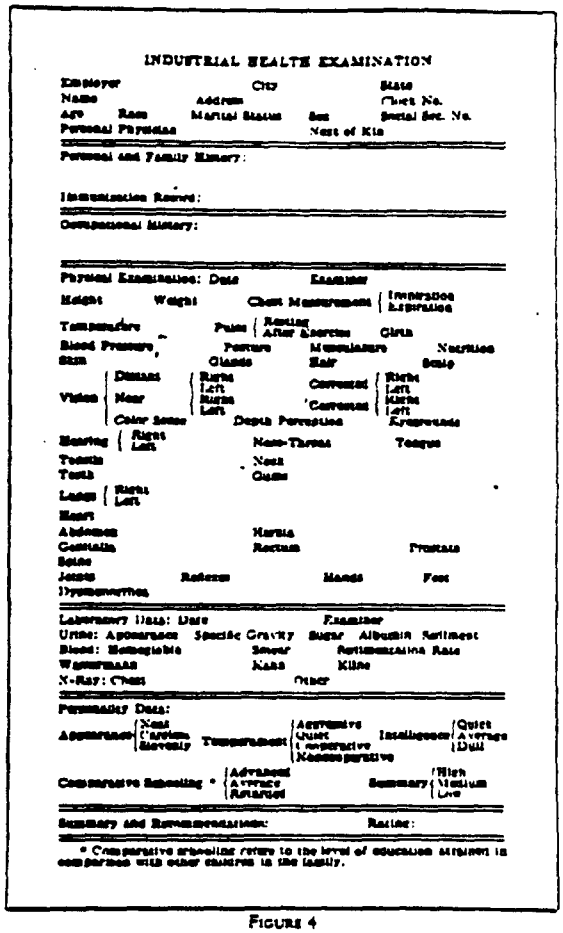
One of a series of examination forms suggested by the American College of Surgeons, 40 East Erie Street, Chicago, Ill., is shown in Figure 5.

Examples of simple forms of convenient size (5 by 8 inches), in use for recording physical examinations in the Norton Company's plant where several thousands are employed making abrasives and grinding machinery, are shown in Figures 6 and 7. These forms are used primarily in preplacement examinations. The essential physical examination findings are transferred to the face of a manila envelope in which the entire subsequent sickness and accident-history of the employee is kept permanently.

The physical examination form (Form A) and the form for reporting findings to employer and to employee (Form B) recommended by the Medical Subcommittee on Physical Examinations in Industry to the Industrial Commission of Wisconsin are shown in Figures 8-A and 8-B and 9. In formulating the physical examination program for industry in that State (see page 7), both industry and labor collaborated with the State Division of Industrial Hygiene and the Industrial Commission.

A simple form for recording physical examinations of applicants for employment for use in plants where different doctors are engaged in the work, rather than one central medical department, is shown in Figure 10. This form was worked out by a number of industrial physicians and by the Metropolitan Life Insurance Company as an example of a useful type. The form can be printed on a moderately stiff card, size 8½ by 11 inches. The reverse is left blank and can be used for additional remarks or subsequent examination records.

A record form especially designed for recording physical findings on workers about to be employed in exposure to lead, and on periodic examinations during such exposure, is shown in the section on Special Examinations (see page 38).



INDUSTRIAL HEALTH EXAMINATION

Employer — City — State
Name — Address — Chest No.
Age — Race — Marital Status — Sex — Social Sec. No.
Personal Physician — Next of Kin

Personal and Family History:

Immunization Record:

Occupational History:

Physical Examination: Date — Examiner
Height — Weight — Chest Measurement { Inspiration / Expiration
Temperature — Pulse { Resting / After Exercise — Girth
Blood Pressure — Posture — Measurement — Nutrition
Skin — Glands — Hair — Scalp
Vision { Distant { Right / Left — Corrected { Right / Left
Near { Right / Left — Corrected { Right / Left
Color Sense — Depth Perception — Ophthalmoscopic
Hearing { Right / Left — Nose-Throat — Tongue
Tonsils — Neck
Teeth — Gums
Lungs { Right / Left
Heart
Abdomen — Hernia
Genitalia — Rectum — Prostate
Spine
Joints — Reflexes — Hands — Feet
Dysfunctions

Laboratory Data: Date — Examiner
Urine: Appearance — Specific Gravity — Sugar — Albumin — Sediment
Blood: Hemoglobin — Smear — Sedimentation Rate
Wassermann — Kahn — Kline
X-Ray: Chest — Other

Personality Data:
Appearance { Neat / Clean / Slovenly — Temperament { Aggressive / Quiet / Cooperative / Noncooperative — Intelligence { Quick / Average / Dull
Comparative Schooling * { Advanced / Average / Retarded — Summary { High / Medium / Low

Summary and Recommendation: — Rating:

* Comparative schooling refers to the level of education attained in comparison with other members in the family.

FIGURE 4

Courtesy of the American Medical Association, Chicago, Ill.
(This form is being revised.)

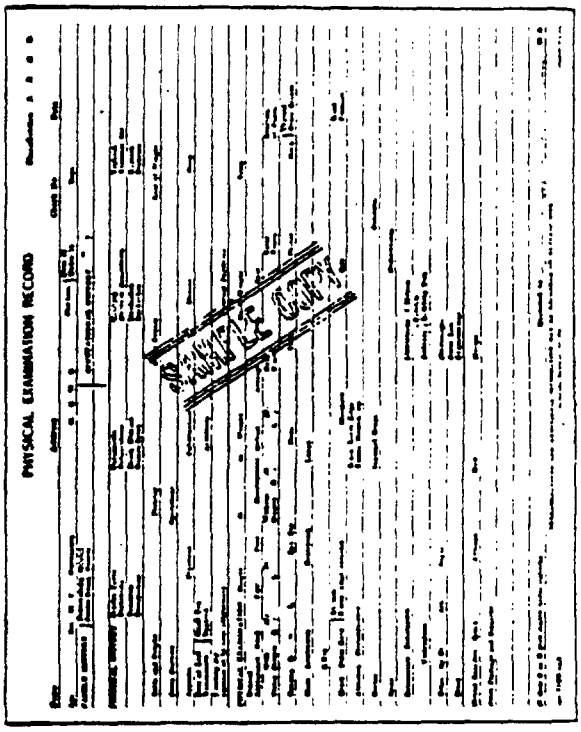
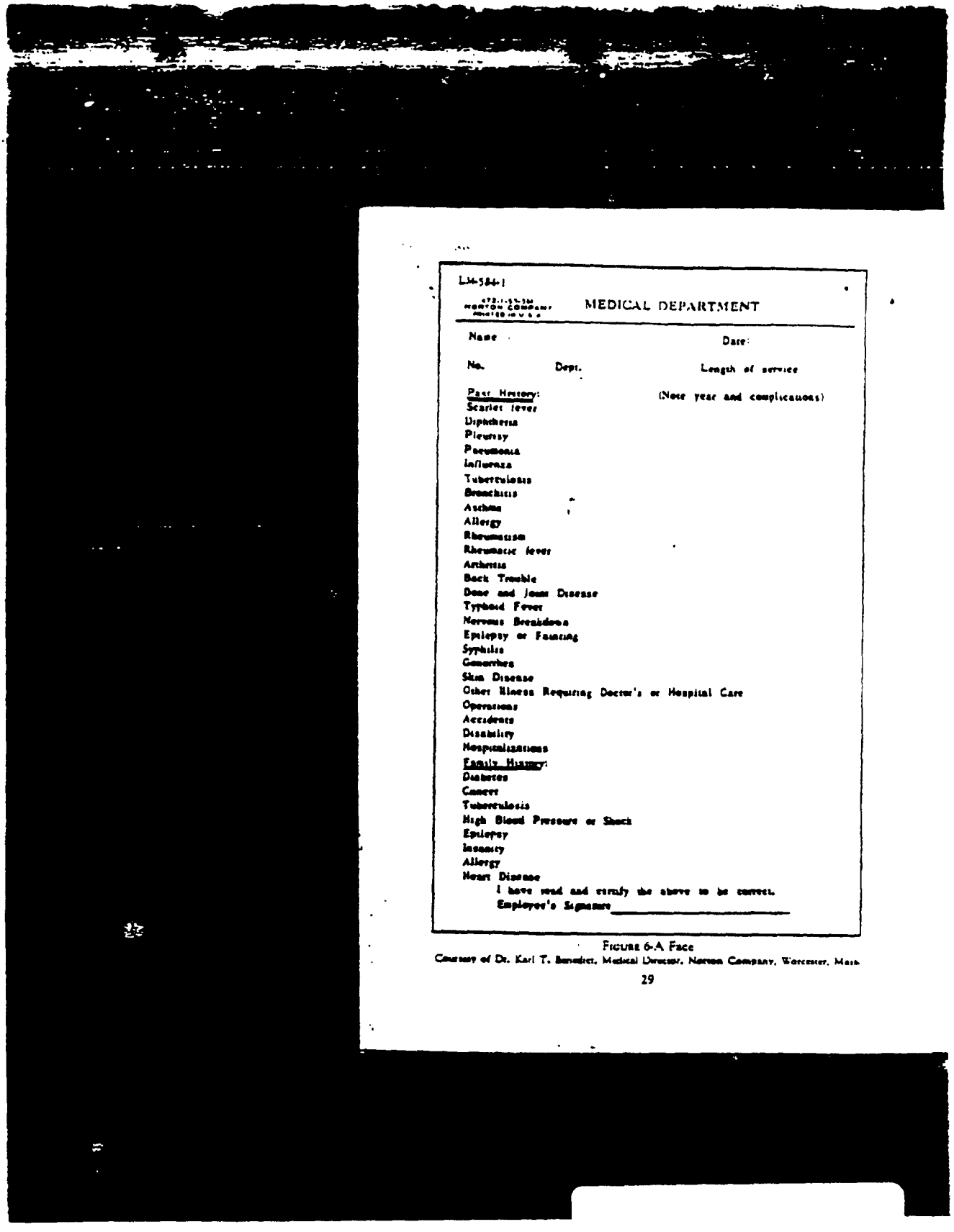

PHYSICAL EXAMINATION RECORD

FIGURE 5

Courtesy of the American College of Surgeons, Chicago, Ill.



LM-584-1

NORTON COMPANY MEDICAL DEPARTMENT

Name Date:

No. Dept. Length of service

Past History: (Note year and complications)

Scarlet fever
Diphtheria
Pleurisy
Pneumonia
Influenza
Tuberculosis
Bronchitis
Asthma
Allergy
Rheumatism
Rheumatic fever
Arthritis
Back Trouble
Bone and Joint Disease
Typhoid Fever
Nervous Breakdown
Epilepsy or Fainting
Syphilis
Gonorrhea
Skin Disease
Other Illness Requiring Doctor's or Hospital Care
Operations
Accidents
Disability
Hospitalizations

Family History:

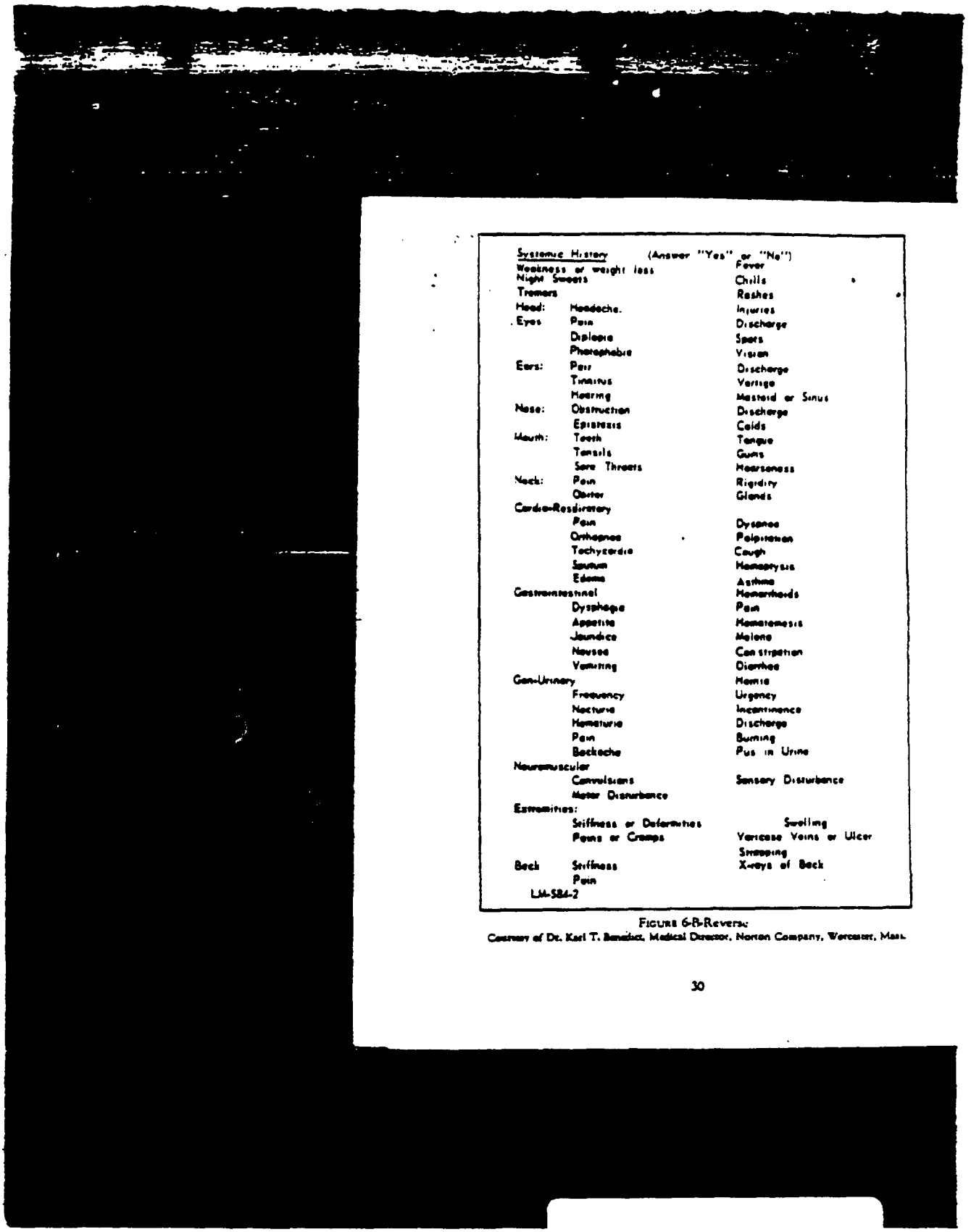
Diabetes
Cancer
Tuberculosis
High Blood Pressure or Shock
Epilepsy
Insanity
Allergy
Heart Disease

I have read and certify the above to be correct.

Employee's Signature _____

FIGURE 6-A Face

Courtesy of Dr. Karl T. Benedict, Medical Director, Norton Company, Worcester, Mass.



Systemic History (Answer "Yes" or "No")		
Weakness or weight loss		Fever
Night Sweats		Chills
Tremors		Rashes
Head:	Headache.	Injuries
Eyes	Pain	Discharge
	Diplopia	Spots
	Photophobia	Vision
Ears:	Pain	Discharge
	Tinnitus	Vertigo
	Hearing	Mastoid or Sinus
Nose:	Obstruction	Discharge
	Epistaxis	Colds
Mouth:	Teeth	Tongue
	Tonsils	Gums
	Sore Throats	Hoarseness
Neck:	Pain	Rigidity
	Goiter	Glands
Cardio-Respiratory		
	Pain	Dyspnea
	Orthopnea	Palpitation
	Tachycardia	Cough
	Sputum	Hemoptysis
	Edema	Asthma
Gastrointestinal		Hemorrhoids
	Dysphagia	Pain
	Appetite	Hematemesis
	Jaundice	Melena
	Nausea	Constipation
	Vomiting	Diarrhea
Gen-Urinary		Hernia
	Frequency	Urgency
	Nocturia	Incontinence
	Hematuria	Discharge
	Pain	Burning
	Backache	Pus in Urine
Neuromuscular		
	Convulsions	Sensory Disturbance
	Motor Disturbance	
Extremities:		
	Stiffness or Deformities	Swelling
	Pains or Cramps	Varicose Veins or Ulcer
		Sweating
Back	Stiffness	X-rays of Back
	Pain	

LM-584-2

FIGURE 6-B-Reverse
Courtesy of Dr. Karl T. Benedict, Medical Director, Norton Company, Worcester, Mass.

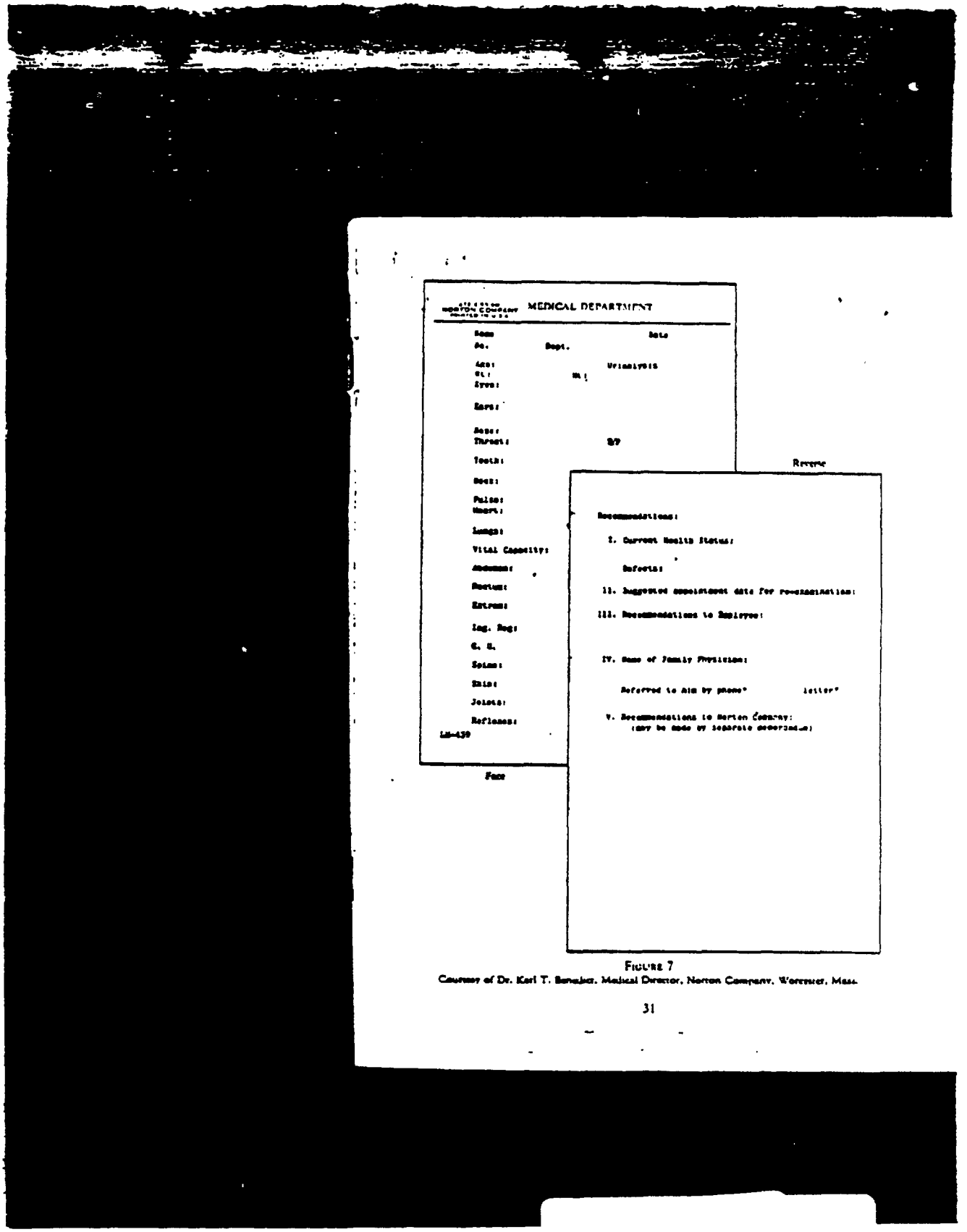
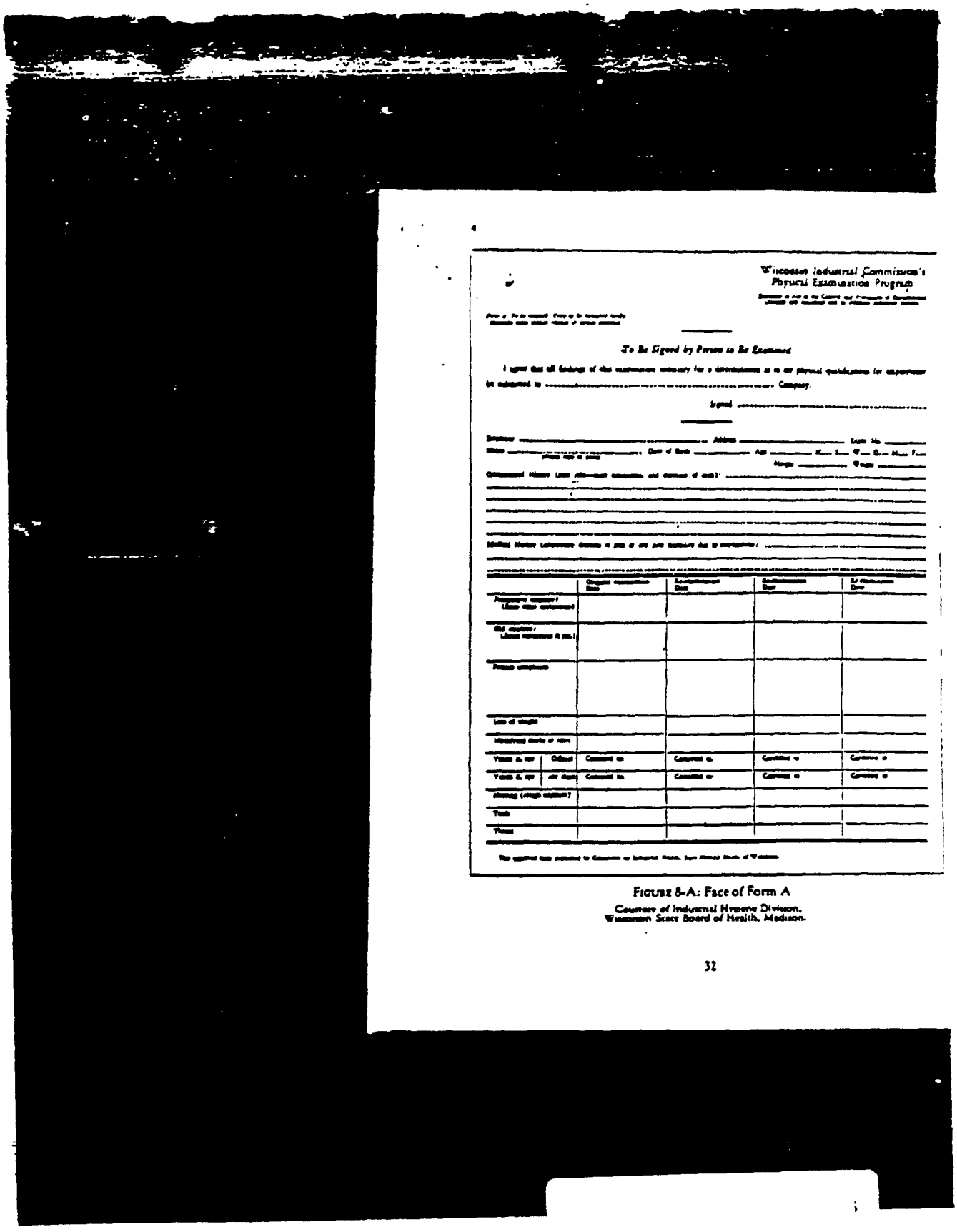


FIGURE 7
Courtesy of Dr. Karl T. Benedict, Medical Director, Norton Company, Worcester, Mass.



Wisconsin Industrial Commission's
Physical Examination Program

To Be Signed by Person to Be Examined

FIGURE 8-A: Face of Form A

Courtesy of Industrial Hygiene Division,
Wisconsin State Board of Health, Madison.

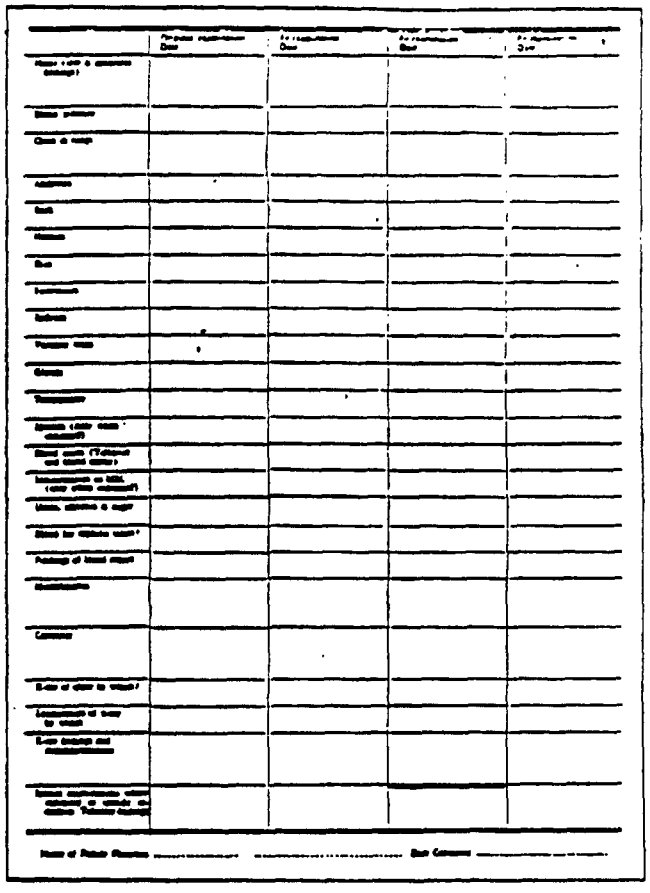
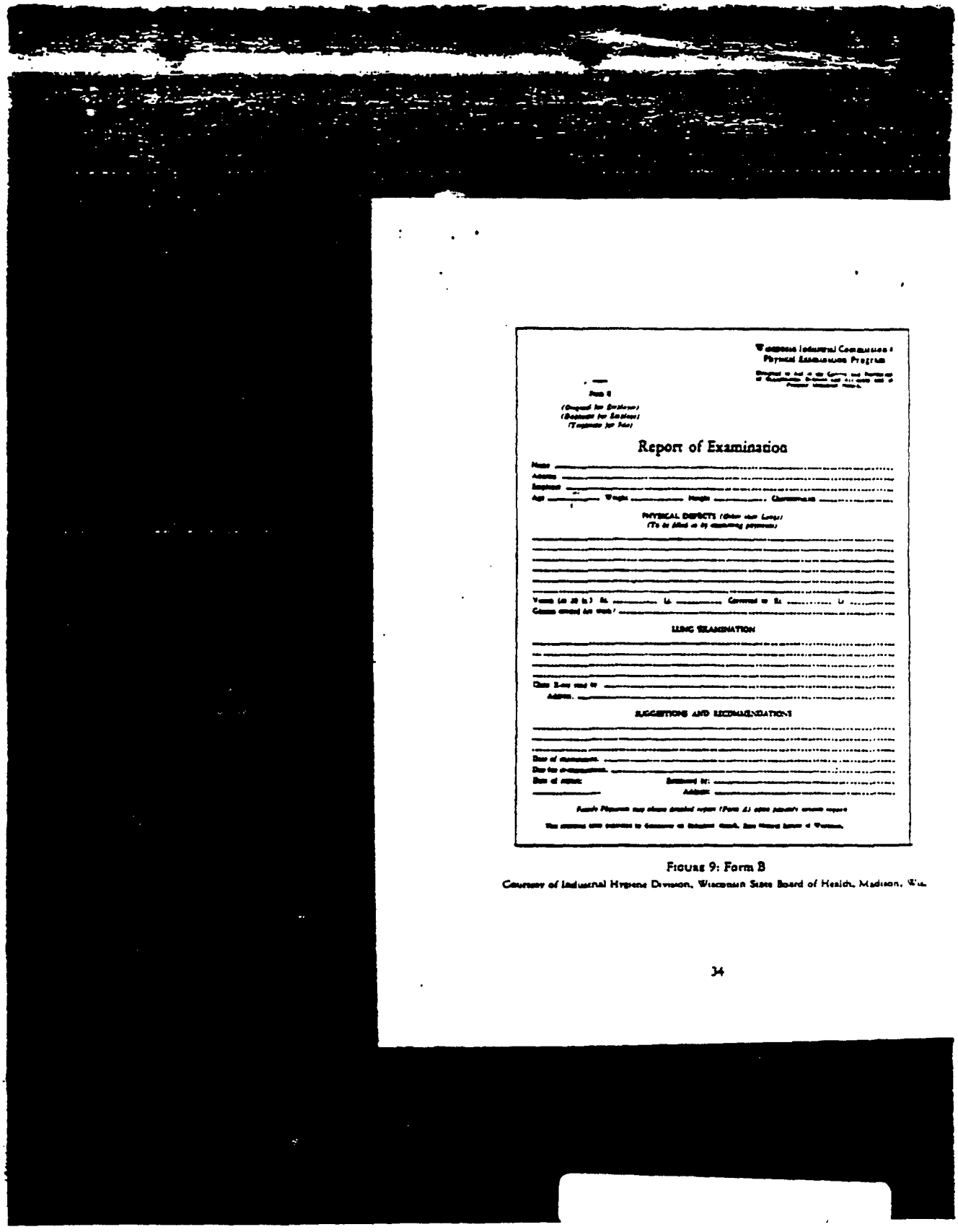


FIGURE 8-B: Reverse of Form A

Courtesy of Industrial Hygiene Division,
Wisconsin State Board of Health, Madison, Wis.



Wisconsin Industrial Commission
Physical Examination Program

Form B

(Original for Employer)
(Duplicate for Employee)
(Triplicate for File)

Report of Examination

Name _____
Address _____
Employer _____
Age _____ Weight _____ Height _____ Characteristics _____

PHYSICAL DEFECTS (Other than Lungs)
(To be filled in by examining physician)

_____
_____
_____
_____
_____
_____

Vision (at 20 ft.) Rt. _____ Lt. _____ Corrected to Rt. _____ Lt. _____
Glasses needed for work? _____

LUNG EXAMINATION

_____
_____
_____
_____

Date X-ray read by _____
Address _____

SUGGESTIONS AND RECOMMENDATIONS

_____
_____
_____

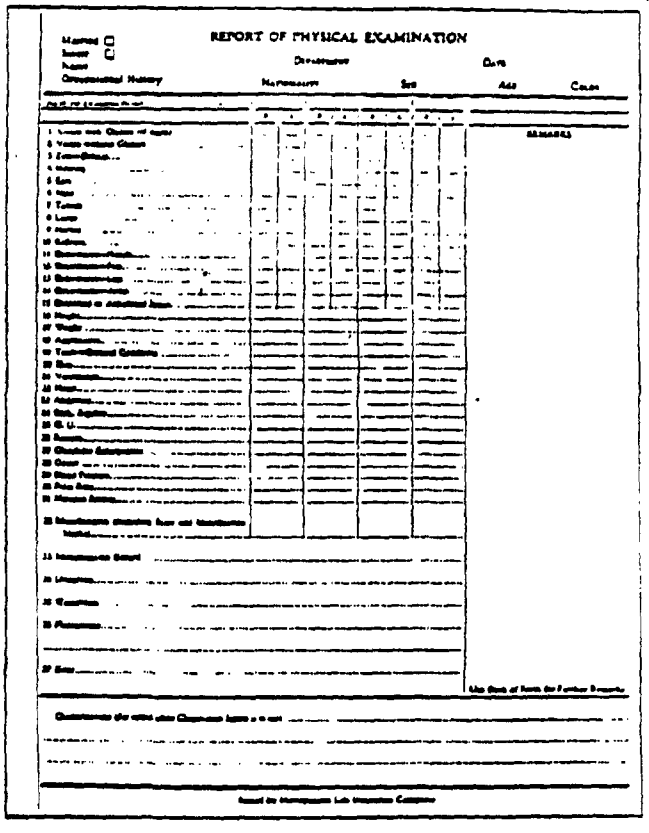
Date of examination _____
Date for re-examination _____
Date of report _____ Examined by: _____
_____ Address _____

Family Physician may obtain detailed report (Form A) upon patient's written request.

This examination was submitted to Commission on Industrial Health, State Board of Health of Wisconsin.

FIGURE 9: Form B

Courtesy of Industrial Hygiene Division, Wisconsin State Board of Health, Madison, Wis.



REPORT OF PHYSICAL EXAMINATION

FIGURE 10

Special Examinations for Workers Exposed to Potential Occupational Hazards •

One of the most important functions of the physical examination in industry, after the assessment of the initial physical condition of applicants for employment, is the early detection of industrial diseases and intoxications in those whose work exposes them to health hazards. This presumes a first-hand knowledge on the part of the physician of the hazardous processes involved in each particular occupation. He should also be familiar with the toxic limits of injurious substances to which the workers are exposed, in so far as these have been established.

For such workers the initial preplacement examination should be somewhat specialized, having in mind the potential toxic hazard, and there should be a very careful recording of the previous occupational history and a search for physical findings indicating previous exposure to injurious substances, as well as for the presence of disease or impairment which might render the worker unduly susceptible to the occupational disease in question. The periodic follow-up examinations of such workers are conducted at certain intervals, depending upon the type and severity of the exposure and in some cases determined by State regulations. These examinations are highly specialized, usually involving laboratory tests, and the routine physical examination is not necessarily repeated each time that these are done.

For example, where workers are exposed to dusty occupations, particularly those dusts containing fine silica, emphasis should be placed on chest examinations. The roentgenogram is an important aid, without which a positive diagnosis of diseases caused by the inhalation of dust is difficult if not impossible. This part of the examination may be referred to an experienced roentgenologist, as the diagnosis of dust diseases of the lungs depends upon the type of films taken and the experience of the reader who interprets them. An annual X-ray examination is recommended for such workers.

When X-ray equipment is installed additional space, depending upon the type of equipment, must be provided. Equipment ranging from small portable units to large complex units costing from one thousand to several thousands of dollars is available, and the organization furnishing such equipment can best suggest the necessary requirements for its installation.

On account of the expense and certain technical problems involved in X-raying large numbers of employees, some organizations make use of the fluoroscope to select the proper cases for further X-ray study.

The fluoroscope is a device used for making internal organs visible to the eyes of the physician by means of the Roentgen rays. Any physician with normal eyesight, after a short period of instruction in its use, will be able to detect the presence of pathology in the chest. X-ray pictures will then be needed for further study or for permanent-record purposes in those cases showing defects.

Some industrial occupations, although exerting no influence on the lung tissue, involve dusts, fumes, or gases of a toxic nature, and these poisons enter the body chiefly through the respiratory tract.

Where workers are exposed to lead dust or fumes, frequent examinations should be made of these workers for changes in the blood, which are often the first and most important sign of lead poisoning in man.

The preplacement examination form and the form for periodic examinations of lead workers suggested by the Committee on Lead Poisoning of the American Public Health Association[18] are shown in Figures 11A and 11B on pages 38-39. The full report of the Committee should be consulted for details of procedure.

Unless the plant medical department is provided with ample laboratory facilities and competent personnel, special examinations of the urine and blood are best referred to a reliable hospital laboratory. Samples collected and analyzed within the plant are very apt to become contaminated by the lead dust in the air.

For workers exposed to benzol, a valuable test is available for confirmation of the fact of exposure, consisting in the determination of the ratio of inorganic sulphates to total sulphates in the urine from samples taken during the worker's exposure. The test, however, is not diagnostic of poisoning, nor can it be used for diagnostic evidence after removal from the exposure.

Industrial dermatitis is responsible for a very large proportion of the occupational disease disability experienced in industry. It can be averted to some extent through the selective physical examination if those with a history or manifestation of allergy or eczema of any sort are eliminated from employment in skin

[18] *Occupational Lead Exposure and Lead Poisoning*. Report of the Committee on Lead Poisoning, American Public Health Association, New York, N. Y., 1943.

LEAD EXPOSURE

MEDICAL EXAMINATION (Front Side)

1. Name _____ Identification No._____ Date_____
2. Social Security No._____ Birthplace _____ Descent _____ Age _____
3. Address _____ Phone _____
4. *M.F.___ W.B.___ S.M.___ W.D.___ L.R.Average Wt. _____ Greatest Wt. _____
5. Family Dr. _____ Wt. 1 year ago _____
6. What type work applied for _____
7. History of previous employment in this plant _____

8. History of previous employment in other plants _____

9. Family history _____
   - Gastro _____
   - Cardio-vascular disease _____
   - Nephritides _____
   - Tuberculosis _____
   - Diabetes _____
   - Anemia _____

10. Past history _____
    - Illnesses _____
    - Operations _____
    - Accidents _____
    - Venereal treatment _____
    - Remarks _____

11. Physical examination — Employment — Upon Exit
    - Date
    - Weight — Height
    - Pulse — Temperature
    - Pallor
    - Lead line
    - Teeth (chart useful)
    - Right wrist extension
    - Left wrist extension
    - Lungs
    - Glands and Thyroid
    - Arteries
    - Blood Pressure (sitting)
    - Heart
    - Abdomen
    - Reflexes
    - Hernia
    - Spine
    - Extremities
    - Vision—Right Left
    - Vaccination

12. Laboratory examination
    - Stippling/mal. erythrocytes
    - Hb
    - R.B.C.
    - W.B.C.
    - Urine
    - Serodiagnostic test

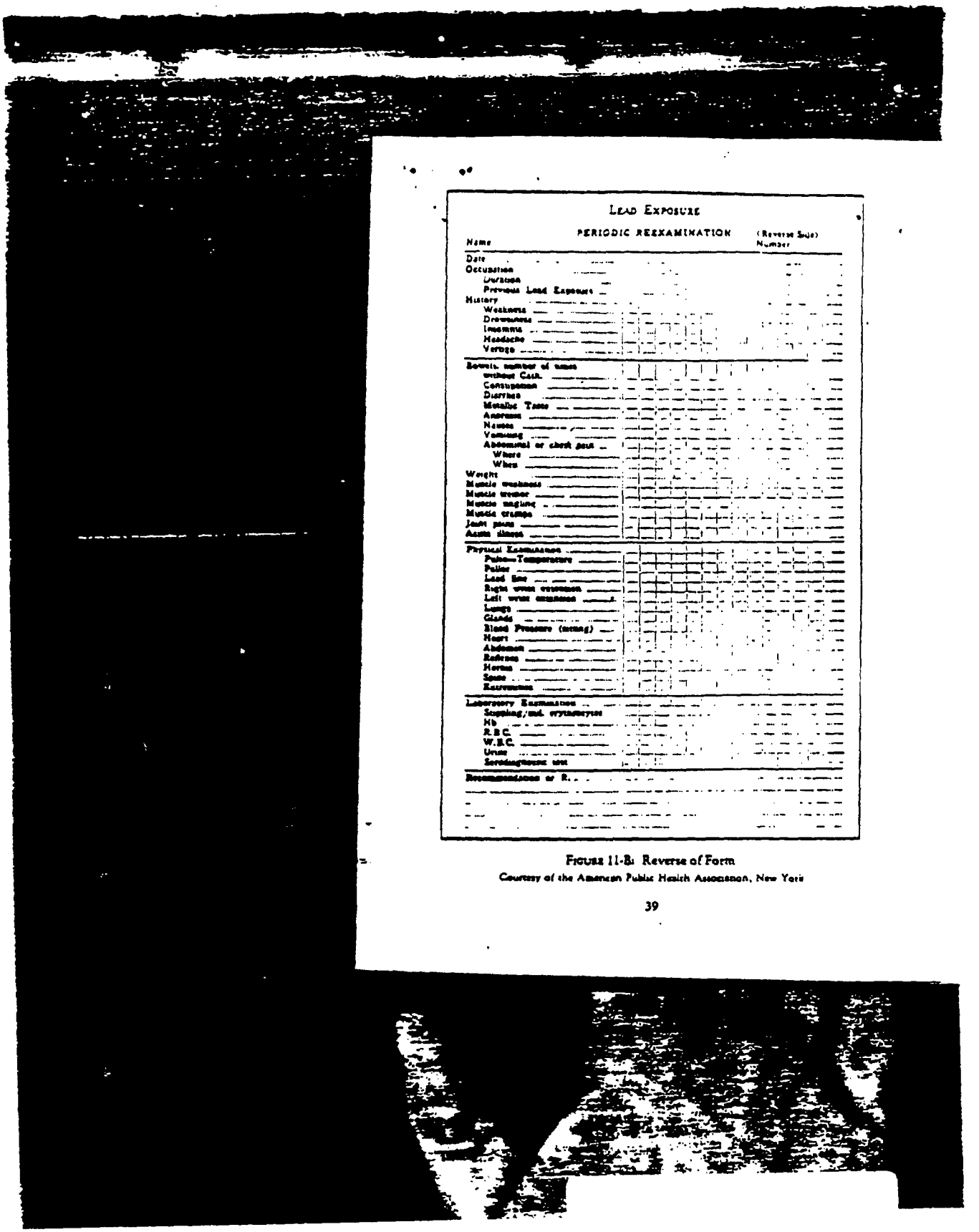
13. Diagnosis _____

14. Rating and Recommendation _____

*M-male. F-female. W-white. B-black. S-single. M-married. W-widowed. D-divorced. L-left handed. R-right handed

FIGURE 11-A: Face of Form

Courtesy of the American Public Health Association, New York



LEAD EXPOSURE

PERIODIC REEXAMINATION (Reverse Side)

Name Number

Date

Occupation

Duration

Previous Lead Exposure

History

Weakness

Drowsiness

Insomnia

Headache

Vertigo

Bowels, number of times

without Cath.

Constipation

Diarrhea

Metallic Taste

Anorexia

Nausea

Vomiting

Abdominal or chest pain

Where

When

Weight

Muscle weakness

Muscle tremor

Muscle tingling

Muscle cramps

Joint pains

Acute illness

Physical Examination

Pulse—Temperature

Pallor

Lead line

Right wrist extension

Left wrist extension

Lungs

Glands

Blood Pressure (mmHg)

Heart

Abdomen

Reflexes

Hernia

Spine

Extremities

Laboratory Examinations

Stippling/red erythrocytes

Hb

R.B.C.

W.B.C.

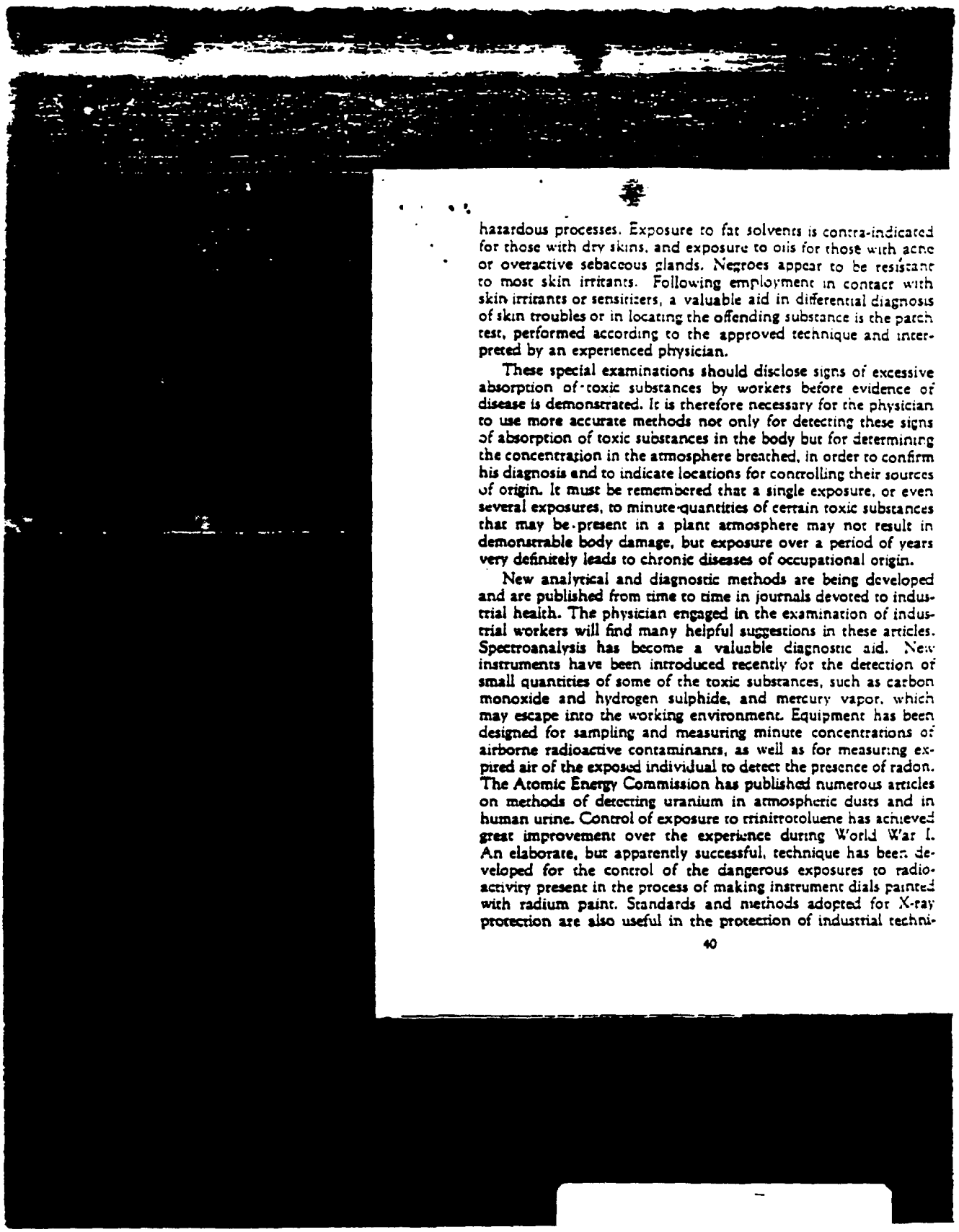
Urine

Serodiagnostic test

Recommendations or R.

FIGURE 11-8: Reverse of Form

Courtesy of the American Public Health Association, New York



hazardous processes. Exposure to fat solvents is contra-indicated for those with dry skins, and exposure to oils for those with acne or overactive sebaceous glands. Negroes appear to be resistant to most skin irritants. Following employment in contact with skin irritants or sensitizers, a valuable aid in differential diagnosis of skin troubles or in locating the offending substance is the patch test, performed according to the approved technique and interpreted by an experienced physician.

These special examinations should disclose signs of excessive absorption of toxic substances by workers before evidence of disease is demonstrated. It is therefore necessary for the physician to use more accurate methods not only for detecting these signs of absorption of toxic substances in the body but for determining the concentration in the atmosphere breathed, in order to confirm his diagnosis and to indicate locations for controlling their sources of origin. It must be remembered that a single exposure, or even several exposures, to minute quantities of certain toxic substances that may be present in a plant atmosphere may not result in demonstrable body damage, but exposure over a period of years very definitely leads to chronic diseases of occupational origin.

New analytical and diagnostic methods are being developed and are published from time to time in journals devoted to industrial health. The physician engaged in the examination of industrial workers will find many helpful suggestions in these articles. Spectroanalysis has become a valuable diagnostic aid. New instruments have been introduced recently for the detection of small quantities of some of the toxic substances, such as carbon monoxide and hydrogen sulphide, and mercury vapor, which may escape into the working environment. Equipment has been designed for sampling and measuring minute concentrations of airborne radioactive contaminants, as well as for measuring expired air of the exposed individual to detect the presence of radon. The Atomic Energy Commission has published numerous articles on methods of detecting uranium in atmospheric dusts and in human urine. Control of exposure to trinitrotoluene has achieved great improvement over the experience during World War I. An elaborate, but apparently successful, technique has been developed for the control of the dangerous exposures to radioactivity present in the process of making instrument dials painted with radium paint. Standards and methods adopted for X-ray protection are also useful in the protection of industrial techni-

cians using this equipment. Protection from radiant energy and fumes in welding processes has received extensive study during the past few years, while the study of the physiology of work under abnormal atmospheric pressures has expanded to become practically a special branch of medical science.

Engineering and medical advice on the control of these special problems of industrial hygiene is now available in many States, through the industrial hygiene divisions established in either the State department of health or the department of labor, as well as from the Division of Special Health Services, Public Health Service of the U. S. Department of Health, Education, and Welfare. The Metropolitan Life Insurance Company also provides, for its Group-insured industries and others, the consultation services of its Safety and Occupational Health Bureau.

Examinations of Other Selected Groups

Physical examinations of a specialized type are also given in many industries to the following classes of workers:

Transport workers, including engineers and operators of motor equipment, trains, cars, trucks, elevators, hoists, loading machinery, and cranes.

Other workers charged with great responsibility or work involving the safety of others.

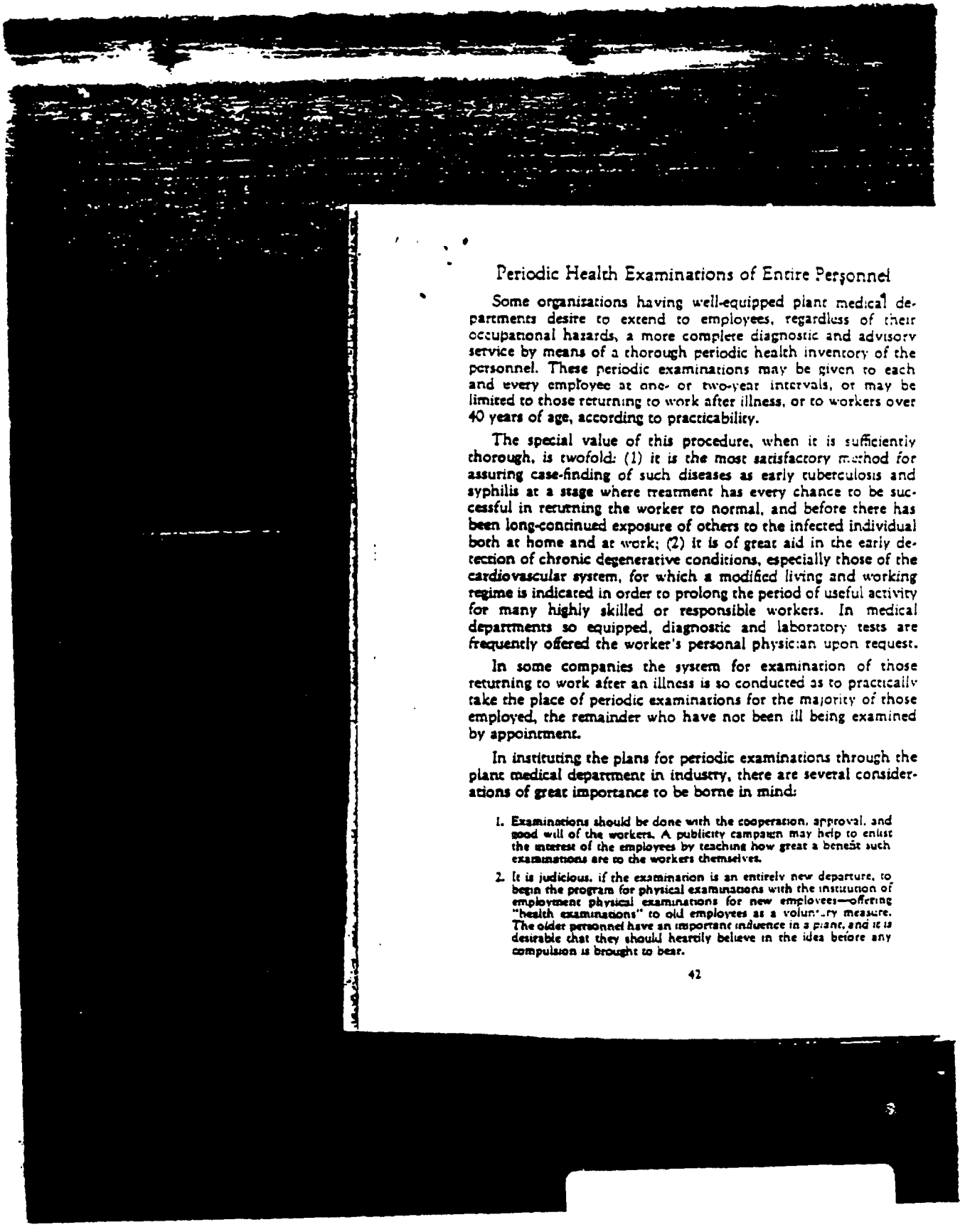
Food handlers (in accordance with local health department regulations, if any exist).

Workers who have been absent due to illness before return to work; work certificates from the attending physician are often unreliable owing to unfamiliarity with the nature of the occupations.

Workers with physical impairments, classed as substandard upon initial examination, especially before transfer to work not medically approved for them.

Workers who request examination or who are prone to repeated illnesses.

Workers who are terminating their employment, at the time of discharge, to determine the presence or absence of any occupational injury or disease. This type of examination is not now done so frequently because of objections to it on the part of labor (see page 7).



Periodic Health Examinations of Entire Personnel

Some organizations having well-equipped plant medical departments desire to extend to employees, regardless of their occupational hazards, a more complete diagnostic and advisory service by means of a thorough periodic health inventory of the personnel. These periodic examinations may be given to each and every employee at one- or two-year intervals, or may be limited to those returning to work after illness, or to workers over 40 years of age, according to practicability.

The special value of this procedure, when it is sufficiently thorough, is twofold: (1) it is the most satisfactory method for assuring case-finding of such diseases as early tuberculosis and syphilis at a stage where treatment has every chance to be successful in returning the worker to normal, and before there has been long-continued exposure of others to the infected individual both at home and at work; (2) it is of great aid in the early detection of chronic degenerative conditions, especially those of the cardiovascular system, for which a modified living and working regime is indicated in order to prolong the period of useful activity for many highly skilled or responsible workers. In medical departments so equipped, diagnostic and laboratory tests are frequently offered the worker's personal physician upon request.

In some companies the system for examination of those returning to work after an illness is so conducted as to practically take the place of periodic examinations for the majority of those employed, the remainder who have not been ill being examined by appointment.

In instituting the plans for periodic examinations through the plant medical department in industry, there are several considerations of great importance to be borne in mind:

1. Examinations should be done with the cooperation, approval, and good will of the workers. A publicity campaign may help to enlist the interest of the employees by teaching how great a benefit such examinations are to the workers themselves.
2. It is judicious, if the examination is an entirely new departure, to begin the program for physical examinations with the institution of employment physical examinations for new employees—offering "health examinations" to old employees as a voluntary measure. The older personnel have an important influence in a plant, and it is desirable that they should heartily believe in the idea before any compulsion is brought to bear.

3. The examination should always be planned in such a way that an opportunity is given for personal conversation of the applicant with a doctor or nurse in order that the object of the proceeding may be carefully explained in each case. Equally, the findings of the examination should be tactfully and patiently interpreted to the examined —without unduly alarming him, of course—before he leaves the medical department.

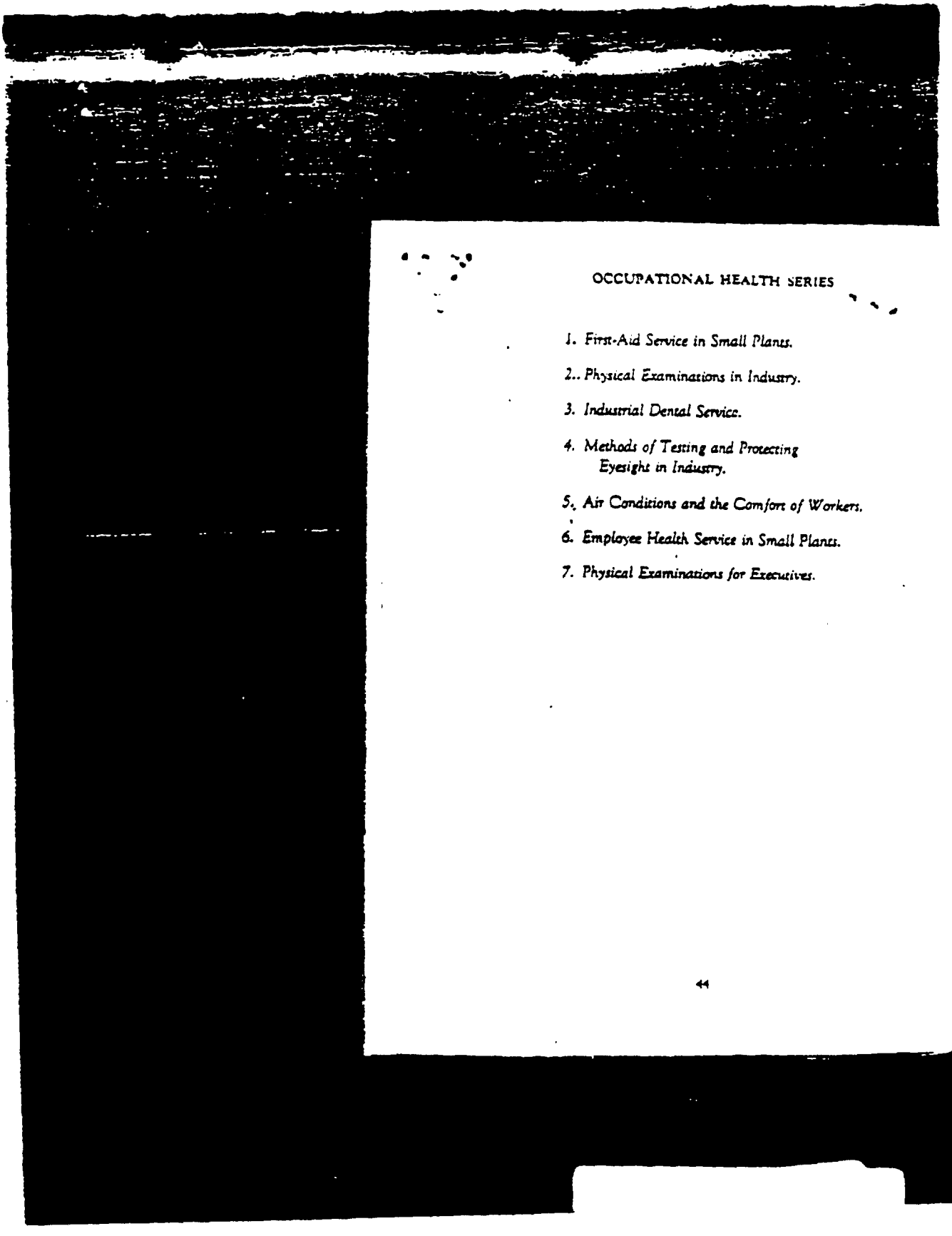
4. The confidential relationship between patient and doctor should be kept, and all records of physical examinations should be filed in the medical department and be solely under the control of the medical personnel. Many misunderstandings may be averted if this rule is scrupulously regarded and constantly impressed upon the workers.

5. A good method for establishing in the minds of the workers conviction of the sincerity of the management's motive as well as thorough confidence in the medical personnel is to begin with the examination of the executives. Unless the service is good enough to command the respect of the executives it is not good enough for the employees. Moreover, this is sound procedure from many angles, since officials, managers, and keymen in the company benefit just as surely from the examination as any of the workers. A breakdown in health among the higher-paid personnel upon whom great responsibility rests is a more costly and more disastrous occurrence than physical disability of many of the less highly trained workers. These health examinations are made either by a company-employed physician, the executive's own doctor, or an outside clinic. Some favor the company-employed physician and others favor outside doctors. The cost and time per examination vary according to the completeness of the examination. In some cases the individual is kept under observation for a period of approximately seven days.

6. It is always advantageous and, in many plants essential, to have the physician become familiar with the different jobs and processes in the establishment he serves and to work in close relation with the employment department.

7. The purpose of the periodic examination should be kept in mind, and ample time and personnel must be provided for conducting it.

Plants which do not employ sufficient numbers to warrant such a program can often obtain excellent case-finding surveys of the personnel through cooperation with the local tuberculosis and health associations and social hygiene associations.



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