
INDUSTRIAL HYGIENE AND TOXICOLOGY

Second Revised Edition

FRANK A. PATTY, *Editor*

VOLUME I GENERAL PRINCIPLES

Authors

G. D. CLAYTON
J. R. COX, JR.
L. F. CURTIS
S. K. GUTH
I. HARTMANN
T. F. HATCH

G. W. JONES
E. A. LINSLEY
C. P. MCCORD
R. A. MCFARLAND
F. A. PATTY
R. B. PATTY

K. E. ROBINSON
O. A. SANDER
L. SCHWARTZ
M. A. SHAPIRO
H. SPECHT
W. N. WITHERIDGE



1958

INTERSCIENCE PUBLISHERS, INC., NEW YORK
INTERSCIENCE PUBLISHERS LTD., LONDON

of high concentrations of tuberculosis. While this in the application of all

o healthful working conditions. Actually there

ninum dust, there may be

symptoms in a very small some groups is more favor-

the general application of partially controlled clinical ing silicosis in man. In the t have been found effective

ost authorities in this ically controlled studies s statement in any way. been increasing interest ponse and in the use of n the lungs. Cortisone, to have an inhibitory as desoxycorticosterone ation of fibrous tissue.

hat produces silicosis, and their effect on the stresses tend to deplete fibrosis. He lists tuberculosis, and inhalation

ides that it is necessary develop increased fibrotic such persons might be he dusty type of work. der way can be retarded insulin with the ACTH.

lobin, which affects experi- persons having silicosis and of silicotic nodules, *Brit. J. Hyg. and Occupational Med.*

tuberculosis by Raule and Grisler." should be given, in my opinion, only to persons with active tuberculosis. It should not be given in cases of purely silicotic reactions because of the danger of enhancing the silicotic process. Important is the prevention of inflammation, both the inflammation of bronchitis in the spring and autumn and that of tuberculous origin. I suggest the prophylactic administration of salicylates in spring and autumn, as these depress the inflammatory reaction, and, as is the case with fibrous rheumatic nodules, may also beneficially affect the silicotic nodules.

Undoubtedly, we shall see much research in this direction in the next few years, which may lead to satisfactory drug prophylaxis and therapy of silicosis. The evidence today, however, is not sufficiently conclusive to warrant applying any of these methods clinically.

Until more specific therapy is available, treatment of disabling silicosis will continue to be symptomatic. It is principally directed at the associated emphysema to improve drainage of retained bronchial secretions. Bronchodilator drugs, such as Neo-Synephrine (1.5 cc. of 0.5 per cent) or Isuprel (6 to 8 drops of 1:200 solution), when placed in a nebulizer with 100 per cent oxygen and inhaled with the intermittent positive-pressure technique proposed by Motley, have given very effective results. The resulting improved ventilation, although temporary, has caused such a frank improvement in the morale and feeling of well-being of many coal miners that this form of therapy is recommended for disabling silicosis and emphysema from any cause. Courses of treatments may have to be repeated at rather frequent intervals, depending on the severity of the case.

Other measures that must be a part of the therapy regimen are prevention and active treatment of colds and other respiratory infections, the maximum possible prevention of contacts with active cases of tuberculosis, and discouragement of smoking to reduce bronchial irritation and secretion to a minimum. Any measures that will prevent bronchial obstruction are indicated. The cough reflex, therefore, should not be subdued and codeine should be withheld unless the cough is severe. Maintenance of the general nutrition of the patient also must be part of the treatment program. Continuing graded exercise is especially necessary to prevent further atelectatic areas of the lungs from developing. Support of the lower abdomen with its resulting support of the diaphragm will improve ventilation in many cases with advanced nonobstructive emphysema, but is contraindicated where there is considerable bronchial obstruction.

B. ASBESTOSIS

Asbestos is a hydrated magnesium silicate. More than 90 per cent of the raw mineral used in this country and Great Britain is produced in the Canadian chrysotile mines. Asbestos is used in two general types of manufacturing processes. It may be used either by itself or mixed with other insulating materials, such as diatomaceous earth, for fireproofing, packing, or insulating; or it may be com-

^a A. Raule and R. Grisler, *Primi risultati clinici ottenuti nella silico-tuberculosis*, *Med. lavoro*, 43, 4 (1952).

bined with cotton and woven as a textile for fireproof and heat-resistant clothing and other substances. Lanza⁸² estimates that there are about 10,000 persons exposed to asbestos in the United States. Most observers feel that the incidence of asbestosis in American asbestos workers is quite low. Asbestosis has, however, been reported more frequently in England and Canada.

★ Lanza, McConnell, and Fehnel⁸³ concluded from their study of asbestosis that prolonged exposure to asbestos dust causes pulmonary fibrosis different from that produced in silicosis and demonstrable by roentgenogram. Clinically it resembles silicosis in that it is not disabling in the early stages, but it may be markedly disabling when advanced, and frequently leads to death by right heart failure. Although tuberculosis has been shown to be no more prevalent in persons with asbestosis than in the general population, lung cancer is under suspicion as occurring more frequently with asbestosis, especially in England.

Symptoms. The onset of symptoms of asbestosis, as of silicosis, is slow although symptoms in advanced cases are apt to be somewhat more marked than in silicosis. As in silicosis, dyspnea is the cardinal symptom. Anorexia occurs frequently in advanced stages, and cyanosis and clubbing of the fingers are apt to appear with greater constancy in asbestosis.

Pathology. The fibrosis in asbestosis is diffuse and tends to predominate in the basal portions of the lungs in contrast to the generalized nodular fibrosis of silicosis with a predominance in the upper portions of the lung. Bronchiectasis and bronchiolectasis are frequent, especially in the more fibrous portions. Whereas the proliferation of fibrous tissue is caused by chemical action in silica exposure, it is induced by mechanical action in asbestos exposures. Gardner⁸⁴ found that the fibrosis-producing character of asbestos could be almost eliminated by grinding the fibers so that no particles more than 20 μ in length were present. As previously mentioned, asbestos is classified among the inert dusts. Vorwald, Durkan and Pratt⁸⁵ report that the typical bronchiolar fibrosis is best produced by fibers ranging from 20 to 50 μ in length but not by fibers shorter than 20 μ . The significance of this finding on prevention of the disease will be discussed below.

Microscopic anatomy. Johnstone⁸⁶ described the microscopic appearance of the lungs somewhat as follows: In the early phases of the disease there is thickening of the alveolar septa which results from fibroblastic proliferation. The alveolar spaces contain numerous phagocytes. With progression of the disease fibrosis becomes more marked; the alveolar structure gradually disappears, and in its place there is now dense fibrous tissue. The few alveoli that remain in the area of fibrosis are lined with low cuboidal epithelium giving them an almost glandular appearance.

⁸² A. J. Lanza, *J. Am. Med. Assoc.*, 106, 368 (1936).

⁸³ A. J. Lanza, W. J. McConnell, and J. W. Fehnel, *U. S. Pub. Health Repts.*, 50, 1 (1935).

⁸⁴ L. U. Gardner, *Ind. Med.*, 9, 45 (1940).

⁸⁵ A. J. Vorwald, Experimental studies of asbestosis, *Arch. Ind. Hyg. and Occupational Med.*, 3, 1 (1951).

⁸⁶ R. T. Johnstone, *Occupational Diseases*. Saunders, Philadelphia, 1942.

and heat-resistant clothing about 10,000 persons expect that the incidence of Asbestosis has, however,

their study of asbestosis is very different from the program. Clinically it is in early stages, but it may be due to death by right heart failure more prevalent in persons who are under suspicion of asbestosis.

As of silicosis, is slow and somewhat more marked than in asbestosis. Anorexia occurs and rigidity of the fingers are apt

tends to predominate in asbestosis. Nodular fibrosis of lung. Bronchiectasis and emphysema in upper portions. Whereas the case in silicosis exposure, it is more common. Gardner⁸⁴ found that the disease is eliminated by grinding and is not present. As previously stated, Vorwald, Durkan and others⁸⁵ have produced by fibers less than 20 μ . The significance is discussed below.

Macroscopic appearance of disease there is thickening and hyperplasia of the alveolar septa. In the disease fibrosis becomes apparent, and in its place in the area of fibrosis is most glandular appearance.

Scattered throughout the lung in both the diseased and healthy parts are spindle-shaped structures described first by McDonald.⁸¹ These bodies are 20 to 100 μ in length and are bulbous on one or both ends so that they appear club- or dumbbell-shaped. They are brownish in color, do not stain, and give a Prussian-blue reaction for iron. Simson⁸² has produced these bodies in guinea pigs by experimental exposure to atmosphere containing asbestos. Lynch⁸³ concludes that these "curious bodies" signify exposure to asbestos dust but do not necessarily indicate asbestosis. In other words, they are more properly referred to as "asbestos bodies" and not "asbestosis bodies."

X-ray examination. For an excellent review of roentgenographic findings in both silicosis and asbestosis the reader might well refer to Pendergrass.⁸⁰ Characteristic differences in the roentgenographic findings in silicosis and asbestosis are tabulated below:

Asbestosis	Silicosis
Fibrosis diffuse (film may have ground glass appearance from pleural involvement).	Fibrosis nodular.
Findings may be either bilateral or unilateral.	Findings characteristically bilateral.
Lesions largely in the lower one half or two thirds of the lung fields.	Lesions predominantly in the upper two thirds of the lung fields.
Emphysema in upper portion of lung fields.	Emphysema in lower portion of lung fields.
Borderline degree difficult to recognize.	Borderline degree more easily recognized.

Control. Prevention of asbestosis depends largely on preventing exposure to sufficiently high concentrations of long fibers to produce the characteristic reaction. Also, if only long fibers cause the disease, fine dust respirators are not necessary. The more comfortable gauze respirators appear to be perfectly adequate filters for the long fibers. Up to this time, however, they have not been approved by the United States Bureau of Mines for this purpose.

Allowable concentrations. Dreessen, DallaValle, Edwards, Miller, and Sayers⁸¹ have found evidence to indicate that 5 million particles per cubic foot of air is a satisfactory figure for the maximum permissible atmospheric concentration of asbestos to which workers may be exposed. However, in setting up this figure, only fibers less than 10 μ in length were counted and the longer ones were disregarded. It now appears that the shorter fibers may have to be disregarded and permissible concentrations of long fibers established, which has not been done.

The prognosis with early to moderately advanced asbestosis is good, provided the inhalation of asbestos fibers is materially decreased. Unlike silicosis,

⁸¹ S. McDonald, *Brit. Med. J.*, 2, 1025 (1927).

⁸² F. W. Simson, *Brit. Med. J.*, 1, 885 (1928).

⁸³ K. M. Lynch, *J. Am. Med. Assoc.*, 109, 1947 (1936).

⁸⁰ E. P. Pendergrass, "Roentgen-Ray Diagnosis in Silicosis and Asbestosis," in A. J. Lanza, ed., *Silicosis and Asbestosis*. Oxford Univ. Press, New York, 1938.

⁸¹ W. C. Dreessen, J. M. DallaValle, T. I. Edwards, J. W. Miller, and R. R. Sayers. U. S. Pub. Health Bull. No. 241, 1938.

asbestosis does not tend to progress after exposure is stopped or markedly reduced. Advanced asbestosis usually is associated with considerable emphysema and commonly leads to right heart strain and failure.

C. BAUXITE PNEUMOCONIOSIS (SHAVER'S DISEASE)

A new occupational fibrosis of the lungs was recognized for the first time in 1942 by Dr. Cecil G. Shaver,²² Niagara Peninsula Sanatorium, St. Catharines, Ontario. It is essentially a diffuse interstitial fibrosis and marked associated emphysema, with a complete absence of any nodular fibrosis. It has been found only in workers exposed to the fumes resulting from the fusion of bauxite in the manufacture of artificial aluminum abrasives.

Bauxite is a natural hydrated aluminum oxide (Al_2O_3) containing small amounts of silica and iron. When it is fused by heating at a high temperature in open electric furnaces, a crystalline artificial corundum results. This process gives off dense white fumes containing from 40 to 60 per cent aluminum and 30 to 45 per cent amorphous silica. Particle size ranges of the fume are remarkably small—from 0.5μ down to $.02 \mu$ —and can be visualized only with the electron microscope. Workers with the heaviest exposures have been the overhead crane operators and those who shovel the mix into the furnaces.

In the early stages there are no symptoms or clinical signs. The early x-ray pattern is characterized by indefinite granular or lacelike shadows, particularly in the upper lobes, resembling early tuberculous infiltration. As the pathological changes progress, involvement of the lower lobes occurs. The shadows may remain granular or may assume an irregular nodular pattern. The root shadows usually are enlarged and increased in density. Emphysema usually is present and may be extreme, with large emphysematous blebs. Spontaneous pneumothorax has occurred in numerous cases and resulted in the death of several of these workers. The main symptom of those with advanced disease is shortness of breath. This may be sudden and extreme at the time the pneumothorax occurs. Most cases have developed in a rather short period of exposure: from two to five years.

Approximately 50 cases had been discovered in the Niagara Falls area up to about five years ago. No tuberculosis was found in any of them. Since better fume control measures have been instituted, no new cases have come to light. It is of interest that no cases of the disease were recognized until 1942, even though the fusion process had been used since 1914. The only explanation for this is the tremendous increase in production of the artificial abrasives during the war years.

The precise causative factor in the fume has not been positively identified. Heretofore, aluminum and amorphous silica had been thought to be innocuous. Also, extremely fine particles of any dust, less than 0.5μ in size, had been thought to have no significance in the development of lung fibrosis. It was believed that

²² C. G. Shaver and A. R. Riddell. Lung changes associated with the manufacture of alumina abrasives, *J. Ind. Hyg. Toxicol.*, 29, 145 (1947).

CHAPTER XV

The Visible Marks of Occupation and Occupational Diseases

CAREY P. McCORD, M.D.

I. Introduction

Some, but not all, trades lead to external markings or signs on workers that may serve to identify either the trade or the diseases associated with the trade. In times past the term "stigmata" has been widely applied to these marks, but this term is at times inappropriate and confusing. In medicine, "stigma" or "stigmata" has been chiefly limited to the skin, and often possesses religious connotation. In general, the term denotes disgrace or inferiority. This is far removed from the purposes of a manifest of the signs of various trades imprinted upon the worker, many of which constitute honorable badges of long years of service. For this reason the designation "stigmata" is carefully avoided in relation to occupation. As here presented, the markings of trades and trade diseases are limited to those evidences that may be seen by the layman as he may observe attired human beings at the factory entryway or on a bus or train, or as he passes along the aisle of a work department. The term "layman" in this instance merely indicates that the observer is not a physician, a nurse, or a dentist; he might well be highly skilled as an engineer, a chemist, or lawyer. Frequently the signs that may be observed are not single but occur in groups to which the term "syndrome" is well applied. Thus, given a known exposure to manganese, anyone presenting an expressionless, masklike face, who is unable to purse the lips as in whistling, whose gait is apparently not quite controlled, and who indulges in fits of unprovoked laughter or crying, should be suspected of having manganese poisoning. These signs constitute the syndrome of that disease.

While some definite medical ends may be served by a knowledge of occupational signs in their hundreds of variations, greater interest may reside in intellectual curiosity about the tell-tale indications of different trades or different trade diseases as branded onto the bodies of those who ply them. On the street, or anywhere else, there might be observed a man who reveals a circular hole about the size of a dime in the midline of his teeth as they rest in apposition. Further, it might be noted that this individual is having some difficulty with his breathing, the inhalations being feeble and short while the exhalations are prolonged and

possibly labored. The astute observer at once will realize that he is in the presence of an old-time glass blower with emphysema—the characteristic occupational disease of that trade. The unfavorable critic may urge that such is not the case, that the observed individual is merely an aged pipe smoker with asthma. But there is a difference. The pipe smoker's dental hole is smaller, more likely to be oval and, moreover, to be right or left of the midline. Other signs may reveal not especially the trade, but a specific occupational affection. Let it be assumed that a stranger unexpectedly enters a workroom, whereupon the workers therein immediately appear to be frozen in whatever position exists at the moment. An entire group of workers on such an occasion may resemble a grotesque lot of statues—utterly embarrassed, incapable of motion, little capable of speech. To the knowing one, these signs at once should suggest the erethismus of mercury poisoning. One of the classical stories about mercurial erethismus centers about a group of hat makers with nondisabling mercury poisoning who were gathered together after work in a saloon for drinking purposes when a stranger entered. During the entire time the unfamiliar person remained, not one of these hat makers was able to lift a glass to his lips or to make other movements—because of pathologic shyness and timidity.

There is no intention here to suggest that all occupational diseases present obvious outward evidences of their existence so that he who runs through a factory may make precise diagnoses. More often than not, when a disease state has reached the point of gross, external characteristics, the time has long passed at which the condition should have been recognized. It is equally obvious that many visible marks are related to nonoccupational diseases and injuries. It is nonetheless true for nonmedical workers in industry, and significantly for the industrial hygienist, the safety engineer, the chemist, the foreman, and the superintendent, that a wide acquaintance with unusual markings on the body or in the actions of workers may serve an end helpful to all. Such workers should know that many drugs taken internally may lead to peculiar markings on the skin; thus, some laxatives containing phenolphthalein may, even when taken by the manufacturer's directions, produce pigmented skin blotches as large as those of the leopard. They should know that some diseases and some work materials may identify themselves in the breath of the person involved, even though this does not constitute a visible sign. They should know that some tradesmen may suggest their jobs through bodily markings or actions, for example, the dirt farmer by his bronzed, warty skin, the train dispatcher by his proneness to cock his right ear toward you because of partial deafness in the left. They should know that the evidences of some acute diseases may be found in the altered color of the skin, as the cherry red skin of the victim of carbon monoxide. They should know that from the gait of some workers some diseases may be spotted with precision, as in the case of some syphilitics who go about their duties with high, slapping steps like a prancing horse.

The unfavorable critic, with some justification, may claim that a mere

familiarity with a large number of heterogeneous signs provides insufficient information for any practical application—that engineers, hygienists, chemists, and others may not be transformed into other than pseudo-physicians by the acquisition of miscellaneous lore about the external characteristics of diseases. Conceding part of the point, there still remain opportunities for the simple application of facts gained, as in the following instance.

Expansion in a small plant led to the employment of a number of young women for the first time and under somewhat unfavorable work conditions. Soon thereafter, more than half of the women developed what was for them an alarming livid eruption over their shins, roughly resembling a bluish-red Scotch plaid. No male worker, although in the same department, was afflicted. Sheer panic was in the making, claims and acrimony. Then came the safety engineer, not a physician, but experienced in the markings of some diseases. He simply pointed out that in that expanding department it has been necessary to introduce several coal stoves, and that the girls, being more thinly clad than the men, had stood or sat for long periods close to these hot stoves, with the resulting patchy lattice work corresponding to the distribution of the superficial blood vessels in these girl's lower legs. This common condition is known to the dermatologist as "erythema ab igne"—"skin redness from fire." This condition is familiar to every country boy and girl who goes barefoot late in the fall or early in the spring and hovers close by the open fireplace or stove. It is information of this character that provides ever-expanding opportunities for nonmedical personnel in industry.

Widely, characters in fact and fiction have become famous through infinite capacity to observe and interpret apparently trivial external markings on the human body. In no small part, the fame of Osler, America's greatest contribution to medicine, rests upon this ability, while in fiction Sherlock Holmes, as created by another physician, gained part of his immortality through this same quality of genius. However, there is nothing so sacred in the domain of medicine as to bar nonmedical personnel in industry from observing physical peculiarities of workers, and setting in motion appropriate steps that may lead to helpful interpretation.

II. Stigmata of Degeneration

In an earlier period, and chiefly among criminologists, a vogue long existed centering about numerous anatomic or physiologic deviations from the usual in relation to criminals, perverts, the insane, the epileptic, the feeble-minded, and the degenerate. These deviations were termed "stigmata of degeneration," and this term designedly indicated inferiority or disgrace. It was thought that the unfortunate possessors of such abnormalities as supernumerary fingers, webbed toes, pointed ears, or microcephalic (small) heads might in the over-all picture be more frequently encountered in the undesirable citizenry than elsewhere. While in feeble-minded, insane, or penal institutions there may be found a greater number of divers stigmata of degeneration, it does not follow in every instance that

these markings are significant. In a court trial, some stigmata of degeneration might as often be found on the prosecuting attorney, the judge, the doctor in the witness chair, as on the prisoner at the bar. Inevitably, many of these stigmata of degeneration will be exhibited by industrial workers and be wholly unrelated to occupational signs. Since so many unhappy interpretations of these congenital or hereditary markings are made, it may be desirable, even on a negative basis or basis of sympathetic understanding, that some of these so-called degenerative signs here be included.

The most obvious stigmata of degeneration are anatomic. On a lower level of discernibility are physiologic and physical signs. On an anatomic basis, almost any organ, system, or portion of the body may be involved, or even the body as a whole. Thus, there may be decidedly large, small, elongated, or asymmetric heads. Common are deformities of the palate, best observed as "harelip." Quite apart from dental anomalies associated with work causes, there may arise congenital dental defects. Tongues may be excessively large, small, or bound down. In the eyes at birth there may exist cataracts; the two eyes may be of wholly different color; the eyes may be crossed (strabismus). Occasionally, eyes may be pathologically small. Unusual closeness of the eyes one to another is sometimes regarded as a sign of degeneration. A number of stigmata are associated with the ears, and perhaps without great significance, such as: the implantation of ears at different levels, excessive length of ears, the absence of one or both ears, very small ears, the binding down of the lobule to the neck, the congenitally thickened or knobbed ear, which is in distinction to the "cauliflower ear" of the boxer, ears that are implanted too far forward or too far rearward, the ear without external auditory canal, etc.

In the realm of stigmata of limbs, there may be mentioned: excessive numbers of fingers or toes, varying degrees of webbing of fingers or toes, the absence of one or more fingers or toes, improper location of fingers or toes, excessive length or shortness of entire limbs or portion of limbs, such as in achondroplasia (one form of dwarfism). In addition, many stigmata are seen in such instances as the clubfoot, entire absence of certain muscles or muscle groups, or the absence of certain joints.

A wide variety of congenital peculiarities of the skin may be classed in the category of degeneration. A few of these are the absence or scantiness of hair, the occurrence of hair in unusual places, unusual colors of the skin, albinism, absence of nails, ichthyosis (fish scale skin), congenital tumors, and so on.

Some deviations from the normal affect the body as a whole, such as: dwarfism, gigantism, infantilism, femininism, masculinism, certain types of obesity, progeria (childhood characterized by premature senility), mongolism (one form of physical and mental defection characterized by physical resemblance to Mongol races), and so forth.

In like manner, anatomic stigmata of degeneration by the hundreds have been associated with every other portion of the body, including the lips, nose, neck,

chest, spinal column, and glands. In order that these anatomic defects may not appear too far afield from the practical, let it be pointed out that with few exceptions all inguinal hernias represent congenital defects, constituting in the majority of instances failure of complete anatomic structure in the inguinal area. Further, lest there be prideful feeling of freedom from the stigma of defects, let it be pointed out that every woman or man whose beauty or handsomeness partly depends upon winsome or seductive dimples is merely presenting minor anatomic defects. All persons possess some anatomic defects, and only when the number is large or the condition profound should much significance be attached to them as evincing degeneration. It is not remarkable that the mythologies of primitive people should center about some of the severer malformations of bodies. Thus, Janus undoubtedly had his counterpart in some actual human born with two faces. Medusa probably is to be associated with some woman afflicted with numerous horny growths of the scalp. The legendary mermaid finds basis in those rare cases of symphysis or sirenomelus, a gross malformation in which the two lower extremities are fused. In more modern times and reminiscent of the side show, gross stigmata of degeneration are exhibited as the "turtle boy," the "dog-faced woman," the "bearded lady," and so forth.

The stigmata of degeneration on a physiologic basis are not so numerous, or at least not so obvious, though many compel attention. Likewise, physiologic deficiencies on a hereditary or congenital basis are not so readily separated as the anatomic ones from those caused during postnatal life. Again it may be pointed out that physiologic stigmata of degeneration may involve any portion of the body. Representative examples are: color blindness, some deafness, mutism, stuttering, blindness, constricted visual field, migraine, anesthesia, hyperesthesia, astigmatism, epilepsy, endocrine dysfunction (abnormal function), colored sweat, hyperodorous sweat, vicarious menstruation, dysfunction of appetite, and delayed puberty. Many instances of such conditions as deafness and blindness in no sense represent stigmata of degeneration.

In the psychic province there are unfortunately almost unlimited evidences of degeneration. These embrace some, but not all, feeble-mindedness, idiocy, imbecility, insanity, precocity, eccentricities, sexual perversions, and so on. Even genius itself, when warped, may be a sign more of degeneration than of exceptional brilliance.

The practical man at this point may be disposed to disavow any connection between the foregoing and the day-by-day world of medicine and industrial hygiene. This attitude is unwarranted. Many hundreds of thousands of workers go about their tasks with continuous mental, if not physical, discomfiture as a consequence of the departure from the usual found in their bodies, their physiologic functions, or their minds. They are in need of human understanding, of medical guidance. After all, industrial medicine is not limited to lead poisoning, silicosis, and broken bones.

III. Marks from Work and Work Diseases

Manifestly, occupational markings on the body are not the stigmata of degeneration in the above sense. Almost equally manifest is the fact that work signs are directly acquired and are not congenital; yet this statement is not precisely true, since some occupational affections of one or both parents may adversely influence the offspring. Hence, some children may present stigmata of degeneration when one or the other of the parents has suffered from such afflictions as lead, radium, or phosphorus poisoning. These and other materials constitute race poisoning and may, in fact, contribute to the degeneration of offspring.

As under foregoing circumstances, work marks, as observed in those portions of the body of an attired person that may be seen with the eye, may involve any external portion of the body, such as the skin and its appendages, the eyes, ears, nose, teeth, lips, limbs, and bones. Other signs may derive from posture, gait, mannerisms, or facial expressions. A number of more common ones such as should challenge the attention of nonmedical persons are listed on pages 486-510. For the purpose of differentiation between occupational and nonoccupational afflictions, some nonoccupational affection signs are included. R. M. I. represents "Recommended Medical Investigation."

IV. Summary

In cursory fashion, numerous signs of disease and near-disease states directly or indirectly related to work are presented in terms designed for nonmedical personnel.¹ Never will any listing of occupational and disease stigmata be complete. New items continually are appearing. By iteration it is observed that the objective here is to take notice of physical peculiarities that readily attract the curiosity of the layman and at times provoke apprehension lest there exist some state of communicability. Conversely, the point of view is not that of the physician making more nearly exact observations, interpretation, and ultimate diagnoses. Most occupational dermatoses and callosities are far from characteristic of any one or few trades and thus are not revealing. However, a callosity (for example) that characteristically appears on just one or two fingers would possess identifying values and thereby justify inclusion here. Always the emphasis is on the striking as observable through the eyes of the layman. The purpose has been twofold: (1) the hope of piquing the interest of nonmedical personnel in medical matters, and (2) the hope of bringing to the attention of physicians larger numbers of persons at workplaces genuinely in need of medical care.

In a measure all of this material fits into the precepts of the remarkable

¹ For more extensive and technical medical data, reference is made to: W. E. and H. F. Robertson, *Diagnostic Signs, Reflexes and Syndromes*. 2nd rev. ed., Davis, Philadelphia, 1942. W. M. Barton and W. M. Yater, *Symptom Diagnosis*. 4th ed., Appleton-Century, New York, 1942. F. Ronchese, *Occupational Marks and Other Physical Signs*, Grune and Stratton, New York, 1948.

Dr. Joseph Bell who wrote: "Nearly every handicraft writes its sign-manual on the hands. The scars of the miner differ from those of the quarryman. The carpenter's callosities are not those of the mason. . . . The soldier and sailor differ in gait. Accent helps you to district and, to an educated ear, almost to county. . . . With a woman, especially, the observant doctor can often tell what part of her body she is going to talk about."

V. Common External Marks of Occupation or Occupational Diseases or Other Diseases

486

Mark or sign	Probable cause	Significance	Comment
Skin			
Pallor—transient (white skin).	Temporary blanching from fainting, fear, pain, nausea, loss of blood, shock.	Dependent on cause.	Not necessarily occupational.
Pallor—persistent (white skin).	Anemia from any of many causes.	R. M. I.	Many specific types of anemia related to work, such as "baker's anemia."
Pallor—localized (white skin).	Hysteria, freezing, pressure, localized poisoning such as from insect stings.	R. M. I.	More common among women.
Abnormal color (cherry red skin).	Carbon monoxide.	May be absent in carbon monoxide poisoning. More likely to involve ears, cheeks, lips, finger tips; instead of cherry red, carbon monoxide color may be yellowish red, greenish red, bluish red. R. M. I.	Patient usually prostrate.
Abnormal color (slatish purple skin).	Silver.	Condition of argyria; may be uniform, may be patchy. Color not always same in different cases.	Not always occupational; must have been exposed to silver; essentially incurable; not disabling.
Abnormal color (slatish violet, red splotches on skin).	Phenolphthalein.	Skin damage from laxatives containing phenolphthalein; splotches usually on arms and chest; may be one or a score; variable sizes; persistent; no superficial skin rash.	Sometimes leads to compensation claims. Unwarranted except in phenolphthalein workers.
Abnormal color (bluish purple skin).	Methemoglobinemia.	Distribution may be limited to ears, lips, fingertips, or possibly generalized. R. M. I.	May be associated with other forms of abnormal hemoglobin, such as sulfhemoglobin.
Abnormal color (bluish purple). Cyanosis.	Heart disease.	Resembles preceding item as to color, but not cause; common manifestation of cardiovascular disease. R. M. I.	Ordinarily not occupational.

CAREY P. MC CORD

Abnormal color (yellow jaundice icterus).	Bile in skin; many causes of jaundice, including occupational causes, catarrh, cancer.	Depends upon exact cause, such as carbon tetrachloride. R. M. I.	In the young, commonly catarrhal; in the middle aged, usually gall bladder disease; in the old, usually cancer.
Abnormal color (bronze).	Many causes, such as suprarenal disease, arsenic, pellagra.	May be universal, diffused, or localized. R. M. I.	Important if extensive and persistent.
Abnormal color (coffee color).	Endocarditis.	May resemble Addison's disease or nicotinic acid deficiency except for distribution of latter. R. M. I.	Unrelated to work as cause.
Abnormal color (yellow). Carotinoid.	From the eating of excessive quantities of carrots, squash, oranges.	Harmless; rapidly disappears on correcting diet; resembles jaundice.	Most often found on palms and soles and around nose; unlike jaundice, does not involve eyes.
Abnormal color (yellow). Picric acid.	Picric acid and picrates.	Usually limited to point of contact.	May be associated with dermatitis; some picrates used in the treatment of burns may both discolor skin and induce dermatitis.
Abnormal color (orange). Tetryl.	Munition materials.	Discolored area limited to contact points; may be associated with dermatitis.	Sometimes removed by washing.
Abnormal color (green).	Either from sweat from copper content, or external contact with fine copper.	Clinically not important; at times may be washed away.	Hair may turn either green or blue; disturbing to workers, particularly women.
Abnormal color (bluish-green streak or blotches).	Powder burns or ground-in coal dust; usually limited to miners, and chiefly coal miners.	Not ordinarily disabling, although previous injury may have been disabling.	May resemble chlorosis in appearance.
Abnormal color (hectic flushed cheeks).	Heart disease or tuberculosis.	Represents localized capillary dilatation.	In tuberculosis occurs only in far advanced state. More discernible in men.
Abnormal color (red skin).	Impending sunstroke, high blood pressure; may be natural for some types or races.	R. M. I.	May indicate fever; may be localized as on head, cheeks, or hands.
Abnormal color (leucoderma).	May be caused by external contact with certain rubber antioxidants. Monobenzyl ether of hydroquinone.	Frequently from nonoccupational causes; vitiligo; may be related to avitaminoses.	More prominent in Negroes and other dark races; loss of pigment fairly readily spontaneously replaced in some conditions.
Abnormal color (absence of normal skin sheen in Negro).	May be caused by any organic disease.	In reflected light, normal skin sheen almost invariably present in absence of organic disease.	A possible test for malingering in the Negro.

(continued)

Common External Marks of Occupation or Occupational Diseases or Other Diseases (*continued*)

488

Mark or sign	Probable cause	Significance	Comment
<i>Skin, continued</i>			
Abnormal color (excess pigmentation).	May be due solely to sunburn; some industrial causes, including superficial infection; nicotinic acid deficiency.	May be localized, spotty, or generalized; growing pigmented moles dangerous. R. M. I.	All marked hyperpigmentation without obvious cause should be investigated; characteristic of many trades, such as sailors. Bismuth, mercury, and arsenic used for therapy may induce excess pigmentation; also some cologne waters.
Abnormal color (any color—industrial tattooing).	Mechanical imbedding of fine materials; any color.	Usually limited to small areas. Equivalent of tattooing; not disabling.	Frequently associated with some scarring.
Abnormal color (any color).	Scores of chemicals directly color the skin, such as silver nitrate.	External contact with many types of work. Materials discolor skin with or without producing dermatitis, such as materials of photographers.	Such skin coloration frequently only identifies the trade, but may be associated with dermatitis.
Abnormal color (chocolate pigmentation with hyperkeratosis).	Possibly hydrocarbon oils, greases, or tars.	May involve forehead, sides of face, backs of hands, extensor surfaces of forearm, axillary folds.	Pruritus common. May represent Riehl's occupational melanosis.
Abnormal color (bronze deposits).	May follow use of iron compounds in treatment of dermatitis such as that from poison ivy.	Deposits sometimes disappear after long periods.	Ultraviolet application sometimes causes disappearance as does cantharides blister.
Abnormal color (blue nevi).	Unknown.	No more prone to become malignant than other nevi.	When any nevus changes in character, such as size or color. R. M. I.
Abnormal color (Berlucque pigmentation).	Sunlight exposure after some colognes, perfumes, or lotions.	Chiefly in summer in connection with bathing or sun bathing.	Involvement only of exposed part. Acute dermatitis sometimes present. Related to oil of bergamot.
Abnormal color (orange, through brown to blue-black).	Benzanthrone.	Common site face, neck, upper part of chest, sometimes hands and forearms.	May result from specific liver damage.
Rashes (misc.). Dermatitis.	Almost unlimited industrial causes; bacterial and fungal infections; drugs used for therapeutic purposes; mechanical and physical factors involving any portion of the body.	Types, sites, severity, diagnostic features too numerous to receive mention. Significance depends on exact cause and severity. R. M. I.	Apart from mild acne, mild seborrhea, mild erythema, mild sunburn, all skin rashes should be investigated. See subsequent references to distribution patterns of dermatoses.

Scars.

Obviously many; mechanical, chemical, infection.

Often serves as proof of previous disease states, such as chicken pox, smallpox, syphilis, "commemorative scars," i.e., smallpox vaccination; or identifies trades such as moulders from multiple burn scars on lower legs.

Scars suggest, when on thumb, shoemakers and skivers; on tongue, epileptics; when jagged on nose and face, windshield accidents; when short and straight above collar-bone, tuberculosis; when long and curved across neck, thyroid operation; long, linear scars, knife wounds; when jagged and furrowed, from gun shot accident; behind ears, mastoid disease; irregular, oblique on neck, scrofula; star-shaped at base of neck, previous tracheotomy; multiple burn scars on forearm, welders; pitted scars on back, shoulders and face, healed acne; pitted scars on forehead and face, chicken pox or smallpox.

Skin parasitism (scabies, pediculosis).

Animal parasites.

May be chiefly indicated by scratch marks. Lice or nits may be seen on hair. R. M. I.

Readily eliminated from intelligent persons; recurrences probable in unintelligent, unhygienic persons.

Skin atrophy.

May indicate normal senility or may constitute portion of damage from dermatoses; from many industrial causes.

Typical example—long standing x-ray dermatitis.

Some atrophy irreparable; further exposure elimination always desirable.

Capillary dilatations (chronic).

Many causes both industrial and nonindustrial, such as alcoholism and x-ray exposures.

Minor condition of obscure cause and significance; cosmetically unattractive.

If limited, sometimes may be removed by electrolysis.

Keloids.

Peculiar skin hypertrophy following superficial injury.

More common among Negroes; usually follows mechanical injury, such as incised wound; characterized by overgrowth of scar tissue at site of previous injury; tumorlike; multiple or single.

Occasional troublesome sequela of industrial injury.

Common External Marks of Occupation or Occupational Diseases or Other Diseases (continued)

Mark or sign	Probable cause	Significance	Comment
Skin, continued			
Itching (pruritus).	Numerous; both industrial and nonindustrial.	Obviously not a visible mark. Scratch lines constitute the mark. May be associated with neurosis, dermatitis, parasitism, diabetes, leukemias. R. M. I.	Undue scratching of head suggests seborrhea or lice; scratching on back of shoulders, usually acne; scratching of feet, frequently fungal dermatitis; scratching in older persons, frequent in diabetics; scratching of anal region, parasites, fungal dermatitis, or neurosis.
Erysipeloid lesions.	Bacterial origin—staphylococci, streptocci.	Chiefly on hand and forearm. Highly common among fish handlers, particularly fish butchers. Commonest occupational disease on ocean liners.	May arise among butchers other than of fish. Often called "salt water sores." Mechanical injury from fish scales and bones may be a factor.
Swimmer's itch.	Caused by snail parasite <i>Schistosoma cercariae</i> .	As an occupational disease arises among fishermen, clam diggers, and other workers in outside waters.	The parasite lives in both fresh and salt water although exact form may be different.
Creeping eruption.	Animal parasite, larva migrans.	Burrowing parasite moves 1 to 2 cm. per day. Intense itching. Several parasites may be creating burrows at the same time. Not always occupational.	Common occupational disease in Florida among construction workers. Chiefly acquired from cat and dog feces. Condition known as Brazilian Hookworm. Several other parasites produce similar creeping eruptions.
Thresher's itch, Grain itch, Bunkhouse itch.	Animal parasite <i>pediculoides ventricosus</i> .	Chiefly limited to the threshing season. Acute dermatitis with pruritus.	May arise in manufacturing plants using straw for packing.
Rat mite dermatitis.	<i>Liponyssus bacoti</i> .	Common form of acute dermatitis with intense itching, urticaria. Commonly appears in areas under belts, girdles, bras, or socks.	Many other mites may produce human dermatitis.
Anesthesia, hyperesthesia, paresthesia.	Usually neuroses and unassociated with work; also chemicals, such as formaldehyde, phenol.	Not visible markings; encountered from complaints of increased localized skin sensitivity; numbness, burning, pricking; may be symptom in some occupational disease, such as arsenic poisoning. R. M. I.	More common among pharmaceutical workers, lepers, pneumatic tool operators.

Hair abnormalities (patchy baldness—alopecia areata).	Common causes—syphilis, arsenic, fungal infections; thallium, barium sulfides; synthetic rubber intermediates.	Industrially more important than widespread loss of hair because of possible industrial causation R. M. I.	Some forms of patchy baldness may involve eyebrows, beard, eyelashes, and the cause may be unknown.
Hair abnormalities (alopecia totalis).	Baldness in industry; may be caused by x-ray, industrial or medical.	Extensive baldness commonly unrelated to work causes, and perhaps more related to testicular function, heredity.	Any sudden extensive baldness or any baldness occurring in groups of workers quickly should be investigated.
Hair abnormalities (blue or violet colored hair).	Suspect improper or excessive hair dyeing; sometimes deliberate.	Usually unrelated to work, but various work materials settling on hair or scalp may impart divers colors.	Not disabling and usually temporary.
Hair abnormalities (localized canities).	Chiefly hereditary.	A fair number of persons present localized greying in midst of normally colored hair.	Ordinarily harmless condition existing from early life. Rarely associated with scalp, skin tumors.
Hair abnormalities (excess hairiness on faces of women).	Hormonal dysfunction.	In women cosmetic unsightliness from hair often associated with multiple indications of masculinity.	May appear first at puberty or only in later life.
Loss of nails.	Both industrial and nonindustrial causes, such as arsenic, fungal infection, alkalies.	Depends upon specific cause. R. M. I.	Frequently nails are slowly separated from bed among dishwashers, bottle washers, laundry workers, etc.
Watchmaker's nail.	Characteristic occupational stigma involving hypertrophy of left thumbnail.	Due to continual opening of watches.	Occurrence of condition on wane.
Beau's lines (transverse coloration of nails, brown or black). Discoloration of nails.	Occur among mercury workers. Many industrial chemicals.	Arise in many forms of debilitating disease. Many different colors produced, such as purple from acetanilid, brown from chromates, yellow from TNT, yellow from nitric acid, black from mercury, brown from photographers' chemicals, light yellow from picric acid, brown from hair dyes; many others.	R. M. I.
Nail inflammation (and tissues immediately around nails).	Large number of industrial and nonindustrial chemicals; also nonindustrial infection.	Among many others, it occurs among confectionery workers, arsenic workers, bakers, bricklayers, chemists, dye workers; seek out particular exposure.	Apart from contact, some nail discoloration may be produced as part of general involvement as in argyria.
			Nails themselves little subject to inflammation. See Chapter XIV.

(continued)

Common External Marks of Occupation or Occupational Diseases or Other Diseases (*continued*)

Mark or sign	Probable cause	Significance	Comment
<i>Skin, continued</i>			
Nail dissolution.	Many industrial keratin solvents; notably alkalies.	Complete destruction of nails rare; typical examples of causes—formalin, cement.	Outstanding feature inflammation of tissues adjacent to nails.
Nail deformities (thickening, curvature, pitting, linear markings, spotting).	Large numbers of industrial contact chemicals.	Common among furriers, dyers, lace makers, packers, cordage makers, thallium workers, auto washers, engravers, etchers, glass makers, miners, sulfide workers, x-ray technicians, string instrument players, tanners, many others.	Apart from infection, condition rarely disabling. White spots and transverse markings may indicate antecedent disease.
Vagabond's skin.	Lice.	Deep, patchy bronzing of skin from irritation of lice bite and possibly lice excreta.	Usually associated with low order of personal hygiene.
Morphea.	Unknown.	Diffused white spots, usually over torso and upper extremities representing a patchy scleroderma.	Startling when present on Negroes or other dark races.
Ichthyosis (fish skin).	Unknown but usually congenital.	Entire skin rough, scaly, thickened. Usually permanent.	Grossly troublesome to owner. Harmless to fellow-workmen.
Milker's nodules.	A virus disease (false cowpox). (Always associated with milking or udder cleaning.) Incubative period 5 to 7 days.	Usually involves exposed parts, chiefly fingers, hands, forearms. The reddish or reddish-blue nodules may be as large as 2 cm. in diameter. Sometimes as many as 40 present at one time. Mild systemic disease with lymphangitis, lymphadenitis may appear.	Self-limiting disease. Requires no treatment, but complications such as secondary infection may require treatment.
Barber's dermatitis (not Barber's Itch). Hives ("Bold Hives" Urticaria).	Mechanical punctures from customers' hair. Usually allergic causes. Many occupational excitants. Some forms related to photosensitivity.	Chiefly limited to webs of fingers, or at least to fingers. Layman's "Bold Hives" means "giant urticaria." Gross lesions may appear in a few minutes usually accompanied by itching.	Burrowing sinuses made troublesome by secondary infection. Urticaria may involve such tissues as around larynx and pharynx. Extreme edema may lead to prompt fatality.
Prickly Heat (Miliaria).	Related to profuse sweating. Common summer dermatitis. May occur in winter among cooks, bakers, bathhouse attendants, furnace workers, etc.	Commonly not an occupational disease but may be.	Common sites chest, back, axillary folds.

Fungicide Furunculosis.	While causes are multiple, such as "oil furunculosis," a specific type is caused by pentachlorophenol, an insecticide and fungicide causing gross furuncles and other skin eruptions.	New furuncles and acne may arise months after elimination of exposure.	Lesions not limited to exposed areas. Secondary infection may be prominent.
Chloracne.	Exposure to certain chlorinated compounds, chiefly waxes.	Characterized by extraordinary numbers of comedones, sometimes with typical acne pustules.	Systemic involvement may be associated.
Pathological sweating.	Many nonindustrial causes, but sometimes seen in lead poisoning.	Unusual sweating may be localized, odoriferous, colored, excessive. Sometimes found in heart disease, rickets, syphilis, palsy, tuberculosis, goiter, etc.	In arsenic or lead poisoning, abnormal sweating usually local to parts involved in neuritis.
Brick red (warm weather). Plum colored (cold weather).	Polycythemia (pathologic increase in numbers of red blood cells).	May be a manifestation of repeated exposure to carbon monoxide in relatively low concentrations. R. M. I.	Engorgement and congestion of superficial blood vessels. Most prominent on face. May involve conjunctivae.
Paroxysmal face and head flushing.	Chiefly associated with the menopause, this type chiefly limited to women 40 to 50.	May be associated with mental depression, excessive perspiration, weakness, insomnia, emotional instability.	Not occupational.
Lymphangitis.	Infection.	Red streak up arm or leg. Alarming indication of extension of localized pyogenic infection. R. M. I.	Frequently associated with "kernels" such as in axilla or groin.
Keratosis (farmer's warts).	Excessive sunlight, ultraviolet light, etc.	Represent warty, flat, or horny, persistent overgrowth of outer layers of skin. Characteristic of past middle age life; usually limited to exposed parts of skin; characteristic of many trades including farmers, sailors, fishermen, gardeners, trappers.	Rarely become cancerous; readily removed by electrocauterization, by x-ray and by electric needle; less well by keratin solvents. Quite common both in and out of industry.
Asbestos warts.	Mechanical penetration by asbestos fibers; possibly chemical action akin to production of silicotic nodules.	Condition usually limited to fingers and hands.	Similar condition with glass fiber workers, but in that case always mechanical.
Tumors (on skin).	Several types, both benign and malignant. Commonest variety, epithelioma.	Apart from nongrowing warts and obvious abscesses of skin, any enlarging mass on or in skin should be investigated. R. M. I.	Pigmented moles are prone to become malignant.

(continued)

Common External Marks of Occupation or Occupational Diseases or Other Diseases (continued)

494

Mark or sign	Probable cause	Significance	Comment
Skin, continued			
Tumors (beneath skin).	Frequently harmless, fatty tumors (lipomas). Attain to large size.	Because of uncertainty, every mass beneath the skin should be investigated by a physician.	Skin over lipomas, if squeezed, becomes dimpled, "orange peel" sign. See next item.
Subcutaneous lymph nodes (enlarged).	Lymph nodes of neck, axilla, groin, etc., may become enlarged and observable; many causes, but chiefly infection. "Kernels."	Depends upon precise cause of gland enlargement. R. M. I.	Lice in head hair frequently is cause of enlarged lymph glands on sides of neck.
Skin cysts.	Plugged-up oil glands.	Large or small sacs in skin with fluid or pasty content; few or numerous cysts may appear almost anywhere on skin surface, particularly about head; on scalp called "wens"; relatively harmless; disfiguring.	Milium "white heads" ordinarily represent multiple minute cysts.
Work callosities.	Pressure and friction.	Characteristic of many trades, the exact location usually identifying the trade or profession, e.g., fingertips in harp players, base of little finger in bundle tiers, hod carriers on shoulders, sailors on abdomen, hand type setters on fingertips, violinists on left jaw, basket makers on outer edge of palm, engravers on little finger, wood cutters on face, porters on palms and shoulders.	Callosities are often more revealing of a trade than important as disease state. Merely skin hypertrophy of fingers, hands, feet, or other local portions of body.
Skin corrugation (rugosity).	Several nonindustrial causes; outstanding cause in industry, tannins; less definitely alkalies.	In tan yards, some workers' skin of hands literally may be tanned, grossly rugose and brown discolored. From alkalies, hypertrophy with fissuring is common; somewhat dissimilar to rugosity; many other examples.	Tendency to recover on elimination of exposure; some permanent damage.
Skin hemorrhage (purpura).	Many nonindustrial causes including infection, tuberculosis, cachexia, endocarditis. In industry suspect benzol.	Always significant. R. M. I.	In benzol poisoning may be associated with bleeding from gums, nose, genitalia.

CAREY P. MCCORD

"Birthmarks."

Never industrial, and not properly "birthmarks."

Area of birthmarks sometimes more susceptible to action of industrial irritants, pressure, etc.; may become cancerous.

To eliminate disfigurement, many so-called "birthmarks" may be removed by electric needle, x-ray.

Hypodermic skin markings.

Improper or extensive use of hypodermic needle.

Marks the hypodermic introduction of drugs, such as morphine or insulin.

Usually important to rule on the desirability of work applicants—drug addicts, diabetics. On side of chest, may be associated with collapsed lung in tuberculosis.

Skin Patterns

Pattern contact dermatitis.

Variety of chemicals.

Distribution and shape of lesions commonly reveal the cause. Almost unlimited varieties such as peculiar distribution of lesions from handling bowling balls, hairpins, combs, wrist-watch bands, shoelaces, door knobs, steering wheels, brief case handles, cigarette lighters, hat bands, spectacles, etc.

Extensive information chiefly developed by Waldbott in his *Contact Dermatitis*.

Lesion distribution.

Contact dermatitis.

Common distribution—back of hands and fingers, wrists, forearms (any surface), elbow folds, upper arms, neck and face, but not scalp; waistline, thighs, lower legs, with no or little involvement of chest or back, knees or feet. R. M. I.

Apart from traumatic injury, palms are seldom primarily involved in industrial dermatitis.

Lesion distribution.

Psoriasis.

Elbow points, knee caps, palms, back of head, shins, abdominal wall. R. M. I.

This distribution almost rules out all industrial dermatitis.

Lesion distribution.

Cutaneous syphilis.

Characteristic distribution — palms, cheeks, forehead, chest, abdomen, genitalia, anal region, soles of feet. R. M. I.

Almost opposite that of industrial dermatitis.

Lesion distribution.

Erythema multiforme (papular erythema).

Characteristic distribution—back and front of hands but not fingers; front of wrists, around elbows, around mouth, forehead, rarely on torso, rarely on thighs, front of knees, front of feet. R. M. I.

This distribution varies greatly.

(continued)

Common External Marks of Occupation or Occupational Diseases or Other Diseases (*continued*)

496

Mark or sign	Probable cause	Significance	Comment
Skin Patterns, <i>continued</i>			
Lesion distribution.	Acne.	Shoulders, chest, neck, face but not scalp, back.	Lesions and distribution quite dissimilar to industrial dermatitis.
Lesion distribution.	Shingles (herpes zoster).	Characteristic distribution follows nerve courses; front of arms, forehead and upper face, obliquely on chest and abdomen, outer surface of thighs, rarely around shoulders, rarely below knees. R. M. I.	Associated with much more pain than many forms of dermatitis.
Lesion distribution.	Seborrhea (on oily skin).	Scalp, forehead, sternal region, armpits, midway between shoulders, genital region; practically never on back or abdomen.	Seborrhea on dry skin may have different distribution and chiefly involves extremities.
Lesion distribution.	Scabies (itch).	Webbing between fingers, palms of hands, armpits, breasts in women, around and on genitalia, between buttocks. R. M. I.	Less frequent in lower extremities.
Lesion distribution.	Mycotic dermatitis (ringworm).	Palmar surfaces of fingers and hands including webbing of fingers, but seldom backs of fingers and hands, forearm, scalp, bearded region, midsection of chest (certain varieties), around genitalia, anal region, between toes, soles of feet, around ankles. R. M. I.	Fungal lesions as seen in industry seldom are characterized by the circular involvement with clearing center.

CAREY P. MCCORD

Eyes

Blindness (in industry usually partial).	Arsenic, benzol, carbon monoxide, hydrocyanic acid, hydrogen sulfide, lead, methanol, nitroglycerin, tobacco, trauma; many nonindustrial causes.	The pathology of industrial blindness as occupational diseases varies highly; e.g., from methanol, optic neuritis; from benzol, intraocular hemorrhage. R. M. I.	Many other substances than those listed may impair vision.
--	--	--	--

Cataracts.	Usually not an occupational disease, but traditionally associated with glass making, furnace work, and other incandescent operations. Common from penetrating foreign bodies around lens. Frequently congenital, and frequent among diabetics.	Disappearing as an occupational disease. R. M. I.	Use of suitable eye protection in hot and excessively luminous industries is preventing the occurrence of cataracts.
Conjunctiva (yellow-brown pigmentation of conjunctiva and cornea). Conjunctivitis.	Many chemical causes, chiefly aniline and its derivatives, particularly hydroquinone. Almost unlimited; nonindustrial and industrial agents, such as vapors, acids, dust, ultraviolet rays (Klieg eye). Vitamin A deficiency.	May be accompanied by reddish discoloration of hair and skin of hands and feet. Seek out particular cause. Frequently associated with respiratory tract inflammation. R. M. I. Thickening of conjunctivae over eyeball; vascular injection with growth over corneal margin in severe cases. Commonly unrelated to work exposure; causes staring expression. R. M. I.	Rare condition. One of commonest manifestations of industrial irritants. One red eye more likely to be industrial than two red eyes. More general distribution than pterygium.
Conjunctival xerosis (dry eye).			
Exophthalmos (protruding eyes).	Usually bilateral from hyperthyroidism; monolateral from brain or eye tumors.		Associated with tremors, sweating, flushed skin, agitation, other aspects of thyroid syndrome.
Xanthelasma (buttery eyelids).	Caused by fatty degeneration. Occurs chiefly in elderly patients, women more often than men.	When prominent, gives startling appearance to eyes.	Harmless except for cosmetic unsightliness. Frequently removed surgically by those who can afford it.
Abnormal pupil size.	Caused by many drugs such as pin-point pupils by morphine.	Pupil size abnormalities frequent from occupational diseases, as among pharmaceutical workers handling such chemicals as atropine.	R. M. I.
Strabismus (cross eyes).	Commonly congenital. May arise after one-eye blindness.	May be divergent or convergent. Congenital strabismus not always manifest in infancy.	May arise as acute state after brain hemorrhage.
Discoloration of eyes (blue sclera). Discoloration of eyes (yellow sclera).	Familial disease unrelated to work. Usually jaundice.	Part of well-established syndrome of brittle bones and blue sclera. Reflects liver damage possibly from industrial causes, such as carbon tetrachloride, or instead, infection or cancer. R. M. I.	For confirmation, observe other members of the family. Look for jaundice of skin or bile in urine.

(continued)

Common External Marks of Occupation or Occupational Diseases or Other Diseases (continued)

498

Mark or sign	Probable cause	Significance	Comment
<i>Eyes, continued</i>			
Discoloration of eyes (slaty grey sclera).	Part of picture of argyria.	Produced by silver.	Does not always occur in argyria.
Discoloration of eyes (purple sclera).	Methyl violet.	External entry of traces of indelible pencil or some ball pen inks. R. M. I.	Methyl violet, in addition to abnormal coloration, may induce definite irritations and rarely ulcers. Temporary.
Discoloration of eyes (mineral specking).	Several mineral dusts.	Various mineral dusts, such as iron, mercury, calcium, may induce spotty, colored deposits; color depends upon metal.	Does not always arise in presence of mineral or metal dusts; black specks also produced among workers melting sealing wax; also phenol.
Discoloration of eyes (misc.).	Various dyes and other industrial and therapeutic agents; lack of vitamins.	Relatively unimportant; staining of eyes from accidental or deliberate introduction of divers agents.	Usually unimportant and temporary except in avitaminosis.
Arcus senilis.	Usually old age.	White circle or arc at periphery of cornea.	May occur in premature old age.
Impairment of color vision (temporary—not color blindness).	Few drugs, such as santonin, tobacco.	Temporary loss of color judgment.	Santonin possibly may discolor eye humors.
Restriction of color field.	Chlorinated hydrocarbons; possibly other substances.	Does not appear as a visible sign; attracts attention on complaint of worker. R. M. I.	More frequently from nonindustrial causes.
Diplopia (double vision).	Usually nonindustrial, but may be caused by emetine and possibly other substances.	R. M. I.	Common feature of alcoholism.
"Doll's eye."	Postdiphtheritic paralysis.	Dissociated movements of head and eyes; when head is raised, the eyes are lowered, etc.	Sometimes associated with protruding eyeballs.
Impaired movement of eyes or lids.	Many nonindustrial causes; may be a feature of some industrial diseases as lead poisoning.	Many types of paralysis. R.M.I.	Droopy eyelids, hollow cheeks, fatigued expression, suggests myasthenia gravis.
Nystagmus (fine repetitive motions of eyeballs).	Neuroses; fatigue, ear disease.	Fairly frequent among miners, train dispatchers, jewelers, draftsmen. R. M. I.	Eye motion may be lateral, vertical, circular or combined.
Deposits in or around eyelids (misc.).	Deposits of fat, pus, fibrous tissue or pigment.	May represent abscesses, cysts, or calcareous formations; many varieties.	Certain deposits suggest diabetes or gout.

CAREY P. MC COY

Trachoma (granulated eyelids).	A virus disease.	This condition is readily communicated to others.	Commonly described as a filth disease occurring and spreading chiefly under conditions of uncleanness.
Pterygium.	External chemical or mechanical repeated minor injuries.	Wedge-shaped film growing from angle of eye toward and sometimes covering cornea; resembles eye condition in certain avitaminoses. R. M. I.	Occurs among lime burners, stonecutters, masons, sand blasters, and varnish cookers.
Intrascleral hemorrhage.	Rupture of minute blood vessel with filming of blood between scleral layers.	Alarming bright red in appearance, but usually without medical importance. May be related to high blood pressure.	Goes through usual stages of ecchymotic clearing, that is, purple, yellow, etc.
Sty (hordeolum).	Staphylococcus infection of eye glands.	May be single or multiple.	Ordinarily unrelated to work causes. Common among diabetics.
Chalazion (bump in upper eyelid).	Mechanical stoppage of gland ducts.	May be noninflammatory.	Frequently occur in crops, tendency to recurrence.
Ectropion (pulling down of lower eyelid exposing eyeball).	May follow contraction of scars, wounds, burns, or chronic conjunctivitis.	Commoner in old workers.	Unrelated to work except as a result of scarring from work injuries.
Puffiness of eyelids.	May be early sign of arsenic poisoning.	Frequently associated with other characteristics of eye or respiratory infection. R. M. I.	Observe for additional swelling above eyebrows. If not infection, establish possibilities of arsenic exposure.
Iritis (injection of white of eye around colored portion of eye).	Chiefly infection.	Common consequence of small neglected eye injuries such as from foreign bodies.	Warning of beginning of serious situation. R. M. I.
Cloudy cornea.	Usually unrelated to work.	May represent beginning glaucoma. R. M. I.	Usually associated with foggy vision, severe pain in eye, dilated pupil, swelling of conjunctivae and lids.
Pearly sclera.	Pearly white or pearly blue sclera, usually associated with anemia.	May be associated with occupational anemias. Highly brilliant eyes produced by drugs, and especially in women. R. M. I.	Frequently suggests anemia, particularly when conjunctivae are pale pink.
Photophobia (intolerance of light).	Eye strain.	May indicate uncorrected defects in vision. R. M. I.	In industry may be related to excess light, either natural or artificial. Glare.
Nose			
Rhinitis—"running nose."	Infection or chemical irritation of nasal passages.	Obviously one of commonest non-occupational affections and one feature of irritation from numerous industrial gases, vapors, dusts, etc.	Rhinitis may appear on an allergic basis from both industrial and nonindustrial causes.

(continued)

Common External Marks of Occupation or Occupational Diseases or Other Diseases (*continued*)

500

Mark or sign	Probable cause	Significance	Comment
<i>Nose, continued</i>			
Rhinophyma (bulbous nose).	Related to acne rosacea.	Hypertrophy of nose and nearby tissues; not associated with industry.	Sometimes associated with alcoholism; largely unproved.
"Saddle-nose."	Congenital syphilis.	May be due to trauma.	May occur in acquired syphilis.
Infected nodules with severe systemic disease.	Glanders.	Rare disease commonly limited to horse tenders. R. M. I.	Nodules discharge yellow, glary pus with offensive odor.
Nose bleed (epistaxis).	Many nonindustrial causes. If industrial, caused by irritant gases, dusts, or mists such as chromic acid, benzol, or fluorides.	If profuse and repeated, R. M. I.	May be associated with foreign bodies in nose, deviated septum, many infectious diseases, such as measles, various forms of anemia, cancer, etc.
<i>Ears</i>			
"Cauliflower" ears.	Trade-mark of the pugilist.	Fibrous deposits in external ear.	In the absence of protection, may arise among military tank operators.
Noise deafness (cocked good ear is the visible sign, or attitude may indicate deafness).	Noise.	Temporary or permanent deafness or impaired hearing to some or many frequencies; probably originates on a fatigue basis followed by organic impairment. R. M. I.	Usually bilateral, even when one ear is protected against noise. Deafness in one ear, if occupational, may arise in train dispatchers, telephone operators, etc.
Deafness (impaired hearing other than from noise).	Various substances, such as lead, hydrogen sulfide, carbon disulfide, are credited with capacity to produce deafness.	Often difficult to differentiate between industrial and nonindustrial deafness; normally occurs in old age. R. M. I.	Deafness may constitute a neurosis.
Impacted cerumen (wax-plugged ears).	Ear wax as such, or mixed with dusty materials.	Common minor affliction in and out of industry, particularly dusty trades; signs of hearing impairment constitute mark. R. M. I.	Readily may be remedied by softening and washing.
Aural dermatitis (ear itch).	Varied; external irritants, infection, systemic impairment, lack of vitamins.	The ears are common sites for many forms of dermatitis and other dermatoses. R. M. I.	Noise-preventing and hearing appliances may favor aural dermatitis. Ear scratching prominent sign.
Otitis media (running ears).	Infection.	Common ear disease of all ages; frequent in industry, but not often caused by it. R. M. I.	A frequent source of subsequent deafness.

Equilibration disturbances (Ménière's disease).	Dysfunction of semicircular canals. Falling without obvious cause is the objective sign.	Any defect of equilibration of grave importance in airplane operators. R. M. I.	Probably related to sea sickness, train sickness, etc.
Gangrene.	In industry, frostbite.	In absence of history of frostbite, suspect diabetes. R. M. I.	May be caused by infection.
Trophi.	Gout.	Characterized by numerous hard, yellowish, round, pointed nodules at ear margin.	Similar nodules may appear on various portions of body, such as feet.
Increased hearing (overirritation by noise).	Alcohol and/or tobacco poisoning.	Pathologic irritation by moderate noise.	Also caused by certain neuroses, quinine and salicylic acid poisoning, and migraine.
Lips, Mouth, Teeth, Tongue, Neck			
Cornification of lips (thickening of lips).	Mechanical pressure and friction on lips.	Characteristic of many trades or professions, such as wind instrument players, glass blowers, etc.	Nondisabling.
Lips (cancer, epithelioma).	Exact cause unknown.	The lips are perhaps the most common site of epithelioma. R. M. I.	Rarely related to industry as the cause; said to be common in fishermen from tar on fish nets and the holding of net thread between lips.
Lips (encrustation and ulceration).	Attributed to arc welding and presumably ultraviolet rays in absence of protection.	In some welding, eyes only are protected. Undesirable.	May represent precancer lesion.
Cheilosis (one form of inflammation of lips).	Riboflavin deficiency.	Pallor of lips with maceration of mucosa; may be one indication of vitamin lack.	Common among industrial workers; not directly related to work as a cause.
Rhagades.	Congenital syphilis.	Fissured inflammation, or scars therefrom at angles of mouth.	Not to be confused with cheilosis from vitamin deficiency.
Tongue (greenish-black).	Vanadium pentoxide dust.	One item in syndrome. Among others dyspnea, emphysema, bronchitis, hypertension.	Rare affection.
Swollen tongue.	If industrial, suspect ingestion of corrosive poison, phenol, cresol, mineral acids, mercury, etc.	Many causes unrelated to work, such as cretinism, infection, cancer, actinomycosis. R. M. I.	When due to industrial material, usually accidental or suicidal.
Tongue (scars from epileptic tongue biting).	Epilepsy.	Some epileptics will present evidence of fresh or healed damage of the tongue from biting during seizures. R. M. I.	Evidence of tongue chewing does not constitute proof of epilepsy.
Coated tongue.	Constipation, gastritis, dehydration, vitamin deficiency.	Relatively unimportant.	Rarely coated tongue in colors such as black may be due to fungal infection.

(continued)

Common External Marks of Occupation or Occupational Diseases or Other Diseases (continued)

Mark or sign	Probable cause	Significance	Comment
Lips, Mouth, Teeth, Tongue, Neck, <i>continued</i>			
"Beefy" tongue.	Vitamin B deficiency.	One manifestation of vitamin B lack. R. M. I.	Enlarged tongue, roughened, rugose and red; somewhat resembles raw beef.
Herpes (labial)—"cold sores."	Action of a virus, allergy.	Virus probably always present but only becomes active under unfavorable conditions such as infection.	Not to be confused with labial chancre.
Occupational fungal disease around mouth.	Condition limited to Mediterranean countries. Involves chiefly quail force-feeders.	Organism transferred by quail pecking feeders' faces.	Condition not known in United States.
Discolored gums.	Various metal or mineral deposits, tobacco stain, etc.	The purple gum line of lead absorption, the similar line from bismuth, the blue line following trinitrotoluene exposure or poisoning, purple line from copper, bluish line from mercury or zinc, purple gums from scurvy. R. M. I.	Lines or discoloration of gums are not conclusive proof of any occupational disease.
Burton line (lead line).	Bright purple line at gum margin. Common after exposure to lead.	Not diagnostic of lead poisoning.	Not readily visible as a sign of abnormality. R. M. I.
Acute multiple dental caries.	Specific form attributed to work with citric acid, chiefly bakers and confectioners.	Well recognized in European countries. Uncommon in exaggerated form in United States.	All sugars as used in bakeries and confectionaries may produce some excess of dental caries.
Dental erosions.	Erosion from chemicals, such as from acids or mechanical erosion such as from glass-blowers' pipes; numerous variations; specific variations for many trades, such as battery makers from acid, sewers from thread biting, wind instrument players, "tack spitters," brush makers who trim bristles by biting, pencil chewers in offices.	Profoundly eroded teeth of acid workers seldom decayed and are not painful.	Apart from dental erosion constituting a sign of occupational damage in many trades, the premature loss of teeth may possibly be related to work as a contributory cause.
"Mulberry molars."	Congenital syphilis.	Dome-shaped, stunted first molars due to overgrowth of enamel.	Various other dental defects suggest congenital syphilis.
Hutchinson's teeth.	Congenital syphilis.	Notched incisors with narrow edges and peg topped.	May be associated with impaired hearing and baked cornea.

Discolored and mottled teeth.	Fluorine is the cause of characteristic mottling, but many metals such as copper and iron bring about diffused coloration.	Apparently no great harm produced by many forms of teeth coloration.	Smoking, and particularly pipe smoking, may lead to black deposits on teeth.
Speech defects (not visible defects).	Highly varied causes—brain tumors, syphilis, neuroses, fatigue, etc.	Stammering, slurred speech, monotonous speech, explosive speech, aphonia, etc. R. M. I.	Stammering may be related to improper management in childhood of left-handedness.
Goiter (hyperthyroidism).	Enlarged thyroid gland.	Common as simple goiter due to iodine deficiency. Also toxic goiter from hyperthyroidism. R. M. I.	More common in women.
Salivation.	Industrial causes—mercury, potassium chlorate, phosphorus, copper, bromides.	Excessive formation of saliva. R. M. I.	Scores of nonindustrial causes, such as Vincent's angina, mumps, cancer, syphilis, scurvy, etc.
Mouth breathing (open mouth).	Numerous causes unrelated to work, such as adenoids. If associated with dyspnea, may be caused by silicosis, which is rare.	Mouth breathing may be caused by nasal obstruction. R. M. I.	If related to recent injury to face, suspect dislocation of jaw.
Breath (garlic odor).	If not garlic, then possibly tellurium, selenium, or arsenic.	Persists months after termination of exposure.	Disappears after increased intake of ascorbic acid. Odor will return unless use of ascorbic acid is long continued.
"Phossy Jaw."	Yellow phosphorus.	Deformity from necrosis of facial bones, chiefly lower maxillary.	Condition now rare. Formerly common among match makers, fireworks manufacturers, rarely fertilizer operatives.
Chest			
Bulging of breast bone (sternum).	If associated with pulsation, suspect aneurysm; if chicken-breast-like, suspect rickets; if series of knobs on either side at rib section, suspect rickets.	Any marked external protrusion should lead to medical observation.	Converse picture that of depressed sternum frequently called "cobbler's chest" associated with shoemakers' trade as cause. Now rare.
Extremities Apart from Skin			
Ganglion (ganglia).	Cysts in the region of joint capsules and tendon sheaths.	May occur along any tendon sheath or about many joints but more common on hands and feet; may be either industrial or nonindustrial.	Frequently attributed to coarse vibration as from pneumatic tools.

Common External Marks of Occupation or Occupational Diseases or Other Diseases (*continued*)

504

Mark or sign	Probable cause	Significance	Comment
Extremities Apart from Skin, <i>continued</i>			
Bursitis (excess fluid around joints).	Friction, pressure, or infection.	Bursae are potential spaces in connective tissue around joints that grow in response to functional demand. R. M. I.	Many varieties constitute occupational diseases, as in "beat elbow" in miners.
Clubbed fingers.	Congenital, or may be related to heart disease.	Various occupations lead to some bulbing of finger ends from hypertrophy; cause of the relationship to silicosis and heart disease obscure.	Many other variations in shape of fingers. Toes may be clubbed.
Joint enlargement (arthritis).	Usually infection and gout.	Bony enlargement frequently called rheumatism, usually in error; ordinarily represents reaction of infection or infection products.	Some occupational diseases, such as lead poisoning, infrequently lead to bone and joint enlargement.
Varicose veins.	Hydrostatic pressure, infection among others.	May appear anywhere, but most common in lower extremities; little related to work as a cause.	Frequently associated with indolent ulcers.
Flat feet (pes plenus).	May be congenital; may result from weight bearing; may be related to degeneration of senility.	A well-known common affection important to industry but little caused by it.	May be influenced for good or bad respectively by good or poor footwear.
Saber shins.	Congenital syphilis.	Forward bending and thickening of middle third of tibia.	Knobby shin bones in absence of saber deformity also suggests syphilis.
Wrist drop (wrist weakness).	Metal poisoning, usually lead or arsenic. Alcohol.	A frequent feature of lead poisoning; its counterpart is ankle drop; seen in lead poisoning when leg muscles are much used. R. M. I.	Many other muscle groups similarly may be weak in metal poisoning, and chiefly in lead poisoning.
Tremors.	Different causes for different types.	Many types involving many portions of the body from fingers to tongue. May be related to various diseases and states, including fear, goiter, Parkinson's disease, lead poisoning, etc. R. M. I.	Some tremors cease on the accomplishment of an intention; thus a marked tremor may exist in reaching for a book and cease when the book is picked up.

CAREY P. MC CORD

Dead fingers (white fingers).	Cold associated with vibration.	This condition is akin to several others involving capillary blood supply to fingers; some conditions unrelated to cold or vibration, such as Buerger's disease. R. M. I.	Has occurred among marble cutters working with vibrating tools in cold weather in outside sheds; persists for months.
Writer's cramp.	At times, a neurosis; at times caused by local fatigue.	When apart from neurotic influence, writer's cramp constitutes a good example of localized fatigue; ordinarily involves those fingers and those muscles employed in any particular form of writing. R. M. I.	Cramplike pains may occur. Actual site of damage not in fingers but in arm.
Stereo movements.	Habit; continuation of work movements after work.	In some occupations requiring highly repetitive small motions, these motions are continued long after work hours. No disability, but some significance related to monotony effects, etc.	Well presented years ago in famous comic motion picture.
Baseball finger.	Blow by baseball on end or palmar surface of finger.	Somewhat characteristic swelling and deformity, usually limited to one joint of one or more fingers.	Common among industrial workers and fairly common basis of claims for compensation.
Dupuytren's contraction.	Shortening of the palmar fascia.	Permanent flexion of little and ring fingers (at times all fingers) with rigidity of palmar tissue. May be caused by infection, may result from oft-repeated severe pressure on palm. Said to be common among upholsterers.	Rare before middle age. Associated with arthritis.
Trigger finger (snap finger).	Injury to fingers in or out of industry.	Difficulty in extending fingers, but after great effort fingers fly out like jackknife blade.	A corresponding condition may exist in toes.
Sclerodactylia (deformed, pigmented fingers).	Unknown, but probably unrelated to work.	One, and usually more, fingers of both hands become withered, shortened, deformed, nodular, waxy-white, and at times brown or black pigmented. R. M. I.	Much worse in cold weather.

(continued)

Common External Marks of Occupation or Occupational Diseases or Other Diseases (*continued*)

506

Mark or sign	Probable cause	Significance	Comment
Extremities Apart from Skin, <i>continued</i>			
"Red Hands."	Often purely psychogenic. At times specific chemical cause, such as oxalic acid.	Patch tests usually negative.	Barrier creams sometimes effective, possibly constituting only psychotherapy.
Seal finger, Spekk-finger, Blubber finger.	Infection.	Chiefly limited to Arctic sealers.	May arise among seal furriers anywhere.
General and Miscellaneous			
Edema.	Immediate cause—increased fluid in tissue.	Edema may occur in any tissue, organ, or system from ankles to eyelids. Ordinarily not a disease in itself. R. M. I.	Edema around ankles after long standing in the absence of known disease may not be important.
Pathologic sleepiness (somnolence).	If organic, may be related to pituitary disease or other glandular disorders. Commoner in obese or giant-sized persons. Sometimes appears in early pregnancy.	May only represent lack of proper sleep. May be associated with alcoholism. May be a symptom of various occupational diseases. R. M. I.	Many workers, particularly on late night shifts, now indulge in drug stimulation, chiefly caffeine. Many proprietary preparations available. Caffeine poisoning in industry is a ready possibility.
Sunstroke.	Chiefly direct exposure to sun's heat. Less frequently artificial heat.	Represents derangement of heat-regulating system of body. R. M. I.	Chief characteristics—high body temperature, hot dry skin, loud breathing, unconsciousness; in early stage eye pupils dilated, later contracted.
Myxedema (hypothyroidism).	Lowered functioning of thyroid gland.	More frequent among women. R. M. I.	Characterized by dull, heavy features, thickened, swollen skin, some loss of hair, subnormal temperature, sleepiness, joint pains, constipation.
Shaking palsy, Parkinson's disease.	Unknown.	Rare before middle age. R. M. I.	Chief features—shaking of head, tremors of hand and arms, muscular rigidity, masklike facies, propulsive gait; some similarity to manganese poisoning.
Barrel-shaped chest.	Common among asthmatics, fairly common among glass blowers, less frequent among musicians, i.e., singers, wind instrument players.	Associated with pulmonary emphysema (dilation of lungsacs). R. M. I.	During asthmatic attack, there may be either skin pallor or cyanosis, anxious facies, violent respiratory movement, short inspiration, long, wheezy expiration.

CAREY P. MC CORD

Tics.	Spasmodic contraction of any portion of body, such as cheek, tongue, eyelid, fingers. Not directly related to industry.	Common among neurotics.	Tics are frequently called "habit spasms."
X-ray gangrene.	Improper x-ray exposure.	Begins like common skin burn but advances to deep ulceration and sloughing. Usually involves fingers and hands. R. M. I.	Common among older x-ray workers and technicians. Frequently seen among factory workers and industrial workers as a result of poor x-ray treatment for dermatoses.
Phenol gangrene.	Extensive or prolonged contact with concentrated carbolic acid (phenol).	Following accidental and painless contact with carbolic acid, fingers, hands or other parts become brown, dry, shriveled, and finally black, with possible eventual spontaneous amputation. R. M. I.	May arise apart from industry from accident or poor medication.
Scurvy (sailors' scourge). Chiefly manifest by bruised appearance of legs, edema (chiefly of ankles) profound, weakness, loss of weight, loss of teeth, bluish, reddish, blackish spongy gums, heavily coated and brownish tongue.	Vitamin C deficiency.	As occupational disease now rare. Term "scurvy" chiefly has disappeared although vitamin C deficiency of mild degree is highly common.	Still might arise occupationally among explorers, seamen, remote mining and lumber camps, dietary cranks, etc.
Erethism (pathologic shyness).	In industry chiefly seen as manifestation of mercury poisoning.	In mercury poisoning many patients are extraordinarily bashful, awkward, assume rigid poses.	Seen in other conditions unrelated to industry.
Enlarged glands (lymphadenitis).	Chiefly in infections but may indicate malignancy.	Often occurs on sides of neck, under arms, and in inguinal regions. "Scrofula," now rare, represents TB of glands, chiefly of neck.	Head lice may be accompanied by enlarged glands. R. M. I.
Hernia (inguinal). Enlarged mass in inguinal region.	Condition usually represents congenital defection. Trauma as ultimate cause rare but possible.	Usually unilateral. May be bilateral.	Common cause of partial or temporary disability.
Hernia (umbilical).	Protruding mass from abdomen around navel.	More common among women than men.	Rarer than inguinal hernia.
Hydrocele (water in scrotum).	Relates to inflammation. Specific cause uncertain.	May be unilateral or bilateral.	May be associated with inguinal hernia.

(continued)

Common External Marks of Occupation or Occupational Diseases or Other Diseases (continued)

508

Mark or sign	Probable cause	Significance	Comment
General and Miscellaneous, <i>continued</i>			
Facial paralysis.	Nerve damage such as from toxic agents or trauma.	A common variety reveals mouth drawn to one side, drooping eyelids, impaired articulation.	Can arise as manifestation of occupational disease.
Paroxysmal asthma.	Commonly spasmodic asthma is an allergic disease unrelated to industry.	As one manifestation of occupational diseases, paroxysmal asthma occasionally may arise in such conditions as trichloroethylene poisoning, chlorine bronchitis, etc.	R. M. I.
Effeminization of males.	Stilbestrol and similar agents.	Limited chiefly to pharmaceutical workers processing hormone-like chemicals. May be characterized by enlarged breast in males, production of feminine type of body, sexual impotency.	Legally held to constitute an occupational disease. Manifestations may subside after elimination of exposure.

Mark or sign	Characteristics
Abnormalities of gait.	The manner of walking, together with the carriage of the entire body, may afford a true insight into precise disease states, or at least may indicate abnormality to the point that a medical investigation should be carried out. It is difficult to describe in a few words the peculiarities of gait, even though on observation abnormality be quite obvious. For this reason, resort to tabular presentation is for the moment abandoned. Many peculiarities of gait call for no description since the provoking cause is at once evident. Such, for example, are the waddling gait of the woman in advanced pregnancy, the worker with an artificial leg, the victim of a stiff knee, the many types of gait abnormality following infantile paralysis, the gait occasioned by shortening of one limb, the tottering, generally unstable gait characteristic of senility or convalescence from disease. In other states, some of which are clearly occupational, gaits, while characteristic, may be less obvious as to cause. In any peripheral neuritis of the lower limb, e.g., from <i>lead</i> or <i>arsenic</i>, the resulting ankle drop or weakness may lead to a revealing gait. In such instances the leg is lifted high with exaggerated knee action, the foot is thrown forward, and the ground or floor is slapped at each step. The shoe is worn at the toe. Although the condition is commonly bilateral, when unilateral an obvious variation is induced. The gait of the worker under the influence of <i>alcohol</i> exposes his condition. The gait is staggering, tottering, reeling. Alternately the body may be leaned forward, backward, or sideward with purposeless lurching. The drunk, apparently about to fall with each step, rarely does so. The gait in <i>manganese</i> poisoning is called the "rooster gait." There is propulsion with ever-increasing rapidity, until the victim may catch himself on some support; otherwise he may fall. If he starts backward, retropulsion becomes the obvious counterpart of propulsion.

CAREY P. MC CORD

In some forms of central nervous system *syphilis*, the gait is ataxic. The patient walks with his eyes on the ground, and in some severe circumstances may not walk without seeing every step. Manifestly, this gait is worse at night, and some patients with this disease fall to the ground whenever their eyes are closed. In this gait, the feet are turned out and the legs are far apart. The leg movements are excessive and the feet lifted too high. In this instance, the heels come down sharply, as may be proved by unusual wear on the heel.

When one leg is paralyzed, as in *hemiplegia*, the afflicted leg is rigid and moves as a part of the body as a whole. The leg is thrown outward, swinging in a semicircle and with a motion toward the trunk. Thus, shoes will be worn down on the outer side.

In *palsy* (paralysis agitans), the steps are short and shuffling, with a tendency to walk faster and faster, as in manganese poisoning. This gait may be accompanied by a variety of tremors of hand and head, and is associated with a characteristic speech.

In *sciatica*, the afflicted leg is kept in a position of slight bending with the heel raised and in walking, the chief pressure on that side is limited to the front part of the shoe, which part shows most wear.

Many *epileptics* exhibit no gait peculiarities, but some in well-established instances have a gait characterized by slouching and apparent weakness.

In *Huntington's chorea*, a rare disease, the gait is associated with motion in all parts of the body. The arms, head, and legs move from side to side, as well as forward. There is continuous rocking and lurching with flinging motions interspersed with momentary periods in which the whole body is at a standstill.

In *hysteria* and *malingering* involving the lower extremities, the assumed gait may be so bizarre as to arouse suspicion that no organic lesion exists. Variations are almost limitless. One neurotic may push an imaginary lame leg along as though on a skate; another may drag the foot with the top of the toes downward; another may walk on the outer edge of one or both feet. Occasionally the motion made may suggest the arc of a scythe. All of these gaits possess some feature apart from the characteristic gait of any organic lesion.

In *mercury* poisoning there may be no involvement of a lower extremity, but on occasion may be characterized as a running gait.

At least 50 other conditions unrelated to work as a cause, but occurring among workers, may be observed ranging from the ordinary limp due to corns, injury, gout, inguinal or pelvic abscess, to the complex gait of Thomsen's disease in which the legs are alternately stiff.

The countenance may in itself disclose disease states, some few of which may be related to occupation. The most characteristic peculiarities of facies are related to disabling diseases, of a type not seen in workers on duty, for example, the facies of typhoid fever. Some facies that may give clue to diagnosis are now mentioned.

In the *dyspneic* facies, the mouth is open, the lips are dry, the nares dilate with each inhalation. The face may possess a bluish pallor, the expression is one of anxiety. This condition might be found in well-established silicosis, in heart disease, and in some types of asphyxiation.

Manganese facies may be characterized as masklike. The skin is without wrinkles, the countenance without expression and comparatively motionless—doll's face. Other diseases of the central nervous system may give rise to masklike facies.

In the presence of *adenoids*, and more particularly in persons younger than those in industry, the face is likely to be long and hatchetlike, the expression is dull, the nares pinched, the mouth open and prominent, the lips dry, the eyelids droop.

(continued)

Abnormalities of facies.

Common External Marks of Occupation or Occupational Diseases or Other Diseases (*concluded*)

Mark or sign	Characteristics
Abnormalities of facies (<i>continued</i>)	In <i>neurotics</i> and <i>hysterical</i> persons, the facies may give a hint that such states exist. The expression is characterized by amiable but silly smiling on an otherwise empty face, or instead repeated but not continuous frowning may take place in the absence of any reason for such. Irregularly these faces exhibit facial tics. The facies of congenital <i>syphilis</i> are characteristic in adults. The forehead is overhanging and bumpy, the bridge of the nose is depressed (saddle nose), linear scars radiate from the angles of the mouth. Hutchinson's teeth, elsewhere described, may be present. Occasionally a patient with beginning but well-established <i>pneumonia</i> may be still at work. Although the characteristic facies may not have established themselves, they, if present, will show a flushed skin, the breathing may be rapid and hurried, and possibly associated with a grunt at the end of every exhalation. Herpes may be present; the eyes glisten; the expression is that of anxiety. In some cases of <i>hyperthyroidism</i>, the facies continually reflect astonishment—staring facies. This is brought about by protruding eyeballs, which bare more than normal proportions of the whites of the eyes; the eyebrows may be lifted; the skin of the face may be flushed and moist. In <i>shaking palsy</i>, the face may be so motionless as to appear neatly starched, but accompanying this there may be tremors of the entire head with eyes wide open and the eyeballs in motion. Such an expression in this disease may be accompanied by tremors of the hands or legs and a jumpy speech. In <i>thyroid deficiency</i>, the features are thick, coarse, broad. The face is moonlike, expressionless, and stolid; the outer third of the eyebrows may be missing or scanty; the skin is dry. "Pudgy" characterizes these facies. <i>Cyanotic</i> facies (cyanosis elsewhere mentioned) may arise from several industrial causes, as well as non-industrial. In either instance, the ears, lips, cheeks will take on a bluish-purple tinge which frequently also may be observed at the finger tips. Some clearly indicative facies scarcely lend themselves to verbal presentation. Thus, the chronic alcoholic reveals his intemperance by his little-describable physiognomy; so also the facies of early tuberculous meningitis, which is unlikely to be seen in industry. Of interest ordinarily limited to the physician are the revealing facies of complex central nervous system diseases, such as myasthenia, dyspituitarism, acromegaly, lenticular degeneration, etc. It is obvious that not in all and every case of the several states or diseases mentioned will the facies be so characteristic as here mentioned, which by design attempt to portray well-established conditions.