Industrial Hygiene

In the Rocky Mountain Region

Health Conservation Programs Protect and Benefit Both Employer and Workman

For the purpose of this discussion, let us consider that the Rocky Mountain region covers the area in the seven Mountain States, Idaho, Montana, Wyoming, Utah, Colorado, New Mexico, and Arizona, and before we discuss the needs of these states, let us define Industrial Hygiene. Industrial Hygiene is that branch of preventive medicine concerned with the protection of health, improvement of efficiency, and prolongation of life of the industrial worker; in short, adult health conservation. It includes in its broad meaning not only the prevention of occupational diseases, such as silicosis, lead poisoning, cadmium poisoning, and many others, but such relative problems as overcrowding, fatigue, and personal and mental hygiene; exposure to abnormal temperatures, pressures, and humidities; ventilation, heating, and lighting. It is a science which requires the combined activity of medical personnel (doctors and nurses), engineers, and chemists to evaluate the exposures and determine the means of eliminating the hazard. The engineer surveys the workplace, takes air samples at the breathing level of the workman, and analyzes the work exposure. The chemist determines in his laboratory the exact amount of toxic material collected in the sample, which represents the exposure of the workman. The doctor must diagnose the occupational disease, recognize its cause, and evaluate the disability. Together, all three must correlate the data obtained and devise efficient methods, medical or engineering or process changes, for controlling or minimizing the dangerous condition and for studying the effectiveness of these measures. The plant doctor, in addition, must aid in the readjustment of the incapacitated worker and provide facilities for prevention. Industrial hygiene, however, is of no avail without the understanding co-operation of management.

Modern industry but recently has awakened to the fact that the old-time "Safety First" program is no longer adequate to meet the needs of its present varied type of production. The safety program and the safety engineer were instituted to prevent or reduce the incidence of injuries arising out of accidents. These agencies now find themselves unprepared to meet the exigencies of modern industry, since guards, rails, goggles, etc., are not effective against fumes, gases, dusts, or other noxious materials or conditions. Industry has an acknowledged responsibility to protect the health and safety of employees from hazards incident to their work. This is just as true of occupational diseases as of accidents. Many employers do not believe they have any occupational disease hazards but whether or not this is true can be determined only by actual workroom quantitative studies. How is a manufacturer, mine operator, or a mill owner to foresee what poisonous effects various unfamiliar toxic substances may have upon the workman? How is he to guard against the effects even if he knows in advance about the potential toxicity? Who is to tell him whether his men are being or will be made ill by some noxious material encountered at work, or whether they are ill from some other cause? Obviously, he must call upon persons with training in this field, specialists in industrial hygiene, with specially designed apparatus to measure the concentration of noxious materials within the working environment. Such a service necessitates a laboratory equipped with many implements of measurement for use in analyzing both atmospheric and biologic samples. Is such a service available?

Today, throughout the country, we have this service available in three ways. First, a few—extremely few—of the larger industries in this country have incorporated within their medical program a complete industrial hygiene department. Second, some plants have provided either limited industrial hygiene facilities or none at all, relying on an outside agency for consulting service. Obviously, most companies cannot afford to maintain their own service, nor is it necessary for them to do so. A complete and adequate industrial hygiene service can be available, however, to any company, large or small, if the cost of such is proportional to the number of employees engaged by each company. This would indicate either combined or single company use of the services of a private consultant group of specialists in industrial hygiene, whose entire facilities—laboratory, technical, and service—would be at the disposal of the plant. Third, many states have instituted divisions of industrial hygiene, either in the health department or in the labor department. The primary function of such divisions is to acquaint industry and various interested groups with the importance of safeguarding the health of the worker. This is usually done by demonstrating to industry, on a small scale, the need for a program of medical, nursing, engineering, and chemical services. Depending upon the size of the plant, material exposures, and other factors, the program may cover one plant or be extended to include a group of plants.

In other words, state divisions of industrial hygiene have been organized to co-operate with industry to point out its industrial health needs and to assist in fulfilling these needs. It is not a function of such a division, after industry has been informed of its problem or problems, to continue in a consultant capacity free of charge. The state division is a fact-finding agency, and after the initial study to determine whether or not hazards exist and after it has
acquainted industry with the necessity for instituting an industrial health program, the official agency should and does discourage continued use of state facilities and encourages the plant to establish industrial hygiene facilities, either within the plant itself or by retaining a private outside agency, or both.

In general, then, the state unit points out to industry whether hazards do exist and what the hazards are. Industry then may elect to institute an industrial health program either alone or in cooperation with nearby plants. Such a program may be complete, or industry may rely on private specialists in industrial health matters for advice and assistance in solving its occupational health problems.

With this picture before us, what are the facilities available in the Rocky Mountain region for industrial health services of the various types? Let us consider first the state services: Idaho, Montana, Utah, and Colorado have divisions of industrial hygiene within their respective state departments of health, functioning along the lines outlined. Consider second, plant facilities. Only a few plants have industrial hygiene departments of their own, perhaps six, with limited facilities, although there may be others. In none of these is the department organized to handle every problem in industrial hygiene with which it may be confronted. Reliance for adequate service must be placed with some outside consultant.

Are there any private agencies in this region to which industry can turn for assistance and advice? The answer is yes. Within the school of medicine at the University of Colorado is organized a division of industrial hygiene whose technical staff of engineers and doctors is available for this purpose. Although the division is a part of the University, it is a separate entity and does not receive any tax funds for its support. Its funds are derived entirely from fees paid by industry for its services and from private grants. It has a completely equipped laboratory for the analysis of atmospheric and biologic samples; its staff is trained in the medical and engineering evaluation of occupational disease hazards and their control, and it has the background of the University with its facilities to use if necessary. The area or region in which the division may serve is not limited by state boundaries.

In addition to the three ways discussed, inspectors or other personnel of the industrial commissions of each state, over and above their duties as required by law, seek to promote better health among workmen and their families by advising industry on all health matters of which they may have knowledge and by passing on to other plants the solution of problems previously solved and which these plants may now be experiencing. So much then, regarding the actual facilities for industrial health services in the Rocky Mountain region.

Some misunderstanding, intentional or otherwise, seems to exist as to just what the purpose of an occupational disease law is. It is for the specific purpose of compensating workers for diseases only. Sometimes the term "occupational disease insurance" or "health insurance," call it what you will, is used indiscriminately with occupational disease compensation. This should not be done, because no amount of insurance, per se, is going to guard against the contraction of an occupational disease; nor is it the intent of an occupational disease law to provide over-all health insurance, that is, payment of stipulated sums or monthly allocations for any type of illness contracted by the individual. The intent of the occupational disease law is, as the name implies, compensation to the employee for an occupational disease. Payment of such compensation is an obligation of the employer.

In the United States, as a whole, 28 states, or 58 per cent, have occupational disease coverage laws. Fifteen, or 31 per cent, provide full coverage, i.e., compensation is paid for all diseases contracted from exposure to materials or conditions in connection with the occupation. Thirteen, or 27 per cent, provide for coverage under a schedule of occupational diseases, i.e., compensation is paid only for diseases, contracted in connection with employment, specifically mentioned in the law. No states in this region provide full coverage, and only Arizona, Idaho, and Utah have schedule coverage laws. In Montana, by separate enactment, any person totally disabled from silicosis, who has been a resident of the state for ten years, is entitled to $30 a month paid out of public funds. In Montana also, in 1939, the legislature, by law, established the division of industrial hygiene in the State Board of Health. This law provides for the reporting of occupational diseases and for the investigation of such reported diseases by the division. The division is empowered to make the necessary regulations to prevent occurrence or recurrence of occupational diseases. Failure to comply with the law is a misdemeanor punishable by a fine not in excess of $500. In effect, then, Montana does have a certain type of occupational disease coverage.

Probably siliceous dust is the one material to which most workers in this area are exposed. In a survey in Colorado by the State Board of Health in 1939, 20 1/2 percent of workers were found exposed to siliceous dust, this figure being exceeded only by exposures to carbon monoxide, 27.6 percent, and dermatitis producers, 22 percent. Certainly, from the standpoint of its effect on the individual, exposure to siliceous dust is far more important to this group today than is exposure to the other toxic materials. The four states in the area which provide compensation for occupational diseases in one way or another all recognize the importance of silicosis and have included it in their schedules.

There has been much debate in arriving at schedules or definitions, or both, as to the advisability of using the word "pneumoconiosis," and among mining people the term is possibly preferred to silicosis. I do not believe this is the correct interpretation. Without attempting to go into a detailed medical definition, I shall simply say that pneumoconiosis is the broad term applied to the fibrous condition of the lungs due to the irritation caused by the inhalation of any dust incident to various occupations. Many pneumoconio-
s, however, are benign in character, such as anthracosis, siderosis, and the like. Silicosis, on the other hand, although one of the pneumoconioses, is not benign in character and is characterized by definite generalized nodular fibrotic changes throughout both lungs. In preparing a schedule of occupational diseases, it is much more fair to the employer and employee alike to state definitely by name the specific disease which will cause changes in the body capacity.

An occupational disease law of the schedule type is before the legislature of Colorado now (subsequently passed, signed by the Governor, and effective Jan. 1, 1946), and more and more legislatures are recognizing that a worker should be protected from illness arising from and out of his job as well as from injuries caused by industrial accidents. The diseases listed in the schedule for the Colorado law are only those which can be determined with reasonable certainty to have originated in the course of and as a result of the employment. Such diseases as anthrax, glanders, tuberculosis, and others have purposely been left out of this schedule, as there might be some doubt as to the source of the contraction of the disease; that is, the individual could have contracted one of these diseases not in the course of employment and made claim that it was in the course of employment.

How does a small operator fare economically and operationally under an occupational disease law such as that of Colorado? You may say that he will be required to add an insurance premium to his operating cost, which at present he does not have to pay. This would be true, but on the other hand, the insurance premium for these plants is relatively small. As time goes on, without a specific law there would no doubt be more action at common law where the limit for liability would depend on the attitude of the jury and might reach staggering figures. On the other hand, the limit of liability under the Occupational Disease Law in Colorado is $4375. The additional cost to the plant for each one action at common law could be such as to provide insurance premiums for many years. To cite an instance in Utah: a small company had three silicosis claims against it. Based on experience, each of these claims would have been filed in civil court for at least $30,000. As the small plant was at fault, in that it permitted unhealthy working conditions to exist, the verdicts would have been against it. Under the occupational disease law, however, these cases were settled on the basis of the maximum liability as specified in the law, and the total cost to the operator was the cost of his insurance premium. Because of the experience rating and the fact that unhealthy conditions were permitted to exist in the plant, the compensation insurance rate for this plant was increased above the basic rate for the industry; but by putting his house in order and eliminating or minimizing the exposure to silica dust, this operator may apply for and receive a reduction in his insurance rate. Compensation rates are based on actuarial experience which may be minimized by a proper industrial health program and the installation and use of engineering and medical control procedures.

Operationally, the small operator suffers no hardship. His only obligation will be the reporting of all occupational diseases. Economically, there is to be taken into account the liability under common law as opposed to the cost of insurance and the net cost of an industrial health program. Studies made by the National Association of Manufacturers of a large number of its members have shown that the small plant can no longer afford not to provide healthy working conditions. It has been shown that the average small plant (less than 500 employees) can actually save up to $5500 per year from the operation of a health program. This saving is made up by reduction in accidents and occupational disease and therefore cost of compensation; by reduction in absenteeism, with its cost to the company of approximately 1½ times the daily wage; and by the increase in production, due to increased efficiency of the healthy individual. Even though there is an increase in cost, the returns from this investment exceed the additional cost involved. Elimination of common-law liability must be considered also in the profit column. Therefore, the small operator, operating under an occupational disease law with its inherent obligations, is, in the long run, benefited.

The question might also be raised, "What about an accrued liability?" In other words, under the Colorado law will the full liability mentioned above of $4375 be payable on proof of total disability? This is of no importance, except for silicosis and asbestosis. For each of these diseases the Colorado law includes the so-called escalator clause, by which liability under the law is limited to $500 if disablement or death occurs in the calendar month in which the act becomes effective, to $500 during the next calendar month, thereafter increasing by $50 per month until the total amount of compensation payable for disablement or death reaches the limit previously mentioned. It will be 6½ years before full liability under this clause can be paid for silicosis or asbestosis. This is long enough to assure that any claims coming before the compensation board at that time could readily be cases that have developed since the effective date of the act.

In summary, it is an acknowledged responsibility of industry to protect the health and safety of its employees from hazards incident to the work. Legislators are recognizing this responsibility by enacting occupational disease laws in addition to accident or personal injury laws. Each legislative year, several additional states join the list of those providing coverage for occupational diseases. This responsibility entails an evaluation of the health exposures in the plant, which requires the services of trained industrial hygiene personnel. Three types of industrial health services are available to industry in the Rocky Mountain region:

(1) The state divisions of industrial hygiene, which acquaint the plant with the nature and degree of its exposures.
(2) The private industrial hygiene consultant, whose office is available for a continuing service either in co-operation with plant industrial hygiene personnel or actually as the industrial hygiene agency for the plant.
(3) Self-sufficient plant industrial hygiene units.

Idaho, Utah, Arizona, (now Colorado) and to some degree, Montana, have enacted occupational disease laws. Idaho, Montana, Utah, and Colorado have state divisions of industrial hygiene. Private consultation services by industrial hygiene specialists are available to all industry in the region from the division of industrial hygiene of the University of Colorado. Small and the large operators alike should provide industrial health facilities for their plants because of the over-all savings in compensation costs, absenteeism costs, and the improved efficiency of the workman.