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SUPPLEMENT I

SUMMARY OF

REPORT OF MEDICAL COMMITTEE

A. J. LANZA, M.D., Chairman

The report to be published is planned as a comprehensive treatise on the subject of silicosis. More than merely a detailed technical report on various medical phases, it attempts to present the subject as an entity and in a form which will appeal to the industrialist and the layman.

Chapter I points out that dust is a natural—it may be said, a normal constituent of the air and it shows how it can become a menace to human beings. There is a brief history of silicosis and the more interesting and important theories and fallacies that were advanced to explain it. Those phases of silicosis which have been the subject of research are detailed—those which have been settled, more or less conclusively, and those which have not.

Chapter II is a brief history of silicosis in foreign countries, mostly within the British Empire.

Chapter III is a history of silicosis in the United States. The various industries are examined one by one—metal mining, coal mining, iron mining, granite, sandstone, marble, slate, talc, diatomaceous earth, excavation in building and construction, potteries, porcelain, glass and cement, abrasives, foundries, rock-wool, asbestos—with a synopsis of experimental research in the United States.

Chapter IV deals with the nature of silicosis and tuberculosis, the pathology, diagnosis and prevention. This is obviously the most technical chapter in the report. However, the authors and contributors have endeavored to express their knowledge and experience as clearly and as concisely as possible.

The conclusion of the report is a summary, which is given below:

The extensive studies of silicosis in this country and abroad have given us a very clear idea of the cause of this disease, its pathology, its complications, and its prognosis. On the basis of our present knowledge, it may be stated that

1—Silicosis results only from the inhalation of dust containing free silica (SiO^2).

2—The time required for the development of silicosis varies from a few years to twenty or more, depending on the

concentration of the silica particles in the air and on the constancy of exposure.

3—Beginning silicosis is recognizable only by properly taken roentgen films of the chest; small nodular shadows distributed throughout both lungs are the characteristic appearance. There are no other symptoms or physical signs associated with early simple silicosis which can be depended upon for making a diagnosis.

4—Associated with silicosis is a marked predisposition to tuberculosis. In the majority of cases of severe silicosis, a tuberculous infection is found.

5—Silicosis can be prevented by protecting the industrial worker from inhaling silica dust. This may be accomplished by reducing the concentration of dust in the atmosphere or by the use of suitable respirators or similar devices. The first method is always the method of choice.

6—Concentrations to which the dust must be reduced in order to be safe have not been absolutely determined. There is evidence that a concentration of more than five million particles per cubic foot of a highly siliceous dust is dangerous. Therefore, it may be stated that it is desirable to avoid counts of more than five million particles of dust containing free silica to a high percent in working places.

Granite dust which contains about 35% free silica, when in concentrations of ten to twenty million particles per cubic foot, has been found not to cause disabling silicosis in a working lifetime. Anthracite dust, containing less than 5% free silica has been found not to cause disabling silicosis (anthraco-silicosis) in concentrations of less than fifty million particles per cubic foot.

7—Industrial dusts, containing silica, are frequently not all silica, being mixed with other materials. It is possible that some of these non-silica components may prevent or modify the action of silica in the body and may alter the tendency towards a complicating tuberculosis.

8—Asbestos, which is a silicate, is the only dust other than free silica, which has been shown to cause a lung fibrosis with disability. Asbestosis, so-called, is distinct from silicosis both in its pathology and appearance on roentgen films.

9—Simple—that is, uncomplicated—silicosis, as seen in industries in the United States, causes relatively little severe disability.

Control of silicosis calls for adequate medical and engineering measures.

Medical Control: A practical program of pre-employment and periodic examination of all workers exposed to dust containing silica is essential. Such examinations should include a complete physical examination of each individual, a careful history of past occupational exposure to dust, and a chest roentgenogram with a standard technic.

The value of such procedure may be summarized as follows:

1—Protection of prospective employees, who may have diseased lungs, from silica exposure.

2—Discovery of the hazardous jobs, as a result of finding the silicosis cases, in order to eradicate these hazards.

3—Discovery of active and open cases of tuberculosis which are in contact with other employees, especially protecting the younger workers who are susceptible to contact infection.

4—Discovery, through periodic examination of those with inactive tuberculosis, of any reactivation of their tuberculosis before they have been active too long, so as to protect especially the younger employees. Such early discovery of a reactivation also offers the infected individual a better chance for cure of his tuberculosis.

5—Discovery of the early cases of simple silicosis through periodic examination to give them added protection from further excessive dust exposure.

6—Determination, through periodic physical examination, of the adequacy of the dust control program.

A careful consideration of the foregoing summary as well as the varied experiences of the members of the Medical Committee clearly indicate that there is a wide field for research still in this matter of pulmonary dust diseases. There is no phase of employee health which concerns the employer more than does this question of dust diseases, and the ever increasing extent to which the employees' health is being made a responsibility of the employer demands that every available opportunity for increasing our knowledge be explored.

We still do not know the nature of the relationship between silicosis and tubercle infection. We do not know the extent to which exposure to silica dust to an amount insufficient to cause definite silicosis may reactivate arrested tuberculosis.

The following research projects are listed, therefore, for the consideration of Air Hygiene Foundation:

1—Relationship between silicosis and tuberculosis, with especial reference to the question of activation or re-

activation of tubercle infection consequent upon exposure to silica, especially in massive doses, over a short period in the absence of definite evidence of silica action (nodulation) in the tissues.

One of the phases of the dust question that has given rise to a great deal of confusion and misunderstanding is this question of the possible effects of the inhalation of large amounts of silica for a short time. Cases have occurred of individuals being so exposed, it being understood that the length of exposure was not sufficient to develop true silicosis, and these individuals have later succumbed to tuberculosis. What are we, therefore, justified in concluding with respect to the possible occupational causes of tuberculosis in such individuals? These and similar questions are of utmost importance to employers and employees alike.

2—The effects of other substances upon the action of silica in the body. It has been claimed from time to time with a considerable amount of justification that where other substances are present in the dust along with the silica, these substances may modify the action of silica. That is to say, they may retard the action of silica so as to actually prevent or, at least, delay the development of silicosis while, on the other hand, certain other substances have been credited with greatly intensifying the action of silica. The real nature of these cases of quickly developing silicosis, to which the term "acute silicosis" has been loosely and improperly applied, has never been studied in a satisfactory manner.

3—Study of the mechanism by which silica exerts its injurious effects upon the body. This, to a certain extent, is a corollary of number one. The pathologist can demonstrate what silica does in the pulmonary and other tissues of the body, but so far no reasonable explanation has been offered or demonstrated as to why silica acts as it does. Various explanations have been offered, such as that silica acts mechanically, chemically, and physio-chemically. It has also been suggested that the electrical charge of the silica particles may be a factor in its action in the tissues.

It is quite probable that if we knew the exact manner in which silica acts and of its relationship to the tubercle bacillus, we would have much more useful knowledge with respect to tuberculosis itself.

4—Research in the technic of roentgenography. It has

long been apparent to medical specialists in the field of pulmonary diseases and to roentgenologists that the satisfactory solution of the problem of pulmonary diseases depends upon the earliest possible diagnosis both to insure adequate treatment and prevent further progress of the disease. In the last few years, the technic of taking x-ray films has greatly improved. Inasmuch as it would appear that to an ever increasing extent preemployment medical examinations will include chest roentgenograms, a man may be hired or rejected on the basis of his x-ray film. It is, therefore, evident that the very best technic that can be evolved is the least with which industry can be satisfied.

SUPPLEMENT II

SUMMARY OF

REPORT OF PREVENTIVE ENGINEERING COMMITTEE

PROF. PHILIP DRINKER, Chairman

The report of the Preventive Engineering Committee having been published by Air Hygiene Foundation and distributed to its members, only a brief review of a few of the more important sections of the report will be necessary at this time.

It should be emphasized that dust control is primarily a maintenance job and should be made routine procedure. Granting that a firm applying dust control for the first time is dealing with something which to it is new, there is no excuse for not at once adding the necessary equipment to the general production machinery and putting it under the direct responsibility of the company's engineers.

Methods of Determining Dust

Some dusts (as lead) are determined by chemical methods and the concentrations in air are recorded gravimetrically as milligrams per cubic meter. Others (as silica) are given by particle count, which in such cases is the easier method. Neither gives the whole story, but in either case it may be possible to secure the information necessary for the purpose.

Present dust-sampling and dust-estimating methods, the results by which usually are not comparable one with another, will be amended and changed from time to time. Where dust control alone is in question, however, the Preventive Engineering Committee advises the use of the simplest possible procedure which will give the necessary data for guidance.

No useful purpose would seem to be served by determining accurately extremely dense dust concentrations. In such cases, it is obvious that the workplace is much dustier than it should be. It is probable that any sampling procedure which fixes concentrations in groups 100% apart is sufficient and that the results of any attempts to come closer to the concentration at the moment of sampling are simply misleading. Thus ranges such as 0-5, 5-10, 10-20, 20-40, etc., suffice for dust control.

Analysis of Dust.—Where mixed dusts are involved, there are two necessary precautions: (1) selection of the sample, so that it shall be representative, and (2) use of a technic by which the various constituents can be determined.

Dust Collection

The dust collecting plant consists of four essential parts: (a) the exhaust hoods, (b) the piping, (c) the dust arrestor, and (4) the fan or blower.

If dust collecting is to be installed in any plant, it usually is well worth while studying each process with the help of experimental hoods and a portable blower. A series of such studies gives the engineer the data he needs for his final design work, and permits him to select with confidence his piping, dust arrestors, and fans.

Published data for the design of hoods is comparatively meager. In practical work the engineer must rely largely on his own experience and use purely empirical methods. Obviously such lack of data results in needless expenditures of fan power, for the engineer is forced to allow much too large factors of safety. Such data as are available are listed in the following table:

Minimum Air Velocities Required to Capture Certain Industrial Dusts

Industry	Process	Required air velocity		Criterion
		At point of origin	At face of hood	
Granite cutting	Hand pneumatic tool	220 FPM		Reduced concentration to safe level.
	Surfacing machine	1500 FPM		Reduced concentration to safe level.
	All tools		1500 FPM	Reduced concentration to safe level.
Grain elevators	Elevator boot & head turner		500 FPM	Visual test.
Paint Spraying	Spraying booth		50-200 FPM	Reduced concentration to safe level.
Sand pulverizing	Bagging machine	400 FPM		Reduced concentration to safe level.
Electric welding		100-200 FPM		Visual test.
Quarrying and mining	Horizontal drilling with Kelly-Hatch trap	60*		Reduced concentration to safe level.
	Vertical drilling with Kelly-Hatch trap	200*		Reduced concentration to safe level.
Electric plating	Chromium plating	5**	1500 FPM	Reduced concentration to safe level.
	Steam to acid tanks	75-100 FPM		Reduced concentration to safe level.
Hatters' Fur	Brushing	200*		Usual Practice.
	Cutting machines	350*		Usual Practice.
	Blowers	2000*		Usual Practice.

*Cubic feet per min.
**Cubic feet per min. per foot of slot (common practice).
Recommendations as to hood design, requisition velocities, and the like, can now be obtained from the appropriate departments of many states, some of which embody these recommendations in codes.

COMPENSATION LEGISLATION—A CRITICAL REVIEW

THEODORE C. WATERS

In reviewing the activities of Air Hygiene Foundation, I have been impressed with its progress and accomplishments. When the organization was originally conceived, those of us interested in its activities felt that it had a definite purpose to serve in the field of industrial hygiene. Its officers, trustees and committees have devoted their efforts to the solution of many of the problems that have served to perplex our modern industrial society, and I feel that the Foundation is to be congratulated upon its various activities, which have proved to be of material assistance to its member organizations. For the past several years we have all benefitted by the research work done by the distinguished scientists who have served upon its committees and I know that I express the sentiments of the member organizations when I thank these committees for the signal services that they have rendered.

At the last annual meeting of the Foundation, we discussed some of the problems presented to industry by the contemplated enactment of legislation compensating occupational diseases. Since that time many new laws have been enacted, creating new problems for those who may be concerned with their administration.

I have been asked to discuss briefly the bulletin prepared by the Legal Committee, which is now being printed and will shortly be submitted to the membership as Legal Bulletin No. 3. In the time that has been allotted to me it would be impossible to present an intelligent analysis of this bulletin, but there are several subjects treated therein that I desire to call to your attention for careful consideration.

During the past year occupational disease amendments to existing Workmen's Compensation Laws have been enacted by the States of Delaware, Indiana, Michigan, Pennsylvania, Ohio and Washington. Therefore, today there are twenty-one states whose laws now provide compensation for occupational diseases. In the following states Commissions have been appointed for the purpose of studying and recommending compensation legislation:

Alabama	Georgia	Maine	New Mexico
Arizona	Kansas	Maryland	Oregon

It is apparent that a new emphasis has been placed upon the need for compensating occupational disease injuries, and

in the course of the next few years all of the industrial states will have probably enacted laws for this purpose.

In choosing three of the subjects discussed in the new bulletin, I do not mean to minimize the importance of the other subjects treated therein. However, in view of the present trends of occupational disease legislation, the following subjects are of special interest at this time:

(a) Provisions compensating partial and total disability from silicosis.

(b) Limitation provisions.

(c) Provisions dealing with pre-employment and periodic post-employment physical examinations of employees.

Compensation for Partial and Total Disability from Silicosis

Occupational disease laws generally award compensation for partial and total disability in the same manner and under schedules similar to those for disabilities caused by accidents. In several of the laws recently enacted, compensation for partial disability caused by silicosis has been denied. The basic theory of the Workmen's Compensation Acts is to provide compensation solely for disability, and the legislatures of certain of the states have come to recognize that many employees who have some presently determinable evidence of silicosis are engaged in trade, not knowing of the existence of the disease in them, showing no noticeable disability, and fully capable of performing their regular duties. Precedent for the denial of compensation for partial disability was established by the method of awarding compensation for silicosis in South Africa, where medical classification of the stages of the disease were provided in the law. In the first stage (ante-primary), relatively low compensation was payable, so that the employee would be compensated for the time that might elapse from the date of his removal from his hazardous employment until he could find employment in some other trade.[1] The West Virginia law follows this idea and defines three stages of the disease, providing compensation in the amounts of $500 and $1000 respectively for the first and second stages of the disease, with full compensation in the same manner and at the same rate as is provided for permanent disability or death from accidental injuries when the claimant is suffering from the disease in the third stage.

1 The original Ontario statute contained similar provisions.

During the year 1936, New York State amended its occupational disease compensation statute to deny compensation for partial disability due to silicosis or other dust diseases, while during 1937, Ohio, Pennsylvania and Michigan passed laws denying compensation for partial disability from the dust diseases.

The Medical Committee of the Foundation, in its Bulletin No. 1 of the Medical Series, has recognized the difficulty of evaluating partial disability. Similarly, the summary report of the Committee on the Prevention of Silicosis through Medical Control of the National Silicosis Conference has recognized the intricacies of the problem.

In many instances employees have been advised by physicians, untrained and inexperienced in the diagnosis and effect of silicosis, that they have the disease and thereby have sustained disability. Acting on this advice, the employee, now concerned about his condition, leaves his employment, even though that trade may be the only one in which he is able to earn a living He may then find himself unacceptable for employment elsewhere and becomes unable to earn a living wage, with resulting hardships to himself, his family and eventually to his community, which might have been avoided had he been properly advised that he had suffered no actual disability and that the risk of continuing in his employment was negligible. Employers likewise suffer from improper diagnoses, with the resulting persecution of common law suits or unjustified compensation claims. Not only is this litigation excessively expensive, but it may have a far reaching detrimental effect upon the entire employer-employee relationship, tending to destroy public confidence in an industry which may, as a matter of fact, be well managed, properly equipped and operated with full consideration for the health of its employees.

There are persuasive reasons both for and against legislative provisions denying compensation for partial disability from silicosis, but until an approved method is devised for the purpose of evaluating such disability, the denial of compensation for partial disability is not only equitable, but desirable.

With respect to total disability, the problem is much simpler. When the disease is accompanied by active pulmonary tuberculosis, the employee should be removed from the hazard of dust, not only for his own protection, but for that of his fellow workmen, in order to remove them from the possibility of infection. An employee so injured should receive the full total disability benefits of the law. Adequate protection should be afforded to employers to determine the actual cause

of disability so that compensation may not be awarded unless the claimant is determined by competent medical examination to be suffering total disability. Pre-employment examinations will enable employers to avoid the employment of tubercular and tubercular suspects in industries wherein silica is a hazard, and by this method they may relieve themselves from a considerable portion of the potential total disability benefits that may be awarded under our compensation statutes.

Limitation Provisions

One subject that has not received merited attention is the period of limitations after exposure or injury within which formal proof of claim for compensation must be filed. Our state laws vary widely with respect to this problem, but generally speaking they relate to:

(a) A period of employment within the state as a prerequisite to the filing of claim for compensation and/or

(b) The time within which claims for compensation must be filed after injury or the termination of employment.

The following states require exposure in employments within the state as a prerequisite to the right to file claims:

Illinois—sixty days exposure (all diseases)
Indiana—sixty days exposure (all diseases)
North Carolina—two years exposure (silicosis and asbestosis)
Ohio—five years exposure to silica dust; for other diseases, employee must be resident for ninety days
Pennsylvania—two years exposure (silicosis and asbestosis)
Washington—three years exposure (all diseases)
West Virginia—two years exposure (silicosis)
Wisconsin—ninety days (silicosis)

Another important provision is the requirement that the disease should have been due to the nature of the employment and contracted within a fixed period of time previous to the date of disablement. The following are examples of such provisions:

Michigan, Minnesota and Ohio—one year
Illinois, Indiana, Nebraska and Pennsylvania—two years
North Carolina—three years (silicosis and asbestosis)

All of the compensation acts specify procedure relating to

the filing of claims and fix the time after injury or last exposure within which claims must be filed, and in order to determine the rules of each state, it is necessary to examine the particular state statutes applicable thereto. These statutory provisions lack uniformity as to procedure, and unfortunately, in many instances, the period of limitations runs from the date of injury or manifestation of the disease rather than from the date of last exposure to the disease hazard. This is objectionable to the employer because he is unable to determine his liability in the case of diseases that do not manifest themselves or cause injury until many years after employment or exposure to disease hazard has been terminated. To determine liability, it is essential that the period of limitations run from the date of last exposure.

The refusal and reluctance of representatives of labor to recognize the necessity for physical examinations of employees has impeded the successful administration of these laws, but the question of limitation provisions could be readily solved by the physical examination of employees upon the termination of their exposure to disease hazards, whereby it could be promptly determined whether or not they have suffered disability.

Pre-employment and Periodic Post-employment Examinations of Employees

The medical profession generally, including the Medical Committee of the Foundation, recognize and recommend pre-employment and periodic post-employment examinations of employees for the prevention and control of occupational disease. In spite of the misunderstanding that has arisen regarding their use, pre-employment examinations have served a valuable purpose in avoiding the employment of men in certain industries having hazards to which they may be peculiarly susceptible, as for example, preventing the employment of tuberculars in those industries having silica hazards.

Periodic post-employment examinations have already proved their merit. They make it possible for employees to be advised of conditions not due to their employment that need treatment for the preservation of their general health. Competent medical advice is given, resulting in the treatment and cure of conditions which, undiscovered or unattended, might later cause irreparable damage to an employee's health. From the social standpoint, the benefits of examinations properly conducted may render to the employees invaluable assistance and the workman and his family, as well

as the employer, will reap immediate and obvious benefits therefrom.

Time does not permit a discussion of the legislative provisions of the states dealing with this problem but the Legal Bulletin that will soon be available to members discusses these statutes in detail. Suffice it to say that pre-employment and periodic post-employment examinations of employees are of vital importance to ascertain the incipiency of diseases when employees are or may be exposed to hazards. When a disease is permitted to develop to the stage where it becomes manifest or disabling, it is generally too late to avoid its ultimate disabling effects, and the employee is then limited to the compensation benefits that the statute provides. By prevention, the health of the employee is safeguarded and the employer relieved from the liability for compensation. Therefore, a complete and comprehensive program for medical control, with routine examinations, is essential for the successful administration of these laws.

In the beginning of my remarks I referred to the problems that have arisen and will arise in connection with the administration of occupational disease laws and, for your consideration, I would like to make brief reference to some of the provisions of these laws that will inevitably lead to difficulties. We have been discussing specific provisions of occupational disease legislation common to all laws and I would like to call to your attention some instances of problems that will arise in the future in connection with the administration of these laws. Due to the limitation of time, I can make but brief reference to these problems, without detailed discussion thereof, but I hope that these references will emphasize their importance.

As you know, the New York Workmen's Compensation Act was originally amended to compensate a scheduled list of occupational diseases. In 1935 the Act was again amended to compensate "any and all occupational diseases." There is now pending before the Court of Appeals of the State of New York the claim of Shirley Goldberg against the Marcy Corporation and the Maryland Casualty Company for an occupational disease alleged to have been sustained by the claimant during the course of her employment. The duties of the claimant were to sell tickets for a motion picture theatre in a sidewalk booth which was heated by a small electric heater. Her claim sets forth that her legs were weakened by the heating and that she fell, breaking her ankle and sustaining injury. I quote the following averments from her claim:

> "My condition was caused by the electric heater in the cash box. It drew the blood out of my feet and caused blotches and veins to come out, making my feet weak."

The accident whereby she sustained a broken ankle did not occur during the course of her duties so that her claim was based solely on an alleged occupational disease of inflammation and weakness of the legs caused by her employment. The Referee before whom the matter was heard awarded compensation, which was affirmed by the Appellate Division and, unless reversed in the present appeal, the case will stand as a precedent of what may be expected in the course of the administration of the New York Occupational Disease Law.

I cite this case to bring home to you the hazard presented to industry by those state laws providing general coverage. There are claims now pending under general coverage laws for diseases such as tuberculosis, pneumonia, boils, scarlet fever, flat feet, and countless other diseases not peculiar to or characteristic of the trade or employment wherein a claimant is engaged. I do not mean to imply that compensation will be awarded for all of such cases, but I repeat the warning that general coverage laws may in the future be construed to provide general health insurance for employees. If our present society desires this to be accomplished, our legislatures should say so and not hide the purposes of the proposed legislation behind the name, "occupational disease compensation."

Another instance of immediate interest is the provision of the Pennsylvania Occupational Disease Act that becomes effective January 1, 1938. You are all familiar with the problem of so-called "accrued liability" common to all occupational disease legislation. The Pennsylvania law attempted to take care of this problem as it related to certain diseases by apportioning this liability between the employer and the Commonwealth over a period of ten years, by providing that if disability or death from the disease occurs within the first year after the Act becomes effective, the employer shall be liable for and pay one-tenth of the compensation for such disability or death, the remainder of such compensation being payable by the Commonwealth. For disability or death occurring each year thereafter, the employer assumes an additional one-tenth of this liability until the ten year period is past, after which time full liability is imposed upon the employer. The Act does not specify the diseases to which this provision applies, leaving this for the determination of the

Workmen's Compensation Board. The Board is empowered to determine those diseases that develop to the point of disability only after five or more years of exposure. At the effective date of the Act, therefore, neither the employer nor his insurance carrier will be apprised of the diseases to which this provision applies. It is apparent that such confusion must react detrimentally to all industrial interests and, in a sense, makes the risk imposed by the law uninsurable. Assuming that the disease of silicosis is one of the diseases that the Board will find to be within the terms of this section, we have a limitation of the employer's liability in the law in the amount of $3600. Does the section providing for the apportionment of liability between the employer and the Commonwealth limit the employee's right to compensation to $3600, or does it mean that during the first year the Act is effective, the employer pays one-tenth of the disability or death benefits, not to exceed $3600, and the Commonwealth pays the remaining benefits granted by the general law? Such a construction is possible and would result in claimants becoming disabled the first year after the Act becomes effective receiving substantially more compensation than claimants becoming disabled ten years after the Act becomes effective. If this is the proper construction of the Act, I hazard the guess that during the first few years it is effective, there may well be an avalanche of claims thereunder.

I regret that time does not permit the discussion of many of the other important legislative provisions that are treated in the Legal Bulletin upon which I have been asked to make report. In closing, I believe it proper to express the warning to the Foundation, its members and supporters, that during the next few years careful attention should be paid to the administration of the occupational disease laws now effective, so that unjust and inequitable construction may not be placed upon the provisions of these laws. I believe that the members of this Foundation are ready, willing and able to accept their responsibility for occupational disease injuries to their employees, but will seek to avoid unjust and inequitable claims that may hereafter be asserted against them. It is important that those industries having occupational disease hazards should carefully scrutinize all proposed rules and regulations adopted by administrative agencies and that false and improper claims should be contested to the utmost. The next few years may well determine the ultimate course of the administration of these laws and your continued attention to this matter is vitally necessary to the protection of your own interests.

CORRELATION OF AMERICAN RESEARCHES IN INDUSTRIAL AIR HYGIENE

H. B. MELLER

The rapid expansion of interest and activities in the field of industrial health necessarily has resulted in a certain amount of overlapping of effort. One of the functions of Air Hygiene Foundation is to unify and correlate activities in this rapidly-developing field so that the sum total of our knowledge on the subject may be efficiently advanced.

In line with this objective, the Foundation recently set out to compile a rough directory of institutions and individuals engaged in researches on those occupational diseases in which Foundation members are interested. In other words, we attempted as a preliminary move to take a partial inventory of institutions and research specialists working in this field.

A test list of 200 such institutions and individuals was carefully prepared. We did not include research by individual companies or corporations for their own advantage, nor did we include the work of independent consultants nor the excellent and valuable studies being conducted in particular industries by some of our national trade organizations. Our survey was concerned only with the broad, fundamental problems affecting industry as a whole.

Of the institutions and specialists contacted in the survey, more than half sent answers to the questionnaire. It was most interesting to note that in every case the question, "Are you willing to cooperate by supplying reasonable information and other advice looking toward coordination of research in the field of air hygiene?" was answered in the affirmative.

An analysis of the replies revealed that there is an increasing number of specialists entering this field of research; that more hospitals, through their pathological and roentgenological departments, are broadening their activities; that more institutions of learning are inaugurating departments of industrial medicine or industrial hygiene; that many states and some cities are including regulation of industrial disease hazards in their program. And, of course, there is the continued broad, valuable work of the U. S. Public Health Service and of the U. S. Bureau of Mines.

These findings are convincing evidence of an increasing regard for the health of workmen, and cognizance of the advantages that will accrue to employers as well. A pertinent query now confronts us, namely: How can the greatest advantage be taken of the opportunity afforded by these

increasing facilities, so that they may be directed, through cooperation and coordination, toward securing in the shortest practicable time authoritative answers to perplexing questions that are serious in their importance and in their need for early solution.

Let us consider briefly some facts of relevance.

There are the Federal and State agencies with their prepared programs.

There are outstanding institutions whose sole, self-imposed responsibility is the conduct of research. These institutions either are endowed entirely or in part, partially supported through private grants, or are entirely dependent upon outside funds. That the interest, research and support of this group should be encouraged cannot be gainsaid.

The number of departments of industrial medicine and of industrial hygiene in educational institutions is increasing, and it is hoped will increase more rapidly. Such departments will undoubtedly be a tremendous asset to labor and industry in training physicians, engineers, chemists, and physicists for this field of research and control.

But in the programs of proposed research activities which have come to us from these sources, there is implied a large amount of unnecessary duplication, if all are able to proceed as they indicate they wish to do; which brings to mind a logical question: Should industry be asked to pay over and over again for the same research projects? Or should it, instead, use a central control to aid in direction of scientific effort and financial support in order to minimize wasteful duplication and spur research progress on a long list of problems crying for attention? Obviously, far more could be accomplished and for far less money if the expenditures were so directed.

We are not discussing the research being done by individual companies or corporations for their own advantage, the work of consultants whose laboratories are industrial plants, nor the excellent and valuable studies being conducted in particular industries by some of our national organizations. All such studies are desirable and valuable, but have no direct bearing on the program under discussion except insofar as the Foundation, in its turn, is able to cooperate with these organizations to steer clear of those researches whose results will be made available to industry through the efforts of others. This will be a move of progressive type toward reducing unnecessary duplication in research.

Nor is there included research in educational institutions where it is conducted for the purpose of benefitting industry in particular districts, in which case appeal for research support from local industries is natural and proper. But where problems affect industry broadly and/or where support is sought from a widely distributed group, it is our opinion, which we hope will be shared by others, that the best interests of all concerned will be served and the greatest return secured from the investment if the problem is considered part of a comprehensive program devised for the benefit of all; and if the place at which the work is to be done is chosen with that broad outcome in mind. This action in itself will prevent considerable duplication that otherwise would likely occur.

We refer in the discussion here only to the broad program of investigation for application in which industry as a whole is interested. The results of the survey carried out by us so far give definite indication that the men directly engaged in this field are willing to aid in coordination of the work. They realize that duplicate effort is costly, not only in money, but—what is of greater moment—in time. The scientist, we are convinced, can therefore be depended upon to do his part; but there must be evolved a plan, which can be preliminary in its nature, as the basis for consideration of such timely and essential questions as who should do what, who should refrain from which activities, and why. Scientists engaged in this field can work out a practicable arrangement of inestimable value in hastening the clearing-up of many uncertainties which have had their effect upon current legislation. These scientists must however be stimulated to bring about this result through a central agency.

The coordinated program should be made up of basic problems, the solution of which is needed by all industry, or at least by groups of industries. As rapidly as answers are found they can be used to practical benefit, not only in plants but also in clearing up uncertainties that have affected legislation. It is one thing to comply with regulations under an existing law; it is quite another to attempt to clarify and add to existing facts so as to clear up controversial points considered in formulating that law.

Industry knows more or less clearly what needs to be accomplished. Industry is aware that, in addition to researches on problems of special or immediate interest, a long-range program is necessary to supply incontrovertible facts that then may be woven into sound laws, fair to employers and employees alike.

The path to this goal will be made very much shorter if executives in industry will work closely with scientists who would welcome a comprehensive program, equitably distributed, carefully coordinated, and adequately financed.

On the one hand, interested scientists would be spared in large part service as salesmen to secure necessary financial support for their investigations. (Bear in mind what has been said about local service, or services or studies carried on by or for specific industries or groups.) These specialists would be able to devote all their attention to constructive effort.

Industry, on the other hand, through its executives, would be able to keep in close touch with the program as a whole as well as with parts that might be of special or immediate interest, and this connection would accelerate the progress by thus getting a maximum return for the money spent in research. Industry should definitely pool its interests, helping in the formulation of the program, and supplying the necessary sinews of war. Science will cooperate to the full in solving the problems of industry, if industry is a part of the army in the field and is prepared for a vigorous attack.

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