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SUBJECT INDEX TO VOLUME 12

The following Index contains an alphabetical list of significant subjects presented in this volume. Abstracts are indexed by category under the heading "ABSTRACTS." Books reviewed are listed alphabetically by title under the heading "BOOKS." Obituaries and death notices are indexed under the heading "DEATHS."

Occupational health news compiled by the United States Health Service is indexed separately under the heading "OCCUPATIONAL HEALTH NEWS."

Pulmonary Disability in Asbestos Workers

KENNETH W. SMITH, M.D., New York

Asbestosis has been described in detail in numerous published articles and texts. While it is true that cases of far-advanced asbestosis may have severe pulmonary disability, relatively few of the people exposed to the fiber develop the disease. Therefore, it is the intent in this paper to mention asbestosis only briefly and then to outline various other pulmonary disabilities seen among asbestos workers.

The word "asbestos" is generally used to describe several fibrous magnesium silicates which are different in their chemical composition and physical properties. The most important types of fibers are chrysotile, amosite, crocidolite, anthophyllite, actinolite, and tremolite. Total world production of all fibers last year amounted to slightly more than 1,500,000 tons. Approximately 95% of the fibers produced were of the chrysotile variety, 3% crocidolite, and 2% amosite. Deposits of various types of this mineral are found in many countries, but the largest mines are located in Canada and Africa.

Asbestos fibers are highly resistant to heat and acids. They have great tensile strength and large surface areas. Because of these properties as well as their filamented structure, industrial use of these fibers throughout the world is increasing. The textile industry has used them for many years to produce blankets, clothing, threads, ropes, tapes, braided tubing, and filters. In recent years, however, there has been an increasing use of asbestos in the insulation, building, and friction-material trades. In addition, the fibers can be found in paper, wallboard, shingles, pipe covering, floor tiles, brake linings and brake blocks, cements, putties, and plastics.

It should be noted that the facts presented here apply to those persons who have been exposed only to asbestos fibers and to no other dusts. As previously indicated, industry today is finding many new uses for the fibers when they are mixed with other dusts. It is an established fact that when asbestos fibers are mixed with silica, diatomaceous earth, or other potentially toxic dusts, the pulmonary changes resulting from the inhalation of these mixtures are not typical of asbestosis. The x-ray pattern may be different, the clinical course changed, or the susceptibility to intercurrent infection increased or decreased. Thus, in making a diagnosis of occupational pulmonary disease, it is highly important to obtain a detailed occupational history, so that asbestosis, silicosis, or mixed pneumoconioses can be differentiated.

The statements and observations reported here concern several thousand men and women employed in the asbestos industry in Canada and the United States. In this industry the various mining, milling, and manufacturing operations create some dust containing asbestos fibers. If the fibers up to 50μ in length are inhaled continually in sufficient quantities over a period of several years, a typical pulmonary fibrosis will develop. It has been demonstrated that this fibrosis is due not to the chemical but rather to the mechanical action of the fibers.[1] The asbestos fibers are deposited in the terminal bronchioles, initiating a tissue response which coats the fiber and eventually produces what is known as the asbestos body. This appears to be a defense mechanism of the lung. Nu-

Recorded for publication April 7, 1955.

sputum of persons who have had only short and sporadic exposure to the dust. These persons are healthy and have no demonstrable signs or symptoms of asbestosis. Therefore, it seems more appropriate to use the term "asbestos" bodies rather than "asbestosis" bodies, signifying exposure to the fibers but not necessarily indicating disease.

If increasing quantities of the fibers are continually inhaled, the tissue reaction progresses, and a generalized, diffuse fibrosis gradually appears throughout the lower lobes of the lungs. With additional exposure, this

Fig. 1.—Early asbestosis.

fibrosis will spread to the other lobes, eventually causing respiratory embarrassment and finally cardiac failure.

The pulmonary fibrosis resulting from prolonged inhalation of asbestos fibers will produce a typical x-ray pattern. In early, or first-stage, asbestosis (Fig. 1), the x-ray shows a fine, diffuse, homogeneous infiltration throughout both lower lung fields. It should be noted that this infiltration is bilateral, that it is generalized at both bases, and that the nodular conglomerate patterns of other pneumoconioses, such as silicosis, are not seen in asbestosis. There is a ...

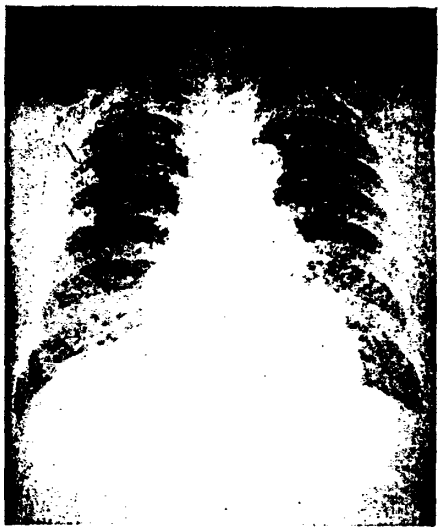

Fig. 2.—Moderately advanced asbestosis.

ated with this disease, which may account for the "ground glass" pattern which has been used to describe the typical x-ray picture.

In moderately advanced, or second-stage, asbestosis (Fig. 2), the infiltration has increased but still is confined to the lower lung fields. The "ground glass" pattern is

Fig. 3.—Far-advanced asbestosis.

more apparent, and the heart borders are becoming indistinct or shaggy. There is some irregularity of the diaphragmatic outlines and beginning obliteration of both the cardiophrenic and the costophrenic angles.

In far-advanced, or third-stage, asbestosis (Fig. 3), the infiltration still is homogeneous and bilateral, has spread to the middle and possibly the upper portion of the lung fields, but the apices remain clear. The cardiac outline is almost completely obliterated, as are the domes of the diaphragm and the costophrenic sulci. With this picture in mind, it is advisable to reiterate the observations of many physicians, namely, that the x-ray picture should never be used to estimate the presence or the extent of impaired pulmonary function or disability. Many cases with x-ray evidence of third-stage asbestosis have been known to carry on their usual work and live fairly comfortable lives for several years. On the other hand, no case of definite disability has been seen unless there was the typical x-ray pattern.

There is no typical clinical picture for asbestosis. The disease is insidious in its onset and slowly progressive with continued inhalation of the fiber. There is a gradual increase in cough and expectoration, some anorexia and weight loss, then slowly increasing dyspnea. Cyanosis and clubbing of the fingers are rare findings. There is evidence that asbestosis will not progress after exposure ceases, but this seems to be true only if the worker does not develop an intercurrent pulmonary infection.

It will be shown that asbestos workers are not predisposed to develop more intercurrent pulmonary infections than are found in other workers. However, when an acute pneumonitis develops in the presence of an established asbestotic fibrosis, the infection is slow to heal, relapses are frequent, and the patient may be more susceptible to subsequent pulmonary infections. While it is true that the disease is slow and insidious in its onset and that people with advanced asbestosis may lead relatively normal lives, eventually the heart begins to fail, and death from cor pulmonale rapidly follows.

Gregoire * has reported that pulmonary function studies on asbestos workers have shown that the chief physiological problem is that of a "tight" lung. The vital and maximum breathing capacities are lowered, expansion of the lung is difficult, and arterial oxygen saturation of the blood is diminished in some cases, indicating an impairment of gas transfer through the lung. Diffuse obstructive emphysema, so commonly seen in silicosis, is not apparent in asbestosis. These pulmonary function studies are of importance in the proper diagnosis of pulmonary fibrosis and the estimation of pulmonary disability. Of more importance is the fact that these tests can often help the clinician in directing the treatment of the case. Unfortunately, there are too few persons who are properly qualified today to carry out these tests and interpret the results.

An x-ray survey was made of one group of 708 employees working in an asbestos mill where the ore was dried, crushed, separated and graded, packed, and then shipped. Operations in this plant required the employees to rotate through various jobs; hence it was impossible to relate any x-ray changes to a particular job or to a specified dust concentration. At the same time it could be assumed that all members of the group had been exposed to varying concentrations of the dust. The chest x-rays of these employees were divided into three broad groups: (*a*) essentially normal lungs; (*b*) marked linear exaggeration (P-2) but no typical pattern of asbestosis, and (*c*) definite asbestosis.

Table 1 shows that of the 708 employees studied 649, or 91%, had normal x-rays. This is of interest because 204 employees or 29% of the total group, had 10 or more years of service, and 2 men actually had worked more than 40 years in the dust.

Table 2 indicates that 52 of the 708 employees showed a marked increase of all peribronchial markings, although none had definite asbestosis. Inasmuch as these men had essential films early in their employ assumed that most of th lung markings were assoc subsequent dust exposures. on of the length of expos develop x-ray changes is oted that 69% of this g ore years of exposure.

Table 3 shows that of th had developed definite x sbestosis. These men e tages of pulmonary invo ere working steadily at obs with no signs of di interest to note that non x-ray evidence of asbestos 20 years of exposure.

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* Gregoire, F.: Pulmonary Function Studies in Men Exposed for Ten or More Years to Inhalation of Asbestos Fibers, read before the Seventh Saranac Symposium, 1952 (unpublished).

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1952 (unpublished).

TABLE 1.—*Employees with Normal X-Rays*

Exposure, yr	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Employees, no.	294	151	94	40	44	16	5	3	1	1

nite asbestosis. Inasmuch as the majority of these men had essentially normal x-ray films early in their employment history, it is assumed that most of the later increased lung markings were associated with their subsequent dust exposures. Further indication of the length of exposure necessary to develop x-ray changes is seen when it is noted that 69% of this group had 10 or more years of exposure.

Table 3 shows that of the 708 employees 7 had developed definite x-ray evidence of asbestosis. These men exhibited various stages of pulmonary involvement, but all were working steadily at their accustomed jobs with no signs of disability. It is of interest to note that none had developed x-ray evidence of asbestosis with less than 20 years of exposure.

Frequently it has been stated that it takes from 5 to 10 years of exposure to develop asbestosis. The survey reported here concerned mill employees. It is possible that other operations might have different exposures with other disease experience. Factors which might influence this experience are not only the length of exposure or the concentration of dust in the air but also the fact that there is probably an individual susceptibility to the development of pulmonary fibrosis.

Medical literature has given considerable attention to occupational pulmonary disease, but very little has been reported on the occurrence of nonoccupational respiratory disease among those employed in the dusty trades. The following survey was made in order to determine the incidence of nonoccupational respiratory disease in another group, of 1561 men and women, working in the asbestos industry.

A review of absentee records indicated that no valid conclusions could be obtained from this source, because the reason for absence was given by the employee himself. Sickness often was used as an excuse to cover short absences for a variety of personal reasons.

It then was decided to study the claims submitted for sickness and accident insurance. All employees in the survey participated in a plan operated by an independent insurance company. Indemnification was made only after the nature of the illness had been certified by the treating physician.

The study included claims submitted over a three-year period for such illnesses as the common cold, sinusitis, pharyngitis, grippe, bronchitis, pneumonia, asthma, and pleurisy. Occupational respiratory diseases and pulmonary tuberculosis were excluded in the report.

Table 4 shows that of the 1561 employees in the survey group there were approximately equal numbers in dusty and nondusty occupations. Of all claims filed for respiratory diseases, 45% were for employees with dust exposure. Clinical observations for many years had given the impression that a dusty occupation in itself would not predispose a person to more nonoccupational respiratory disease than would a dust-free job. This survey shows that the rate of disease over

TABLE 2.—*Employees with P-2 X-Ray Readings*

Exposure, yr	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Employees, no.	5	11	8	10	11	4	1	1	0	1

TABLE 3.—*Employees with Asbestosis*

Exposure, yr	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Employees, no.	0	0	0	0	5	1	0	1	0	0

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Evaluating Disability in Compensation for Pneumoconiosis

Legal Aspects

THEODORE C. WATERS, Baltimore

In our approach to the discussion of the subject which has been assigned to me, I should like to call to your attention that provisions for the compensation of pneumoconioses have presented some of the most controversial subjects in state legislation. In 22 states,* benefits payable for silicosis or silicotuberculosis are subject to limitations which are not applicable to injuries resulting from accident; in 15 states,† compensation is not payable for partial disability, and with respect to those statutes providing compensation for pneumoconioses, there is extensive variation in the benefits paid and in the concept of disability resulting from these diseases. In my opinion, the reasons for this legislative differentials are as follows:

1. The fact that, upon enactment of the occupational disease compensation statutes, an employer became liable for the so-called "accrued" liability resulting from the inhalation of dust prior to the time that the law became effective.
2. Problems incident to the proper diagnosis of the disease.
3. Differentials in the concept of compensable disability.
4. Evaluation of disability.

With respect to the first of these items, "accrued" liability is perhaps a misnomer, because what industry was faced with upon the enactment of the compensation statutes was potential liability for pulmonary changes resulting from extended exposure of employees to the inhalation of dust prior to the effective date of the statute. We must bear in mind that upon the enactment of the compensation statutes the employer became an insurer of the health of the employee as to these diseases. He was stripped of his common law defenses, and the continuation in employment by employees automatically imposed upon the employer responsibility for compensation.

With respect to the diagnosis of pneumoconioses, I do not need to tell this audience of the limited general medical knowledge that existed some years ago, at the time of the enactment of our compensation statutes making the diseases compensable. Industrial medicine has made great progress in this field, although there is still room for continuing improvement. In the trial of any given compensation case, commissions and courts follow the general administrative policy of giving to the claimant the benefit of every doubt; and if there is medical evidence in the record to support a diagnosis and finding of the existence of the disease, our administrative agencies are inclined to hold that the disease is compensable, irrespective of the fact that reputable, competent medical testimony will refute an affirmative diagnosis. This reason alone caused great concern to those industries having dust hazards and to insurance carriers responsible upon such risks.

With respect to concepts of disability, we again find material differences in the legislative provisions of our compensation laws.

Accepted for publication April 7, 1955.

* Alabama, Arizona, Arkansas, Colorado, Florida, Georgia, Idaho, Iowa, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, Oklahoma, Oregon, Pennsylvania, South Carolina, Texas, Utah, Vermont, and West Virginia.

† Arizona, Colorado, Florida, Idaho, Massachusetts, Michigan, Minnesota, New Hampshire, New York, Ohio, Oklahoma, Pennsylvania, South Carolina, Utah, and Vermont.

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effect a release of continuing liability to his employer? Should his ability to procure other employment free from dust exposure deprive him of any continuing benefit under the compensation law? What methods are available to our commissions and courts to properly evaluate disability free and clear of prejudiced medical testimony that may be offered by the claimant? By the employer? Or by the insurer? These are the imponderables with which we are faced in our consideration of this subject.

We still do not know all the answers to these questions, but I would like to review with you briefly some of the standard legislative provisions which have attempted to deal with these matters and to establish directives to administrative agencies in handling claims. The principal legislative provisions to which I would refer are as follows.

1. DENIAL OF COMPENSATION FOR PARTIAL DISABILITY

From the medical standpoint, the evaluation of partial disability resulting from pneumoconioses differs materially from scheduled injuries presently compensable for loss, or loss of use, of other parts of the body, such as an arm, leg, hand, etc. The Saranac Laboratory has been a leader in medical research attempting to find some method for the evaluation of partial disability, but its present distinguished Director, his predecessors and their associates, and other scientists engaged in these studies have not as yet found the answer to the problem. Of necessity, the attempted evaluation of a fixed percentage of disability is exceedingly complicated and unsatisfactory. Therefore, the employer and the insurer contend that compensation should not be paid unless the claimant has suffered wage loss or that compensation, if any, payable for partial disability should effect the discharge of the employer's liability within a reasonable time after termination of employment. Contra, the employee has, in fact, received some injury from the inhalation of dust and development of demonstrable disease. Perhaps legislative provisions denying compensation for partial disability are not thoroughly satisfactory or fair to the parties concerned with the administration of the laws, but unless and until the medical profession gives its approval to some method of evaluation of partial disability, strong arguments may be presented for this type of legislative provision.

2. COMPENSATION FOR TOTAL DISABILITY

No one can challenge the propriety of paying compensation for total disability for pneumoconioses. However, what do we mean by total disability? Under the definitions above referred to, it may mean one of several things:

a. The inability to earn any wages in the employment where last employed.

b. The inability to perform any further work in the occupation in which the employee was engaged.

c. The inability to earn equal wages in other suitable employment.

Under the first concept of disability, complete loss of wage is a condition precedent to an award of compensation.

Under the second concept, the employee must be unable to perform any further work in his occupation. In this class, we are faced with the administrative and court rulings that have the effect of awarding compensation in those cases where the administrative agency is of the opinion that continuing exposure is hazardous and detrimental to the claimant and, therefore, compensation for total disability should be awarded even though the claimant is able to make as much, and in some cases more, in other employment.

In the third classification, the right to recover compensation is dependent upon proof that the claimant has been incapacitated from earning equal wages in other suitable employment.

Simply to state these phases that enter into the determination of what is and what is not a compensable claim illustrates the problems facing our compensation commissions in disposing of issues presented by this disease.

In summary, they fall into four classifications, as follows:

1. Inability of the injured employee to earn full wages in the employment in which he was last employed.‡

2. Total disability rendering the employee unable to perform any further work in his then occupation or in any other trade, business, or occupation.§

3. The event of becoming incapacitated, either partially or totally, from performing his work in the last occupation in which he was exposed to the hazard of such disease.‖

4. The event of becoming incapacitated from performing his work or from earning equal wages in other suitable employment.¶

There can be no doubt that the basic concept of "disability" upon the enactment of the workmen's compensation laws was to provide monetary compensation for injuries resulting in a loss of wage-earning capacity resulting from the traumatic injuries or occupational diseases arising out of and in the course of employment. Unfortunately, that original concept has changed. In an effort to liberalize the administration of the laws, compensation has been, and is being, awarded not for wage loss but for what might be termed to be damages sustained by an employee during the course of his employment irrespective of wage loss. While I admit my own prejudice on behalf of the employer and the insurer, the fact is that our legislatures, commissions, and courts, interpreting and administering workmen's compensation laws, are tending to award compensation for loss of earnings irrespective of cause. Perhaps that result is socially desirable; I am not here to argue that point pro or con, but in fairness to the employer and to the emp... and to the public, I feel that the car... out of such a policy will make the emp... an insurer of the health of the emp... whether or not the employee's illness ... tributable to conditions that are characte... of and peculiar to his employment.

Bearing in mind this change in con... of the basic purpose of workmen's comp... tion legislation, we now come to the fou... reason above set forth, namely, the eva... tion of disability in compensation for pn... moconioses.

It has been my privilege to participate ... the trial of a number of compensation ca... involving claims for pneumoconioses, an... I know of no problem of greater importan... and more difficult of solution than the a... tempted evaluation of disability. While t... medical profession has improved its tec... nique for the diagnosis of this condition, ... little progress has been made in the esta... lishment of some formula for the evaluatio... of disability. Admittedly, the inhalation ... dust over an extended period of time wi... cause pulmonary changes demonstrable ... roentgen examination. All of us are expose... to dust, and I assume that it is correct to... say that with advancing age such chang... are inevitably demonstrable.

Let us assume that a given employee is exposed to the inhalation of dust, and let us assume further that such inhalation causes pulmonary changes. When does that condition become disabling within the concepts of that term as above referred to? When should the employee subject to exposure be removed from his employment? When should such employee be deprived of his privilege of continuing at work in the occupation in which he may be engaged? What methods are available to medical science to evaluate partial disability? What methods are available to medical science to pronounce that the employee is totally disabled? What sequelae result from a diagnosis of partial disability? Should the employee at that time terminate his employment? Should he be paid "X" dollars and have that payment

‡ Illinois, Indiana, Michigan, New York, and Rhode Island.

§ Arizona, Colorado, Nevada, New Mexico, Utah, and Vermont.

‖ Florida, Georgia, Idaho, Kansas, Maryland, North Carolina, South Carolina, and South Dakota.

¶ Iowa. (Disability not defined in the States of Alabama, Arkansas, California, Connecticut, Delaware, Kentucky, Louisiana, Maine, Massachusetts, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Texas, Virginia, Washington, West Virginia, and Wisconsin.)

effect a release of continuing ... employer? Should his ability t... employment free from dust ... prive him of any continuing l... compensation law? What met... able to our commissions and ... perly evaluate disability free a... judiced medical testimony th... fered by the claimant? By ... Or by the insurer? These are ... ables with which we are face... sideration of this subject.

We still do not know all t... these questions, but I would l... with you briefly some of the s... lative provisions which have ... deal with these matters and ... directives to administrative age... ing claims. The principal le... visions to which I would refer ...

1. DENIAL OF COMPENSATI... PARTIAL DISABILIT...

From the medical standpoin... tion of partial disability resultin... moconioses differs materially fr... injuries presently compensable ... loss of use, of other parts of th... as an arm, leg, hand, etc. ... Laboratory has been a leade... research attempting to find s... for the evaluation of partial d... its present distinguished Direc... decessors and their associates, ... scientists engaged in these stud... as yet found the answer to the ... necessity, the attempted evaluati... percentage of disability is excee... plicated and unsatisfactory. Th... employer and the insurer conten... pensation should not be paid ... claimant has suffered wage loss ... pensation, if any, payable for ... ability should effect the disch... employer's liability within a rea... after termination of employment. ... employee has, in fact, received ... from the inhalation of dust and d... of demonstrable disease. Perhaps ... provisions denying compensation

3. VALUE OF MEDICAL BOARDS IN THE STATE ADMINISTRATIVE AGENCY

One result of the problems presented by compensation for pneumoconioses is legislative recognition of the value of Medical Boards to assist the administrative agency in its determination of issues presented in claims. The basic questions involved are medical, namely: (*a*) whether or not the claimant has a disease; (*b*) the nature and extent of disability. Owing to the highly technical nature of the medical testimony presented on behalf of the claimant or the employer, the need for Medical Boards to evaluate that testimony is imperative. The net result is that now 17 states# have Medical Boards whose decisions are either conclusive with respect to the medical issues involved in the claim or advisory to the administrative agency.

In the past, too little attention has been given to the role of the medical examiner in the administration of workmen's compensation laws. Time does not permit an extended discussion of this matter, but I express the hope and opinion that in the future our legislatures and commissions will not only recognize the need for such Boards but accept and enforce their opinions in preference to the prejudiced opinions of witnesses testifying on behalf of litigants.

4. EXISTING LEGISLATIVE METHODS PROVIDING COMPENSATION FOR TYPES OF DISABILITY

Time does not permit the detailed discussion of this phase of the subject that is merited, and I can only generalize with respect to it. However, I should like to call your attention to the following features of legislative provisions:

a. Denial of compensation for partial disability (discussed above).

b. Monetary limitations of compensatio... ing limited compensation for partial disab... escalator provisions for total disability.

c. Limitation provisions barring right t... dating from the termination of employm...

With respect to these matters, I com... to you for consideration the statut... Arkansas, Maryland, North Carolina, W... Virginia, and Wisconsin. None of the... perfect, but they have attempted to ... some method for the proper compensa... for partial disability with termination ... continuing liability of the employer.

Perhaps the most grievous defect in a... statutes is found in those sections deali... with limitation provisions relating to the ti... when claims must be filed in order for th... to be compensable. This is a major problem... and one which presents the opportunity f... extended discussion. From the standpoint... of the employer and the insurer, they ... the termination of liability within a reas... able period of time after employment ... ceased. From the standpoint of the em... he feels that he is entitled to compensation... beginning at any future time when the dis... ease becomes demonstrable or disabili... irrespective of the date of termination ... employment. Certainly from the stand... of legislation, we do not know the answer to this problem.

CONCLUSION

The foregoing discussion has been pre... sented for the purpose of directing ... thoughts to those questions, medical and legal, involved in the evaluation of disa... y. I have attempted to address my remarks to the legal issues presented. Our state legis... tures and our commissions and courts ... not found the answers to the problems presented. In cooperation with our broth... s of the medical profession, it is to be hop... d that greater uniformity of legislation a... l administration may develop in this field a... l that justice may be done to those affect... by the administration of our compensation laws.

The Radon Probl...

DUNCAN A. HOLADAY, B.S., M.A., Sal...

The occupational exposure of w... adioactive dust and gas has only ...come of general interest. Interest ... uranium became an important a... ught after mineral. This develop... sulted in the employment of large... miners, so that a problem that ... apparently minor importance in ... try has become one that demands a... It is the purpose of this paper to pr... on levels of radon found in uraniu... nonuranium mines, to refer briefly ... ble biologic effects, and to make ... the careful examination of exis... which should help in the determin... safe working level of radon and i... dation products.

All uranium ores contain rad... therefore the radioactive gas rado... tinuously produced and is released ... atmospheres. This gas and its ... daughters, RaA through RaC', are ... as the most important radioactive ... present in uranium mines from t... point of their possible biologic eff... question then is: What are the ef... duced by the inhalation of alph... radioactive elements? The result ... exposures should provide the data ... lishing proper working levels, bu... tunately, such records are limited w... to the elements with which we are ... cerned.

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Sanitary Engineering Director, C... Health Field Station, Division of Spe... Services, Public Health Service, U. S. ... of Health, Education, and Welfare (Mr... Presented by W. Clark Cooper, M.D... Director and Chief of the Division ... Health Services, Public Health Service.

Arizona, Colorado, Georgia, Idaho, Iowa, Maryland, Minnesota, Nevada, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Texas, Utah, and West Virginia.