FILE NAME: New York State & NY Times (NY)

DATE: 1951 Oct

DOC#: NY008

DOCUMENT DESCRIPTION: NY Dept of Labor Monthly Review - Occupational Cancer

New York State Department of Labor

MONTHLY REVIEW

Division of Industrial Hygiene & Safety Standards

VOL. 30 OCTOBER, 1951 No. 10

OCCUPATIONAL CANCER*

A Challenge to the Physician

In the prevention of occupational diseases we have a ...tile field to which the practicing physican can make a ...al contribution in the course of his regular work. It is ...ique in that the data required cannot be developed in a ...search laboratory or in a university. It must come from ...e physicians who actually see cancer cases or cases of ...spected cancer, either in their own private offices, in ...ncer-screening clinics, or in the hospital. It is thus a ...search problem of extraordinary importance practically ...de to order for the busy practitioner who is willing to ...vote the few extra minutes necessary to take a careful ...cupational history on his cancer patients; and report, for ...rther investigation, cases suspected of having been ex...sed to carcinogenic agents in industry.

To assist the practicing physician in this matter, the New ...ork State Occupational Cancer Committee has prepared ...is information. The tables provide a few useful clues, ...cluding a list of the chemical substances and physical ...gents found in industry, which are, at the present time, ...spected of having carcinogenic properties, and the types ...f cancer believed to be caused by them. Further study ...ill, no doubt, add others to this list; some now on the ...st may very well be dropped as new data become available. ...he table of precancerous lesions together with the occu...ational carcinogens with which experience has associated ...hem, is in the nature of a tentative check-list on the basis ...f present information. A copy of the form used by physi...ians in New York State, exclusive of New York City, for ...eporting cancer cases is also included.

Early recognition of the possible occupational etiology of cancer will:

- *give us information as to type of work the patient must avoid in the future.*
- *provide a basis for prognosis.*
- *make available, under State Compensation Laws, financial assistance to the patient and his family.*
- *establish statistical data as to incidence, distribution, and causative agents. — information now practically non-existent.*

If called upon by any physician interested in cooperating in this program, the New York State Occupational Cancer Committee is prepared to follow any suspected case of occupational cancer in New York State into the workroom where it is believed that it had originated, and to make all necessary technical investigations of the environmental factors which might have been responsible. Such investigations will include chemical analysis of materials, radiation measurements, chemical analysis of air contaminants in the form of dusts, gases, fumes, dust counts, or any other techniques as indicated. In thus tracing back the occupational exposures of cancer patients, it is hoped that occupational factors not now suspected of causing cancer will thereby be brought to light.

In New York State, the professional staff of the Division of Industrial Hygiene and Safety Standards may be called upon at all times for consultations and study of these problems in particular plants; the scientific evaluation of any health hazards which may be present, and practical assistance with control measures. All such requests should be addressed to Dr. Leonard Greenburg, Director, Division of Industrial Hygiene and Safety Standards, New York State Department of Labor, 80 Centre Street, New York 13, N. Y.

The medical profession is well aware of the extent to which lack of knowledge of the basic causes of cancer is responsible for the unsatisfactory state of our prophylactic and therapeutic approach to this problem. We do know that a causal relationship has been definitely established between cancer and exposure to certain chemical and physical agents in industry. Thus, exposure of the skin to certain types of oil, tar or pitch are known to cause skin cancer. On the other hand, epitheliomata of the bladder are definitely known to result from exposure to certain of the intermediates in the manufacture of aniline dyes, such as beta naphthylamine.

This small group of cancer cases for which an occupational etiology has been established thus offers a rather unique point of departure for the further study of this baffling disease. Too little attention has, however, been paid to these occupational cancers; too little is known of the environmental factors responsible for their production. An appreciable number of such cases have, no doubt, gone unrecognized as to occupational etiology.

This is true not only of occupational cancer, but of many other occupational diseases as well. It is a common fallacy to believe that occupational diseases have certain clinical

* Reprinted from publication by the New York State Occupational Cancer Committee, Sponsored by Medical Society of the State of New York, New York State Department of Health, New York State Department of Labor.

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of the
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DEPARTMENT OF LABOR
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earmarks which immediately suggest an occupational etiology, or even a specific occupational exposure; or that they present medical syndromes so distinctive as to clearly differentiate them from non-occupational diseases. This may occur, but it is relatively rare. Whether one is dealing with cancer or with other systemic diseases, such as hepatitis, nephrosis or aplastic anemia, resulting from exposure to toxic agents in industry, as clinical diseases entities, they provide no specific clues as to etiology. In many cases, the occupational etiology is unsuspected.

In order to acquire new data as to the environmental factors — suspected as well as unsuspected — which are responsible for cancer cases, it is necessary to know precisely what the patient's occupational exposure was; what chemical substances he came in contact with; what other environmental factors were present in the workroom. Since cancer will usually develop only after a great many years of exposure, and even many years after exposure to an occupational carcinogen had ceased, the occupational history of the patient must be carefully studied all the way back to his first job. This is difficult. But it will be rewarding. At any rate, it is the only way to get the necessary data. Frequently, however, the patient will not know or remember the precise chemical substances, for example, with which he worked. Or he may forget to mention the only exposure which happens to be significant in his case. The names and addresses of the plants where the patient had worked are more readily obtained. This information alone can be a useful guide for a technical investigation of the patient's occupational exposure over the years.

The importance of the occupational history form thus cannot be overemphasized, since a complete occupational history is indispensable to developing any useful data with reference to occupational cancer. History taking, whether it is the clinical history or an occupational history, is very time-consuming. The occupational history, however, is less familiar to the medical practitioner and so it always seems to present the greater hurdle. For that reason, the suggested Occupational History Form has been made as simple as possible.

No matter how carefully and intelligently the case has been worked up, or how accurate the diagnosis, the possibility of an occupational etiology must not be overlooked. Recognition of an occupational etiology, where it exists, will provide invaluable information as to the type of work the patient must avoid in the future; it will provide a basis for prognosis; and it will make possible assistance to the patient and his family under the Compensation Laws of the State in which he lives, providing them with much-needed financial assistance during a period of disability.

Recognition of the occupational etiology of cancer cases where it exists, will provide statistical data as to incidence.

TOWN VILLAGE CITY (Legal Residence of Patient) COUNTY DIST. NO.

PATIENTS NAME: (Please Print) PRESENT AGE: YEAR OF BIRTH:

PATIENTS LEGAL ADDRESS: (If Institution Inmate, Give Previous Legal Address) SEX: COLOR:

USUAL OCCUPATION TRADE: INDUSTRY: MARITAL STATUS:

Date First Symptom *of This Tumor* | Date of First Visit *for This Tumor* to Physician Reporting: | Was Prior Visit Made to Another Physician *for this Tumor?*

CLINICAL DIAGNOSIS:

PATH. DIAGNOSIS: PRIMARY SITE (Tissue of Orgin):

NAME OF PATH. LABORATORY: METASTATIC SITE:

STAGE OF DISEASE	When First Diagnosed By Physician Reporting:	Early Local ☐	Advanced Local ☐	Regional Nodes Involved ☐	Distant Metastasis ☐	Recurrent ☐
	Now:					

REFERRED BY:

REPORTED BY: Hospital ☐ Physician ☐ (Name) Address or Institution:

DATE OF THIS REPORT: If Now Hospitalized, Name of Hospital or Institution: Tumor Clinic Patient ☐

HERMAN E. HILLEBOE, M.D.
Commissioner

MALIGNANT NEOPLASM
CONFIDENTIAL REPORT
New York State Department of Health
BUREAU OF CANCER CONTROL

Check here if you wish more report cards ☐

Name of Clinic
Address:
Name of Patient
Address:
Diagnosis:
Present Occ
Each preced
SUI
SKIN
Alopecia
Atrophy
Eczema
Keratosis
Hyperkera
Verrucae
Ulceration
Leukoderm
Leuko-mel
Melanoder
Scleroderm
NASAL PAS
Papilloma
Polyps
Perforatio
Ulceration
BLADDER
Hemorrha
submuc
Papilloma
EYES
Papilloma
BONES AND MARROW
Blood dy
Bone
LUNGS

OCCUPATIONAL HISTORY FORM

Name of Clinic or Hospital: _____ Date: _____

Address: _____

Name of Patient: _____ M _____ F _____

Address: _____

Diagnosis: _____ Age at Commencing Work: _____ Present Age: _____

OCCUPATIONS *(List in chronological order)*

NAME OF PLANT	ADDRESS	PRODUCT MANUFACTURED	PRECISE JOB THERE	TIME EMPLOYED MONTH — YEAR FROM TO
Present Occupation				
Each preceding occupation				

CHECK-LIST OF EXPOSURES

SUBSTANCES	INDUSTRIES	OCCUPATIONS	YEARS IN EACH

TABLE I

Description of Selected Lesions Which May Be Associated With Occupational Cancer Producing Agents

LESION	DESCRIPTION	ETIOLOGIC AGENT
SKIN		
Alopecia	Spotty loss of hair.	Arsenic, radio-active substances, radiation.
Atrophy	Skin grossly thinned and glistening in patches, associated with keratotic areas.	Pitch, tar, asphalt, radio-active substances, radiation (including ultraviolet rays).
Eczema	Dry seborrheic patches on skin.	Arsenic, asphalt, pitch, soot, tar.
Keratosis	Flat, discrete, scaly area on skin with raised pearly borders. Usually on parts of skin exposed to carcinogen, but may occur in unexposed parts, particularly about sweat glands, with arsenic.	Anthracene, arsenic, asphalt, creosote, crude mineral oil, crude paraffin, pitch, sodium nitrate, soot, tar, radioactive substances, radiation (including ultraviolet rays)
Hyperkeratosis	Rough, fissured keratotic plaques with small, hard, wart-like horns, usually on hands and soles. May become nodular and ulcerate.	
Verruca	Form of hyperkeratosis.	
Ulceration	Breakdown of keratotic lesions.	
Leukoderma	Absent pigmentation alone.	Anthracene, arsenic, asphalt, creosote, crude mineral oil, crude paraffin, pitch, tar, radio-active substances, radiation (including ultra-violet rays).
Leuko-melanoderma	Patchy increased and absent pigmentation of skin. Most common in areas of highest pigmentation, and may involve oral mucosa.	
Melanoderma	Increased pigmentation alone.	
Scleroderma	Dry, scaly, parchment-like skin, with enlarged pores, associated with leukomelanoderma.	Crude mineral oil, crude paraffin, radio-active substances, radiation.
NASAL PASSAGES		
Papilloma	Develop in antrum, ethmoid cells, and turbinates.	Nickel carbonyl.
Polyps		
Perforation	Nasal septum.	Chrome salts.
Ulceration	Nasal mucosa.	Chrome salts.
BLADDER		
Hemorrhage, submucosal	Varying size with telangectasis. Located mainly in trigone and about ureteral orifices.	Aniline, benzidine, beta napthylamine and derivatives.
Papilloma	Polypous or villous, pedunculated or sessile, often multiple about trigone and ureteral orifices.	
EYES		
Papilloma	Pedunculated, develop mainly on lids, occasionally on eyeball.	Arsenic, asphalt, creosote, crude mineral oil, pitch, tar, radiation (including ultraviolet rays).
BONES AND BONE MARROW		
Blood dyscrasias	Hyperplastic, hypoplastic, aplastic or hemolytic anemia. Thrombocytopenic purpura with spleen not markedly enlarged.	Benzol and derivatives, radio-active substances, radiation.
Bone	Periostitis.	
LUNGS	No precancerous lesions observed.	Chrome salts.

distributions causative agents, etc., now practically non-existent. Very few people realize how little reliable information there is, at the present time, as to the incidence of any of the occupational diseases.

Occupational cancers, as a rule, result from prolonged exposure to physical or chemical carcinogenic agents in the working environment. Such exposures may be continuous or intermittent over a period of many years. There may be a long latent period before the first evidence of cancer begin to manifest themselves. During all or part of this period, there may be no contact whatever with the carcinogenic agent originally responsible for the cancer. In the case of radium, for example, this latent period may be as long as 20-30 years.

Individual susceptibility probably plays an important role here as in all other diseases, occupational or non-occupational. No doubt, when more is known about the many metabolic and biochemical factors involved in cancer formation generally, it will be found that some of these same factors are operative in cases of occupational cancer.

It is a matter of great practical importance, for the present purpose, that the industrial environment is essentially a man-made artificial one peculiarly susceptible of scientific measurement and medical evaluation from the standpoint of hazards to health — including the production of occupational cancer as well as other occupational diseases. Of equal importance is the fact that these environmental factors in industry responsible for injury to health, once recognized, can be successfully controlled. Fortunately, the techniques for the control of the industrial environment and the prevention of occupational diseases are highly developed at the present time.

As a guide to the physician who, for purposes of prevention, is interested in investigating the role of occupation in cancerous or pre-cancerous lesions presented by his patients, Tables I and II are appended; also a selected bibliography of literature having a direct bearing on these problems.

Table I presents a description of selected lesions which have been found, as a result of experience, to be associated with agents in the occupational environment which are known to be carcinogenic.

Table II lists, alphabetically, for reference purposes, some of the more common substances or conditions in the occupational environment which are recognized as being cancer-producing or suspect. With each such agent the organ or system usually involved, is presented together with a classification in the right-hand columns, indicating whether the etiological relationship is doubtful (Class D) or established (Class E).

The New York State Occupational Cancer Committee would greatly appreciate the cooperation of practicing physicians in reporting any information they develop as to the possible relation of occupation to the pathological lesions, malignant or benign, which they find in their patients.

(*Continued in the November, 1951 issue*)

TABLE II

Alphabetical Listing of Recognized and Suspected Occupational Cancer Producing Agents, With Sites Characteristically Affected

SUBSTANCES OR CONDITIONS	ORGAN OR SYSTEM	CLASS D*	CLASS E†
Aniline and derivatives	Bladder, ureter, kidney	D	
Anthracene, crude	Skin		E
Aromatic organic chemicals	Liver	D	
Arsenic	Skin		E
	Liver	D	
	Respiratory system	D	
	Eyelids		E
Asbestos	Respiratory system	D	
Asphalt, artificial	Skin		E
	Eye		E
Benzidine and derivatives	Bladder, ureter, kidney	D	
Benzol	Blood forming organs		E
Benzol derivatives	Blood forming organs	D	
Burns, thermic	Skin		E
Chlorinated hydrocarbons	Liver	D	
Chromates	Respiratory system		E
Coal	Skin	D	
Creosote	Skin		E
	Lip		E
	Eye		E
Estrogens	Breast (male)	D	
Frostbite	Skin	D	
Iron dust	Lung	D	
Irritation, chronic	Skin	D	
Mineral oil, crude	Skin and Lip		E
	Lip	D	
	Respiratory system	D	
	Eye		E
Naphthylamine-alpha	Bladder, ureter, kidney	D	
Naphthylamine-beta	Bladder, ureter, kidney		E
Nickel carbonyl	Respiratory tract	D	
Paraffin, crude	Skin		E
Pitch	Skin		E
	Lip	D	
	Bladder	D	
	Eye		E
Radiant heat	Skin	D	
Radio active substances	Skin		E
	Lungs		E
	Blood forming organs		E
	Bone		E
Roentgen rays	Skin		E
	Blood forming organs		E
	Subepithelial connective tissues		E
	Eye		E
Shale oil	Skin	D	
Sodium nitrate, crude	Skin		E
Soot	Skin		E
	Bladder	D	
Spindle oils, aromatic	Skin		F
Tar	Lip		E
	Skin		E
	Respiratory system	D	
	Bladder	D	
	Blood forming organs	D	
	Eye		E
Trauma, chemical	Skin	D	
Trauma, physical	Skin	D	
	Blood forming organs	D	
	Mesenchymatous tissues	D	
	Eye	D	
Ultraviolet rays	Skin		E
	Eye		E

* D—Neoplastic disease—etiology still doubtful.
† E—Established etiology.

New York State Department of Labor

MONTHLY REVIEW

Division of Industrial Hygiene & Safety Standards

VOL. 30 NOVEMBER, 1951 No. 11

ROLE OF THE OFFICIAL AGENCY IN INDUSTRIAL HYGIENE

LEONARD GREENBURG, M.D.
Director

The chief function of the official industrial hygiene agency is to maintain safe and healthful working conditions in industry. In certain states, the ends to be achieved are set forth in the Public Health or Labor Law. For example, in the Labor Law of the State of New York, the Industrial Commissioner is charged with the duty of protecting the workers as follows:

"Section 200. General Duty to Protect Health and Safety of Employees — All places to which this chapter applies shall be so constructed, equipped, arranged, operated and conducted as to provide reasonable and adequate protection to the lives, health and safety of persons employed therein. The board shall make rules to carry into effect the provisions of this section."

In certain jurisdictions the charge is not so specific but is rather a part of the general police power of the state and of the Health or the Labor Commissioner. In practice there has been little question of the possession of authority in a given area — for with few exceptions, the power to enforce is well accepted.

While the objectives of industrial hygiene are well crystallized and accepted in most areas, it is important to note that the means of attaining these ends are often left to the decision of the industrial hygiene administrator. For example, in a certain health department, the Division of Industrial Hygiene locates a definite health hazard after study and test. The problem is to achieve correction and control. It is at this point that the enforcing authority has leeway in method. In general, in labor departments, the enforcement of safety rules and regulations is achieved in a somewhat routine fashion, i.e., the inspector is required to issue the orders immediately on perceiving the so-called violation. With respect to health violations, the industrial hygiene divisions may, after finding a violation, move to obtain correction by agreement. Not being successful after a reasonable period, the Division of Industrial Hygiene may forward the papers to the Division of Inspection for necessary enforcement. The important fact is that the industrial hygiene division has considerable latitude in arranging for compliance with its requirements for the control of a health hazard.

THE EDUCATION OF INDUSTRY

During the last 10 years, health has become a popular subject and along with the increase of knowledge and interest in personal and public health matters, there has gone a corresponding increase in knowledge and interest in the field of industrial health. The work of the universities, the insurance companies, the Industrial Hygiene Foundation, the National Association of Manufacturers, the Public Health Service and other agencies has served to inform the industrialists of this country about health, and particularly, health in industry. This has made the task of what must be done today a relatively simple one.

The key to educating industry to appreciate industrial hygiene lies in demonstrating the healthful plant working conditions are the basis of: (1) good management; (2) good working conditions generally; (3) good union and worker relationships; (4) decreased labor turnover and lost time, and (5) decreased production losses and, therefore, costs of production.

In other words, there are so many axiomatic and obvious reasons why healthful working conditions are good for management, that it is only rarely that this direct approach fails. Printed matter has also been of great aid. Lastly, factory inspectors should be utilized in the education of industry with regard to accident prevention, industrial health and hygiene, and public health.

PERSONNEL WITH WHOM TO DEAL

At this point, it is well to introduce a fundamental consideration, namely, the influence of company size on the whole problem of industrial hygiene and industrial health.

The size of the company and plant determines its administrative organization and the choice of persons with whom the industrial hygienist may deal. In the small plant, one man may make all important decisions—he may purchase as well as sell and, at the same time, be factory superintendent. Such an organization leaves little to the choice of the industrial hygienist. He must see the boss of the establishment. At the other extreme, one may find a large organization where function and jurisdiction are limited and well defined. Here, there may be an industrial hygiene department, a medical department, a department of maintenance, a complete engineering department, a personnel office, a factory manager, a plant superintendent, and one or more safety engineers. Between the small plant and the large one, there are many gradations in size and in kinds of personnel. Thus the choice of the person to whom to report is often made for the industrial hygienist by the company organization. The plant manager or the plant superintendent must be acquainted with the efforts of the

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industrial hygienist. If industrial hygiene technical personnel are a part of the organization, they will be consulted and the problem explored with them. With reference to control ventilation techniques, the plant engineer will naturally play an important role. Use should be made of any and all technical services available at the plant, including the plant physician and the medical department.

As a general rule, no matter whom the industrial hygienist deals with regarding the details of the problem at hand, he should start his plant contacts high up in the managerial scale. Management is entitled to this presentation on a high level and, if it is not forthcoming, work at the plant may meet with delays and unnecessary restrictions. All of this may easily be avoided by a simple explanation to someone high in authority.

TRANSLATION OF RESULTS

There are many ways in which industrial hygiene results may be translated into terms usable by plant personnel. For instance, with reference to exhaust systems, the speed of motors and fans may easily be checked against the original design. Adequate maintenance, a most important factor in the operation of exhaust equipment, constitutes a large industrial hygiene area which may be translated into terms usable by plant personnel.

The difference between good and poor housekeeping may be a determining factor in the difference between industrial disease due, for example, to solvents, and protection from such solvent vapors. Surely, it should be possible to convince plant personnel of the importance of housekeeping in such circumstances. Management is intelligent enough to know that the use of a non-toxic solvent as a substitute for a toxic one is good business, and this industrial hygiene lesson is being translated into usable terms every day.

CHANNELS FOR EMPLOYEE EDUCATION

The individual employee receives the major portion of his industrial hygiene education from three sources:

1. Such material as comes to his attention, chiefly in writing or printing, from the official agencies. Viewed from the overall point of view, the amount of such material coming into the hands of the average worker must be considered to be rather small and limited in scope. At the present time, it cannot be said that this occupies as large a place in the program as it should. There is, of course, real difficulty in spreading information by this means, and, considering the number of workers in this country, it must, in general, be concluded that this avenue of approach is costly and, perhaps, somewhat inefficient.

2. The second avenue of education is that provided by the labor union. At the present time, this approach is used with great efficiency in certain unions and not at all, in a far greater number. That much can be done, has been demonstrated by those unions which have shown a deep interest in this aspect of the industrial health problem. The union approach has something to recommend it, for a worker usually has confidence in everything that comes to him from his own self-supported union.

3. The third and, perhaps, most important channel of industrial hygiene education is that provided by the employer. Here, the education is by word of mouth and comes from the foreman to the shift boss and directly to the worker. It is clear that the importance of the foreman and the shift boss cannot be over-estimated. A plant that intends to conduct a good educational program in the field of accident prevention and industrial hygiene can achieve tremendous results by teaching the foreman and shift boss and, in turn, have them teach the individual worker. The instruction obtained in this fashion is usually pertinent to the specific plant and process operation at hand and is of the utmost value in maintaining safety and health in the plant sponsoring the program. It is usually the plant management who decides on the instruction the worker shall receive, with, of course, a certain area devoted to the education by the union.

GETTING CORRECTIVE ACTION

All corrective action must rest on the firm basis of studies which demonstrate a hazard or the existence of conditions which might tend to injure the health of the worker.

Obviously, it is not necessary to prove that anyone has actually been injured. The dictates of public health and preventive medicine make it mandatory that this be so. Nevertheless, if one is to expect to achieve corrective measures one must unequivocally demonstrate that there is something that really requires correction. This need must be translated into plain talk comprehensible to lay management, if the size of the plant compels the industrial hygienist to deal with non-technical personnel. Usually, this is not too difficult and, as a rule, can be demonstrated in a simple fashion. This demonstration may be reinforced by quotations from rules or regulations and the use of medical or industrial hygiene references which carry conviction.

In order to achieve control, it is important to demonstrate to management why control is to the benefit of both the organization and the worker. This should be made so clear that the self-interest of management should motivate the action desired by the hygienist. Corrective measures should be designed so as to be achieved at the lowest possible cost consistent with the end. There is no reason why management should be asked to spend more money than absolutely necessary in order to achieve protection. Here, as in all engineering work, the elements of cost and economy should be given adequate consideration.

Management should be given guidance and assistance in deciding what to do and how to do it. This is really a part of the educational work of the official agency. In fact, the official agency should rarely be called upon to do fundamental research, with the important exception of

that type and kind of research which can be used to assist management in achieving control results. In this connection, I might mention that at the present time, we are conducting a study of dust control in the making of common brick and we hope to use the results of this research as a basis for engineering control in all of the brickyards of the state.

Management should be given a sufficient period of time for compliance with recommendations. Only in the case of extreme hazards which may cause death on short notice, need the action be very rapid. For the most part, there is sufficient time for conferences and for the purchase of necessary equipment, including the usual delays. No good can come from putting undue pressure on an industry to move with extra rapidity unless there is urgent need for it.

Only after all cooperative efforts have failed to produce results, should the law be invoked and legal action taken. In our experience, this is a rare occurrence. American labor and industry appear to be of one mind in the importance of the subject of health and health maintenance. In many years of experience, I still have to meet the employer who is not himself so interested in health, that he cannot visualize the problem from the point of view of his workers.

INDUSTRIAL MERCURY POISONING

(There will be no author)

Plant situations arise, from time to time, where ventilation does not provide the conventional answer to the control of health hazards, and other measures are necessary. This is peculiarly true in the case of metallic mercury which volatilizes at room temperature.

Mercury Used as a Catalyst

Some difficult problems in this category were recently presented by the finding of excessive concentrations of mercury in several buildings of a large chemical plant in which mercury is used as a catalyst in the manufacture of one of its main products. It was possible to take care of the mercury vapors released from reaction kettles, by means of local exhaust ventilation. However, other sources were more difficult to control. Among these were leaks of metallic mercury from various pipe fittings, pumps and reacting vessels; overflow of charges from reactors; and accidental spillage of mercury during the manual handling of material containing mercury. But the main source of the trouble was general contamination of the buildings by mercury deposits that had become lodged, over a period of many years, in structural members, and in the walls and floors of the workrooms.

Because of the serious nature of the hazard and the inherent difficulties involved in its control, a cooperative program was set up with management, for detailed study of each phase of the problem. Thus far this study indicates, among other things, the need in some cases to provide entirely new equipment and to make important changes in plant processes. As work along these lines is progressing, periodic testing for mercury vapor is being carried out at strategic operations by the Chemical Unit of the Division as well as by the plant chemist. Workers are kept under close medical surveillance.

It is believed that the excellent cooperation, on the part of this plant, will make it possible in time to reduce mercury exposure to within safe limits.

Manufacture of Blood Pressure Instruments

The work in this plant of filling blood pressure instruments with metallic mercury is done by hand from a quart bottle elevated on a stand above the workbench. The bottle was connected to an automatic weighing device, with a hose connection leading to the instrument. Each instrument was filled with ⅓ lb. mercury, and a total of approximately 5000 lbs. of mercury were used per year.

Spillage, in handling the mercury, resulted in considerable accumulations in cracks and tops of work-benches, and in all crevices of the floors. There was volatilization of mercury vapor throughout the building. With all windows closed at the time of the investigation, air tests showed extremely high mercury vapor concentrations, in the air, ranging from 0.18 mgms. per cubic meter in the office to 0.68 near one of the work tables.

In view of the above, management was advised as to the type of ventilation required; procedures for avoiding spillage of mercury; materials to be used for floors and workbenches; the need to wipe up spilled mercury immediately; and the critical importance of plant housekeeping.

In addition, the plant was informed as to the legal requirement in New York State that a separate lunchroom be provided completely removed from mercury contamination. The practice of eating lunch at workbenches was immediately discontinued. This plant is being kept under continuing surveillance while the necessary changes are being made.

Fig. I

Signature of worker with chronic mercurialism, illustrating tremor.

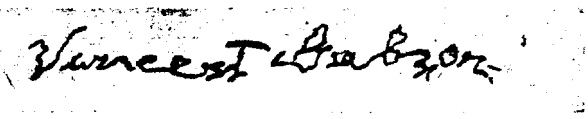
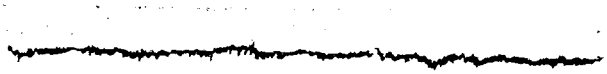
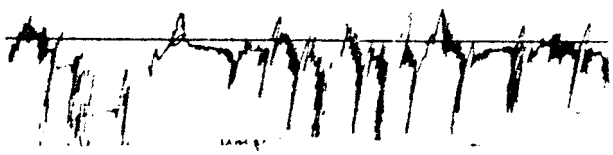


Fig. II

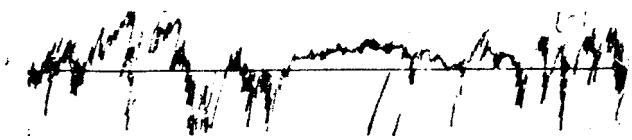
Kymograph Tracings of Mercurial Tremors in Workers



a. Control (No Mercury Exposure)



b. Chronic Mercurialism



c. Chronic Mercurialism

Organic Mercury for Treating Seeds and Grain

Treating of seeds and grain with organic mercury (ethyl mercury phosphate) was being carried out in order to prevent black smut, a fungus disease. Part of the grain so

treated was to be used as seed; another part was ground for feed.

In this plant, approximately 20-25 tons of seed were treated during the months of March, April and May. As the seed grains drop from an overhead hopper, through an enclosed chute, prescribed amounts of the mercury compound were sifted on it. The dusted grain was then moved, by means of an enclosed conveyor, either to spouts for filling burlap bags, or to a grinding mill. In the filling of the burlap bags, an exhaust system carried off the dust from the grain and excess mercury compound, and deposited it under the floor of the building. Bagging of the ground material was done from a port in the mixer.

Air tests for mercury, made at strategic plant operations and at the breathing zone of the workers, were all above permissible concentrations. The plant was advised as to ways and means of controlling the mercury hazard and is cooperating in carrying out these measures.

OCCUPATIONAL CANCER

A Challenge to the Physician

(*Continued from the October, 1951 issue*)

Terms and Pathological Diagnosis Included* Under "Cancer and Other Malignant Tumors" and Reportable in Accordance with §25-b, Public Health Law

Carcinoma
Sarcoma
Epithelioma
Endothelioma
} And any term of which one of these words is a part.

Acanthoma
Astrocytoma
Brain Tumors
Chorioma
Chloroma
Cholesteatoma
Embryoma
Ependymoma
Ganglioneuroma
Glioma
Granulosa Cell Tumor (Ovary)
†Giant Cell Tumor (Bone)
Hypernephroma
Hodgkin's Disease
Leukemia
Lymphoma
Lymphosarcoma
Linitis Plastica (Stomach)
Melanoma
Meningioma
Myeloma
Medulloblastoma
Mesothelioma
Mixed Tumor
Neurocytoma
Oligodendroglioma
Pinealoma
Syncytioma
Seminoma
Sympathoblastoma
Spongioblastoma
Teratoma
Thymoma
Paget's Disease (Breast)
Wilms' Tumor (Kidney)
Ewing's Tumor (Bone)
Grawitz' Tumor (Kidney)

* This list is not exhaustive but comprises the great majority of terms usually used. WHEN THERE IS DOUBT CONCERNING THE MALIGNANT NATURE OF A TUMOR, IT SHOULD BE REPORTED.

† Giant Cell Tumors of Bone Are Usually Benign, But May Become Malignant. Included for Special Study.

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