

FILE NAME: National Safety Council (NSC)

DATE: 1961

DOC#: NSC208

DOCUMENT DESCRIPTION: NSC National Safety Congress Transactions Vol. 1 - Occupational Health Hazards-Medical Aspects & Some Observations on Occupational Dermatoses

1961

National
Safety
Congress
Transactions

VOL. 1

3
Copies for
Robert
John
RAL
IONS

INDEX OF ALL VOLUMES

COUNCIL
Avenue

sensitization. They are inclined to ignore the warnings because in many cases the skin reactions do not appear until several months after a person has started working with the resin. Once a reaction has developed, they must exercise even greater care then required initially in order to prevent a recurrence.

High Energy Fuels

The race for missile supremacy and the conquering of space has confronted us with increased problems of exposure to high energy fuels and their decomposition products. Among these are hydrazine and the boranes—diborane, pentaborane and decaborane.

Hydrazine finds its use as a propellant fuel, either alone or with other compounds such as nitric acid, hydrogen peroxide or oxygen. It has a maximum allowable concentration of one (1) part per million, and in addition to the inhalation hazard, the material is absorbed through the skin. It is primarily a central nervous system stimulant causing excitement, convulsions and cyanosis.

Diborane is a gas at room temperature and has a maximum allowable concentration of 0.1 part per million. Inhalation produces congestion, edema and hemorrhage in the lungs. Its toxicity is comparable to that of phosgene.

Pentaborane is a volatile liquid with a tentative maximum allowable concentration

of 0.005 part per million; however, it is recommended that the exposure be kept as near to zero as is possible since no medical preventive or therapeutic agent has yet been developed for this compound.

Decaborane is a solid having a tentative maximum allowable concentration of 0.05 part per million. Both decaborane and pentaborane attack the central nervous system. Protection is best afforded by the use of air-supplied respirators or cartridge-type respirators that are specifically designed and designated for protection against these compounds.

In concluding this brief discussion, may I point out to you that the services of your local, state, and federal health agencies are always available to you. Should you desire information on the potential health hazard associated with any material or process to which you or your associates are exposed in your particular place of work, feel free to contact any one of them for assistance in evaluating the problem.

REFERENCES

1. Easton, William H., "Smoke and Fire Gases," *Industrial Medicine*, Vol. II, No. 10, p. 467, Oct., 1942.
2. Eisenbud, M., et al, *J. Industrial Hygiene and Toxicology*, p. 232, 1949.
3. Haggard, Howard W. and Henderson, Yandell, "Noxious Gases," Reinhold Publishing Corp., 1943.
4. Stokinger, Herbert E., Ph.D., *Industrial Hygiene Quarterly*, p. 311, Sept., 1956.

OCCUPATIONAL HEALTH HAZARDS — MEDICAL ASPECTS

By HERBERT K. ABRAMS, M.D.

Medical Director, Union Health Service, Inc., Chicago

I would like to quote from a famous writer his description of a "modern" community:

It was a town of red brick, or of brick that would have been red if the smoke and ashes had allowed it: but as matters stood it was a town of unnatural red and black like the painted face of a savage. It was a town of machinery and tall chimneys, out of which interminable serpents of smoke trailed themselves for ever and ever, and never got uncoiled. It had a black canal in it, and a river that ran purple with ill-smelling dye, and

vast piles of buildings full of windows where there was a rattling and a trembling all day long, and where the piston of the steam engine worked monotonously up and down, like the head of an elephant in a state of melancholy madness. It contained several large streets all very like one another, and many small streets still more like one another, inhabited by people equally like one another, who all went in and out at the same hours, with the same sound upon the same pavements, to do the same work, and to whom every day was the same as yesterday and tomorrow, and every year the counterpart of the last and the next. . . .

'pestoies' And, there is a lung disease and in workers in the manufacture of alumina abrasives, called 'Shaver's disease' (after Dr. Shaver who described it). The dust has high concentrations of alumina and silica. Diatomaceous earth, a form of fine silica, similarly causes serious lung disease. And there is byssinosis, resulting from the inhalation of cotton dust. Until a handful of years ago, some of the experts insisted that many dusts when inhaled into the lungs were inert; that is, they produced no effect on the body. However, as we learn more, we find that these so-called "nuisance" dusts are also capable of causing disease. For example, talc, coals, feldspar, graphite, porcelain, barite, bentonite, mica, slate, kaolin, and many others. Even farmers, as well as grain handlers in the holds of ships, suffer from a respiratory disability when inhaling large amounts of grain dust. They develop chronic bronchitis with shortness of breath, cough, etc. Chronic bronchitis can result from inhalation of irritating dusts, fumes and gases: for example, phosphorus chloride and other toxic chloride compounds, acid fumes, hydrogen, nitrous gases, aldehydes, solvents and other chemicals.

One of the leading toxicologists in the country, Dr. Herbert Stokinger, of the Public Health Service, points out that:

Our experience with occupational lung diseases makes it difficult to escape the conclusion that *all dusts*, irrespective of their size, if breathed in sufficient quantity and for sufficient time, may cause profound damage to the lung, and emphasizes the desirability of the physician's obtaining an accurate and thorough history on individuals suspected of pulmonary disease.

Chronic Diseases

I am going to discuss a few more of the chronic health hazards, since these are the chief national health problems of the present.

The chlorinated hydrocarbons, such as carbon tetrachloride, represent a large class of chemicals used in industry. These damage the liver and the kidneys. The chemicals known as aromatic amines, represented by beta naphthylamine, used in the manufacture of dye and other commodities, have been proven to cause cancer of the urinary bladder. The central nervous system—that is, the brain and spinal cord—is affected by many chemicals. Tetra-lead causes severe brain disease called neuropathy. Manganese, one of the im-

portant industrial metals, causes a disease that is remarkably similar to multiple sclerosis. Carbon disulphide may cause severe nervous system effects, affecting the nerves, muscles, and brain.

Serious and sometimes fatal blood diseases may be caused by exposure to benzol. Of course, we know that ionizing radiation in any form—whether through exposure to X-rays or radioactive chemicals—may cause fatal blood diseases as well as various types of cancer. The bones can be affected by exposure to radioactive chemicals, fluorides, phosphorous, and other chemicals. Cadmium affects the lungs and kidneys.

The heart may be affected by the metal known as antimony, and possibly by nitroglycerin, and there have been a number of reports that the heart may also be affected by brucellosis infection, which occurs among slaughterhouse workers and farmers.

Nitroglycerin and related chemicals used in the manufacture of dynamite and other explosives make an interesting story and illustrate some of the problems in occupational medicine. Workers have been exposed to this group of chemicals for many years. They have known for many years that the severe headaches this chemical causes. For years, also, we have heard reports of sudden deaths among workers exposed to nitroglycerin. We do know that this chemical has a powerful effect on the body. It causes profound reduction in blood pressure, severe headaches, palpitation of the heart, nausea and vomiting, fainting, dizziness, and other symptoms. It can also cause skin inflammation. Whether it can cause heart disease is disputed. Even though we have known this chemical for many years, there has been insufficient investigation of the health hazards, and inadequate preventive measures.

Cancer

Occupational cancer is one of our most serious problems. It also provides us with a remarkable opportunity to study cancer in general. The first breakthrough in the mystery of cancer came with the discovery of an occupational cancer. In 1775, in England, Dr. Percival Pott called attention to scrotal cancer as a cause of cancer of the scrotum in chimney sweeps. These were little boys who climbed into the chimneys to clean them out. Years after working in this

occupation, they died of cancer of the scrotum, which was traced to the soot which penetrated their clothing. Similarly, for years we have known that an excessive number of uranium miners in Europe have died of lung cancer. (Recent studies in our own uranium mines reveal dangerously high exposures.)

Since then numerous other chemicals, in addition to ionizing radiation, have been demonstrated to be capable of causing, or contributing to the development of, cancer in various parts of the body. Some examples are beta naphthylamine, which I mentioned earlier, causing cancer of the urinary bladder, coal tars which can cause cancer of the skin, chromates which cause cancer of the lung, and many others. Recent studies have focused suspicion of lung cancer hazards in the work of welders, sheet metal workers and other metal workers.

Skin Diseases

Skin diseases are, as you know, the most frequent type of occupational disease which we see. Most of them result from direct irritation by chemical or physical agents. A smaller number result from an allergic reaction to a chemical. Almost any chemical contact can result in dermatitis. Many of the new chemicals are causing skin troubles. For example, the epoxy resins: These materials are being widely used in electronics, automobiles, pattern-making, die-casting, aircraft, and other trades—for surface coatings and paints, molding compounds, various plastics, and electrical insulation. Another group of chemicals which causes skin disease are the chromates. Chrome ulcerations of the skin are well known. The chlorinated hydrocarbons also may cause skin diseases. One of them is called 'chlor-acne' because it resembles acne. Machinists and metal workers often get a dermatitis from cutting oils. Coal tars produce skin changes, some of which may turn into cancer. There are a host of others too numerous to mention.

Protection

These are only a few examples of the occupational disease hazards arising from contact with chemicals. The alert worker will become acquainted with the materials he is handling and the process he is using, so that he can help to protect himself and his fellows. If he should suffer excessive

exposure to some harmful material, he will know what to tell the doctor who examines him. The alert doctor will be able to correlate the occupational history with the physical findings and symptoms and decide whether the patient is suffering from an occupational disease.

Very few occupational diseases produce such characteristic symptoms that they can be readily identified as an occupational disease. After all, the body can react to harmful stimuli only in a limited number of ways. For example, a worker may have severe pains in his abdomen. These might be caused by appendicitis or by lead poisoning. Leukemia may result from unknown causes or from exposure to X-rays. A person suffering a certain type of paralysis may have multiple sclerosis, a disease of as yet unknown cause, or it could be manganese poisoning. The person who has a cough, shortness of breath, and is losing weight, may have tuberculosis, silicosis, berylliosis or cancer of the lungs. A history including occupational history and a thorough examination is the only way of telling those conditions apart.

Prevention

All occupational diseases are preventable. If we were doing our job right, we would have nothing to talk about today. The fact is that unknown numbers of people are suffering from a great variety of occupational diseases because we are not adequately protecting against them. What are the protective measures which we should follow?

(1) *Education:* Employees should be given adequate training for their jobs, so that they understand the process, know the materials they are handling, and, therefore, can protect themselves and other workers from injury.

Key employees should be instructed in first aid. Management and labor both have responsibilities here. Shop health and safety committees can help in the health education of workers. *There is no substitute for knowledge.*

(2) *Protection of the environment:* This means from the air of harmful dusts, fumes, gases, vapors. This is accomplished by means of engineering measures, such as exhaust ventilation, enclosure of hazardous processes, wetting down methods for suppression of

ists, and substitution of less harmful for dangerous materials. Good lighting and reduction of noise, etc. are other environmental problems that the engineer can help solve.

Only when engineering measures are not possible should respirators or other personal protective devices be depended on for protection against inhaling of harmful materials.

(3) *Good housekeeping and sanitary place of work:* This means a clean place of work, free of dirt and dust, and accident hazards. There should be adequate toilet, washbasin, shower, locker and eating facilities. Washing alone can often prevent dermatitis and other diseases. All containers of chemicals should be properly labeled.

(4) *Personal protective devices:* Whenever necessary, management should supply workers with respirators for protection against noxious dusts, fumes and gases in the air; suitable gloves and work clothing for protection from harmful chemicals; hard-topped shoes and hats for protection from falling objects; safety goggles,

(5) *Medical protection:* This includes first aid facilities and a medical department. Every worker should have a periodic physical examination, not for the purpose of disqualifying him for work, but for the purpose of detecting disease early so that prompt measures can be taken to protect health. The physician has an ethical obligation to inform the worker or his family of any finding important to his health.

In addition to first aid and medical care for work injuries, all workers and their families should have access to modern medical care. Unions throughout the nation are obtaining such care through collective bargaining. Union health centers and others, such as Health Insurance Plan of Greater New York and the cooperative health plans, are attempting to bring good medical planning, preventive medicine, to workpeople.

(6) *Plant health and safety committees:* Every place of work should have a committee of representatives of the workers concerned with the health protection of the men and women in the plant. This committee should have authority to make periodic inspections of the plant and make recommendations to management. The com-

mittee should meet regularly with the plant physician, the nursing staff, the plant safety and industrial hygiene engineers, and with other representatives of management to discuss health and safety problems and to plan programs of education of the workers in these problems.

(7) *Government safety and industrial hygiene agencies:* These agencies should be called upon for help, whenever the union believes that management is not adequately providing health and safety measures in any particular problem.

How We Are Doing Our Job

How well are we doing in protecting our workers? Let me cite a few facts. The prevalence and incidence of occupational diseases in the United States is unknown, because in many states there is no reporting of occupational diseases. And, in those states where there is reporting, it is incomplete and not uniform. Moreover, we know that numerous occupational diseases are not recognized because of medical ignorance, deficiency in medical education, deficiencies in workmen's compensation laws and health and safety laws.

Health services in many private industrial plants are inadequate, and most workers are employed in small plants where such services are not provided. According to the Public Health Service, 90 per cent of the labor force is not receiving proper industrial hygiene and health services.

The governmental agencies, federal, state and local, which are charged with responsibility for protecting the health of workers, are for the most part grossly inadequate in their resources and services. They suffer from lack of funds, personnel and even from lack of authority. At least seven of our states have no occupational health units in their health or labor departments, and in all of the state occupational health agencies in the entire country, there are less than 40 physicians employed. There is no uniformity of industrial health codes and standards, and the states differ in the hazards regulated and in their regulations for the same hazards.

There is a serious and growing shortage of physicians and other health personnel both in and out of industry. Dr. Harold J. Magnuson, Chief of the Division of Occupational Health of the U. S. Public Health

Service, estimates that by 1970, industry will need 4800 physicians, but is expected to have only 2900; while 35,000 industrial nurses will be needed, but only 26,000 are expected; and 3400 industrial hygienists will be needed, but only 1600 are expected.

Workmen's Compensation

Good workmen's compensation laws are basic to the health of industrial workers. Without strong workmen's compensation laws, it is difficult to see how we can ever have really effective implementation of our industrial health measures. The fact is that although the workmen's compensation laws are the earliest form of social legislation in the United States, they are in almost all cases hopelessly behind the times. They are inadequate in their provisions for compensation, for medical care and rehabilitation, and most of them have not been brought up to date to permit equitable recognition and compensation for the injuries inflicted by radiation and chemical hazards which cause chronic diseases, usually after long latent periods between exposure and the first symptoms of disease.

Two states still have no occupational disease coverage. Nineteen state laws cover only specified diseases. Most of the laws exclude farm work, domestic work and casual employment. In over half the states, employees in small establishments which have less than a specified number of employees are excluded, and in 12 states the laws apply mainly to a list of "hazardous" employments. Many white collar workers are today excluded from the workmen's compensation laws.

Research

The level of our research in occupational health is correspondingly low. Research is largely in the hands of private industry, and it is guided substantially by the economic needs of the particular industry. Even where research is done in universities, much of this is subsidized for special needs by private industry. Governmental agencies sporadically have made excellent contributions, but their resources are chronically inadequate. There is an urgent need for a system of research and consultation facilities in various parts of the country where workers and employers alike can go for scientific solutions to their problems.

Hope for the Future

Last year, a subcommittee of the House committee on appropriations under Congressman Fogarty conducted hearings on these problems. These are published in a "Report on Environmental Health Problems," available through the Government Printing Office.⁸ It is interesting reading. These hearings raised hope that better appropriations would be made to the Public Health Service and other agencies for an expansion of services in the environmental health field.

In the meantime, there is a dangerous vacuum in the supervision of hazards from ionizing radiation as differences prevail among the interested agencies, AEC, U. S. Public Health Service and the states, over jurisdiction in this field. At the moment, controls in this field are a patchwork with good programs in a few states like New York and California, but poor or almost non-existent programs in most others.

The implications of all this should be obvious. Occupational health and workmen's compensation vitally and directly affect the health and life of working people. Yet the unions so far, for the most part, seem to be apathetic about this. Now that unions are deeply involved in health insurance, for the care of non-occupational diseases, perhaps there will be a resurgence of interest in the environmental factors which affect our health.

A few unions have begun to help themselves. Some have negotiated clauses in their collective bargaining agreements embodying a number of the preventive measures I outlined earlier, and have also asserted the union's right to bring expert consultants into the plant.

The United Auto Workers has a department of occupational health, staffed by two experts in safety and industrial hygiene. The International Association of Machinists has a medical consultant. The International Chemical Workers' Union also has a medical consultant and recently appointed a staff safety man. These people can be of great help to workers in providing them with expert knowledge and honest information. Obviously, however, every union cannot and should not hire its own corps of experts and set up its own research laboratories. We are dealing with big social problems, and they must be met socially.

Professor of Sociology of Columbia University, C. Wright Mills, defines the issue in this way:

No moral endeavor, no political orientation, no human study that does not pay close attention to man at work, can possibly be adequate for our time. For work is affected by and in turn affects all that man is and all that he might become. The question we must ask of any society or of any social program is what kinds of men and women does it select, encourage, create? And, in terms of this human evaluation, the most important question we can ask is whether work is a void in which men sacrifice themselves or whether work is a central feature of a style of life in which man may realize himself. . . .

REFERENCES

- (1) Hunter, Donald, *The Diseases of Occupations*, Little, Brown & Co., 1955, pp 85-6
- (2) *Report of the Atomic Power Investigating Commission to the 71st General Assembly*, State of Illinois, March, 1959, p. 25

- (3) U. S. Department of Health, Education and Welfare, Public Health Service, *Summary of Report on Hearings on Environmental Health*, 1959
- (4) Rumford, John, *Mortality Studies in Relation to Air Pollution*, presented at meeting of American Public Health Association, 1959
- (5) Stokinger, as quoted by Mancuso, Thomas, in *Ohio State Law Journal*, "Medical Aspects of Occupational Diseases," Vol. 19, No. 4, p. 631
- (6) Mills, C. Wright, in Symposium, "Man and Work," Northern California Mental Health Association, San Francisco, 1951
- (7) *Governor's Conference on Health Hazards in Uranium Mines*, U. S. Department of Health, Education and Welfare, Public Health Service, Washington, D. C., 1961
- (8) *Report on Environmental Health Problems*, Hearings before Subcommittee of Committee on Appropriations, House of Representatives, 86th Congress, Government Printing Office, Washington, D. C., 1960

SOME OBSERVATIONS ON OCCUPATIONAL DERMATOSES

By PAUL P. BOSWELL, M.D.
Senior Dermatologist, Provident Hospital, Chicago

Incidence of Industrial Skin Diseases

While there are at present no reliable statistics on the incidence of occupational dermatoses, their frequency is undisputed. Indeed, in World War II evidence indicates that there were more skin casualties than all other battle casualties in this very specialized occupation of soldiering.

In England, a three year study done between 1930 and 1932 inclusively, more than 72 per cent of all occupational diseases were found to be industrial or occupational dermatoses.

Reports from the compensation boards in seven states in this country indicated that 65 per cent of all compensable cases were occupational dermatoses. In a fashion more understandable to those of us accustomed to cost and taxes, this means an estimated loss of more than ten weeks per year with an annual cost of approximately one million dollars. This, in itself, a staggering figure.

Anatomy and Function of the Skin

With these brief statistics, it is well to ask something of their body area, so easily

disposed to such great measure of damage. And again it is felt that a most superficial look at the anatomy and function of the skin, as it is related to this question, is indicated especially for those not related to the medical sciences.

It is not always realized that the skin is one of the most important organs of the body. In its embryonic development, it represents the first of the three primary or basis tissues formed, the ectoderm. And from this ectoderm the largest sensory organ is developed, the brain. So the skin is not only a prologue to the brain, but remains the next largest sensory organ.

The skin is an organ, a very complex organ, constituting about one sixteenth of the total body weight. It contains, within its comparatively thin structure, muscles, blood vessels, nerves, glands, specialized cells such as those that produce pigment and appendages such as nails and hair.

With over-simplification, we can divide the skin in two major layers—an inner layer, called the corium and an outer layer called epiderm. The inner layer is tough, elastic and resilient, and its chief function

is to protect the body from injuries and this produces le

The epiderm protects by sensitive, or sweat gland pigment color in all normal or quantity.

Of the following a this discussion

(1) It protects the body by and elasticity

(2) It protects insensitive of dermis by stances.

(3) It protects the body by its pigment

(4) It protects the body by its pigment

(5) It protects the body by its pigment

(6) It protects the body by its pigment

(7) Finally

All of the following modified influences described some constant environment.

Historical Background

From a historical point of view, the skin has suffered by many factors. Not until 17th century his *Treatise* and many of today.

In 1775, I described the scrotum, as Abrams.

Not until the 19th century were

RAILROAD SECTION

NATIONAL SAFETY COUNCIL 1961-62

General Chairman—H. C. DAULTON, The Louisville & Nashville Railroad Co., Louisville, Ky.

Vice Chairman—D. P. RUSSELL, Canadian Pacific Railway Co., Montreal, Quebec

Chairman—W. V. HAYES, New York Central System, New York, N. Y.

Secretary and Newsletter Editor—G. R. HUNTOON, Chicago Rock Island & Pacific R. R. Co., Chicago, Ill.

Associate Newsletter Editors

West Coast—G. W. MEREDITH, Norfolk & Western Railway Co., Roanoke, Va.

San Francisco—M. A. NUGENT, The Southern Pacific Co., San Francisco, Calif.

Chicago—A. W. SHEA, Chicago, Milwaukee, St. Paul & Pacific Railroad Co., Chicago, Ill.

Richmond—H. A. HILL, Richmond, Fredericksburg & Potomac Railroad Co., Richmond, Va.

Arkansas—G. R. KNIGHT, St. Louis Southwestern Railway Lines, Pine Bluff, Ark.

Montreal—J. R. BANNERMAN, Canadian National Railways, Montreal, Quebec

Executive and Statistical Committee—W. C. LARAWAY (*Chairman*), The Delaware & Hudson Railroad Co., Albany, N. Y.; E. L. DUGGAN (*Vice Chairman*), Atchison, Topeka & Santa Fe Railway System, Chicago, Ill.; G. E. GETTY, Bureau of Railway Economics, ssn. of American Railroads, Washington, D. C.; T. L. HILDEBRAND, Soo Line Railroad Co., Minneapolis, Minn.; G. W. MEREDITH, Norfolk & Western Railway Co., Roanoke, Va.

Public Relations and Sound Committee—M. A. NUGENT (*Chairman*), Southern Pacific Co., San Francisco, Calif.; A. B. AUERHAAN (*Vice Chairman*), New York, New Haven & Hartford Railroad Co., New Haven, Conn.; E. H. BLEWER, New York Central System, Cleveland, Ohio; G. R. KNIGHT, St. Louis Southwestern Railway Lines, Pine Bluff, Ark.; L. C. McDOWELL, Chicago & North Western Railway, Chicago, Ill.; A. W. SHEA, Chicago, Milwaukee, St. Paul & Pacific R. R. Co., Chicago, Ill.; *L. C. WHNEY, Elgin, Joliet & Eastern Railway Co., Joliet, Ill.; E. L. CARROLL, Southern Pacific Co., San Francisco, Calif.

Road and Highway Traffic Safety Committee—G. M. DEMPSEY (*Chairman*), Chicago, Milwaukee, St. Paul & Pacific Railroad Co., Chicago, Ill.; C. M. SCHAEFER (*Vice Chairman*), Chesapeake & Ohio Railway Co., Huntington, W. Va.; E. W. HOBBS, Missouri Pacific Lines, St. Louis, Mo.; H. E. SHAUGHNESSEY, Erie-Lackawanna Railroad Co., Cleveland, Ohio; G. R. HUNTOON, Chicago, Rock Island & Pacific R. R. Co., Chicago, Ill.; J. P. KOLAC, Illinois Central Railroad, Chicago, Ill.

On and Off-The-Job Safety Committee—J. T. WILLIAMS (*Chairman*), Pennsylvania Railroad Co., Philadelphia, Pa.; J. L. ROHWER (*Vice Chairman*), Duluth, Missabe Iron Range Railway Co., Duluth, Minn.; *R. P. HAMILTON, St. Louis-San Francisco Railway Co., St. Louis, Mo.; P. W. ACKERMANN, Denver & Rio Grande Western Railroad Co., Denver, Colo.; VIRGIL SMITH, Terminal Railroad Assn. of St. Louis, Louis, Mo.; J. W. THOMPSON, Seaboard Air Line Railroad Co., Richmond, Va.

Membership Committee—P. M. BRITT (*Chairman*), Clinchfield Railroad, Erwin, Tenn.; O. W. SMITH (*Vice Chairman*), Grand Trunk Western R. R. Co., Detroit, Mich.; R. W. BOWMAN, Bessemer & Lake Erie Railroad, Greenville, Pa.; W. O. COTTINGHAM, Western Maryland Railway Co., Hagerstown, Md.; P. H. JENNER, Western Pacific Railroad Co., San Francisco, Calif.; J. H. WILLIAMS, Texas & Pacific Railway Co., Dallas, Tex.

Nominations and Elections Committee—*G. C. STROMSOE (*Chairman*), Atlantic Coast Line Railroad Co., Jacksonville, Fla.; *F. C. LEWIS (*Vice Chairman*), The Pullman Co., Chicago, Ill.; *L. C. HAHNEY, Elgin, Joliet & Eastern Railway Co., Joliet, Ill.

Program Committee—D. P. RUSSELL (*Chairman*), Canadian Pacific Railway Co., Montreal, Quebec; W. V. HAYES (*Vice Chairman*), New York Central System, New York, N. Y.; J. E. SLAVEN, Chicago, Burlington & Quincy Railroad Co., Chicago, Ill.; E. W. HORBS, Missouri Pacific System, St. Louis, Mo.; *J. LLOYD, Jersey Central Lines, Jersey City, N. J.; D. F. GIFFORD, Chicago Great Western Railroad Co., Oelwein, Iowa; RAYMOND DAVIS, New York City Transit Authority, Brooklyn, N. Y.

Planning and Publications Committee—*J. LLOYD (*Chairman*), Jersey Central Lines, Jersey City, N. J.

Posters—L. E. WALL (*Vice Chairman*), Illinois Central Railroad, Chicago, Ill.; C. E. THORNEY, Chicago, North Shore & Milwaukee Railway Co., Highwood, Ill.; G. M. DYER, Kentucky & Indiana Terminal Railroad Co., Louisville, Ky.; E. G. HUSK, The Pullman Co., Chicago, Ill.; T. G. WIGLEY, Akron, Canton & Youngstown Railway Co., Akron, Ohio; ROSS S. VAN NESS, Chicago, Burlington, & Quincy R. R. Co., Ottumwa, Iowa

Publications—J. A. DILLAN (*Vice Chairman*), Duluth, Missabe & Iron Range Railway Co., Duluth, Minn.; J. T. ANDREW, Great Northern Railway, St. Paul, Minn.; F. B. LEWIS, Union Pacific Railroad, Omaha, Nebr.; J. G. BELDHAM, Toronto, Hamilton, & Buffalo Ry. Co., Hamilton, Ontario; C. A. BIRGE, Missouri-Kansas-Texas Lines, Denison, Texas; A. J. BENSALA, Boston & Maine Railroad Co., North Station, Boston, Mass.

Planning—J. R. BANNERMAN (*Vice Chairman*), Canadian National Railways, Montreal, Quebec; *C. T. DEWITT, Northern Pacific Ry. Co., St. Paul, Minn.; R. A. NEWTON, Chicago & Western Indiana RR-Belt Railway Co., Chicago, Ill.; CASMER SMITH, McKeesport Connecting Railroad Co., Pittsburgh, Pa.; R. F. DUVALL, New York, Susquehanna & Western Railroad Co., Paterson, N. J.; HOWARD ODOM, New York, Chicago & St. Louis Railroad Co., Cleveland, Ohio; T. L. HILDEBRAND, Soo Line Railroad Co., Minneapolis, Minn.

Resolutions Committee—G. M. DEMPSEY (*Chairman*), Chicago, Milwaukee, St. Paul & Pacific Railroad Co., Chicago, Ill.; J. P. KOŁOC (*Vice Chairman*), Illinois Central Railroad, Chicago, Ill.

Staff Representative—L. W. DUTTON, National Safety Council, Chicago, Ill.

*Past General Chairman

Other Volumes in this (1961) Series

Users of this volume will find much value in its companion volumes, which offer the complete record of the 49th National Safety Congress! Here is the list:

Vol. No.	Title	1 to 9 Copies	10 or more	Stock No.
1	General Sessions and Index to all Volumes.....	\$.65	\$.55	022.31-1
2	Aero-space; Air Transport.....	.65	.55	022.31-2
3	Automotive and Machine Shop; Power Press and Forging.....	.65	.55	022.31-3
4	Cement, Quarry and Mineral Aggregates.....	.40	.35	022.31-4
5	Chemical and Fertilizer.....	.65	.55	022.31-5
6	Civic Leadership; Church, Home, Women, Youth, Farm.....	.90	.80	022.31-6
7	Coal Mining.....	.65	.55	022.31-7
8	Construction; Public Employee.....	.65	.55	022.31-8
9	Electrical Equipment.....	.40	.35	022.31-9
10	Food and Beverage; Meat Packing, Tanning and Leather Products; Trades and Services.....	.65	.55	022.31-10
11	Glass and Ceramics; Rubber.....	.65	.55	022.31-11
12	Industrial Subjects Sessions (ASSE).....	.90	.80	022.31-12
13	Labor.....	.65	.55	022.31-13
14	Marine.....	.65	.55	022.31-14
15	Metals.....	.65	.55	022.31-15
16	Mining.....	.65	.55	022.31-16
17	Motor Transport; Transit.....	.90	.80	022.31-17
18	Occupational Health Nursing.....	.40	.35	022.31-18
19	Petroleum.....	.65	.55	022.31-19
20	Public Utilities.....	.65	.55	022.31-20
21	Pulp and Paper; Printing and Publishing.....	.65	.55	022.31-21
22	Railroad.....	.40	.35	022.31-22
23	School and College.....	.90	.80	022.31-23
24	Traffic.....	.65	.55	022.31-24
25	Wood Products; and Textile.....	.65	.55	022.31-25
26	Early Morning Sessions—"Time Management".....	.65	.55	022.31-26
COMPLETE SETS (26 Volumes).....		\$10.50	\$10.50	022.11

All prices shown are subject to a 10 per cent discount to National Safety Council members.

NATIONAL SAFETY COUNCIL • 425 NORTH MICHIGAN AVE. • CHICAGO 11, ILL.

210036202

PRINTED IN U. S. A.

022.31-22