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LITERATURE ABSTRACTS

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INDUSTRIAL HYGIENE FOUNDATION
MELLON INSTITUTE
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INDUSTRIAL HYGIENE FOUNDATION
OF AMERICA, Inc.

Engineering Series. Bulletin No. 7

COMBUSTIBLE GAS AND VAPOR DETECTORS

4400 Fifth Avenue
Pittsburgh, Pennsylvania 15213
1967

Introduction

As an introduction to the general subject, it should be recalled that a combustible gas or vapor, dispersed in air, will form an explosive mixture only over a definite range of concentrations characteristic of that material. Certain gases form flammable mixtures over extremely wide concentrations and represent serious explosion hazards when leakage occurs. In this respect the most dangerous gases, and their flammable limits are ethylene oxide (3-100%), acetylene (2.5-81%), and hydrogen (4-75%). Special equipment and precautions are required when testing for these or in testing for other combustible gases in oxygen-rich atmospheres. Concentrations below the lower explosive limit cannot burn explosively because of insufficient fuel; those above the upper limit will not explode because lack of oxygen does not permit rapid propagation of the flame. However, concentrations above the upper explosive limit must be regarded as extremely hazardous because dilution of the mixture with air will bring it into the explosive range.

Description and Use of Combustible Gas Indicators

Combustible gas indicators are calibrated in terms of the lower explosive limit, generally designated the "0-100% LEL" scale. A few are calibrated in decimal values, the LEL having a value of 1.0. The purpose of this system is the prevention of misinterpretation of "%LEL" as percentage concentration of gas. An example will illustrate: for acetone vapor in air, the limits of flammability are 2.6 to 12.8% by volume. Therefore, in an atmosphere containing 1.3% acetone vapor, a meter reading of 50% LEL or 0.5 LEL would be expected. However, each manufacturer calibrates his instruments against a particular gas or vapor (e.g. methane, hexane, and benzene are common) and reference charts or tables of conversion factors are necessary to convert meter readings to accurate values for other materials. These charts or tables are available from the supplier, usually without additional charge, and should be requested when an instrument of this kind is purchased.

In addition to the 0-100% LEL scale, certain combustible gas indicators carry a second scale representing a ten-fold increase in sensitivity. This is commonly designated as the 0-10% LEL scale, but may be marked 0-1000 ppm (parts per million). A dual-range instrument makes possible the monitoring of combustible vapors at concentrations too low to be explosion hazards but which may be dangerous to health when inhaled. An atmosphere may be safe from an explosion standpoint yet quite dangerous from an inhalation standpoint. The dual-range instrument therefore serves a double purpose and is the better buy.

Principles of Operation

Most combustible gas indicators operate on the same general principle: combustion or flammable material on a heated platinum wire (working filament) which forms one leg of a Wheatstone bridge. The resulting heat of combustion increases resistance of the working filament and unbalances the bridge. This unbalance, being proportional to the temperature and thus to the amount of combustible gas, is shown on the meter in terms of the lower explosive limit. Near the working filament, but protected from the air sample, is an identical (reference) filament which forms the adjacent leg of the bridge circuit. The reference filament compensates for changes in ambient temperature and voltage. Operating temperatures of working filaments vary from one brand to another. Some manufacturers stress the safety and long life of their low temperature filaments while others prefer higher temperatures. The latter have the advantage of giving better performance on the more difficult oxidizable materials (such as methane) and of avoiding contamination of the filament by tetraethyl lead in gasoline vapors.

Types of Detectors Available

Several suppliers offer both portable and fixed detectors. The latter, in single- or multipoint models, may be had with a simple alarm (horn, bell or light), indicating meter, or graphic recorder; while the more complex systems may have all these and control auxilliary ventilation equipment as

well. The permanently installed detectors are generally of single range (0-100% LEL). Permanently-installed detectors use either a sampling pump or, in the lower priced models, depend upon diffusion of air-vapor mixtures to the working filament through a porous cover, e.g. sintered metal, which acts as a flash-back arrestor and coarse filter. Most portable types use a rubber squeeze-bulb or small electric pump to draw the atmosphere sample through a special hose, conditioning filter, flash-back arrestor, and then over the working filament. The electric pump results in steady meter readings rather than the oscillations produced by the squeeze bulb.

The only advantage of the permanently-installed detector is, of course, the capability for continuous monitoring of one or several fixed areas. Such systems are more expensive, costing about $500 to $1, 500 (for certain explosion proof models) for a single station, plus $200 to $500 for each additional station. Also, they lack the flexibility to explore and define a situation, or easily to meet changing needs. It is recognized that there are situations where full-time monitoring would be very desirable if placement of sensing heads could be made in the areas of greatest hazard. In most cases this may be difficult to determine.

Meaning of Approvals by Certifying Agencies

The prospective buyer may be confused by various "approvals" conferred upon combustible gas indicators. Chief among these are Bureau of Mines, Factory Mutual, and Underwriters Laboratories. The Bureau of Mines,

as the name indicates, was set up to concern itself with the safety of mining operations. As such, its approval of a combustible gas indicator extends only to use underground in atmospheres containing methane. The ignition temperature of methane is higher than that of other gases and much higher than for organic vapors. It is therefore clear that approval or lack of approval by the Bureau of Mines means little when looking at meters intended for use in our plants and in the presence of a variety of combustible gases and vapors.

Approval of Factory Mutual or Underwriters Laboratories means, primarily, that flame arrestors and case will not permit a flame, originating within the case, to escape and propagate a flame or explosion outside. Approvals are occasionally restricted to certain groups of materials. For the benefit of those who may not be familiar with the Occupancy Classes and Atmospheric Groups, a description is appended. For general use, our requirements should be adequately met by equipment approved for Class I, Group D. It should be noted that instruments of the type under discussion do not respond to explosive dusts, Groups E, F, or G. Since the cost of these FM or UL tests is high and must be borne by the manufacturer, the latter usually submits only his low cost, high sales volume model for approval. If this model passes, one can be reasonably sure that the higher priced instruments of the same manufacturer are at least as safe.

Calibration and Proper Use is Essential

Before taking a portable combustible gas indicator into a contaminated area, the instrument must be turned on and the zero adjustments made in a "clean" atmosphere. If hazardous concentrations are expected in the area to be tested, it is good practice to leave the instrument on until one has

returned to a "clean" environment to avoid switching in a potentially explosive situation. An extension tube is required for sampling atmospheres inside operating equipment, or tanks, or reaching into manholes. Such tubes should be made of a material that is impervious to the combustibles that may be present.* In using sampling probes and tubing, care must also be taken to avoid loss of easily condensable vapors in the line. This is a common source of error in testing for solvent vapors, and warming of the instrument sampling system and associated tubing to a temperature slightly above ambient or process temperature may be required.

Regardless of the type or brand of equipment selected, readings may be relied upon only if the system is occasionally checked against a known gas mixture. Only experience will indicate how frequently checking is required but testing before each day's use is suggested to those starting with a new piece of equipment. Cylinders of compressed gas-air mixtures, with certificates of analysis, are available from several suppliers: Linde (sold through J. T. Baker Chemical Company), Matheson, Mine Safety Appliances Company,** Union Industrial Equipment Company, and Davis Emergency Equipment Company. These are satisfactory for the "fixed gases" but are impractical for easily condensable vapors such as those of paint solvents. Test kits are

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* Conditions under which a nonconducting and/or nonsparking probe are indicated cannot be prescribed here but may be of concern in special situations.

** In addition, Mine Safety Appliances Company manufacturers a Field Calibrator Kit whereby one small "sparklet" type cylinder of isobutane may be used to calibrate a large number of instruments. (Isobutane is used in this service because its ignition temperature is the same as that of methane.)

also available which are convenient and inexpensive. A very simple one is the Johnson-Williams "Gas Indicator Test Kit" which contains sealed gas ampoules filled with methane at atmospheric pressure. For use, an ampoule is broken inside a plastic bottle to give a methane-air mixture equivalent to 22% LEL. Since methane is somewhat more difficult to oxidize than other gases, satisfactory performance on a methane standard assures normal response to other combustible gases and vapors.

APPENDIX

Occupancy Classes and Atmospheric Groups*

Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

Class II locations are those which are hazardous because of the presence of combustible dust.

Group A, Atmospheres containing acetylene;

Group B, Atmospheres containing hydrogen, or gases or vapors of equivalent hazard such as manufactured gas;

Group C, Atmospheres containing ethyl ether vapors, ethylene, or cyclopropane;

Group D, Atmospheres containing gasoline, hexane, naphtha, benzine, butane, propane, alcohol, acetone, benzol, lacquer solvent vapors or natural gas;

Group E, Atmospheres containing metal dust, including aluminum, magnesium, and their commercial alloys, and other metals of similarly hazardous characteristics;

Group F, Atmospheres containing carbon black, coal or coke dust;

Group G, Atmospheres containing flour, starch, or grain dust.

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* Taken from 1965 National Electrical Code of the National Fire Protection Association.

INDUSTRIAL HYGIENE FEATURES

The burden of responsibility in suicide and homicide are discussed in Abst. No. 230.

The effect of alcohol on hemopoiesis is described in Abst. No. 231.

Abst. No. 235 surveys the problems of contact lenses in industry.

Information on the ventilatory performance of American physicians is given in Abst. No. 241.

Abst. No. 246 investigates the effect of posture on the plasma cholesterol level.

Abst. No. 253 is concerned about the smoking habits and survival of lung cancer patients.

A report on skin tumorigenesis by an extract of amber petrolatum is given in Abst. No. 262.

Activated charcoal vs "universal antidote" as an antidote for poisons is discussed in Abst. No. 265.

Acute occupational cadmium poisoning is reviewed in Abst. No. 269.

Details on mercury hazard in the manufacture of artificial jewelry are presented in Abst. No. 272.

Liver disease secondary to tetrachloroethylene exposure is discussed in Abst. No. 275.

Abst. No. 278 presents metabolic studies on men exposed to nitrobenzene vapor.

A report on experiments on elimination of dust from human lungs is given in Abst. No. 284.

Data on silica excretion in relation to the chemotherapy of silicosis are given in Abst. No. 287.

Asbestos dust and its measurement is the title of Abst. No. 288.

See Abst. No. 295 for observations from a 26-year sulfur dioxide survey.

FOUNDATION FACTS

STAFF ACTIVITIES:

Dr. Paul Gross, Director of the Foundation's Research Laboratory, will attend a meeting of the American Conference of Governmental Industrial Hygienists TLV Committee to be held in Washington, D.C. on March 30 and 31, 1967

Dr. Robert T.P. deTreville, Managing Director, attended a conference, "Emotional Health—An Industrial Problem," held in Pittsburgh on March 9, 1967 and sponsored by the Tristate Industrial Association and Pennsylvania Mental Health, Inc. On the program were two members of the Faculty of the Foundation's experimental course on Employee Mental Health (See Industrial Hygiene Digest 28:7, pp. i-ii, July 1964 and Nursing Series Bulletin No. 1): Dr. John MacIver, Director Psychiatric Services, U.S. Steel Corporation, and Dr. Jack A. Wolford, Chief, Social Psychiatry, Western Psychiatric Institute and Clinic, University of Pittsburgh. Foundation Trustee Dr. Robert B. O'Connor also participated. (See Editorial on pages ii-v).

PUBLICATIONS: The Foundation is pleased to enclose with this Digest its 1966 Annual Report and a copy of the Engineering Series Bulletin No. 7 entitled "Combustible Gas and Vapor Detectors." Bulletins in preparation by other committees are: "The Pneumoconioses" and "Critical Incident Technique." Material is also being assembled for the second Engineering Committee "Information Exchange Capsule." Comments so far received have been uniformly favorable concerning the new capsule service and its possible application to other technical and professional areas is under consideration.

TRANSACTIONS OF THE 31st ANNUAL MEETING, October 18-19, 1966, have been mailed to the membership. These contain information of importance to industrial management and should be brought to the personal attention of top management. It has been said that, in truth, industrial hygiene is too important today to leave entirely to industrial hygiene technicians. Additional copies available at $2.00 a copy to members, $3.00 to non-members.

32nd ANNUAL MEETING: Plans are being made for the 32nd Annual Meeting, October 10-11, 1967. Members having suggestions for inclusion in the Technical Conferences are urged to forward them directly to the Managing Director for consideration.

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ADVISORY FELLOW TO ASSIST INDUSTRIAL HYGIENE FOUNDATION RESEARCH

Dr. Ian T. T. Higgins, Professor of Community Health Services and Epidemiology and Director of the Adult Health and Aging Unit, University of Michigan School of Public Health has accepted an appointment of Advisory Fellow to the Industrial Hygiene Foundation.

Dr. Higgins received his medical degree (M.B.) from the London Hospital Medical School in London, England in 1946 subsequently holding hospital appointments in general medicine, pediatrics and diseases of the chest. He obtained his M.D. (the equivalent of Ph.D. in the United States) in 1951. His academic distinctions include the Charrington Prize in Anatomy and the Arnold Thompson Prize in Diseases of Children.

In 1953 he became a member of the scientific staff of the British Medical Research Council's Pneumoconiosis Research Unit advancing to the office of Assistant Director of the Unit in 1962. In 1963 he joined the staff of the University of Pittsburgh Graduate School of Public Health as Professor of Chronic Disease Epidemiology, leaving in December, 1966 to accept his present position.

Among his appointments are Consultant to the Division of Occupational Health, U.S. Public Health Service, and Consultant to the Epidemiology Branch, Communicable Disease Center, Atlanta, Georgia. He is a member of the Committee on Standardization of Techniques for Respiratory Surveys of the American Thoracic Society and the Air Pollution Training Grants and Fellowships, U.S. Public Health Service.

Society memberships in the United Kingdom include Fellow of the Royal Society of Medicine, Member of the Tuberculosis Association, Associate Member of the Thoracic Society and Member of the Society for Social Medicine. In the United States he is a Fellow of the Council on Epidemiology of the American Heart Association, a Member of the American Epidemiological Society and the Council on Arteriosclerosis.

While at the University of Pittsburgh, Dr. Higgins carried forward studies in mining communities in Britain and the United States (West Virginia) to compare prevalence of chronic respiratory disease between miners and non-miners and to obtain international comparisons as well. His talk to the Symposium on "Emphysema in Industry"* indicates the scope of work in which he is currently involved. He also participated in IHF discussions of a central data repository of environmental exposure information and central management of industrial mortality and morbidity experience.

Dr. Higgins' excellent background of training and experience, his unique accomplishments and his desire to extend epidemiologic studies in industry and its workers should aid the Foundation in implementing several of its new and important research undertakings.

* Proceedings published as the IHF Medical Series Bulletin No. 10 "Emphysema in Industry" (1966).

EDITORIAL

Dr. O'Connor gave this presentation at a conference sponsored by the National Association of Manufacturers and the Center for Occupational Mental Health "Mental Health and the Business Community" in New York on October 21, 1966. He also participated in a similar meeting "Emotional Health—An Industrial Problem" sponsored by the Tristate Industrial Association and Pennsylvania Mental Health, Inc. This paper will soon appear in a book Mental Health and the Business Community.* Dr. O'Connor is a Trustee of IHF. (See Industrial Hygiene Digest 27:8, p. i, (Aug. 1963).

THE CHALLENGE TO AMERICAN INDUSTRY

By

Robert B. O'Connor, M.D.
Vice President-Health Services
United States Steel Corporation

A major challenge to American industry stems from the fact that human beings persist in acting like human beings.

Industrial management is comfortable with measurable, predictable things. Machines, materials, money and manufacturing operations are not uncomplicated, but they are susceptible to measurement, and to a considerable degree causes and effects are predictable. But human beings appear to be human enigmas. Even the most astute executive, with a high degree of intuitive understanding of people, wishes he could measure and manage the people part of his business as confidently as the material part.

This is true in the supervisor's day-to-day relationships with his subordinates. It becomes blatantly and confusingly true if an emotional problem or mental illness is involved. And so, although the title of this conference is Mental Health, a significant part of it will be devoted to mental illness.

Mental illness is not an ideal term here because it is too apt to connote major mental aberrations such as schizophrenic and manic depressive reactions. Industry is concerned with the whole range of human behavior and so a more widely inclusive term, perhaps "emotional problems," would be more useful for us.

Although the problem case presents the more immediate and obvious need, mental health should be the more fruitful long term goal.

Whatever the terms, we will at the outset be talking about people who have some degree of disablement in one or more of the functions of living. From the famous Manhattan study we know that the incidence of emotional problems is high, probably as high as one in four in the general population. One would expect that it would be considerably lower in the industrial population because there is selection at the time of employment and continuing further selection because of continuing at work. There are no equivalent studies of the industrial population, but a good guess-estimate might be one in eight or ten. However, all of us are likely at one time or another to have an emotional problem of a greater or lesser degree of seriousness. So, while mental illness is surprisingly ubiquitous, the incidence of emotional problems in any group, over a long enough time span, will approach 100 per cent.

Most of the major industries today have industrial medical programs of one sort or another. To a significant degree their focus is on organic medical illness. Yet a case of emotional illness can have a far more pervasive and disruptive effect on the functioning of a department. It can be far more subtle and difficult to identify, evaluate and treat.

Subtle, pervasive and disruptive are useful adjectives to describe the characteristics of a majority of emotional problem cases in industry; subtle because the behavior of the individual is often not blatantly normal; pervasive because it can involve a unit or section for a considerable period of time before being properly identified, and disruptive because it so often distorts interpersonal relationships and such relationships are at the core of effective functioning of a unit.

* From the forthcoming book, Mental Health and the Business Community, edited by Dr. Alan McLean, to be published by The Macmillan Company.

Identification is not always difficult. I once saw a man in industry, at the request of his supervisor, because the man was found regularly using an unconnected telephone that hung on the wall near his machine. Before making any decision he would use that phone to talk with and obtain advice from three sources. They were Bing Crosby, Harry Truman and God—in that order. Without impugning the consultative qualifications of these three sources, one can say with a fair degree of confidence that this was not normal behavior.

On the other hand paranoid ideas (delusions of persecution) may be described with seeming clarity and logic by an individual who appears to be quite intact.

There are numerous clues to identification of an emotional problem, such as manner, demeanor, interpersonal relations, deterioration of work performance, and the like. But in many instances there are no obvious clues. The individual may be bottling up within himself and masking from the rest of the world a painful anxiety or depression. And it must be accepted too that some of these are transient or self-limited, or are resolved more or less successfully by the individual without intrusion or intervention by others.

Once the case is identified, the next step is evaluation, parallel in many ways to determining diagnosis and prognosis in organic medicine. Evaluation in industry is often provided by the industrial physician—with greater or lesser degrees of expertise. Answers are needed to questions such as these: Is the patient dangerous to himself or others? Can he be safely kept at work? Does he have a true psychosis? Would he benefit by referral to an outside psychiatrist? Expert appraisal, that provides more competent answers to questions such as these, is one of the important reasons for having an industrial psychiatrist in the company medical department.

From such appraisal the next step, disposition of the problem case, is derived. Without it, disposition is apt to be fumbling and fumbling is all too common.

These three aspects, identification, evaluation and disposition, will be discussed in greater depth in later sections of this conference.

This brings us to the other side of the coin—the matter of mental health. The great contribution of Freud was to provide information about, and to focus attention on, the molding effect of the multitude of things that surround the evolving personality of infancy and childhood. There is growing awareness, however, that this is but one of four major cause and effect relationships in mental health. In addition to psychological, there are also biological, societal and cultural causes and effects. Knowledge of changes in mood produced by chemicals is growing. "Cultural deprivation" and its effects are in the popular press. As more understanding of the inter-relations of these four factors emerges, the true foundations of mental health will become clearer, and better understanding of the seemingly endless variety of individuality will develop. There are many things we now know, but there are so many yet to be learned that I doubt that anyone can today, in complete confidence, define a practical course that will assure mental health for everyone. To use Elton Mayo's terms, we have now come a long way from the "traditional society" in which the farmer's son inevitably becomes a farmer. Instead we have moved far into an "adaptive society," minus the comforting anchors and roots of tradition, requiring endless adaptation to an almost dizzying rate of change. The ability to adapt to change is one of the hallmarks of mental health.

It is important to note that mental health carries no connotation of loss of individuality nor conformity to some concept of an "average man." Individuality is a part of the very essence of human beings. A search for an average man in an industry is as absurd as a search for an "average" book in a library. All books have covers, and pages and words, arranged in meaningful sequence. But there is an infinite variety of arrangement of words and of the meanings conveyed. And there is a similar variety among human beings.

Also the "normal range" has a blurred periphery. There are some psychoneurotics and obsessive-compulsive personalities whom supervision in industry would classify among their very best workers, because these individuals set such a high standard of performance for themselves. They work well in industry, but at considerable cost and discomfort to themselves.

And now to a question that is especially significant for this conference, a question for which too few facts are as yet available. What is the relationship between mental health and mental illness and the work environment? If the occurrence of emotional problems of greater or lesser severity approaches 100% in a long enough time span, it is patently impossible for industry to contemplate conducting its affairs only with employees who are never subject to emotional problems. While it

is expected that at the time of the employment consideration the individual who is sufficiently out of touch with reality to merit hospitalization will probably be screened out, it is equally expectable that those who will be employed will bring with them the whole variety of human foibles and frailties. There will be some whose degree of emotional stability is enviable. There will be some who have been wobbling along through life on such an uneven keel that most of their energy is used to keep their own boat bailed out with little energy left over for working and living. The remainder, including you and me, will be somewhere between these two extremes.

In a gross sort of way it is possible for industry to match people and job assignments: the introspective, creative individual may do well in the research department and the hearty, gregarious person may be better suited for the sales department. But when one considers the infinite variety of individualities and our serious inability to measure the emotional content of each job and job situation, it seems highly unlikely that a complete matching of each individual's specific psychiatric make-up with the emotional factors of each job assignment can be accomplished, at least with the present state of the art.

Lacking specifics then, we are led to generalize, and generalizations are always hazardous. Regarding the individual we have said that, beyond Freud's concepts of the psychological molding of infancy and childhood, there are in fact four factors—biological, psychological, societal, and cultural—which interplay in cause and effect relationships in personality structuring. The same four factors can readily be identified in the industrial setting, have a bearing on the emotional climate in an industry, a company or a specific job, and add formidably to the complexity of the subject. During the past several decades there have been, and continue to be, many attempts to extract from these complexities certain "truths" that have broad applicability.

Adam Smith contended that the thing that moved and satisfied men was money. Current theories accept this with some reservations but consider that other things of equal or perhaps greater importance must be in the mix. The famous Hawthorne experiment suggested that attention to the human aspects of the work situation was more important to productivity than the adequacy of light at the work bench. The theory of the "hierarchy of needs" is receiving increasingly wide acceptance, viz., that as the more basic needs of man are fulfilled, needs of a higher order become dominant. Another theory divides human needs into satisfiers and motivators, meaning that fulfillment of certain needs will lead only to satisfaction and not to motivation; other needs are involved with motivating. The theory of "participatory management" has had its ups and downs in recent years. As with other current theories, this one too probably contains a nugget of truth, its application needs more study, and it is too simplistic to be the whole answer. The management theory of Macgregor's "X and Y," Blake's managerial grid, the use of so-called sensitivity training, and many others have their proponents, indeed their ardent supporters today.

There is a truism in medicine to the effect that when a great many types of treatment are in use for a condition, the true etiology of the disorder is unknown and the kinds of treatments available are not wholly effective. This is undoubtedly true regarding interpersonal relations and "emotional climates" in industry. Nevertheless, the fact that so many theories have been developed and so much attention is being given to these matters is salutary and one can hope that a continuance of these efforts will be increasingly productive.

We have said that an employed group contains the variety of foibles and frailties of human beings and that these varying personality characteristics come with the individual to the job. And we have emphasized the individuality of individuals. A monotonous job can be terribly disturbing to one individual, while the same monotony can act as a soothing sedative to another. This is not to say, however, that the emotional climate of the work situation is not important. One can conceive of a climate that is conducive to maximum job satisfaction and optimal productivity as well as minimally disturbing to the emotional state of employees, or even emotionally supportive. Conceiving of such a climate and knowing how to produce it, however, are two different things.

Knowledge in the whole spectrum of the behavioral sciences is growing. Studies range from the microbiology of nervous tissue and computer stimulation of nerve networks, the rapidly emerging science of psycho-pharmacology and clinical studies of various emotional states, to studies of group phenomena of psychologists, psychiatrists, sociologists and others. Industries have departments of personnel research.

Universities continue their studies of animals and man in controlled and manipulated laboratory environments. But to a growing extent, universities and industries are joining hands to study man at work in the actual work environment. Much knowledge that is useful can be expected to come from this combined effort.

We are in the midst of a "knowledge explosion" in all fields, including the behavioral sciences. As our understandings and insights increase, we face a growing awareness of the need for a loom on which to weave all this into a useful fabric.

4th AMA NATIONAL CONGRESS ON ENVIRONMENTAL HEALTH MANAGEMENT

Americana Hotel, New York City, April 24-26, 1967

PROGRAM

MONDAY—April 24

Registration

Opening Remarks—James H. Sterner, M.D.

Welcoming Remarks—Charles C. Edwards, M.D.

KEYNOTE: "What Quality of Environment Do We Want?" R. Buckminster Fuller

PANEL I: Medical Determinations

Clinical and Epidemiological Determinations. Richard A. Prindle, M.D.
Evaluation of Biological Findings from Molecular Biology to Man in Final Decision-Making. G. Burroughs Mider, M.D.
Genetics and Environmental Health. Arno G. Motulsky, M.D.
Relating Biochemical Effects to Psychological and Physiological Disorders and Environmental Stress. Lawrence E. Hinkle, Jr., M.D.

Discussion

Luncheon

PANEL II: Operations

Patterns of Environmental Health Agencies in the U.S. and Abroad. Malcolm H. Merrill, M.D.
Organizing Environmental Health Information Systems and Centers. Mel Weisburd
Coordinating Regional Operations: Water Pollution and Supply. Hollis S. Ingraham, M.D.
Coordinating Regional Operations: Air Pollution. S. Smith Griswold
Organization of Industrial Programs in the Development and Manufacture of Control Equipment. Charles M. Heinen

Discussion

TUESDAY—April 25

PANEL III: Responsibilities

Bringing the Scientific Community into Government Decision-Making. R. Keith Cannan, D. Sc.
Environmental Health: A New Challenge to University Education and Research. Barry Commoner, Ph.D.
The Role of Professional Organizations in Environmental Health. Berwyn F. Mattison, M.D.
Utilizing Industrial and Commercial Resources in the Community. E.M. Adams, Ph.D.
The Problem Shed as a Primary Control Jurisdiction. Allen V. Kneese, Ph.D.

TUESDAY—April 25 (continued)

Luncheon—Basic Science Aspects of Research in Environmental Health. Paul Kotin, M.D.

PANEL IV: New Approaches

Restoring the Quality of Our Environment—One Year Later. John W. Tukey, Ph.D.
Urban Ecology—The New Challenge. Arthur A. Atkisson
Potentialities of Systems Approaches. John A. Logan, D.Sc.
Aerojet-General's "California Waste Management Study." B.D. Culver, M.D.
System Analysis and Planning for Public Health Care in New York City. Harvey M. Adelman, Ph.D.

Discussion

WEDNESDAY—April 26

PANEL V: Medical Organizations As Action Units

The Role of the Physician in Environmental Health. James G. Telfer, M.D.
The Role of the Medical Society in Environmental Health. Norman J. Ashenburg, M.D.
Diagnosing Environmental Health Problems and Evaluating the Performance of Official Agencies. Leonard Greenburg, M.D.
Progress Report: Action for Clean Air Committee. Stephen M. Ayres, M.D.

Discussion

Concluding Remarks—James H. Sterner, M.D.

Congress Adjourns at Noon

* *

For further information write to:

Department of Environmental Health
American Medical Association
535 North Dearborn Street
Chicago, Illinois 60610

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Industrial Hygiene Foundation
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INDUSTRIAL HYGIENE DIGEST

Literature and News

NEWS ITEMS

209 Insurance Booklet Tells Research On Drinking-Driving Accidents.

Research into the drinking-driving accident situation in the United States is summarized in a new booklet The Way To Go, by Kenneth A. Rouse, director of rehabilitation services, Kemper Insurance Group, Chicago. The nature and extent of accidents resulting from drinking and driving are beginning to be revealed by current research findings. This research also shows the directions in which more effective prevention and control measures must move. "Considering that there are 98 million drivers in the United States and that 93-1/2 million persons drink," Rouse said, "there must be a substantial overlap of adult drinking and driving." Percentages: This overlap is further indicated by the fact that 79% of men and 63% of women over 21 drink. National Safety Council figures show drinking a factor in as many as half of the fatal motor vehicle accidents which claimed 49,000 lives in 1965. A man weighing 150 pounds and consuming two to three ounces of whiskey, gin or rum of standard 80-90 proof in an hour, would reach a blood-alcohol level of around .05%. The effects would be more severe, where his existing mood may be heightened. Accident Factor: Rouse quoted data from a University of Indiana report which said "Blood-alcohol levels over .04% are definitely associated with increased accident involvement." Copies of the booklet are available by writing the Public Relations Department, Kemper Insurance Group, 4750 North Sheridan Road, Chicago, Illinois 60640. -- AMA News 10, 10 (Feb. 6, 1967)

210 Seat Belts.

The president of the Insurance Institute for Highway Safety said that all states should pass laws making the use of seat belts mandatory. Russell I. Brown, addressing the Texas section of the Institute of Traffic Engineers, said the life-saving and injury-preventing advantages of seat belts are so well established that their use should be compulsory. -- AMA News 10, 2 (Feb. 6, 1967)

211 Air Pollution Apathy.

Industry apathy toward air pollution control drew a blast from John Gardner, Secretary of Health, Education, and Welfare. At hearings recently on S.780, a pollution control bill, he said, "Some firms have made an outstanding effort, but on the whole, industry has tended to do only what public pressure required it to do. If we can bring about a dramatic reversal in this situation, we will move rapidly toward a solution." If little action is taken now, he warned, the public will demand drastic controls no matter how costly, disruptive, or inefficient they may be.
-- Chem. Eng. News 45, 31 (Feb. 13, 1967)

212 No Oil-or Gas-Fired Boilers for Power Plants.

Los Angeles' smog chief will not allow any new oil- or gas-fired boilers for power plants and will also reject applications to replace existing ones. Louis J. Fuller, head of the county's Air Pollution Control District, told a U.S. government task force that all future increases in electric generating capacity must come from nuclear generation or from sources outside the Los Angeles basin. By applying the ban to replacements, Mr. Fuller serves notice that power companies will eventually have to phase out existing fossil-fueled plants. The edict is a new application of a rule now in effect and does not have to be approved by county supervisors.
-- Chem. Eng. News 45, 15 (Feb. 13, 1967)

213 HEW Proposes Evaporation Limits.

John W. Gardner, Secretary of Health, Education, and Welfare (HEW), has proposed additional standards to control air pollution from new motor vehicles. The standards prescribe limitations on evaporative losses from fuel tanks and carburetors and would be effective for new model automobiles and light trucks sold in the U.S. beginning in 1969. On an average trip, an automobile evaporates about 10 grams of gasoline from its carburetor. It also loses about 30 grams daily through the tank cap as a result of pressure changes from the tank's thermal expansion and contraction. HEW estimates that 1 billion gallons of gasoline annually pollute the atmosphere as a result of these evaporations. The new standards limit these losses to 2 grams of gasoline per "test" as specified to manufacturers. The testing procedure simulates an average trip and one gas-tank volume change per day. Recent technological improvements have been made that could reduce these evaporative losses by more than 90%, HEW says.
-- Chem. Eng. News 45, 12 (Feb. 13, 1967)

214 Analysis Kit for Pesticides.

A portable chemical analysis kit contains laboratory equipment to analyze pesticide residues in food crops. The prototype model, developed by scientists at the Midwest Research Institute, Kansas City, Mo., under a contract with the Department of Agriculture, shows the feasibility of running field analyses on grain, vegetables, fruit, milk, and meat to check whether pesticide residue content exceeds tolerance levels set by the Food and Drug Administration. With little chemical training, food inspectors and graders could measure the residue levels of pesticides from any of the three major classes—chlorinated hydrocarbons, organophosphates, and carbamates. The kit comprises three cases of chemicals, glassware, a 12-volt battery-powered motor which runs a blender and centrifuge, an electrolytic heater fueled with propane, and an ultraviolet light for reading spots on chromatographic plates. -- Chem. Eng. News 45, 47 (Feb. 13, 1967)

215 Radiation Report.

Radioactive Iodine-131 was detected in milk from 28 of 63 U.S. sampling stations since the fifth Chinese Communist nuclear weapons test on December 27. The U.S. Public Health Service said that the highest level found was 210 picocuries per liter of milk in samples in the Charleston, S.C. area. This is far below the level considered as a public health hazard, the Public Health Service said. -- AMA News 10, 2 (Feb. 6, 1967)

216 FDA and the Drug Industry.

The FDA and the drug industry are at it again—this time on the generic vs. brand name issue. The Pharmaceutical Manufacturers Association (PMA) said recently that over the past five months it has asked the Food and Drug Administration (FDA) repeatedly to supply "more meaningful information" on the agency's survey on drug potency. But each time, it claims, FDA failed to do so. The PMA statement follows FDA's release of the names of the companies and products involved in the survey. The study was limited to certain drug categories in which variation in potency is medically significant. FDA claims that 7.7% of the generic drugs tested were above or below acceptable potency levels, compared to 8.8% of the brand name products tested. But "because of FDA's failure to provide (the information)," PMA claims, "it is impossible to determine (the test's) validity." -- Chem. Eng. News 45, 31 (Feb. 13, 1967)

217 LSD Policy.

The Ohio State Medical Association recommended restrictions on the use of lysergic acid diethylamide (LSD), stating that it and other hallucinogens should be administered only by physicians trained in its use. It called on county medical societies to prepare educational materials to enable physicians to easily recognize hallucinogenic, barbiturate, and amphetamine toxicity.
-- AMA News 10, 2, (Feb. 6, 1967)

218 Larynx Replaced.

Physicians at the Massachusetts Eye and Ear Infirmary, Boston, said a 25-year-old Marine was continuing to improve after they replaced his shattered larynx with an artificial tube and valve made from skin taken from the patient's thigh. They said the procedure could be used to restore the voices of many patients who have their larynxes removed because of cancer.
-- AMA News 10, 2 (Feb. 6, 1967)

219 Emphysema Deaths Increase.

Data compiled so far show 20,208 deaths in the United States attributed to emphysema and chronic bronchitis in 1964—a nearly ninefold increase from the 1945 total of 2,300—the new National Center for Chronic Disease Control reports. Further, said Albert Roberts, M.D., chief of the Center's chronic respiratory disease program, these no longer can be considered "male diseases." Of the 1964 death total, 3,145 were women—a quadrupling in a decade.
-- J. Am. Med. Assn. 199, adv. p. 32 (Jan. 30, 1967)

220 American Industrial Health Conference.

The 52nd annual meeting of the Industrial Medical Association and Silver Anniversary meeting of the American Association of Industrial Nurses will be held at the Americana Hotel, New York, April 10-13, 1967. This is the first time that the AIHC has been held in New York.

221 Need for Mental Health Center.

Only 1.5 of 19 million "disturbed" persons receive some form of treatment. Such disturbances cause 50% of present sick absence, costing about $5 billion a year. Over the next decade, $2 billion in federal support will help build and staff 2,000 Mental Hospital Centers. State and local governments must add $30 billion. -- Business Week (Nov. 5, 1966)

COMING EVENTS

222	April 2- 9	American Petroleum Institute, 7th World Petroleum Congress, Mexico City, Mexico.
	April 7- 9	American Society of Internal Medicine, San Francisco, California.
	April 9-14	American Chemical Society, 153rd National Meeting, Miami Beach, Florida.
	April 9-14	American Pharmaceutial Association, Annual Meeting, Las Vegas, Nevada.
	April 10-12	Institute of Environmental Sciences, 13th Annual Technical Meeting and Equipment Exposition, Washington, D. C.
	April 10-13	American Industrial Health Conference, New York, N. Y.
	April 10-13	Aerospace Medical Association, Washington, D. C.
	April 13-15	American Society for Cancer Research, 58th Annual Meeting, Chicago, Illinois.
	April 16-21	Federation of American Societies for Experimental Biology, Annual Meeting, Chicago, Illinois.
	April 17-19	American Association for Thoracic Surgery, New York, N. Y.
	April 17-21	American Society for Experimental Pathology, Chicago, Illinois.
	April 17-19	TAPPI, 4th Water Conference, Philadelphia, Pennsylvania.
	April 18-19	American Zinc Institute, Annual Meeting, Chicago, Illinois.
	April 18-20	American Federation of Information Processing Societies, Spring Joint Computer Conference, Atlantic City, New Jersey.
	April 20-22	Institute of Sanitation Management, Western Regional Conference, Los Angeles, California.
	April 24-26	National Academy of Sciences, Annual Meeting, Washington, D. C.
	April 24-26	National Congress on Environmental Health Management, 4th AMA Congress, New York, N. Y.
	April 24-29	American Academy of Neurology, San Francisco, California.
	April 26-27	International Lead Zinc Research Organization, Annual Meeting, Montreal, Quebec, Canada.
	April 26-28	American College of Clinical Pharmacology and Chemotherapy, Atlantic City, New Jersey.

LEGAL DEVELOPMENTS

223 The New Law and the Mentally Ill in Pennsylvania.

This law exemplifies local application of Federal legislation. Industry has much to gain from assisting in this community effort. There is doubt that the program can succeed without industrys interested involvement. This legislation, which provides opportunity for progress in mental health, climaxed two years of work on the part of 3,000 volunteers in Pennsylvania. The degree of interest by industry is indicated in an editorial by Dr. Robert B. O'Connor, Vice President-Health Services, United States Steel Corporation—See pages ii-v, this issue. -- Pa. Mental Health Bulletin (Jan. 1967)

BOOKS, PAMPHLETS, AND NOTICES

224 Toxicity and Metabolism of Industrial Solvents. Ethel Browning. AVAILABLE FROM: American Elsevier Publishing Company, Inc., 52 Vanderbilt Avenue, New York, N.Y. 10017. xi + 739 pp. (1965). PRICE: $32.50.

Dr. Browning's "Toxicity of Industrial Organic Solvents," published in 1953 (now out of print) has become a standard reference for toxicologists and occupational physicians. Dr. Browning's personal experience included pathology (Assistant Pathologist at St. Paul's Hospital, London) and institutional medicine (School Medical Officer in Liverpool) before beginning her association

with industrial medicine. In 1940, she was appointed H.M. Medical Inspector of Factories, Ministry of Labour and National Service, London. She was especially concerned with hematological studies of workers with ionizing radiation, and later with all toxic solvents. She has received awards in physiology (The Holt Medal) and pathology (The Kauthack Medal). She is an advisor on toxicology to the Courtauld Organization and an Honorary Member of the American Industrial Hygiene Association. In addition to the above text on solvents, she has written numerous other books, including "Toxicity of Industrial Metals" and "Harmful Effects of Ionising Radiation." "Toxicity and Metabolism of Industrial Solvents" has been completely rewritten, with special attention to the latest information on metabolic effects. In her preface, the author thanks Drs. F.A. Patty (Editor of "Industrial Hygiene and Toxicology" Interscience Publishers, N.Y.) and R. Tecwyn Williams (author of "Detoxication Mechanisms"—Chapman and Hall, London) whose "innumerable references not only to published articles but also to their personal researchers, have been invaluable..in providing.. at least a starting point..into this vast subject." The author's richly referenced but narrative style provides the reader with an entré to the world's literature on each solvent covered. She adds value judgments based on extensive personal experience. Of the first 140 pages, devoted to aromatic hydrocarbons, the first 65 deal with benzene alone in great detail. Each solvent's properties, formula, economy, sources and uses are given, as well as its biochemistry (estimation in the atmosphere, in biologic tissues and fluids) metabolism and toxicology (symptoms of intoxication, changes in the organism and toxicity to human beings). Profuse references are provided—in the case of Benzene alone there are 11 pages of bibliography. Reference is made in the text to authors and dates rather than to numerical bibliographic reference.

225 Organic Pesticides in the Environment. Advances in Chemistry Series 60. R.F. Gould, Editor. AVAILABLE FROM: American Chemical Society, 1155 Sixteenth Street, N.W. Washington, D.C. 20036. x + 309 pp. (1966). PRICE: $8.50.

This is a collection of papers on the environmental hazards of organic pesticides, including their sorption and leaching in soils, residues in waterways, and translocation by air and rain. It surveys effects on mammal enzyme systems, residues in human body tissues, and the effects of chronic poisoning by organophosphorus insecticides. Methods of sampling and analysis are included, such as infrared identification of chlorinated insecticides and electron capture chromotography to determine organic insecticides in water. Of special interest are papers on: Sorption and Leaching of 4-Amino-3, 5, 6-trichloropicolinic Acid in Soils; Urinary p-Nitrophenol Concentrations in Acute and Chronic Parathion Exposures; Effects of Chronic Poisoning by an Organophosphorus Cholinesterase Inhibitor on Acetylcholine and Norepinephrine Content of the Brain; Distribution of Pesticide Residues in Human Body Tissues from Montgomery County, Ohio; Respiratory Exposure of Dairy Animals to Pesticides; Potential Hazard in Using Dichlorvos Insecticide Resin; and Persistence of 2, 6-Dichlorobenzonitrile in Aquatic Environments.

226 A Digest of State Air Pollution Laws—1966 Edition. Public Health Service Publication No. 711. U.S. Department of Health, Education, and Welfare, Public Health Service. AVAILABLE FROM: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. ii + 292 pp. (1966). PRICE: $1.50.

This publication was prepared especially for the National Conference on Air Pollution held on December 12-14, 1966 in Washington, D.C. by the U.S. Department of Health, Education, and Welfare, Public Health Service, Director of Air Pollution. It will be of great interest to all who have responsibilities requiring that they keep abreast of Federal and State Legislation in Air Pollution Prevention and Control. In view of the dynamic situation which exists in this legislative area (described by Andrew Kalmykow, American Insurance Association, in a talk "Recent Legislative Developments" presented at the Foundation's 31st Annual Meeting last October, and included in the Transactions of the meeting) information contained in this reference cannot be considered current, and must be up dated frequently by the user. Nevertheless, it should be a useful reference to readers of Industrial Hygiene Digest.

INDUSTRIAL MEDICAL PRACTICE

227 Occupational Inadequacy. An Inquiry Into the Inadequate Personality. D.G. Mayfield, et al. J. Occ. Med. 9, 1-8 (Jan. 1967).

This study indicates that examination of occupational performance can be quite fruitful. Performance in this sphere is a good index of global personality factors in many individuals and possibly the most revealing in some. In view of the heightened interest in psychiatric rehabilitation and the national interest in unemployment, it is likely that we will meet increasing demands on our knowledge in this area. Patients who have previously been considered inaccessible to psychiatric treatment are now projected into plans for comprehensive psychiatric programs. Our ability to deal with many of these problems is severely limited—and the inadequate personality constitutes one of the problem areas. The first step in solving the problem of causation and proper therapy is identification and verification of the syndrome under consideration. We feel that we have accomplished this with our limited study. It is hoped that a more intensive investigation of a large number of similar patients will provide the answers necessary for dealing with this baffling but most interesting entity. -- Cond. from authors' summary

228 Psychodynamic Mechanisms of Emotional Illness in Executives. S. Lesse. Int. J. Soc. Psychiat. 12 (1), 24-28 (1966).

During the early development phase, the young organization man develops a massive dependency upon the company. Teamwork is stressed and individuality is frowned upon. But the junior executive, if he is to rise in the company, must develop a happy balance between his group-dependency feelings and his need for individual expression. When he is rejected by the organization through discharge, lack of promotion, or seeing other men promoted ahead of him, emotional crises are often the result. For top executives, the stresses of work pressure, demands of stockholders, and competition from younger men can cause emotional illness and even exhaustion. Retirement, too, can become a threatening problem for those intellectually, emotionally, or culturally unprepared for it. Hypochondriasis and psychosomatic illness, both with underlying deep depression, are patterns frequently seen in executives. Aggravation, frustration, guilt feelings, and damaged self-image are also results of executive stresses. The emotional problems of executives should receive more attention from industrial psychiatry than they have so far if progress is to be achieved. -- J. Occ. Med. Absts.

229 Social Factors in Suicide. G.E. Murphy and E. Robins. J. Am. Med. Assn. 199, 303-308 (Jan. 30, 1967).

Two diagnostic groups, affective disorder (depression) and alcoholism account for the majority of urban suicides. Alcoholic suicides are more often divorced, separated, or living alone than is the general population. Suicides with affective disorder differ little from the U.S. population except in the proportion living along. Unlike the affective disorder group, alcoholics are found frequently (32%) to have experienced obvious disruption of affectional relationships within six weeks of suicide. The findings suggest that suicide is often a response to social disturbance in alcoholism, chiefly to depressive symptoms in affective disorder. The alcoholic appears particularly vulnerable to suicidal impulses on losing an important affectional relationship. This knowledge should improve suicide prevention. There are 17 references. -- Authors' abst.

230 The Burden of Responsibility in Suicide and Homicide. P. Solomon. J. Am. Med. Assn. 199, 321-324 (Jan. 30, 1967).

In all cases of possible impending suicide or homicide, the physician must assess the burden of responsibility as he evaluates the patient's total situation. Repugnant though it may be, he may have to act against the patient's wishes in order to protect the patient's life and that of others. Thoughts, threats, and plans of violence cannot be dismissed lightly; preparatory actions and attempts cannot be dismissed at all. -- Author's conclusions

231 Effect of Alcohol on Hemopoiesis. A.H. Waters, A.A. Morley, and J.G. Rankin. Brit. Med. J. 2, 1565-1567 (Dec. 24, 1966).

A study of 16 alcoholic patients without cirrhosis showed that disturbance of hemopoiesis was common even in the absence of anemia. Radioactive ferrokinetic studies with Fe-59 in six subjects showed depressed iron utilization by the bone marrow which improved after withdrawal of alcohol. There was cytoplasmic or nuclear vacuolation of early myeloid and erythroid precursors in the bone marrow of 14 of the 16 patients, and in 10 of these patients one week after withdrawal of alcohol the vacuolation had disappeared in 9, and was much less obvious in one. These observations

suggest a direct toxic effect of alcohol on the bone marrow. There was also a high incidence of both folate (approximately 50%) and iron (approximately 30%) deficiency, but none of the patients was B_{12} deficient. -- J. Am. Med. Assn. References & Reviews

232 Death From Appendicitis and Appendectomy. J.G.R. Howie. Lancet 2, 1334-1337 (Dec. 17, 1966).

A detailed survey of 805 deaths from appendicitis or appendectomy in Scotland from 1954 to 1963 is presented. Death rates for appendicitis of different degrees of severity in adults at different ages are calculated and an estimate made of the risk of death from nonoperative treatment of mild appendicitis in the young adult. The death rate in each age group rises sharply with advance of the pathological changes in the appendix, and mortality for each pathological change advances with increasing age of the patient. Mortality for males was twice that of females in the same age and pathological group. For the young adult patient the mortality of removing a normal appendix (1/5, 000) seems to be less than the mortality of failing to remove an abnormal appendix (1/850) to (1/2, 300). Evidence is presented to support the belief that there has been a fall in the incidence of true appendicitis. No evidence is found to support the belief that teaching and nonteaching hospitals offer a different prognosis in their treatment of appendicitis.
-- J. Am. Med. Assn. References & Reviews

233 Results of the Surgical Treatment of Spondylolisthesis. E.D. Henderson. J. Bone Joint Surg. 48, 619 (June, 1966).

The consensus of present medical opinion is that spondylolisthesis is an acquired anomaly. Very rarely the cause is a single trauma, but the great majority are due to a series of minor traumas. The result of these traumas is a stress fracture through the pedicles of the involved vertebrae or the pars interarticularis. The lumbosacral level was involved in 190 of 216 patients operated on consecutively. Spinal fusion was performed on the majority of patients. All but 12 were allowed to be up, with belt or corset, within two weeks of operation. Nerve roots were explored at operation in more than 130 patients, and in 46 instances protrusion or extrusion of intervertebral disks was found. This is a higher incidence of this defect than most series report.
-- J. Occ. Med. Absts.

234 Clinical Applications of a Transcutaneous Ultrasonic Flow Detector. R.F. Rushmer, et al. J. Am. Med. Assn. 199, 326-328 (Jan. 30, 1967).

Blood flow in vessels deep within the body can now be detected via ultrasonic beams emitted by transducers positioned on the skin surface. The velocity of blood flow modulates ultrasonic waves to produce audible signals in accordance with the Doppler shift principle. The transcutaneous Doppler flow detector has shown value in detecting live fetuses early in pregnancy (10 to 12 weeks) locating the placenta, and in exploring peripheral blood vessels to determine the site and severity of arterial occlusive disease, particularly in the extremities. Additional applications are currently under study. More important, this development is a small step in the acquisition of clinical information by means of nondestructive techniques which are applicable to routine clinical diagnosis. There are eight references. -- Authors' summary

235 Contact Lenses in Industry. S.L. Fox. J. Occ. Med. 9, 18-21 (Jan. 1967).

Contact lenses are causing increasing problems for the industrial surgeon. Contact lenses have no place in industry where dusty work environment or where foreign-body or chemical hazards are present. The industrial physician must make a decision in each individual situation. If contact lenses are permitted, the wearer must be identified and known to the plant medical department. The medical department should periodically test and record the employee's vision with and without contact lenses, as well as with spectacles. Special care is required in carrying out the visual-acuity testing during pre-employment physical examinations to insure that a contact lens wearer is not missed and his vision recorded as being normal, when in fact it is markedly deficient. It is also necessary to maintain a constant watch over older employees who may be fitted with contacts without reporting the same to the medical department. The patient with aphakia after an operation for cataract requires special handling if he is allowed to return to work with contact lenses. Placement of the one-eyed, the individual with contact lenses, the aphakic, and the highly myopic are all situations which the industrial physician must evaluate on the basis of the individual involved and upon the desires of management Six references are given.
-- Author's summary

236 Prevalence of Chronic Respiratory Disease in a Pulp Mill and a Paper Mill in the United States. B.G. Ferris, Jr., W.A. Burgess, and J. Worcester.
Brit. J. Ind. Med. 24, 26-37 (Jan. 1967).

A sample of 147 men drawn from the workers in a pulp mill was compared with one of 124 men from a paper mill. The former included those exposed to chlorine and the latter to sulfur dioxide. No significant differences were found in respiratory symptoms or in simple tests of ventilatory function in the two samples, but men working in chlorine had a somewhat poorer respiratory function and more shortness of breath than those working in sulfur dioxide. The working population of both mills together had a lower prevalence of respiratory disease than that of the male population of Berlin, New Hampshire, previously studied, suggesting that working populations may not be representative of the general population. Further, a low prevalence of disease in a working population exposed to pollutants may not indicate their "safety" in general populations. -- Authors' abst.

237 Museum Preparations of Segments of Human Lung. D.H. Tompsett.
Med. Biol. Illus. 17, 2-4 (Jan. 1967).

A detailed method is given for the preparation of colored segmental lung specimens. Full expansion of the lung is ensured by filling each segment with gelatin. Sufficient colored synthetic resin is injected before the gelatin solution sets to differentiate each segment clearly. The result is greatly superior to that produced by injecting colored gelatin.
-- J. Am. Med. Assn. References & Reviews

238 Chronic Bronchitis in Miners and Non-Miners: An Epidemiological Survey of a Community in the Gold-Mining Area in the Transvaal. G.K. Sluis-Cremer, L.G. Walters, and H.S. Sichel.
Brit. J. Ind. Med. 24, 1-12 (Jan. 1967).

An epidemiological survey to determine the prevalence of chronic bronchitis in a mixed mining and non-mining population of Carletonville on the Witwatersrand is described. Eight hundred and twenty-seven men over the age of 35 years were investigated. Chronic bronchitis is shown to be significantly more common in miners than in non-miners for every age and smoking categroy with the exception of the non-smoker. In the non-smoker no significant difference exists in the prevalence of chronic bronchitis between the mining and non-mining groups. Smoking habits were found to have overwhelming effects on the prevalence of chronic bronchitis in both groups. It is suggested that a synergistic interplay of smoking and general underground aerial pollution (rather than dust inhalation alone) is responsible for the excess prevalence of chronic bronchitis in the miner who smokes. -- Authors' abst.

239 Long-Term Efficacy of Oil-Adjuvant Influenza Vaccine in an Industrial Population. R.W. Howell.
Brit. J. Ind. Med. 24, 66-70 (Jan. 1967).

The mild influenza epidemic of mixed A and B strains early in 1966 provided an opportunity to assess the efficacy of an oil-adjuvant influenza vaccine which had been administered more than two years earlier to 1,341 volunteers at two U.K. Atomic Energy Authority establishments. At the 5% confidence level, a statistically significant reduction in sickness absence due to influenza was found in this vaccinated group when compared with a control group of 918 employees. This trend was observed at both establishments. Some confirmation was thus obtained of serological predictions that protection would last two to three years or longer after inoculation. There was some indication that the vaccine might be more effective in older workers. This trial suggests the need for more long-term evaluation of oil-adjuvant influenza vaccines. -- Author's abst.

240 Ventilatory Function in Relation to Mining Experience and Smoking in a Random Sample of Miners and Non-Miners in a Witwatersrand Town. G.K. Sluis-Cremer, L.G. Walters, and H.S. Sichel.
Brit. J. Ind. Med. 24, 13-25 (Jan. 1967).

The ventilatory capacity of a random sample of men over the age of 35 years in the town of Carletonville was estimated by the forced expiratory volume and the peak expiratory flow rate. Five hundred and sixty-two persons were working or had worked in gold mines and 265 had never worked in gold mines. No difference in ventilatory function was found between the miners and non-miners other than that due to the excess of chronic bronchitis in miners. -- Authors' abst.

241 Ventilatory Performance of American Physicians—A Pilot Study. F. J. McIlreath and B. M. Cohen. Am. J. Med. Sci. 252, 35-41 (July, 1966).

Between one-third and one-quarter of the 262 physicians surveyed presented ventilatory evidence suggesting the presence of obstructive ventilatory disease. Abnormalities of ventilatory capacity testing were more common among cigarette smokers than among pipe or cigar smokers or non-smokers. There are 27 references. -- Public Health Eng. Absts.

242 Epidemiological Study of Sudden and Unexpected Deaths Due to Arteriosclerotic Heart Disease. L. Kuller. Circulation 34, 1056-1068 (Dec. 1966).

A study of sudden and unexpected nontraumatic deaths among Baltimore residents between the ages of 20 to 64 was conducted between June 15, 1964, and June 14, 1965. After adjusting for sampling, it was estimated that 1,178 (32%) of 3,648 deaths were sudden; arteriosclerotic heart disease (ASHD) accounted for 58% of these. Sixty percent of all ASHD deaths were sudden. Of 1,033 ASHD deaths in Baltimore city, between the ages of 40 to 64, 20.6% occurred outside of a hospital, 46.2% were dead on arrival, and only 18.9% occurred after 24 hours of hospitalization. Approximately half of the ASHD sudden deaths had a history of heart disease and 24% had seen a physician within a week prior to death. Because of the rapidity and high frequency of deaths that occur outside of a hospital, a combination of better hospital treatment and earlier diagnosis is needed to reduce ASHD mortality. -- J. Am. Med. Assn. Reference & Reviews

243 Cardiovascular Disease, Diabetes Mellitus, and Anthropometric Evaluation in Polynesian Males on the Island of Niihau (1963). D. R. Bassett, et al. Circulation 34, 1088-1097 (Dec. 1966).

A study of 30 adult Polynesian males living on the isolated Hawaiian island of Niihau was conducted in October 1963. These relatively pure Polynesians were distinctly overweight, had a high prevalence of diabetes, and were hypertensive. Hematocrit and whole blood viscosity were elevated. Serum uric acid levels were normal. Although Hawaiians generally have a high mortality from coronary heart disease, the average serum cholesterol level for this group was 30 to 40 mg./100 cc. lower than in most populations having a high prevalence of coronary heart disease.
-- J. Am. Med. Assn. References & Reviews

244 Anesthesia and Recent Myocardial Infarction. J. G. Fraser, P. R. Ramachandran, and H. S. Davis. J. Am. Med. Assn. 199, 318-320 (Jan. 30, 1967).

A review has been made of mortality statistics associated with surgery in patients with recent myocardial infarction. The overall mortality figures compare closely with those of coronary-disease patients not involved in surgery or anesthesia. The authors' findings support the concept that elective surgery should be postponed until the end of the healing stage (three months). Essential surgery performed during the early postinfarction period carried a very high risk. The prognosis following surgery performed after the first 15 days postinfarction was significantly improved. There are 12 references. -- Authors' abst.

245 Hyperglycemia After Acute Myocardial Infarction. Its Relation to Diabetes Mellitus. K. K. Datey and N. C. Nanda. New Engl. J. Med. 276, 262-265 (Feb. 2, 1967).

Glucose tolerance tests were carried out in 145 out of 167 consecutive cases of acute myocardial infarction within 72 hours of the onset of the attack, after 7 to 10 days and after one month. Sixty-five per cent of the patients showed initial hyperglycemia, which persisted at the end of 7 to 10 days. At the end of one month this number was reduced to 29%. Follow-up studies were carried out in 57 cases at the end of one or two years. The incidence of hyperglycemia was 70% at the onset of the attack and at the end of 7 to 10 days. The hyperglycemia was transient in 38% of the cases, its duration being 11 to 30 days in 23% and between one month and one or two years in 15%. Delayed return of the curves to normal in these cases can lead to an erroneous diagnosis of diabetes mellitus. Myocardial infarction unmasked latent diabetes in 14% of the patients whereas 17% still had abnormal curves but no clinical diabetes. Patients with initial normoglycemia did not show any tendency to diabetes. The incidence of hyperglycemia was higher in persons over than in those under 50 years of age at each period of testing. A comparison of clinical and electrocardiographic findings between the normoglycemic and the hyperglycemic patients revealed no significant differences. The possible mechanism of hyperglycemia is discussed.
-- Authors' summary

246 Effect of Posture on the Plasma Cholesterol Level. D.J. Stoker, V. Wynn, and G. Robertson. Brit. Med. J. 1, 336 (Feb. 1966).

On changing from the lying to the standing position there is a loss of blood volume and an increase in the concentration of plasma proteins. Plasma cholesterol is nonfilterable, and so may vary with body position. Plasma cholesterol was measured on samples obtained after a minimum of one hour recumbency, after walking about, and after a sphygmomanometer cuff inflated to 100 mg. had been applied. There was a mean rise in cholesterol of 12.9% after 15 minutes in the vertical position in both normal subjects and those with hypercholesterolemia. Application of the blood-pressure cuff produced a further rise in the hypercholesterolemic patients. Ideally, for accurate comparisons of cholesterol levels, the patient should be supine for 20 minutes prior to withdrawal of the sample. -- J. Occ. Med. Absts.

247 Palpable Spleens in College Freshmen. O.R. McIntyre and F.C. Ebaugh, Jr. Ann. Internal Med. 66, 301-306 (Feb. 1967).

In 2.86% of 2,200 entering college students palpable spleens were detected by at least three independent examiners. Of the 63 students studied, approximately 30% persisted with this finding for at least three years after the initial detection. The finding of a palpable spleen could not be explained on the basis of body habitus or infectious mononucleosis. In the first six years of study there is no evidence for an increased prevalence of disease in the group of students with palpable spleens. The subsequent medical history of this group will be determined. Eight references are given. -- Authors' summary

248 Factors in a Total Rehabilitation Program for Low Back Pain. J.N. Schaeffer. J. Occ. Med. 9, 12-15 (Jan. 1967).

The variety of factors at work among cases of chronic or recurrent low back pain calls for close teamwork in evaluating the problems which perpetuate the symptoms. Needless treatment may be avoided if the resources of the psychologist, the social worker, and the vocational counseler are used in a realistic approach to the basic problem, rather than excessive attention to the presenting symptoms. Four references are given. -- Author's conclusion

249 Survey on Smoking. B.A. Cook. Med. J. Australia 1, 363-365 (Feb. 26, 1966).

The literature relevant to smoking and maglignant disease is reviewed. Mortality rates for cigarette smokers are compared with those for non-smokers. The social aspects associated with prohibition of smoking and education are discussed. It is concluded that Australians should become more actively interested in the problem posed by the tobacco habit. -- APCA Absts.

250 Nitrosamines as Environmental Carcinogens. II. Evidence for the Presence of Nitrosamines in Tobacco Smoke Condensate. W.J. Serfontein and P. Hurter. Cancer Research 26, 575-579 (April, 1966).

Trace amounts of N-nitrosamines in biological material were determined qualitatively and semi-quantitatively by conversion of the nitrosamines into the corresponding asymmetrical hydrazines. The hydrazines were selectively concentrated by extraction techniques and identified by means of thin-layer chromatography after reaction with 4-nitro-azobenzene-4'-carboxylic acid chloride. There are 11 references. -- Public Health Eng. Absts.

251 Cardiac Output, Blood Pressure and Free Fatty Acid Responses to Smoking in the Nonbasal State. W.S. Frankl, R. Friedman, and L.A. Soloff. Am. J. Med. Sci. 252, 73-78 (July, 1966).

The dye dilution technique and the method of Bragdon were used in measurements taken before smoking, during smoking, and at four 15 minute intervals in six normal subjects in the nonbasal state. Cardiac output and free fatty acids were elevated prior to smoking. In none of the subjects was there a significant further rise in cardiac output or free fatty acids after smoking. These findings cast some doubt on whether tobacco actually exerts any signficant effect on cardiac output, stroke volume, or blood free fatty acids in the nonbasal state. There are 15 references. -- Public Health Eng. Absts.

252 Reduced Benzo(a)pyrene and Phenolic Content of Smoke From Experimental Cigarettes. R.J. Shamberger. Nature 211, 86 (July 2, 1966).

An extraction process applied to soybean leaves that greatly reduces the tar content, phenols, benzo(a)pyrene, and toxic substances indicates the possibility of designing a relatively safe cigarette. There are 12 references. -- Public Health Eng. Absts.

253 Smoking Habits and Survival of Lung Cancer Patients. Application of the Temporary Expectation of Life as a Measure of Survival. T. Abelin. Am. J. Epidemiology 84, 110-119 (July, 1966).

Except for a statistically insignificant trend among localized cases, no association could be found between smoking habits and survival experience. If an association exists, it must be small and can be detected only by using much larger study populations. There are 12 references.
-- Public Health Eng. Absts.

254 Measurement of Polonium-210 in Human Blood. J.B. Little and R.B. McGandy. Nature 211, 842-843 (Aug. 20, 1966).

The measurement of Po-210 concentration in blood may be a practical method of estimating body burdens of this isotope, as well as of its parent Pb-210. Data from experiments on effect of smoking and diet on Po-210 concentration in the blood are given. There are seven references.
-- Public Health Eng. Absts.

255 Study of Smoking in Relation to Occupation. F. Aubry, et al. Can. J. Public Health 57, 335-342 (Aug. 1966).

Results of a survey of smoking habits, especially cigarette smoking, of a group exposed to industrial dusts and another group not exposed indicated that the first group was higher in the percentage of smokers, the quantity of cigarettes smoked daily, and the length of time since the smoking habit was begun. A comparison of subjects with similar duties indicated the difference is not influenced by the age of the smoker, but by the environment in which he works.
-- Public Health Eng. Absts.

256 Ciliastatic Components in the Gas Phase of Cigarette Smoke. O.A. Roholt and D. Pressman. Science 153, 1248-1250 (Sept. 9, 1966).

When the gas phase of cigarette smoke, separated into its components by gas chromatography, was passed across a ciliated specimen, the acetaldehyde, acrolein, and hydrogen cyanide produced strong inhibition of the ciliary beat. A filter that removed most of the acetaldehyde and acrolein from smoke did not reduce the inhibitory effect of the gas phase of the smoke, whereas a filter that removed most of the hydrogen cyanide did reduce inhibition. There are 13 references.
-- Public Health Eng. Absts.

257 The Depressant Effect of Cigarette Smoke on the In Vitro Antibacterial Activity of Alveolar Macrophages. G.M. Green and Diana Carolin. New Engl. J. Med. 276, 421-427 (Feb. 23, 1967).

In an in vitro phagocytic system using rabbit pulmonary alveolar macrophages small amounts of cigarette smoke quantitatively inhibited the capacity of the cells to inactivate Staphylococcus albus bacteria. The inhibiting action of the smoke, as obtained from the burning cigarette, varied quantitatively with the volume of smoke used, the type or brand of cigarette and the kind of filtration (mechanical or aqueous) employed. The active component of the smoke was largely contained in the gaseous and filterable phase. The toxic action of the smoke was greatly reduced by aqueous filtration and was subsequently demonstrable in the aqueous phase. Nicotine, acetaldehyde, formaldehyde and cyanide did not by themselves affect the alveolar macrophages in doses comparable to their content in smoke. Cells exposed to cigarette smoke did not adhere to the surface of the flask in which the experiments were performed. Cell viability, as measured by the ability to exclude vital dye, was not affected by the smoke. The role of cigarette smoke in the pathogenesis of pulmonary diseases may be mediated through an inhibition of the phagocytic activity of alveolar macrophages and impairment of this integrated defensive function at the respiratory membrane level of the lung. There are 16 references.
-- Author's summary

258 Methoxyflurane as an Obstetric Analgesic: A Comparison With Trichloroethylene. V. Major, M. Rosen, and W.W. Mushin. Brit. Med. J. 2, 1554-1560 (Dec. 24, 1966).

Methoxyflurane and trichloroethylene were compared as obstetric analgesics by an anesthetist who also continuously graded the behavior and reactions of the mother during and between contractions. From these observations the percentage of the duration of inhalation, when all factors were simultaneously satisfactory, was calculated. Methoxyflurane was significantly better than trichloroethylene as judged by this assessment; more mothers receiving methoxyflurane were satisfied with the pain relief. The midwives were unable to distinguish any difference in pain relief but found that more patients receiving trichloroethylene were restless ($P < 0.05$). Patients receiving methoxyflurane were slightly more drowsy. A continuous recording of the inhaled concentrations was made for each patient. From the range of concentrations required, it was deduced that methoxyflurane was suitable for intermittent administration in a single fixed inhaled concentration.

-- J. Am. Med. Assn. References & Reviews

259 Partial Inhibition of the Laser Reaction in Man by Topical Corticosteroids. L. Goldman and K.W. Kitzmiller. Life Sciences 5, 2215-2224 (Dec. 1966).

An individual working in laser research was made reactive to impacts of low energy normal mode ruby laser. The energy level at the beginning of the experiments was 100 joules/sq. cm. his minimal reactive dose was found to be 38 joules/sq. cm. Partial inhibition to the delayed papular response of his laser skin reaction was done by topical applications of 0.2% and 0.025% fluocinolone acetonide, but not by 0.01% fluocinolone acetonide. Occlusive dressings with 0.01% fluocinoline acetonide, 0.4 mg. and 0.1 mg. of fluorandrenolone acetonide per 100 sq. cm. of an occlusive tape were also effective. The failure of inhibition of the petechial phase of the delayed inflammatory response to the laser is not explained. -- J. Am. Med. Assn. References & Reviews

260 Tooth Transillumination With Laser Radiation. T. Kinersly, et al. Med. Biol. Illus. 17, 5-6 (Jan. 1967).

A low-powered ruby laser head (output 0.4 joule), an extracted tooth with a hole drilled to the crown center, and a camera were aligned on an optical bench. Exposures were made by coordinating the camera opening with the laser flash (0.5 msec. duration). Intensity of the tiny beam (1.5 mm. diameter) was sufficient to light up the entire crown. Films indicated enamel cracks difficult or impossible to detect with the naked eye. Practical applications appear possible if suggestions for piping and sealing the beam are embodied in instrument design to shield personnel.

-- J. Am. Med. Assn. References & Reviews

261 Initial Experience With and Potential of Data Processing and Computer Techniques in a Hospital Clinical Laboratory. E.R. Gabrieli, et al. Am. J. Clin. Pathol. 47, 60-68 (Jan. 1967).

Automation of laboratory data required standardization of terminology. Stored data were used to construct institutional listings and frequency distribution. The latter were used to establish the distributions of local physiological values. Each laboratory test result was transformed into a relative value which characterized the result relative to the local physiological values. The interpretation of individual assay values against the background of all physiological and pathological values increases the information content of the individual results. The clerical assistance offered by the computer is acknowledged, but much more importance is assigned to the new information derived from the large mass of data. -- J. Am. Med. Assn. References & Reviews

SKIN DISEASES AND BURNS

262 Skin Tumorigenesis by an Extract of Amber Petrolatum. W. Lijinsky, U. Saffiotti, and P. Shubik. Toxicol. & Appl. Pharmacol. 8, 113 (Jan. 1966).

A sample of amber petrolatum has been resolved into aliphatic and aromatic fractions. The aromatic portion was separated into two components by solvent partition. The aromatic portion and the two subfractions were tested in iso-octane solution at 50 times their concentration in the petrolatum, and all showed significant carcinogenicity to mouse skin. The petrolatum itself, tested as a 15% solution in iso-octane, showed no significant tumorigenic activity. The tumorigenic activity detected in the fractions cannot be ascribed to any of the compounds so far identified in the original sample. -- J. Occ. Med. Absts.

263 Ichthyosiform Dermatoses: II. Autoradiographic Studies of Epidermal Proliferation. P. Frost, G. D. Weinstein, and E. J. Van Scott. J. Invest. Dermatol. 47, 561-567 (Dec. 1966).

The major ichthyosiform dermatoses have, on the basis of clinical and cellular kinetic observations, been classified into four distinct categories: ichthyosis vulgaris, lamellar ichthyosis, epidermolytic hyperkeratosis, and psoriasiform erythroderma. The last category is considered to be a severe form of psoriasis which begins during childhood: it was not included in the present study. Transit times of epidermal cells through the epidermis were determined by injecting tritiated thymidine in vivo and then studying autoradiographs of sequential biopsy specimens. The transit time was normal in ichthyosis vulgaris (10 to 14 days) but extremely rapid in lamellar ichthyosis (4 to 5 days) and epidermolytic hyperkeratosis (4 days). The number of labeled cells per unit surface and basal lines was determined and was greatly elevated in lamellar ichthyosis and epidermolytic hyperkeratosis, but normal in ichthyosis vulgaris. Increased proliferative activity is, therefore, considered to be a significant factor leading to excess scale accumulation in lamellar ichthyosis and epidermolytic hyperkeratosis, but not in ichthyosis vulgaris.

-- J. Am. Med. Assn. References & Reviews

264 Experiments on the Biology of Fungous Infections of the Feet. S. A. Rosenthal and R. L. Baer. J. Invest. Dermatol. 47, 568-576 (Dec. 1966).

Clinical or persistent asymptomatic fungous infections of the feet have been induced in 37% of 71 human volunteer subjects without the use of occlusive procedures following exposure. Severe trauma (blistering) immediately before exposure appeared to be an important factor in the occurrence of experimental infections of the feet since infection occurred only rarely in non-blistered sites. The clinical incubation time and the duration of the induced lesions varied widely among individual subjects. A clinical and, in some instances, also a mycologic incubation time of three months or more in some volunteers suggest the possibility that dermatophytes may exist in an altered phase. Male and female subjects were equally susceptible to experimental infection. Sites on the toe webs and on the soles were equally susceptible. No difference in pathogenicity could be demonstrated between Trycophyton rubrum and Trycophyton mentagrophytes. The infection rates in subjects exposed during the cold months—October to March—and the warm months—April to September—were not statisically different. -- J. Am. Med. Assn. References & Reviews

CHEMICAL HAZARDS

265 Activated Charcoal vs. "Universal Antidote" as an Antidote for Poisons. A. L. Picchioni, et al. Toxicol. & Appl. Pharmacol 8, 447 (May, 1966).

Results indicate that both activated charcoal and "universal antidote" are effective for adsorption of the chemical agents tested, pentobarbital, strychnine, and malathion. However, in-vitro as well as in-vivo tests demonstrated that activated charcoal alone is more effective as an adsorbent than an equivalent weight of activated charcoal present in "universal antidote." The tannic acid or magnesium oxide component of "universal antidote" apparently interferes with the adsorptive activity of the activated charcoal. Activated charcoal is recommended as a replacement for "universal antidote" in the treatment of poisoning. -- J. Occ. Med. Absts.

266 Determination of the Carboxyhaemoglobin Saturation of Blood by Spectrophotometric Analysis. J.M. Beeckmans. Brit. J. Ind. Med. 24, 71-72 (Jan. 1967).

The spectrophotometric method of Commins and Lawther (Brit. J.Ind. Med. 22, 139 (1965)) for the determination of carboxyhemoglobin saturation in blood was found to lead to systematic under valuation, because of dissociation of the carboxyhemoglobin, and physical dissolution of the carbon monoxide in the solvent used for the analysis. The theoretical relationship between the true and apparent carboxyhemoglobin saturations was calculated and was found to be in satisfactory agreement with the experimental findings, using samples of blood saturated with carbon monoxide, and aerated solvent. The error is much smaller when using oxygen-free solvent, but it is nevertheless appreciable at high carboxyhemoglobin saturations. -- Author's abst.

267 Selenium in Human Urine: A Tenative Maximum Allowable Concentration For Industrial and Rural Populations. J.R. Glover. Ann. Occ. Hyg. (London) 10, 3-14 (Jan. 1967).

The results of 1,517 estimations of selenium in the urine of exposed workers and 793 estimations of persons presenting themselves for a pre-employment examination are given. The causes of death of 17 workers who had worked with selenium are compared with their expected death rate. A maximum allowable concentration of 0.1 mg./liter of selenium in urine is recommended both for persons exposed industrially to selenium and for a rural population -- Author's abst.

268 Carbon Monoxide Poisoning. E. R. Hughes and D. A. Fisher. J. Arkansas Med. Soc. 62, 225-260 (Dec. 1965).

Carbon monoxide poisoning is probably the most common cause of chemical death in the United States. The chemical reacts with hemoglobin to produce carbon monoxyhemoglobin, which in blood levels of 20-30% gives clinical symptoms of poisoning. The mechanism of death in carbon monoxide inhalation and intoxication is described. The exact mechanism of leukoencephalopathy of carbon monoxide poisoning is not known but it would appear that this is best explained on the basis of cerebral edema. -- APCA Absts.

269 Acute Occupational Cadmium Poisoning. A Critical Review of the Literature. B. Dunphy. J. Occ. Med. 9, 22-26 (Jan. 1967).

The history of man's occupational exposure to the fumes of cadmium extends back more than 4000 years into the antiquity of the Bronze Age. By the fourth century B. C. Aristole was able to describe in some detail the production of cadmium admixtures. Although in the mid-seventeenth century cadmium fumes were suspected of being the source of certain illnesses among foundry workers, the first detailed description of acute occupational poisoning appeared in 1858 and listed the respiratory symptoms of three men engaged in the polishing of silver with juniper and cadmium carbonate. In the United States occupational exposure to the fumes of cadmium was infrequent until after World War I, when cadmium electroplating was introduced. In 1925 animal experiments suggested the possibility of a respiratory hazard associated with acute occupational exposures. Subsequent industrial experience soon confirmed that melting cadmium or cadmium compounds without adequate ventilation was an extreme occupational hazard. Consideration of the circumstances and events surrounding cases of acute occupational cadmium poisoning reported in the literature reveals that three factors are common to most of them. First, the presence of cadmium in some particular alloy or on the surface of some other metal is unsuspected. Second, some physical or chemical process (i.e. heating, spraying, brazing), capable of generating high concentrations of particles smaller than 10 microns in diameter, is in use. Third, sufficient ventilatory protective measures are not provided. Preventive measures must be directed primarily at the third factor if cadmium poisoning is to be eliminated. There are 20 references.

270 Observations on the Excretion Rate and Concentration of Mercury in Urine. M. K. B. Molyneux. Ann. Occ. Hyg. (London) 9, 95-102 (July, 1966).

In the case of industrial exposure to inorganic mercury vapor the estimation of mercury in urine may be used to identify the individual with increased and excessive mercury absorption. A study was directed toward this biological index of exposure in order to establish a control for the hazard of mercury. Evidence is presented that mercury is excreted rhythmically, as a result of some physiological mechanism rather than the direct effect of immediate environmental exposure. -- APCA Absts.

271 Mercury Poisoning and Its Treatment With N-acetyl-D, L-Penicillamine. V. Parameshvara. Brit. J. Ind. Med. 24, 73-76 (Jan. 1967).

Two cases of chronic inorganic mercury poisoning of moderately rapid onset are described. Although exposure was the same in the two patients, the mercurial poisoning affected chiefly the kidneys in one and the gums in the other. Mercurialentis and corneal opacities were seen after short exposure to the metal. One case was treated successfully with N-acetyl-D, L-penicillamine. No toxic effects were observed and this is suggested as the treatment of choice for mercury poisoning. -- Author's abst.

272 An Inorganic Mercury Hazard in the Manufacture of Artificial Jewelry. J. F. Copplestone and D. A. McArthur. Brit. J. Ind. Med. 24, 77-80 (Jan. 1967).

An unusual inorganic mercury hazard in a factory manufacturing artificial jewelry is described. Considerable exposure of workers was confirmed by levels of up to 2,000 micrograms/liter of mercury in urine. The air concentration was also found to be correspondingly high, up to 0.5 mg./cu. m. of mercury in the general atmosphere. Preventive measures have resulted in a slow fall in urinary concentrations over a period of several months. Despite the high results obtained, no worker showed any overt evidence of mercurialism. The significance of this is considered in the discussion and it is suggested that mercurialism may be due to a failure in excretion. If this is so, it would have a considerable effect on surveillance techniques; furthermore such a hypothesis may account for the anomalies that are well known in the surveillance of workers exposed to mercury. -- Authors' abst.

273 Lead Retention by the Lungs of Lead-Exposed Workers. S. Mehani.
Ann. Occ. Hyg. (London) 9, 165-171 (July, 1966).

A study has been made of the retention of lead dust and fume by the lungs of 51 lead workers, 22 shipburners, and 25 control subjects. It was found that 39-47% by weight of the inspired lead is retained in the lungs of lead-exposed workers, and in this group, the average ventilation under various working conditions is approximately 10 cu. m. /8 hour shift. It is concluded that at an atmospheric concentration of lead of 2 mg. /10 cu. m. of air, the working conditions are within safe limits, as the amount of lead retained per shift is less than 1/2 the amount which can be tolerated by man without producing evidence of ill-health. It was also found that the degree of lead retention was not associated with the depth of breathing. The present findings, and those of previous authors, and the various factors which affect dust retention have been discussed.
-- APCA Absts.

274 Renal Failure Due to Carbon Tetrachloride. Ann Arbor Case Reports. T.N. Markham.
J. Occ. Med. 9, 16-17 (Jan. 1967).

The case presented here appears to follow the general pattern usually seen in carbon tetrachloride poisoning involving renal failure. The exposure is frequently minimal and the patient frequently has been in good general health. He usually has a history of significant ethanol intake, generally over a prolonged period. The over-all prognosis in these cases appears to be 80-90% recovery when artificial dialysis is used. Death in nearly all cases is a result of the renal failure and not liver injury. There are five references. -- Cond. from author's comment

275 Liver Disease Secondary to Tetrachloroethylene Exposure. L.C. Meckler and D.K. Phelps.
J. Am. Med. Assn. 197, 662-663 (Aug. 22, 1966).

This paper reports on a case of hepatitis in the acute state, caused by the inhalation of tetrachloroethylene fumes in a dry-cleaning establishment. The amount of inhaled tetrachloroethylene was assumed to be substantial enough, especially the higher concentration on the patient's last day of work, to produce the characteristic picture of an acute stage of hepatitis. There are nine references. -- Public Health Eng. Absts.

276 Acute Benzene Poisoning. J. Drozd and E. J. Bockowski.
J. Occ. Med. 9, 9-11 (Jan. 1967).

The circumstances of exposure in a case of an acute benzene poisoning are presented, including evaluation of benzene concentrations at the location where the exposure occurred, urine—sulfate ratios of the patient and other exposed workers, and the symptoms and laboratory findings of the patient. The low-threshold limit value of 25 ppm for benzene indicates that adequate ventilation should be a primary concern for users of this solvent—preferably a less toxic solvent be substituted. Personnel having occasion to work with benzene should be informed of the toxicity and flammability of the vapor. Detailed instructions for safe handling and use of benzene are given in the Chemical Safety Data Sheet SD-2, the American Petroleum Institute's review on benzene, and the Shell Chemical Company's Industrial Hygiene Bulletin. Eight references are given.
-- Authors' summary

277 Adverse Reactions to Sulfobromophthalein Sodium. R.I. Wang and J. Jacobson.
Am. J. Digest. Diseases 11, 973-976 (Dec. 1966).

In view of the fact that eight fatal reactions to sulfobromophthalein sodium (BSP) have been reported in the literature, vigilance must be maintained whenever BSP is administered. Three new cases of adverse reactions to BSP are presented. The allergic history of the patient and his response to previous administration of BSP should be obtained in order to avoid BSP reaction. BSP should be administered slowly to avoid thrombophlebitis, and other precautionary measures, before, during, and after BSP injection, should be observed.
-- J. Am. Med. Assn. References & Reviews

278 Further Investigations on the Evaluation of Exposure to Nitrobenzene. J. Piotrowski.
Brit. J. Ind. Med. 24, 60-65 (Jan. 1967).

Metabolic studies were performed on men exposed to nitrobenzene vapor under experimental conditions. Absorption was estimated by the analysis of urine for p-nitrophenol. About half as much vapor was absorbed through the skin as through the lungs. In inhalation studies the accumulation of nitrobenzene in the course of repeated exposures was investigated. It was found that

p-nitrophenol was excreted in the urine in increasing amounts on successive days of exposure, reaching, by the end of a week, levels approximately two and a half times as high as on the first day. The specificity of the p-nitrophenol test on urine was studied using rats. Of all nitro-compounds investigated only chloronitrobenzenes, especially the ortho-isomer, gave interfering compounds in the urine. o-Chloronitrobenzene gave lower results than nitrobenzene by a factor of three. -- Author s abst.

279 Dieldrin Persistence in Cranberry Bogs. C.W. Miller. J. Econ. Entomol. 59, 905-906 (Aug. 1966).

Although large volumes of water were applied to the area, dieldrin remained localized in the upper four inches of the soil profile. Lack of vertical and lateral movement to any great extent is attributed to the relatively high organic content of the soils. Six references are given. -- Public Health Eng. Absts.

INDUSTRIAL DUSTS

280 A Note on Reliability of Membrane Filter Dust Sample Evaluation by Microscope Counting. A. Sniegowski. Ann. Occ. Hyg. (London) 9, 65-67 (April, 1966).

A study has been made of the statistical error associated with the counting of respirable dust particles collected on a membrane filter. The error is shown to be higher than predicted by Poisson's Law. -- APCA Absts.

281 Electrostatic Precipitators in Thermal Power Stations Which Use Low Grade Coal. H.L. Engelbrecht. Air Eng. 8, 20-25 (Aug. 1966).

The requisite size of a precipitator ultimately depends solely on the migration velocity of the dust particles (cm./sec.). Because this value cannot be calculated accurately in advance, the precise dimensional design of an electrostatic precipitator remains largely a matter of experience. -- Public Health Eng. Absts.

282 Effects of Histamine Aerosol in Byssinotic Subjects. A.A.E. Massoud, et al. Brit. J. Ind. Med. 24, 38-40 (Jan. 1967).

The changes in symptoms and lung function tests of 26 cotton cardroom workers were investigated before and after inhalation of histamine aerosols. Three subjects with no chest symptoms and 11 with uncomplicated byssinosis showed no evidence of any pulmonary reaction, but 12 bronchitic byssinotic subjects showed evidence of the pulmonary hypersensitivity found in patients with chronic bronchitis alone. These findings cast doubt on the possible role of nonantigenic histamine liberators in the mechanism of production of "return-to-work" tightness in byssinosis. -- Authors' abst.

283 Post Mortem Studies of Deceased New South Wales Coal Miners. K.G. Outhred and H.I. McKenzie. Joint Coal Board (Sydney, Australia), various paging, mimeographed, (Sept. 1966).

This report covers the results of examination of the lung specimens and medical and occupational histories from 504 deceased coal miners. Information is presented on (1) causes and modes of death in relation to age at death and mining district; (2) prevalence of pneumoconiosis in various degrees, analysis of origin by district mine and seam, and severity in relation to years of exposure; (3) prevalence of emphysema; and (4) relationship of chronic obstructive bronchitis to age and exposure. There is an association between history of chronic obstructive bronchitis, employment at the coal face and the finding of coal dust in the lungs at autopsy.
NOTE: In a cover letter, Dr. Glick, Chief Medical Officer of Joint Coal Board, has indicated that much of the data in this study was collected before their medical scheme became effective. The authors propose a more extensive assessment of bronchitis post mortem in future studies, as well as an evaluation of such important aspects of personal history as smoking habits, which were not included in this study. -- PG

284 Experiments on the Elimination of Dust From Human Lungs. H. J. Einbrodt. Ann. Occ. Hyg. (London) 10, 47-49 (Jan. 1967).

The dust content of the individual lung lobes of two groups of miners was determined with formamide. The first group consisted of lungs from victims of a mine disaster; the second included lungs of retired miners who were not exposed to heavy dust loads for at least 10 years prior to their deaths. Incomparison, the latter group exhibited less dust content, implying a self-cleansing over a period of no dust exposure. -- Author's abst.

285 The Association of Progressive Systemic Sclerosis (Scleroderma) With Coal Miners' Pneumoconiosis and Other Forms of Silicosis. G. P. Rodnan, et al. Ann. Internal Med. 66, 323-334 (Feb. 1967).

Twenty-six of 60 consecutive men with progressive systemic sclerosis were found to have been coal miners or to have been engaged for long periods of time in other occupations in which there was prolonged and heavy exposure to silicious dusts. With the exception of more frequent respiratory complaints the mode of onset, the severity, and the course of the progressive systemic sclerosis did not differ significantly from what was observed in the authors' patients as a whole. There was roentgenographic evidence of silicosis in eight cases, and in three others nodular anthracosilicosis of the lungs and the tracheal lymph nodes was found at necropsy. There is evidence that indicates that the prevalence of progressive systemic sclerosis among coal miners and other men engaged in similar dusty trades is higher than that in the general population, and it is suggested that silicosis may be a predisposing factor in the pathogenesis of this disease. There are 36 references. -- Authors' summary

286 Immunological Reactions and Pulmonary Dust Disease. B. Pernis. Ann. Occ. Hyg. (London) 9, 49-57 (April, 1966).

An immuno-histochemical study of Caplan nodes supports previous assumptions that this node is essentially a rheumatoid nodule in the lung, and is the same lesion as the subcutaneous rheumatoid lesion, only it has been localized in the lung by reason of dust. In the area of pneumoconiosis, there is evidence that immunological reactions are playing a role, but the specificity of the antigens and antibodies involved are not known. The relevance of immune reactions to the development of the lesions, and ultimately to the development of an invalidating disease is also not clear. -- APCA Absts.

287 Silica Excretion in Relation to the Chemotherapy of Silicosis. T. G. Morris, P. J. Patterson, and J. Marks. Ann. Occ. Hyg. (London) 9, 69-71 (April, 1966).

Recent research promises the hope of effective chemotherapy for silicosis but means for its assessment during treatment have been lacking. It is suggested that agents which depress the toxicity of silica will reduce its solubility and this will be reflected in the amount of silica excreted. Experimental observations and different aluminum compounds show, for example, that aluminum-dextran, which offers considerable protection against the effects of silica also greatly reduced its excretion, while the aluminum-EDTA chelate, which has little protective action does not. -- APCA Absts.

288 Asbestos Dust and Its Measurement. C. G. Addingley. Ann. Occ. Hyg. (London) 9, 73-82 (April, 1966).

The nature of asbestos dust and the testing requirements are discussed. Existing standard methods are briefly reviewed. The development of a membrane filter method of dust counting for asbestos is described in detail. It is thought to be an improvement on existing methods. Tyndallometric methods are considered, and a description of the application of the "Royco" Particle Counter, an instrument based on this principle, to factory testing is described. It is believed that this instrument represents a big advance in routine test methods. -- APCA Absts.

289 Environmental Investigation of a Plant for the Production of Synthetic Detergent and Abrasive Soap. M. S. Abdel Salam, et al. Ann. Occ. Hyg. (London) 10, 51-56 (Jan. 1967).

Dust exposures in a synthetic detergent and abrasive soap factory were studied. High concentrations of respirable dusts were found. Cases of silicosis and silicotuberculosis were found among the workers. No practical method could be thought of to decrease the silica-containing dust in the abrasive soap department with the existing layout of the machinery. The production of abrasive soap had to be stopped. A closed system, with effective dust control devices, is now being designed. Proper ventilation of the plant for synthetic detergent was suggested. -- Authors' abst.

PHYSICAL ASPECTS OF THE ENVIRONMENT

290 Hearing and Infectious, Tropical and Nutritional Diseases. Y. P. Kapur. Laryngoscope 76, 418-457 (1966).

A pool of 1,000 normal-hearing (less than 30 db. loss at any frequency between 500 and 6,000 cps) children was established by screening audiometry. When any of these children contracted mumps or developed vitamin B deficiency, they were given complete audiograms during and 6-12 weeks after the illness. During the first two years of the study, 20 children developed vitamin B deficiency; of these 20, seven showed a persistent conductive loss (30 db. or greater hearing levels). Of the 14 who developed mumps, two showed a similar conductive loss. Some data on the hearing of people with other diseases (prior auditory status unknown) are also presented. During the acute stages of typhoid fever and chickenpox, the incidence of conductive deficit is very high in India (50% and 20%, respectively), but this loss disappears upon recovery from the illness. In smallpox, on the other hand, the conductive losses observed in 25% of the 47 patients apparently persisted at least six weeks. Sensorineural losses were negligible in all aspects of the studies.

-- J. Occ. Med. Absts.

291 Noise: An Occupational Hazard and Public Nuisance. A. Bell. World Health Organization, Public Health Papers 30, 131 pages. (1966).

After describing the medical aspects of hearing, the operation of hearing-conservation programs, and the engineering control of noise, the author discusses the assessment of disability, legislation in different countries, and the problems of community noise. Throughout the text, reference is made to many original papers and works on the subject. There are 310 references

-- Public Health Eng. Abstr.

292 A Noise-Attenuating Enclosure for Audiometer Earphones. R.R.A. Coles. Brit. J. Ind. Med. 24, 41-51 (Jan. 1967).

Noise-excluding earphones may be subdivided into circumaural earphones and noise-attenuating earphone enclosures. Two versions of "Otocups," an example of the latter subdivision, were evaluated in a series of experiments and in comparison with a conventional type of earphone (Telephonics TDH-39 receiver in a MX-41/AR cushion). The experiments involved a comparison of auditory threshold, artificial ear measurements, test-retest reliability, and pure-tone attenuation. The second version of "Otocups" was considered sufficiently reliable for most purposes and to have practical applications in industrial and clinical audiometry when proper booths are not possible on account of cost, weight, or space factors. -- Author's abst.

RADIOACTIVITY AND X-RADIATION

293 The Radiant Energy Received by Patients in Diagnostic X-Ray Practice. R.H. Morgan and Judith C. Gehret. Am. J. Roentgenol. Radium Therapy Nuclear Med. 97, 793-810 (July, 1966).

Data from a study of the radiant energy projected on and received by 36,000 patients at the Johns Hopkins Hospital appear to be useful in evaluating levels of unnecessary exposure prevailing in diagnostic radiology, in estimating annual genetic dose due to diagnostic x-ray methods, and in evaluating trends in this dose arising from an increased application of x-rays in medical practice and from the institution of techniques to reduce patient exposure. There are 11 references.

-- Public Health Eng. Abstr.

294 High Energy Electron Injury From Accelerator Machines (Cathode Rays): Radiation Burns of Chest Wall and Neck: 17-Year Follow-Up of Atomic Burns. J.B. Brown and M.D. Fryer. Ann. Surg. 162, 426 (Sept. 1966).

A brief summary and photographs of the injury and treatment of four patients following accidental exposure to cathode rays of high-energy electron accelerators show that resection and skin grafting can result in functionally adequate skin surfaces. The development of these degenerative burns is uneven in time, extent, and location on the body because of the wide dispersion of the rays. Accelerated electrons in the range of one to a few million electron volts are particularly hazardous because of their ability to pentetrate surface tissues. It is necessary to recognize the delayed breakdown of irradiated areas so that repair with grafts or flaps is done while as much tissue as possible may be saved. Tissue breakdown may continue up to four years or more. Pathologic

studies of the skin show typical changes of chronic radiation dermatitis in these cases. Radiation lesions of the chest, especially from deep radiotherapy, may be complicated by involvement of pleura, pericardium, lung or heart. A brief follow-up report on the radiation burns of the hands suffered by four workers at the Eniwetok tests in 1948 shows the continued preservation of hand function as the result of surgical resection and repair with thick, split-skin grafts.

-- J. Occ. Med. Absts.

ENVIRONMENTAL MEASUREMENTS

295 Observations From a 26-Year Sulfur Dioxide Area Survey. M. Corn, D.H. Thompson, W.J. Schreibeis and R.T.P. deTreville.
Arch. Environmental Health 12, 445-451 (April, 1966).

The authors have described a sampling program which was faithfully carried out over a 26-year period to determine if the sulfur dioxide concentration in the air basin surrounding plant operations changed significantly as industrial plant capacities and the resident population of the area increased. A total of 13,751 air samples were collected by a consistent technique at 42 sampling stations in Beaver County, Pa., and were analyzed by one method for sulfur dioxide. The sulfur dioxide concentrations determined in this program were subjected to statistical analysis after punching all appropriate data for each sample on an IBM card. The data revealed the following information: It was not possible to discern a yearly trend demonstrating improvement or deterioration of air quality with respect to sulfur dioxide over the 26 years. Only 0.5% of the samples obtained during a four-minute sampling period were associated with sulfur dioxide concentrations of 0.3 ppm or above. A sulfur dioxide concentration of 0.3 ppm for eight hours may cause damage to vegetation and represents an "adverse" condition in the California Standards for Ambient Air. Sulfur dioxide concentrations were higher during winter months than during summer months, suggesting the effects produced by changes in residential space heating demands. Sulfur dioxide concentrations were higher during the 5:00 AM to 12:59 PM time interval than during the remaining hours of the day. This result suggested the presence of periods of atmospheric stagnation and increased space heating during this period. Sulfur dioxide concentrations were higher at stations downwind from the reference point but were highest during periods of calm, suggesting the great influence of atmospheric inversions. The air sampling program described here was initiated and sponsored by an industry interested in the quality of the air basin in which it functions. In the opinion of the authors, this study should serve as a model, not necessarily in specific methodology used, but as a relatively inexpensive approach by industry to ensure that air quality in the vicinity of plant operations does not deteriorate. There are 15 references.

-- Cond. from authors' summary

296 Toxic Constituents of Welding Fumes. J. Steel and J.T. Sanderson.
Ann. Occ. Hyg. (London) 9, 103-111 (July, 1966).

Although the main constituents of electrode coatings are known, little information exists on toxic substances present as impurities, and even less on their concentrations in arc welding fumes. In this investigation, spectrographic, and chemical analyses of the coatings of a number of electrodes in common use have been carried out. The same electrodes have also been subjected to standard welding tests and the concentrations of toxic substances in the respirable atmosphere have been measured. The results reveal that current methods for assessing welding fume hazards, based on iron oxide or total fume concentration are unacceptable. -- APCA Absts.

297 A Chemiluminescence Method for Determining Ozone. D. Bersis and E. Vassiliou.
Analyst 91, 499-505 (Aug. 1966).

A method for determining ozone is described which is characterized by the direct recording and automatic determination of ozone within a wide range of concentrations. The development of the method is based on the use of a chemiluminescent solution that is stable and shows a linear relationship between the light emitted and ozone concentration. The electronic instrumentation used is simple and other methods of ozone analysis based on this principle meet difficulties, because of the direct oxidation of the chemiluminescent compound. The present method, by contrast, involves the use of gallic acid as an ozone acceptor, and rhodamine B, which remains unchanged during the measurement as a photon emitter. Observations made with an oscillograph of the light emitted by single bubbles of ozonized air passing through the chemiluminescent solution gave valuable information about the response time of the system.

-- APCA Absts. modified

298 Organochlorine Pesticides in the Atmosphere. D.C. Abbott, et al. Nature 211, 259-261 (July 16, 1966).

Experiments were carried out to ascertain the extent to which organochlorine compounds are present in the atmosphere. It was found that the concentrations of these residues are so low that it was necessary to work almost at the limit of sensitivity of the detection systems. There are 13 references. -- Public Health Eng. Absts.

299 The Dosage of Quartz in Air Samples Taken in the Foundry. M. Martin and R. Paton. Fonderie 243, 179-182 (May, 1966). (French).

The dosage of quartz contained in fine dusts in suspension in the air, is an essential factor in studying the atmosphere in foundries. The dosage methods usually employed are numerous: methods of chemical attack, indirect colorimetric micro-method, physical and physico-chemical methods. Among the latter, the diffraction method by x-rays is of interest for determinations in series. The Technical Center has developed a simple process which applies to this method. In principle, it consists of comparing the intensities of the diffraction line of a sample with a range of intensities obtained on standards. Hundreds of dosages have been made using this technique over two years. This process may be considered sufficiently precise for evaluating the risk of silicosis. -- APCA Absts.

PREVENTIVE ENGINEERING

300 SAF-HANS—A Positive Means to Improve Safety. E.J. Ferguson and J.M. Daschbach. J. Am. Soc. Safety Eng. 12, 14-17 (Feb. 1967).

Safety program effectiveness under present standards is measured in terms of reduced accident frequency or severity. This measurement depends on a response time that is quite long and in the meantime other parameters such as weather, holidays, etc. may bias the results. An investigation of the hazards frequency reduces the effect of these other parameters and gives a better evaluation of safety program effectiveness. An important corollary to the photographic studies concerns the inherent hazards created in the plant facilities by the architect, engineer, or planner. In several photograph sequences, the hazards caused by parts of the building, placement of conveyor systems, and other elements of plant layout were quite evident. This means of establishing safety criteria is feasible and economical enough for small industrial concerns who are concerned enough about their safety records to make positive efforts to improve them. Safety research is normally oriented to making the equipment safer through mechanical means. However, just as defensive driving of an automobile has proven to be an effective means to prevent accidents so hazard frequency reduction can effectively reduce accident rates. The Safety through Frequency of Hazards Analysis (SAF-HANS) procedure is one way to analyze these hazards.
-- Authors' conclusion

301 Heat-Protective Ventilated Jackets: A Comparison of Humid and Dry Ventilating Air. G.W. Crockford and D.E. Lee. Brit. J. Ind. Med. 24, 52-59 (Jan. 1967).

A comparison has been made between humid and dry air for ventilating a heat-protective jacket. At sensible cooling capacities of 4.5 kcal./min. and above, humid and dry air provided equal protection. At sensible cooling capacities of 4 kcal./min. and above, the subject achieved thermal equilibrium within 65 minutes with both humid and dry air, but below this value humid ventilating air is associated with elevated sweat rates and a failure to achieve thermal equilibrium within 65 minutes. -- Authors' abst.

302 Allergies and Air Conditioning. S.M. Feinburg. Am. J. Nursing 66, 1333-1336 (June, 1966).

Air conditioning, natural or mechanical, can offer special benefit to persons who have asthma and hay fever if the cause of the condition is determined to be an inhaled allergen and if the proper equipment is selected. -- APCA Absts.

303 Replacement of Quartz Sand in Pneumatic Operations by Mineral Blasting Media That Do Not Cause Silicosis. W. Gesell. Stahl Eisen 86, 906-912 (July 14, 1966).

Measures adopted in various countries to prevent silicosis among personnel engaged in blasting operations using quartz sand are described. Laboratory and practical blasting tests with various media such as blast-furnace, Renn, and copper slags, basalt, ferro-chrome slag and corundum are given. Determination of the various characteristics of the media, including removal rate, specific blasting time, and the specific media consumption rates were investigated. Results of blasting tests on bridges are shown as well as profitability aspects of the various media.
-- APCA Absts.

304 Procedure for the Dry Separation of Sulfur Dioxide From Waste Gases. H. Juntgen.
Chem. Ingr. Tech. 38, 734-736 (July, 1966).

In the dry processes for separating sulfur dioxide from waste gases, the sulfur dioxide is bound by adsorption onto carbon-containing substances, or chemically by reacting with metallic oxides or carbonates in the presence of oxygen to form sulfates. The regeneration of the sulfates involves a considerable outlay and usually proceeds via various intermediate stages, whereas the sulfur dioxide can be removed relatively simply from carbon-containing adsorbents either by washing out with water or by applying heat. -- APCA Absts.

305 Utilizing Solvent Refined Coal in Power Plants. R.M. Jimeson.
Chem. Eng. Progr. 62, 53-60 (Oct. 1966).

The economic aspects of the process and the cost of reducing air pollution from power plants by the substitution of clean solvent refined coal for conventional contaminated fuels are estimated. The emission of oxides of sulfur from power plant stacks is a major source of air pollution in the U.S. There are three approaches to the solution of the problem, the oxides of sulfur can be removed from the stack gases, power plants can resort to the burning of fuels with a low sulfur content, and the power industry may adopt new clean power cycles as they become available.
-- APCA Absts.

306 Economics of Coal Desulfurization. R.E. Zimmerman.
Chem. Engr. Progr. 62, 61-66 (Oct. 1966).

The object of coal preparation processess for desulfurization of coal is the removal of pyritic sulfur. To determine the extent of pyritic sulfur reduction possible for different coals, tests are made showing the effect of various degrees of crushing and pulverization. Microscopic examinations can be made to show the degree of liberation. This article reviews the modern coal preparation practices and discusses the uses and limitations for desulfurizing coal. --APCA Absts.

307 Removing Sulfur Dioxide From Flue Gases. S. Katell.
Chem. Eng. Progr. 62, 67-73 (Oct. 1966).

The removal of sulfur from coal prior to its utilization as a power plant fuel is investigated. An economic evaluation of new methods for removing sulfur dioxide from power plant flue gases is presented. Processes under development or proposed for development in the U.S. are considered. Estimated capital investment and operating costs for three dry processes for removing sulfur dioxide from flue gases are projected for an 800-Mw. power plant burning 3% sulfur coal.
-- APCA Absts.

COMMUNITY AIR HYGIENE

308 Economic Effects of Air Pollution. E.M. Parrish.
District Heating 51, 93-94, 112 (Jan. 1966).

There are over 6,000 communities in the U.S. which are faced, to some degree, with air pollution problems. What any one community can and will do depends on the collective judgment of its citizens in evaluating the cost of permitting air pollution as compared with the cost of eliminating it. In both instances, the dollar cost is difficult to evaluate because air pollution is mixed with environment, and judgment often tends to be influenced by the people's feelings and emotions rather than facts. The cost of air pollution in the continental U.S. is estimated to be in excess of 6 billion dollars a year. This is the cost of permitting and tolerating air pollution—not the cost of abatement, enforcement, research, or personal suffering. Six billion is the loss of property or property values and the increased burden of maintenance and premature replacement. This does not include the cost of medication or medical treatment for relieving the inconvenience, discomfort, or illness attributed to air pollution, nor how these effects are reflected in corporate operating costs in high absenteeism, sick pay, insurance costs, and substandard production. These expenses are in addition to the injury, damage, and destruction of property and personal possessions.
-- APCA Absts.

309 Comparative Method for Studying Costs of Air Pollution. I. Michelson and B. Tourin.
Public Health Repts. 81, 505-511 (June, 1966).

Previous estimates of the economic effects of air pollution have been vague and uncertain. A study was performed in the Upper Ohio River Valley in 1960 in order to establish more firmly cost figures of air pollution. Although the project must be considered as a pilot study, the conceptual

framework, design, execution, and the results of the study are presented. The methodology of the study is emphasized in order to allow persons interested in pursuing such studies to profit by this example. -- APCA Absts.

310 Atmospheric Pollen in Amherst, Mass. M. L Allessio and J.R. Rowley. Botan. Gaz. 127, 35-40 (March, 1966).

Records of airborne pollen grains and spores from two collection sites show the influence of the immediate vegetation. A larger number of pollen grains but fewer spores were recorded from slides exposed atop an unobstructed building than from those exposed near ground level 500 meters away on a forested hillside. Some of the differences between the two sites could be explained by the proximity of the plant genera to the site having the higher number. Almost all genera were recorded at both stations, and recovery at both sites was generally parallel in time. Because of the qualitative similarities in the genera recorded at each site and the general uniformity of the local and regional floras, it was not possible to determine whether the data reflected local or regional vegetation. No record was obtained, however, that could not have been produced by the local vegetation. -- APCA Absts.

311 Industry Action to Combat Pollution. J. J. Hanks and H. D. Kube. Harvard Business Rev. 44 (5) 49-62 (1966).

Private enterprise has the opportunity to participate in a market that will total at least $275 billion over the next 34 years, and to ensure the availability of clean air and clean water. Industry and motor vehicles are responsible for a large portion of air and water pollution. Air and water pollution, solid wastes, container and other problems, and possible solutions are discussed. -- APCA Absts.

312 Basic Air Pollution Control Equipment. Anonymous. Safety Maint. 132, 38-41 (Aug. 1966).

The basic types of air contaminants are defined. Diagrams are shown for a filter (cloth tube) collector, a cyclone dust collector, a wet scrubber dust collector, and an electrostatic precipitator. The principle and mode of operation for each type of system is discussed. -- APCA Absts.

313 Air Pollution. A New Response to an Old Problem. V.G. Mackenzie. Can. J. Public Health 57, 65-70 (Feb. 1966).

Several provisions of the Clean Air Act and the activities being carried out under them are discussed. Developments of new controls in such areas as sulfur dioxide control, solid waste disposal, and automobile exhaust emissions are described. New legislative proposals now pending before Congress to amend the Clean Air Act are held as an indication of the influence of rising national concern for air pollution and an indication of greater scientific awareness and public understanding of the problem. -- APCA Absts.

314 New York City's Tough New Air Pollution Bill, and What It May Mean to You. S. Elonka. Power 110, 71-73 (Aug. 1966).

The new ordinance prohibits the burning of soft coal for heating purposes and bans the installation of incinerators in new buildings. The sulfur content of fuel burned must be reduced to 2.2% by January 20, 1967 and to 1% by May 20, 1971. -- Public Health Eng. Absts.

MANAGEMENT ASPECTS

315 A Method of Handling Partial Disability Placement Problems. J. Rheinheimer. J. Am. Soc. Safety Eng. 12, 9-12 (Feb. 1967).

Objective placement of partially disabled employees to available jobs is a difficult task at best, but it can be minimized by the presence of a pre-arranged method for handling such problems. Although the employee or his employer have the most to lose in the process, both are heavily dependent upon information furnished by an outside source — medical opinion. The examining physician's findings cannot be of specific value to the disability placement procedure until it is compared with the physical demands of the job that needs to be done. -- Cond. from author's summary

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