

1964

HWBB-0019507



IN RE: ABRAMS November 1992

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November 1992



NW88-0019589

Industrial Hygiene Digest

INDUSTRIAL HEALTH NEWS

LITERATURE ABSTRACTS

MEDICAL

ENGINEERING

CHEMICAL

TOXICOLOGICAL

LEGAL

JANUARY, 1964

(Vol. 28, No. 1)

INDUSTRIAL HYGIENE FOUNDATION

MELLON INSTITUTE

4400 FIFTH AVENUE -- PITTSBURGH, PA. 15213

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INDUSTRIAL HYGIENE FEATURES

Discovering the functional illness in interview is discussed in Abst. No. 14.

A multi-plant program in employee and environmental health is presented in Abst. No. 18.

A discussion of the aeromedical problem of glaucoma is given in Abst. No. 21.

See Abst. No. 22 for the influence of environmental factors in chronic bronchitis.

Data on smoking and the health of older men are presented in Abst. No. 27.

Consult Abst. No. 38 for a report on occupational ultraviolet and skin disease.

A study of topically applied mineral oil fractions on the skin of guinea pigs is presented in Abst. No. 40.

Abst. No. 44 reports on the effects of mild carbon monoxide intoxication.

See Abst. No. 45 for information on phosphorus poisoning in humans.

Consult Abst. No. 48 for the effect of arsenic trioxide exposure on mortality.

Kerosene pneumonitis: an experimental study with small doses is the title of Abst. No. 58.

Toxicity studies on furfural are given in Abst. No. 62.

Abst. No. 66 is concerned with fatal liver damage after barium enemas containing tannic acid.

The findings of blood groups of miners with coal workers' pneumoconiosis and bronchitis are detailed in Abst. No. 71.

Details on ocular hyperoxia are presented in Abst. No. 87.

The continuous functional testing of oxygen breathing equipment is described in Abst. No. 96.

FOUNDATION FACTS

ROBERT T. P. deTREVILLE, The Foundation's Managing Director presented a Seminar at the University of Cincinnati on January 11. His topic was the Industrial Hygiene Foundation.

THEODORE F. HATCH, of the University of Pittsburgh, Graduate School of Public Health and Treasurer of IHF, will be one of the keynote speakers at a golden anniversary testimonial luncheon to be given by the American Industrial Hygiene Association for the Division of Occupational Health of the U.S. Public Health Service on February 6 at Skyline Inn in Washington, D.C.

1961-1963 SUPPLEMENT TO THE LIST OF PERIODICALS abstracted in the Industrial Hygiene Digest is being mailed along with this issue of the Digest. It contains the names and addresses of journals which published original articles abstracted in the Digest and is for the convenience of our readers in obtaining reprints of articles abstracted. Beginning with this issue of the Digest, the names and addresses of the journals will be found at the end of each issue. We hope this will provide greater convenience to those who wish to obtain reprints. Also being mailed is the ANNUAL INDEX of the Industrial Hygiene Digest for 1963. It provides a quick reference to some 1100 abstracts of literature on industrial health which appeared in the Digest last year.

PITTSBURGH SECTION, AIHA, has held its annual election for officers. Two members of the staff of IHF have been elected. On January 28, William J. Schreiber will become President-Elect; and James M. McNerney will take over the duties of Secretary-Treasurer.

NEW REPRINT available from IHF upon request, see Abstract No. 58 in this issue. "Kerosene Pneumonitis: An Experimental Study with Small Doses" by Paul Gross, J. M. McNerney and Mary Ann Babyak. Am. Rev. Resp. Dis. 88, 656-663 (Nov. 1963).

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EDITORIAL

The November issue of Industrial Hygiene Digest carried a letter from Dr. Wescott, Chairman of the IHF Board of Trustees, requesting guidance from members in preparation for the 1964 Annual Meeting. A number of suggestions have been received and are under consideration in IHF Committees. There is still time to submit additional suggestions.

One member suggested categorizing IHF members by product and process in order to allow more prompt communication on highly specialized and timely subjects. From the 1962 IHF questionnaire and 1963 Annual Reports from member companies, IHF is studying the feasibility of this suggestion in the Chemical-Toxicological Committ

Dr. Lester V. Cralley, Chairman of the IHF Engineering Committee, conducted an exploratory meeting at Mellon Institute on December 17 on the current status of oven exhaust effluent treatment. Another meeting is being considered to treat this subject in greater depth. Mr. William J. Schreibeis, Director of the IHF Engineering Division and Secretary of the Engineering Committee, has contacted several companies which he knew to have similar problems inviting representatives to meet with the Engineering Committee.

Mr. Schreibeis is also presently making arrangements for IHF to present the 6th Health and Safety Seminar for the National Industrial Sand Association at Mellon Institute on March 19-20, at the request of Mr. V. P. Ahearn, Managing Director of NISA. Possibility of a seminar on welding hazards control has been raised by the Pipe Fabrication Institute and is under consideration. Incidentally, Mr. E. K. Davison, Secretary, National Sand and Gravel Association, advises that copies of the IHF Report "Evaluation of Dust and Noise at Typical Sand and Gravel Plants" printed in 1961 are still available upon request through the National Sand and Gravel Association, 1411 K Street, N.W., Washington, D.C. 20005.

According to a recent news item (Chem. & Eng. News p. 30-31, Nov. 11, 1963) the demand for phosgene is increasing due to its use in polyurethanes and polycarbonate. Phosgene consumption was 133 millions of pounds in 1962 and the expectation was for 164 in 1963 and 365 in 1964. Of the 10 leading producers listed, it is noted that 7 are IHF members. Of additional interest is the recent announcement of the intent of American Conference of Governmental Industrial Hygienists to lower its Threshold Limit Value on phosgene from 1 ppm to 0.1 ppm in 1964 (Am. Ind. Hyg. Assn. Newsletter Dec. 31, 1963).

Mr. Theodore F. Hatch, Treasurer of IHF and Professor of Industrial Health Engineering at the University of Pittsburgh Graduate School of Public Health has suggested that there may be sufficient interest in this subject to merit consideration of a joint Pitt/IHF meeting on phosgene. There is considerable information from recent toxicological studies (some performed by University of Pittsburgh Graduate School of Public Health and by Dr. Paul Gross and Mr. James M. McNerney of IHF's Toxicology Laboratory) which has not yet been assembled into useful form. This suggestion is

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being referred to the Chemical-Toxicological Committee. Exchange of experience in health hazard evaluation and control by member companies within IHF, a nonprofit organization, offers significant advantages. Frank discussion of such matters in intimate detail in the presence of recognized experts and with representatives of other companies who may have solved similar problems has been a valuable IHF service in the past. It should be even more so in the future, with the increasing complexity of environmental and occupational health technology and a mounting sense of anxiety and urgency on the part of the general public and regulatory agencies.

Mrs. Jane Lee, Chairman of the IHF Nursing Committee, advises that a short experimental course on interviewing and counseling for industrial nurses will be held by IHF at Mellon Institute from June 7-13. Attendance is being limited to a selected group of nurses from nearby member companies. Following the course, if a U.S. Public Health Service grant is received, some of the material will be converted into programmed instructional courses. The auto-instructional courses may then be introduced into controlled use within a number of IHF member companies. Some companies have hundreds of nurses, and there are definite advantages in programmed instruction which allows the learner to study on her own at her own pace and which can be given inplant. We feel exceptionally fortunate to have been able to arrange for Mrs. Jean Gray's assistance as director of the course through the generous cooperation of the USPHS Division of Occupational Health, and we look forward to a continued and mutually rewarding association with the USPHS following the course through Mrs. Gray's membership in the Nursing Committee.

IHF is also considering short courses in special aspects of industrial health for supervisors of member companies to be programmed and used in inplant training of employees. An invitation has been extended to a representative of USPHS Division of Occupational Health, Research & Training Facility, Cincinnati, to visit IHF to evaluate the suitability of these IHF courses for programmed instruction.

In distribution with this issue of the Digest is a letter from Dr. Joseph Treon, Chairman of the IHF Chemical-Toxicological Committee, concerning the Hygienic Guide program. 1964 can be a year of significant progress, developing further the potential which rests in IHF and thus directly and indirectly aiding progress in the fields of occupational and environmental health. IHF has a unique role to play as an association of industries interested in insuring that, through proper management of resources, technology does not outstrip human progress in industry. Your part within IHF is essential if we are to succeed.

Please indicate your interest and willingness to support the programs outlined above on the tear sheet and return it without delay in order that we may proceed with our plans to make IHF as useful as possible to your company, and to employed populations generally.

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TEAR SHEET

Editorial note: Because some individuals, e.g. industrial nurses, may not have ordinarily reviewed the Industrial Hygiene Digest in the past, we'll count on each member company to insure adequate coordination of the following questionnaire.

--Robert T. P. deTreville, M.D.

Return to: Industrial Hygiene Foundation, 4400 Fifth Ave., Pittsburgh, Pa. 15213

1. Suggestions for the 1964 Annual Meeting on October 21-22 (are) (are not) attached. We (will) (will not) plan to send representatives of our company.
2. We (are) (are not) interested in timely notification on matters pertaining to occupational and environmental health and would like to receive notification on the products listed in our Annual Report and/or those listed in the attachment.
3. We (will) (will not) notify IHF if we learn of any information which would benefit other members of IHF.
4. We are interested in having the opportunity to meet with other IHF member companies who have problems in the following environmental and occupational health areas (specify): _____
5. We would like to (obtain further information on the availability of inplant programmed instruction) (have our chief nurse serve on the IHF Nursing Committee or a subcommittee). We feel that the course and follow-up (should) (should not) be conducted at Mellon Institute (with as much support as possible from USPHS) (with matching funds from USPHS and private industry and institutions) (without USPHS support).
6. We (are) (are not) interested in seeing courses developed along similar lines for representatives of other industrial health disciplines. We (are) (are not) interested in training of supervisors and subordinates inplant by programmed instruction in special industrial health subjects (specify): _____
7. We (have) (have not) chemical products which are not listed in the current list of AIHA Hygienic Guides. We (need) (do not need) help from the IHF Chem-Tox Committee in preparing proposed Hygienic Guides for submission to AIHA Hygienic Guides Committee. We (are) (are not) interested in this means of playing an effective role in the writing of technical literature on our company's products and, indirectly, influencing the setting of TLV's and MAC's on our products. A list of our products which might be suitable for consideration for Hygienic Guides (is) (is not) attached, or (may) (may not) be found in our Annual Report.

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(Name)

(Company)

(Date)

INDUSTRIAL HYGIENE DIGEST
Literature and News

NEWS ITEMS

1 PHS Conducts Nationwide Survey on O. H. Nurses, Work Situations.

The first nationwide study of occupational health nurses is being conducted by the Department of Occupational Health of the U.S. Public Health Service. This survey will include all nurses who, at their last registration, stated that they were doing occupational health nursing. It is intended to factually identify some of the characteristics of O.H. nurses and their employment situations. During 1962, ANA conducted an inventory of all registered nurses. This data is now being summarized and will be available soon. The new study of O. H. nurses by the U.S. Public Health Service will be even more detailed and will make it possible to plan better programs and to more ably meet the needs of O.H. nurses. A questionnaire may be expected early in 1964 and the questions should be completed and returned as requested.

-- Notes & Quotes for Occupational Health Nurses 8, 3 (Dec. 1963)

2 Industry Jobs.

The number of persons working in the health care field increased by 46% between 1950 and 1960, a Health Insurance Institute analysis showed. The 1950 total was 1.3 million, while the 1960 total was 1.9 million. Largest increases were in the categories of hospital and other institutional attendants, up from 199,440 to 391,136, and in medical and dental technicians, up 77.1%.

-- AMA News 6, 1 (Nov. 25, 1963)

3 Hygienic Guide Series.

The following additional Hygienic Guide Series are now available: Cyclohexane, Ethyl Chloride (Chloroethane), and Triorthocresylphosphate (Tri-o-tolylphosphate). They are given in the September-October AIHA Journal (pp. 529-536) and can be obtained from the American Industrial Hygiene Association, 14125 Prevost, Detroit, Michigan 48227, at 25 cents each.

-- Am. Ind. Hyg. Assn. J. 24, 529-536 (Sept.-Oct. 1963)

COMING EVENTS

- | | | |
|---|------------|--|
| 4 | Feb. 1-2 | Midwinter Radiological Conference, Los Angeles, Calif. |
| | Feb. 5-7 | American Academy of Occupational Medicine, Hartford, Conn. |
| | Feb. 5-8 | American College of Radiology, Tucson, Arizona |
| | Feb. 7-12 | American Academy of Allergy, San Francisco, Calif. |
| | Feb. 8-11 | Congress on Medical Education, Chicago, Ill. |
| | Feb. 9-14 | American Dioptr and Decibel Society, Kingston, Jamaica |
| | Feb. 10-14 | Medical Society of the State of New York, N. Y. |
| | Feb. 12-16 | American College of Cardiology, New Orleans, La. |
| | Feb. 13-15 | North Pacific Pediatric Society, Vancouver, British Columbia |

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Feb. 13-15	Society of University Surgeons, Los Angeles, Calif.
Feb. 17-19	American College of Surgeons (Sectional Meeting), Denver, Colo.
Feb. 17-19	Canadian-American Medical and Dental Ski Assn., Harbor Springs, Mich.
Feb. 25	National Multiple Sclerosis Society, New York, N. Y.
Feb. 27-29	American Academy of Forensic Sciences, Chicago, Ill.
Feb. 27-29	Central Surgical Association, Rochester, Minn.
Feb. 29-Mar. 6	American College of Allergists, Bal Harbour, Fla.
Feb. 29-Mar. 5	International Academy of Proctology, Miami Beach, Fla.

OCCUPATIONAL DISEASE STATISTICS

5 Occupational Disease Statistics. (Cases reported to the respective Health Departments).

	Conn. Oct.	Pa. Nov.-Dec.	Total
Dermatitis	15*	7	22
Impairment of hearing	1		1
Lead poisoning		1	1
Silicosis		2	2
Silicosis (suspected)	—	3	3
Totals	16	13	29

* Causes are listed as follows:

Connecticut: Occupational dermatitis due to plants: poison ivy 1; occupational dermatitis due to oils and greases (and metal cutting compounds) 4; occupational dermatitis due to solvents 2; occupational dermatitis due to other chemicals: nickel and compounds 3, plating chemicals 1, synthetic resins or resin (plastic) compounds 2; occupational dermatitis—other: infection 1, multiple agents 2.

LEGAL DEVELOPMENTS

6 States Pass 1963 Laws Affecting Medicine.

More than 1,800 state legislative proposals that could have affected the practice of medicine, or the practice of the various allied health professions, were reviewed and followed in 1963 by the Am. Med. Assn. Law Department. Legislatures of all states except Kentucky, Mississippi, and Virginia were in session during the year, some in both regular and special session. The following are some of the more important actions relating to medicine taken by the 1963 sessions of the legislatures: Health Insurance. Joint action by insurance companies in underwriting a single group of health insurance for persons 65 years of age and over and their spouses was approved in California, New Hampshire, New York, New Mexico, Nevada, N. Carolina, Ohio, Oregon, Texas, and Washington. Similar proposals were considered but not enacted in Hawaii, Iowa, New Jersey, Pennsylvania, and Wisconsin. Ionizing Radiation. Illinois, Nebraska, New Hampshire, Oklahoma, and Wisconsin adopted comprehensive state laws regulating ionizing radiation from all sources and authorizing agreements concerning regulatory authority in the field of radiation hazards. Regulatory laws in this area were defeated in Alabama, Arizona, Colorado, Georgia, Pennsylvania, and West Virginia. Motor Vehicle Operators. Michigan required seat belts to be installed in all

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new vehicles after January 1. A number of bills relating to automobile drivers' physical condition, and the reporting by doctors of patients with disabling or potentially hazardous conditions were considered in several states, but were not passed. -- AMA News 6, 14 (Nov. 25, 1963)

7 Air Pollution Control Bill Awaits Signature.

The air pollution control bill now awaits President Johnson's signature. The final version, approved by Congress after a House-Senate conference, expands the Federal Government's role in supporting research on causes and prevention of air pollution but leaves control of air pollution largely up to the states. Under the bill, the Secretary of Health, Education, and Welfare can call pollution abatement conferences only after he has consulted state officials; the Senate version would have permitted the Secretary to call conferences without consultation. The bill also forbids the Government to bring suit in an intrastate pollution case unless requested to do so by the state governor. The bill also authorizes studies of pollution by automobile exhausts and studies on lowering the level of pollution from sulfur compounds. It does not contain a Senate-backed provision requiring the Government to take title to patents resulting from air pollution research grants. -- Chem. Eng. News 41, 23 (Dec. 16, 1963)

EDITOR'S NOTE:

The Clean Air Act was passed and signed by President Johnson on December 17, and is being printed as PL88-206 according to the Air/Water Pollution Report of December 30, 1963.

8 Legislation to Ban Hard Detergents Unnecessary.

Legislation to ban hard detergents is unnecessary, David C. Melnicoff, president of the Soap and Detergent Association, told the House Committee on Public Works at hearings on S. 649. One section of the bill would authorize the Secretary of Health, Education, and Welfare to issue rules controlling non-biodegradable detergents to take effect December 31, 1965. Industry will complete a voluntary changeover to soft detergents by December 1965, hence legislation is unnecessary, Mr. Melnicoff says. Hard detergents will automatically be driven off the market because all facilities now making them will be converted to the production of soft detergents, he says. In addition, the expected selling price of soft detergents will make it uneconomic to import hard detergents, he adds. -- Chem. Eng. News 41, 23 (Dec. 16, 1963)

BOOKS, PAMPHLETS AND NOTICES

- 9 A Full Life After 65. Edith M. Stern. Public Affairs Pamphlet No. 347. 28 pp. (1963).
AVAILABLE FROM: Public Affairs Committee, 22 East 38th Street, New York, N.Y. 10016
PRICE: 25 cents.

The author discusses many of the psychological and practical problems people face after retirement. Her suggestions reflect basic principles of good mental health; accept things as they are when they cannot be changed; adapt to changing circumstances; fill the post-retirement years purposefully, according to your own individuality. The author's underlying conviction is that there are almost as many ways to age in good mental health as there are people. "Distinct break though retirement is", she points out, "there is not any more real, discernible break between middle age and old age than between youth and middle age. The figure 65, used for statistical purposes and convenience, is an arbitrary one. Moreover, it is outdated, for with better medical care and sanitation, the 75-year-olds of the 1960's are like the 65-year-olds of the 1880's." As a primary step, the author urges those in retirement years to make a habit of getting an annual medical check up, for mental disorder is less likely to be present where physical health is good. In addition, many serious ailments can be prevented and others controlled through regular medical attention. Her advice on how to choose and use a doctor is helpful.

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- 10 Protection of Electronic Computer Systems. NFPA No. 75. National Fire Protection Association. 30 pp. (1963). AVAILABLE FROM: National Fire Protection Association, 60 Batterymarch Street, Boston, Mass. 02110 PRICE: 60 cents.

A newly revised standard for the protection of electronic computer systems has recently been issued by the National Fire Protection Association (NFPA). The 1963 text of this publication is principally a clarification of a number of recommendations included in the previous edition. The standard classifies computers according to their construction, design features and protection needs. It outlines measures needed for the protection of the computer area as well as the computer tapes and records. Emergency fire procedures are detailed. Officially adopted by the NFPA at its 1963 annual meeting, the revised standard was prepared by the NFPA Committee on Electronic Computer Systems under the chairmanship of John J. Ahern of General Motors Corporation.

- 11 Protection of Records. NFPA No. 232. National Fire Protection Association. 107 pp. (1963). AVAILABLE FROM: National Fire Protection Association, 60 Batterymarch Street, Boston, Mass. 02110 PRICE: \$1.00.

A newly revised standard for the protection of records has just been issued by the National Fire Protection Association (NFPA). The 1963 edition of this widely-used NFPA Standard incorporates a number of changes and clarifications in the text. The standard covers minimum requirements for records protection from fire and standards for fire-resistive vaults and file rooms, safes, containers, and other equipment. A separate chapter deals with management of records including methods of salvage. Officially adopted by the NFPA at its 1963 annual meeting, the revised standard was prepared by the NFPA Committee on Record Protection under the chairmanship of A. J. Steiner of Underwriters' Laboratories.

INDUSTRIAL MEDICAL PRACTICE

- 12 The U. S. Air Force Progress in Aerospace Medicine. O. K. Niess. Military Med. 128, 215-216 (Mar. 1963).

At an address delivered to the Korean Aerospace Medical Association in December, 1962, the author speaks of the future needs in space exploration that must be fulfilled by the aerospace physician. Problems in biomedical monitoring and environmental medicine are fields where research will be stressed. But the author notes that medical benefits can be derived from space research and applied to problems still existing on earth. Social problems inherent in medicine must be met, and American achievements in aerospace medicine must be shared with the rest of the world.

-- Aerospace Med. Absts.

- 13 The Control of Operating-Suite Temperatures. F. P. Ellis. Brit. J. Ind. Med. 20, 284 (Oct. 1963).

Three main requirements influence the control of the temperatures of operating suites: (1) avoid humidities which contribute to the risks of anesthetic explosions; (2) promote the comfort and working efficiency of the staff; and (3) conserve the patient's resources. In the United States, an air temperature of 70 to 75°F (21 to 24°C) with 50 to 60% relative humidity provides a compromise between the requirements of the patients and those of the operators. In Britain, a temperature of 65 to 70°F (18 to 21°C) and a relative humidity of 50% is "well tolerated for many hours." In the U. S. S. R., air-conditioning should provide in summer an air temperature of 68 to 72.5°F (20 to 22°C) and in winter 66 to 68°F (19 to 20°C) with a relative humidity of 55%. According to the American Society of Heating, Refrigeration and Air-Conditioning Engineers (1961) Guide "little is known about optimum air-conditions for maintaining normal body temperatures during anesthesia and the immediate post-operative period." Clarke and his colleagues' observation in

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New York City that the patient's temperature begins to rise when the wet-bulb temperature exceeds 75°F (23.8°C) fills one important gap. But his findings may not apply to other populations. Deaths from heat stress have occurred in Britain with wet-bulb temperatures of this order; and in the tropics surgeons operate successfully without air-conditioning where the ambient wet-bulb temperature rarely falls much below 75°F (23.8°C). When temperature control is available, it is not only at high temperatures that trouble arises. Excessive cooling of the patient leads to cardiac arrhythmias. The patient's position is more hazardous than that of those exposed to climatic extremes in industry or in the armed forces. He is not only unconscious but his responses may be poikilothermic in character because shivering is abolished and there is peripheral vasodilatation. When he is exposed to levels of warmth at which he might not maintain thermal equilibrium, his body temperature should be recorded continuously during the period of anesthesia in the theater and in the ward.

-- Author's abstr.

- 14 Discovering the Functional Illness in Interview. T. M. Overley.
J. Am. Med. Assn. 186, 776-777 (Nov. 23, 1963).

When the possibility of a functional illness is kept in mind it is possible to discover it with little departure from the usual medical interview in a significant percentage of cases. A carefully taken medical history seems the most useful clue for discriminating patients who are functionally ill from those who are organically ill. A collection of variables, some of which are supposed to be characteristic of functionally ill patients, proved to be unsuccessful in discriminating a group of functional patients from a group of organic patients.

-- Author's conclusion

- 15 Short Term Psychotherapy of the Aviator. R. E. Ehrlich and P. B. Phillips.
Aerospace Med. 34, 1046-1047 (Nov. 1963).

A significant number of aviators can be treated for psychogenic problems and returned to useful flight status, particularly those with good motivation, strong defenses, and somatization of their conflicts. In a reasonably short period of time a workable insight can be developed, especially if reinforced by authoritarian support and encouragement. Short-term psychotherapy for the aviator not only has a definite place in aviation medicine, but is to be encouraged, and good results may be expected.

-- Authors' summary

- 16 Alcohol Accumulation in Humans after Prolonged Drinking. R. B. Forney and F. W. Hughes.
Clin. Pharmacol. Therap. 4, 619 (Sept.-Oct. 1963).

Twenty-two female and 35 male young adult subjects drank either one or two ounces of 100 proof bourbon whiskey per 150 pounds of body weight. When the subjects drank one ounce aliquots for 5 hours (6 drinks), blood levels considered to be legally intoxicating were not attained. With the consumption of two ounce drinks every hour, a blood level considered to be prima facie evidence of alcoholic intoxication (100 mg. per 100 ml.) was reached within 90 minutes.

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

- 17 Sclerosing Hyaline Necrosis of the Liver in the Chronic Alcoholic. A Recognizable Clinical Syndrome. H. A. Edmondson, et al. Ann. Internal Med. 59, 646-673 (Nov. 1963).

A group of 19 chronic alcoholic patients, with a characteristic clinical syndrome associated with sclerosing hyaline necrosis of the liver, is reported. The clinical features of the syndrome included leukocytosis, fever, abdominal pain, liver enlargement, and tenderness. Fourteen patients were admitted with jaundice, and although liver or biliary tract disease was suspected, the correct diagnosis was not always made. Five patients had little or no jaundice, and the nature of their illness was often unrecognized. Three patients were subjected to laparotomy because of the abdominal pain, physical findings, and leukocytosis. The pathologic changes responsible for the clinical syndrome are hyaline necrosis of liver cells, infiltration with neutrophils, and intense sclerosis of the centrilobular sinusoids and veins. The sclerosing vascular change may progress, leading to partial obliteration of the venous outflow tract and to centrilobular cirrhosis. Resistant ascites was common in these patients. The prognosis was poor in this highly selected group of patients, as only 4 of the 19 recovered. The prognosis seems to be better in those patients who do not yet have cirrhosis or marked fatty change in the liver.

-- Authors' summary

- 18 A Multi-Plant Program in Employee and Environmental Health. W. W. Stalker, V. G. Stalker and A. L. Rosenblatt, *Am. Ind. Hyg. Assn. J.* 24, 462-468 (Sept.-Oct. 1963).

The organization and operation of a multi-plant occupational health program is described. The program is designed to meet the needs of industrial plants with 1000 or fewer employees. Industrial medicine, health education, and industrial hygiene, are coordinated as the basic phases in this approach to the solution of a health program for the small plant. The procedures are described for developing, incorporating, and operating the program, including figures on costs for such programs in 30 plants.

-- Authors' abst.

- 19 Energy Expenditure Ranges and Muscular Work Grades. J. R. Brown and G. P. Crowden. *Brit. J. Ind. Med.* 20, 277-283 (Oct. 1963).

This paper is based on the findings of a field study which was planned to ascertain by metabolic measurement the rates of energy expenditure of men and women on productive effort at work in modern factories. The investigation which is described was carried out during a period of peace-time full employment, mainly in factories associated with the Slough Industrial Health Service in which a nutritional survey of the calorie intake of male operatives had been made by the Ministry of Health and the Medical Research Council in 1952. The rates of energy expenditure of 70 men and 54 women in 27 occupational groups were measured by indirect calorimetric methods. On the basis of the criteria for the classification of work according to its heaviness, adopted by the Factory Department of the Ministry of Labour, muscular work grades have been ascribed to occupations studied. From the distribution of 390 metabolic measurements, ranges of energy expenditure have been computed for occupations classed as sedentary, light, moderate, heavy, or very heavy. Observation of recurrent phase variations in types of productive effort in the work-cycle indicated that wider work grades, such as light-to-moderate or moderate-to-heavy are needed to cover the energy expenditure rates of men and women in many occupations. The data obtained in this study have enabled a table termed the "Slough Scales" to be compiled giving ranges of energy expenditure and pulmonary ventilation rates for the various work grades ascribed to occupations.

-- Cond. from authors' abst.

- 20 Objective Visual Field Testing. Occipital Potentials Evoked from Small Visual Stimuli. R. M. Copenhaver and G. D. Beinhocker. *J. Am. Med. Assn.* 186, 767-772 (Nov. 23, 1963).

A computer was developed specifically to record the small evoked occipital potential produced in response to focal visual illumination. Experiments have been performed which indicate that the responses recorded are the result of relatively focal stimuli. Approximately 25 patients with visual field defects have been studied to determine the feasibility of objective visual field testing. Present difficulties have been described with some instrument modifications that are in progress to reduce these difficulties. Objective visual field testing, which now appears feasible, should soon become practical.

-- Authors' summary

- 21 The Aeromedical Problem of Glaucoma. J. F. Culver and W. B. Clark. *Aerospace Med.* 34, 1055-1058 (Nov. 1963).

In the performance of tonometry there are three vital factors influencing the safety, ease, and reliability of each determination: physician's skill, patient's cooperation, and instrument function. When all three of these are adequately controlled, referral to an ophthalmologist can be based upon these findings: 2 or more pressures of 22 mm. Hg. or higher; a single pressure of over 25 mm. Hg; or a reproducible difference in pressures between the two eyes of over 4 mm. Hg. Ophthalmologic evaluation will clarify the diagnosis and therapy. Some preglaucoma patients whose flying duties are militarily vital may be carefully followed in the absence of disc changes or field defects until their pressures reach 30 mm. Hg. Patients who have a diagnosis of glaucoma and are on medication must be suspended from flying status. There will be a few in this group who are adequately controlled and for whom the therapy produces no visual disturbance. After careful consideration, the flight surgeon may refer these unusual patients to the USAF School of Aerospace Aeromedical Evaluation Service for a thorough documentation of the absence of any aeromedical hazard. Consideration by the Surgeon General's Office will then be given for appropriate waivers. Eight references are cited.

-- Authors' summary

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- 22 The Influence of Environmental Factors in Chronic Bronchitis. A. M. Phillips.
J. Occ. Med. 5, 468-475 (Oct. 1963).

Epidemiologic studies of chronic bronchitis appear to indicate that the cigarette-smoking factor is of such importance as to overwhelm other environmental influences. More information on the effects of other environmental factors is urgently needed. This may come from study of individual occupational groups exposed to specific substances or from further laboratory studies with the substances themselves.

-- Author's conclusion

- 23 The Common Cold—A Continuing Aeromedical Problem. J. W. Funk.
Aerospace Med. 34, 1058-1061 (Nov. 1963).

The magnitude of the problem of the common cold is discussed. Its incidence in flyers is given, and its importance as a cause of non-effectiveness is discussed. The clinical syndrome is described and the underlying pathophysiologic mechanism is postulated. Treatment is discussed and the author's suggested therapeutic management is given with particular reference to the flyer. There are 26 references.

-- Author's summary

- 24 Coronary Heart Disease and Hypertension in the White Mountain Apache Tribe.
N. J. Clifford, et al. Circulation 28, 926 (Nov. 1963).

Over an 8-year period from 1952, not a single Apache on the Fort Apache Reservation was treated for angina pectoris or myocardial infarction. Electrocardiograms were recorded on 147 individuals over the age of 40 years in a 2-year period. Not one record diagnostic of myocardial infarction, left bundle-branch block, or second or third degree atrioventricular block was obtained. The mean serum cholesterol in men was 198-42 mg./100 ml. and in women 205-41 mg./100 ml. The Apache diet is composed of 10.2% protein and 24.1% fat, little of which is obtained from dairy foods. Blood pressures obtained in 327 individuals above the age of 20 years revealed diastolic pressures over 100 mm. Hg. in 26.4% of the men and in 23.2% of the women. Of interest was the finding that over 40% of men aged 30-49 years had blood pressures in the hypertensive range.

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

- 25 Coronary Heart Disease Among the Navajo Indians. H. S. Fulmer and R. W. Roberts.
Ann. Internal Med. 59, 740-764 (Nov. 1963).

A 6-year cohort and descriptive epidemiologic study in the Many Farms Navajo Indian population has revealed only 4 cases of coronary heart disease in 508 adults 30 years old or older. The incidence is significantly low when an appropriate age and sex matched segment is compared to the Framingham population, whose people have undergone intensive study for coronary heart disease. Analysis of so-called "risk" variables in a comparison with the Framingham population reveals that blood pressure levels are significantly lower throughout the entire studied age range in both male and female subjects. Electrocardiographic evidence of left ventricular hypertrophy is also significantly low. Cholesterol levels appear to be somewhat lower, although direct comparison cannot be validly made. Host and environmental variables of possible relevance in causation of coronary heart disease are described in the Navajo setting. Of all factors, diet has been studied most intensively, demonstrating that Navajo have a high animal fat intake of adequate caloric value. It is suggested that multiple factors in addition to diet are operative through mechanisms that are in part expressed by the so-called "risk" variables (blood pressure levels, left ventricular hypertrophy, and cholesterol levels) in determining the low incidence of coronary heart disease among the Navajo.

-- Authors' summary

- 26 The Chronic Effect of Cigarette Smoking on Pulmonary Ventilation. R. K. Larson.
Am. Rev. Resp. Dis. 88, 630-635 (Nov. 1963).

A total of 658 smokers and nonsmokers was studied for evidence of expiratory obstruction by using the rapidly recorded expired vital capacity. After exclusions for incomplete questionnaires, technically unsatisfactory spiograms, abnormal chest roentgenograms, asthma,

cardiac disease, exclusive cigar or pipe smoking, and interrupted smoking history, 418 subjects remained to be studied. These were subdivided into sex, smoking, and age categories. The timed vital capacities for all age groups of more than 29 years in both sexes were inferior in smokers when compared with those in nonsmokers. When measured by the midexpiratory and third quarter flow rates, these differences were significant on statistical analysis. Increasing expiratory obstruction in smokers correlated even better with cumulative smoke exposure in pack-years than with age. The incidence of grossly abnormal spiograms was almost limited to smokers. This lends further support to the important role of tobacco smoking in the genesis of chronic pulmonary emphysema.

-- Author's summary

- 27 Smoking and the Health of Older Men. II. Smoking and Ventilatory Function. W. Weiss, et al. Arch. Environmental Health 7, 538-547 (Nov. 1963).

A total of 338 consecutive men aged 50 and over reporting routinely for checkup to the Philadelphia Pulmonary Neoplasm Research Project over a 6-week period were studied by means of the McKesson Vitalor. The tests included the vital capacity, one- and three-second forced expiratory volumes, and the maximal expiratory flow rate from 200 to 1,200 cc. Because of the paucity of published data on ventilatory studies in older men, a study was also made of the "normal" men (nonsmokers with negative chest photofluorograms without respiratory symptoms) among 4,764 men continuing to make routine visits to the Philadelphia Pulmonary Neoplasm Research Project at the time of this study. Data are presented on the vital capacity, one-second forced expiratory volume, and maximal expiratory flow rate in 294 men aged 50-69. The highest percentage of ventilatory abnormalities was found in heavy cigarette smokers, in cigarette smokers of long duration, and in cigarette smokers with abnormal photofluorograms and symptoms. These findings suggest chronic bronchial obstruction due to irritative bronchitis. Ex-smokers have ventilatory values intermediate between those of nonsmokers and those of current smokers. The correlations demonstrated suggest that cigarette smoking is a factor in impairment of the vital capacity and one-second forced expiratory volume.

-- Authors' summary

- 28 The Problem of Pulmonary Scar Tumors. A Case Report and Brief Review. F. H. Strauss, E. Dordal and A. Kappas. Arch. Pathol. 76, 693-699 (Dec. 1963).

A case of traumatic lung scarring with inclusion of a knife blade fragment for 55 years followed by development of peripheral lung carcinoma at the site of the embedded foreign body is described. Gross description, histology of the carcinoma, and analysis of the foreign body are included. The accepted criteria for post-traumatic carcinoma development are discussed. Discussion of the pathogenesis is carried out with regard to the role of scarring and chemical carcinogenic agents localized to an isolated area of lung parenchyma. There are 37 references.

-- Authors' summary

- 29 Smallpox—Here? E. R. K. Leiter. J. Occ. Med. 5, 486-490 (Oct. 1963).

The serious nature of smallpox, once so common is recalled. Its continued presence and evidence of a credible threat to further outbreaks or epidemics are emphasized. The importance of early recognition of the disease and some of its manifestations are noted. The importance of revaccination is stressed, and comment is made on materials, technique, interpretation, and the few hazards which may be associated. The chief contraindications to vaccination against smallpox are eczema, steroid therapy (supportive) and debilitation.

-- Author's summary

- 30 The Diarrhea of Travelers to Mexico. Summary of a Five-Year Study. B. H. Kean. Ann. Internal Med. 59, 605-614 (Nov. 1963).

A series of experiments designed to explain the nature of turista, the diarrhea of travelers to Mexico, and observations of 208 students from the United States in Mexico, yielded the following information: (1) The syndrome is a definite clinical entity characterized by acute nonbloody diarrhea, slight fever, abdominal pain, nausea, chills, and malaise. It occurs in one quarter to one third of visitors to Mexico, more often in younger people, and it usually develops

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several days after arrival. The illness lasts from 1 to 3 days, and one third of those affected are incapacitated. (2) The cause of turista remains unknown, but viruses, Salmonella sp., Shigella sp., and E. histolytica could not be incriminated in these studies. Shifts in the bacterial populations of the intestinal tract, possibly involving enteropathogenic strains of E. coli, are suspected. (3) The incidence of turista can be reduced substantially by the prophylactic use of phthalylsulfathiazole, 2 g. daily, or neomycinsulfate, 1 g. daily. Iodochlorhydroxyquinoline and a lactose placebo are ineffective. Furazolidine, on the bases of limited studies, has questionable usefulness. Simple hygienic precautions and symptomatic treatment remain the current recommendations for travelers to Mexico.

-- Author's summary

- 31 Familial Leukemia: Report of Instance and Review of the Literature. K. H. Kolmeier and E. D. Bayrd. Proc. Staff Meetings Mayo Clinic 38, 523-531 (Nov. 20, 1963).

An instance of familial leukemia, occurring in a mother and her son, after heavy exposure to insecticide spray is reported. The literature on familial leukemia is reviewed and the controversy of opinions on heredity as a factor in the etiology of leukemia is pointed out. In the cases described, it is possible that the insecticide acted as a trigger mechanism for the induction of acute myelogenous leukemia in two "genetically susceptible" patients. There are 38 references.

-- Authors' summary

SKIN DISEASES AND BURNS

- 32 "Kissing Bug" Bite in Los Angeles. R. L. Swezey. Arch. Internal Med. 112, 977-980 (Dec. 1963).

A case of insect-bite reaction to Paratriatoma is reported. Recognition of the presence of these bugs and the nature of the management of their bites are discussed. The potential danger of complicating Chagas' disease (American trypanosomiasis) in the United States is noted. Fourteen references are cited.

-- Author's summary

- 33 Cave Disease: A Report of Three Cases from Southern Rhodesia. M. Gelfand. Central African J. Med. 8, 461-466 (Dec. 1962).

Murray and his colleagues in 1957 first drew attention to pulmonary histoplasmosis in South Africa when they reported 3 cases of the disease. The 3 patients became ill after exploring deep limestone caves. Positive histoplasmin skin tests were found, but the organism was never isolated from the patients. Subsequently, Murray compared the frequency of a positive histoplasmin skin test in speleologists from the Transvaal with that of people who had never frequented caves. The histoplasmin skin test was positive in 94% of the cave explorers, and was consistently negative in the general population. Histoplasma capsulatum has usually not been isolated, although the fungus has been recovered from a series of experimental animals (monkeys, rabbits, and guinea pigs) which were exposed to the dusty atmosphere of a cave. Three cases of histoplasmosis in speleologists are reported.

-- Am. Rev. Res. Dis. Absts.

- 34 Follow-Up Study of 41 Cases of Cement Dermatitis. Protective Value of Silicone Aerosols. G. Desmichelle and Vilensy. Arch. maladies profess. 24, 330-336 (Jan.-Mar. 1963). French.

Cement dermatitis is the occupational disease most commonly encountered in France. Out of 449,800 workers handling cement, 2,331, about 0.5%, suffered from the disease in 1959. Silicone ointments were of little value, but silicone aerosols gave good results in 27 persons out of 41 showing clinical evidence of the disease. Localized eruptions reacted more favorably than more extensive, possibly allergic, lesions. Twenty-six brief case-histories are given.

-- Bull. Hyg.

- 35 Cosmetic Formulating. R. L. Goldenberg. Arch. Dermatol. 88, 627 (Nov. 1963).

This paper first attempts to correct several misunderstandings evident in recent attacks on the cosmetic industry, pointing out the difference between advertising claims and actual formulating practice, and discussing differences in dermal reactions to cosmetics of the general population versus that of clinics. The rationale and formulation details of three types of cosmetic products are then discussed: oily materials, antiperspirant-deodorants, and keratin substantive preparations. Possible dermatological applications of some of the principles used in formulating these preparations are suggested, with particular emphasis on the implications of the effects of keratin substantivity on dermal reactivity to many materials.

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

- 36 Hormones in Cosmetics. J. S. Strauss. J. Am. Med. Assn. 186, 759-762 (Nov. 23, 1963).

In review of experimental data on the use of sex steroids in cosmetics, there was evidence that some topically applied steroidal hormones, both active and inactive biologically, cause slight histological thickening of the epidermis of aged skin. Dermal changes are questionable and clinical effects usually negligible. In the amounts which can be safely incorporated into cosmetic preparations, topically applied estrogens have no effect on human sebaceous glands and oil secretion. Natural progesterone in physiological amounts causes no increase in oil secretion in the human. Used as directed, topically applied hormones as presently formulated in cosmetic preparations have adequate safety factors.

-- Author's abstr.

- 37 Modification of Sunburn by Infrared Rays. M. A. Everett, et al.
J. Am. Med. Assn. 186, 778-779 (Nov. 23, 1963).

This study of the effect of infrared radiation on cutaneous ultraviolet exposure demonstrates suppression or diminution of ultraviolet erythema by infrared light. A concomitant reduction in the pigmentary, midepidermal PAS-position granule and, probably, Keratinous responses were observed. Mitotic activity and basal cell PAS-positive granule formation were not influenced. These results are compatible with the theory of ultraviolet erythema which regards the vasodilation induced by ultraviolet light as a direct dermal effect of more deeply penetrating ultraviolet rays.

-- Authors' summary

- 38 Occupational Ultraviolet and Skin Disease. R. Auerbach and G. D. Weinstein.
Arch. Dermatol. 87, 691 (1963).

Although light eruptions are usually associated with outdoor sunlight exposure, indoor ultraviolet sources may also produce light eruptions in certain occupational situations. In the first of two cases cited as examples, a research biologist developed a patch of chronic discoid lupus erythematosus at the site of exposure to an ultraviolet microscope lamp. The second exposure occurred in an operating room, where a nurse was exposed to ultraviolet sterilizing lamps and developed a recurrence of her polymorphous light eruption.

-- J. Occ. Med. Abstrs.

- 39 Serum Activity of Ornithine Carbamyl Transferase and Transaminases in Severe Burns.
H. Reichard, S. O. Liljedahl and G. Birke.
Acta Chir. Scand. 126, 45 (July-Aug. 1963).

In a study of the incidence of acute liver cell damage in cases of burns, the activity of ornithine carbamyl transferase (OCT), glutamic oxalacetic and glutamic pyruvic transaminases (GOT) and GPT) was investigated in the serum of 15 patients. Simultaneous increases in the levels of the 3 enzymes were recorded in almost all the patients in whom the burns covered more than 15% of the body surface. The serum enzyme levels were normal for the first 4 to 5 days, and then gradually reached their peak levels about 9 days after the accident. The OCT in the serum showed the most frequent and marked elevation. In 2 patients with electrical burns the peak serum enzyme values were noted immediately after the accident indicative of sudden damage to the liver and muscle cells. In the patients who received blood transfusions, plasma, and electrolytes the enzyme levels were normalized after 2 to 3 weeks (or longer), showing that the liver injury seems to be reversible.

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

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- 40 Effects of Topically Applied Mineral Oil Fractions on the Skin of Guinea Pigs. W. G. Hoekstra and P. H. Phillips. *J. Invest. Dermatol.* 40, 79 (Feb. 1963).

Repeated applications of a number of light petroleum distillates to clipped, intact guinea pig skin caused marked epidermal hypertrophy, hyperplasia, hyperkeratosis, and depilation. No correlation could be made between severity of effect and crude source of the oils or viscosity, aromatics and unsaturates content, or type of acid treatment. Fractional separation of a mineral-seal oil sample into its component hydrocarbon classes yielded aromatics, n-paraffins, iso-paraffins and naphthenes. All fractions caused skin damage, but the effect was most severe with the aromatic and iso-paraffinic fractions. Lower boiling-point fractions distilled from a highly refined white oil in the light lubricating oil viscosity range, which by itself caused minimal skin effects in guinea pigs, were found to be severely damaging to the skin, while the higher boiling-point cuts were essentially innocuous. The same was true for a specially blended oil of similar boiling range when it was subjected to a separation into its hydrocarbon component classes and each component class, then fractionally distilled: within each class (n-paraffins, isoparaffins, mono- and polycyclic naphthenes) a break in skin-damaging potency occurred at approximately the same boiling point (no effect above 350°C). Fractional distillation of aromatics fraction with similar boiling range did not yield innocuous fractions. It was estimated that the maximum skin damage caused by the nonaromatic fractions resulted from C₁₄ to C₁₉ hydrocarbons; loss of potency occurred at about C₂₁ to C₂₃. A companion study of highly purified paraffins (C₇ to C₂₂) showed that marked skin effects were caused by C₁₂ to C₁₈ compounds with the peak at C₁₅ to C₁₈. Skin effect is a general response to lipid solvents not related to groups or structure, but molecule size is an important factor. The intermediate-size hydrocarbons presumably exert the most irritating effect by virtue of their ability to penetrate the skin barrier most readily. The implications of this work to formulating petroleum-based vehicles for application to livestock and man are discussed.

-- J. Occ. Med. Absts.

- 41 The Quantitative Assay of the Active Principles of Poison Ivy by Biological and Gas Chromatographic Methods. H. Baer, et al. *J. Allergy* 34, 221 (1963).

The potency of several poison ivy extracts was determined by a guinea pig sensitivity assay and compared with a gas chromatographic procedure which quantitatively measured the concentration of the individual pentadecylcatechol antigens. An ether extract of freshly collected and dried leaves showed similar reactivity by both procedures, but two commercial alcoholic solutions were inactive by both tests.

-- J. Occ. Med. Absts.

CHEMICAL HAZARDS

- 42 Metabolic Fate of Foreign Compounds and Toxicity. R. T. Williams. *Arch. Environmental Health* 7, 612-620 (Nov. 1963).

For the proper understanding of the toxicity of foreign compounds, it is necessary to know how a compound is metabolized in vivo, for toxicity is closely related to the biochemical changes which a compound undergoes in the body. Some compounds are metabolized to toxic agents, whereas others, already toxic in themselves, are detoxicated by the body. These metabolic changes are usually brought about by enzymes which are either special enzymes dealing with foreign compounds or enzymes of normal metabolic routes. The activity of these enzymes varies with species, sex, strain, and the age of animals, and the known species differences in toxicity can probably be explained by these variations in enzyme activity. These enzymes are often located in specific tissues, but the tissues metabolizing the compound need not always be the tissues showing the toxic effect of the compound, for a compound may be metabolized in one tissue to a substance which is toxic to another tissue. These enzymes can be modified in their action in many ways, and of particular interest is the effect of one compound upon the enzymes metabolizing another compound. By affecting the metabolism of one compound, a second compound

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could potentiate the toxicity of the first. Many situations of this type are possible in persons exposed to more than one chemical at a time, be they food additives, pesticide residues, detergents, drugs, or industrial chemicals.

-- Author's summary

- 43 International Threshold Limits Values—1963. H. E. Stokinger.
Am. Ind. Hyg. Assn. J. 24, 469-474 (Sept.-Oct. 1963).

The activities and recommendations of the Second International Symposium on Permissible Limits of Air of Workplaces are briefly reviewed. Basic aspects of various methods of developing and establishing limits and standards are considered with comments. Agreement was reached that substances be classed in three groups: Group I—primarily acute toxic response; Group II—primarily cumulative response; and Group III—carcinogens and sensitively acting substances.

-- Author's abst.

- 44 Effects of Mild Carbon Monoxide Intoxication. J. H. Schulte.
Arch. Environmental Health 7, 524-530 (Nov. 1963).

The effects of exposures for varying lengths of time to an atmosphere containing 100 ppm of carbon monoxide were measured in a group of 49 healthy men between 25 and 55 years of age. This exposure produced levels of carboxyhemoglobin in the blood of the subjects ranging from 0 to 20.4%. Impairment of function due to exposure to carbon monoxide occurred earliest in the higher centers of the central nervous system in that area (or areas) of the brain which controls some of the cognitive and psychomotor abilities. Impairment is detectable at levels of carboxyhemoglobin below 5%, and the degree of impairment increases with increasing concentration of the carboxyhemoglobin in the blood. The need for reducing the maximum allowable concentration of carbon monoxide in the working environment has been speculated upon.

-- Author's summary

- 45 Phosphorus Poisoning in Humans. G. F. Fletcher and J. T. Galambos.
Arch. Internal Med. 112, 846-852 (Dec. 1963).

Two cases of acute phosphorus poisoning with liver biopsies in the acute and recovered phases are reported. One other such case has been reported, and the findings in this case and in various experimental studies are discussed. The authors' findings on liver biopsy in the acute phase are consistent with previous information. These initial biopsies revealed that case 1, in which the patient had ingested about 715 mg. of yellow phosphorus, had more extensive liver injury than did the patient in case 2, who had ingested 350 mg. Therefore, some correlation is apparent between the amount of phosphorus ingested and the extent of acute liver injury. However, the follow-up biopsy in case 1 revealed normal liver tissue, whereas in case 2, in which the patient had ingested the lesser amount of phosphorus, there were findings of septum formation, focal necrosis, and periportal fibrosis. These follow-up findings indicate a discrepancy between the amount of phosphorus ingested and the associated liver injury. To explain this, it is proposed that the human liver may exhibit a basic difference in its long-term response to a toxic insult and that other unknown differences in the basic physiology of the patient may help account for this. Further conclusion regarding this cannot be made until more information is obtained and other patients are studied. There are 10 references to the subject.

-- Authors' summary

- 46 Selenium and Vitamin E Influence Upon the In Vitro Uptake of Se-75 by Ovine Blood Cells.
P. L. Wright and M. C. Bell. Proc. Soc. Exptl. Biol. Med. 114, 379-382 (Nov. 1963).

Whole blood from ewes being fed a purified diet containing urea as the sole nitrogen source was used to determine the in vitro uptake of selenium by ovine blood cells. Selenium-75 as selenite moved into the ovine blood cell in vitro via an oxygen-dependent transport mechanism. The magnitude of this influx was inversely proportional to the dietary intake of selenium, but was not affected by dietary vitamin E. The uptake of sulfur, zinc, or cesium was not influenced by dietary selenium level.

-- Authors' summary

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- 47 Distribution of Se-75 in Serum Proteins of Chicks and Influence of Selenium on Albumin Recovery. E. D. Walter, L. S. Jensen and J. S. Dunlap. *Proc. Soc. Exptl. Biol. Med.* 114, 527-530 (Nov. 1963).

Se-75 was orally administered to 3-week-old chicks fed either selenium deficient or supplemented diets. Distribution of Se-75 in serum proteins with time and its effect on serum protein pattern were determined electrophoretically. Selenium in the diet had no effect on the distribution of Se-75 in the protein fraction, but markedly decreased its retention. After 2 hours the major portion of the dose was found in the beta and gamma fraction and the activity in this fraction increased with time. Marked increases in A/G ratios in depleted chicks were observed within 96 hours after administration of Se-75. Albumin was increased and globulin fractions were decreased. Increases in A/G ratios, somewhat smaller in magnitude, were also noted in chicks receiving a diet supplemented with selenium. -- Authors' summary

- 48 Effect of Arsenic Trioxide Exposure on Mortality. S. S. Pinto and B. M. Bennett. *Arch. Environmental Health* 7, 583-591 (Nov. 1963).

A study has been made in a copper smelter of the causes of death among present and pensioned employees dying in the period 1946-1960. The influence of arsenic trioxide exposure was specifically reviewed. Previous work had shown men in this plant not exposed to arsenic excreted an average of 0.13 mg. arsenic/liter urine; those exposed excreted an average of 0.82 mg. arsenic/liter urine. There was no evidence that chronic arsenic trioxide exposure of the amount described in this study is a cause of systemic cancer in humans. Industrial arsenic trioxide exposure of the amount described in this study had no measurable effect on fatal cardiovascular disease. Thirty-six references are given. -- Authors' summary

- 49 Some Problems in the Large Scale Handling of Beryllium. F. B. Crossley. *Ann. Occ. Hyg. (London)* 6, 89-103 (April-June 1963).

A highly technical description is given of the beryllium pilot plant at ICI Metals Division at Birmingham. The maximum permissible concentrations are: (a) in the process area, (1) over any 8-hour period, 2 micrograms/cu.m. in the breathing zone, (2) the daily average must be within this limit but for any 30 minutes must not exceed 25 micrograms/cu.m.; (b) outside the process area concentrations must not exceed 0.01 microgram/cu.m. averaged over a month, calculated with reference to the breathing zone. This is observed by stack monitoring. Before the plant started working, measurements of beryllium air levels made in the Birmingham area were well above the tolerance level. Control of the beryllium dust content of the air in the plant is achieved by ventilation techniques which are described in detail. The control of the personnel in the areas where beryllium is worked is obtained by pre-employment examination with x-ray examination, and subsequently at intervals of 6 months. The provision of special clothing and of cleaning facilities and the use of masks and air-fed pressure suits are described in detail.

-- Bull. Hyg.

- 50 Delayed Carcinoma from Beryllium Aerosol in Man. H. K. Niemöller. *Intern. Arch. Gewerbepathol. Gewerbehyg.* 20, 180-186 (1963). German.

Various authors have reported the production of malignant tumors in animals after exposure to beryllium salts. The present paper presents 3 cases which confirm for man the results obtained by Schepers in animals. The first patient had come into contact with beryllium compounds in the form of dust, fumes, or gas at work for a period of 3 years. From 1943, he had no further exposure. In 1946, his chest x-ray showed an appearance interpreted as due to beryllium; he was given a pension. In 1959, he developed a cancer of the lung and died of intracranial pressure due to cerebral metastases in 1960. The lungs did not show the typical beryllium granulomata but there was a diffuse fibrosis. The lung tissue on spectrum analysis gave a positive finding for beryllium. This may be the first case in world literature described as a late beryllium carcinoma. The second patient was employed for 15 years in a beryllium factory and at the end of that time in 1945 was found to have typical signs. In 1961, an increased shadow on the right side of the mediastinum was investigated. Cells of a squamous celled carcinoma were

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found in the sputum. Radiation therapy caused a regression of the shadow. A third possible case is also described. The conclusion is drawn that exposure to beryllium leads to berylliosis and later to carcinoma, and the latter may develop without the typical radiographical changes of berylliosis. The use of beryllium is increasing; it is imperative that industries manufacturing its products should control its concentration in the atmosphere. It is possible that beryllium in cigarette tobacco smoke may play a part in the production of lung cancer. Williams and Garmon (Tobacco 152, 20 (1961)) have measured its amount in cigarette tobacco, smoke and ash. It has also been found in the lung tissue of a large number of the American population.

-- Cond. from Bull. Hyg.

- 51 Haemolytic Power of Copper and Comparative Analysis of "Times of Haemolysis" Induced by Different Metals. A. Granata and D. Germano. Med. lavoro 54, 81-87 (Feb. 1963). Italian.

Copper, zinc, cobalt, aluminum, lead, tin, or iron were used in these tests on blood collected from 35 fasting subjects who had no red cell abnormality. The times at which haemolysis took place in 8 samples of sterile blood for all subjects are shown in a figure. The results suggest that the induced haemolysis time may be of value in determining whether a substance is toxic to red cells and it may also be a useful practical test for screening subjects who have abnormal red cell resistance before work in certain environments. The blood, collected in a lightly heparinized syringe from each subject, was divided among 8 serum tubes, 2 ml. in each. One tube was untreated and 100 mg. of one only of the metallic dusts were mixed, by gentle rotation, into the other 7 tubes. The 8 tubes kept at 18° to 25°C to discourage contaminants, were examined every 12 hours until the appearance of the red ring diffusing into the plasma which indicated when haemolysis was taking place. Spontaneous haemolysis in the untreated tubes took 7 to 11 days, confirming previous normal values of at least 7 days. The induced haemolysis times in days for the metals ranged as follows: Cu 1 to 4; Zn 2 to 9; Co 3 to 11; Al 4 to 11 (mostly after 7 days); Pb 5 to 11 (also mostly after 7 days); Sn 7 to 11; Fe 8 to 11. In this order of decreasing haemolytic power, the results, as well as confirming the haemolytic toxic power of Cu, show the comparatively low lytic power of Pb and confirm its minimal capacity for affecting the cell membrane of the mature erythrocyte.

- 52 Absorption and Excretion of Mercury in Man. IV. Tolerance to Mercury. L. J. Goldwater, M. B. Jacobs and A. C. Ladd. Arch. Environmental Health 7, 568-573 (Nov. 1963).

The bases for present threshold limit (TL) values for inorganic and organic mercury have been critically examined and found to have inherent weaknesses. Human observations spanning a period of 21 years suggest that tolerance to some forms of mercury may be greater than has been believed. The propriety of a single TL for all organomercurials is questioned. The use of data from clinical medicine and pharmacology in arriving at TL values is suggested. There are 27 references.

-- Authors' summary

- 53 Acute Mercurial Intoxication Treated by Hemodialysis. L. Sanchez-Sicilia, et al. Ann. Internal Med. 59, 692-706 (Nov. 1963).

In ten patients having acute mercurial intoxication, the mercury compound involved was bichloride of mercury in 7 patients, cyanide of mercury in one patient, and unknown in 2 patients. In 9 patients oliguria and uremia developed. One patient was fairly asymptomatic, although markedly oliguric for 3 days. The 3 patients who died had severe hemorrhagic colitis occurring as late as 9 days following the poisoning. One of these 3 patients bled so massively that a colectomy was necessary. However, the bleeding continued from the rectal stump which had to be removed also. Pathologically, the rectum was the most severely involved portion of the colon. Nine patients underwent a total of 21 hemodialyses and 1 peritoneal dialysis. One patient responded to conservative measures alone. BAL was used in 6 patients. It is felt that in those patients who do not respond to the administration of BAL and the usual therapeutic measures, frequent and early hemodialyses are beneficial to support the patients through the period of oliguria. Frequent hemodialyses, by improving the uremic state, increase the resistance of these patients to infections, and may provide a means of removing the mercuric ion. By ultrafiltration, the overhydration that these patients may have sustained through overzealous intravenous fluid therapy, can be corrected. Colectomy with removal of the rectum should be done if gastrointestinal hemorrhage becomes uncontrollable. There are 26 references.

-- Authors' summary

- 54 Hazards to Health. Thallium Poisoning Treated with BAL. O. Grunfeld.
New Engl. J. Med. 269, 1138-1140 (Nov. 21, 1963).

A case of thallium poisoning in which the clinical picture was mainly neuropsychiatric is presented. Treatment with high doses of BAL (2-3-dimercaptopropanol), totaling 4,600 mg. in 14 days, was very effective. The diagnosis of thallotoxicosis must be kept in mind in bizarre neurologic syndromes with involvement of other organs as well, especially in children. There are 28 references to the subject.

-- Author's summary

- 55 A Follow-Up Study of Lead Workers. I. Dingwall-Fordyce and R. E. Lane.
Brit. J. Ind. Med. 20, 313-315 (Oct. 1963).

Following the suggestion that lead derivatives might cause cancer in man, the causes of death among workers known to have been exposed to lead were studied. A group of companies made available the records of their pension fund, and an accumulator factory provided details of men who had died whilst in their employ. Details of each man's exposure to lead were supplied. There were 425 pensioners, of whom 184 had died; 153 deaths occurred among an unknown number of employed men who had not yet reached pensionable age. Expected deaths were calculated from the appropriate rates for all males in England and Wales. It was concluded that there was no evidence to suggest that malignant disease was related to lead absorption. There was, however, evidence that heavy exposure to lead was associated with an increased incidence of deaths from cerebrovascular catastrophies.

-- Authors' abst.

- 56 The Mechanical Fragility of the Red Cell in Patients with Lead Poisoning. A. J. deKretser and H. A. Waldron. Brit. J. Ind. Med. 20, 316-319 (Oct. 1963).

Observations on the mechanical fragility of the red cell in 68 workers having had exposure to lead in varying degrees, and on blood to which lead had been added in vitro in concentrations up to 5 micrograms/ml., showed that the mechanical fragility index did not vary significantly from that of a control group. Furthermore, the use of various anticoagulants produced no significant alterations in the mechanical fragility index. It was found, however, that in subjects suffering from anemia of varying types, the mechanical fragility index was always greatly increased if the hemoglobin was below 80%.

-- Authors' abst.

- 57 Clinical Manifestations and Therapy of Acute Lead Intoxication Due to the Ingestion of Illicitly Distilled Alcohol. J. C. Crutcher. Ann. Internal Med. 59, 707-715 (Nov. 1963).

The clinical manifestations and results of therapy in 27 patients with 32 episodes of lead intoxication due to the ingestion of whiskey distilled in lead-containing apparatus is reported. In 7 patients, lead encephalopathy manifested by convulsions, coma, and associated with increase in cerebral spinal fluid protein was observed. One of these patients died because the diagnosis was not recognized, and therapy was not instituted. A hypochromic anemia on peripheral smear, moderate to marked basophilic stippling, both in the bone marrow and in peripheral blood, and an occasional direct positive Coomb's test were the major hematologic findings. The gastrointestinal symptoms of nausea, vomiting, and abdominal pain associated with constipation were of sufficient magnitude to cause surgical exploration in 3 of the patients. CaEDTA treatment resulted in the excretion of extremely high quantities of lead. All patients responded well to therapy and no toxic effects were observed.

-- Author's summary

- 58 Kerosene Pneumonitis: An Experimental Study with Small Doses. P. Gross, J. M. McNerney and Mary Ann Babyak. Am. Rev. Resp. Dis. 88, 656-663 (Nov. 1963). Reprints available from Industrial Hygiene Foundation upon request.

When sublethal doses of kerosene types of hydrocarbons are injected intratracheally into rats, two different inflammatory processes are initiated simultaneously: an acute exudative and a chronic proliferative inflammation. The first, representing the reaction of the alveolar capillaries, reaches its acme within 3 days and subsides to almost complete disappearance within

another 7 days. The chronic inflammation, representing the reaction of the alveolar membrane, reaches its acme in 10 days and then gradually resolves; but remnants of the inflammation are still demonstrable more than a month later. The results of this experimental study offer a ready explanation for the protracted resolution and other complications reported in some human cases of kerosene pneumonitis.

-- Authors' summary

- 59 Fatal Amphetamine Poisoning. E. G. Zalis and L. F. Parmley, Jr.
Arch. Internal Med. 112, 822-826 (Dec. 1963).

The tenth case of fatal amphetamine poisoning is reported as occurring in a 23-year-old man who ingested 140 mg. of methamphetamine hydrochloride. This experience, as well as the other reported fatal cases of amphetamine toxicity, indicates that the present estimate of the lethal dose of these drugs should be revised downward, for amphetamine may be a potentially fatal poison even when taken in relatively small doses. The clinical course emphasizes that amphetamine toxicity may be manifested by marked hyperpyrexia and, contrary to expectation, profound vascular collapse. In addition, peritoneal dialysis has been shown to be a useful and effective means of rapid removal of circulating amphetamine. There are 29 references.

-- Authors' summary

- 60 Exposure to Mixtures of Nitroglycerin and Ethylene Glycol Dinitrate. Christine Einert, et al.
Am. Ind. Hyg. Assn. J. 24, 435-447 (Sept.-Oct. 1963).

Combined measurements of air and skin exposures and medical examination of workers were undertaken in an explosives manufacturing plant. Evidence is presented that ethylene glycol dinitrate and nitroglycerin are not only respiratory, but also skin hazards which can be measured environmentally and by medical methods. The suggestion is made for study of skin exposures by standardized use of lining gloves with or without plastic disposable gloves. The authors urge that methods be undertaken to standardize skin exposure measurements. The importance of the hazard through skin exposure is emphasized relative to setting and interpreting threshold limit values.

-- Authors' abst.

- 61 Benzene Hemopathy. Three Cases of Chronic Benzene Poisoning with Two Deaths. (Acute Leukemia, Acute Marrow Aplasia). R. Gallinelli and A. Traldi.
Med. lavoro 54, 169-182 (Mar. 1963). Italian.

These cases of chronic benzene poisoning are discussed with particular reference to the difficulties and complications of therapy and the aggravation of illness brought about by pregnancy. The relevant literature is reviewed. The 3 patients, aged 27, 30, and 19 when benzene poisoning was diagnosed, had worked for 12, 16, and 3, years with an adhesive varnish which was diluted with approximately equal volumes of benzene. Blood counts, marrow biopsies, clinical findings and numerous investigations are described in the case notes. Serial values for many months are plotted in figures showing red cell, white cell and platelet counts, hemoglobin and temperature levels and the amounts of packed cell transfusions or prednisone or both. Antibiotics and liver injections were given. Infected hematomata required incision. The first 2 patients, sisters, were pregnant and had pancytopenia and marrow aplasia. The younger was delivered at term of a healthy baby. Her condition began to improve and some 3 years later blood and marrow were normal. The older woman miscarried at 6 months and her condition then began to improve. However, 8 months later she became pregnant again and though the intensive therapy was repeated she died in 2 months of acute leukemia. The third patient had chronic benzene pancytopenia and improved slightly during the first month of treatment. Then she developed resistant septicemia, which was attributed partly at least to the steroid therapy, and she died, with marrow wasting, some 3 months later.

-- Bull. Hyg.

- 62 Experimental Research on Toxicity of Furfural. N. Castellino, O. Elmino and G. Rozera.
Arch. Environmental Health 7, 574-581 (Nov. 1963).

Toxicity studies on furfural revealed: (1) In mice the subcutaneous LD50 appeared to be: 222.7 mg./kg. (LD50 one day); 211.7 mg./kg. (LD50 3 days); 119.4 mg./kg. (LD50 10 days).

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For the rabbit, 500 mg./kg. is lethal in 30 to 50 minutes; 250 mg./kg. is lethal in 2 to 4 days. The symptomatology observed in the treated animals has to be related to a deep inhibition of the bulbar vegetative centers and encephalic base nuclei. (2) The study of liver and kidney function, hematopoiesis and some coagulability tests showed a serious compromising of these functions in the acute, subacute, and subchronic intoxications obtained by daily subcutaneous injections of furfural. In animals intoxicated by furfural inhalation, the above-mentioned functions appeared to be less altered. With heavy concentrations of furfural the death of the animals seemed to be determined by pulmonary congestion, related to a direct local irritant action of the furfural. These observations were confirmed by histological findings. In chronic intoxication from the subcutaneous injection (200 μ g./kg./day) of furfural, or by inhalation of furfural vapors (0.2 g./cu.m.) after 60 to 80 days of a similar treatment no statistically significant alterations appeared.

-- Authors' summary

- 63 Therapy of Acute UDMH Intoxication. K. C. Back, Mildred K. Pinkerton and A. A. Thomas. *Aerospace Med.* 34, 1001-1004 (Nov. 1963).

The missile fuel, 1,1-dimethylhydrazine (UDMH) is being used on a large scale. Pharmacological studies have revealed that the compound is primarily a central nervous system irritant and causes latent cardiovascular collapse and ensuing irreversible shock when given in lethal doses. Consequently, there is an increasing medical interest in the clinical toxicology of this compound. The present report concerns both symptomatic and antidotal treatment of acute UDMH intoxication and especially the effects of two vitamin B₆ congeners, pyridoxine and pyridoxamine. Symptomatic treatment consisting of a combination of sedatives, anticonvulsants, cardiac glycosides, potent vasoconstrictors, artificial respiration, and plasma expanders failed to protect animals from lethal doses of UDMH. Vitamin B₆ analogue therapy constitutes the first successful approach to specific treatment which prevents convulsions and death in all species tested. The ED50's (effective doses) of two vitamin B₆ congeners, pyridoxine hydrochloride and pyridoxamine dihydrochloride, were determined in mice, rats, dogs, and monkeys. The only manifestation which was not abolished by this therapy in dogs and monkeys was vomiting. The data presented in this paper are the basis for the suggested emergency treatment of severely exposed personnel, consisting of the injection of 25 mg./kg. pyridoxine hydrochloride. The toxicity of pyridoxine hydrochloride is discussed with overall therapeutic and clinical considerations including routes of administration, dosage regimens, and other supportive measures. Ten references are given.

- 64 An Outbreak of Respiratory Symptoms Caused by Toluene Di-isocyanate. H. J. Trenchard and W. C. Harris. *Lancet* 1, 404-406 (Feb. 23, 1963).

Toluene di-isocyanate (TDI) has a high degree of volatility; it is used as a foaming agent in the manufacture of plastic foam. This report describes 12 cases of acute respiratory illness associated with exposure to TDI. At the start of the illness there was a feeling of irritation of the upper respiratory tract, then tightness across the chest, and dyspnea often associated with audible wheezing. Rhonchi were heard over the chest. Most patients had to stop work a few days after the onset of the symptoms, which persisted for as long as 3 weeks and recurred within 4 days of return to work. The roentgenogram was normal in all but one patient who had mild bronchopneumonia. One patient had eosinophilia. Skin testing with TDI failed to produce a reaction. It is thought that workers become sensitized to TDI so that after recovery from acute illness, return to work may produce a recurrence on exposure to a very small concentration of the irritant.

-- Am. Rev. Resp. Dis. Absts.

- 65 Aplastic Anemia Due to Pentachlorophenol and Tetrachlorophenol. H. J. Roberts. *Southern Med. J.* 56, 632-635 (June 1963).

This appears to be the first record of a blood dyscrasia due to these chemicals. A full account is given, from Florida, of a truck driver admitted to a hospital with bleeding from the skin, gums, urinary tract, and bowel, which had persisted for 10 days. The clinical picture was at first perplexing. Clinical and laboratory studies, including bone marrow biopsies, eventually confirmed the diagnosis of aplastic anemia. After a stormy course, the patient died 5 months

later despite appropriate treatment. It emerged that the patient had been engaged for a year on loading his truck with lumber soaked in a product containing 3% pentachlorophenol and 1.5% tetrachlorophenol. His hands and clothes usually became drenched during this activity and he was a habitual nail-biter. As he had no evidence of bleeding diathesis and autopsy did not reveal any other cause, it was concluded that the bone marrow damage was due to these two chemicals. The toxicology of pentachlorophenol is reviewed. -- Bull. Hyg.

- 66 Fatal Liver Damage After Barium Enemas Containing Tannic Acid. H. H. Lucke, K. E. Hodge and N. L. Patt. Can. Med. Assn. J. 89, 1111-1114 (Nov. 30, 1963).

Tannic acid contained in the barium enema was found to have been the sole known potential hepatotoxin in 4 of the 5 cases of fulminating fatal liver failure that occurred in a 213-bed hospital over a period of 27 months. In the other case halothane anesthesia had been administered. Autopsies (performed on 4 of the cases) did not suggest viral hepatitis but showed substantially identical hepatic changes, not unlike those reported in the past following tannic acid exposure. Proof is not claimed that tannic acid was the cause of these deaths, but further investigation regarding the safety of its administration in barium enemas is advocated. -- Authors' abst.

- 67 Gases Released When Fire Resistant Epoxy Resins Are Burned. R. I. Thrune. Am. Ind. Hyg. Assn. J. 24, 475-480 (Sept.-Oct. 1963).

The gases resulting from the burning of halogenated epoxy resins were analyzed by various techniques to identify the component gases. Five resins were studied. Phosgene and phosgene-type gases were not found. The free halogens and hydrogen halides were predominant in the gaseous products, and are considered of greatest importance relative to health and safety. The irritancy of the gases provides a warning mechanism to prevent voluntary acute over-exposure. -- Author's abst.

INDUSTRIAL DUSTS

- 68 Synergistic Effects of Aerosols. 3. Carbon and Air-Borne Ions. D. M. Bevilacqua and C. W. LaBelle. Am. Ind. Hyg. Assn. J. 24, 448-461 (Sept.-Oct. 1963).

The learning rates of rats, as determined by means of a Skinner box apparatus, are compared for a control group and 5 test exposure groups. Exposure to an excess of negative ions yielded an increased learning rate, whereas excess positive ions impeded the learning rate. Exposure to carbon particles alone and with excess positive or negative ions, resulted in improved learning rates over those from similar exposures in the absence of carbon particles. The synergistic effect of carbon particles is believed due to alteration of the ion balance in the atmosphere. -- Authors' abst.

- 69 Byssinosis Prevalence and Flax Processing. A. Bouhuys, F. Hartogensis and H. J. H. Korfage. Brit. J. Ind. Med. 20, 320-323 (Oct. 1963).

Previous evidence suggested that byssinosis in flax workers is caused by the inhalation of dust of biologically retted flax. In the present study, no cases of byssinosis were found among workers in a flax plant which produces yarn by chemical degumming instead of biological retting. The absence of byssinosis in this plant could not be attributed to differences in the quantities of dust developed as compared with the conventional retting procedure. These findings support the view that the agent in flax dust which causes symptoms of byssinosis originates during biological retting of flax and is absent from unretted flax. Chemical degumming of flax appears to be superior to biological retting procedures with respect to the health of the workers. -- Authors' abst.

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- 70 Effect of Dust Suppression Measures on the Prevalence of Coal Workers' Pneumoconiosis in the Dutch Coal Mines. Ch. A. M. Hendriks and H. Claus, Brit. J. Ind. Med. 20, 288-292 (Oct. 1963).

The underground workers in the Dutch coal mines have been radiographed (70 mm.) seven times since 1949. The prevalence of coal miners' pneumoconiosis shows a continuous decrease in all age groups. To evaluate the effect of the intensive system of dust suppression over this period, a cohort analysis was made of the proportion of men with pneumoconiosis with the same number of years of exposure underground but who started work in different years. The results show that the number of men with pneumoconiosis decreases the longer they have worked in the period since dust suppression measures were applied intensively. The differences are significant at the 5% level.

-- Authors' abst.

- 71 Blood Groups of Miners with Coal Workers' Pneumoconiosis and Bronchitis. I. T. T. Higgins, et al. Brit. J. Ind. Med. 20, 324-329 (Oct. 1963).

An unexpected finding in a survey of a random sample of men from Rhondda Fach valley in South Wales suggested an association between blood group A and coal workers' pneumoconiosis. A further and larger sample of 1,250 miners and ex-miners from the same area, covering the same age range of 35 to 64 years, was chosen at random from the population in order to verify this finding. Each man was radiographed and questioned on his history and symptoms of chronic respiratory disease, and samples of blood and of saliva were obtained. The chest radiographs were classified according to the 1953 International Classification of Pneumoconiosis, and ABO and Rhesus blood groups and the secretor status were determined. No convincing association between ABO and Rhesus blood groups or secretor status and either pneumoconiosis or respiratory symptoms associated with bronchitis was found. If an association between the blood groups and pneumoconiosis in fact existed, it would manifest itself as an effect on the response to exposure to dust. Future investigations should therefore be concerned with variations in the dose-response relation rather than with variations in the prevalence of pneumoconiosis.

-- Author's abst.

- 72 The Successful Prevention of Silicosis Among China Biscuit Workers in the North Staffordshire Potteries. A. Meiklejohn. Brit. J. Ind. Med. 20, 255-263 (Oct. 1963).

The pottery industry in North Staffordshire was established towards the close of the seventeenth century. At first the wares which were made from local clays were rather crude but manufacturers unremittingly sought to improve the quality of their productions by the addition of other ingredients to the clays. In 1720, calcined powdered flint was introduced into the clay body. Six years later Benson described the serious effects of the dust on the lungs of millmen engaged in dry flint crushing. Later the disease became very prevalent not only among millmen, but among workmen, males and females, in a wide range of pottery occupations and processes. Popularly the disease was known as potters' asthma or potters' rot, which was later identified scientifically as silicosis. Among the workmen most seriously affected were men engaged in china biscuit bedding and placing and women in the china biscuit warehouse. The risk arose from bedding the ware in flint for the first or so-called biscuit firing. In the course of firing some flint adhered to the surface of pieces and this had to be scoured or brushed off to ensure a clean surface for glazing. The manufacturers experimented to discover a suitable substitute for bedding flint. In due course, it was proved that calcined alumina fulfilled all the practical requirements. This success immediately raised the question as to whether or not alumina was free from any risk to the health of workmen. The problem was investigated by a survey of furnacemen who had been seriously exposed for many years to the inhalation of alumina in the manufacture of aluminum. The research team concluded that alumina was safe. Thereafter, manufacturers progressively substituted alumina for flint. At first this action was voluntary, but it was made statutory in 1947.

-- Cond. from author's abst.

- 73 Silicosis in the Electrical Porcelain Industry. P. Barrie, et al.
Arch. maladies profess. 23, 859-860 (Dec. 1962). French.

Since 1930, a large French factory has manufactured porcelain fittings for electrical equipment and employs more than 1,000 workers in this task. Notified cases of silicosis have been studied from 1946 to 1961. Between 1946 and 1955, there were 39 cases, between 1955 and 1960, there were 10 and none have been recorded since. Eighty percent of the workers affected had been employed for 10 years or more, but 2 were exposed for less than 5 years. Among the 29 men and 20 women, there were 34 with the nodular form and 7 with the pseudotumoral; the latter group had been exposed for more than 19 years. Tuberculosis was observed in only 5 workers. Only one had evidence of right ventricular hypertrophy, but ECG evidence of cardiovascular disease was found in 15 workers over the age of 50 years. Silicosis in this industry seems to be slowly developing and only slightly progressive, but the percentage of nodular forms is higher than that in coal miners. The risk has diminished greatly since 1952 when improved measures of dust control were introduced, but certain tasks are still dangerous and difficult to control, such as hand polishing of dry pastes and certain finishing processes. -- Bull. Hyg.

- 74 Histochemical Studies into the Cytotoxicity of Tridymite In Vitro. F. Rilke and R.W.I. Kessel.
Med. lavoro 54, 161-165 (Mar. 1963).

Although recent work (Kessel, Proc. IV Internat. Congr. Silicosis, Munster, (1962)) has shown that the crystalline form of silica tridymite is cytotoxic for macrophages of at least 5 mammalian species, no such effect follows the administration of amorphous silica of the same chemical composition and distribution of particle size. The authors postulated that uncontrolled release of one or more intracellular enzymes with subsequent autolysis was brought about by the phagocytosed tridymite and the present histochemical study was undertaken with a view to exploring this possibility. Materials and methods are described and it was found that amorphous silica and tridymite yielded essentially similar results. Possible reasons for the failure to note any changes are suggested: thus, the most likely explanation is that histochemical techniques remain undeveloped for a wide variety of enzymes and the methods used may not have been sufficiently precise to detect the presence of presumed autolytic enzymes. Another possibility is that normal cells may contain autolytic enzymes in a situation or state which renders them incapable of functioning. Tridymite, moreover, might cause biochemical changes resulting in cytolysis by some means other than enzyme activity; blocking of certain metabolic pathways might take place with a resulting "unbalanced growth" as occurs in bacteria after inhibition of DNA synthesis. Finally, active metabolism of the macrophage may not be involved and tridymite might be acting as a physical or chemical agent, perhaps altering membrane permeability causing osmotic shock followed by cytolysis. -- Bull. Hyg.

- 75 Aluminum Pneumoconiosis. I. In Vitro Comparison of Stamped Aluminum Powders Containing Different Lubricating Agents and a Granular Aluminum Powder. B. Corrin.
Brit. J. Ind. Med. 20, 264-267 (Oct. 1963).

The discrepancy in previous reports of the action of aluminum on the lung may be explained by differences between stamped and granular aluminum powders. A stamped powder of the variety causing pulmonary fibrosis showed a brisk reaction with water, but a granular powder was unreactive. This difference is primarily due to the granular particles being covered by inert aluminum oxide, the formation of which is partially prevented in the stamping process by stearine and mineral oil. The reactivity of the flake-like stamped particles is also dependent on their large surface area per unit volume. The appearance of aluminum pneumoconiosis in Britain is explained by the introduction of mineral oil into the stamping industry for, in contrast to stearine, mineral oil permits the powder to react with water. The lung damage is believed to be caused by a soluble form of aluminum. - Author's abst.

- 76 Aluminum Pneumoconiosis. II. Effect on the Rat Lung of Intratracheal Injections of Stamped Aluminum Powders Containing Different Lubricating Agents and a Granular Aluminum Powder. B. Corrin. Brit. J. Ind. Med. 20, 268-276 (Oct. 1963).

Three stamped aluminum powders were injected into the lungs of rats. One powder contained stearine and another mineral oil, whilst the third had had its lubricant removed. The

powders produced a rapid and marked fibrosis of equal severity. It is concluded that aluminum rather than any additive in the powders is the fibrogenic agent. The protective action of stearine demonstrated in vitro was not confirmed in vivo, suggesting that pulmonary fibrosis may also occur in men handling stearine-containing powders. Such a case has recently been reported by McLaughlin, et al. (Brit. J. Ind. Med. 19, 253 (1962)), but this is exceptional to the general industrial experience. A granular aluminum powder was also injected into the lungs of rats. In accordance with the results of in vitro experiments, this produced only minimal fibrosis, contrasting strongly with the action of the stamped powders. -- Author's abst.

- 77 A Comparison of Some Alternative Procedures in the Classification of Chest Radiographs for Coal Worker's Pneumoconiosis. S. Rae, et al. Brit. J. Ind. Med. 20, 293-299 (Oct. 1963).

This paper is concerned with the problem of reading individual chest radiographs for coal-workers' pneumoconiosis in terms of the International Labour Office (I. L. O. (1953)) classifications, using a group of 4 readers. It represents the first of a series of investigations by the National Coal Board's Pneumoconiosis Field Research into various aspects of the general subject of the classification of chest radiographs. Later, papers in this series will cover related problems, including the effect of radiographic "technique" on reading standards, the classification of a series of radiographs of the same individual, and the use of the readings in correlation of radiographic abnormality with environmental exposure. The effect of the circumstances under which the readings must be made in the Pneumoconiosis Field Research, including the geographical separation of the 4 readers into 2 groups of 2, is described, and it is shown that any acceptable procedure must involve two distinct stages. On the "first stage" every radiograph must be read by some or all of the doctors individually, and on the "second stage" a proportion of films (those on which the individual readings are "ambiguous") must be classified by the 4 doctors reading together. The general conduct of the joint reading sessions is then considered, and a description is given of a trial which was held to compare some alternative procedures. On the basis of these results, an optimum reading procedure is derived. -- Cond. from authors' abst.

- 78 An Experiment in Film Reading. F. D. K. Liddell. Brit. J. Ind. Med. 20, 300-312 (Oct. 1963).

In a first trial of an experimental classification of simple pneumoconiosis, each observer was asked to record, for each reading, not only the International Labour Office (I. L. O.) category into which he would have placed the radiograph, but also whether he had seriously considered placing it in an adjacent category. Three skilled readers took part in the experiment, in which 120 films (consisting of 3, taken in 1949, 1952, and 1956, for 40 subjects who had been in one colliery throughout the period) were read independently by each reader on 2 occasions and, subsequently, in a joint reading session. Despite the element of arbitrariness in the definition of when an alternative category should be recorded, the proportion of films for which alternates were quoted was very similar (just about half) for all 3 readers. Complete agreement in the finer classification which is produced with the experimental method of reading was naturally less common than when conventional categorization was considered. However, when account was taken of the extent of the disagreements, both intra-observer error and inter-observer error were found to be considerably reduced in the experimental classification. In studying the progression of pneumoconiosis in the subjects' films from one survey to another, it was found that there was an apparent understatement of progression when the conventional classification was adopted. This arose because, where both films for one subject were placed in the same (I. L. O.) category, there was a considerable tendency for progression to be indicated by a change in the categorization according to the experimental classification. -- Author's abst.

- 79 Some Observations on Asbestosis. G. L. Leathart and J. T. Sanderson. Ann. Occ. Hyg. (London) 6, 65-74 (April-June 1963).

The object of this paper is to consider the question of an increased occurrence of asbestosis in Britain and to describe the changing pattern of its incidence. The asbestos industry is expanding and the use of asbestos is increasing. The sources of information on the incidence of asbestosis are not very reliable. Although asbestos workers may claim benefit if suffering from asbestosis, medical supervision by periodical medical examination is limited to

workers in asbestos textile and product factories. A large number of patients certified for benefit for asbestosis are insulating workers and sprayers and in these occupations there is no medical supervision. The authors estimate that 5,000 men are employed in insulation. The process of lagging is described. Dust counts were made during the installation of a new heating system at a local hospital. The dust count rose above the official MAC of 177 particles per cu.m. during the mixing process which takes place at 5 to 15 minutes ever 2 to 4 hours. Mixing is usually done by an apprentice and it is suggested that this work should be done by an elderly worker. The dust counts did not suggest that there was prolonged exposure to high concentrations of dust. It may be that conditions are much worse in other kinds of lagging, say in ships, or it may be that magnesium sensitizes the lungs to the effects of asbestos. It is suggested that the Asbestos Industry Regulations, 1931, and The National Insurance (Industrial Injuries) (Prescribed Diseases) Regulations, 1948 (covering the Medical Arrangement Scheme, 1931) should be amended to cover ladders; it is understood that this is under consideration. In the discussion which followed the reading of this paper at the 14th Conference of the British Occupational Hygiene Society, Professor R. C. Browne asked, but without reply, if anybody in the audience could say why asbestos is carcinogenic. -- Bull. Hyg.

- 80 Some Aspects of the Respiratory Function in Pneumoconiosis from Abrasive Wheels.
L. Pettinati, A. Parigi and G. C. Coscia. *Rass. med. ind.* 32, 61-78 (Jan.-Feb. 1963). Italian.

Modern grinding wheels are made of alundum, carborundum, or related substances, or of synthetic resins which contain only a negligible amount of free silica (if any), but silicosis may nevertheless develop occasionally in workers engaged in their manufacture. The authors surveyed 49 male workers of ages ranging from 23 to 60 years, employed in an engineering works and engaged in finishing operations on ferrous material with the use of abrasive grinding wheels of synthetic type. A complete occupational history, with special reference to possible previous exposure to a silica risk, was taken and those who had been so exposed or who had been working as operators of grinding wheels for longer than 15 years (before the introduction of synthetic wheels) were excluded. All the subjects underwent complete clinical examination, x-ray of chest, ECG, and were also submitted to a battery of respiratory function tests including Knipping's ergometric test on a moving belt. The results are presented in a series of 5 comprehensive tables and it was found that not one of the 49 subjects inhaling dust derived solely from the use of synthetic grinding wheels could be regarded on clinical or radiological grounds, or on the evidence of respiratory function tests, as suffering from silicosis. However, slight changes due to the effect of the inhalation of dust were noted in 37 out of 49 subjects (70%), generally speaking either on clinical or radiological examination. The pneumoconiosis was quite benign in character; nodulation was not seen and the condition is held to be due to dust retention. -- Cond. from Bull. Hyg.

- 81 Deposition and Disposal of Inhaled Dust. The Influence of Pre-Existing Pneumoconiosis.
A. G. Heppleston. *Arch. Environmental Health* 7, 548-555 (Nov. 1963).

The process of hematite disposal was studied in rats that had already acquired coniotic lesions by prolonged exposure to coal or silica. Throughout these experiments dusts were administered by inhalation from atmospheric suspension. As in earlier studies on normal rats, the deposition of hematite was not confined to the sites of aggregation at the apex of the pulmonary acinus but occurred throughout its peripheral subdivisions to the distal extremity. However, in the presence of mature coniotic lesions of either kind, more hematite tended to reach many of the acini and to penetrate more distally than in animals without such lesions. The disposition of hematite changed with survival after the brief exposure. Clearance from the periphery of acini was associated with its focal collection mainly into the pre-existing aggregates of coal or silica, where the usual intimate mixing occurred within individual phagocytes. Disposal of hematite appeared to take place more rapidly in coniotic than in normal rats, but the fibrotic or non-fibrotic nature of the established lesions made no detectable difference. Although complexities of the process of dust disposal by the lung remain, the results support and extend the hypothesis previously propounded. Possible implications of the findings are discussed in relation to the progression of pneumoconiosis. -- Author's summary

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 82 Work Limitations at Very High Altitude. J. B. West.
J. Physiol. (London) 167, 14P (June 1963).

On the assumption that the maximal work level depends on the amount of oxygen transported by the blood to the muscles, the relative importance of various factors involved in oxygen transfer by the lung and blood were examined, using data collected with a bicycle ergometer at altitudes up to 24,400 ft. The calculations show that the diffusing capacity of the lung is an important limiting factor and, to a lesser extent, so are the cardiac output and the oxygen capacity of the blood under these conditions. An interesting feature of the analysis is that the oxygen cost of ventilation may become a significant component of the total oxygen consumption during maximal exercise at 24,400 ft. This may explain why the ventilation at maximal exercise at this altitude was about 125 liter/minute B.T.P.S. whereas it was about 200 liters/minute at 19,000 and 21,000 ft.

-- Aerospace Med. Absts.

- 83 The Ideal Relationship Between Inspired Oxygen Concentration and Cabin Altitude. L. J. Ernsting.
Aerospace Med. 34, 991-997 (Nov. 1963).

The factors which determine the physiologically desirable relationship between the concentration of oxygen in the inspired gas and the absolute pressure within a pressure or sealed cabin have been reviewed. The minimum acceptable concentration of oxygen at a given cabin altitude is determined by the need to prevent both hypoxia in the steady state and following a sudden decompression. The maximum allowable concentration of oxygen is influenced principally by the direct toxic effects of oxygen upon the respiratory tract, and by the need to reduce the possibility of gross pulmonary atelectasis in the presence of blockage of the airways induced by exposure to accelerative forces. The incidence of decompression sickness is the main factor which limits the maximum cabin altitude and it can also influence the composition of the gas breathed in the intact cabin if depressurization of the cabin or the use of a full pressure suit have to be considered. Although in certain areas there is conflict between these various requirements the physiological ideal at cabin altitudes below 20,000 ft. is an inspired oxygen concentration of 50%.

-- Author's summary

- 84 Rapid Decompression Hazards After Prolonged Exposure to 50 Per Cent Oxygen—50 Per Cent Nitrogen Atmosphere. M. J. Damato, et al. *Aerospace Med.* 34, 1037-1040 (Nov. 1963).

Based on the results of this investigation, the following are concluded: in rapid decompression followed by prolonged exposure to altitudes of 35,000 ft., the following procedures preceding the decompression have been found to minimize the incidence of bends: (1) Breathing 100% oxygen for at least 3 hours at sea level. (2) Breathing a 50% oxygen—50% nitrogen gas mixture for about 18 hours or more at an altitude equivalent of 18,000 ft. (3) Breathing 100% oxygen for 2 hours at sea level followed by breathing a 50% oxygen—50% nitrogen gas mixture for 12 hours at an altitude equivalent of 18,000 ft. During repeated exposures, recurrence of bends in the same area is very likely. The manifestation of bends may be delayed for more than 2 hours following decompression. Characteristic sensations of bends may be either localized in one area or may radiate eventually to involve more than one area simultaneously.

-- Authors' conclusions

- 85 The Effects of a Raised Body Temperature on the Performance of Mental Tasks. R. H. Fox, et al. *J. Physiol. (London)* 167, 22P-23P (June 1963).

Mental performance was compared in subjects at normal and at 3 raised levels of body temperature (37.3°, 37.9° and 38.5°C). The effects of each temperature level were tested once during each of the 4 replicated periods of 4 days. The results showed that when body temperature

was elevated to 38.5°C, both speed and accuracy in mathematics was impaired ($P < 0.02$) whereas vigilance was improved ($P < 0.05$). In the accuracy of mathematics and in vigilance a similar trend was seen at the 2 lower body temperatures. The subjects became heat-acclimatized but the effects of an elevated body temperature on mental performance did not diminish as acclimatization developed. It is concluded that raising body temperature does directly affect mental performance and the change observed may be either an improvement or impairment of performance depending on the type of test and the conditions of testing used. -- Aerospace Med. Absts.

- 86 Noise Specifications. D. C. Murphy. *Ann. Occ. Hyg. (London)* 6, 15 (Jan.-Mar. 1963).

Figures and tables are presented for use in preparing specifications of maximum noise levels for equipment manufacturers. Basic criteria for noise levels are shown at different frequencies in areas ranging from a broadcasting studio to a workshop. These are then corrected for special situations. For example, the criterion for an impulse noise would be lowered by 5 db, whereas 30 db could be added if the noise existed only .02% of the time. Specifications are given for maximum noise levels which must not be exceeded 10 ft. from a source if criteria for proximal sleeping areas are to be met. The basic table assumes hard ground material between source and listener. The tables following show altered figures which allow for the presence of vegetation, the screen effect of buildings, and the attenuation afforded by common construction materials. Also included is a tabulation which facilitates calculation of the attenuation effect of walls which are not made of the same material throughout. On the basis of given data, one can determine the loss of insulation resulting from the presence of plate-glass windows covering one quarter the area of a 9-inch brick wall plastered on both sides. -- J. Occ. Med. Absts.

- 87 Ocular Hyperoxia. C. C. Beehler, et al. *Aerospace Med.* 34, 1017-1020 (Nov. 1963).

The widespread use of high partial pressures of oxygen in aerospace and clinical research today demands that its toxicity be clearly defined. It is well known, for instance, that the misuse of oxygen in premature infants may lead to permanent damage in the form of retrolental fibroplasia. Recent studies indicate that such damage may not be limited to immature animals. In the present investigation, it has been shown that exposure to 680 and 760 mm. Hg of oxygen for no longer than 48 hours can result in profound eye damage in mature animals' eyes. Clinically, the animals developed retinal detachment, conjunctivitis, iritis, and hypotony. Histologic studies revealed subretinal fluid, degeneration of the rod and cone layer, as well as ciliary cysts. As with other types of oxygen poisoning, the mechanism by which these changes occur is not known.

- 88 The General and Comparative Biology of Experimental Atmospheres and Other Stress Conditions. Oxygen Toxicity in Plant and Animal Forms at One Atmosphere or Less. S. M. Siegel, L. Halpern, G. Davis, and C. Giunarro. *Aerospace Med.* 34, 1034-1037 (Nov. 1963).

Sixteen plant and animal forms including seed plants, mosses, protozoa, insects and human cells were exposed to oxygen at 1.0 atmosphere pressure. Germination, growth, defoliation, and survival were examined relative to their respective air control. Germination and growth were markedly inhibited; leaves were induced to fall; protozoa and HeLa cells were killed. Insects were also killed, but underwent loss of coordination prior to death. The sensitive plant, *Mimosa*, lost its typical touch sensitivity after a brief contact and eventually its leaves. HeLa cells grown under 35 to 50% oxygen develop granularity of cytoplasm and nuclear malformation, but most strikingly showed an increase in globular lipid (Sudan III stain). The number of globules per cell increased as cell viability declined. The toxicities of several peroxides toward plant and animal test objects were also compared in recognition of the probable role of peroxides in oxygen-damage. Twenty-two references are cited. -- Authors' summary

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RADIOACTIVITY AND X-RADIATION

- 89 Radiation Dose to the Skin and to the Gonads from Diagnostic X-Ray Procedures. H. E. Duggan and G. L. Olde. Can. Med. Assn. J. 89, 1144-1147 (Nov. 30, 1963).

The design of a study to assess the hazard to patients from radiation received during diagnostic radiological procedures is described. The long-term accumulation of data relating to the skin and gonadal doses received by patients in a large x-ray department has been initiated. This will serve as a model for any situation involving small recurrent radiation doses to a significant proportion of the population. A description is given of the basic dose measurements made and the method used in calculating and recording the skin and gonadal doses for each patient. Although no definite conclusions concerning the presence or absence of a radiation hazard have yet been made, the proposed future course of this study is discussed. -- Authors' abst.

- 90 Fast Neutron Generators: Radiation Levels and Shielding Requirements. R. J. Cloutier. Am. Ind. Hyg. Assn. J. 24, 497-501 (Sept.-Oct. 1963).

Neutron and gamma radiation levels around a Cockcroft-Walton neutron generator producing 14-Mev neutrons at an approximate rate of 10^{10} neutrons per second were measured under conditions typical of those required for activation analysis. Neutron flux reduction to acceptable levels for limited operation was accomplished by 12 ft. of distance that included shielding consisting of 27 inches of water and 16 inches of solid concrete block. Other radiation hazards encountered were the production of x-rays and the release of tritium from the target. -- Author's abst.

- 91 Medical Therapy for Internally Deposited Radioisotopes. W. D. Norwood. Am. Ind. Hyg. Assn. J. 24, 492-496 (Sept.-Oct. 1963).

Preventive methods are being vigorously pursued in the handling of dangerous radioisotopes. However, the number of accidental depositions may be expected to increase because of the rapid increase in the use of these materials. While considerable work is being done to learn more about the metabolism of radioisotopes in animals and man, much more remains to be accomplished. General and specific methods are outlined for treating individuals who have inhaled, ingested, or received depositions of dangerous radioactive materials through the intact or injured body surface. Considerable progress has been made but continued research is necessary to improve our knowledge in this field. -- Author's summary

ENVIRONMENTAL MEASUREMENTS

- 92 Determination of Toxic Organic Compounds in Admixture in the Atmosphere by Gas Chromatography. F. R. Cropper and S. Kaminsky. Anal. Chem. 35, 735-743 (May 1963).

A variety of chemical and physical methods exists for detecting toxic organic compounds when present alone in the atmosphere, but these often prove inadequate when two or more contaminants are present in admixture. Gas chromatographic methods described so far, e.g., for air pollutants in "smog", have, in general, required the use of special cooled traps and have involved lengthy sampling periods. In this paper, a method is described that traps the components on a solid absorbent at room temperature and that requires only a relatively small sample of air; the total time for a test, including the sampling stage, is thus, only 10 to 15 minutes. It has been

applied, for example, to atmospheres near a chlorination plant where toluene, benzylchloride, benzalchloride, benzotrichloride, benzoylchloride, and benzaldehyde might be encountered. Because the procedure is so simple and rapid, it has also been used for detecting single components such as nitrobenzene. It is deduced that the method would be applicable to the majority of organic compounds in the list issued by the American Conference of Governmental Industrial Hygienists.

-- Public Health Eng. Absts.

- 93 A Technique for Construction of Predictable Low-Capacity Critical Orifices. M. Corn and W. Bell. *Am. Ind. Hyg. Assn. J.* 24, 502-504 (Sept.-Oct. 1963).

A rapid, inexpensive technique is described which utilizes stainless steel hypodermic needles as low capacity critical orifices. A range of needle sizes is available and manufacturers' quality controls ensure reproducible results.

-- Authors' abst.

- 94 The "USPHS" Method for Determining Lead in Air and in Biological Materials. R. G. Keenan, et al. *Am. Ind. Hyg. Assn. J.* 24, 481-491 (Sept.-Oct. 1963).

The "USPHS" method for determination of lead in air and biological samples has been developed and tested over a quarter of a century. Complete details of procedure are presented with associated information on sampling, preferred method of ashing, purification of reagents, and other preparative procedures. An evaluation of the method for lead in blood shows mean recovery of 97.1% of lead. Among replicate analyses the coefficient of variation ranged from 4.0% to 9.5% for samples respectively containing from 0.291 to 0.020 mg. Pb/100 g. blood.

-- Authors' abst.

- 95 The Synthesis of Defined Aerosol Systems. A. Goetz and T. Kallai. *Am. Ind. Hyg. Assn. J.* 24, 453-461 (Sept.-Oct. 1963).

Instrumentation and procedures for the synthetic production of photo-chemical aerosols within a laminar airflow along a tubular channel are described. Special micro-dosimetry quantitatively facilitates continuous addition of reactive trace components (hydrocarbons, NO, NO₂, SO₂) and of defined nucleating particulates. The flow is subsequently irradiated symmetrically in the spectral range (320-450 millimicrons) in a special channel section without temperature increase, at adjustable intensity levels and exposure durations up to several times solar intensity at ground level. The resulting aerocolloidal components are analyzed with the Aerosol Spectrometer for determining the size and mass distribution of the photoactivated particulates at various reaction stages. Examples of smog-type reactions between traces of NO₂ and olefins, and of modifications of natural aerosols, are presented.

-- Authors' abst.

PREVENTIVE ENGINEERING

- 96 Continuous Functional Testing of Oxygen Breathing Equipment. J. R. Neville. *Aerospace Med.* 34, 1020-1024 (Nov. 1963).

Certain test procedures for regulators and oxygen masks have been shown to detect faulty and ill-fitting equipment which might otherwise be unnoticed. A relatively simple means of ascertaining the oxygen ratio of an oxygen regulator is available with use of the in-line sampling and oxygen electrode detection system. The use of these test procedures is believed to have considerable significance to flying safety, generally, but especially to military flying safety. A more precise testing of oxygen breathing equipment, including oxygen duration, is not only possible on a routine basis but would appear to be definitely desirable if the results found in these tests are the general rule rather than the exception. Finally, in view of the prime importance

of properly functioning oxygen breathing equipment, it is illogical to contemplate the use of individual in-flight hypoxia warning devices while neglecting the simple tests suggested here. As a matter of fact, there is reason to believe that with a vigorous program of such testing, especially when combined with already existing indoctrination procedures, the use of individual in-flight hypoxia warning systems would be a superfluous addition to life support equipment.

-- Author's conclusions

COMMUNITY AIR HYGIENE

- 97 Occupational Health and Air Pollution Research in Canada's Changing Economy. M. Katz and W. L. Ball. *Am. Ind. Hyg. Assn. J.* 24, 517-528 (Sept.-Oct. 1963).

In terms of numbers of people employed and volume of production, industry in Canada has increased greatly in recent years. Occupational health programs have kept abreast of new hazards in the industrial environment so the health status of workers has improved. The potential for community air pollution problems is increasing and research into methods of control and prevention have begun already. Specific areas are discussed.

-- Authors' abstr.

- 98 Photodynamic Bioassay of Polycyclic Air Pollutants. S. S. Epstein, et al. *Arch. Environmental Health* 7, 531-537 (Nov. 1963).

Fifteen fractions of organic atmospheric particulates from several American cities were bioassayed for photodynamic activity, and results obtained were expressed as apparent potencies relative to an arbitrary benzo(a)pyrene standard. All 6 crude benzene extracts assayed showed photodynamic activity, with a correlation evident between apparent relative potencies as determined by bioassay and benzo(a)pyrene concentrations as determined by chemical analysis. Five aliphatic fractions were photodynamically inactive. The single aromatic fraction tested had high activity. Three oxygenated fractions showed photodynamic activity, despite the absence from them of benzo(a)pyrene and other polycyclic hydrocarbons of known structure commonly found in atmospheric particulates. Such oxygenated fractions are reportedly carcinogenic. In recovery experiments, the constituents of neither crude benzene extracts nor oxygenated fractions interfered with the activity of added benzo(a)pyrene. Photodynamic bioassay of 9 other polycyclic hydrocarbons commonly found in atmospheric particulates showed that their activities and/or atmospheric concentrations, generally, were so limited as not to contribute materially to the potencies of the air samples. This pilot study suggests that photodynamic bioassay may provide a rapid, simple, and economical biological index of potential carcinogenic hazard attributable to polycyclic hydrocarbons. The utility of the assay for this purpose should be further evaluated.

-- Authors' summary

- 99 Combustion Nuclei. A Potential Air Pollutant. J. E. Quon. *Arch. Environmental Health* 7, 600-611 (Nov. 1963).

Particulate and gaseous pollutants result from combustion processes involving the use of carbonaceous fuels. Combustion processes are prolific sources of "combustion nuclei", carbon-rich particles whose radii range from 1 to 100 millimicrons. Unique physical and chemical properties of combustion nuclei are important in the manifestation of many air pollution effects. Greater fog frequency and persistence have been attributed to increases in nuclei concentration. A continual source of nuclei can result in a large concentration of submicron particles which are effective in reducing visibility drastically. Radioactivity in the atmosphere is largely associated with particles of nuclei dimensions. Since retention of both nuclei and submicron-size particles by the respiratory system is high, combustion nuclei represent a real hazard to the respiratory system. The production of submicron particles from nuclei through the process of coagulation is also of physiologic importance since submicron particles can exert, under certain circumstances, a synergistic intensification of the effects of irritant gases upon living cells. A topical

concentration of 1,000-fold above the ambient irritant gas concentration is possible. An antagonistic effect is a possible explanation of the lower incidence of vegetation damage observed in the field as compared with the expected occurrences based upon laboratory observations. Greater knowledge of the physical, chemical, and physiological behavior of combustion nuclei can elucidate the important, although vaguely understood, role of combustion nuclei to air pollution and its effects. An air quality index based upon the concentration and properties of combustion nuclei is a distinct possibility. There are 62 references. -- Author's summary

- 100 Fog Bronchiolitis. G. M. Davies. *Lancet* 1, 580-581 (Mar. 16, 1963).

Nine patients, known to have chronic bronchitis, were admitted to Guy's Hospital in London during the fog of December 1962, with the diagnosis of acute bronchiolitis; 8 of the patients were men and all but 2 were more than 65 years old. All of the patients had severe respiratory distress with clinical evidence of airway obstruction, and cyanosis was present in most; 8 had scanty mucoid sputum whereas the ninth had copious but mucoid sputum. None of the patients had fever or leukocytosis. Three had increased jugular venous pressure; one (the patient with copious sputum) showed roentgenographic evidence of limited consolidation in one lower lobe; and one had evidence of cardiac enlargement. Treatment included the use of antimicrobials, antispasmodics, digitalis, diuretics, physiotherapy, steam inhalation, and oxygen. These measures produced no increase in the volume or change in the consistency of the sputum, and none of the patients improved until the fog cleared, when improvement was rapid. The mortality rate for Greater London during the fog was much lower than during the 1952 fog. The smoke content of the 1952 fog was 3 times that of the more recent fog; the sulfur dioxide content was similar in both, but the duration of exposure was longer in the 1952 fog. -- Am. Rev. Resp. Dis. Absts.

- 101 Status of the Flue-Fed Incinerator as a Source of Air Pollution. R. L. Stenburg. *Am. Ind. Hyg. Assn. J.* 24, 505-516 (Sept.-Oct. 1963).

Flue-fed incinerators are discussed as a source of air pollution. Design and operating factors responsible for the air pollution problems are presented with alternative modifications for improvement. Recommendations are included for modification of existing units and improved design of new installations. Alternative methods of refuse disposal are considered also.

-- Author's abst.

MANAGEMENT ASPECTS

- 102 Successful Placement of Handicapped Workers. Occupational Health and Workmens' Compensation Problems. W. S. Allan. *Arch. Environmental Health* 7, 621-624 (Nov. 1963).

Problem areas relating to the successful placement of handicapped workers are discussed. Consideration is given to some of the studies made by governmental and private organizations. Improvement of management attitudes, need for specific research, statutory and administrative relief are indicated as vital concerns of the moment. The effect of automation on placement of handicapped workers will be increased opportunity, but it will demand redirection of training programs.

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

ACCIDENTS AND PREVENTION

- 103 A Psychiatric Change in Accident Victims. P. J. McCleave.
Med. J. Australia 2, 312 (Aug. 24, 1963).

The psychiatric change described does not occur in all accident victims, but it does occur frequently enough to form a clinical entity. The change is of ultra-acute onset and of short duration. Initially, the patient is dazed and disoriented, he does not reply to questions. His gait is unsteady. Then a psychotic phase ensues in which he suddenly becomes very active. He resents being touched, or having people near him, and may even try to push them away. He talks in a loud voice, pretends to feel all right, and may become abusive. After a few minutes, the aggressiveness subsides. Then, in the final stage, the patient becomes pale and may sweat. His attitude is cooperative. He is sleepy and if left in a quiet room, falls into a natural sleep from which he is easily aroused. Apart from facial pallor and some listlessness, he now appears normal. After a short rest the patient is able to go home, provided there are no other injuries. The question arises whether this is a temporary organic psychosis. The sudden striking force must result in a physical change or the surfacing of an aberration of personality. The transient nature of the change is of medicolegal importance, particularly with regard to the degree of legal responsibility of the temporarily deranged patient.

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

MISCELLANEOUS

- 104 Water Pollution Problems of the Pulp and Paper Industry. T. W. Beak.
Tappi 46, 160A-166A (May 1963).

This is a review of the water pollution problems connected with the manufacture of pulp and paper with sulfite pulp, kraft pulp, and paper making considered separately. For sulfite pulp, deoxygenation due to high biological oxygen demand (BOD) of spent sulfite liquor is the principal of the several effects considered. This is only a serious problem where there is insufficient dilution to maintain dissolved oxygen at a safe level. Recent literature on safe levels of dissolved oxygen is reviewed. Although BOD is a difficulty with kraft wastes, toxicity is probably the more serious problem in some cases. The literature on toxicity of kraft wastes is reviewed. It is pointed out that the toxic compounds in kraft liquor are more complicated than was formerly thought to be the case and are imperfectly known. Paper making usually only poses a problem when a mill is situated on a small river offering little dilution. The danger of damage by loss of slimicides is considered. The author suggests that a very pressing need is for far more detailed knowledge of the effects of pulp and paper mill wastes on natural waters, so that the safe limits for discharge without impairing water quality can be more accurately defined.

-- Public Health Eng. Absts.

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Journal of the Technical Association of the Pulp
and Paper Industry
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New York, N. Y. 10017

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