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contain asbestos products from the roof to the basement. It would be a hard turn of fate if the avoidance of ordinary pulmonary asbestosis might lead to an increased frequency of mesothelioma of the pleura or peritoneum, presumably because the population is living longer and the carcinogenic action of asbestos has a longer time to act. It might be well to start now to restrict some of the unnecessary and possibly dangerous uses of asbestos.

-- APCA Absts

- 376 Peritoneal Tumours in Asbestosis. J.B. Enticknap and W.J. Smither.
Brit. J. Ind. Med. 21, 20-31 (Jan. 1964).

Eleven cases of diffuse abdominal tumors in association with exposure to asbestos were discovered in the years 1958 to 1963. There were 8 men and 3 women, all of whom had worked in the same factory. In 7 of the men the age at death ranged from 38 to 78 years; one man is still alive at the age of 46. The women died at 44, 61, and 67. The survival time after the first exposure varied from 20 to 46 years. The shortest period of exposure was 10 months and the longest 32 years. All three of the main commercial types of asbestos had been involved in their working operations. Histological confirmation of the nature of the tumor has been obtained at necropsy in 9 of the 10 deceased and at biopsy in 6, including the survivor. A remarkable feature of these cases is the minimal fibrosis found in the lungs. In 3 men and one woman, asbestosis was not diagnosed during life, and no patient was completely disabled by pulmonary fibrosis.

-- Authors' abst.

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 377 Laser—Medical and Industrial Hygiene Controls.
H.E. Tebrock, W.N. Young and W. Machle. J. Occ. Med. 5, 564-567 (Dec. 1963).

The principles of controlling environmental laser hazards are as follows: (1) Avoidance of principal beam and its reflection. (2) Proper education of personnel involved. (3) General information given those who might be casually exposed. (4) Use of warning devices to indicate laser in operation. (5) Policing and clearing of area for long-range operation. (6) Use of proper antilaser eye shields on any observer likely to be exposed. (7) Use of count-downs, with persons closing eyes or looking away from pulsed, high-power beam. (8) Reporting of all persistent after-images to medical department. (9) Fundoscopic and slit-lamp examination of all people involved in laser operations. Laser research may well lead to beams of longer and longer wave length as new materials are discovered that satisfy laser requirements. There is also a simultaneous effort to secure increased power output. Since new effects may be noted as the equipment changes, new or additional health and safety requirements must necessarily be formulated to meet the ever changing experiments.

-- Authors' summary

- 378 How to Cope With Electric-Motor Noise. J. Campbell.
Machine Design 35, 139-158 (March, 1963).

Noise of magnetic and mechanical origin in electric motors is discussed; diagrams of airborne noise and vibration levels are presented for various types of electric motors; establishing specifications for maximum permissible noise values, and steps to reduce motor noise are described. This article is based on a two-year investigation performed at the Norwood Development Laboratory of the Allis-Chalmers Manufacturing Company.

-- J. Am. Soc. Safety Eng. Absts.

- 568 Nine Years' Toxicity Control in Insecticide Plants. I. Hoogendam, J. P. J. Versteeg, and M. de Vlieger. Arch. Environmental Health 10, 441-448 (March, 1965).

More than 300 workers have been employed in the Royal Dutch/Shell plants in Pernis manufacturing aldrin, dieldrin, and endrin over periods up to nine years. These workers have been under thorough medical supervision, including periodic electroencephalographic examinations and liver function tests. Seventeen of them had convulsive intoxications. Five of these 17 had more than one convulsion each. Clinical, neurological, and electroencephalographic recovery has been rapid and complete in all cases after removal from exposure, though at times this was only temporary. No impairment of liver function could be detected. The pattern and rate of absenteeism is not different from that of other industrial workers. The maintenance and supervision of hygienic discipline and selection in personnel placement are important factors in controlling toxicity hazards.

-- Authors' summary

- 569 Bird Mortality after Spraying for Dutch Elm Disease with DDT. C. F. Wurster, Jr., Doris H. Wurster, and W. N. Strickland. Science 148, 90-91 (April 2, 1965).

In Hanover, New Hampshire, where elms were sprayed with DDT, 151 dead birds were found; 10 dead birds were found in Norwich, Vermont, where no DDT was used. Chemical analyses of dead birds, observation of symptoms of DDT poisoning, and a population decline after spraying all indicate severe mortality among certain species in Hanover. -- Authors' abst.

INDUSTRIAL DUSTS

- 570 Asbestosis and Pulmonary Carcinoma. F. R. Dutra and J. D. Carney. Arch. Environmental Health 10, 416-421; editorial comment 422-423 (March, 1965).

Asbestosis is a chronic progressive pulmonary disease which results from irritation of the lungs by crystalline asbestos fibers. The disease is often unsuspected clinically because the occupational exposure to dust containing asbestos fibers has not been elicited, and because the chest films may not be diagnostic even in the presence of disabling abnormality. In asbestosis, pulmonary and subpleural fibrosis distort the lungs and lead to respiratory insufficiency. Squamous metaplasia of the bronchial epithelium is induced by the irritating fibers, and in some cases there is progression to squamous cell carcinoma of the lung. Pleural mesothelioma is also reported, particularly in cases of asbestosis in South Africa.

-- Authors' summary

- 571 Pulmonary Function of Uranium Miners. V. E. Archer, H. P. Brinton, and J. K. Wagoner. Health Physics 10, 1183-1194 (Dec. 1964).

Analysis has been made of several ventilatory function field measurements made on uranium miners in 1957 and in 1960. Results show that cumulative exposure to the atmosphere in uranium mines adds to the loss in ventilatory function that results from aging and from cigarette smoking. The data indicate that high radon daughter levels are associated with transient improvement in ventilatory function. Two possible explanations of this "transient improvement" are discussed. Long exposures within uranium mines are definitely detrimental to ventilatory function. There are 34 references.

-- Public Health Eng. Absts.

- 572 Error in the Determination of Average Concentration of Dust as a Function of the Number of Individual Measurements. J. Juda and K. Budzinski. Staub 24, 283-287 (Aug. 1964). German.

The strong dependence of dust concentration on time leads to difficulties in the determination of the average value. A formula which reproduces the sum frequency of the dust concentration distribution with sufficient accuracy is given. The relationships for the tolerance in determination of the average value are derived and the results are shown in a diagram.

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-- APCA Absts.

- 483 Particle Deposition by Diffusion in the Lower Lung: Application of Dimensional Analysis. S.K. Friedlander, *Am. Ind. Hyg. Assn. J.* 25, 37-42 (Jan.-Feb. 1964).

Using dimensional analysis, an expression is derived for the dependence of the particle removal efficiency of the lower lung on the particle diffusion coefficient, the time per breath and parameters related to the structure of the lung. The analysis is limited to particles smaller than a few tenths of a micron in diameter, for which diffusion is the controlling mechanism of removal. It is not necessary to assume a special model for the structure of the lung. The analysis can be used to correlate and extrapolate experimental data; it can also be used to predict the size of the largest particle which is (almost) completely removed in the respiratory region.

-- Author's abst.

- 484 Asbestos Exposure and Neoplasia. I. J. Selikoff, J. Churg, and E. C. Hammond. *J. Am. Med. Assn.* 188, 22-26 (April 6, 1964).

Building trades insulation workers have relatively light, intermittent, exposure to asbestos. Of 632 insulation workers, who entered the trade before 1943 and were traced through 1962; 45 died of cancer of the lung or pleura, whereas only 6.6 such deaths were expected. Three of the pleural tumors were mesotheliomas; there was also one peritoneal mesothelioma. Four mesotheliomas in a total of 255 deaths is an exceedingly high incidence for such a rare tumor. In addition, an unexpectedly large number of men died of cancer of the stomach, colon, or rectum (29 compared with 9.4 expected). Other cancers were not increased; 20.5 were expected, 21 occurred. Twelve men died of asbestosis.

-- Authors' abst.

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 485 Chronic Skeletal Changes in Divers. P. C. Alnor. *Bruns Beitr. Klin. Chir.* 207, 475 (Dec. 1963).

Based on follow-up examination of 131 divers, new ideas about the origin and development of chronic injuries of the skeletal system were gained. Among the 131 divers, there were 72 pathological findings in the skeleton which in 15 of them were monostotic, and in 57 polyostotic. The head of the humerus was the most prominent site of lesion, whereas in caisson workers the head of the femur is most frequently involved. In a group of 65 divers, who were followed up for more than a decade, 43 had skeletal changes. Of these, 26 had no symptoms. Of the 17 who had complaints, 7 were without loss of function, 3 had a loss of function, and 7 were incapable to work in their occupation. The role that diver's accidents play in the development of skeletal changes is discussed. The rare occurrence of spontaneous bends resulted in skeletal injuries in more than half of the cases. It is concluded that typical skeletal changes may develop at any time, even a long time after the diver stopped working, and also, when he had never experienced accidents or bends.

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

- 486 Treatment of Severe Decompression Sickness in Aviators. P. Cannon and T. R. Gould. *Brit. Med. J.* 1, 278 (Feb.), 1964).

Four cases of the post-decompression collapse syndrome are described in aviators who have been exposed to a simulated altitude of 37,000 ft. (11,277 m.) in a decompression chamber. The factors which predispose to the development of this

- 281 Fundamentals of Silicosis Research. K. Thomas.
Schweiz. med. Wochschr. 94, 213-217 (Feb. 15, 1964).

The author discusses the conditions which have a bearing on the development, in experimental intraperitoneal tests, of the stratified hyaline granuloma which is characteristic of silicosis. Special attention is drawn to the granule size and the surface texture of the powders; the crystalline texture of the SiO_2 material, on the other hand, is not particularly significant. The recently discovered high-pressure and high-temperature modified materials, called "Coesit" and "Stischowit" will probably provide further insight into the primary mechanism of the tissue-damaging reaction of the SiO_2 particle after phagocytosis. These investigations fall within a hitherto neglected sphere of biological chemistry, known as solid-body biology. In this field, the relation of the texture of solid surfaces to certain metabolic reactions is studied.

-- APCA Absts.

- 282 Experimental Tricalcium Phosphate Crystallosis. H.A. Reimann, Thelma Ducanes, and R. Gatter. Arch. Environmental Health 10, 33-36 (Jan. 1965).

Crystals smaller than 5 microns of tricalcium phosphate, a component of some dentifrices, entered the intestinal mucosa of rats after ingestion and their lungs after intracheal injection. Intraperitoneal injection caused local microscopic foreign-body granulomas. The lungs and the gut served as portals of entry for the hematogenous and lymphogenous systemic dispersion of crystals. They were deposited in normal appearing tissues, or caused areas of mild or severe inflammation and granulomas.

-- Authors' summary

- 283 Lung Structure--Relation to Response to Particulate. P.P. Yevich.
Arch. Environmental Health 10, 37-43 (Jan. 1965).

One of the main anatomical differences between the lung of the dog and rat is in the terminal portions of the bronchial tree. Exposure of dogs and rats for long periods to oil mist and calcined diatomaceous earth revealed that the histopathologic response in the dog was limited to accumulation of particulates and macrophages around the respiratory bronchioles; the alveolar spaces of the air sacs were free of any changes. In the rat the histopathologic changes showed accumulation of particulate-laden macrophages in the alveolar spaces and around the blood vessels. Phagocytosis of the particulates by macrophages was seen in both species of animals. Accumulation sites differed between the rat and dog. This probably was due to lack of lymphatics and a long respiratory bronchiole in the terminal portions of the bronchial tree of the rat lung. Bronchoconstriction in the dog may be an important factor for the accumulation of particulates in this area. That the human lung accumulates particulates around the respiratory bronchioles has been shown by numerous researchers.

-- Author's summary

- 284 Asbestosis and Lung Cancer. W.J. Williams.
Arch. Environmental Health 10, 44-45 (Jan. 1965).

This report records 52 American cases of asbestosis among whom there were 10 patients with malignant tumors, an incidence similar to that reported in Britain. There are 17 references.

-- Author's conclusion

- 285 Lung Function Changes in Talc Pneumoconiosis. M. Kleinfeld, et al.
J. Occ. Med. 7, 12-17 (Jan. 1965).

Pulmonary function tests were performed in 16 workers who were engaged in the milling of talc for more than 10 years and had clinical and roentgenographic findings consistent with talc pneumoconiosis. In 14 of 16 the pneumoconiosis was symptomatic. Dyspnea was the predominant symptom. Cough was present but was not consistent. The mean duration of exposure for the group was 20.4 years, with a range of 13-26, and the mean weighted average exposure was 68.9 mppcf. The latter exceeds the present threshold of 20 mppcf as recommended by the American Conference of Governmental Industrial Hygienists. The changes in pulmonary function indicated that there was an impairment in ventilatory function and diffusion capacity (DL_{CO}) in a significant number of individuals. The changes in ventilatory function were primarily of a restrictive type, although in some instances an obstructive component was also present. Some correlation was found between DL_{CO} and clubbing and pulmonary infiltration. The total lung capacity showed a correlation with clubbing only. There are 11 references.

-- Authors' summary

were examined in each slide. Routine histological sections of unexpanded lungs were also examined in all cases. Asbestos bodies were found in 41% of the subjects. They were not encountered in persons up to 24 years of age. Among males the incidence was 47%, and in females 34%. Although significant microscopic pulmonary fibrosis was encountered in two positive cases, no instance of classical asbestosis was found. Mesothelioma of the pleura was not encountered. Primary lung carcinoma occurred in one patient with asbestos bodies and in one without.

-- Authors' abst.

- 687 Benign Asbestos Pleurisy. H.B. Eisenstadt.
J. Am. Med. Assn. 192, 419-421 (May 3, 1965).

The clinical picture of benign asbestos pleurisy differs greatly from that of classical asbestosis. It may occur in the absence of significant pulmonary disease and respiratory dysfunction. This entity must be considered in the differential diagnosis of any form of idiopathic pleurisy. The history of exposure to asbestos will aid in directing the attention to this entity; however, the final diagnosis depends on a lung tissue specimen containing asbestos corpuscles or asbestos fibers.

-- Author's summary

- 688 Asbestos and Cancer. The Report and Recommendations of a Working Group Convened under the Auspices of the Geographical Pathology Committee of the International Union Against Cancer. Can. Med. Assn. J. 92, 1020-1025 (May 8, 1965).

This report is not suitable for abstracting, however the Editor of the Canadian Medical Association Journal summarizes the purpose and work of this international meeting as follows: "In October 1964, the New York Academy of Sciences sponsored an international meeting on the biological effects of asbestos. Following this meeting, some 40 delegates from Australia, Canada, Finland, France, Germany, Great Britain and Ireland, Italy, South Africa and the United States were invited to study the vast amount of information which had been presented with a view to the organization of an international study of asbestos and cancer. The terms of reference of this Working Group covered three major aspects of the problem: epidemiology, pathology and experimental pathology, and physics and chemistry. The findings of the Working Group and their recommendations arising from these studies are recorded, in slightly abridged form."

-- Cond. from Editor's summary

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 689 First US Tests of High Altitude Pressure Suits. C.L. Wilson.
Arch. Environmental Health 10, 805 (May, 1965).

Historical research was conducted to collect and evaluate information on the earliest American high altitude pressure suit research program. Mr. Post, the first aviator in the world to fly in a high altitude pressure suit, attempted to break the existing world's altitude record. There were three prototype suits. The third, which was successful, was tested in an Army Air Force altitude chamber. These were the first US altitude chamber tests of pressure suits. His stimulus as a private citizen greatly contributed to American pressure suit technological superiority and directly influenced the design of the Project Mercury astronaut US Navy and Air Force pressure suits. It is surprising that development was even partially successful without the guidance of high altitude physiologists and diving suit specialists. Each of six other major nations enlisted these specialists as crucial team members.

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

bone marrow had been adequately excluded. The findings correlate with the histopathological changes which are reported to occur in the lungs of silicotic patients; they indicate a high degree of stimulation of the reticulo-endothelial system. If these changes are considered together with the industrial history and clinical and laboratory data, they may provide a clue to the diagnosis of silicosis and help in the differential diagnosis from other diffuse pulmonary lesions. -- Auth. abst.

- 71 Mesothelioma of Pleura and Peritoneum Following Exposure to Asbestos in the London Area. Muriel L. Newhouse and Hilda Thompson. *Brit. J. Ind. Med.* 22, 261-269 (Oct. 1965).

A series of 83 patients from the London Hospital with a diagnosis of mesothelioma confirmed by necropsy or biopsy has been studied for possible exposure to asbestos. The series consisted of 41 men and 42 women; 27 of the patients had peritoneal and 56 pleural tumors. The earliest death recorded was in 1917, but only ten of the series died before 1950 and 40 (48%) between 1960 and 1964. In 76 of the series full occupational and residential histories were obtained. Forty (52.6%) gave a history of occupational or domestic (living in the same house as an asbestos worker) exposure to asbestos compared with nine (11.8%) out of 76 patients from the same hospital suffering from other diseases ($P < 0.001$). None of the 17 suspected cases of mesothelioma, rejected on pathological grounds, was found to have had any exposure to asbestos. There was also evidence that neighborhood exposures may be important. Among those with no evidence of occupational or domestic exposures, 30.6% of the mesothelioma patients and 7.6% of the in-patients with other diseases lived within half a mile of an asbestos factory ($P < 0.01$). Out of the 31 patients with occupational exposures only ten were in jobs scheduled under the Asbestos Regulations of 1931. The interval between the first exposure and the development of the terminal illness of mesothelioma ranged between 16 and 55 years. In 47 patients in the mesothelioma series, lung tissue or sputum was available for examination. In 30 (62.5%) either asbestosis or asbestos bodies were present. -- Auth. abst.

- 72 Diffuse Mesothelioma of the Pleura and Asbestos. P. C. Elmes, W. T. E. McCaughey, and O. L. Wadc. *Brit. Med. J.* 1, 350 (Feb. 6, 1965).

Mesothelioma of the pleura is an uncommon tumor and, in recent years, studies have indicated a relationship of this tumor to exposure to asbestos. The occupational histories of 42 patients with diagnosed mesothelioma were contrasted to 42 control patients with regard to their exposure to asbestos. Thirty-two of the 42 patients with diagnosed mesothelioma had a history of exposure to asbestos which was considered to be heavy exposure in eight and a light exposure in 24. In the 42 control patients there was a history of exposure in only nine, and in two of these it was considered heavy. The difference between these two groups was highly significant. In another study it was shown that the finding of asbestos bodies in lung tissue was significantly related to the history of industrial exposure to asbestos. When the lungs of 24 patients with diagnosed mesothelioma were examined for the presence of asbestos bodies, 21 of the 24 patients showed this finding. In contrast, asbestos bodies were found in only six of the 24 controls, a highly significant difference. The occupational histories of these patients revealed that the interval between the first exposure to asbestos and the diagnosis of mesothelioma was often long and in some cases exceeded 40 years. Exposure to asbestos, even though many years before and transient, is an important factor in the development of mesothelioma of the pleura. -- J. Occ. Med. Absts.

- 73 Relation Between Exposure to Asbestos and Mesothelioma. I. J. Selikoff, J. Churg, and E. C. Hammond. *New Engl. J. Med.* 272, 560 (March 18, 1965).

Ten deaths due to mesothelioma were found in a study of 307 consecutive deaths among asbestos insulation workers in New York and New Jersey. There were four pleural mesotheliomas (1.3%) and six peritoneal mesotheliomas (1.9%). This is probably an underestimate of the true incidence, since, of the remaining 297 deaths, only 110 cases were autopsied. These figures can be contrasted to a prospective study of the American Cancer Society in which only three deaths due to mesothelioma were noted in 31,652 deaths of patients between 30 and 89 years of age. In an autopsy series of 2,500 deaths, asbestosis was found in 26. There were four mesotheliomas of the pleura, three mesotheliomas of the peritoneum, and seven bronchogenic carcinomas recorded in the patients with asbestosis. No mesotheliomas were found in the absence of asbestosis. Cases of diagnosed mesothelioma from the files of the Armed Forces Institute of Pathology were reviewed and in all cases where lung tissue was available it was examined for asbestos fibers. Asbestos fibers were found in five of the 19 pleural mesotheliomas and in 17 of the 26 peritoneal mesotheliomas.

bone marrow had been adequately excluded. The findings correlate with the histopathological changes which are reported to occur in the lungs of silicotic patients; they indicate a high degree of stimulation of the reticulo-endothelial system. If these changes are considered together with the industrial history and clinical and laboratory data, they may provide a clue to the diagnosis of silicosis and help in the differential diagnosis from other diffuse pulmonary lesions.

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- 71 Mesothelioma of Pleura and Peritoneum Following Exposure to Asbestos in the London Area. Muriel L. Newhouse and Hilda Thompson. *Brit. J. Ind. Med.* 22, 261-269 (Oct. 1965).

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-- Auth. abst.

- 72 ✓ Diffuse Mesothelioma of the Pleura and Asbestos. P. C. Elmes, W. T. E. McCaughey, and O. L. Wade. *Brit. Med. J.* 1, 350 (Feb. 6, 1965).

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- 467 Inhibition of Oxidation of Benzene by Certain Antioxidants. Zh. I. Abramova and I. D. Gadaskina. Federation Proc. 25, Part II (Translation Supplement) T91-T92 (Jan.-Feb. 1966).

Experiments with liver homogenate *in vitro* showed, that several antioxidants (propyl gallate, cystamine, cystine, methionine) inhibit the oxidation of benzene. Experiments *in vitro* with liver homogenates of rabbits receiving methionine revealed depression of the oxidation of benzene. Experiments *in vitro* with homogenate of livers from rabbits with subacute benzene poisoning, receiving methionine and cystamine at the same time, revealed inhibition of benzene oxidation. Excretion of bound sulfur and glucuronides was reduced in rabbits with subacute benzene poisoning receiving sulfur-containing compounds at the same time. -- Authors' conclusions

- 468 Factors Influencing Hazards in Isocyanate Foam-Spraying. K. E. Grim and R. E. Knox. Am. Ind. Hyg. Assn. J. 27, 62-67 (Jan.-Feb. 1966).

Controlled foam-spraying experiments conducted in a sealed, unventilated room were designed to evaluate the influence of formulations and application techniques on atmospheric contamination with isocyanates. The conditions for sampling the atmosphere during application of formulations involving TDI (toluenediisocyanate) and MDI (methylenebis(4-phenylisocyanate) are described in detail. The Elastomers Laboratory spray gun, which mixes the chemicals internally, is compared to a conventional external-mix spray gun. Equipment for quantitative measurement of TDI and MDI retained by activated charcoal canisters is described, and results are given. Recommendations of the safest method of foam-spraying based on information acquired, and safety precautions, including the use of operator protection equipment, are discussed. Nine references are given. -- Authors' abstr.

- 469 Ethanol Potentiation of Halogenated Aliphatic Solvent Toxicity. H. H. Cornish and Julita Adefuin. Am. Ind. Hyg. Assn. J. 27, 57-61 (Jan.-Feb. 1966).

Ethanol potentiation of toxicity could be readily demonstrated in rats exposed 18 hours later to carbon tetrachloride or trichloroethylene vapors, but not in those exposed to perchloroethylene or 1,1,1-trichloroethane. Serum enzyme levels and histopathologic studies served as a measure of toxic response. Subsequent exposure of ethanol-treated rats for eight hours to 25 or 50ppm of carbon tetrachloride or to 100ppm of trichloroethylene failed to affect serum enzyme levels. However, ethanol potentiation of carbon tetrachloride toxicity could be demonstrated after as slight an exposure as two hours at 100ppm, and potentiation of trichloroethylene toxicity was apparent after a four-hour exposure to 5,000ppm. Ten references are given. -- Authors' summary

- 470 Epoxy Hazards in Industry. The Hazards and Their Control. W. E. Broughton. Ann. Occ. Hyg. (London) 8, 131 (1965).

The main components of the epoxy resins in commercial use in England over the past two decades and their attendant hazards are identified. It is reported that no systemic intoxication of any significance has been associated with epoxy resins, but that both uncured resins and hardeners can produce dermatitis and occasionally a sensitization after repeated contact with the skin. Hardening agents containing amines are said to be more irritating than uncured resins, which become increasingly inert as their molecular weight and viscosity is increased. The experience of several large plants manufacturing resins and the tabulated incidence of dermatitis at one of them over a period of approximately seven years are presented. Proper personnel selection, the use of protective clothing and devices, instruction of employees on the nature of the hazard and proper work techniques, good plant layout, and adequate ventilation are the main points included in a description of means by which effective control of the hazards may be achieved. -- J. Occ. Med. Abstr.

INDUSTRIAL DUSTS

- 471 Mesothelioma Associated With Asbestosis. A Report of Three Cases. R. H. Mann, J. L. Grosh, and W. M. O'Donnell. Cancer 19, 521-526 (April, 1966).

A study of 54 autopsies of patients dying with pulmonary asbestosis disclosed three cases of peritoneal mesothelioma, one of which was complicated by a mesothelioma of the pleura. In two of the three patients there was an occupational exposure history of 20 and 34 years in an asbestos textile plant. Although the remaining patient had classical asbestosis of the lungs at autopsy, there was no known history of industrial exposure to asbestos. The authors think asbestos can produce mesothelioma of either peritoneum or pleura; they present three cases to support the concept of a causal relationship. The increased utilization of asbestos material and the recent demonstration of asbestos bodies in the lungs of urban dwellers may have significant implications for cancer epidemiology in the future. -- Authors' abstr.

- 182 Rheumatoid Factor in Serum of Individuals Exposed to Asbestos. B. Pernis, et al.
Ann. N. Y. Acad. Sci. 132, 112-120 (Dec. 31, 1965).

The presence and titer of rheumatoid factors in the sera of 315 asbestos insulation workers and of 103 controls were determined by conditioned hemagglutination with tanned red cells coated with aggregated human or rabbit gamma globulins. The asbestos workers were exposed to the dust for periods from 1 to 54 years, and most of them showed x-ray evidence of asbestosis that was graded into grades from one to three. A definite increase in frequency and titers of rheumatoid factors in the controls of same age and sex, was found in workers with asbestosis of grades in two and three. Similar serological abnormalities are found in cases of pulmonary fibrosis of different origin, idiopathic, silicosis, coal workers' pneumoconiosis, and sarcoidosis.

-- APCA Absts.

- 183 Occupational Hazards of Pipe Insulators. W. T. Keape and M. R. Zayon.
Arch. Environmental Health 13, 171-184 (Aug. 1966).

In this survey the attempt has been made to investigate all of the substances with which insulators come in contact in the normal pursuit of their trade. In the present state of technology, and in light of existing medical and toxicological data, the majority of the substances examined proved incapable of presenting a serious health hazard to insulators. The only insulating substance which justifies concern is asbestos. This report and other available scientific data at the present time are insufficient to provide an adequately based conclusion. The most convincing data are those of Selikoff. The further results of his and other investigations will be awaited and should contribute toward sound judgment of this matter. There are 155 references. -- Authors' summary

- 184 Malignancies in Asbestos Workers. J. Lieben.
Arch. Environmental Health 13, 619-621 (Nov. 1966).

A study of 68 hospital admissions with asbestosis from an asbestos textile and friction materials plant included 21 malignancies—13 of these were carcinoma of the lung and eight carcinomas of other organs. Eighteen of the patients had exposures to asbestos in their occupational environment for a period of 10 to 36 years. Only three patients had their first exposure after 1940. Extensive dust control measures have been instituted by the plant. There are six references.

-- Author's summary

- 185 Exposure to Asbestos and Malignancy. Anonymous.
London Clin. Med. J. 7, 10-11 (Jan. 1966).

Recent surveys have shown asbestos bodies to be present in many of the otherwise normal lungs of those living in clean, non-industrial communities, suggesting that environmental contamination with asbestos dust is widespread. Perhaps this is not altogether surprising considering the variety of domestic asbestos products that exist and their wide use in modern building. Present evidence suggests that there is a wide spectrum of pathological changes resulting from asbestos inhalation. Prominence was given recently to the relationship between asbestos exposure and mesothelioma. Possible widespread community contamination by asbestos clearly calls for a full assessment of its carcinogenic properties. Both crocidolite and crocidolite have been associated with bronchial carcinoma and mesothelioma, but amosite has not. It follows that both qualitative and quantitative analyses of asbestos in tissues could be most helpful in the further elucidation of this problem. In addition the relationship between asbestos exposure, smoking, and neoplasia formation, requires analysis.

-- APCA Absts.

- 186 Pleural Calcification as a Sign of Silicatosis. M. Kleinfeld.
Am. J. Med. Sci. 251, 215-224 (Feb. 1966).

Of the agents capable of producing a pneumoconiosis, only asbestos, talc, and mica (and rarely, free silica) have so far been incriminated in the production of pleural calcifications. Such calcifications following silicate exposure may vary from a few linear or circular plaques over the dome of either or both leaves of the diaphragm or the lateral chest wall to formation of an extensive shell over the whole lung field. The configuration may be bizarre, but the nature of the calcification usually is readily apparent on standard posteroanterior and lateral films. Pleural calcification is usually asymmetric. The plaques are most frequently located over the dome of the diaphragm rather than in other lung areas. Clinical and environmental evaluation was made of eight workers showing varying degrees of pleural calcification from exposure to talc, asbestos, or mica. The minimal duration of exposure was 23 years and the longest, 54 years. Respiratory symptoms, chiefly dyspnea, were present in six. Four of the six showed clubbing. In five,

- 775 Byssinosis in Hemp Workers. A. Bouhuys, et al.
Arch. Environmental Health 14, 533-544 (April, 1967).

Severe byssinosis, chronic cough, and other chronic respiratory symptoms are highly prevalent among workers exposed to dust of raw, biologically retted, soft hemp (*Cannabis sativa*). Within this group nonreactors and reactors could be distinguished by the absence or presence of a decrease of forced expiratory volume (FEV_1) during dust exposure on Mondays. The questionnaire interview underestimated the extent of the workers' symptoms. Urinary excretion of a major histamine metabolite (1, 4-methylimidazolacetic acid; MeIAA) was higher on Monday than on Wednesday in those reactors whose FEV_1 decreased on Monday but not on Wednesday. This finding agrees with the hypothesis that the bronchoconstrictive response to hemp dust exposure on Monday is a result of the release of histamine in the lungs. A deleterious effect of long-term hemp dust exposure upon pulmonary function is highly probable: (1) FEV_1 (before dust exposure; adjusted for age and height) was significantly lower among the hemp workers than among a control group (farm workers), although the latter smoked more, and significantly lower among those with byssinosis grades 1 and 2 than among those without or with mild symptoms of disease; (2) 9 out of 20 retired hemp workers had an FEV_1 of half the expected value or less. Among the active workers, abnormally low values of FEV_1 (before dust exposure) were only found in reactors. This supports the assumption that irreversible pulmonary function changes develop primarily in those individuals who are sensitive to the acute bronchoconstrictive effect of hemp dust. There are 25 references.

-- Authors' summary

- 776 Lycoperdonosis. R.D. Strand, E.B.D. Neuhauser, and C.F. Sornberger.
New Engl. J. Med. 277, 89-91 (July 13, 1967).

Lycoperdonosis is the respiratory disease caused by inhalation of large quantities of spores from the mature mushroom, commonly termed puffball. Lycoperdon is the genus of fungi to which most puffballs belong. The two most common species, *Lycoperdon pyriforme* and *L. gemmatum*, have worldwide distribution. They may be found July to October, often growing on decaying logs, stumps and woody refuse, generally in dense clusters, and may occasionally be scattered through open fields. The spore fruits of lycoperdon are pear or top shaped, with large, sterile bases. Within the wall, or peridium, of the puffball, vast numbers of club-shaped spores form. At maturity, any external agitation or compression of the peridium cause the spores to be discharged through the apical ostia. A single lycoperdon produces approximately 1.6×10^4 spores. It is well known to many nonherbalists that some practitioners of folk medicine use the hemostatic effect of the "dust" that can be extruded from puffballs. The concept has been applied to surface wounds and nosebleeds. For the treatment of epistaxis, the usual technic is to hold the puffball under the nose and inhale gently as the spores are puffed, so that the spores adhere to the inside of the nostril. With a massive inhalation of the spores, symptoms become rapidly progressive. Nasopharyngitis occurs within a few hours of exposure, and a form of pneumonitis, appears, accompanied by nausea, a rapid pulse, crepitant rales and dyspnea. The course may be protracted for many weeks, with gradual subsidence of symptoms to complete recovery. Two cases are described in detail. There are 7 references.

- 777 Mesothelioma and Asbestos Exposure. J. Lieben and H. Pistawka.
Arch. Environmental Health 14, 559-563 (April, 1967).

Forty-two cases of mesotheliomas reported from 152 hospitals over a five-year period, were studied with regard to exposure to asbestos. Survivors or employers, or both, were questioned regarding the possibility of asbestos exposure. Ten patients actually worked in asbestos plants; eight lived or worked close to an asbestos industry; three patients were family members of asbestos workers. In ten patients a history of assumed exposure to asbestos was obtained after prolonged questioning. In 11 other patients no history of asbestos exposure could be obtained.

-- Authors' summary

- 778 Asbestos Bodies in the Lungs of Inhabitants of Milan. I. Ghezzi, G. Molteni, and U. Puccetti.
Med. Lavoro 58, 223-227 (March, 1967). (In English).

The incidence of asbestos bodies in the lung of adult inhabitants of Milan was studied by lung smears obtained at autopsy, following the same technique used by Thomson and by Cauna et al. None of the individuals studied had been occupationally exposed to asbestos. Asbestos bodies were found in 51 out of 100 subjects studied. The incidences observed were 54% for men and 14% for women. Positive cases were more frequent in the oldest group of subjects and in those

- 947 Insects as Potential Sources of Ingestant Allergens. H.S. Bernton and H. Brown.
Ann. Allergy 25, 381-387 (July, 1967).

The dialyzed extracts of eight food-contaminating insects have been used in a series of cutaneous tests. The entire life cycle of these insects is confined to plant products. The incidence of positive cutaneous reactions in a group of 230 unselected allergic patients is 68% or 30%. The incidence of positive cutaneous reactions in a group of 194 "normal" non-allergic individuals is 50% or 25%. The allergen of four insect extracts is thermostable. Preliminary tests indicate the presence of skin-sensitizing antibodies and precipitins among the reactors of both the allergic and non-allergic. Insect-contaminated food is unavoidable. Twenty-eight per cent of our combined groups exhibit a skin sensitiveness. A more definite characterization of allergens and antibodies by the immunologist will help identify those of clinical importance. The Indian meal moth heads the list of insects capable of provoking positive skin reactions.

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

- 948 Teflon Embolism of Coronary Arteries. F. Gonzalez-Crussi, et al.
J. Thoracic & Cardiovasc. Surg. 54, 53-59 (July, 1967).

A patient is described who developed coronary embolism of Teflon material from a Hufnagel prosthetic aortic cusp. Bacterial endocarditis appeared to have contributed significantly to development of the embolic phenomena. The case is unusual in that the clinical, bacteriological, and histopathological evidence indicated an eradication of the active bacterial endocarditis during life, and the patient succumbed to the effects of coronary Teflon embolism.

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

- 949 Immunological Diagnosis of Type of Snake in Snake Bite. E.R. Trethewie and P.A. Rawlinson.
Med. J. Australia 2, 111-113 (July 15, 1967).

Serum expressed from the region of simulated bite and actual snake bite in animals has been separated and has been shown to react specifically with a series of antivenenes. The technique employed for this analysis is double diffusion in agar, and while the reaction time has varied from two to five hours, it is expected to speed this up to one hour or less with certain modifications. In the first instance one should give antivenene according to the type of the snake, if this information is available, and taking into account the geographical distribution.

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

- 950 Occupational Disability in Patients With Chronic Airway Obstruction. C.F. Diener and B. Burrows. Am. Rev. Resp. Dis. 96, 35-42 (July, 1967).

In a group of 99 emphysema-bronchitis patients who were not disability applicants, work status was closely related to the exertional demands of their usual occupations and to measurements of expiratory slowing. Electrocardiographic findings had some independent usefulness in predicting work status. Pulmonary function tests and other clinical and laboratory data did not further improve this prediction. As a rule, patients with a forced expiratory volume (one second) (FEV₁) of 1.0 liter or more continued to work unless their occupations were very demanding physically. The prognosis for continued employment was poor when the FEV₁ was below 0.75 liter regardless of occupation. -- J. Am. Med. Assn. References & Reviews

- 951 Emphysema Produced in Dogs by Cigarette Smoking. O. Auerbach, et al.
J. Am. Med. Assn. 199, 241-246 (Jan. 23, 1967).

Pulmonary fibrosis and emphysema, similar to those conditions in human beings, were found in dogs that had smoked cigarettes twice daily for more than 420 days. There are 9 references.

-- Public Health Eng. Absts.

- 952 Asbestosis and Malignancy. N. G. Demy and H. Adler
Am. J. Roentgenol. 100, 597-602 (July, 1967).

History reveals a relationship between asbestosis and malignancy. A study based on 20 years' experience with asbestosis in an industrial community shows a correlation between malignancy and long-term exposures varying from 15 to more than 25 years. Of 47 patients studied, 36 had carcinoma, one had fibrosarcoma, and 10 had mesothelioma. All of these 47 patients had previous long exposure to asbestos products and processing.

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

- 1188 Mushroom Worker's Lung. A. Salata.
Brit. Med. J. 2, 708-710 (September 16, 1967).

A characteristic illness developing in workers on mushroom growing farms is described. In four cases constitutional and respiratory symptoms similar to those seen in farmer's lung developed following the inhalation of dust liberated from disturbance of compost on which mushrooms are cultivated. In sensitive workers, symptoms developed a few hours after exposure, and chest radiographs revealed diffuse miliary mottling. Precipitins to thermophillic actinomycetes (present in the compost) were demonstrated in the serum of two cases—*Thermopolyspora polyspora* and *Micromonospora vulgaris*, respectively. Similar serological findings are present in farmer's lung, and it is concluded that mushroom worker's lung is merely a variant of farmer's lung.

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

- 1189 Experimental Asbestosis. The Development of Lung Cancer in Rats With Pulmonary Deposits of Chrysotile Asbestos Dust. P. Gross, et al. Arch. Environmental Health 15, 343-355 (September, 1967). (Reprints available from Industrial Hygiene Foundation).

One hundred and thirty-one rats were exposed to chrysotile asbestos, finely milled, in an exposure chamber for six hours a day, five days a week for a maximum of 62 weeks. Dust concentrations were very heavy, ranging from 42 to 146 mg/cu m (average 86 mg/cu m). About half the animals exposed also had intratracheal application of caustic (lye) to reduce lung clearance and maximize dust retention and pathogenicity. Also, 64 additional animals were given intratracheal injections of chrysotile dust, 14 receiving single doses and the remainder multiple injections of 3.5 mg each. Controls consisted of 30 untreated, unexposed animals and 15 rats treated with caustic but unexposed to asbestos. Designed to study asbestosis, the most important findings of the investigation related to lung tumor production. Other investigators have not been successful in producing lung cancer experimentally in rats with chrysotile. Tumor incidence was high. Of those surviving 16 or more months (ie, after appearance of the first tumor) 31% had primary malignant tumors of the lung. Occurrence in rats treated with lye was 48%, twice the rate of those exposed but not treated with caustic. Malignant pulmonary tumors included adenocarcinomas, fibrosarcomas, and squamous cell cancers as well as a mesothelioma and a mucinous adenocarcinoma. A number of pulmonary lymphoblastomas which occur spontaneously in rats were not counted. Also, atypical metaplasia, not manifestly malignant, was commonly noted. Multicentricity of malignant lesions was observed in several animals. Results of this study support the unitarian concept of tumor origin from alveolar cells. Despite extreme exposure conditions, diffuse asbestosis was not seen. Fibrosis observed was multifocal, centered in the proximal portion of primary lobules with normal appearing tissue intervening. Cancer production with chrysotile in this study appears to involve trace metals introduced during hammer milling which increased nickel, chrome, and cobalt. Previous investigators have not reported subjecting their dusts to hammer milling. The increase in content of trace metals after milling was as follows: nickel, 82%; cobalt, 145%; chrome, 34%. Analysis of the worn hammer of the hammer mill revealed a nickel content of 2,338 µg/gm of sample. This finding, if validated by further studies, should provide an important aid to guide industrial hygiene controls of potential health hazards. There are 13 references.

- 1190 Asbestosis and Neoplasia. I. J. Selikoff, et al.
Am. J. Med. 42, 487-496 (April, 1967).

The prediction that asbestos-induced neoplasms will rival cigarette-induced lung cancer in the next several decades is reviewed as well as the present state of our knowledge of the role of asbestos in pulmonary asbestos lung cancer, mesothelioma, other neoplasms, and pleural calcification. The progression of asbestos disease without continued exposure and the diagnosis of asbestos disease are reviewed also. All of the conditions arising from asbestos are slow in developing. The neoplasms now encountered in both industry and in the general public are the result of the inhalation of asbestos associated with the limited asbestos production of 30 years ago. The neoplasms associated with the present utilization of and exposure to asbestos will not be evident until the 1990's. From 50 tons a year 90 years ago, the world production is now 4 million tons a year. Asbestos has been described as the fiber with a half life of infinity. In at least 1/4 of the adults who die in the U.S. and other industrial countries, asbestos bodies are found in the lung. At present, in most cases, neither pulmonary fibrosis nor neoplasia is associated with the asbestos now being found postmortem. There

and chemical characterization of the asbestos minerals which lead to their being inhaled and retained in the body, in their carrying with them other chemicals, in their migration, may open up unsuspected avenues of biological research.

-- Cond. from text.

- 562 Clinical and Pathological Studies of Pulmonary Asbestosis. I. Nakamura.
J. Nara Med. Assn. 18, 455-465 (Aug., 1967).

The environmental conditions in asbestos factories in Osaka and Nara were investigated. The nature of the dust in the factories was studied by electron microscopy. The concentration of suspended particles is tabulated for different plant operations in a Nara factory. The occurrence of asbestosis among the employees of these factories was studied by periodic x-ray examinations. Although definite asbestosis could not be found in employees working less than 5 years, the frequency of detection of definite asbestosis increased in those working more than 5 years as follows: there was 21% in those employed between 5 and 10 years, 54% between 10 and 15 years, 70% between 15 and 20 years, and 100% for those employed for over 20 years. The classification of x-ray findings and the development of asbestosis are discussed. Case histories and photographs of x-rays and lung sections are presented.

-- APCA Absts.

- 563 Mesothelioma and Its Association With Asbestosis. M. Borow, et al.
J. Am. Med. Assn. 201, 587-591 (Aug. 21, 1967).

Within a three-year period 17 cases of mesothelioma (9 of the pleura and 8 of the peritoneum) were seen at a community hospital in New Jersey located near a major asbestos mill. The incidence of mesothelioma as well as asbestosis appears to be increasing.

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

- 564 Pulmonary Function Tests in Asbestos Workers. G. L. Leathart.
Trans. Soc. Occ. Med. 18, 49-55 (April, 1968).

There are three ways in which pulmonary function tests may contribute to the management of workers exposed to asbestos: they may be used to confirm a diagnosis of asbestosis, to follow the progress of the disease, or to monitor unaffected workers at risk. The object of this paper is to consider how successfully these three parts are played. The typical physiological abnormalities are described, serial studies in cases of asbestosis are presented, and tentative conclusions are drawn from a small prospective study of asbestos workers who were free of disease when first seen. The findings from this investigation are summarized as follows: (1) Established asbestosis causes a loss of diffusing capacity, vital capacity and compliance. Pleural calcification by itself does not. (2) Progressive loss of function is seldom arrested when the patient is transferred to other work and most cases deteriorate. (3) Diffusing capacity appears to be the best measurement for making an early diagnosis, but the diagnosis has been subsequently confirmed by other means in only four of the cases reported in the literature. (4) The development of crepitations at the lung bases sometimes precedes a significant drop in diffusing capacity and this may be a useful observation. (5) Finally, as a general conclusion, the function tests should not be interpreted in isolation nor be given undue respect. They should always be considered in conjunction with clinical and radiographic examination.

-- Cond. from text.

- 565 Source and Identification of Respirable Fibers. L. J. Cralley, et al.
Am. Ind. Hyg. Assn. J. 29, 129-135 (March-April, 1968).

Fibrous bodies with an iron-containing coating have been found in the lungs of persons coming to autopsy in a number of urban hospitals, the number of fibrous bodies varying greatly with approximately 4 to 6% of the persons examined showing numerous bodies. Because these findings raise questions with regard to the possibility that asbestos is a factor in increased lung cancer, questions concerning the nature, source, and significance of these bodies are discussed in the light of research needed to find answers. There are 19 references.-- Authors' abstr.

- 566 Pulmonary Ferruginous Bodies. Development in Response to Filamentous Dusts and a Method of Isolation and Concentration. P. Gross, et al. Arch. Pathol. 85, 539-546 (May, 1968).
Reprints available from Industrial Hygiene Foundation, 4400 Fifth Ave., Pittsburgh, Pa. 15213.

Formation of ferruginous bodies should not be confused with pathogenicity. Failure to understand this differentiation may result in the erroneous generalization that all fibrous dusts share the

tend to succumb to mesothelioma after many years of such contact. A number of examples are given, including those of carpenters and construction workers, who do not realize that their relatively brief contact in sawing or handling asbestos materials can lead to lung cancer many years later. The great increase in asbestos production and in asbestosis in recent years is tabulated; the need for utilization of alternate materials in industry, and for further research on biological effects is emphasized. The presence in asbestos of carcinogenic oils and other components, including benzopyrene and chromium, is mentioned.

--APCA Absts.

- 283 Asbestos Exposure and Pleural Mesotheliomas. R. H. Mortimer and C. B. Campbell. Med. J. Australia 2, 720-722 (Oct. 26, 1968).

Diffuse pleural mesothelioma is reported in two patients exposed to asbestos dust. The neoplasmas were dissimilar in macroscopic and histological appearances. Criteria for classification as mesotheliomas are presented. Asbestos bodies were found in the lungs of both patients, but minimal interstitial fibrosis was present.

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

- 284 Prevalence of Asbestos Bodies in Basal Lung Smears. A. Polliack and M. I. Sacks. Israel J. Med. Sci. (Jerusalem) 4, 223-226 (March-April, 1968).

Asbestos bodies were found in basal lung smears in 26 of 100 consecutive adult autopsies in Jerusalem. They were present in 29.1% of males and 22.2% of females, and were more frequently encountered in Ashkenazi than in non-Ashkenazi Jews. Asbestos bodies, when present, were usually scanty (less than 10), and in only two males were more than 30 bodies found under low power. The five subjects with more than ten asbestos bodies each were all Ashkenazi Jews. The prevalence of asbestos bodies is compared with Cape Town, Pittsburgh, Miami, Montreal, Glasgow, and Jerusalem. Highest frequency found is in Montreal (48%) and may reflect differences in the degree of atmospheric pollution.

--APCA Absts.

- 285 Pathological Symptoms Due to Inhalation of Asbestos Dust. H. Bohlig. Zentr. Arbeitsmed. u. Arbeitsschutz. 16, 353-355 (Dec., 1966).

In brief literature review, in which authors are mentioned but no references cited, the problem of asbestos dust as a carcinogenic substance is surveyed. Despite greatly increased preventive measures taken in many asbestos plants, and the resultant reductions in cases of asbestosis, problems of asbestos inhalation have acquired new significance during the past five years. The retrospective examination of mesothelioma autopsy material in various countries has implicated asbestos dust as a malignant-tumor inducing agent, not only in asbestos workers but even in others. The well-known "pleura-plaques" of asbestosis and diffuse mesotheliomas have been observed in individuals who had never had occupational contact with asbestos but who had resided in the vicinity of asbestos plants or mines. It can be stated with assurance that pollution of the ambient air (emission) by asbestos factories—which were relatively late in utilizing the asbestos dust of their dedusting installations instead of simply releasing it to the atmosphere—has been a causative factor in a significant increase in the rate of appearance of both pleural plaques and mesotheliomas. Whether or not the quantities of asbestos dust released into the atmosphere from brake linings of automobiles are also responsible for these malignancies is a question which has yet to be determined; however, asbestos was detected histologically in the lungs of city dwellers not exposed occupationally in the following percentages: Pittsburgh, 41.0%; Miami, 27.9%; Cape Town, 26.4%. Individuals endangered by asbestos, in addition to those just cited, include persons who have occasional contact with asbestos in construction or other activities (such as roofers, insulation specialists). The properties of asbestos ores, including their benzopyrene content, are briefly mentioned.

--APCA Absts.

- 286 Asbestos Bodies in the Lungs and Mesothelioma. A Retrospective Examination of a Ten-Year Autopsy Material. I. Hagerstrand, L. Meurman, and B. Odlund. Acta Pathol. Microbiol. Scand. (Copenhagen) 72, (2), 177-191 (1968).

In 12,763 autopsies performed during 1957-66 at the General Hospital, Malmö, Sweden, 35 cases of mesothelioma were found (27 of the pleura, 8 of the peritoneum) for a frequency of 0.27% (0.3% if children under 15 years of age are excluded). Of these, 34 were re-examined

of 6 percent NaHCO_3 , 3 percent Na_2CO_3 , and 1 percent benzalkonium chloride has a pH of 9.4, and has been found to promptly relieve the stinging caused by CS exposure. This decontaminating solution seems to be much less effective on the forehead and mustache area, however, than on the neck. After decontamination, supportive treatment may be needed, as indicated, for either chemical irritant or allergic contact dermatitis. Topical corticosteroids are the principal therapeutic agents. There are 19 references. --Cond. from text

- 74 Biochemical Differences Found in Persons Chronically Exposed to High Levels of Pesticides. P. M. Tocci, et al. *Ind. Med. & Surg.* 38, 188-195 (June 1969).

Men who are occupationally exposed to large amounts of pesticides were chosen as subjects for these studies. Several parameters of liver and kidney function as well as amino acid levels in the blood were compared to those of men of the same age and race who were not exposed to pesticides in their occupations. These comparisons revealed a number of differences, none of which could be considered pathological. When considered collectively however, they indicate a physiological response to pesticide exposure. This response varies according to the individual and may depend upon environmental and genetic factors. The evidence presented is insufficient to determine whether the response is a beneficial adaptation to or a detrimental effect of pesticide toxicity. There are 26 references. --Authors' abst.

- 75 Ecological Significance of Pesticide Interactions. J. C. Street, F. L. Mayer and D. J. Wagstaff. *Ind. Med. & Surg.* 38, 409-414 (Nov. 1969).

Hormonal imbalance may be intensified due to additive induction by many types of pesticide residues. As an example, DDT and dieldrin, it has been shown, are additive at low doses in inducing testosterone metabolism in pigeon liver. Lowered chronic toxicity of insecticide combinations may result from the phenomenon of induction of hepatic detoxifying enzymes. The authors assess the significance of such effects depending on minimum effective levels, combined action of two or more pesticides, and species sensitivities toward interaction effects. There are 17 references. --Authors' abst.

- 76 Factors Influencing the Dermal Absorption of Chemicals. W. E. Rinehart. *Tennessee Ind. Hygiene News* 26, 1-5 (No. 2, 1969).

An area where our lack of specific knowledge on dermal absorption puts us to a practical disadvantage and increases our confusion relates to the combined effects of inhalation and dermal absorption. Most of us have relied at one time or another on the list of TLV's published yearly by the American Conference of Governmental Industrial Hygienists (ACGIH) for guidance on air quality of industrial environments. We should also be aware that in a majority of cases we are dealing with mixtures and that vehicles of compounding or physical form can alter the characteristics of absorption greatly. First to be considered is the nature and integrity of skin. The importance of penetration through dermal lesions is often overlooked. We may consider a dermal lesion in its simplest sense to be the lack of, or an alteration in, protective skin. Some chemicals are more soluble in organic solutions, such as in fats, than in water; for other chemicals the reverse situation holds. The important factor is that there probably is some solubility, however slight, in both types of solvents. The skin also contains both a lipid barrier and a water barrier. Thus the absolute solubility of a chemical in one or another system is of little use by itself. Volatility is another important factor not often considered when approaching the subject of dermal absorption. For equivalent partition coefficients, it has been found that the more volatile a material the greater the potential for passing the epidermal barrier. While it is true that the overall hazard from direct contact with a volatile liquid is often less, this is because the amount available for absorption decreases. Condition of the skin with regard to hydration is of some importance. --Cond. from text

INDUSTRIAL DUSTS

- 77 Asbestos and Neoplasia. M. Kleinfeld. *Ind. Hyg. Rev.* 11, 3-10 (June 1969).

Asbestos bodies or mineral-fibre bodies have been discovered in random necropsies of urban populations. The frequency in various cities is as follows: Montreal, 48%; Pittsburgh, 41%, Miami, 27.2%; Capetown, 26.4% and London, 24.3%. Because of the increased frequency of malignant disease in asbestos workers, it has been suggested but not established that the presence of small amounts of asbestos dust in the atmosphere may constitute a public health

- 82 Fifteen Cases of Pleural Mesothelioma Associated with Occupational Exposure to Asbestos in Victoria. J. Milne. Med. J. Australia 2, 669-673 (Oct. 4, 1969).
- Fifteen cases of pleural mesothelioma occurring in Victoria are described. Occupational histories and the finding of asbestos bodies in lung tissue indicate a relationship between occupational exposure to asbestos and induction of pleural mesothelioma many years later. The exposure in some cases was relatively short but intense. Crocidolite or blue asbestos would seem to be particularly potent in the induction of these tumors. There are 16 references.
- Author's abst.
- 83 Welder's Siderosis. A Clinical, Roentgenographic, and Physiological Study. M. Kleinfeld et al. Arch. Environmental Health 19, 70-73 (July 1969).
- Clinical, roentgenographic, physiologic, and environmental data were obtained in a group of welders exposed largely to iron oxide. The average duration of exposure was 18.7 years with a range of 3 to 32 years. Eight of the 25 welders had reticulonodular shadowings on the roentgenographs consistent with siderosis. The prevalence of chronic cough and positive lung findings (crepitations and rhonchi) were relatively low and did not vary appreciably from the control. The mean parameters of pulmonary function for welders were within a normal range and were not significantly different from the mean of the control group. In general, there was no good correlation between the clinical, roentgenographic, and pulmonary function findings with duration of exposure. There are 6 references.
- Authors' abst.
- 84 Some Problems Associated with the Storage of Asbestos in Polyethylene Bags. G. W. Gibbs. Am. Ind. Hyg. Assn. J. 30, 458-464 (Sept.-Oct. 1969).
- Samples of milled Canadian chrysotile asbestos, collected and stored in polyethylene bags, were found on extraction with benzene to yield oils in substantially greater quantity and with at least one different constituent from those collected and stored in glass jars. The constituent isolated from the asbestos collected in certain polyethylene bags is yellow and shows a strong absorption band at 421 mμ. Extracts of polyethylene bags do not contain this compound, but the compound is formed on the introduction of asbestos into the bag. The relevance to sample collection for subsequent organic analysis and to animal experiments for tests of carcinogenic activity of samples of asbestos and other substances is discussed. There are 12 references.
- Author's abst.
- 85 Pleural Reaction Associated with Asbestos Exposure. T. F. B. Collins. Brit. J. Radiol. 41, (489), 655-661 (1968).
- Routine miniature radiography of 552 men, working under "favorable" conditions in an asbestos, cement factory in Durban, showed obvious pleural reactions in 11/552 (2%), while the incidence among workers not handling asbestos was 0.3-0.6%. These 11 pts. and 4 others are described: all were African males, had worked in the industry 2-5 years and all except 2 had no overt symptoms. One pt. had a probable old tuberculous lesion and another had possible tuberculosis. Asbestos bodies in the sputum, clubbing and a positive Heaf tuberculin reaction (II-IV) were present in 8/15, 9/15 and 15/15, resp. It is suggested that the observed pleural lesions are the first signs of disease induced by light exposure to asbestos over a relatively short time. The "acute" (with visible parenchymal disease) and "chronic" (usually symptomless, with dense soft tissue plaques without apparent calcification) asbestosis, corresponding to sustained heavy exposure or light and/or intermittent exposure, are described and illustrated.
- Carcinogenesis Absts.
- 86 Diagnosed Cases of Silicosis in Finland. K. Ahlman. Work-Environ.-Health 4, suppl. 1, 15-43 (1968).
- On the basis of a retrospective study, certain factors relating to the occurrence of silicosis in Finland have been analysed, and the following conclusions may be drawn: (1) The known cases of silicosis total 878. Hence, this occupational disease may be regarded as relatively rare in this country, but still frequent enough to deserve attention. (2) The series, although collected from all available sources, cannot be regarded as representing the true morbidity, since, apart from some exceptions, no regular medical examinations for silicosis have been performed in this country in occupations where the workers are exposed to dangerous dust. (3) Previously, the miners were the occupational group most liable to silicosis, but a change has occurred in this respect to the disadvantage of certain other dusty occupations. (4) The annual incidence

- 629 THE CONTROL OF DUST DISEASE IN THE BRITISH CERAMIC INDUSTRY. E. Posner. *Arch. Hig. Toksikol.* 20: 11-23, Jan. 1969

The British ceramic industry has always been concentrated in a small area of Staffordshire where there has been a widespread use of flint (almost 100% free silicic acid) for kiln placing and as a component of most ceramic articles. Silicosis has been a serious health problem for about 300 years. The paper deals with the trends of silicosis morbidity since the reconstruction of the industry which began at the end of the last war. In only a few processes hazardous materials have been substituted by harmless ones (for instance flint by alumina in the placing of bone china). Most efforts have been concentrated on the improvement of local dust control and general workshop hygiene. In recent years it was found that the traditional so called protective clothing of ceramic workers constituted itself a definite hazard and has now been replaced by materials made of dust repelling man made fibres. Modified routine mass radiography has proved a valuable tool for assessing the incidence of dust disease in ceramic workers and the analysis of its records suggests that only a small proportion of workers acquired pneumoconiosis during the past 15 years. Although manufacture of flint containing articles must be considered the most hazardous risk, it is shown that pneumoconiosis occurs to a significant extent in the manufacture of fine china which does not contain any flint. In recent years the most impressive facet of pneumoconiosis statistics has been the rapidly declining rate of progressive massive fibrosis. In Great Britain category 1 simple pneumoconiosis (according to the I.L.O. classification) is generally not considered to be a disease process but its importance as a biological index of undue dust exposure is stressed.

--Excerpta Med. (Occ. Health & Ind. Med.) Abstracts

- 630 UNUSUAL FERRUGINOUS BODIES: THEIR FORMATION FROM NONFIBROUS PARTICULATES AND FROM CARBONACEOUS FIBROUS PARTICLES. P. Gross, J. Tuma and R. T. P. deReville. *Arch. Environ. Health* 22: 534-537, May 1971

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Among the ferruginous bodies isolated from the lungs of people not occupationally exposed to asbestos dust are those which have a nonfibrous core. These bodies are generally round or ovoid, 4 μ to 30 μ in diameter, and vary in color from translucent light yellow to semitranslucent red-gold. Their central core may be composed of a single large, or multiple small, particles which may be colorless and translucent or black and opaque. Ferruginous bodies with black fibrous cores are believed to owe their origin to inhaled smoke particles from burning leaves, paper, wood, or coal.

--Authors' abst.

- 631 INCIDENCE OF PULMONARY FERRUGINOUS BODIES IN FRANCE. J. Bignon, et al. *Environ. Res.* 3: 430-442, Dec. 1970

A method of chemical digestion and microfiltration of lung tissue has shown that ferruginous bodies, with a transparent central fiber or invisible core, were present in the lungs of all cases in a series of 100 French people dwelling either in Paris or in the country. The youngest subject was a 13-year-old boy. The ferruginous bodies were counted and cases classified in respect to the frequency of ferruginous bodies per cm³ of lung. The number of ferruginous bodies seemed to increase with age. Moreover, the percentage of cases with high density of ferruginous bodies was greater in the Paris area than in the country. While no significant relationship was found according with either sex or occupational history, a greater frequency of ferruginous bodies was found in cases with primary lung cancer than with other diseases. The significance of these findings requires more accurate epidemiological study.

--Cond. from authors' abst.

- 632 ASBESTOS AND MESOTHELIOMAS. M. C. Godwin and J. Jagatic. *Environ. Res.* 3: 391-416, Dec. 1970

Seven selected cases with asbestos in the lungs and a mesothelioma in the pleura or peritoneum were studied intensively using routine methods, polarized light, incineration technique, and acid digestion. The authors found that asbestos bodies, fragments, particles, and dust could be found in hilar and mediastinal nodes regularly; asbestos bodies in lymphatics being transported to the nodes; asbestos

bodies in the spleen, abdominal tumor, and small bowel wall; and dust and particles in abdominal nodes and peritoneum; a small mesothelioma arising in the pleura in a case of peritoneal mesothelioma; a squamous cell carcinoma in the right lung and a mesothelioma of the left pleura. They concluded that asbestos is irritating mechanically and chemically and that it is distributed widely in the body by the lymphatics and blood resulting in malignancies of various types with pleura and peritoneum being especially susceptible.

--Authors' abst. modified

Editor's Note: The authors, obviously, have not studied any controls; the reliability of the article as a whole is, perhaps, best epitomized by an illustration (fig 17) which purports to show asbestos dust in splenic tissue but pictures luminescent *nonfibrous* particles by polarized light. --P.G.

- 633 SILO-FILLER'S DISEASE: NITROGEN DIOXIDE-INDUCED LUNG INJURY. J. Ramirez-R and A. R. Dowell. *Ann. Intern. Med.* 74: 569-576, April 1971

A patient has been followed for 7 years after exposure to silage gas. His chest film showed diffuse reticular and fine nodular infiltrates. Except for mild hypoventilation and hypoxemia his pulmonary function has remained normal. Persistent lung malfunction after exposure to silage gas is uncommon in those patients who recover from the initial toxic pulmonary edema. Reported cases of chronic lung disability after silage gas inhalation were probably due to other causes, such as chronic bronchitis.

--Authors' abst.

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 634 USE OF SKIN TEMPERATURE TO PREDICT TOLERANCE TO THERMAL ENVIRONMENTS. P. F. Iampietro. *Aerosp. Med.* 42: 396-399, April 1971

Skin temperature is a sensitive index of the effect of the thermal environment on the seminude man. Skin temperatures and tolerance times from several studies have been utilized in an attempt to establish a relationship between (1) final skin temperature and tolerance time and (2) skin temperature during the early minutes of exposure and final skin temperature. The number of subjects during each exposure ranged from five to ten. Exposure temperatures ranged from -4°C to 113°C (25°F to 235°F). Many criteria were used to fix tolerance time: for hot exposures, rectal temperature were used, 39.2°C (102.5°F); heart rate 180 beats/min; nausea, etc.; for cold exposures, toe temperatures below 4.4°C (40°F) and subjective evaluations were used. A relationship exists between final temperature and tolerance time and between final skin temperature and skin temperature at 10 minutes of exposure. Final skin temperature (at tolerance) in hot and cold environments can be predicted from the skin temperature at 10 minutes. Tolerance time may also be estimated from the 10-minute skin temperature.

--Author's abst.

- 635 LIGHTING FOR VISUAL PERFORMANCE AND VISUAL COMFORT. S. K. Guth. *J. Amer. Optom. Assn.* 41:63-71 Jan. 1970

The increasing complexity of educational and commercial activities and industrial operations in our modern world make it imperative that occupational vision specialists are fully aware of the many factors which influence human performance, efficiency, comfort and safety. Light and lighting are important environmental factors. However, full consideration must be given to the entire visual environment to insure that all brightnesses are in proper balance. --Excerpta Med. (Occ. Health & Ind. Med.) Abstracts

- 636 CHANGES IN VITAL CAPACITY PRODUCED BY OXYGEN BREATHING DURING IMMERSION WITH THE HEAD ABOVE WATER. U. I. Balldin, G. O. Dahlback and C. E. G. Lundgren. *Aerosp. Med.* 42: 384-387, April 1971

Oxygen breathing and immersion for 2 hours, with the head above water, reduced the vital capacity (VG) in 13 healthy subjects by an average of 22.4% compared with controls during immersion before oxygen breathing. Oxygen breathing without immersion did not reduce the VC but it was reduced by 7.8% by immersion per se. Immersion apparently strongly potentiated the adverse effect that oxygen may have on 22.