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Industrial Hygiene Digest

Literature Abstracts

- MEDICAL
- ENGINEERING
- LEGAL - - - decisions and trends

Industrial Health News



Issued Monthly By

INDUSTRIAL HYGIENE FOUNDATION

4400 FIFTH AVENUE

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FOUNDATION FACTS

Foundation Facts is a monthly news-letter issued to industrial concerns holding membership in Industrial Hygiene Foundation. The Foundation is a combined research and service institution to protect the health of workers in industry.

Vol. I. February, 1943 No. 2.

Proceedings Published

The Proceedings for the Seventh Annual Meeting, one of the most valuable publications the Foundation has issued, has just been received from the printer and copies are now going into the mails. Included are sections on such timely subjects as:

- More Manpower Through the Reduction of Absences
- Putting Women, Older Men and Physically Handicapped to Work
- Fatigue in Wartime Industry -- Hours of Work, Rotation of Shifts

Also included are practical discussions and reports on the Prevention of Dermatitis, Health Hazards in the Use of Grinding Wheels, Further Studies of Aluminum Powder in Combating Silicosis, Action of Magnesium on the Lungs, Keeping Score on Toxic Materials and Processes in the Plant and the Industrial Feeding Program.

Grandmothers in War Plants

Grandmothers are war workers in some of Western Pennsylvania's booming mills. Seven are employed in one plant. The company commenting on their work, says "they're really turning it out." In this connection, English works managers recently declared that women over 40 are the best workers; that they are more reliable and more willing to learn.

UAW Re-establishes Medical Institute

MODERN INDUSTRY reports "the re-birth of the United Automobile Worker's Medical Research Institute in Detroit after a lapse of six years. Just getting underway, the UAW Institute aims a three-pronged attack on the health and safety problem by (1) Examining union members who think they're exposed to hazardous conditions on the job; (2) Surveying plant conditions through questionnaires to shop stewarts and committeemen; (3) Enlisting the aid of the Michigan State Board of Health and the U. S. Department of Labor in investigating and recommending corrections for hazardous plant conditions."

Pointed Comments

Says T. Spencer Shore, Vice President, General Tire & Tubber Co. --- "Can you imagine anyone staying in business today who doesn't continually study his markets? Can you imagine anyone staying in business today who doesn't change his production when 'bugs' are found? The same principles apply to employee relations."

A number of member companies are making contributions to the Foundation in addition to their regular membership dues for 1943. Says the president of one such company, an internationally known firm, (name upon request):

> "The work that the Industrial Hygiene Foundation is doing is well known to us and very much appreciated."

-----Keep War Workers Well!-----

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Industrial Hygiene Foundation,
4400 Fifth Avenue,
Pittsburgh, Pa.

INDUSTRIAL HYGIENE DIGEST
Literature and News

News Items

126 Occupational Diseases.
The report of the Bureau of Industrial Hygiene of the Connecticut State Department of Health for December, 1942 shows the following occupational disease experience. There were 101 cases of which 96 were from dermatitis (oils, soaps, sulfur dioxide, synthetic resins, dyes and inks, organic dust and alkali). The remaining cases were pneumoconiosis (silicosis) 2, chromium poisoning 2, and infection 1.

127 Static Electricity Measurement.
The Davis Emergency Equipment Company, 56 Halleck St., Newark, N. J. has announced a "Resistometer" for testing employees, machines and flooring for resistance to ground. Safe, low voltages are used for testing humans. The complete unit is housed in a portable, vapor-proof case. The instrument records immediately the resistance to ground on a meter calibrated in two zones, safe and unsafe. Resistances from 0 to 20 million ohms may be measured. The device is battery operated. -- Chemical Equipment Preview.

128 Conductive Floors.
A new ready mixed mastic material for heavy duty service capable of dissipating static electric charges from friction has been produced by the Rock-Tred Corporation, 605 W. Washington St., Chicago, Ill. An official test showed resistance to the flow of current as low as 700 ohms. -- Chemical Equipment Preview.

129 Sound-Slide Films of First Aid Training.
First aid training in industrial plants may be accelerated by the use of sound-slide films. The basic material for a selection of 20 films is official. Complete information may be obtained from the Jam Handy Organization, 2900 E. Grand Blvd., Detroit, Mich. -- Chemical Equipment Preview.

130 Women Workers Warned to Cover Their Hair.
The feminine hairdo and machinery are a bad combination. Stray curls or wisps of hair may be caught in moving parts. Machine operators should cover their heads, but not with the popular bandana and turban because their loose ends may catch in the machine. A hairnet alone is not safe, but may help if worn under a good cap. In an ordnance plant a woman operating a barrel-turning machine leaned too close and her hair was pulled around the barrel. A large clump of hair was torn from her head. She spent days in the hospital recovering from the wound and shock.

Legal Developments

Injury to Hands and Feet Allegedly from Coming in Contact with Acid Solution. Complete Disability. Causal Connection.

Sometime ago this action, presenting a claim for damages under Revised Civil Code Article 2315, was before this court on an appeal from a judgment sustaining exceptions of no cause and no right of action. This court reversed and set aside that judgment, overruled the exceptions, and remanded the case for trial on its merits. Plaintiff alleged that while in the employ of defendant for six years he worked in close proximity to the beaters that contained acids, liquids and other chemicals necessary in the production of paper; that such beaters were in a bad state of repair and leaked, and he was compelled to walk and stand on the floor where the chemical mixture accumulated and to handle objects saturated with the solution. His hands and soles of his feet became callused, cracked open, and are sore and tender. There was judgment rejecting the demands of plaintiff. It is undisputed that plaintiff is now experiencing complete disability. Assuming that the beater substance constantly remained on the floor and in it the employee was compelled to stand and work, plaintiff has not proved with legal certainty that his contact with the solution caused his physical disability. Several chemists agreed that the stock in the beater was considered as a harmless neutral liquid. Then too the medical experts testifying unanimously stated that the cause of plaintiff's disorder is unknown to the medical fraternity. The judgment is affirmed. Clark v. Southern Kraft Corporation. La. Ct. of App., 2d Cir. Decided December 14, 1942. (CCH).

Silico-Tuberculosis. Application of Widow. Method of Determining Time Within Which Application Must be Filed.

This is an application of the widow of an employee for a death benefit under the workmen's compensation act, where death allegedly resulted from disease (silico-tuberculosis). The claim is barred by the statute. The last day the employee worked was June 27, 1934, he died on March 30, 1940, and no claim was filed until February 26, 1941. The law applicable to the events here involved is found in secs. 102.46 and 102.17 (4), Stats. 1933. The application for a claim must be filed within the time fixed after the date of injury or death, that the right of a dependent was limited in amount to what the deceased might have recovered had he lived. By sec. 102.10 (2), Stats., "date of injury is ... in the case of disease the last day of work for the last employer whose employment caused disability." If it occurred in this case, it could not be later than June 27, 1934. Here, then, although the six year period had not expired at the time the employee died, it had expired by the time the widow filed her claim. Since an application filed by Weissgerber on February 26, 1941, would have been barred, the same is true for the claim of the present plaintiff. The death of the employee does not start a new period of limitations running in favor of his dependent.

Judgment affirmed. Weissgerber v. Industrial Commission et al. Wis. Supreme Ct. Decided January 12, 1943. (CCH).

[illegible]. Statute of Limitations as Applicable to Occupational Diseases. Filing Claim.

Appeal from a judgment of the superior court reversing an order denying a claim for disability due to an occupational disease. Plaintiff filed a claim with the department of labor and industries for compensation for disability sustained by contraction of an occupational disease, known as silicosis. The claim was

made under the provisions of Rem. Rev. Stat. (Sup.), Sec. 7679-1 (P.C. Sec. 3478-81), Laws of 1939, chapter 135, p. 382. He certified that the date of his first exposure was October, 1926, and the last was of January 1, 1940. From an order of the supervisor of industrial insurance rejecting the claim because "no claim has been filed for or on behalf of said workman within one year after the day upon which the injury occurred, the claimant appealed to the joint board of the department. That board sustained the order of the supervisor. Claimant's appeal to the superior court resulted in reversing this order upon the ground that the one-year statute of limitations provided by Rem. Rev. Stat., Sec. 7686 (P.C. Sec. 3480) (d), applied only to traumatic injuries and not to occupational diseases. Inasmuch as the legislature failed or refused to definitely apply the one-year limit to claims filed for occupational diseases, it is concluded that there is no statute governing the time in which a claim for injuries caused by an occupational disease may be filed. The very nature of the disease indicates that the legislature never intended to refuse relief to those workmen who did not know and could not know that they had a disabling disease until long after contact with the cause of the disease and after a year had expired since the last exposure. Judgment affirmed. Henson v. The Department of Labor and Industries, Washington Supreme Ct. Decided November 12, 1942. (CCH).

134 Illness of Employee. Administering of Medicine. Action in Tort. Application of Compensation Act. Preclusion of Tort Action.

Plaintiff, employed as a cashier by the defendant, became ill at work, asked for medicine which was given her by fellow employees, and suffered spasms and convulsions as a result of which she fell from a table where employees had placed her in plaintiff's store, severely injuring her shoulder. Medical testimony shows that she was given an overdose of strychnine which caused the spasms and consulsions. The vital question is whether plaintiff's injuries arose out of and in the course of her employment. Plaintiff contends that the court erroneously admitted the original complaint against her. The original complaint alleged that defendant's custom was to administer medicine to employees who became ill in the store; that plaintiff became ill and requested medicine; that she had done so on other occasions and been administered to; which was done at this time. This count was dismissed by the plaintiff who filed an amended complaint relying on an alleged custom of defendant to administer to the sickness of customers who requested first aid or emergency attention. The trial court decided that plaintiff's injury arose out of an in the course of her employment as a matter of law, and, accordingly, her tort action was precluded by the act. Plaintiff took medicine so she could continue work, the medicine caused convulsions which resulted in her injury, and the court holds the injury arose out of and in the course of her employment. Her tort action is precluded by the Workmen's Compensation Act and the court's action in directing the verdict for the defendant was proper. Since plaintiff's own testimony produced the facts, defendant was thereby relieved of the burden. Affirmed. Greene v. Walgreen Co. Ill. Appellate Ct., 1st Dist. Decided December 9, 1942. (CCH).

135 Allergy of Printer-Operator to Soap Furnished by Employer. Accident. Occupational Disease.

Appellee, an employee of the appellant New Mexico Publishing Company, sued that company and its surety for an injury alleged to have arisen out of, and in the course of, his employment as a printer-operator. In the course of appellee's employment he had to cleanse his hands frequently, for which purpose the employer furnished soap. Appellee was highly allergic to the Lan-O-Klean soap furnished and as a result of his use thereof; large painful eruptions broke out on the back of his hands. He became completely disabled. The resulting injuries constituted an unlooked-for mishap which was neither expected nor designed and they were accidentally caused. Lanolin and corn meal used in the soap are not

usually and ordinarily component parts of soap. Contrary to defendant's contention, the evidence substantially supports the finding, in the sense that the use of lava soap was extensive though not universal; that it was used by the greater number of printing establishments. Appellant states that the words "... and were accidentally caused" is a conclusion of law. It was necessary for appellee, in the course of his employment, to frequently wash his hands. The soap furnished was one to which he was unknowingly allergic. The injury from the use of the soap could not have been reasonably expected or foreseen. The findings bring the injury within the definition of "accident." Likewise the cause and place of the injury is definitely established and also the time of the injury. Appellant suggests that the injury was a disease "in the nature of an occupational disease." The court is of the opinion that it was not an occupational disease. The judgment is affirmed. Webb v. New Mexico Publishing Co. et al. New Mexico Supreme Court. Decided January 13, 1943. (CCH).

Industrial Health Hazards and Their Effects

136 Anthraco-Silicosis Among Bituminous Coal Miners. R.H. Flinn, H.E. Seifert and H.P. Brinton. Ind. Med., 11, 470-473 (October, 1942).
In this first extensive study of anthraco-silicosis among soft coal miners, one case of second stage, and fifteen cases of first stage of the disease were found among 507 men whose only dust exposure was in soft coal mines. These cases fulfilled the x-ray, clinical, and occupational criteria for the diagnosis. There were no advanced cases such as were seen in 3.9% of anthracite miners. No case occurred in men with less than 10 years employment. Cases showed excellent correlation with years of service and with average dust exposure in the various occupations. Dust exposure was measured in number of particles, and in silica content and those operations at the coal face were most hazardous. Ventilation studies showed that although overall ventilation was satisfactory, half of the coal faces had poor ventilation and air movement in some places was practically zero. Adequate ventilation and use of water to wet down cars and roadbeds reduced dust concentration to the level at which 30 years exposure of 11 men has produced no cases.

137 Pneumoconiosis Among Mica and Pegmatite Workers. A Supplementary Study. T. F. Vestal, J. A. Winstead and P.V. Joliet. Ind. Med., 47, 11-14 (January, 1943).
The paper is a brief report of a recent study of 1121 prospective workers in the mica industry in North Carolina. One group of 222 had had no previous mining experience; a second group of 443 had worked at mining or mineral grinding at least a month, but not with mica; and the third group of 456 included all men who had mined or ground mica. The conditions under which the last group had worked corresponded generally to those described in U.S. Public Health Bulletin No. 250 on the subject, although there is now a tendency toward better conditions. Tuberculosis and chest pathology increased in the order given -- only inactive tuberculosis in the first or control group, and 5.4 and 9.4% dust pathology, respectively, in the other two. Those percentages included 2.9 and 4.2% of pneumoconiosis. The mica workers included a number of men who had been engaged in mica mining, and therefore probably were exposed to some extent to silica dust. In order to obtain at least tentative information on the effect of mica alone, the investigator included a group of 79 men whose only experience with mica had been in grinding "clean" mica, i.e. containing no free silica. An

incidence of 11.4% dust pathology is revealed in this group. From the x-ray standpoint, this pathology is similar to that of other mica workers and is classed as pneumoconiosis or silicatosis, rather than silicosis. Although the small number of cases does not permit definite conclusions, the results are indicative of a specific action of mica and the question deserves further study.

138 Pulmonary Disease in Miners. Editorial. Brit. Med. J., 43-44 (July 11, 1942). This editorial discusses a recent Medical Research Council report (Chronic Pulmonary Disease in South Wales Coal-Miners. H.M. Stationery Office, 1942) which shows by means of a thorough study that anthracosis does bring about incapacity and predisposes to tuberculosis, contrary to wide belief. The report distinguishes two separate pulmonary conditions caused by coal dust: (1) consolidation, a condition showing discrete nodulation which is found in men still working underground as well as in cases certified as "silicosis for compensation"; (2) reticulation, a non-nodular condition, hitherto little emphasized, which also definitely tends to impair the function of the lung, often forming the basis for the grosser indurations of anthracosilicosis, though compensation is not generally granted for it. The term "pneumoconiosis" is suggested for both these conditions to distinguish them from classical silicosis. Pulmonary tuberculosis in miners tends to merge with pneumoconiosis to constitute with it a fairly distinct disease. The report recommends that pneumoconiosis be included with silicosis for compensation and suggests periodic examination of the miners. This discussion of the report also recommends that active tuberculosis be included for compensation, in view of its relation to dust-reticulation.

139 Atmospheric Conditions in Mines: A Study of the Physical Condition of Mine Air. 3rd Report of the General Research Committee of the Monmouthshire and South Wales Coal Owners' Assoc. (August, 1942).
The report is intended for the guidance of colliery managements. There is a short summary of literature on the physical factors of mine air as they affect body heat loss and subjective feelings of warmth, and various indices of thermal conditions are described and discussed. Later, there are given the results of surveys of thermal conditions in a number of South Wales mines; these were made by Prof. T.D. Jones, who is Director of Research to the Association. One of the objects of these surveys was to compare effective temperature and wet Kata cooling power as indices of warmth over the range of conditions encountered. Observations were made at the coal face and in airways. It is said that effective temperature is a better index of warmth than is wet Kata cooling power, but then it is claimed that "as an indicator of ventilation efficiency the wet Kata cooling power is superior to effective temperature as it demands some degree of air movement generally." In elucidation of this statement it is added: "Standards fixed by the effective temperature index alone could be complied with by use of stagnant air up to the limit of temperature specified, whereas with the former index stagnant air would only comply at low wet-bulb temperatures. Thus the efficiency of the ventilation as measured by the ratio of air reaching the face to that passing through the fan could be almost nil in low temperature conditions and yet comply with an effective temperature standard laid down for mines in general. As a measure to show the improvement produced in a given set of conditions by increase of ventilation, the wet Kata cooling power is useful. Its use appears to be more fitted for the qualitative side of mine ventilation rather than for the quantitative estimation of atmospheric warmth." Later it is added that from the mining point of view the employment of both indices is preferable to the use of one singly. If one wants to measure environmental warmth and at the same time to assess the improvement in ventilation efficiency, that efficiency depending on the proportion of the air handled by the fan that reaches the face, clearly two indices are necessary. The Research Committee appear to agree that effective temperature is the desirable scale for use as an index of warmth, and with

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that view the reviewer concurs. But wet Kata cooling power seems to be a strange index to select for the assessment of ventilation efficiency. Surely, the measurement of the volume of air passing along a given air circuit would be a far better method. It would give a direct measure of efficiency, while any change in the overall degree of warmth could be assessed on the effective temperature scale. After re-reading the report the reviewer is still at a loss to understand in what respect wet Kata cooling power has any advantages over direct measurements of air volumes; on the contrary its use would seem certain to introduce unnecessary complication and risk of misunderstanding.

140 Nineteenth Annual Report of the Safety in Mines Research Board, 1940. London: H.M. Stationery Office. (1942).
Studies related to the prevention of coal dust explosions included work on the reduction and collection of coal dust in mines; on the relative efficacies of different incombustible dusts for suppressing the inflammation of coal dust; on the effect of varying the disposition of dust on the ease of propagation of flame; on the dispersability of stone dusts, and the mechanism of dispersion of a dust deposit; on the prevention of caking of sodium chloride during exposure; on the visual estimation of the density of dust clouds; on rapid methods for estimating the incombustible content of mine dusts, and on the chemical analysis of mine dusts. In connection with firedamp explosions, it was found that when rusty ironwork, painted with an aluminum paint, was quite lightly struck with a metal tool, violent flashes occurred. For sparking to be possible the painted iron surface must be rusty, and after being painted it must at some time have been heated to at least 130°C., but once a rusty specimen has been heated after painting it may spark on being struck whether it is hot or cold. The sparking can ignite various explosive mixtures, e.g. those of air with methane, ethyl ether, coal gas, pentane, benzene, carbon disulphide and methyl alcohol, individually. It appears that the small flashes are "thermit" reactions. Work on mining explosives was unavoidably curtailed, but some work was carried on. Further studies have been made on the causes of falls of ground, and on certain haulage problems.

141 Mechanization and Falls of Ground Accidents. A. Winstanley. Trans. Inst. Min. Engrs., London. 101, 328 (July, 1942).
The use of machinery for cutting, breaking-down, conveying and loading coal at the working faces of British collieries has been increasing for many years, and has continued to increase since the outbreak of war. In 1940, 64% of the total output was cut by machines and 61% was conveyed, whereas in 1930, only 31% was machine-cut and 17.4% conveyed. Figures for 1940 and the first half of 1941 showed that there had occurred an abnormal rise in the risk of accident through falls of ground at the coal-face. The causes of these accidents are given, and the effects of various supports and systems of support discussed. Fundamental rules for reducing the number of accidents due to falls are: 1. Adequate support must be given to the roof (and sides) as, and when, they are being newly exposed. 2. No newly-exposed roof or sides are fit to be relied upon without support. 3. Minimum of time must be spent within range of falls from unsecured or insufficiently secured roof or sides in moving ground. 4. Strata movements must be reduced to a minimum by adequate support applied with the minimum of delay.

142 The Personal Factor in Accidents. Industrial Health Research Board Emergency Report No. 3. London: H.M. Stationery Office. (1942).
This short report of 19 pages sets out the results of previous work. The conclusions are stated simply, with a minimum of technical detail. In the first part of the report the effects exerted by a number of general factors on accident incidence are outlined. Long hours of work and fatigue cause more accidents,

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as do also unsuitable thermal conditions and inadequate or unsuitable illumination. Inexperience is an important causative factor, and even when due allowance is made for experience or the lack of it, young people have more accidents than older ones. Physical and mental fitness for work, and speed of production are other significant factors. The attitude of the management and of the workers may have a strong influence: managements should not regard accidents as purely fortuitous and unavoidable events, and workers should avoid carelessness and should refrain from indulging in dangerous practices. The second part of the report is devoted to individual accident-proneness. Liability to accident is largely determined by the degree of risk to which a person is exposed. But in an industrial group in which the members are doing the same work and are exposed to equal risks, some persons sustain more accidents than others. Psychological investigations show that those with an unduly high accident rate can be partly differentiated on the basis of measurable individual reactions; and these individual differences are represented by the phrase "accident proneness." Accident proneness is thus a narrower term than accident liability, for it refers only to the personal factors tending to a high accident rate. Accident proneness is a relatively stable factor manifesting itself in all periods of exposure and in different kinds of accidents. Aesthetokinetic tests -- tests measuring the capacity to respond accurately, within a controlled time interval, to various sensory stimuli -- can be used to detect the accident-prone amongst groups of skilled workers. The tests have hitherto failed in unskilled occupations. The most effective way of weeding out the accident-prone is to make a first selection by means of psychological tests, and then, at the end of an initial period, to remove from a dangerous occupation those with an unduly high accident rate.

143 The Effects of Fiberglas on Animal and Human Skin. M.B. Sulzberger and R. L. Baer. Ind. Med., 11, 482-484 (October, 1942).

All of the reactions observed were of a transitory and superficial nature. The only parts of the reactions which persisted for more than a few days were slight thickening and brownish pigmentation of the skin. The latter were sometimes apparent for several weeks. No reactions or symptoms outside the rubbed skin areas were observed at any time during the experiment. The minute pieces of material which were seen sticking into the skin after rubbings with Fiberglas in its wool-like form appeared to be very superficially embedded. This observation was borne out by the fact that ordinary washing with water easily removed a large part of the spicules remaining in the skin after rubbing. No definite sensitization to any of the materials could be demonstrated. In a few subjects there were a few mild and evanescent reactions to several of the materials, but it appeared very questionable whether these reactions were based on specific sensitization. The biopsies of all specimens taken from various sites in animals and humans showed a superficial inflammatory process. Sites on human objects which had been rubbed with the Fiberglas continuous filament and staple fiber presented such mild clinical reactions that it appeared unnecessary to take biopsies from them. There were no significant differences in the types of histologic reaction produced by the other materials. No spicules or pieces of materials, and no foreign reactions, could be demonstrated in any of the histologic sections. -- Authors' summary.

144 Toxicity of Nitroglycerin. Queries & Minor Notes. J.A.M.A. 119, 1536 (August 29, 1942).

Information on the toxicity of nitroglycerin was requested. Used industrially, it is very toxic. Standing near a man with traces on his body or clothing is sufficient to bring on manifestations. Headache, nausea, vomiting and flushing are the commoner features. Acute mania may be associated with the headache.

Alcoholic drinks precipitate attacks and increase the severity. When used in industry, nitroglycerin commonly enters the body through inhalation of vapors or through skin absorption. 3 to 5 drops taken internally may prove fatal. Chronic types of poisoning are doubted. No organic changes are known to arise in the heart or central nervous system. Temporary blindness is common. Low blood pressure and polyuria are significant. In severe poisoning, oxygen should be administered with intravenous saline solution and saline cathartics. The only known cause for rejection of an applicant for nitroglycerin work is alcoholism. A bibliography is added.

145 The Response of Laboratory Animals to Monomeric Styrene. H.C. Spencer, D. D. Irish, E.M. Adams and V.K. Rowe. J. Ind. Hyg. & Tox., 24, 295-301 (Dec. 1942). Vapor concentrations of monomeric styrene which are acutely dangerous to guinea pigs and rats range from 10-12 mg/liter (approx. 2,400 p.p.m.) for an eight hour exposure to 46 mg/liter (10,000 p.p.m.) for an exposure of 30 to 60 minutes. Higher concentrations are impossible to attain at ordinary temperatures. Immediate deaths result from the primary action on the central nervous system, while many delayed deaths result from pneumonia which frequently develops following acute lung irritation. The extreme eye and nose irritation produced in man by a concentration of 6 mg/liter (1,300 p.p.m.) affords a definite safeguard against voluntary exposure to acutely hazardous concentrations. Repeated seven to eight hour exposures to monomeric styrene vapor at a concentration of 6.0 to 6.3 mg/liter are tolerated without evidence of toxic reaction by rats, rabbits and monkeys. No changes in the blood picture are observed in animals receiving such exposures. Repeated exposures to 3.0 mg/liter are well tolerated by guinea pigs. A concentration of approximately 2 mg/liter (400 p.p.m.) which gives a disagreeable odor but does not produce appreciable eye or nose irritation in man, should present no serious industrial hazard and is suggested tentatively as the permissible limit for repeated exposures. Monomeric styrene produces a reaction on the rabbit's skin which is very similar to that produced by the common aromatic hydrocarbons. In industrial use the same precautions should be observed to avoid skin contact as are now followed in the handling of other aromatic hydrocarbon solvents. Monomeric styrene, when administered orally or inhaled as a vapor causes a marked rise in "total benzoic acid" and neutral sulfur excretion in rats and rabbits. Similar changes might be expected to occur in man.

146 Carbon Tetrachloride in Industrial Hygiene. W.H. Easton. Ind. Med., 12, 1-3 (January, 1943).
The author briefly reviews the literature on the toxicity of carbon tetrachloride with conclusions on dangerous concentrations. He first points out that carbon tetrachloride is toxic in two different respects, as a simple narcotic and a source of secondary toxicity. In the earlier literature these effects were confused. The author presents the figures of Flury for acute exposures, according to which 5,000 p.p.m. are dangerous within 30 minutes and 50,000 p.p.m. in 10 minutes. For prolonged exposure, Smyth's studies indicate that 100 p.p.m. is safe for continuous exposure day by day and that 1,000 p.p.m. is safe for periods up to half an hour when the day's average does not exceed 100 p.p.m. These figures are generally accepted as industrial safety standards. It appears impossible to arrive at any very definite conclusions as to the frequency of carbon tetrachloride from records of compensation claims, because in the records of most states industrial poisons are not differentiated, and because it is difficult to judge from the symptoms what poison has been involved.

147 Chlorinated Hydrocarbons. A.L. Coleman. Conn. Ind., 20, 11-12, 30-1, (1942). Methyl chloride, dichloromethane, carbon tetrachloride, dichloroethane, tetrachloroethane, trichloroethylene, tetrachloroethylene, chloroprene, chlorinated naphthalenes and chlorinated diphenyls are considered from the viewpoint of their health hazards.

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148 Metabolic Disturbances in Workers Exposed to Dinitrotoluene. L.C. McGee, A. McCausland, C.A. Plume and W.C. Marlett. Amer. J. Digest. Dis., 9, 329-332 (October, 1942).
An increase in the signs and symptoms of chemical intoxication has appeared following the introduction of a large number of inexperienced workmen into manufacturing operations using dinitrotoluene. The chief symptoms of a group of 154 workers so exposed were an unpleasant metallic taste, weakness, headache, loss of appetite, and dizziness. Two-thirds of the men in the group selected for study had these complaints at one time or another during the past twelve months. One-half the group developed objective signs of intoxication. These signs were chiefly pallor, cyanosis and low-grade anemia. Jaundice was seen but twice. No instances of permanent physical impairment were found. Careful, frequent examinations of workmen in dinitrotoluene appear to be essential in proper supervision of particular operations. -- Authors' summary.

149 Experimental Investigations on the Influence of Vapors of Aromatic Hydrocarbons on Tuberculosis Infection (Benzene and Xylene). E. Rix and O. Schedtler. Beitr. Klin. Tuberk., 95, 401-415 (1940).
Inhalation of benzene or toluene vapors over a long period had an unfavorable effect on experimental tuberculosis in guinea pigs, as measured by the weight curves of the animals. No special effect on the tuberculous animals as compared with the controls could be detected.

150 Methyl Bromide Poisoning. E. Schifferli. Rev. med. Suisse romande. 62, 244-250 (1942).
Methyl bromide appears to act directly on the skin, central nervous system and vasomotor system. It enters the human body through the respiratory passages and skin. No remission period is observed; there is a continuity in the symptoms. Generally several hours elapse between the time of exposure and the appearance of severe symptoms.

151 Smoke and Fire Gases, Toxic Constituents. W.H. Easton. Ind. Med., 11, 466-468 (October, 1942).
More fire casualties are caused by smoke and gases than by any other factor, and there are medico-legal, as well as purely medical problems involved. Thermal decomposition products of different common combustibles are listed and although most of the toxic effects are due to carbon monoxide there are usually sulfur, ammonia, or cyanide containing fumes also. There is some evidence to indicate that mixtures of gases are more toxic than the same concentration of each separately, and the presence of carbon dioxide stimulates respiration and increases absorption. More research on this subject is needed.

152 Recommended Primary Methods to Safeguard Against Poisoning by Cadmium, Hydrogen Sulphide and Arsenic. Illinois Labor Bull., 3, (July 31, 1942).
In this interesting investigation, powdered zinc ore is roasted, then mixed with coke, heated and trapped as a fine dust. The cadmium is leached out of the dust by treatment with sulfuric acid. Cadmium is thrown down from the acid solution by treatment with powdered zinc. A year before this investigation a man doing this precipitation fell ill with a serious arsenic poisoning, and another man with a less serious poisoning. Then followed several suspicious cases. A ventilating system was installed over the precipitation tanks. Since it was not possible to prevent the tanks from sometimes boiling over, all men in the plant were instructed to leave immediately if this happened. By taking samples of the air, it was seen that the company engineers had dealt adequately with the arsine problem. But another dangerous process was found: the operator drew a sample from the tank after each addition of zinc and tested it for the presence of cadmium by adding hydrogen sulfide. The air tests in other processes showed no serious

of carrium per 10 cubic meters of air. None of the men examined showed clinical evidence of arsine poisoning at the time of the investigation, but 17 of the 18 men examined showed abnormally large amounts of arsenic in the hair and nails, which analysed up to 10, 12, 13 micrograms arsenic trioxide per gram of tissues. About two thirds of the men showed significant deviations from the normal in the differential blood counts.

153 An Investigation into the Effects of Continued Exposure to the Vapor of Volatile Solvents. E.M. Killick and W.S.F. Schilling. J. Ind. Hyg. & Tox., 24, 307-313 (December, 1942).
Blood examinations were carried out on all the employees of a small paint factory where one case of solvent poisoning had been reported. The only marked deviation from the normal blood picture was a diminution in polymorphonuclear cells with a corresponding relative increase in lymphocytes; this seemed to be associated with exposure to the vapors of mixed organic solvents, of which the most important were toluene and xylene. Symptoms of slight narcosis were frequent in the men exposed to these solvents. -- Authors' summary.

154 Safety in Laboratories and Factories for Inorganic Chemicals. III. Phosphorus Hydrides. F. Barillet. Industrie Chimique. 123-6 (1940).
Acute poisoning from phosphorus hydrides can occur only from absorption through the respiratory tract. The effects are similar to those produced by white phosphorus. Anemia and nervous disorders occur from chronic poisoning. Gas canisters for absorption of the phosphorus hydrides should contain silver permanganate, potassium permanganate and activated carbon. Phosphine and phosphazine may decompose explosively, phosphazine is especially unstable in contact with organic material or in the presence of light. A two per cent concentration by volume of phosphazine will make hydrogen and other inflammable gases spontaneously inflammable. Hydrogen chloride, ammonia, ether, alcohol, oil of turpentine and hydrogen sulfide in small quantities suppress this latter phenomenon. Phosphorus trichloride may cause dyspnea, and in severe cases pulmonary edema. Burns from phosphorus trichloride are serious and the compound should be removed from the skin with sodium carbonate solution. Gas masks for the removal of the trichloride should contain soda lime and activated carbon. Phosphorus pentachloride resembles the trichloride but causes less serious effects. Tetraphosphorus trisulfide has low toxicity but may produce occasional cases of dermatitis. Its ignition temperature in air is 95-100°. It forms explosive mixtures with most oxidizing agents. It should be stored and transported with the same respect accorded white phosphorus.

155 Safety in Laboratories and Factories for Inorganic Chemicals. XIII. Arsenic and Its Compounds. F. Barillet. Industrie Chimique. 201-4 (1940).
Acute poisoning from arsenic compound normally occurs from ingestion, but can occur in some cases from inhalation or skin penetration. Chronic poisoning is observed most frequently from inhalation. Arsenic bearing dust is very dangerous. Skin protection is of great importance. The etiology of arsenic poisoning is described at length.

156 Metallic Poisons. J.M. McDonald. Safety Eng., 85, 33-36 (January, 1943).
This first installment of a series deals very briefly with lead, mercury, cadmium and carbon monoxide poisoning, with permissible limits and most important prevention methods for each.

157 Acute and Chronic Toxicity, Public Health Aspects. G. Woodard and H.O. Calvery. Ind. Med., 47, 55-59 (January, 1943).
While this paper does not refer specifically to industrial toxicology or to poisoning by the means usually encountered in industry, it contains valuable advice to all who study toxicity problems. In order to understand the problem of acute and chronic toxicity resulting from exposures to any chemical, well controlled toxicological investigations must be carried out. It is essential in these experiments that the levels causing acute, subacute and chronic toxicity be accurately determined on several species of animals. Chronic studies must extend for the lifetime of the animal. Since the results of these experiments on animals are to be determined in terms of man, and since the tests are made upon normal animals under ideal conditions, all factors related to species variation must be kept in mind when evaluating toxicity data in formulating tolerances or regulations for the protection of public health.

158 Toxicity of Gallium. S.F. Meek, G.C. Harrold and C.P. McCord. Ind. Med., 47, 7-9 (January, 1943).
In connection with a recent investigation of the toxicity of indium (Abstract No.40, January, 1943 Digest), the question of the toxicity of gallium arose because it is intermediate between indium and aluminum in the periodic system, although gallium is rarer and less used than indium. The results of experiments indicate that gallium and its salts produce notable toxic effects only when in rather high concentration.

159 Radiation Cancer. S.M. Silverstone. J. of the Mt. Sinai Hospital. 9, 74 (July-August, 1942).
Radiation cancer develops in three groups of persons: those who work with roentgen rays and radioactive elements, those on whom roentgen rays or radium is used during a long time for diagnostic or therapeutic purposes and industrial workers who come in contact with radioactive elements. The exact amount or dose of radiation necessary to produce radiation cancer, Silverstone points out, is not known, nor is it as important as the fact that the radiation must be administered over a long continuous exposure or many intermittent exposures. Radiation in doses sufficient to destroy diseased tissue completely produces radionecrosis, and radionecrotic tissue seldom undergoes malignant change; but cancer may occur in the viable tissue at the edge of the radionecrotic area. If the dose produces incomplete destruction or differential destructive effects on various tissue components, a complex balance of necrosis and repair is set up which may eventually lead to malignant neoplastic formation. In such an injury, degenerative and regenerative processes are operative at the same time. Both processes are progressive and continue indefinitely even though the radioactive agent is withdrawn. This stage corresponds to the long latent unpredictable and variable period between their radiation and the appearance of a neoplasm. It may vary from one to twenty-five years, during which time both reparative and degenerative processes are active but neither repair nor necrosis is ever complete. Finally a stage is reached in which the reparative processes undergo increased activity and a transition to neoplastic activity, frequently multiple, occurs. These events are best observed in the skin; every stage of transition may be found from simple hyperplasia of the epithelium to infiltrating squamous cell carcinoma but in a stroma characterized by extensive hyalinization and poor vascularity. The type of neoplasm depends not on the nature of the injurious agent but on the type of tissue affected. The origin of the neoplasm is limited to the irradiated tissue, but, once established, it behaves like any other malignant neoplasm of similar structure and anatomic site.

... Industrial Health Hazards in Magnesium Foundries. Illinois Labor Bull., 8, ...-9 (September, 1942).
This article is written as a guide for safe operation of magnesium foundries. The hazards of sulphur dioxide and fluorides as well as the nuisance of magnesium oxide fumes are discussed. Four air samples were taken which indicate fluoride and sulphur dioxide hazards in shakeout, core knockout, and pouring operations even when there was good general ventilation and enclosed processes. It is guessed that in molding sand containing sulphuric acid rather than fluoride, even more complete control is needed. Good local exhaust is recommended for the control of sulphur dioxide and fluoride hazards. Telescoping hoods for magnesium furnaces and local exhaust for heat treating furnaces are recommended and lateral exhaust for chromic acid tanks. In addition, the usual protective clothing for workers should be issued. A booth exhausting directly into an efficient wet dust collector should be located behind each grinding wheel used for magnesium bearing metals to control explosive dusts. Operators of such grinding wheels should wear tightly woven fire resistant clothing.

161 Manganese. Industrial Data Sheet D-Chem-26 (Revision). National Safety Council. Nat. Safety News, 47, 56 (February, 1943).
The principal hazard from manganese is that of chronic poisoning due to inhalation of its dust or fumes. There are no records of acute poisoning. There is wide difference in individual susceptibility but symptoms usually appear in about the following order, beginning in about 3 months or more of severe exposure: languor and sleepiness, stolid masklike appearance of face; low monotonous voice and tendency to be sparing with words; muscular twitches; cramps in the calves of the legs; increases in tendon reflexes; spastic gait; occasional uncontrollable laughter or crying. Early cases improve if the victim is removed from exposure, but advanced cases do not. Manganese, unlike lead, causes no life-shortening degeneration but destroys some non-vital portion of the central nervous system and leaves the victim a cripple but usually does not affect other parts of the body. Prevention of exposure includes sampling and analysis of the air, reduction of dust and fumes to 60 milligrams per 10 cubic meters of air (American Standards Association pamphlet 237.6, July 16, 1942), proper ventilation, medical supervision and examination, a high standard of personal hygiene, and keeping food and beverages out of the workroom.

162 More Care With Mercury. A. Stock. Z. physik Chem. 189, 63-9 (1941).
Chemists and physicians are frequently exposed to concentrations of mercury capable of causing chronic mercurialism. It is claimed that a few gammas of mercury per cubic meter of air will produce serious symptoms, among which are injuries to mental ability and the memory. It is further claimed that individuals hypersensitive to mercury may be poisoned by a few tenths of a gamma per cubic meter of air.

163 Sclero-keratitis Following Phosphorus Injury of the Eye. T.K. Lyle and A. G. Cross. Brit. J. of Ophth., 26, 301-303 (July, 1942).
The case of phosphorus injury of the eye cited in this article is one of the first to be reported. In 1918 the face, eyes and body of the subject were severly burned by the explosion of a barrel of phosphorus. In 1921 there was a severe attack of eye inflammation lasting about ten months, followedby milder attacks in 1930, 1931, 1938 and 1941. These widely-spaced recurrences are similar to those of mustard gas keratitis, but the clinical features are different. The resulting corneal opacities are, with one exception, deep in the substantia propria and, contrary to the usual sclero-keratitis, are not in continuity with the sclera, nor is there any corneal vascularization. In this case, moreover, there is no " marbling" of the conjunctiva or uveitis.

164 Effect of Sodium Hexametaphosphate on the Solution of Lead. E.W. Moore and F.E. Smith. J. Am. Water Works Assoc., 34, 1415-24 (1942).
The effect of various concentrations of sodium hexametaphosphate on the solution of lead has been measured using a dithizone method for the lead analyses. The metaphosphate retards the solubility of lead when the pH is lower than 7.0. Under certain conditions where the pH is 8.8 or over, the solubility of lead is increased. The authors conclude that metaphosphate does not increase the lead hazard in drinking water except with softened waters where metaphosphate is substituted for recarbonization.

165 Occupational Exposure to Citric Acid. Queries & Minor Notes. J.A.M.A., 120, 658 (October 24, 1942).
Men working in a chemical plant making citric acid complained of bad teeth. As this acid is relatively weak, it was not thought likely to cause decalcification of the enamel of the teeth, as do nitric and hydrochloric acids. Prolonged exposure might cause decalcification. The citric acid dust would be more likely to produce a harmful effect through irritation of the soft tissues by physical rather than by chemical action. It was suggested that masks would prevent the harmful effects of the acid better than the use of alkaline mouth washes.

166 Health Hazards in the Fur Industry. H. Heimann. J. Ind. Hyg. & Tox., 24, 322-330 (December, 1942).
Based on a medical study of 694 workers in the fur industry it is concluded that: 1) Traumatic affections of the skin appear characteristically among the occupational groups of fleshers, unhairers, hand-stretchers, and nailers. 2) The cases of dermatosis appear among those workers who handle the dyed furs and are not related to cleanliness, hand-cleansers, or the complexion of the worker. 3) All cases of dermatosis gave a positive reaction to patch tests applied with the appropriate dye in the proper concentration, emphasizing again the diagnostic value of these tests. 4) When dyes of the paraphenylenediamine series are used for test materials, cases of asthma among fur workers may show negative scratch tests, while the patch tests are positive. 5) There is no evidence that pulmonary tuberculosis is more frequent among fur workers than in the general population. 6) The relative frequency of acute and chronic non-specific upper respiratory disease among fur workers, may be due to the dust present in the environmental air.-- Author's summary and conclusions.

167 Industrial Dermatitis in Our War Industries. L. Schwartz. Ind. Med., 11, 457-462 (October, 1942).
Note to Members: The Proceedings of the seventh annual meeting of Industrial Hygiene Foundation carries an article by Dr. Schwartz on this subject.
This article presents practical aspects of the prevention and treatment of the new as well as the familiar dermatoses, the chief type of occupational disease in the war industries. Cutting oils, depending on their composition, are likely to cause 1) comedones due to plugged pores; 2) folliculitis by the same mechanism plus secondary infection from skin saphrophytes; 3) other infections because of cracks and fissures caused by their drying action, or imbedded metal slivers; 4) papillomas, warts and prickle cell carcinoma because of their keratogenic and carcinogenic properties. These are rare. Their use may also result in: 5) allergic eczema if hypersensitivity to the oils, added inhibitors or disinfectants, develops. These disinfectants increase the incidence of eczema without preventing folliculitis. These forms of cutting oil dermatitis may be prevented by 1) compulsory use of adequate washing facilities. Adequate implies plenty of clean waste to wipe splinters and clean towels laundered so that all slivers are removed. Sulfonated oil cleansers should be substituted for fat solvents and strong chemicals. 2) Innocuous vegetable or animal fat protective ointments prevent defatting actions of mineral oils. Resin ointments are washed

off by perspiration, and crack at the creases. 3) Provision of clean clothes with sleeves and aprons of impervious synthetic materials help to keep the work clothes clean. Protective clothing of synthetic resins is light and impervious and is of great value also to those exposed to rust-preventive compounds, solvents, thinners, "dopes," trichlorethylene, or to the fumes of tear gas, the zinc and fluoride fumes caused by welding, the fumes of acid, chromium and cadmium that occur in electroplating. Protective clothing for workers manufacturing mustard gas and Lewisite can be impregnated with neutralizing chemicals. Thin seamless chamois gloves can be worn by tetryl workers unless their work is exceptionally fine. The concentration of irritant fumes and dusts, such as T.N.T. and tetryl can be reduced by suction vents. Protective ointments are relatively ineffective but should be used on face and on hands necessarily bared in order to do fine work. Their removal after hours removes also the overlaying irritant. Workers get a sense of protection and like them. Their characteristic and a list of the most effective formulae is presented. The ointment devised for protection against poison ivy is quite effective against tetryl dust. Irritant cleansers cause much dermatitis wrongly attributed to the occupational exposure. Use of strong alkalies, abrasives and strong solvents are strongly condemned. Superfatted neutral soaps with added detergent and a soft scrubber are safest. When strong cleansers must be used, they in turn must be removed with soap and water and an emollient applied. Neutral sulfonated caster oil with added detergent is safe and is an effective cleanser for inflamed skins. Mild cases should be treated while remaining on the job, since they may become "hardened." Cases that cannot be cured while exposure continues can often return to the job without recurrence. Workers who have recurrent attacks should be removed to other types of work.

168 Dermatitis in War Industries. C.A. Weslager. Safety Eng., 84, 36-38, 42 (November, 1942).
Although no statistics are as yet available, it is evident that industrial dermatitis is increasing with the expansion of war industries. A number of instances are reported in which dermatitis followed exposure of the skin to oils and solvents. The chief method of control - removal of the worker from contact with the irritant - is often impractical. Correspondingly more reliance must be placed upon the use of protective creams and ointments.

169 Dermatitis in Tanneries. H.M. Davies and M.E. Robertson. Leather World. 34, 264-5, 332-3 (1942).
The most common sources of dermatitis in the tannery industry are liming and chrome tanning. There has been an increase of dermatitis cases recently, probably due to the influx of new workers and to the lack of selection of resistant workers. Vitamin B complex is important in dermatitis prevention in those with dietary deficiencies. The prevention program should stress worker selection, protective clothing, cleanliness and protective creams.

170 Industrial Dermatitis. I. T. McLachlan. Soap, Perfumery & Cosmetics. 15, 309-310 (1942).
The tendency to susceptibility increases rather than decreases in industrial dermatitis with exposure to chloracetophenone, mustard gas, soda and nitro compounds. Susceptibility is increased in ill-health, hot weather or moist atmospheres. Dark people are less susceptible than light people. Proper ventilation and personal hygiene are necessary for prevention. Numerous protective applications and several formulas for curative lotions and salves are detailed.

171 Industrial Dermatitis. II. Character, Incidence and Treatment. F.H. Sedgwick. Soap, Perfumery & Cosmetics. 15, 419-421 (1942).
The principal skin hazards of factory workers are listed. Cases of rubber dermatitis from gas masks are described. Creams should act as protective barriers

capable of neutralizing the irritant. Hence the nature of the irritant substance must be considered. If an oil is to be repelled the preparation must be oil-repellent. Several remedial preparations are detailed. One per cent solution of aluminum acetate dries vesicles more rapidly and more conveniently than calamine lotion.

171 Some Notes on Metol Dermatitis. C.E. Drew. Radiography. 8, 103 (September, 1942). Though it is known that metol, used in certain photographic developers, gives a dermatitis to some people, many do not realize this. The author describes the dermatitis and points out that the metol crystals cause more damage than the solution. It is presumed that, with the possible exception of especially sensitive people, the rash is caused by a dimethyl impurity in the metol rather than by the metol itself. Once the dermatitis has occurred, the skin becomes still more sensitive and washing in dilute acid, plain water, and then soapy water is suggested as a safe-guard. A formula is given for an alternative X-ray developer which contains p-aminophenol-hydrochloride in place of metol.

172 Ragweed Dermatitis Among Workers in the Flour and Grain Industries. J.W. Jordan, P.C. Campbell and E.D. Osborne. Arch. of Dermat. & Syph., 46, 721-724 (November, 1942).
1. Case histories of 9 patients employed in the flour and grain industries who had a dermatitis due to ragweed are presented.
2. Ragweed dermatitis is a common industrial hazard among this group of workers.
3. The dermatitis observed in this group of workers is similar to that seen in farmers or others engaged in work in the open fields.
4. Patch tests made with alcoholic extract of the weed, pollen oil or a fresh leaf from the plant are highly diagnostic. -- Authors' summary.

173 Occupational Tuberculosis. A. Licurzi. Rev. assoc. med. argent. 40, 855 (November, 1941).
The problem of occupational tuberculosis involves the establishment of a causal or contributory relationship between occupation and certain forms of the disease, the concept of total disability with the obligation to submit to treatment, the provision of the means for treatment, the estimation of degree of residual disability, compensation for such disability and the rehabilitation of the individual within the limits of that disability. The clinico-anatomical picture with its diagnostic and prognostic implications is not enough to determine degree of residual disability. The use of the respiratory capacity advocated by Sturgis and co-workers may be adequate for pulmonary tuberculosis but does not cover extrapulmonary forms. Actually, the evaluation should include a consideration of the degree of psychic and socio-economic readjustment necessary, as well as measurement of specific functions. In some countries, provision is now made for rehabilitation along with sanatorium care. The omission of specific statements concerning tuberculosis in the existing law has led to arbitrary, conflicting and unjust decisions. Since compensation law is in the process of evolution, statutes should be drawn so that they may be extended to cover new situations. To say that the community and not the employer should be responsible for the care of the tuberculous, scouts fundamental social principles. To define the employer's responsibility as ending with restitution to status quo overlooks the concept of stabilization rather than cure in tuberculosis. The French Army regulation that all tuberculosis arising after more than three months of service be considered service-connected takes account only of newly-acquired tuberculosis. Actually, to set limits upon the time relation between trauma or entry into an occupation and the development of clinical tuberculosis is difficult, if not impossible, because tuberculosis is rarely diagnosed in a truly early stage. Tuberculosis contracted or aggravated because of working conditions is to be considered compensable.

...blications by the Division of Industrial Hygiene, National Institute of Health ... Other Public Health Service Publications on Industrial Hygiene Subjects. ...ary 2, 1942. Div. of Ind. Hyg., Nat'l Institute of Health, U.S. Pub. Health ...vice, Bethesda, Md.
"This is a complete list, to December 31, 1941, of publications of the Division of Industrial Hygiene, and the United States Public Health Service publications on industrial hygiene subjects." These publications can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D.C.

...General Requirements of Plant Sanitation Facilities. Indiana State Board of Health. December, 1942. 12 pp.
The contents of the bulletin are offered as suggestions and recommendations, to be tempered, if necessary, by local conditions. It is not a code or set of regulations. The bulletin is one of a series being prepared on important health problems. The scope of pamphlet can be seen by the following index: (1) Water supply; (2) Drinking water; (3) Sewage disposal; (4) Toilets; (5) Lavatories and washing facilities; (6) Showers; (7) Dressing rooms and lockers; (8) Personal protective equipment; (9) Rest rooms; (10) Eating rooms; (11) Restaurants, and (12) First aid and medical services.

176 Acute Coronary Thrombosis in Industry: II. Indirect Injuries from Toxic Gases and Other Physical Agents. H.D. Leinoff. Am. Heart J., 24, 187 (August, 1942).
The reaction of the heart of 10 industrial workers, who applied for compensation benefits, to indirect injuries caused by exposure to toxic fumes, electricity, infections and foreign proteins is discussed by Leinoff. The patients believed that certain incidents in the course of their employment had caused acute heart disease. The most common diagnosis was acute coronary occlusion, although a better diagnostic term would have been acute toxic myocarditis or coronary circulatory insufficiency. The amount of damage was usually in direct proportion to the offending force. The physical status of an organ determines the response to such trauma. Every effort should be made to check the patient's story so that a fair clinical conclusion can be made. Oxygen want, as systemic infection and foreign protein, results in an excessive demand on the heart, which, if prolonged is followed by structural and functional changes. Electrical shock produces dysfunction without organic changes. In gas poisoning, blood tests should determine the qualitative and quantitative character of the toxin. The toxic action of gases depends on the concentration and length of exposure.

177 Wartime Occupational Health Hazards. F. Prendergast. Industry, 8, 21-23 (January, 1943).
The four industries involving the principal hazards peculiar to wartime are shipbuilding, munitions manufacture, army raincoat making and similar rubber industries where solvents are used, and radium dial painting. Shipbuilding involves a large amount of welding, with the hazards of exposure to lead fumes from paint, mercury fumes from anti-fouling paint, metal fume fever in welding galvanized iron, and toxic fumes from the coating of the welding rod. The munitions industry is practically free from hazards because it has profited from the experiences of the last war and its workers are well safeguarded. The effects of TNT, tetryl, nitroglycerin and other explosives are described. The hazards of the raincoat industry include exposure of the respiratory system and skin to various solvents. In the radium dial industry, also, past experience has led to safety precautions, and now workers are examined by means of an instrument which determines whether almost infinitesimal quantities have been absorbed.

178 Occupational Medicine and Hygiene: Its Role in Britain in Wartime. E.R.A. Merewether. Am. J. Pub. Health. 33, 1-14 (January, 1943).
The author presents an extensive account of the work of the Factory Department of the Ministry of Labor and National Service of the British Government, under normal conditions and especially during the war. The head of the Department is the Chief Inspector of Factories, aided by a number of other inspectors, but their duties are not as much like that of a policeman as the word implies. "Nowadays to inspect is to look and inquire and -- to aid -- and this applies to both sides, employers and workers alike." A generally high standard of safety and industrial health has been obtained through cooperation; there are only 372 inspectors for 280,000 concerns registered under the Factories Act. The word "factory" has a broad meaning; it includes warehouses, docks, shipbuilding and engineering construction such as tunnels, bridges, etc. The war has laid many additional duties on the department. The additional problems include effects of the blackout, effects of enemy action, infestation by lice and scabies, hours of employment, overwork and overstrain, increase in women workers, and the use of radioactive substances in painting aircraft instruments, and first aid. Detailed information of accomplishments in each of these fields is given. Similar supervision of mines is under the Chief Inspector of Mines under the Ministry of Fuel and Power, and that department has made similar progress in making Britain's mines safe and healthy.

179 Industrial Toxicology as Related to the War Effort. J.C. Rice. Tri-State Med. J., 15, 2827-2830 (1942).
The following topics are considered: industrial poisoning in plants which produce explosives, toxicology of the machine tool industry and related industries, industrial poisoning with solvents, and prophylaxis.

180 Industry, the War and Tuberculosis. C. Kuh. Ind. Med., 47, 34-40 (Jan.1943).
The author discusses the need of the assistance of industry in prevention of tuberculosis, especially referring to conditions in California. He urges preemployment examination, including chest x-rays, maintenance of cafeterias supplying nutritious food, or in their absence, education in principles of nutrition of housewives and restaurant keepers.

181 Who is Responsible for Occupational Diseases? V. Wrabetz. Occup. Hazards. 5, 16-18, 34-36 (January, 1943).
The author discusses the logic of occupational disease compensation, especially making the point that while the employee's carelessness may contribute to an accident, he is not responsible for an occupational disease. Various objections to compensation laws have been met in the course of experience. A brief history of compensation in Wisconsin with cost statistics, forms a part of the article.

182 The Problem of Faulty Stereopsis in Industry. A Preliminary Study of Certain Operations in the Publishing Industry. L.D. Redway. N. Y. State J. of Med., 42, 1445-1448 (August 1, 1942).
Examination of results, obtained by any method, of those exhibiting some deficiency of stereopsis shows that these findings differ widely. On the basis of probability alone, this is to be expected. Experimental work on binocular acuity from the time of Helmholz, in 1866, has shown a wide latitude of results. As reported by Duke-Elder, "Stratton (1898-1900) obtained 24 seconds, Bourdon (1902) 5 seconds, Crawley (1905) 2.3 to 20 seconds; Howard (1920) found very variable values, 1.8 to 10.6 and up to 136.2 seconds, Anderson and Weymouth (1923) 2 seconds, Freibose and Jaensch (1923) obtained similar values, and Langlands (1927) 1.8 to 5 seconds." Davidson (1935) found, as has been said, 5 seconds to 64 seconds of arc. Some of these figures, of course, refer to average normals; others to the lowest threshold observed. A great deal of work obviously

remains to be done with respect to methods and evaluation of the handicap plus hazard in industry of this group of deficients. There does seem to be some sort of consistency, however, by any method, in detecting those who have a complete absence of the function of stereopsis. It seems to lie somewhere between 2 and 6 per cent of the population. If a census of industry should show 30,000,000 persons employed, for example, complete absence of stereopsis would be a characteristic of at least some 600,000 people. It would seem desirable, on the basis of the size of this group alone, to attempt further studies of the significance of the complete absence of stereopsis in its relation to job placement in the highspeed world of the present and in anticipation of a higher-speed world of the future. Already we classify the variations of the visual function for industrial purposes. We rate people as (a) normally sighted, (b) partially sighted, and (c) blind. Similarly, we could now classify the function of depth perception as (a) excellent, (b) average, and (c) mediocre. All screening methods can be accepted as sufficiently accurate to grade the excellent and the mediocre. As to the average, there will always be doubt, for it is to be anticipated that further work on procedure and instrumentation will continue to produce more accurate and reliable information as to the size of the group and the vocational possibilities or handicaps of these persons. In the meantime, nothing stands in the way of attempts to correlate the findings of the increasingly numerous serious workers in this field. -- Author's summary.

Methods of Detection and Determination

183 A Comparison of the Methods of Analysis for Lead in Urine. W.R.V. Marriott. Am. J. Clin. Path., 12, 488-495 (September, 1942).
The author has quite adequately evaluated nine different methods for determining lead, based on accuracy and applicability to the average clinical laboratory. The methods compared are: the diphenylcarbazide procedure of Lentonoff and Reinhold; the dithizone methods of Thompsett and Anderson; Kench; Ross and Lucas; Horwitt and Cowgill; Wilkins et al., and of Shiels; the lead chromate techniques of Fairhall; and the spectroscopic method of Cholak. According to the author the spectroscopic procedure was found to be the best for determining lead in urine (fastest and quite accurate). The dithizone methods of Lentonoff and Reinhold and of Horwitt and Cowgill are as accurate as the spectroscopic but longer, and the procedures more elaborate. The methods of Fairhall and of Shiels are considerably less accurate especially at the lower levels of lead which would be borderline cases. The author states in the discussion of the paper: "There is no simple and foolproof way to determine lead in urine. The spectroscopic method comes the closest to offering this, but a great outlay for expensive equipment is required. The other methods mentioned are capable of giving very good results, but are rather long and unless done very carefully, open to considerable error. For clinical laboratory work, the Horwitt and Cowgill, or the Lentonoff and Reinhold methods are perhaps the most satisfactory. In doing any of these tests, a blank should be done on the reagents and the values obtained subtracted from the total amount found."

184 The Application of Bacteriology to Industrial Hygiene. Illinois Lab. Bull., 3, [illegible] (August 31, 1942).
This article describes steps taken to ascertain the health hazards existing in a waste paper sorting and baling plant. The plant obtained its waste from factories and physicians' offices and it was felt that the latter source would have a

definite influence on bacterial content of the workroom air. Culture plates were exposed for definite periods of time and then incubated and counted. (In the opinion of the reviewer the use of a sampling unit such as the Wells centrifuge or the electrostatic funnel unit might be better adapted to this problem.) The greatest contamination was observed at the baler and baler chute. Dust concentrations were also measured at these points. Methods of control are suggested.

185 Measurements of Concentrations of Air-Borne Dusts. T. Bedford and C.G. Warner. J. Ind. Hyg. & Tox., 24, 315-321 (December, 1942).
The correlation of total particle counts with total mass concentrations are much lower than those reported by Bloomfield and DallaValle. This difference is almost certainly explained by the different methods of dust sampling employed. The counts given by Bloomfield and DallaValle were made by the impinger technique, and with that method few particles smaller than 0.8 or 0.7 micron are counted. On the other hand in our thermal precipitator samples roughly 50 per cent of the particles counted were below 0.8 micron in size. We have shown that when only the particles larger than 1 micron are included in the particle count a much higher correlation is obtained with the mass concentration. There is good reason to believe that the larger dust particles are of little pathological significance. If in considering the mass concentration of the dust attention is confined to the smaller particles, say those not exceeding 5 microns in size, the mass of these particles can be accurately estimated from a knowledge of the count of particles larger than 1 micron. This count of the larger particles gives a better prediction than does the total count as obtained by the thermal precipitator method. The impinger technique has been criticised on the ground that the particle count yielded by it does not take into consideration the numerous small particles which occur in industrial dust clouds, but it appears that this shortcoming is actually an advantage when dust counts are required as indices of mass concentrations. Similarly, the surface area of the dust particles is more accurately indicated by the count of particles larger than 1 micron than by the total count obtained from thermal precipitator samples. Another point of importance is the relatively low correlation between the total mass concentration and the mass of particles up to 5 microns in diameter only. If the mass concentration for the restricted range of particle size is regarded as the pathologically significant value, it does not appear worth while to determine mass concentrations gravimetrically by the existing methods. More accurate information can be obtained by the readier method of counting the particles larger than 1 micron in diameter. -- Authors' conclusions.

Control Methods

186 Ventilation in Shipbuilding. J.W. Thomson. Calif. Safety News. 26, (September, 1942).
The need for ventilation in shipbuilding is made acute by the change from riveting to welding, the use of coated electrodes, and the large amount of galvanized metal. The problem is complicated by the presence of small spaces and compartments which must be ventilated, and the absence of portholes and large deck openings. In addition to zinc fumes from galvanized metal, ventilation must also clear a variety of metal fumes from the electrode or base metal, or lead fumes which may be generated in welding or burning through lead painted surfaces. For these ventilation jobs Bethlehem Ship in San Francisco uses ventilation by dilution augmented by local exhaust, the latter to clear fumes from the vicinity of

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the welders' arc during operations in confined spaces. Welders at this yard have been provided with a special adaptation of the M.S.A. Comfo Metal-Fume Respirator which is light and small enough to be worn under the welders' helmet. This is not considered a substitute for ventilation, however. Air analyses made of selected working areas on the ships under construction demonstrated the effectiveness of the ventilation, for zinc concentrations from galvanized welding were found to be within allowable limits.

187 The Characteristics of Double Pitot Tubes. F.R. Ingram, E. Diez-Canseco and L. Silverman. Heat., Pip., & Air Cond., 14, 702-707 (November, 1942).
A study of three types of double chamber pitot tubes was made under different flow conditions. The use of double pitot tubes under conditions other than calibration may produce appreciable error. In pipes the coefficients were found to vary with the amount of turbulence present and to decrease with increasing air velocity. Outside of pipes under suction the coefficient was found to increase with increasing airflow. The magnitude of the coefficient depends considerably on the shape of the tube facing the airstream. -- Authors' summary.

188 The Performance of Side Outlets on Horizontal Ducts. D.W. Nelson and G.E. Smedberg. Heat., Pip., & Air Cond., 14, 686-693 (November, 1942).
Actual measurements are given for the air distribution pattern leaving the side outlets of a horizontal duct. Data for three sizes of outlets are reported with various types of corrective devices applied. Complete specifications are outlined for an air flow analyzer, which was used to investigate the flow pattern from the various outlets. The results indicated that the use of curved deflectors showed the best flow characteristics from the standpoint of uniformity of flow, negative area, and static pressure. -- Authors' summary.

189 Wind Tunnel Tests to Establish Stack Height for Riverside* Generating Station. H.L. von Hohenleiten and E.F. Wolf. Trans. A.S.M.E., 64, 671-683 (Oct. 1942).
In order to prevent pollution of a residential area by a new generating station, an investigation of the performance of various stack and building factors was made in a wind tunnel. The problem was resolved into 3 distinct phases (a) to establish the wind and weather conditions which would produce the most serious smoke annoyance; (b) to determine the effect of adding units to the plant; (c) to investigate all possible means for improving dissipation of the gases. When compared with an actual installation, a model of another plant was found to give good agreement. Since the maximum stack height in this investigation was limited by an adjoining airport, a compromise had to be reached. The model tests indicated that a stack height of 157 feet above ground level or 1.3 times the height of the boiler room monitor would reduce smoke nuisance to reasonable limits in a 20 mph wind. A stack velocity of 60 fps was found desirable. None of the special stack designs or shields proved satisfactory. The influence of surrounding structures greatly changes the turbulence pattern. *Baltimore, Md.

190 Dust Under Control. J.M. Kane. Nat. Safety News. 47, 18-19, 88-90 (Jan.,1943).
The increase in production in many plants has led to heavy demands on the exhaust system. The condition and efficiency of exhaust systems should be frequently rechecked. The tools required under most cases for a routine check on the performance of an exhaust system are a manometer (V-gage), and a short piece of rubber tubing. The engineer should also have an understanding of static pressure losses and hood suction. Admittedly hood suction readings do not measure air flow absolutely or accurately but they do provide a simple means of measuring relative air flow. The author discusses extensively the principles of hood suction and its relation to velocity and volume, and its method of measurement, with mathematical formulas.

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191 Hygienic Disposal of Collected Dry Dusts. C.A. Snyder. Ind. Med., 47, 59-60 (January, 1943).
An objection to dry dust collection is the possibility of recirculation of part of the collected dust while unloading the collector hoppers. A simple wet disposal unit is described, by which the dust is sufficiently wet before it is dumped, to restrict greatly the quantity of free dust.

192 The Use of a Bore Hole in Conjunction with a Radon Plant. W.J. Meredith. Brit. J. Radiol. 15, 264-265 (September, 1942).
A grappling device whereby containers holding radium tubes may be left at the bottom of a bore hole whilst the cable is used for a special carrier for flasks containing radium solutions for radon preparation, is described. These flasks when raised to the surface from the safe storage of the bore hole are connected to the purification plant through ground glass flanges. Details of the lay-out and flask carrier are given. -- Author's summary.

193 Cleaning Drums Which have Held Flammable Substances. Industrial Data Sheet No. D-Chem-10 (Revision). Nat. Safety Council. Nat. Safety News. 47, 40 (January, 1943).
The principal hazards in cleaning drums are: (1) burns from caustics; (2) burns from contact with hot containers and steam lines; (3) burns from hot cleaning solutions; (4) fire, and (5) explosion. The method of cleaning drums that have held flammable substances is given in detail, including the following steps: (1) removal of all sources of ignition; (2) removal of the bung; (3) draining on a steam rack; (4) steaming; (5) washing with caustic soda or soda-ash solution; (6) flushing with hot water; (7) hosing down the outside; (8) drying; (9) thorough inspection, and (10) testing for explosive vapors. Proper protective clothing is advocated, and the light used for inspection is specified.

194 Gas Masks Today. W.E. McCormick. Nat. Safety News. 47, 32, 74 (January, 1943).
Gas masks are briefly discussed, with reference to classification according to gases, range and accuracy of vision, transmission of speech. The warning is given that ordinary gas masks give only partial protection against smoke and that the military and civilian types do not protect against carbon monoxide or ammonia. For each toxic gas there is a limiting concentration beyond which the mask is not efficient, and the masks must not be used when the oxygen content of the air is below 16%.

195 Bactericidal Action of Ultraviolet Radiation on Air-Borne Organisms. H. C. Rentschler and R. Nagy. J. Bact. 44, 85-94 (July, 1942).
By the use of a specially devised tower experiment, the sensitivity to ultraviolet radiation of air-borne bacteria and of similar organisms on the surface of agar was shown to be the same. Experiments are described to show that bacteria may be injured by heat, Grenz rays or X-rays so that the surviving organisms are less resistant to ultra-violet radiation. This is incompatible with the "single photon hit" theory. All the bacteria in a pure strain of a culture are not identical and the term, k, in the exponential equation generally used for expressing the survival ratio for different exposures to ultraviolet radiation, is not a constant as is commonly assumed. The air centrifuge, as used in determining the bacterial contamination of air moving through a duct at low humidity is selective in taking the bacteria from the air. This appears to explain the reason for the general statements that air-borne bacteria at low humidity are more vulnerable to ultraviolet radiation than when on the surface of agar, and that at low relative humidity the bactericidal action is greater than for high humidity. -- Authors' summary.

196 An Investigation of the Merits of Ozone as an Aerial Disinfectant. W.J. Elford and Joan Van Den Ende. J. Hyg. Camb. 42, 240-265 (May, 1942).
The authors sought an answer to the question: does ozone, when present in the atmosphere in concentrations safely tolerated by man, exert bactericidal action on micro-organisms dispersed as aerosols, i.e. as minute particles suspended in the air, and on such micro-organisms when they have settled on various types of surfaces as dust, and are liable from time to time to be redispersed in the air? The safe upper limit of ozone concentration for man appears to be 0.04 p.p.m., as was concluded by Witheridge and Yaglou. From their investigations the authors conclude that ozone in tolerable concentration is able to inactivate certain bacteria when these are present as unprotected singleton aerosol particles in atmospheres of 60 to 90 per cent relative humidity. When such bacteria are covered with a protective coating of organic matter, however, as in aerosols naturally emitted during a sneeze or cough, then ozone in permissible concentration is without significant effect. Inactivation of such protected organisms can only be achieved by the use of ozone in decidedly higher concentrations, which must be deemed dangerous for long spells of breathing. Bacteria that have settled on surfaces are generally more resistant to ozone than when in newly formed aerosols. Hence experimental evidence leads to the conclusion that ozone, in concentrations that can be breathed over long periods without irritation, can not be expected to provide any effective protection against air-borne bacterial infection, through direct inactivation of the infectious carrier particles.

197 Further Researches on Bactericidal Mists and Smokes. C.C. Twort and A.H. Baker. J. Hyg. Camb. 42, 266-283 (May, 1942).
1. Hexyl resorcinol and resorcinol were the two most suitable phenols tested as germicidal aerosols. Some others which were equally lethally effective to bacteria had certain prohibitive demerits. 2. A mist of hexyl resorcinol "kills" more slowly, but will act in a weaker concentration and persists longer than does a mist of resorcinol. Therefore, where air changes are frequent and contacts are close, resorcinol should presumably be the more useful in preventing cross-infection. Under reversed conditions hexyl resorcinol should prove the more useful. 3. Good results can be obtained by the use of either a hot-plate or a suitable piece of mechanical apparatus for generating mists of both the above phenols. 4. A solution of sodium hypochlorite is a powerful germicide in aerosol form. The results obtained were disappointing when using a hand sprayer for generating the mist. The solution, as may be supposed, was useless for providing an efficient heat-volatilized aerosol. 5. Atomized emulsions of two acid-fast bacilli proved to be more resistant than N.catarrhalis etc., to the phenolic germicidal aerosols tested, Str. agalactiae and C.xerosis occupying an intermediate position. 6. Attention to the choice of solvent is of more importance when the phenolic mixture is to be mechanically atomized than when it is to be subjected to heat. Except for technical reasons, their use is more likely to damp than enhance the reaction between germicidal base and bacterium. 7. Interference with the reaction of the primary germicidal aerosol by accessory mists and smokes does not appear to be a matter of much consequence. 8. Bacteria suspended in water-saliva as compared with broth were rendered more sensitive to resorcinol but the "kill" by some other phenols was not much affected. Hexyl resorcinol was definitely adversely affected by the presence of saliva in the bacterial particle. 9. A water-saliva emulsion of Str. agalactiae had a sensitivity to the aerosols about equal to that of the flora of a normal saliva. 10. The lethal effectiveness to bacteria of germicidal aerosols appears to reach its peak at a percentage relative humidity of the atmosphere of approximately 60, no obvious improvement in "kill" being observed above this. 11. At a percentage relative humidity of 50 the activity of the aerosol may decline markedly, while at about 30 and lower it may be nil or almost nil, even when using relatively strong mist concentrations of the germicide. -- Authors' summary.

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198 Standards for Lighting War-Production Plants. Bull No. 193 of the Women's Bur., U. S. Dept. of Labor, Washington, D. C. (July, 1942).
Good lighting lessens eyestrain and therefore contributes to better workmanship, resulting in better quality, less spoilage, more output, improved morale and greater safety. British factories soon learned that painting windows and skylights black for blackout purposes had immediate ill effects on output, health, and morale. Good lighting requires absence of glare, as well as correct diffusion, direction, and distribution of the light. A table of minimum standards is presented and for a more complete table the reader is referred to U.S. Dept. of Labor, Women's Bureau, Bull. 94, 1932.

199 Eye Protection in the Defense Industries. J.A. Haller. Sight-Saving Rev. 12, 11 (March, 1942).
The article classes accident-prevention work under three "E's" -- engineering, education and enforcement -- with especial emphasis on the last two. According to the author from 90 to 98 per cent of all eye injuries could be prevented. There is a clear distinction between injury and accident, the latter being something unforseen, unexpected. Bad lighting or a combination of poor lighting and subnormal vision accounts for at least 25 per cent of all accidents.

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200 Oxygen Under Pressure in Carbon Monoxide Poisoning. E. End and C.W. Long. J. Ind. Hyg. & Tox., 24, 302-306 (December, 1942).
Carbon monoxide causes tissue damage by producing anoxia. Our current methods of treatment are unable to correct this anoxia. Inhalation of oxygen under three atmospheres of pressure is capable of preventing such anoxia by causing solution of enough oxygen in the blood to provide for the needs of the tissues. Inhalation of oxygen under this pressure for several hours is safe. In experiments reported in this paper, guinea pigs and dogs poisoned with carbon monoxide were quickly restored to consciousness by inhaling oxygen under three atmospheres of pressure. This is taken to indicate that their anoxia had been corrected. Such treatment also accelerates elimination of carbon monoxide so that thirty minutes' treatment proved ample to remove most of the carbon monoxide from the animals' bodies. Elimination curves for this and other types of treatment are given. It is proposed to introduce inhalation of oxygen under pressure in the treatment of human beings severely poisoned by carbon monoxide. -- Authors' summary.

201 Treatment of Furunculosis, Particularly of Miners' Furunculosis. A. Möhlenbruch. Münchener med. Wochenschrift. 88, 1158 (October 24, 1941.)
Möhlenbruch directs attention to the high incidence of furunculosis in coal miners. The average incidence in the Ruhr region was 1.45 per cent and in one group of miners over 2 per cent. Occupational factors which reduce the miners' resistance to cutaneous infections doubtless play a part in the pathogenesis. It is suggested that the high salt content of water in the mines, dampness and high temperatures favor the development of furunculosis. The customary treatment by incision, ichthammol ointment and plasters accelerates the healing of the individual furuncle but does not prevent the development of additional furuncles. The author resorted to a general treatment with a mixed vaccine containing antigens of staphylococci, streptococci, pneumococci, pyocyaneus and colon bacilli.

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It also contains some nonspecific lipoids and proteins. The authors used this vaccine in 28 moderately severe and severe cases of furunculosis. In the moderately severe cases three intramuscular injections at two or three day intervals were usually adequate to effect cure. In the severe cases two or three additional injections were required. The treatment was ambulatory, was always well tolerated and caused no undesirable secondary effects. The vaccine treatment is superior to local treatment. It causes a rapid disappearance of small foci and liquefies the contents and causes evacuation or resorption in the larger lesions and thus reduces loss of tissue. Prevention of relapses after the vaccine treatment indicates that immunity is favorably influenced.

202 Sulfallantoin in Industrial Medicine. K.A. Koerber, H.A. Spangler, C. O'Donnell and G.H. Moffses. Ind. Med., 11, 475-476 (October, 1942).
Sulfallantoin has definitely shown itself to be of value in industrial medicine and has proved to be suitable, safe and harmless even in as delicate structures as the eye. Though it has not shown itself of value in certain staphylococcus infections, it has demonstrated its worth in the treatment of innumerable pyogenic infections. Both sulfallantoin ointment and powder have been found nonirritating and therapeutically efficacious. As a result of the use of this compound, disability time has been cut down to a great extent. -- Authors' summary.

203 Boric-Butyn-Petrolatum Gauze Treatment of Burns. G.K. Hughes. Mich. State Med. Soc. J. 41, 653 (August, 1942).
Hughes has had gratifying results in the treatment of burns of various degrees of severity with an easily available prepared dressing consisting of 40 strips of 3 by 15 inch gauze, 60 Gm. of boric acid, 30 Gm. of 2 per cent butyn and sufficient petrolatum to impregnate the gauze in the autoclave. The general principles of cleansing and debridement are carried out and then the boric-butyn-petrolatum gauze is applied in strips of one layer thickness. A sterile dressing is superimposed. The burned area is redressed every two to three days after it is sponged with saturated boric acid. The only two disadvantages of the method are the difficulty in bandaging large areas and the necessity of redressing every two to three days, but its advantages are that the method is simple, the preparation is easily available, a clean wound, always under observation, is had, the patient is comfortable and the dressing is nonadherent. Comparison between silver nitrate-tannic acid and the boric-butyn-petrolatum gauze method showed that the side treated with the gauze had healed by the ninth day, whereas the side having the eschar required several additional days. No infection or destruction of viable epithelium was apparent in any of the cases.

204 Minor and Medium Burns: Treatment with Sulfathiazole. J.H. Biram. Ind. Med., 11, 462-463 (October, 1942).
Primary shock occurs with small burns but is readily cured with hypodermic morphine. Secondary shock is caused by plasma loss, and is treated by replacement of plasma. The author subscribes to the generally accepted method of debridement under operating room precautions, and then discusses his wide experience with local treatment. Sulfathiazole powder dusted into 40,000 small and large wounds and burns prevented oozing and infection. Intracaine ointment was also applied to burns for the first few days and quickly allayed pain. Thereafter boric acid ointment was substituted. Butesin picrate caused a rash in some cases and cod liver oil ointment was difficult to remove. Snug application of an elastic bandage prevented swelling. 1303 burns varying in size from 2 inches to second degree of dorsum of both hands and forearms to large areas on back and legs were all treated in this fashion. Only two cases lost time from work and no signs of infection were seen, even though some men were working in oil and acid solutions. Healing without scar took place in a shorter time than by any other method. Reference is made to the role of tannic acid in development of eschar.

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Treatment of Industrial Dermatoses. E.W. Netherton. Ohio State Med. J., 38, 671-674 (July, 1942).
The author states that "the detection of the causal factors and the prevention of future contacts with them" is most important. He gives some advice on patch tests, and says that not every dermatosis of a worker has to be occupational. He recommends "the proper use of a few simple remedies, in preference to preparations, which have been advertized" and discusses several dermatoses and their treatment.

206 War Time Problems in Industrial Health. C.M. Peterson. Calif. and Western Med. 56, 339-341 (June, 1942).
The author, who is Secretary, Council on Industrial Health of the American Medical Association, gives a survey on the growing necessity of intensification of industrial health effort; he mentions certain most interesting problems, stressing the value of analyzing the causes of absenteeism. He discusses the necessary organization of industrial health, the tasks of the individual physician and of the practitioner, the cooperation with the health department of the state, and the cooperation of different organizations.

207 Tuberculosis as a Compensation Problem. C.O. Sappington. Med. Clinics of North America. 1053-1065 (July, 1942).
The author points out that tuberculosis attacks persons irrespective of occupation and financial status. The specific factor is the tuberculosis bacillus, and it is erroneous to assume that all substances that may be inhaled during processes of manufacturing have a direct effect on the disease. Most adult tuberculosis is exogenous, and the reinfection type is the most clinically significant. Occupational disease problems are more complex than accidental injuries; definite causal relationship must be established between employment, disease and consequent disability. This is especially difficult in tuberculosis. Industrial hygiene surveys are necessary, particularly of dust; the amount, particle size, free silica content and period of exposure are factors to be considered. It has been conclusively shown that the incidence of tuberculosis is unfavorably affected when large amounts of free silica dust are inhaled. Air contaminants and physical conditions of the atmosphere such as gases, vapors, fumes, high and low temperatures, and humidity, do not exert an unfavorable effect on tuberculosis mortality. Pulmonary tuberculosis cannot per se be considered an occupational disease except in the case of nurses or attendants who contract the disease in a tuberculosis sanatorium. In some states, tuberculosis as a superimposed infection on silicosis is compensable. Many states have rendered judicial decisions stating that tuberculosis is not an occupational disease. The varieties of opinion have led to a maze of judicial contradictions. Some of the legal aspects are reviewed, and it is suggested that a board of medical examiners be used to determine medical issues involved in a compensation claim and not left to laymen. If tuberculosis is classed as an occupational disease, industry may refuse to employ those people with evidence of healed or inactive tuberculosis. The author summarizes the main points of the article and makes a plea for the establishment of a national or state commission for the study of tuberculosis in industry as a means of supplying adequate information for medico-legal guidance.

208 Shift Rotation Problems. B. Mintz. Ind. Bull., N.Y. State Dept. of Labor. 21, 423-426 (December, 1942).
A survey of shift rotation practice reveals that industrial practice shows no consistency in the system followed, although the greater number of plants surveyed operate under a non-rotating system. Rotation seems to be inefficient in its results on account of difficulties in adjusting sleeping hours, which affect physiological processes and domestic arrangements. Rotating shifts are

especially unsuitable for married women with families and women under 21. Where it still appears necessary to rotate shifts, intervals should be as long as possible, preferably three months, to give the worker time to accustom himself to the way of life required; and breaks between changes should be at least 48 hours to give him time to secure adequate rest before going on a new schedule.

209 Dental Ill-Health in Relation to Absenteeism. H.A. Hooper. Ind. Med., 47, 3-5 (January, 1943).
In most statistical surveys of absenteeism, no mention is made of dental conditions as responsible for loss of time. However, in the few small scale surveys in which dental conditions are included, their effect is shown to be worth considering. In some cases other diseases that are listed are the direct result of dental ailments. The author believes that a dental survey of the employees of any company will disclose a startling need for preventive measures, and that such measures will quickly result in a decrease in absenteeism and visible fatigue; also that dental x-rays should be necessary parts of all physical examinations of employees.

210 Assimilating Women Workers. Reducing Absenteeism. Production Series No. 141. American Management Assoc., 330 W. 42nd St., New York. 1942. 35 pp.
The first paper in this pamphlet is a panel discussion of "Women in the Factory." The discussion includes the problems met in employing women -- their attitude toward war work, what work they can do, and selection, hiring, discipline and time problems. The remaining papers are devoted to absenteeism. In the principal paper, "Industrial Absenteeism," by A.T. Court, the causes of the recent increase in absenteeism over the normal amount due to sickness are discussed. Excessive hours i.e., 55-60 hours per week, increases absenteeism, but there is no relation between absenteeism and working time over its ordinary range. One reason for the excess absenteeism is the high wages without the opportunity to spend them for tangible goods, but there is no general answer to the problem. The remaining short papers deal with methods of combating unnecessary absenteeism.

211 Women as Absentees. Abstracted in Ind. Med., 47, 46-48 (January, 1943) from Bull. No. 196 of the Women's Bureau, U. S. Dept. of Labor, Washington, D. C.
Women are undoubtedly absent from work on account of illness more often than men. However, the reasons for this lie to a considerable extent in industrial conditions that can be improved. In a major aircraft plant with good industrial conditions absences for women as well as for men are under 3%. In another factory it was reduced to 1%. On the other hand, in many factories the absentee rate for women is 50 to 100% higher than that for men. Fatigue is the principal contributing factor to absenteeism, as shown by experience with shortened hours and with rest periods. Household duties are next to illness as a cause of absenteeism. In England such absences are brought to a minimum by arrangement of shifts.

212 Hours of Work in Relation to Health and Efficiency. N.Y. State Dept. of Labor, Div. of Women in Industry & Minimum Wage. 90 pp. (August, 1941).
This survey was designed to sift the literature on the subject, collecting only that portion which rests on scientifically controlled observation. Evidence from biological and industrial investigations shows that excessive hours of work reduce an individual's work capacity. The reduction, in the absence of sudden organic impairment, is the result of fatigue. Excessive or unrelieved fatigue impairs both health and efficiency. Industrial investigations show a correlation between fatigue on one hand and output, accidents, and illness on the other. Fatigue effects have been shown to increase as the day and week wear on and during night work as compared to day work. The question of the exact number of hours most favorable to health and efficiency in a specified industry or

occupation cannot be answered by reference to these investigations. The statistics for several occupations, however, are given. For labellers, maximum production was obtained in a week of 38 hours, for heel builders 39 hours and for box makers 40 hours. At the Hawthorne works of the Western Electric, a reduction in weekly hours from 48 to 43.10 increased the rate of production sufficiently so that no fall in output occurred. The lowest illness rate in manufacturing industries in the United States occurred when the manhours worked were 38.5 per week. During the early days of the present war the Industrial Health Research Board of Great Britain wrote: "In war industry, output and more output is the chief demand, but the very urgency of the demand requires consideration of the means by which it may be attained." A seven page bibliography is appended to the report.

213 What the Industrial Nurse Can Do About Tuberculosis. F.E. MacInnis. Nat. Safety News. 46, 34, 38 (December, 1942).
Many applicants for military service are rejected because of tuberculosis, and many of those rejected are working or applying for work in war industries. This situation calls for vigilance on the part of medical departments. Many plants have their own x-ray equipment and examination is compulsory. The nurse can play a large part in selecting employees for examination especially by use of tuberculin tests.

214 A Health Program in Terms of Results. J.J. Wittmer. Ind. Med., 47, 9-11 (January, 1943).
The medical service plan of the Consolidated Edison Company is described and statistics of accomplishments are given. The system calling for medical treatment of 93% of the 29,000 employees, and first aid treatment of all employees, is supported in part by the company and in part by the employees through payroll deductions. The medical staff totals 147 employees, and 175 additional physicians are on a fee basis. Employees receive the following service at the plant or any of 8 medical bureaus: (1) physical examination; (2) first aid on the job; (3) treatment for illness; (4) diagnosis by specialists; (5) physiotherapy service, and (6) treatment for industrial accidents if requested. District doctors serve employees in their offices or the employees' homes, and dental service is available from dentists in the employees' district. Pharmacies are located in 5 of the medical centers. A convalescent home is maintained 65 miles from New York. The medical department establishes and supervises hygienic conditions, keeps a personal confidential record for each employee, and through statistics and reports is enabled to progress in preventing medicine and safety provisions.

215 Medical Service Plans Outlined for Larger Industrial Plants of (New York) State. A.R. Smith. Ind. Bull., N.Y. State Dept. Labor, 21, 428-431 (December, 1942).
Various subjects are included in the continued discussion of medical service plans, which began in the October issue (Abstract No.118, January, 1943 Digest). The first paragraph lists three advantages of pre-placement examinations to the worker, whose side is not often stressed. They are: (1) protection from injury from a job for which he is not fitted; (2) protection from possible contagion from fellow employees, and (3) information on his minor physical defects. In a brief discussion of the rejection rate in pre-employment examinations, the author states that industry is coming to accept the policy of rejecting an applicant only where he may be a danger to himself, to others, or to the job. A number of points in connection with examination are considered briefly: technique of examination, confidential findings, classification or basis of physical findings, follow-up examinations and periodical examinations. The next section deals with general measures for health, including discovery and follow-up of physical defects for correction, measures to reduce respiratory disease, attention to adequate nutrition, and a syphilis control program. Finally control of industrial environment is discussed, including accident prevention, proper sanitation and prevention of excess fatigue.

216 Industrial Medical Services for Small Industries. E.G. Welt. Yale J. of Biol. & Med. 14, 637-676 (July, 1942).
90% of the industrial plants in the United States have from 25-500 workers. 63% of wage earners are employed in plants, with personnel numbers of less than 500. Provision of adequate medical service for these plants is difficult. The author outlines the activities of an industrial medical program applicable to either a large or a small plant. The section of Preventive Medicine of Yale University worked out a proposition for the small plants of New Haven: Each plant appoints a physician. For 5 plants with about 1000 workers a nurse is appointed. The plant physician shall be responsible for the physical examinations and the care of the workers with compensable illnesses and accidents. The supervision of the entire program and of the industrial hygiene is the duty of the Section mentioned above. The physician shall receive not less than $2 for each examination. The cost for the remaining services shall be $1.50 per employee per year.

217 Distribution of Health Services in the Structure of State Government. Chap. VIII. Industrial Health Activities by State Agencies. J.W. Mountin & E. Flook. Pub. Health Repts., 58, 53-58 (January 8, 1943).
This is a very full report, with statistics, on the functions of the state health agencies in promoting industrial health in each state. In the tables, there are included for instance, designation of the agency that: promulgates and enforces state health laws; conducts a general educational program for the general public, and for staff members of the state agency; receives reports of all accidents; investigates accidents; receives reports of occupational disease, etc. The tables are supplemented by discussion, and an estimate of expenditures is included. In the summarized discussion, much progress in interest in industrial health is noted, but the fact is that less than 10% of the appropriations for industrial health activities is for health department programs. In most states inspection and suggestions for correction of dangerous conditions are included in the department's duties, but efforts are concentrated upon accidents more than upon illness. Administration of workingmen's compensation activities is usually carried on as a separate enterprise. Industrial accidents are covered by compensation plans in all but 5 jurisdictions, but occupational illness is compensable in only 25. A state's expenditure depends upon its wealth, geographic position and industrial development. The average cost of the state service per worker is $0.096 per worker in the 41 states supplying data.

218 Industrial Medical Problems Distribution in California. H.T. Castberg. Ind.Med., 11, 464-466 (October, 1942).
Within the short space of two years California has been transformed into a highly industrialized state and the problems of industrial medicine are not only greater in number but somewhat different in character. Absorption into industry of migrant workers unfamiliar with the hazards of industrial operations is reflected in the increased accident rate. The hazards of the fast growing aircraft and shipbuilding industries are the familiar ones multiplied many times over. Dermatitis is one of the chief problems in these as well as in the petroleum and canning industries. A survey of 700 oil field workers exposed to intense sunlight, crude oils and solvents revealed that 1% had small cancers and 20% had precancerous keratoses on exposed surfaces. Although the war expansion has increased the number of larger factories, in 1939 81% of California's industrial workers were employed in plants with less than 500 employees and most of these provided no industrial health service whatsoever. There is a critical need for medical and nursing services in these factories. The goal should be to provide these with the same facilities of safety promotion, plant hygiene, general health education, pre-employment and periodic physical examinations that exist in the larger organizations. The main load of this work will be on the local practitioner, the on-call or part-time industrial physician, and their alert minds will make strides toward this goal.

219 The Diet of Factory Workers in Wartime. J.D. Kershaw. Med. Press & Circular. 130-134 (March, 1942).
The observations are based on data from a typical north industrial working-class town; they were obtained from various branches of the public health services, from personal observations of factory workers' conditions and from employers' and workers' organizations. Unemployment has virtually disappeared and wages are high. Usually the full ration allowances are bought, but the bread winner tends to get the lion's share. The meat intake is less than half that of peacetime and is replaced by bread and potatoes; bacon is replaced by porridge. The fat intake is much as it was, that of sugar and eggs much lower, and that of milk and green vegetables about the same (green vegetables were never popular in this district). There is a material increase in carbohydrate consumption. So far, no obvious effects of these changes are to be seen, and in a survey at present in progress only two possible deficiencies, a low plasma protein content and a slight but definite indication of vitamin C deficiency, have been found. It is possible that the vitamin supplements to margarine have actually increased the intake of vitamins A and D. The maintenance of satisfactory nutrition becomes increasingly difficult, owing to the shortage of unrationed foods, domestic inefficiency and shopping difficulties. An extension of rationing, an increased supply of vegetable protein, and large-scale provision of natural or manufactured vitamin C, the compulsory introduction of a satisfactory wholemeal loaf, the education of the housewife and the extension of community feeding, are points suggested for immediate consideration.

220 Winning With Food. E. Perry. Nat. Safety News. 47, 18-19, 87-89 (Feb. 1943).
The problem of feeding the war workers is discussed, with accounts of the systems used in factories-cafeterias, food wagons, canteens and vending machines. Suggestions for balanced lunches are given. Cooperation of representatives of restaurants and plant-managed cafeterias with government nutrition agencies is described. The author presents the following eight points telling "how industries can aid the nutrition plan," which will summarize the article: (1) provide adequate food facilities in the plant; (2) provide for food needs for all shifts; (3) allow 30-minute lunch period; (4) establish staggered lunch periods when possible; (5) make certain that all menus include balanced meals providing at least one-third of the daily food needs; (6) conserve food and labor supply through lunch specials and use of proper methods of food preparation; (7) encourage better food habits among all employees, and (8) cooperate with state, county and community nutrition committees, Office of Defense Health and Welfare Service Nutrition Division and the U. S. Public Health Service.

221 Industrial Ophthalmology in the War Effort; The Need for a More Realistic Ophthalmic Service in Industry. A.C. Snell. N.Y. State J. of Med. 42, 1435-1441 (August, 1942).
The author stresses the fact that the standard Snellen 20/20 is too rigid and inflexible. "Good vision is that degree of visual functional ability, which is adequate to perform the visual task presented." Consideration should be taken of the demands of the job on vision. It is now especially important that all potentially competent workers should find suitable employment. But there is a vacuum between the service which the competent ophthalmologists offer and the ophthalmic needs of the worker: that is shown by the large number of workers with uncorrected defects, and the small number of large plants, which offer ophthalmic supervision. Cooperation of management, labor and ophthalmologists is necessary. The author believes that a good method to avoid the difficulties, which individuals with eye defects meet in securing jobs, is one adopted by the state of Massachusetts. By its statute the right of waiver of certain benefits (in compensation) is given to employees with certain partial permanent disabilities. An instrument which performs visual testing more quickly should be developed. Finally, a good organization of the ophthalmologic service is necessary.

222 Industrial Ophthalmology from the Public Health Viewpoint. L. Greenburg. N.Y. State J. of Med., 42, 1143-49 (August 1, 1942).
There is a needless loss of visual efficiency and an actual loss of visual capacity at the present time. In order to conserve eyesight an organized campaign should be instituted, with the following points suggested by the author as important objectives: (1) Preventive medical care; (2) Ophthalmic examinations; (3) More optimum seeing conditions -- more adequate illumination; (4) Control of accidental eye injuries; (5) Mass educational campaign.

223 Color Blindness and its Importance in Relation to Industry. F.H.G. Pitt. Proc. of Physical Soc., Pt. 3. 54, 219-244 (May 1, 1942).
An excellent article describing the physics of color blindness and its importance to people employed in industry. Because of confusion of electric cables, pipes and many other important plant facilities, it is essential that people concerned with their use be examined and classified before employment.

224 Healthy Workers Produce More. H.M. Hall. Aviation. (April, 1942).
The author briefly discusses fatigue and undernutrition as causes of absenteeism and inefficiency. Education of workers' wives and installation of cafeterias or lunch wagons are recommended and instances of results of those measures are given. Good surroundings, recreation facilities and general health programs are urged.

225 War Declared on General Illness. H.M. Hall. Steel. (December 29. 1941).
The paper is a popular discussion of general illness as a cause of absenteeism and of the preventive measures taken by industry, including physical examination and attention to nutrition.

226 Panel Discussion of Effects of Wartime Industrial Conditions on Mental Health. Proc. Roy Soc. Med., 35, 693-698 (August, 1942).
In this panel discussion there was general agreement concerning the importance of mental hygiene for efficiency. Fatigue, maladjustment, etc. are quickly reflected in labor turnover, absenteeism, and accident rates. Fatigue may be due in large part to boredom, anxiety, and other psychological factors as well as to organic disease, overwork, etc. Many complaints such as dyspepsia have a large psychological component, and even when the disability is obviously organic, it may be prolonged by conscious or unconscious mental attitudes. Prevention of fatigue begins with placement of workers according to the results of careful psychological as well as physical examination. In one plant the personnel, medical and welfare offices cooperate to introduce the new worker to the company and his job in it, and establish a relationship whereby the new employee realizes that these are sympathetic people to whom he can turn for counsel or information as various problems arise. These agencies follow up and maintain contact and give advice regarding personal or financial problems, day nurseries, health problems, etc. In this plant supervisors and foremen have lectures and discussions on mental hygiene, accident prevention and are schooled in the attitude of the management. Attractive posters and propaganda are used. Sport clubs and social activities help to maintain physical and mental health. Statistics of the last war largely neglected mental ill-health, but absenteeism for nervous breakdowns and debility showed a marked increase during the tension, speed-up and lengthened hours of the production drive after Dunkirk. Women were especially affected. Tonic doses of ultraviolet light and the use of half hour periods of music were recommended. On the credit side of the mental health ledger's account with wartime industrial conditions are the renewed purpose in life, relief from boredom, and from economic anxiety, and the distraction from worry about loved ones that results from gainful employment of older persons. This has largely offset the expected increase of major and minor mental disturbances among younger age groups.

227 Mental Hygiene. Meyer Brown. Nat. Safety News. 47, 23-33, 97-100 (Feb.1943).
Present conditions call for the employment of many somewhat abnormal persons. Mental illness has as many gradations as physical illness, all the way from the unnoticed minor ailment to the fatal disease. Every factory must deal with workers suffering from various degrees of mental ill health. It is the duty of the physician and nurse to detect such persons before they cause serious accidents or spoilage at work. The author describes the three main types of slight mental and nervous disorder. First come the mental diseases of which the manic depressive type is given as example; the disease appears slowly or suddenly and usually passes away similarly, without apparent reason. Second is the large group of peculiar people -- the feebleminded, the neurotic and the psychopathic. Finally, there is the normal group, which is the largest, consisting of persons who remain normal except under conditions which may be found to be very definite and remediable, such as home influences, state of health and finance, and working conditions. The author very briefly discusses the question of handling the various types of abnormal persons. In general the first two must be understood and dealt with in the best way possible; in the third, the conditions causing the trouble must be removed.

228 Hindering Hysteria. Editorial. Ind. Med., 47, 33 (January, 1943).
Fear of industrial hazards and overmagnification of their importance on the part of new workers and frayed nerves from the pressure of war conditions have in a number of instances led to outbreaks of hysteria. As adequate control based on data on the extent of exposure will mitigate the actual hazard, so will informing the employees about specific data showing conditions to be safe reduce apprehension over the new surroundings.

229 The Application of the Effective Temperature Scheme to the Comfort Zone in Netherlands India. J.A. Wiesebron, C.P. Mom, R. Courtice and C.J. Kip. Heat., Pip., & Air Cond. 14, 632 (October, 1942).
The authors have determined an effective temperature index for residents of Netherlands India, using a group of 21 men and women for subjects. It was found that at low temperatures (65-75°F) the effective temperature scale for the Netherlands did not differ from the American scale, while in temperatures of 90° to 95°F the Netherlands scale was about 2° effective temperature higher than the American.

230 Strains and Hernia. H. Bartle. Nat. Safety News. 47, 34, 38, 90 (February, 1943).
Hernias were recognized and discussed in antiquity, as far back as recorded history. There seems to be a definite connection between strains and hernias, modified by other recognized predisposing factors. The patient is prone to emphasize the coincident precipitating traumatic factors, while the physician may stress the pre-existing tendency, predicated on the anatomical structure status. Compensation claims cause no little embarrassment and discussion and the socio-economic features are perturbing. The responsibility may properly be divided 50-50 between employee and supervisor, negligence on the part of the employee and improper supervision. A person with a hernia should not work without a proper mechanical support or radical cure by surgery. Surgical treatment is to be advised unless contra-indicated. It restores or rehabilitates a decidedly handicapped person, reduced human discomfort and removes a potential hazard. -- Author's Summary.

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