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on sensitized human respiratory mechanism; and (5) search for tubercle bacilli in sputum. Interested readers are referred to the abstract in the *American Review of Tuberculosis*.—E. O.

METHODS FOR SUPPRESSING DUST IN ASBESTOS TEXTILE FACTORIES. HOME OFFICE REPORT. *H. M. Stationery Office, 1931.*

Embodied in this report are a series of agreements between employers and inspectors as to danger points and methods of dust suppression in textile asbestos factories. The report is well illustrated throughout by diagrams and also by photographs of actual plants. The danger from asbestos dust has raised new and difficult problems in ventilation for dust suppression. These problems can, however, be surmounted by the use of modern appliances; but time must elapse before the dust danger in this industry can be brought under control. The interest in this report is the demonstration it gives of the advances which have taken place in recent years in the technic of locally applied exhaust ventilation for suppressing any dust hazard. —E. L. C.

SILICOSIS IN SOUTH AFRICA. A SYMPOSIUM ON THE HISTO-PATHOLOGY, PATHOLOGICAL ANATOMY AND RADIOLOGY OF THE DISEASE. *F. W. Simson, A. S. Strachan, and L. G. Irvine. Proc. Transvaal Mine Medical Officers' Assn., Special Supplement, 1931, vol. 10, no. 118, pp. 44.*

Three papers are presented here in order to set out plainly the conclusions arrived at by South African experts relative to the pathologic types which are associated with different combinations of silicosis and tuberculosis. Simple silicosis starts in lymphoid tissue, which occurs anatomically along the air passages rather than the blood vessels; it is instigated by the arrival in this tissue of phagocytes carrying silica particles. A silicotic islet forms enlarging into a nodule on a whorled plan. Such nodules may coalesce with neighboring ones, and form a fibroid mass; they are generally distributed fairly evenly throughout both lungs.

Should tuberculous infection occur simultaneously with the dust inhalation, the fibrous formation is usually more rapid and more massive; further, it shows a tendency for the center of the nodule to become necrotic. This pathologic condition is called infective silicosis; but it may progress slowly over years, during which the patient appears in fair health and experiences no toxic symptoms. Finally such a case becomes one of overt tuberculosis. Should the tuberculous infection be present before the dust is inhaled, the tendency is for similar infective nodules to occur; but their distribution is isolated and not symmetrical, depending upon the sites of original infection. When, however, the tuberculous infection is superimposed upon simple silicosis, caseous tuberculosis may be found surrounding the fibrous nodules, which in themselves show little sign of necrosis; this condition is usually one of overt tuberculosis from the commencement of infection.

An opportunity arose for correlating pathologic findings with clinical symptoms and X-ray shadows from 400 cases in which a clinical examination and radiograph had been taken within six months of death. An explanation is given of the classification used in judging radiographs. First comes general arborization, then slight mottling which gradually becomes coarse; all these are shown by simple silicosis. The presence of active tuberculous infection is indicated by cloudy shadows, usually localized.—E. L. C.

SILICOSIS. *E. L. Collis. Bull. Hyg., April, 1931, vol. 6, pp. 305–312.*

This is a good general review of the subject, short and to the point. There are no references in the text, but an excellent bibliography is appended.—P. D.

FIBROSIS OF THE LUNGS IN SOUTH COAST COAL MINERS, NEW SOUTH WALES. *K. R. Moore and C. Badham. Health, Commonwealth of Australia, 1931, vol. 9, pp. 33–40.*

The results are reported of examining 471 coal miners with not less than ten years' experience below ground. The inquiry was made to ascertain the influence on the lungs of mine dust before stone dusting was put into practice. Fibrosis was found in 25.9 per cent.; it increased with length of exposure, attaining 40.8 per cent. for men with over thirty years' industrial history. The fibrosis among these South Coast coal miners in radiographs shows as a fine-grained type diffused generally over the lungs; occasionally it is coarser where an infective element is present. It resembles the findings of asbestosis rather than silicosis; and is in accord with other findings among coal miners (see THIS JOUR., 1931, vol. 13, p. 19). Estimations of disability among such miners with fibrosis must depend more upon clinical exami-

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PNEUMONOKONIOSIS, TUBERCULOSIS, AND SOCIAL CONDITIONS IN IRON FOUNDRY WORKERS IN VIENNA. *B. Komissarnk. Arch. f. Gewerbepath. u Gewerbehyg., 1931, vol. 2, no. 1.*

This is a report on the results of examining a group of forty workers in an iron foundry clinically and by X-rays, and also of questioning them as to their family history and conditions of living. There were altogether 153 persons employed at the foundry. None who had less than ten years' work at the foundry were examined. A description is given of the process of casting and the cleaning of castings, and the various materials used are enumerated. The most important injurious factor is sand dust, and according to Collis the sand used in molding contains almost 79 per cent. of silica (SiO_2).

The men worked for nine and three-fourths hours on five days a week and did no work on Saturdays. Of the forty examined half were from 51 to over 60 years of age; thirteen had worked from thirty-one to forty years, five from forty-one to fifty years, and two over fifty years. About 95 per cent. had been employed continuously on dusty work. In twelve cases the fathers of the men examined had also worked at the foundry and had lived from 75 to 84 years; none had died of tuberculosis. According to the statements of the workers there were only

with suitable selected rotative speeds, gave a uniform dust concentration in a particular zone with a fluctuation of 4 per cent.

4. The dust concentration in the central zone was greater than the concentrations at exterior points; such nonuniform vertical distribution was an advantageous condition in those cases where we wished to have different constant dust concentrations.—T. H.

PNEUMONOKONIOSIS IN ITS CLINICAL ASPECTS AND ITS SIGNIFICANCE AS AN INDUSTRIAL DISEASE. *W. Brednow. Abstr. from Klin. Wchnschr., July 19, 1930, vol. 9, p. 1363, in Am. Rev. Tuberc., Nov., 1931, vol. 24, p. 112.*

This is a review and discussion provoked by the recent German ordinance which offers compensation for *severe* cases of pneumonokoniosis. Interested readers are referred to the abstract in the *American Review of Tuberculosis.*—E. O.

ASBESTOS DUST AND ASBESTOSIS BODIES FROM THE LUNGS OF AN ASBESTOS WORKER. *W. E. Cooke. Jour. State Med., Sept., 1931, vol. 39, pp. 544–548.*

Asbestosis bodies are composed of a colloidal covering upon a slender filament of asbestos fiber, upon which the covering is adsorbed. The nuclei of the bodies consist of spicules of biotite. The author ascribes to the iron present in asbestos the reaction which occurs, and maintains that some soluble fraction of asbestos leads to the formation of the asbestosis bodies, and that this chemical action plays its part in the production of pulmonary fibrosis.—E. L. C.

CASE OF ASBESTOS-LIKE BODIES IN THE LUNGS OF A COAL-MINER WHO HAD NEVER WORKED IN ASBESTOS. *F. E. Tylecote and J. S. Dunn. Lancet, Sept. 19, 1931, vol. 2, pp. 632–633.*

Details are given of the pathological condition found in a fatal case of chronic fibroid tuberculosis of the lungs in a man who had worked as a coal miner. He had never been exposed to asbestos dust; nevertheless bodies were found in the lungs resembling those which originate from inhaling asbestos dust. They simulated them in size and in general shape and had rounded swellings at their ends; the color was similar; and they contained free iron abundantly. But they were coarser and less regular than asbestos bodies, and possessed a black core of opaque material. The authors suggest that these bodies resulted from minute fragments of some iron containing mineral, which were inhaled into the lungs, and underwent chemical change under the influence of the tissue fluids; hence resulted the formation of a peripheral lamination from the iron containing part. The interest of these bodies is their occurrence apart from exposure to asbestos.—E. L. C.

PULMONARY ASBESTOSIS COMPLICATED BY PULMONARY TUBERCULOSIS. *W. B. Wood and S. R. Gloyne. Lancet, Oct. 31, 1931, vol. 2, pp. 954–956.*

The point under discussion is whether asbestosis predisposes to pulmonary tuberculosis in the same way that does silicosis. Information is given concerning a total of fifty-seven cases of asbestosis, twelve of which showed evidence of tuberculosis. The information gathered is not held to be conclusive as to whether either condition prepares the way for the other; nor does it negative either assertion. But it does definitely indicate that both diseases can be present simultaneously. The article is of value in presenting concisely the symptoms and physical signs of uncomplicated asbestosis, as follows: "Irritable cough, scanty expectoration, shortness of breath, progressing to a distressing dyspnoea on the slightest exertion, pains in the chest and decline in weight, often followed by extreme emaciation. The complexion is 'earthy.' Cyanosis is usually but not invariably present. Clubbing, if present, is of slight degree. On auscultation, fine dry crackles are usually heard over the lung bases posteriorly, and in the axillary regions. Fine pleural friction is often heard. Percussion may reveal some impairment of resonance at the lung bases. Negative points are the absence of haemoptysis—except perhaps an occasional trace of colour in the sputum—and the slight degree of expectoration. Sputum examination reveals the characteristic asbestosis bodies. X-ray examination shows a diffuse fine fibrosis affecting chiefly the lung bases while sparing the lung apices and infraclavicular regions." These characteristics sharply differentiate the condition from those commonly associated with tuberculosis.—E. L. C.

DANGER TO HEALTH FROM GRINDSTONE DUST WITH SPECIAL REFERENCE TO ARTIFICIAL STONES AND SILICOSIS. *Menslage. Abstr. as follows from Zentralbl. f. Gewerbehyg., May, 1931, N. S. vol. 8, pp. 123–125, in Bull. Hyg., Oct., 1931, vol. 6, p. 745.*

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The value of this article, written by an engineer, lies in the analysis he gives of artificial grindstones. Such chemical analyses are difficult and expensive. The three he cites were made by a German-American firm.

No. 1. Binding material: ceramic. Grinding material: artificial carborundum. Analysis of the fired wheel:

	%
Al_2O_3	83.29
SiO_2	11.14
Fe_2O_3	0.83
MgO	0.48
CaO	0.62
Na_2O	0.25
K_2O	0.70
TiO_2	2.69
Total	100.00

Laboratory remarks: Free silica can be practically excluded in a normal, *i.e.*, highly fired stone.

No. 2. Binding material: ceramic. Grinding material: silicon carbide. Analysis of the fired wheel:

	%
SiC	81.50
SiO_2	12.67
Si	0.85
Al_2O_3	2.89
Fe_2O_3	0.54
MgO	0.18
CaO	0.27
Na_2O	0.29
K_2O	0.83
TiO_2	0.07
Total	100.09

Laboratory remarks: The binding material contains feldspar and quartz; some part of the total silica contained in the feldspar is free silica. The heat reactions during firing dissolve some, but not all, of the free silica so that in the finished stone the free silica amounts to about 3.55 per cent.

A third analysis (in essentials not differing widely from those detailed)

to show the different effects individual dusts have on the lung tissues. The rabbits were placed in a special inhalation chamber, into which the dust was introduced from below. The dust was thoroughly mixed with air by passing an intermittent air current through a series of three glass cylinders, the dust being put in the first. The dust concentration was generally from 60 to 80 mg. per cubic meter of air. Inhalations lasting from one-half to one hour a day were continued for three and one-half to five months; then the animals were killed and the lungs examined both macroscopically and microscopically. The results are arranged in three series: (1) the effects of dust from steel grinding, and from porcelain, coal, chalk, and soot; (2) the effects from cement, tobacco, and schist dusts; and (3) the effects from limestone, quartz, basic slag, white lead, and cotton textile dusts.

The greatest development of pulmonary tuberculosis was caused by the dust from grinding steel, and the next from porcelain and schist dusts, all of which contain much free silica. In spite of its high content of silica, quartz was found essentially harmless. Basic slag, coal, soot, and limestone were only slightly injurious. Cement, textile, and tobacco dusts were almost noninjurious, and the same may be said for white lead dust and chalk dust ($Ca(OH)_2$), the latter of which might almost be regarded as a therapeutic agent. These results agree generally with statistics of diseases, and where variations occur they can be explained by special circumstances, such as careful vocational selection, the employment of many juveniles, and home work under bad housing conditions. A high rate of pulmonary tuberculosis had been expected from the quartz dust owing to the high content of free silica and therefore its harmlessness came as a surprise. It seems, however, that Smith and Collis have previously shown that this harmlessness may be due to a considerable admixture with aluminium oxide, and Hefferman has shown the same among quartz workers in Derbyshire. The failure of white lead dust to produce pulmonary tuberculosis was due to the great solubility of this dust in the lung tissues.—A. J. C

PULMONARY ASBESTOSIS. *E. Beiker. Abstr. as follows from Arch. f. Gewerbepath. u. Gewerbehyg., 1931, vol. 2, pp. 345-358, in Bull. Hyg., Dec., 1931, vol. 6, pp. 862-863.*

The author records two cases, with postmortem examination, of pulmonary asbestosis occurring in a factory concerned with the crushing, cleansing and spinning of asbestos and the manufacture of insulation materials.

The first had been exposed to asbestos dust from 1902 to 1922, and from 1922, when symptoms first appeared, until his death in 1929 as a porter. On X-ray examination the heart shadow was increased in diameter and the lung roots showed enlargement. The lung fields showed diffuse shadowing with small nodules about the size of a millet seed. These appearances were on the whole most marked in the left lower lobe. The patient died of heart failure. Histologic examination of the lung showed increase in connective tissue and extensive inflammation of the lung, together with asbestosis bodies.

The exposure in the second case began in 1900. There was a long period of dyspnea and the patient finally died of heart failure. The X-ray appearances were chiefly confined to the lower lobes.

In discussing the formation of the asbestosis bodies, the author is in

agreement with the general opinion that they are formed from the asbestos fiber *in situ* in the body tissues, probably as the result of a biochemical action with silica contained in the raw material. He attributes the diffuse character of the X-ray shadowing to the fact that the asbestos fibers penetrate impartially throughout the lung tissue and are not aggregated together as they are in the other forms of silicosis. He believes that the asbestos loses its magnesium portion in the tissues and that pure silica remains, which stimulates the formation of connective tissue.

In conclusion, the author notes that asbestosis of the lung differs from silicosis in its radiologic picture as well as in anatomic findings, in that the connective tissue increase is very diffusely distributed. It is arranged in nodules in silicosis, whereas in asbestosis it is distributed lung. The picture app distribution lung tissue, asbestos fib tissues prol development reach the tis the accumu ing material the X-ray cosis, includ so much on ened tissues lung. Diff give the sa the radiolo lar distrib the fibrosis in asbesto down of th fibers into

OCCUPATIONAL INFECTIOUS DISEASE TREATMENT, AND PREVE

DISCUSSION ON THE PRESENT-DAY POSITION OF PNEUMONIA ON THE MINES. *A. Smith, F. Daubenton, P. A. Peall, L. I. Coleman, and H. Q. F. Thompson. Abstr. as follows from Jour. Med. Assn. So. Africa, 1931, vol. 5, pp. 389-396, in Bull. Hyg., Nov., 1931, vol. 6, p. 807.*

This is a report of a meeting held at Johannesburg in May, 1931. Dr. A. Smith, who read the first paper, said that since 1923 pneumonia had steadily increased despite the use of Lister's pneumonia vaccine. Since 1928 the prophylactic vaccination of new recruits had been given up at most of the mines, as it was considered that a new type of pneumococcus had developed, and its discontinuance did not seem to have any ill effec cases increa to the inc taken on t rence of inf ters. Whil causes had mortality creased.

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OCCUPATIONAL INFECTIOUS DISEASES: OCCURRENCE, TREATMENT, AND PREVENTION

DISCUSSION ON THE PRESENT-DAY POSITION OF PNEUMONIA ON THE MINES. *A. Smith, F. Daubenton, P. A. Peall, L. I. Coleman, and H. Q. F. Thompson. Abstr. as follows from Jour. Med. Assn. So. Africa, 1931, vol. 5, pp. 389-396, in Bull. Hyg., Nov., 1931, vol. 6, p. 807.*

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Dr. Daubenton called attention to the incidence rate of 3 per cent. for the Rand and 1 per cent. in other countries, and the case mortality of 11 per cent. on the Rand compared with over 20 per cent. in Britain and between 30 and 40 per cent. in the United States. There were a number of cases resembling lobar pneumonia which cleared up in from two to three days. These he

two could any histologic evidence of infiltration be discovered.

CHANGES IN THE LIVER IN RABBITS WITH TAR CANCER. *A. Babes. Abstr. as follows from Bull. Assn. franç. pour l'étude du cancer, 1931, vol. 20, p. 420, in Am. Jour. Cancer, Jan., 1932, vol. 16, p. 7.*

The author has already described degeneration and necrosis of the parenchyma in the liver of rabbits which die during the first ten days of tarring, and proliferation of the hepatic cells in those that live more than ten days (*Bull. Assn. franç. pour l'étude du cancer*, 1929, vol. 18, p. 328). These lesions are constant and very pronounced.

In the present paper he records the changes found in this organ among thirteen rabbits that survived tar painting long enough for seven of them to develop carcinoma. These were, in brief, very active proliferation of the parenchymal cells and a hypertrophy affecting particularly their nuclei, the two processes being generally more intense in rabbits with cancer and increasing in proportion to the development of the tumor.

The author regards this alteration as equivalent to that proliferative process in the tarred skin which precedes the appearance of cancer, and is inclined to attribute both to one common cause. Together with somewhat similar occurrences in the spleen these proliferative changes are an expression of some still unknown stimulus which tar in appropriate doses exerts upon the cells of the organism, and especially upon those of the epidermis.

The development of tar cancer in particular, and of cancer in general, may thus be considered, in part, as an outcome of some constitutional condition.

DUST HAZARDS AND THEIR EFFECTS

THE IMPINGER DUST SAMPLING APPARATUS AS USED BY THE UNITED STATES PUBLIC HEALTH SERVICE. *L. Greenburg and J. J. Bloomfield. U. S. Pub. Health Rep., March 18, 1932, vol. 47, pp. 654-675.*

The object of the present contribution has been to describe the design and construction of an apparatus for the sampling of atmospheric particulate matter. This device, known as the impinger apparatus, possesses the advantage of high dust catching efficiency when sampling air over the full range of dustiness (from relatively pure outdoor air to that found in very dusty coal mining operations) at the relatively rapid rate of 28.3 liters (1 cubic foot) per minute. The dust is caught in a liquid medium in which it may then be counted and analyzed microscopically, gravimetrically, and chemically. Three forms of the instrument are described: the electrically driven, the compressed air driven, and a hand actuated form. Photographs and drawings of the apparatus have been provided.

The results of the sampling of various dusts, as well as of chromic acid mists and lead fumes, are cited in order to show the range over which this instrument may be used.—*Author's Summary.*

SAFETY CODES FOR THE PREVENTION OF DUST EXPLOSIONS. *U. S. Dept. Labor, Bur. Labor Statistics, Bull. No. [illegible], Dec., 1931, pp. 87.*

The safety codes for the prevention of industrial dust explosions included in this bulletin are the work of a committee sponsored by the National Fire Protection Association and the United States Department of Agriculture. They have been adopted by the National Board of Fire Underwriters and chosen by the American Standards Association as "American Standards." This publication is an enlarged edition of the earlier work which was published as Bulletin No. 433 of the United States Bureau of Labor Statistics. Safety codes are given for the following industries: starch factories, flour and feed mills, terminal grain elevators, pulverizing systems for sugar and cocoa, spice grinding plants, wood flour manufacturing, pulverized fuel systems, and coal pneumatic cleaning plants.

Methods of prevention are treated under the general headings: location, building construction, electric power and lighting, control and removal of suspended dust, prevention of ignition, mechanical precautions, and housekeeping. The use of inert gas for fire and explosion prevention is treated in a separate section, and includes details concerning the amount of gas required, design of gas supply equipment, and operation.—T. H.

THE FIXATION OF MINERAL DUSTS IN THE HUMAN LUNG. *A. Policard. Bull. hist. appl. à la physiol. et à la path., Dec., 1930, vol. 7, pp. 337–353.*

Special treatment of lung tissue by hydrochloric acid and by micro-incineration discloses that adult lungs, apart from any pneumonokoniosis, contain many particles of soot and a large amount of ash. They represent particulate matter inhaled during life. The lungs of adults, but not of infants, are chemically rich in ash, particularly in silica ash. Mineral and silica particles are not peculiar to the lungs of miners; and pulmonary sclerosis due to silica is not entirely confined to certain occupations. It is a question of degree. The air of modern towns contains dust which is inhaled, and the particles which accumulate in the lungs are not always innocuous.—E. L. C.

PNEUMONOCONIOSIS: PARTIAL REVIEW OF LITERATURE. *W. L. Cooke. West Virginia Med. Jour., Jan., 1932, vol. 28, p. 19.*

ASBESTOSIS: TWO CASES. *H. L. Stewart, C. J. Bucher, and E. H. Coleman. Abstr. as follows from Arch. Path., Dec., 1931, vol. 12, p. 909, in Jour. Am. Med. Assn., March 5, 1932, vol. 98, p. 848.*

Stewart and his associates report two cases of pulmonary asbestosis. In the first case the symptoms were relatively unimportant. In the second case the disease was concomitant with tuberculosis and, with it, was the cause of death. The similarity between some of the features of tuberculosis in childhood and tuberculosis complicated by asbestosis is suggested. In asbestosis the lung is not the only organ invaded by asbestosis bodies. The authors show that the spleen and lymph nodes may harbor large asbestosis bodies. They believe that from the histories of the cases they report there appears to be a fur-

ther need for study along the lines of prevention of this disease.—C. K. D.

PULMONARY ASBESTOSIS. *E. Krüger, Rostoski, and Saupe. Abstr. from Arch. f. Gewerbepath. u. Gewerbehyg., 1931, vol. 2, pp. 558-590, in Bull. Hyg., Dec., 1931, vol. 6, pp. 861–862.*

After an exhaustive survey of the work on pulmonary asbestosis in other countries, the authors give an account of the work done in Germany together with a short record of cases of the disease which have come under their own observation in Dresden.

The first record in Germany was a demonstration by Fahr to the Medical Society of Hamburg in 1914 of specimens and photomicrographs of a case of pneumonokoniosis in an asbestos worker. Fahr mentioned the occurrence of a large number of crystals in the lung but did not describe them more closely. He stated, however, that they had been seen by Marchand and Riesel in 1906, who had speculated as to whether they were due to the inhalation of asbestos dust or were a hemoglobin derivative. In 1931 Büttner-Wobst and Trillitzsch described nine cases occurring in two asbestos factories near Dresden. Meanwhile the authors of the present paper had begun to collect cases. They have now examined fifty-two (eighteen male and thirty-four female) workers, of whom thirty showed definite lung changes. A short analysis of the history of these cases is given. The longest exposure to the dust was thirty-one years in a worker aged 60.

The commonest initial complaint was dyspnea. Cough occurred in 43 cases. Night sweats were recorded in 12 cases. Abdominal complaints were rare but loss of weight in the late stages was found in 1 instances with rheumatic pains, headach and general nervous symptoms. Among th 34 female cases abortions were recorded i 10. Conjunctivitis was found in 16. Pha ryngeal symptoms were not infrequen Enlargement of the thyroid was seen on occasions, with definite Basedow symptom in 5. There were 4 cases of kyphosis and of scoliosis.

The pulmonary signs were as follow The respiratory excursion was diminished In 16 cases there were alterations in percu sion note on auscultation at the apex while in the rest diminished breath sound with fine râles, etc., were more marked in the lower lobes. In some cases there was also evidence of pleural thickening. Sputum was present in 28, 12 showing asbestos fiber and 8 asbestosis bodies; there was no blood and no tubercle bacilli or elastic fibers could be found. Cardiac enlargement was noted in 3 instances, 1 case displayed an aortic systolic bruit and 6 a mitral bruit, but they were apparently compensated lesions. The blood pressure was never below 100 and in 5 cases was between 150 and 170 mm. The hemoglobin in 2 cases fell to between 60 and 70 per cent., and in 14 others was between 70 and 80 per cent. Clubbing of the fingers was noted only once. The urine was frequently alkaline or neutral (20 instances) traces of albumin were noted in 18 cases A strong urobilinogen reaction (red coloration with benzaldehyde in the cold) was obtained.

For X-ray films the following exposure data are given: focus film distance 1.5 m., 300 m.A., 45 KV, 0.05 to 0.08 seconds. Especial emphasis is laid on the importance of short exposure. Three stages in the development of the radiologic picture are defined: (1) an increase of the normal lung striation with the appearance of a fine network often difficult to determine except by a long series of films; (2) a thicker network with delicate sharply defined spots of opacity (*Fleckenschatten*); (3) an intensification of this network to form a shadowy veil covering the lung. The signs begin to appear and are most marked in the midzone and lower lobe areas of the radiologic picture. The contour of the heart shadow became ill defined in the second stage. The root shadows were not affected in this stage but showed enlargement in the third stage. The infraclavicular areas remained clear and there was no "snowstorm" appearance such as characterizes the typical silicosis film. In six cases signs of obsolete tuberculosis were recognized (primary complex). Tuberculous foci were generally thicker than asbestosis foci and more easily distinguished than in other forms of pneumonokoniosis. Signs of old pleurisy were frequent.

Four short statistical tables are given showing the relationship of the asbestosis to the period of exposure, type of work, etc. The general conclusion is that moderately severe asbestosis takes about five years to develop. Of the workers examined who had had ten years' or more exposure none were free from signs of the disease. In correlating their findings with the different types of work in the two asbestos factories concerned the authors point out that the numbers are too small for very definite conclusions to be drawn. The four most advanced cases were found in the spinning and twining (*Zwirnerei*) sections. A summary of fifteen cases classified into stages 1, 2, and 3 of the disease is given (see X-ray findings). Several radiograms are reproduced.—S. R. G.

THE NEED FOR DUST-PREVENTION MEASURES IN THE COAL INDUSTRY. *Proc. So. Wales Inst. Eng., 1932, vol. 47, no. 5, pp. 729–743.*

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Attention is drawn to the work recently done upon the pathologic condition of the lungs of coal miners, brought about by the inhalation of dust during their work. Undoubtedly a great development of fibrous tissue is found in the lungs. In certain cases coal dust is collected in the fibrotic tissue to such an extent as to justify the condition being called silicoanthracosis. Such lungs do not appear to succumb readily to tuberculous infection; possibly this is due to the fact that the adsorbing power of the coal dust renders inert the toxic principle of tuberculin. Where the silicotic condition is paramount, as in hard heading workers, the tendency to tuberculous infection is on all fours with that found among gold miners. Coal miners' lung is not normal; the miner suffers from breathlessness and dyspnea, with a high death rate in late life from bronchitis. The causation of such trouble is dust; and every possible precaution should be taken to minimize its presence in the air.—E. L. C.

HISTOCHEMICAL RESEARCH ON THE INITIAL LESIONS OF EXPERIMENTAL PULMONARY SILICOSIS. *A. Policard. Compt. rend. Acad. d. sc., July 20, 1931, pp. 197–199.*

Cellular masses containing silica particles, called plaques, appear in animals exposed to the inhalation of silica dust; rats were used. These plaques are accumulations in alveoli of cells—dust cells—arising from the pulmonary stroma, loaded with mineral particles. The size of the plaques is limited by that of the alveoli from which they cannot escape. They have a high mineral content, due to silica in an organic combination which

twenty years, greatly improved matters; but uncertainty exists as to whether all harmful dust is today removed. The most harmful appears undoubtedly to consist of the finest particles, of about 5 microns in size.

The Committee, notwithstanding laborious investigation of sickness records, found itself unable to determine whether any harm is today resulting from the atmosphere of the workplace. It turned its attention to localizing the factor in the dust which is at fault. Clinical and X-ray examinations failed to indicate the presence of any pathologic characteristic in the lungs of those affected; pathologic investigations gave the same reply. Hence the conclusion was drawn that the condition depended upon contraction of the involuntary muscles in the walls of the air passages brought about by sensitization to some substance present in the dust. The exact substance which sets up this allergic condition has not definitely been isolated. Histamine was found in the dust, and may be the factor in question; but the whole matter has been referred for further research. The sufferers from the asthma gave positive skin reactions to extracts made from the dust, thus establishing the contention that this occupational trouble is due to sensitization.

Without waiting for further scientific research, the Committee recommends that every step shall be taken, as far as possible, to clear all dust from the carding engines by localized exhaust drafts, and to apply general ventilation to the card rooms, preferably by means of a downward draft, in order to keep all fine particles below the breathing level.—E. L. C.

PNEUMONOKONIOSIS AMONG THE MINERS OF REDJANG LEBONG (SUMATRA). *P. J. van Gulik. Abstr. as follows from Geneesk. Tijdschr. v. Nederl.-Indië, 1931, vol. 71, pp. 718-727, in Bull. Hyg., Jan., 1932, vol. 7, p. 21.*

According to Sleeswijk pneumonokoniosis is common among workmen employed in mines where the ground is poor in calcium but contains an excessive percentage of silicates. In order to verify this theory, the author examined the ore of Redjang Lebong and found that it was very rich in silicates and contained very little calcium. He therefore expected to find many cases of pneumonokoniosis among the miners who had worked more than fifteen years underground. The results of the clinical and of the radiologic examination of the miners showed a relatively small incidence of pneumonokoniosis, and the author thinks that this may have been due to a high percentage of moisture in the air of the mines (almost 100 per cent.). —H. L.

PNEUMONOCONIOSIS. *J. W. Gullikson. Northwest Med., Feb., 1932, vol. 31, p. 84.*

PULMONARY FIBROSIS: EXPERIMENTS OF SHORT DURATION. *W. S. Lemon and G. M. Higgins. Abstr. as follows from Am. Jour. Med. Sc., Feb., 1932, vol. 183, p. 153, in Jour. Am. Med. Assn., April 23, 1932, vol. 98, p. 1501.*

Lemon and Higgins believe that the fibrosis of the lungs produced in workers exposed to dusty atmospheres, especially those in which fine particles of silica make up the larger percentage of the dust, is an end product and represents a progressive defeat of the protective mechanisms of the body. It is never found until the lung fails to rid itself of dust carried out of the bronchi by ciliary action or of dust carried through the lung by way of the lymphatic channels. With the breakdown in the carrying mechanisms, the burden of protection is the phagocytic cell, which, with its load of engulfed material, passes to all parts of the lung and ultimately becomes immobilized in those portions of parenchyma in which lymphatic tissue is abundant. The cells concerned are polymorphonuclear leukocytes, which are the first to appear, to disintegrate, and to disappear, and clasmatocytes, which appear later, are extremely active, break up less rapidly, and may become transformed into fibroblasts. In association with the tissue fibroblasts the clasmatocytes form scar tissue. Finally, fibrosis is the result of the action of substances secreted by the cell on the foreign particles. If a tissue poison results from this chemical action, fibrosis is encouraged, and is progressive, lasting as long as the unaltered irritant remains in the lung.—C. K. D.

ASBESTOSIS OF THE LUNG. *Gerbis and Ucko. Deutsch. med. Wchnschr., Feb. 19, 1932, vol. 58, p. 285.*

ACUTE SILICOSIS. *E. M. Chapman. Jour. Am. Med. Assn., April 23, 1932, vol. 98, pp. 1439-1441.*

The appearance of respiratory symp-

workers exposed to dusty atmospheres, especially those in which fine particles of silica make up the larger percentage of the dust, is an end product and represents a progressive defeat of the protective mechanisms of the body. It is never found until the lung fails to rid itself of dust carried out of the bronchi by ciliary action or of dust carried through the lung by way of the lymphatic channels. With the breakdown in the carrying mechanisms, the burden of protection is the phagocytic cell, which, with its load of engulfed material, passes to all parts of the lung and ultimately becomes immobilized in those portions of parenchyma in which lymphatic tissue is abundant. The cells concerned are polymorphonuclear leukocytes, which are the first to appear, to disintegrate, and to disappear, and clasmatocytes, which appear later, are extremely active, break up less rapidly, and may become transformed into fibroblasts. In association with the tissue fibroblasts the clasmatocytes form scar tissue. Finally, fibrosis is the result of the action of substances secreted by the cell on the foreign particles. If a tissue poison results from this chemical action, fibrosis is encouraged, and is progressive, lasting as long as the unaltered irritant remains in the lung.—C. K. D.

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The appearance of respiratory symptoms after eight, twenty-one, and twenty-nine months of exposure to an alkaline dust of high silica content marks a more rapid and severe silicosis than is usual. Russell has seen the disease fully developed in a lens grinder who inhaled a pure quartz spray for eight months. In granite cutters the earliest case without symptoms was found by roentgenograms after two years of service. The rapidly fatal cases of MacDonald occurred in two young girls who had been employed for two and three-fourths and four and one-fourth years packing a similar type of soap. The severity of respiratory embarrassment is attested by the marked decrease in the vital capacity, which was lower in the first case than that usually seen in uncomplicated cardiac failure.

TABLE 1.—SILICA CONTENT OF TISSUES

	MG. OF SILICON DIOXIDE PER GM. OF DRIED TISSUE	
	Lung	Bone Marrow
Normal	1.4	0.3
		0.7
In chronic silicosis (King)	123.55	...
In Case 1: left upper lung	12.0	1.0
In Case 1: left lower lung	13.2	...

The right ventricular hypertrophy, described in the pathologic examinations, is probably explained by the increased resistance and loss of elasticity in the pulmonary vascular bed. This finding aided in the recognition of the disease in the living patient, in whom the diagnosis could not be made by the roentgenogram alone.

No determination was made of the

years later. The author thus confirms the statement of other investigators, that a tumor of the bladder may arise years after exposure has ceased.

The removal of fumes by an improved ventilating apparatus resulted in a diminution of the number of cases.

Two of the growths were papillomas and seven were carcinomas.

CHRONIC (CUMULATIVE) CARBON MONOXIDE POISONING. *a. D. v. Dassell. Abstr. as follows from Gasmaske, Feb., 1932, vol. 4, pp. 5-9, in Chem. Abstr., May 20, 1932, vol. 26, p. 2301.*

Seven persons working in a room together were exposed for from eight to nine hours per day over a period of several months to very low concentrations of carbon monoxide. All showed the same chronic symptoms of fatigue, headache, difficulty in breathing, indigestion, pain in the heart, nervous affections, etc. All recovered after a long period in a sanatorium with strict diet regulation. An investigation indicated that if the product of the time of continuous respiration in hours per day by the concentration in terms of volume of carbon monoxide per 10,000 volumes of air is not greater than 3, no physiologic effect results. When this product is as large as 6, definite effects result.—P. D.

RELATIVE TOXICITY OF SOME FLUORINE AND ARSENICAL INSECTICIDES. *H. F. Smyth and H. F. Smyth, Jr. Abstr. as follows from Indust. and Engin. Chem., Feb., 1932, vol. 24, pp. 229-232, in Chem. Abstr., April 20, 1932, vol. 26, p. 2270.*

The relative toxicity of fluorine and arsenical insecticides was determined by feeding to white rats various accurately measured amounts of cryolite, barium fluosilicate, and lead arsenate mixed with their food for sixteen weeks. The results, including behavior, appetite, fecundity, growth, tooth development, and organ pathology agree in indicating the arsenic compounds used to be several times as toxic as the fluorine compounds. The use of fluorine insecticides leaves a much wider margin of safety than do arsenic materials between the weight of spray residue on fruit and the amount toxic to the customer.—P. D.

STUDIES ON THE EFFECTS OF INDUSTRIAL POISONS ON THE PRODUCTION OF ANTIBODIES. I. LEAD. *F. W. Bickert. Arch. f. Hyg., 1931, vol. 106, pp. 271-298.*

The author records a series of experiments—considerable in their total number, but including relatively few animals in each experimental group—from which he draws the following conclusions:

(1) The administration of lead acetate to rabbits by mouth increases the production of hemolysin. (2) The subcutaneous injection of lead sugar has a similar effect. (3) Hunger, of a degree to reduce weight to the same extent as in the lead treated animals, has no significant effect on hemolysin production. (4) Metallic lead and lead carbonate have a similar action to lead acetate. (5) Lead acetate has a similar stimulating action on the production of agglutinins. (6) Lead acetate has an inhibitory effect on the production of precipitins. (7) Lead acetate has a stimulating effect on the production of diphtheria antitoxin.

RADIUM POISONING. *J. P. Leake. Jour. Am. Med. Assn., March 26, 1932, vol. 98, pp. 1077-1079.*

This is a brief summary of the investigation of the United States Public Health Service into the question of the hazards of luminous dial painting. The results will be published in extenso in the *Public Health Reports*.—L. T. F.

HYGIENIC CONDITIONS OF WORK IN CERTAIN OPERATIONS OF SPRAY PAINTING, WITH THE USE OF CELLULOSE VARNISHES. *F. H. de Balsac and A. Feil. Mouvement Sanitaire, 1932, vol. 9, pp. 222-226, 229.*

Some description is given of the use of the spray to apply cellulose varnishes in France. These varnishes contain from 75 to 85 per cent. fluids, and from 15 to 25 per cent. solids. The solids contain nitrocellulose resins and gums, together with pigments, among which lead salts may figure; but the amount of lead seldom reaches 2 per

DUST HAZARDS AND T.

PULMONARY ASBESTOSIS. *J. V. Sparks. Radiology, Dec., 1931, vol. 17, pp. 1249-1257.*

THE ASBESTOSIS BODY. *S. R. Gloyne. Lancet, June 25, 1932, vol. 1, pp. 1351-1356.*

In this article the author brings together all the information he can collect with regard to the first recognition of what are now known as asbestosis bodies, and concerning their origin, both theoretically and experimentally considered. He has himself contributed much to the whole subject. A series of drawings presents various forms of asbestosis bodies; while information is given as to how these bodies react to acids and alkalies, as well as to ferments. The conclusion

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DUST HAZARDS AND THEIR EFFECTS

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SILICO-ANTHRACOSIS PRESENTING CURIOUS BODIES SIMILAR TO THOSE IN ASBESTOSIS. *W. E. Cooke. Brit. Med. Jour., April 9, 1932, vol. 1, pp. 656-657.*

The primary factor in the production

of coal miners' lung is silicosis, coal dust being retained in large amounts when the lymph drainage has been impaired by the action of silica; thus anthracosis is a special variety of silicosis, depending upon the accumulation of coal dust in a silica damaged lung. Most of the cases have been described among men getting anthracite coal, but the author cites a case in a miner who had worked on soft coal. Chemical analysis of the lung showed a silica figure of 40.2 per cent. in the ash, of which 15.6 was insoluble silica. An interesting point is that certain bodies similar in every way to the curious bodies seen in cases of asbestosis were found in the lungs. Apparently such bodies are not peculiar to asbestosis, and any spicule of insoluble material may have colloid deposited around it and become molded into a curious body. The appearance of such bodies is illustrated.—E. L. C.

SILICOSIS. *Lancet, June 4, 1932, vol. 1, p. 1206.*

A useful summary is here given of the experimental investigations which have been carried out into the development of pulmonary fibrosis following dust inhalation. Tests have shown that there are two groups of dusts, one active and the other inert. The inactive dusts include carbon, coal, aluminium oxide, oxide of iron, marble, and carborundum; the active dusts in all cases contain silica in some form, as either quartz, shale, kaolin, or asbestos. Particular attention is drawn to the procedures followed by Professor Kettle, who studies the effects of dust by either subcutaneous experimental lesions or by intratracheal injection into the lungs.—E. L. C.

SILICOSIS AND THE INDUSTRIALIST. *H. Ballantyne. Jour. State Med., June, 1932, vol. 40, pp. 342–349.*

The causation of silicosis as envisaged by an industrial managing director is set out. No threshold beyond which dustiness in the air becomes a hazard has been fixed medically, although some undefined degree of dustiness is acceptedly quite harmless. Today large industrial concerns must be prepared to install means for trapping or withdrawing from the working atmosphere as much dust as is practicable. It is safest to err on the side of excess when safeguarding the health of workers.—E. L. C.

CLIMATE

ATMOSPHERIC POLLUTION IN BORDEAUX. *P. Lamarque. Gaz. hebd. d. sc. méd. de Bordeaux, 1932, vol. 53, pp. 210–219.*

An investigation extending over a period of eighteen months was carried out by the author into atmospheric pollution of the town of Bordeaux. Various reasons contribute to this pollution, such as the manufacture of sulphuric acid and hyperphosphates, the combustion of organic waste, domestic fires, the exhaust fumes from the combustion of heavy oils and from motor cars; while nitrous fumes and fluosilicic acid emanate from certain industries. The author considers that all forms of pollution can be prevented, frequently with an advantage from the capture of valuable material now allowed to waste. The way in which such steps should be taken is outlined; and the suggestion is put forward that inspectors should be appointed to insure that the regulations laid down are strictly observed. The only form of pollution admitted is that coming from wood fires, which are still used by bakers and confectioners. A definite standard for the amount of permitted dust in suspension is proposed. It adopts Ringelmann's scale, which is much used in America.—E. L. C.

OBSERVATIONS IN BASEL WITH THE DAVOS FRIGORIMETER. *M. Bider. Strahlentherapie, 1931, vol. 39, pp. 541–564.*

In the first part of the paper the meteorologic factors influencing the cooling rate of the frigorimeter are analyzed.

The relation between rate of cooling, temperature, and air velocity is given as

$$\frac{A}{\theta} = 0.31 + 0.112v$$

where A is the rate of heat loss; θ is the

INDUSTRIAL ENVIRON

THE NEW KATA-THERMOMETER. *T. C. Angus. Engin., March 4, 1932, vol. 133, p. 281.*

A new kata-thermometer has been constructed, in which the cooling range is from 130°F. to 125°F. instead of from 100° to 95°. Otherwise the instrument is as before; but it cools more quickly than the original kata under given conditions. The cooling power so measured should not be used directly in connection with our scale of comfort; it is rather a link in the determination of air velocities for which the new instrument was designed. A

suggestion is put forward that inspectors should be appointed to insure that the regulations laid down are strictly observed. The only form of pollution admitted is that coming from wood fires, which are still used by bakers and confectioners. A definite standard for the amount of permitted dust in suspension is proposed. It adopts Ringelmann's scale, which is much used in America.—E. L. C.

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where A is the rate of heat loss; θ is the temperature difference between frigorimeter (36.5°C.)and the surrounding air; and v is the air velocity in meters per second. Dorno found that A varied as $v^{1.5}$, while Hill's kata-thermometer equation shows that the cooling power as measured by that instrument varies as the square of the velocity.

The air velocity formula was calculated from the records for rainless nights. From the difference between the observed cooling rate and that calculated from the equation one finds the influence of rain and radiation. The percentage of the cooling rate due to rain is highest in the summer months. The influence of radiation is naturally much greater in summer than in winter.

In the second part of the paper the data are discussed from a climatologic standpoint.—T. B.

AIR POLLUTION—AND A POSITIVE CURE FOR THE SMOKE NUISANCE. *H. W. Evans. Aerologist, April, 1932, vol. 8, pp. 15–18.*

INDUSTRIAL ENVIRONMENTAL CONDITIONS

THE NEW KATA-THERMOMETER. *T. C. Angus. Engin., March 4, 1932, vol. 133, p. 281.*

A new kata-thermometer has been constructed, in which the cooling range is from 130°F. to 125°F. instead of from 100° to 95°. Otherwise the instrument is as before; but it cools more quickly than the original kata under given conditions. The cooling power so measured should not be used directly in connection with our scale of comfort; it is rather a link in the determination of air velocities for which the new instrument was designed. A nomograph is reproduced for use in industrial ventilating problems.—E. L. C.

AN AIR THERMOSTAT FOR QUANTITATIVE LABORATORY WORK. *W. H. J. Vernon. Tr. Faraday Soc., June, 1931, vol. 27, pp. 241–247.*

Details are given of an air thermostat designed with the object of maintaining accurate control of temperature over comparatively long periods. Readings on a Beckmann thermometer placed in different positions over the whole working space of the thermostat

to another; others with far greater ease. Extreme "perseverators" and extreme nonperseverators are apt to be unstable, unreliable, and uncontrolled, whereas the moderate nonperseverators generally show the opposite characters. In any individual there seems to be little or no general motor capacity so far as the simpler movements are concerned. One who excels in one simple motor test may not excel at another. Practice at one simple movement causes little or no subsequent improvement in other simple movements. There is little if any transfer of practice in such cases. But it is highly probable that there would be a transfer of training if the learner were so instructed that he grasped general principles and adopted favorable attitudes applicable to the acquirement of skill in other movements. One general factor in the capacity of the individual has been found in routine assembling and another in intelligent assembling, distinct from one another and from general intelligence. We have to recognize (1) a general intelligence concerned with abstract thought and symbols—*e.g.*, words and figures; (2) a general intelligence concerned with working on concrete objects; and perhaps, (3) a general intelligence concerned with the handling of living persons. But abilities of these kinds are not the sole psychologic determinants of the performance of work. Interest, temperament, character, and indeed the whole personality of the individual have also to be taken into account.

In the choice of an occupation, the person's interests often play an important part. There is, however, evidence to show that in about 50 per cent. of young people they are at variance with the suitability of the person for the work for which he professes an interest. The unsuitability appears to be as often due to defects of ability as to defects in temperament and character. Interests must be genuinely in the work and not in any unessential feature; too often they are based on inadequate knowledge or are otherwise unworthy of weighty consideration.

Accidents have been shown to be dependent on character, temperament, and mood as well as on abilities, experience, and fatigue. If the worker chooses to work more slowly when tired he may thus exercise the care necessary to avoid accidents. But if he strives to maintain his normal output, his liability to accidents is likely to increase. Liability to accident is not distributed uniformly among any homogeneous group of workers. Some are especially prone to accidents. In certain groups of workers the accident rate of one quarter of their number was about two and a half times as great as that of the remaining three quarters.—E. D. M.

EFFECTIVENESS OF LABOUR INCENTIVES. *G. H. Miles. Human Factor, Feb., 1932, vol. 6, pp. 53–58.*

Pure financial incentives, though of great importance, have certain limitations. The desire for gain may cause a bonus system to operate well at first, but after a few months its incentive value begins to fall, and it may operate only when the employee wants to make extra money—*e. g.*, just before a holiday. Again, a profit sharing scheme generally acts as a strong incentive at first, but later on, especially if there are no profits available, it may even cause resentment. Group bonuses are apt to induce the quick worker to slow down to the rate of the average, rather than to encourage co-operation.

Nonfinancial incentives which emphasize the co-operative and community spirit should be adopted when possible. Pride in work and a lasting interest in it should be encouraged by endeavoring to make a suitable choice of occupation for each worker. Outside recognition and appreciation of good work should be generously given, and there should be a well-organized system of promotion by merit. Some firms enhance the value of promotion schemes by systematic instruction and training in the actual work.—H. M. V.

A SECOND FOLLOW-UP OF VOCATIONALLY ADVISED CASES (1927–8). *A. Macrae. Human Factor, Feb., 1932, vol. 6, pp. 42–52.*

INDUSTRIAL HEALTH LEGISLAT WORKMEN'S COMPENSATIO

LABOR LEGISLATION OF 1931. *Abstr. as follows from Am. Labor Legis. Rev., Dec., 1931, vol. 21, pp. 410–472, in Personnel Jour., April, 1932, vol. 10, pp. 434–436.*

This article summarizes labor laws enacted by the seventy-first Congress, third session, and laws enacted by forty-four states, two territories, and two insular possessions which held regular and special sessions. The following classification is used: individual and collective bargaining, minimum wage, hours, employment, safety and health, social insurance and administration; and the abstracts are arranged by state under each subject.

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Of the cases followed up, 44 were studying at universities, and 134 had been engaged in their chosen occupations for periods ranging from a few months to three and a half years. The results obtained with the students did not show a higher percentage of successes among those who followed the advice offered than among those who rejected it, but various reasons are advanced for this result. The 134 boys and girls engaged in various occupations such as clerical work, industrial administration, salesmanship, etc., gave a very encouraging result, for of the 90 individuals who adopted the advice offered, 76 were considered to be a success, 6 were doubtful, and 8 were unsuccessful. In contrast to these figures, the 44 individuals who took up an occupation considered unsuitable showed 17 successes and 17 failures, while 10 were doubtful.—H. M. V.

INDUSTRIAL HEALTH LEGISLATION: COURT DECISIONS: WORKMEN'S COMPENSATION AND INSURANCE

Labor Legislation of 1931. *Abstr. as follows from Am. Labor Legis. Rev., Dec., 1931, vol. 21, pp. 410–472, in Personnel Jour., April, 1932, vol. 10, pp. 434–435.*

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The Asbestos Industry Regulations, 1931, Dated December 31, 1931, Made by the Secretary of State under Section 79 of the Factory and Workshop Act, 1901. *Reprinted from Statutory Rules and Orders, 1931, No. 1140. H. M. Stationery Office, 1932, pp. 6.*

In pursuance of Section 79 of the Factory and Workshop Act, 1901, I hereby make the following Regulations and direct that they shall apply to all

factories and workshops or parts thereof in which the following processes or any of them are carried on:

i. Breaking, crushing, disintegrating, opening, and grinding of *asbestos*, and the mixing or sieving of *asbestos*, and all processes involving manipulation of *asbestos* incidental thereto;

ii. All processes in the manufacture of *asbestos textiles*, including preparatory and finishing processes;

iii. The making of insulation slabs of sections, composed wholly or partly of *asbestos*, and processes incidental thereto;

iv. The making or repairing of insulating mattresses, composed wholly or partly of *asbestos*, and processes incidental thereto;

v. Sawing, grinding, turning, abrading, and polishing, in the dry state, of articles composed wholly or partly of *asbestos* in the manufacture of such articles;

vi. The cleaning of any chambers, fixtures, and appliances for the collection of *asbestos* dust produced in any of the foregoing processes.

Provided that nothing in these Regulations shall apply to any factory or workshop or part thereof in which the process of mixing of *asbestos* or repair of insulating mattresses or any process specified in group v or any cleaning of machinery or other plant used in connection with any such process, is carried on, so long as (*a*) such process or work is carried on occasionally only and no person is employed therein for more than eight hours in any week; and (*b*) no other process specified in the foregoing paragraphs is carried on.

Provided further, that if the Chief Inspector of Factories is satisfied in respect of any factory or workshop or part thereof that by reason of the restricted use of *asbestos* or the methods of working or otherwise, all or any of these Regulations can be suspended or relaxed without danger to the health of the persons employed therein, he may by certificate in writing authorize such suspension or relaxation under such conditions as he may think fit. Any such certificate may be revoked at any time.

These Regulations may be cited as "The Asbestos Industry Regulations, 1931," and shall come into force on March 1, 1932, except that Regulations 2*a* and 5 shall not come into force until six months after the said date, and Regulation 1*a* (ii), so far as it applies to looms, Regulation 3*a* and *b* (i), and Regulation 4*b* shall not come into force until twelve months after the said date.

Definitions[1]

Asbestos means any fibrous silicate mineral, and any admixture containing any such mineral, whether crude, crushed, or opened.

Asbestos textiles means yarn or cloth composed of *asbestos* or *asbestos* mixed with any other material.

Preparing means crushing, disintegrating, and any other process in or incidental to the opening of *asbestos*.

Approved means approved for the time being in writing by the Chief Inspector of Factories.

Breathing apparatus means (1) a helmet or facepiece with necessary connections by means of which a person using it breathes air free from dust, or (2) any other *approved* apparatus.

[1] Terms to which defined meanings are given are printed throughout in italics.

Duties

It shall be the duty of the occupier to observe Part I of these Regulations.

It shall be the duty of every person employed to observe Part II of these Regulations.

PART I

Duties of Occupiers

1. An exhaust draft effected by mechanical means which prevents the escape of *asbestos* dust into the air of any room in which persons work, shall be provided and maintained for:

a. Manufacturing and conveying machinery, namely:

i. *Preparing*, grinding, or dry mixing machines.

ii. Carding, card waste-end, ring spinning machines, and looms.

iii. Machines or other plant fed with *asbestos*.

iv. Machines used for the sawing, grinding, turning, abrading, or polishing, in the dry state, of articles composed wholly or partly of *asbestos*.

b. Cleaning and grinding of the cylinders or other part of a carding machine.

c. Chambers, hoppers, or other structures into which loose *asbestos* is delivered or passes.

d. Workbenches for *asbestos* waste sorting or for other manipulation of *asbestos* by hand.

e. Workplaces at which the filling or emptying of sacks, skips or other portable containers, weighing, or other process incidental thereto which is effected by hand, is carried on.

f. Sack cleaning machines.

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e. Workplaces at which the filling or emptying of sacks, skips or other portable containers, weighing, or other process incidental thereto which is effected by hand, is carried on.

f. Sack cleaning machines.

Provided that this Regulation shall not apply (i) to a machine or other plant which does not give rise to *asbestos* dust, or is so enclosed as to prevent escape of *asbestos* dust into the air of any room in which persons work; or (ii) where the *asbestos* is so wet or so treated with grease or other material as to prevent the evolution of dust; or (iii) to the making or repairing of insulating mattresses; or (iv) to the mixing or blending by hand of *asbestos*.

2*a*. Mixing or blending by hand of *asbestos* shall not be carried on except with an exhaust draft effected by mechanical means so designed and maintained as to insure as far as practicable the suppression of dust during the processes.

b. In premises which are constructed or reconstructed after the date of these Regulations the mixing or blending by hand of *asbestos* shall not be done except in a special room or place in which no other work is ordinarily carried on.

3*a*. The making or repairing of insulating mattresses composed wholly or partly of *asbestos* shall not be carried on in any room in which any other work is done.

b. In every room in which the making or repairing of insulating mattresses is carried on:

i. Adequate exhaust and inlet ventilation in accordance with arrangements to be *approved* in each case shall be provided and maintained.

ii. No person other than those engaged in filling, beating, or leveling shall be present while such processes are being carried on and work shall not be resumed in the room after filling, beating, or leveling, for at least ten minutes.

iii. The floors and benches shall be kept damped so as effectually to prevent dust arising therefrom.

iv. The covers shall be effectually damped immediately after being cut out and, in the case of fiber filled mattresses, shall be kept damp while filling, beating, or leveling is being carried on.

4*a*. Storage chambers or bins for loose *asbestos* shall, in the case of premises constructed or reconstructed after the date of these Regulations, be effectually separated from any workroom and, in the case of other premises, be effectually separated from any workroom in which the *asbestos* is not required for the purposes of any process carried on in the room.

b. Chambers or apparatus for dust settling and filtering shall not be allowed in any workroom.

c. Arrangements shall be made to prevent *asbestos* dust discharged from exhaust apparatus being drawn into the air of any workroom.

5. All machinery used in *preparing*, grinding of *asbestos*, carding, card roller cleaning and grinding, and sack cleaning, and all card waste-end machines, lattices, elevators, chutes, and conveyors shall be so constructed and maintained that dust or débris containing *asbestos* cannot escape from any part thereof other than dust removed by an exhaust draft provided in accordance with Regulation 1.

6*a*. Cleaning by hand, of the cylinders (including the doffer cylinders) of a carding machine, shall not be done while any person other than those performing or assisting at the cleaning is present.

b. On and after Sept. 1, 1932, such cleaning as aforesaid shall not be done by means of hand strickles or other hand tools.

7*a*. In every room in which any of the requirements of these Regulations apply:

i. The floors, workbenches, and plant shall be kept in a cleanly state and free from *asbestos* débris and suitable arrangements shall be made for the storage of *asbestos* not immediately required for use.

ii. The floors shall be kept free from any materials, plant, or other articles not immediately required for the work carried on in the room, which would obstruct the proper cleaning of the floor.

b. Every room as aforesaid shall be adequately lighted.

8*a*. A sack which has contained *asbestos* shall not be cleaned by hand beating but by a machine, complying with Regulations 1 and 5.

b. All sacks used as containers for the transport of *asbestos* within the factory shall be constructed of impermeable material and shall be kept in good repair.

9*a*. All ventilating plants used for the purpose of extracting or suppressing dust as required by these Regulations shall at least once in every six months be thoroughly examined and tested by a competent person and any defect disclosed by such examination and test shall be rectified forthwith.

b. A Register containing particulars of such examination and test and the state of the plant and the repairs or alterations (if any) found to be necessary shall be kept, and shall be available for inspection by any of His Majesty's Inspectors of Factories.

10. A *breathing apparatus* shall be provided for every person employed:

a. In chambers containing loose *asbestos*.

b. In cleaning dust settling or filtering chambers or apparatus.

c. In cleaning the cylinders, including the doffer cylinders, or other part of a carding machine by means of hand strickles.

d. In filling, beating, or leveling in the manufacture or repair of insulating mattresses.

11. There shall be provided and maintained for the use of all persons employed in the cleaning of dust settling and filtering chambers, tunnels, and ducts, suitable overalls and head coverings.

12. A young person shall not be employed in or in connection with the manufacture of insulating mattresses, in mixing or blending of *asbestos* by hand, in sack cleaning, in chambers or apparatus for dust settling or filtering, in chambers containing loose *asbestos*, or in stripping or grinding the cylinders including the doffer cylinders or other part of a carding machine.

Provided that nothing in this Regulation shall affect any young person so employed at the commencement of these Regulations.

PART II

Duties of Persons Employed

13. No person employed shall wilfully or negligently disregard any directions given him for the purpose of securing the observance of these Regulations or otherwise for the prevention of unnecessary dust.

14. Every person employed shall make full and proper use of the appliances provided for any of the purposes of these Regulations.

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14. Every person employed shall make full and proper use of the appliances provided for any of the purposes of these Regulations.

15. No person shall misuse or wrongfully interfere in any way with any appliance provided in pursuance of these Regulations.

16. Every person employed at work specified in Regulation 10 shall wear and make proper use of the *breathing apparatus* provided in pursuance of that Regulation.

17. Every person employed at the work specified in Regulation 11 shall wear the overall and head covering provided in pursuance of that Regulation.

NOTIFICATION OF INDUSTRIAL DISEASES. STATUTORY REQUIREMENTS. *Reprinted from Correspondence, Brit. Med. Jour., Jan. 16, 1932, vol. 1, p. 118.*

SIR:

Many medical men in Great Britain are, I am afraid, unaware of their statutory obligation to notify certain industrial diseases. I may quote two recent examples in regard to toxic jaundice, one a series of cases due to tetrachlorethane, and the other a series due to arseniuretted hydrogen. Only one of the cases was notified by a medical practitioner. In the series due to arseniuretted hydrogen notification of the earliest case would have led to the adoption of measures which might, it is anticipated, have prevented the occurrence of subsequent cases, including two deaths. This serious result alone seems to be ample justification for asking you to allow me to draw the attention of the profession to the very important statutory requirement of notification of industrial poisoning under the Factory and Workshop Acts, 1901 to 1920, and Lead Paint (Protection against Poisoning) Act, 1926.

Every medical practitioner attending on, or called in to visit, a patient whom he believes to be suffering from any of the following:

Lead poisoning
Phosphorus poisoning
Arsenic poisoning
Mercurial poisoning
Carbon bisulphide poisoning
Aniline poisoning
Chronic benzene poisoning
Anthrax
Toxic jaundice
Epitheliomatous ulceration, or
Chrome ulceration

contracted in any factory or workshop, is required by Section 73 of the Factory and Workshop Act, 1901, under penalty, to notify the case forthwith to the Chief Inspector of Factories, Home Office, London, S. W. 1; and by Section 3 of the Lead Paint (Protection against Poisoning) Act, 1926, he is also required to notify lead poisoning contracted by any person employed in, or in connection with, the painting of any building, whether or not that building is a factory or workshop, unless it has already been so notified; and he is entitled to a fee of 2s. 6d. for so doing. Forms for notification will be supplied on application to the Chief Inspector of Factories, Home Office, S. W. 1.

JOHN C. BRIDGE.

H. M. Senior Medical Inspector of Factories

January 11.

INDUSTRIAL ECZEMA AND COMPENSATION. *R. L. Mayer. Abstr. as follows from Zentralbl. f. Gewerbehyg., Oct., 1931, N. S. vol. 8, pp. 253–257, in Bull. Hyg., Feb., 1932, vol. 7, p. 84.*

The author (working in Jadassohn's laboratory, Breslau), in dealing with the difficulty often experienced in deciding whether or not a given case is industrial, takes the view that whatever the external exciting cause, the subsequent eczema is the manifestation of an idiosyncrasy or hypersensitiveness to it. He regards it as similar to hay fever, asthma, urticaria, and reaction to serum. A correct decision is difficult only in chronic recurring cases, which he still looks upon in probably all cases as due to an external exciting cause which is not looked for carefully enough. He cites as the three typical categories: (1) an eczema, as the simplest case, developing once at work, healing quickly, and not recurring even though a return to work is made; (2) cases in their initial stages similar to (1) but recurring at shorter or longer intervals on resuming work. These are cases of specific sensitization to the external agent which can be proved to be so by the Jadassohn skin test. The variations in exacerbation are due to variations in hypersensibility if contact with the external agent has been unchanged. (3) This category includes cases (the most difficult to decide) where even after removal from the original exciting cause, the eczematous condition continues. Here gradually a non-specific, polyvalent sensitiveness of the skin has been set up to any and every excitant. He concludes that in none of these cases can one ever ride off on the theory of an idiopathic eczema.—T. M. L.

REPORT OF THE DEPARTMENTAL COMMITTEE AS TO CERTAIN PROPOSED EXTENSIONS OF THE SCHEDULE OF INDUSTRIAL DISEASES INCLUDED FOR WORKMEN'S COMPENSATION. *H. M. Stationery Office, 1932.*

Three subjects are reported upon. In the first the Committee recommends that compensation be paid while a workman is undergoing treatment for a localized new growth of the skin, papillomatous or keratotic, due to mineral oil, caused by self-acting mules in the process of cotton spinning. Such new growth would not of itself incapacitate; but it needs treatment, usually by operative means. The period of incapacity due to such treatment is seldom likely to exceed a fortnight. This recommendation extends the conditions under which a claim can be made for mule spinners' cancer; but it should be specifically limited to workmen employed as minders or piecers in connection with the process of cotton spinning by means of self-acting mules.

The second subject considered deals with turpentine poisoning, concerning which the evidence did not establish the existence of chronic turpentine poisoning as a condition that can be recognized. Such symptoms as nausea and colic due to the inhalation of turpentine fumes cause incapacity for so short a period as not to justify the inclusion of such indispositions within the schedule of diseases.

The third subject was that of dope poisoning, which as a heading has become unnecessary, owing to the fact that poisoning by tetrachlorethane is separately included in the schedule of diseases. No other particular solvent has been established as causing poisoning, even though further experience may reveal a definite group of symptoms resulting from exposure for long periods to a particular constituent; but the widespread use of cellulose

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RECOMMENDATIONS TO GOVERN CONDITIONS WHEN INSTALLING AND ORGANIZING INDUSTRIES WHEREIN RADIOACTIVE BODIES ARE MANIPULATED. *C. Regaud and R. Perroux. Méd. du travail, March, 1932, vol. 4, pp. 38–44.*

A code of regulations is sketched out to guard workers from danger arising from exposure to radioactive bodies during the manipulation of the raw products or more concentrated extracts. Danger may occur either to the exposed parts of the body or to the blood forming organs, or through inhalation or ingestion of radioactive dusts. Lead screens should be used to intercept the rays, and active ventilation to carry away the dust. The way in which these two lines of protection should be used is indicated for various processes. Medical supervision of the personnel is also recommended, with occasional microscopic examination of the blood.—E. L. C.

PROCEEDINGS OF THE SEVENTEENTH ANNUAL MEETING OF THE INTERNATIONAL ASSOCIATION OF INDUSTRIAL ACCIDENT BOARDS AND COMMISSIONS, HELD AT WILMINGTON, DEL., SEPTEMBER 22–26, 1930. *U. S. Bur. Labor Statistics, Bull. No. 536, April, 1931, pp. 353. Abstr. as follows in Bull. Hyg., Jan., 1932, vol. 7, pp. 19–20.*

These proceedings deal mainly with the compensation aspects of accidents and accident prevention; but a section is devoted to more particularly medical subjects, such as the industrial capacity