
During the war labour has been directed to factories by order of the Ministry of Labour. There has also been 'dilution' of skilled workers and introduction of part-time labour. There is no legal limit to the hours of work for men, but the Ministry controls hours for women and young persons. Varying forms of shift work for women were devised, but women have proved capable of much work hitherto done by men. During the last war there was a significant increase in anthrax, with a mortality rate of over 13 per cent., infected wool causing 66 per cent. of all cases. In this war there has been no such increase; the mortality rate has been 11.6 per cent., wool being responsible for 35 per cent. of cases. Phosphorus poisoning is practically non-existent, compared with being reported in 1941. The number of cases of lead poisoning has decreased; in 1941 only 59 cases were reported, the lowest ever recorded. Methods of defence against absorption of toxic materials can be seen at the Home Office Industrial Museum, Horseferry Road, London, S.W.1. There has been a great advance in propaganda—by poster and pamphlet—as a means of health education. The Factories (Canteen) Order, 1940, has played a part in maintaining physical health. Nearly 11,000 'pensions' under the Factories Act now have canteens. Distribution of synthetic vitamins in factories is unscientific and is discouraged. Welfare matters outside the factory have been studied. Provisions are made for 'transferred' workers; billets are found; sick bay accommodation is provided. 'Shopping time' is encouraged. Day nurseries have been set up. Recreation clubs and entertainment by E.N.S.A. and the B.B.C. have proved of much value.

The author stresses the need for research. The chemist plays an important part in this. Statistical evidence in regard to the relationship of mortality to occupation is provided by the staff of the Registrar-General. Specialised long-term research is in the care of the Medical Research Council and the Department of Scientific and Industrial Training. Welfare matters outside the factory have been studied.

Night Sanatoria in the U.S.S.R. A. GULAYAEV (1944). Compiled from material supplied by VOKS, Moscow, by courtesy of the Anglo-Soviet Medical Committee.

During the arduous autumn days of 1942 it was suggested that night sanatoria should be established to improve the health of factory workers, to enhance their efficiency, and thereby to raise production. This plan was supported by the People's Commissariat of Health and many such sanatoria have now been established. A typical example is provided by an aircraft factory attached to which there is a sanatorium to accommodate 70 persons. It is financed by the Aviation Workers' Union from its Social Insurance funds. The food comes mainly from the local city Department of Health, which also supervises the medical arrangements. The factory administration provides the buildings and equipment, and contributes some food from its own farm. The worker pays nothing for his maintenance, but hands over his ration cards.

As in other such sanatoria, this establishment provides for workers suffering from any form of physical debility who may need extra diet and rest under medical supervision. The results are seen in a striking improvement in health and output. A chart kept by the medical director, Dr. Yakov Belenky, shows that among a group of workers using the sanatorium for three months there was an average gain in weight of 1–2 kilograms, and a rise of from 5 to 15 per cent. in haemoglobin. Records of three of these workers show that their output had more than doubled, despite the fact that their working day, during their stay in the sanatorium, had been shortened by three hours.

Workers attending the sanatorium cease work at 5 p.m. and go at once to the institution, where they have a shower bath and put on regulation clothing; after this they may have dinner, followed by a 'quiet hour' during which they may sleep. The doctor's examination is then made, after which, from 9 to 10 p.m., they may take walks, play games, or attend entertainments by visiting artists. Supper follows, and the guests retire to bed at 10 p.m. They rise at 6.30 next morning for physical exercises and breakfast. By 8 a.m. they are at work in the factory, returning to the sanatorium at noon for lunch. The diet includes meat or fish three times a day, with butter, vegetables, etc., and extra vitamins, cod liver oil, and haemoglobin. Any special treatment which may be required is provided at a local polyclinic at which it is usual to arrange for x-ray examination as soon as the worker is accepted for sanatorium treatment.


The flicker fusion frequency (F.F.F.) is defined as the frequency, in flickers per second, at which an interrupted light appears as a steady light. The rate at which fusion occurs varies from individual to individual; e.g. in a group of 56 subjects it ranged from 36.5 to 56.0. The fusion level does not change with practice, and it was not affected adversely by one to four hours of hard treadmill work. When the subjects were doing physical work near to the limit of capacity at a temperature of 120°F, the F.F.F. decreased slightly from day to day, and it also decreased very slightly when the subjects did 21 days of very hard work with inadequate food intake. It decreased more noticeably from day to day on a regime of hard work and total food starvation; e.g. from 56.2 to 53.0 in one group of four subjects, and from 55.5 to 54.2 in another group. As the changes observed in the tests were frequently not statistically significant, it is concluded that the F.F.F. cannot be considered a sensitive indicator of 'general fatigue.'

H. M. V.

Silicosis in Miners. From Donetz Institute of Labour Hygiene and Occupational Diseases, U.S.S.R. (1941).

Incidence.—Pneumokoniosis affects 3.3 per cent. of workers in soft coal, and 1.1 per cent. of those in anthracite mines. Examination for tuberculosis showed this disease in 1-6 per cent. of underground workers in soft coal, in 3.5 per cent. of surface workers, and in 2.5 per cent. of workers' wives.

Preventive Measures.—Wet boring, dust extraction, periodic medical examination, extra milk, special clothing, 1 month annual holiday.

Radiological Changes.—Reticulation, going on to...
nodule, then to conglomerate (tumescence) formations, with emphysema. Right lung often more affected than left. Differential diagnosis between silicosis and tuberculosis:

<table>
<thead>
<tr>
<th>Silicosis</th>
<th>Tuberculosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nodules</td>
<td>Vary much in size.</td>
</tr>
<tr>
<td>Area affected</td>
<td>Middle and lower lobes.</td>
</tr>
<tr>
<td>Nodules</td>
<td>Clearly defined.</td>
</tr>
</tbody>
</table>

Effects of Temperature.—Changes in lungs occurred more rapidly at higher temperatures.

Mineral Admixtures.—These are not responsible for the formation of anthracotic nodules—which appear more constantly with pure (ash-free) coal dust than with dust containing much foreign mineral.

Pathogenicity of Silicotic Nodule.—Based on experimental data.) Nodule begins as a cell-accumulation in lung alveolus. Multinuclear cells appear, and fibroblasts are present early (shown by silver staining), appearing before collagen fibres. Formation of these nodules is not connected with tuberculosis—the name of 'pseudotuberculosis' (Mordato) is misleading.

Dampening of Coal Dust.—Dust evolved by use of pneumatic drills can be eliminated by damping or extraction. Dust can only with difficulty be damped with water, owing to presence of gases adsorbed on surface of dust particles. Addition of powders such as sulphur, graphite, or talc (non-water-retaining) assists, especially if solutions of lower surface tension than that of water are used—e.g. soap or electrolytes. Dampening solutions were tested for surface tension (which should be 75-75 erg./sq. m.) by Traube's stellogameter, and for acidity (pH) which was determined electrolytically and varied from 11 (sodium chloride solution) to 4 (iron sulphate solution). Naphthol soap and acido are cheap by-products of petrol extraction, and lower surface tension of water. They are prepared by lixiviation with sodium hydroxide to pH 11. When used in a 0-16 per cent. solution naphthol soap gave good results. Hard water is not liable to form an insoluble precipitate. Water can be softened by addition of sodium hexametaphosphate, or 0-1-0-2 per cent. calcined soda. The softer should be mixed 1-1 hour before introduction of soap. Use of a naphtha soap solution at the Nikitove Mercury Mines showed reduction of dust particles from previous 3816-7355 per c.c. down to 320-671 per c.c.

Dust in Steel Foundries. First Report of a Committee appointed to consider methods of preventing the production or the inhalation of Dust and the possibility of reducing the use of materials containing Silica in Steel Foundries (1944). H.M.S.O., Lond. pp. 23. 6d.

The report points out that since the settling of steel castings was recognized in 'The Various Industries (Silicosis) Scheme' in 1931, it has been realized that workers in steel foundries were exposed to the risk of silicosis. The number of certified cases of the disease rose from six in 1937 to 26 in 1942. The committee was therefore appointed with the above terms of reference. They report that the main processes common to all foundries include (i) the preparation of the moulding materials, (ii) the making and pouring of steel, (iii) the cleaning and dressing of the castings. While dust is encountered generally in foundries, the following processes are particularly dusty and require special consideration—(a) caving, (b) blowing, (c) stripping, (d) tumbling, (e) blasting, which includes compressed air blowing and wheel abrading, (f) the use of pneumatic chisels, (g) the use of hand tools, and (h) grinding. Medical opinion is that the worker is silicotic and that this disease is caused by the inhalation of very small particles of silica in the free state. The methods of combating the risk are by substituting other materials for silica, by reducing the amount of dust, and by preventing its inhalation.

The chief constituent of moulds and cores is sand (free silica), but since 1,500,000 tons are used a year it is not possible to recommend any practicable substitute. Specially fine free silica is sometimes used in moulding compositions, parting powders and silica paint, and so the committee recommend that in these substances it should be replaced by suitable non-silicous substances such as coloured aluminous fire clay (chamotte). The abrasive in general use in steel foundries is steel shot; but as sand is occasionally added this practice should cease. The assistance of the Steel Castings Research Committee has been sought in considering the possibility of substituting materials containing no free silica in the linings of converters and ladles.

In order to reduce dust the committee recommend that effective measures be taken to prevent the escape of dust from blasting apparatus and that efficient ventilating plant should be provided. The plant should be kept in good repair and in continuous use. Waste dust can be prevented from inhaling dust by the use of suitable protective helmets which should be supplied with warm, pure, filtered air at a rate of not less than 6 cubic feet per minute. Helmets, gauntlets, and other protective devices should be kept clean by vacuum cleaners and there should be suitable storage accommodation provided close to every blasting enclosure. Suitable respirators should be provided for and worn by fitters and dressers of steel castings. The committee also advise that no person under 18 years of age should be employed on or within 20 feet of any blasting apparatus. The report concludes with three appendices, on (a) steel foundry moulding materials, (b) air supply to protective helmets, and (c) dust concentrations in shot blasting chambers in steel foundries. The Grinding of Metals (Miscellaneous Industries) Regulations, 1925, dated September 2, 1925, made by the Secretary of State under Section 79 of the Factory and Workshop Act, 1901 (1 Edw. 7, c. 22), for the Grinding or Glazing of Metals, are to the incidental use of powders and other materials in the Grinding of Metals, or the Cleaning of Castings, is also quoted in full.

K. M. A. P.


The course of the disease in 54 cases of silico-tuberculosis, 9 cases of pneumokoniosis without tuberculosis, and 200 cases of tuberculosis without pneumokoniosis, was studied and compared. Although silicosis and tuberculosis existed together in the same lung, each maintained its individual integrity. Tuberculosis does not alter the form of silicosis; pneumokoniosis only alters the tuberculosis in so far as the silicotic nodules prevent the full development of the tuberculoid granulation tissue. The size, situation, and number of cavities are approximately the same, but there is a slightly greater incidence of perforation of cavities through the interlobar fissures in the silicotics and a greater incidence of death from fatal pulmonary haemorrhage. This is due to the greater productive reaction in the silicotic lung with more opportunity for the development of aneurysm of the main branch of the pulmonary artery. Collapse therapy was found to be of little value in cases of silico-tuberculosis. This is due to the fact that the silicotic lung remains productive long after pneumokoniosis and other cases succumbed to progressive pulmonary insufficiency resulting from the invasion of the remaining resilient lung tissue by the tuberculous process. K. M. A. P.

One hundred and twenty-five employees engaged for 6–23 years in making aluminium powder by a stamping process were examined. They had x-rays taken each year but aluminium powder did not cause lung damage, nor favour the development of tuberculosis or any other pulmonary condition. Therefore 34 silicotics were treated by the daily inhalation of fine aluminium powder freshly ground from small aluminium pellets in a specially constructed mill. Treatment began with 3 minutes inhalation, gradually increasing to 15 minutes. Some men had received 300 treatments, the majority about 200. Out of the 34 cases studied, 19 showed clinical improvement, apparent chiefly in the lessening or disappearance of shortness of breath, cough, pain in the chest and fatigue. Fifteen cases remained stationary: they were no worse and their condition has not progressed in spite of continuous employment in silica dust during the investigation. Progress of the disease was assessed by means of respiratory function tests repeated at three-monthly intervals. Aluminium dust cannot be regarded as a cure for silicosis since it cannot restore to normal lung tissue which has undergone fibrotic change, but the authors believe that the inhalation of finely particulate aluminium powder offers every prospect of preventing the development of human silicosis.

K. M. A. P.


This is a record of 11 cases of respiratory disease occurring in men exposed to bagasse dust. A full account is given of the case history of two and a summary of the remaining nine. The length of exposure before symptoms arose varied from 3 weeks to 2 years. Dyspnoea was invariably the presenting symptom. Cough was always present and haemoptysis occurred in four instances. Cyanosis occurred and there was usually some loss of weight. Intermittent fever with temperature ranging from 99·8° to 101·2° F. and persisting for three or four weeks was usual. Impaired resonance and diminished breath sounds with rales chiefly heard at the base were the usual physical signs. X-ray of the chest showed a miliary mottling throughout both lungs, most dense in the hilar areas. Sputum in one case contained a Monilia and in another an unidentified fungus; these were regarded as contaminants. Few of the patients had had previous lung disease. Sputum in hospital varied from 9 to 93 days. Skin tests with extracts of bagasse were carried out on 12 patients who had had the disease and 5 controls who had not been exposed to bagasse. They all gave a positive reaction. Lung puncture biopsies during the sixth week of the disease showed pulmonary tissue with several 'spicules' of an irregular foreign material embedded in it. There was a fibroblastic reaction of the interstitial tissue of the lung. There were many large cells with a foamy cytoplasm in the alveolar spaces.

K. M. A. P.


This is a case report of a negro man aged 32 whose work consisted of moving bales of damp sugar-cane grindings from the sugar house to the fields. One month before admission to hospital with severe dyspnoea he was taking the bagasse from the fields to the railway freight cars. This bagasse was dry and was blown about in a fine dust by the wind. Radiograms showed infiltration with a slight miliary appearance throughout both lungs. Sputum was taken and Bacillus tuberculosis was cultured on three occasions and no fungus were found. Follow-up examination four months later while the patient was working as a wood cutter showed that the x-ray appearances in the lung had cleared, and the patient was completely recovered.

K. M. A. P.


It is generally recognized that both acute and chronic lung changes may occur when electric-arc welders are exposed to highly concentrated fumes. There is some doubt about the proper evaluation of the observed changes. In a previous report it was stated that in chest x-rays there might be changes consisting of discrete nodular shadows uniformly distributed throughout both lungs. A report re-examination of five welders after an interval of some years showed, on the whole, no increase of the pseudo-nodulation. Reports are coming in from all parts of the country describing these nodular shadows, but an examination of 500 welders' films showed the shadows in less than 5 per cent. However, an examination of 84 welders working on auto and jeep frames showed definite small nodular shadows in the lungs of 14 subjects. It is pointed out that these lung changes are almost invariably mislabelled 'silicosis' or 'a typical silicosis.' They should be labelled 'siderosis,' or better still, 'siderosis of welding.' When the atmospheric contains silica dust as well as iron, silicotic nodulation and iron pigmentation may develop, and the term 'siderosilicosis' may be used. In post-mortem examinations the pigmentation due to iron may be identified as iron dust, or iron cyanide, giving the Prussian blue reaction. It is concluded that electric welding does not predispose to tuberculosis or other lung infections, and that the siderosis changes have no functional significance. Acute irritation of the throat may occur with the prolonged confined work in dense clouds of fumes, but this appears to be a transitory reaction leaving no residual impairment. Any respiratory disease may be prevented by proper precautions such as adequate exhaust ventilation.

H. M. V.


Electric-arc welding produces a considerable amount of smoke composed of oxygen, nitrogen oxides, silicon, and iron oxides and small particles of fine iron oxide less than 0·5 µ in diameter. Welding rods are usually composed of approximately the same alloy as that in which is being welded and accordingly the smoke varies in composition. Acute and chronic respiratory disease result from this form of welding. Acute diseases which follow exposure to a dense concentration of the smoke include pulmonary oedema and pneumonia, sometimes complicated by bronchopneumonia. The lungs show a dense pulmonary fibrosis with bronchial spasm, emphysema and fibrosis may result from repeated exposure over a long period of time. Night work seems to cause more symptoms than day work. Acute exacerbations of chronic haemoptysis in persons with arrested pulmonary tuberculosis. Masks and exhaust ventilation give protection to the workers. When symptoms have developed the only effective way to treat them is by change of occupation.

K. M. A. P.


Inhalation of beryllium fluoride is followed typically by an illness beginning with fever which subsides in a few days, followed by a similar period with no symptoms, after which a second phase supervenes, characterised by cough, scanty sputum, dyspnoea, temperature of 102°–103° F., and cyanosis of face and extremities. Rales are heard over the lungs, especially the lower lobes. The blood shows a fall of haemoglobin, leucocytosis, lymphopenia, and a raised sedimentation rate. The illness usually clears up in 10 days to 2 months.

Forty-six cases were studied by clinical and radiological examination, of which 10 were severe; observations were continued on these for three years. Three stages are described by x-ray appearances: (1) Translucent diminished, root shadows enlarged with defined out-
line. Many small ill-defined discrete opacities appear, especially in middle and lower areas, leaving spaces and costo-phrenic angles relatively clear: diaphragm movements are impaired. After 5-6 days this picture changes to next phase. (2) Diminution of all opacities, which tend to become arranged in groups along main bronchi, seldom coalescing as in bronchopneumonia. Lung translucency increases considerably owing to emphysema, diaphragm movements still impaired. This stage lasts 5 days to 7 weeks and is marked by clinical improvement, mucopurulent sputum, temperature normal or subnormal. (3) Gradual disappearance of focal opacities and resolution of other lung changes. In some cases root shadows remain unduly dense, with some peribronchial fibrosis.

Radiographic changes are not sufficient for diagnosis; they need to be distinguished from miliary tuberculosis and from bronchiolitis following influenza or measles. In these latter cases, foci are distributed more widely, including spicules; they are smaller and tend to coalesce, and in tuberculosis do not disappear in a few days or weeks. Beryllium fluoride affects mainly the smaller bronchi, which have no cartilage in their walls. These show desquamation, that walls become infiltrated with leucocytes, and later they become blocked with inflammatory exudate, leading to minute atelectases, with compensatory emphysema. Resolution of the acute catarrhal stage may be followed by fibrosis.

D. C. N.


Beryllium was discovered in 1797. In the last decade it has become important in making an alloy with copper, use of which is found in the liver and bones. Two methods, one colorimetric and one electro-therapeutic, have been devised for the detection of beryllium in patients. Beryllium, and the acid radicle, such as fluoride or hydroxide, have been found to occur in the tissues and it appears that whatever toxicity has been found to occur with the beryllium salts is due to the toxicity of the acid radicle, such as fluoride or hydroxide. Hydrolysis of certain of its salts such as the chloride and sulphate has been shown to depend upon the size of the colloidal particle, since many times the lethal dose may be administered without the development of pathological lesions or clinical symptoms when the particle size does not exceed a predetermined value, but if this size is exceeded, toxicity and death occur.

Chronic manganese poisoning results from inhalation of manganese fumes. It has been shown that workers in contact with manganese are particularly liable to develop pneumonia for which the name 'manganese pneumonia' has been coined, but the most important symptoms are those resulting from damage to the central nervous system. Manganese injection into the central nervous system is toxic to those of thirteen cases treated with the drug there was great tissue destruction in the posterior portion of the lens. After 6-8 days the lesions which were present in the anterior portion of the lenses began to resolve, but an abnormal pattern of the fibres persisted. Lesion of the posterior part of the lenses gradually changed from a diffuse destructive type to a cyst-like lesion after 8-10 days on the drug and this persisted throughout the experiments. Development of cataract was not affected by adding riboflavin to the diet. 0.25 per cent. mixture of 2:6 dinitrophenol produced no change; but with 0.5 per cent. concentration in the diet two of thirteen chicks developed a very fine grey opacity in the anterior part of the lens which was present only on the second and third day of feeding. 2:4 dinitro, 6 aminophenol when added to the diet in concentration of 1 per cent. produced lesions very similar to those in chicks receiving a diet containing 0.25 per cent. dinitrophenol.

K. M. A. P.

Acrylonitrile contains vinyl chloride and liberates hydrogen cyanide. It causes nausea, vomiting, headache, fatigue and diarrhoea. All complained of nasal irritation; and in several cases a mild jaundice occurred which lasted several days. There was a slight anaemia. Every casualty was treated by prophylactic measures. This includes a closed type of operation and adequate ventilation, both local and general. K. M. A. P.


Carbon disulphide poisoning is rare but its use in industry, particularly in the manufacture of artificial silk, is rapidly increasing. Acute symptoms, including delirium and mental disturbances, occur if the concentration of carbon disulphide in the atmosphere reaches 0-15 to 0-2 mg. per litre of air. Some workers complain of a fear of insanity, others are aggressive and destructive, others sleep walk, and others become irresponsibly talkative. These symptoms are accompanied by marked loss of weight and impotence. Optic neuritis with amaurosis, paresis of the nerves of the leg, particularly peroneal, intestinal colic and pylorospasm also sometimes occur. Prognosis is good, improvement usually occurs rapidly, and after three or four weeks the patient is fit to return to work. The author considers that the symptoms are the result of an acute phosphide in the nervous system caused by the fat solvent action of carbon disulphide. K. M. A. P.


Two cases of acute intoxication occurred during the process of waterproofing the seams of raincoats for the Army. There was no exhaust ventilation of any kind. The compounds were applied by brushing, each coat receiving three brushings at intervals of two hours. In the first two acetone was the solvent, in the third butanone. Air tests disclosed concentrations of butanone from 398 to 561 p.p.m., and for acetone from 300 to 495 p.p.m. Case 1, a girl aged 16, complained of gastric distress, watering of the eyes, and sleepiness which passed into coma. Her breath smelt of acetone, but there were no abnormal physical signs except for twitching of the face and hyperactive reflexes. She recovered within 24 hours. Case 2, a girl aged 19, had a fainting attack which was followed by a convolution, after which she regained consciousness. Evidence is also presented that dermatitis will arise from exposure to butanone alone in concentrations ranging from 370 to 620 p.p.m., and is also a serious fire hazard from this combination of solvent. Concentrations of these solvent vapours sufficiently low to prevent the health of workers will automatically provide safe concentrations from fire explosion. K. M. A. P.


This is a case report of a woman aged 22 who worked in a factory where costume jewellery was manufactured. White beads were dipped into carbon tetrachloride to clean them. She had vomited for ten days before admission. She was acutely ill and had a skin rash of dark red and purplish-red macules and large haemorrhagic patches. Her blood pressure was 105/60. There was no oedema. The fundi were normal. The urine was alkaline and showed a cloud of albumin. Her blood urea was 170 mg. per cent. She was treated with intravenous glucose in saline and within 14 days the blood urea was reduced to 24 mg. per cent. Vomiting was the striking symptom and probably caused the azotaemia. K. M. A. P.


An account is given of 7 cases of poisoning with pentachlorinated naphthalenes, two of which ended in death.
The process consisted of coating naval wire cable with the toxic substance to render it heat-resistant and water-repellent. Symptoms consisted of a papular rash on the face and hands with bronze pigmentation, drowsiness, indigestion and finally toxic jaundice. Liver sections from the fatal cases showed no normal liver parenchyma; some areas showed complete absence of liver cells over partial destruction of these cells. Those remaining had proliferated to firm nodules a few months after. The onset was usually within a few months of starting work, and cleared up rapidly if the patient was removed from contact with the chemical as soon as the gastro-intestinal symptoms developed.

K. M. A. P.


If large doses of T.N.T. are given subcutaneously to rats, they soon pass a bright red pigment in the urine and become limp. A proportion of the animals die within 48 hours. At autopsy they are anaemic and dehydrated, but the liver shows no evidence of fatty infiltration or necrosis. By contrast in chronic poisoning with T.N.T. there is loss of weight, increased appetite, excretion of high concentrations of red T.N.T. derivatives in the urine. Loss of hair, changes in the blood and associated tissues (decrease in haemoglobin, the appearance of normoblasts, reticulocytosis and polychromatych erythrocytes in the peripheral blood, an erythroblastic hyperplasia of the bone marrow and siderosis of the spleen) and hepatic lesions which range from fatty infiltration to an acute necrosis of the parenchymal cells. Since 25 per cent. of workers exposed to T.N.T. have symptoms referable to this cause, any factors which influence the susceptibility to T.N.T. poisoning are of importance. White Wister rats were therefore fed on different diets and 0.15 g. of T.N.T. per kilo of rat each day. It was found that typical necrosis of the liver and a profound anaemia developed in rats taking a high fat diet, whilst in animals taking a high carbohydrate or a high protein diet the ill effects are slight or absent. The fat diet influences the animal's metabolism so as to impede its ability to dispose of the T.N.T. within its tissues. The resemblance between the effects of T.N.T. poisoning in the rat and in man is close.

K. M. A. P.


An account of five cases from the literature and one of my own experience is given, in which grease from a grease gun has been accidentally injected into the finger. The grease spreads diffusely throughout the tissue of the finger or hand and may even go into the wrist. The injection does not penetrate the skin; the grease is ejected at such velocity that it can penetrate the finger at a distance of 8 inches. In the acute phase pressure, chemical irritation of the grease, or secondary infection may damage the tissue beyond repair. In the chronic phase the grease may be pushed out or encapsulated in chronic inflammatory tissue, and may even give rise to tumour formation like other oils such as paraffin. Treatment is conservative; surgery should be limited to the removal of sloughing tissue and incision of fluctuant areas when abscesses develop. Early amputation is to be avoided. When subcutaneous oleoma develop they should be removed. Efforts should be made to inform mechanics of the dangers inherent in the careless handling of the grease guns.

K. M. A. P.


An account is given of 11 cases of occlusive arterial disease confined to the hands or fingers. All patients were otherwise healthy men engaged in occupations in which their hands were subject to considerable blunt trauma and pressure. Two used pneumatic drills. The average age at the onset of symptoms was 46 years. The syndrome had developed in the hand which was most used in the man's work. Arteriograms of two of the cases are reproduced and show obstruction to the digital arteries in one instance and to the ulnar artery in the second, a pneumatic tool worker. In four cases, two of whom were pneumatic tool workers, the condition of the test was positive. This consists of asking the patient to make a tight fist to compress blood from the skin of the fingers. The physician then occludes the patient's ulnar and radial arteries by digital pressure. None of the patients showed evidence of acroosclerosis, cervical rib, the scalenus syndrome, or occlusive arterial disease elsewhere. The evidence indicates that arterial occlusion in the hands of these patients is the result of chronic occupational arterial trauma.

K. M. A. P.


This paper is a very detailed study of the physico-chemical relations between acetone and the fluids of the living body. Experimental data were obtained from observations on human subjects and on rats, and by means of which it is possible to show the rate of elimination of the acetone in the air, to calculate the amounts and concentrations in which the acetone exerts its action in the body. Without such knowledge for volatile substances, their toxicity, in terms of concentration in the air, is essentially empirical. Many of the data reported in literature purporting to be measures of toxicity are, in effect, not such measures, but are empirical results which are compiled of many physico-chemical factors. Primary features in the physico-chemical relations are: (1) the fate of the substance in the body, whether metabolized or not, and if metabolized, its rate of change; (2) distribution between the blood and air inhaled and the blood in the lungs; (3) distribution of the substance between blood and tissues; (4) elimination of the substance through the kidneys.

The experimental data described are so numerous that it is not possible to summarize them in a brief abstract, but their application to industrial standards may be quoted. The conclusion is drawn that the upper limit of safety for men performing moderate exertion over a period of 8 hours daily is 5.0 mg. of acetone per litre of air, or 2110 parts per million. Under such exposure the concentration of acetone in the blood might reach 330 mg. per litre for a single day's exposure, and increase on daily exposures to 400 mg. With concentrations above the figure mentioned the blood would never be free from acetone during the entire working week, though it would cause no intoxication. Rats maintained for 9 days continuously at a concentration of 1000 mg. per litre of blood showed slight drowsiness but no signs of intoxication.

H. M. V.