ABSTRACTS

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TOXICOLOGY


It is pointed out that the effects of mercury on the young, as observed by Feer in those susceptible to calomel, do not resemble those noted in adults. In children there may be obvious allergy to the metal which lessens or disappears in later life. Some errors have arisen in industrial poisoning because the effects of other toxic substances, also present in a factory, have been overlooked. Among such are nitrous fumes, often found in explosives factories. A useful measure of the possibility of mercury poisoning may be gained by estimating the loss of metallic mercury in a given process; in some works several tons are not accounted for each year, so that the employees are clearly exposed to considerable hazard. Stock noted the amount of mercury excreted by 9 workers; the urinary excretion varied from 600 to 17 μg. per litre. The amount recovered in water used for washing the hands is also a useful index of the degree of exposure. In many employees the excretion greatly exceeds normal figures yet there are no symptoms of poisoning, suggesting some acquired tolerance to the metal.

The psychic changes noted in mercurialism have been briefly described as an anxiety state with a tendency to panic. Hurried and uncertain movements betray a feeling of insecurity. Blushing and pallor are noted, with an expression of confusion. There is lability of mood with flight of ideas, and tremor increases when the subject thinks that he is observed. Movements needing some dexterity are difficult. Lassitude, insomnia, nightmare, and hallucinations may occur. In addition to symptoms presumably of organic origin apathy and discouragement are not uncommon. Fits of temper, immediately regretted, may develop, but there may be timidity and hesitation. Loss of libido may have serious marital consequences. Rorschach's test has been used to demonstrate affective changes. Intelligence is somewhat diminished, memory weakened, and attention poor.

The author examined 11 patients, all of whom were making insurance claims. It appeared probable that many of the symptoms described were hysterical or due to a desire to substantiate a claim for compensation. Some of the patients complained of fatigue and exhaustion, yet were able to perform fairly heavy work or to move briskly after leaving the clinic. Others complained of headache and the early onset of fatigue after intellectual effort. Loss of concentration, depression, and irritability were frequent.

Preventive measures may be difficult to apply. An experienced workman may resent and try to avoid transfer to a task in which exposure to mercury is less or absent. The factory doctor should watch for mercurial tremor, nervousness, intolerance of alcohol, or loss of libido. A handwriting test performed after muscular effort is a valuable guide to the degree of incoordination present. After recovery from an attack of mercurialism a subject is more sensitive to the metal than before. Delayed poisoning may also occur. Many employees, clearly affected by the poison, may cheerfully continue at work with insight into their condition, knowing that they are receiving higher pay because of the danger involved. Those of poor intelligence but aware of their disabilities may exaggerate their symptoms and develop a persecution state. In reviewing the literature the author was struck by the great diversity of signs and symptoms; no clear-cut syndrome can really be described.

It is necessary in all cases to take into account the individual peculiarities of the patients, notably in the psychiatric sense, for this will determine to a great degree the symptoms developing in mercurialism.

G. C. Pether.


An account is given of the effects on experimental animals of inhalation of air containing beryllium oxide dust in various grades and concentrations for periods of 6 hours, 5 days a week, the total exposure ranging from 56 to 360 hours. No pathological changes were found post mortem, save in the lungs. Tissue analysis showed
eliminated which the kidneys part of No discussed.

33 values the benzene mixtures was followed a period in all Death the haematological studies or that human chronic pulmonary berylliosis Gianulomatosis (as aspiration was noted, was followed a lung of the human pulmonary changes. L. W.

animals in granulomatous diseases. Diffuse and focal pulmonary granulomatosis with fibrosis, as described in chronic berylliosis in human subjects, were not found, the animals showing acute inflammatory bronchial and pulmonary changes.

L. W. Hale.


Commercial gasoline (benzene, petroleum spirit) is a mixture of volatile hydrocarbons and may cause irritative lesions of the skin, conjunctiva, or pharynx. It may be absorbed via the pulmonary or gastro-intestinal system and may cause disturbances of the central nervous system. Pneumonia, bloody pleural effusion, emphysema, and lung abscess have been described as occurring after aspiration of gasoline. The literature is briefly reviewed and the case is described of a man who inhaled gasoline when attempting to siphon it from a car tank. He developed bilateral pneumonia, predominantly right-sided, with right pleural effusion, the onset being (as is usual) within 24 hours of inhalation. Recovery followed a period of critical pulmonary illness.

L. W. Hale.


An account is given of 27 experiments carried out at Charles University, Prague, on 23 volunteers, who inhaled mixtures of benzene vapour and air, the concentration of benzene ranging from 150 to 350 μg. per litre. After periods of inhalation of 2 to 3 hours, the benzene content of the subject’s blood, urine, and exhaled air was estimated polarographically until the values were no longer significant. It was found that different subjects retained amounts of benzene varying between 33 mg. and 198 mg. during 2 hours’ inhalation; the reason for variation in absorptive capacity is discussed. No subjective symptoms resulted. A considerable part of the absorbed benzene was excreted by the lungs (16-5% in 6½ hours), and a much smaller quantity by the kidneys (0-05% in 12 hours), the remainder being retained and metabolized. Equations are given by which the time necessary for inhaled benzene to be eliminated from the body may be calculated.

L. W. Hale.


The majority of foreign and many Soviet authors hold that chronic intoxication with lead tetraethyl does not exist, on the grounds that persons exposed for long periods to the substance do not show the cardinal symptoms of saturnism. The author does not agree with this view, and in the course of periodical examinations of workers in lead tetraethyl has encountered several cases of chronic intoxication. She classifies symptoms into two syndromes. (1) Disturbances of the vegetative nervous system, manifested by hypotonia, bradycardia, hypothermia, salivation, sweating, and tremor in the extended fingers, the tongue, and the eyelids. (2) Asthenic state, shown by general weakness, proneness to rapid exhaustion, headaches, and disturbing dreams. Later, disturbance of the intellectual faculties and loss of weight are observed.

While many cases show both syndromes, one or other preponderates in each case. It is sometimes difficult to decide whether the condition is one of chronic intoxication or the initial stage of acute poisoning. The development of psychopathic symptoms points to the latter, as does the patient’s restlessness and anxiety about his condition; the patient with chronic intoxication, while complaining of his symptoms, does not as a rule show grave concern.

The majority of cases of chronic intoxication are not associated with punctate basophilia, haematoporphyrinuria, or any great increase in the excretion of lead. The symptoms may show temporary remission, but this cannot be regarded as a sign of cure, and they often return and progress. On the whole, disturbances of the vegetative nervous system are associated with a better prognosis than is the asthenic syndrome.

L. Firman-Edwards.


The authors have continued their earlier observations (J. industr. Hyg., 1944, 26, 47) on 26 men exposed to at least 6-2 mg. per day of lead chromate for over 40 months and for a large part of the time to 15 to 20 mg. per day. At the end of this period the group “basophilic aggregation” (B.A.) was 0-7 and the lead-in-urine average was 0-039 mg. per litre and no abnormal clinical or pathological signs were observed. With lead chromate, unlike lead oxide, there is correlation between the B.A. and lead-in-urine but none with the amounts of lead-in-air. Lead chromate is less readily soluble in human lung fluid than is lead oxide. The authors state that signs of lead absorption will appear more rapidly with the more soluble salts than with the less, and they believe that their work, on the analysis of the amounts of uncoated lead chromate in human pleural fluid, provides an “explanation of the lack of harm due to very large amounts of inhaled lead chromate”. The amounts of lead chromate found soluble in 1 litre ranged from 1-28 mg. in pleural fluid to 1-14 mg. in serum. Since the amount of tissue fluid acting as an exchange medium
between lung and blood is limited, saturation would provide less than 1.0 mg. of lead ion which is subject to continuous unstable equilibrium with the blood and finally the kidney. Maintenance of saturation would require large quantities of lead chromate in the lungs. In the 26 men observed, not only was saturation not reached but the lead-in-urine and the B.A. dropped to normal even when the men were exposed to 6-2 mg. of lead chromate daily. The authors suggest that the lead salts which prove to have solubilities in the range of 1 mg. or less in human lung fluid will not be likely to cause intoxication from inhalation of less than 20 mg. insoluble lead compound per 10 cubic metres of air.

The authors discuss whether or not levels of urinary excretion higher than that of the general population can be maintained without clinical symptoms. Since the rate in 100 men exposed to large quantities of lead chromate rose to 0.1 mg. per litre with no demonstrable damage, there must be some regulatory mechanism. (The rate in the general population has been reported as 0.05 mg. per litre.) That this rate is in equilibrium with the exposure is shown by the return to normal industrial levels and finally to normal general population levels even though men were exposed to over 6 mg. of lead chromate daily at work. From their results it is concluded that lead intoxication from lead chromate is highly improbable in the industrial exposures likely to be encountered. This conclusion is based almost entirely on the solubility characteristics of this compound. "Where the amounts of lead compounds which can be dissolved in body fluids are equal to, or less than, the amounts which are transported and eliminated without harm, the potential saturation limit is the important factor." The factor of solubility here is independent of particle size, in contrast with the lead compounds that are more soluble in body fluids. A. J. Amor.


By a modified de Langen and ten Berg test (Acta med. scand., 1948, 130, 37), the authors determined by visual estimation the excretion of porphyrins in the urine of 116 men exposed to lead. No false-negative reactions were encountered. Only a very small percentage of false-positive reactions were obtained from the urine of non-exposed workers. The test is regarded as a reliable means of estimating increased porphyrin excretion as an early sign of lead absorption. T. A. Lloyd Davies.


Porphyrins, especially coproporphyrins, are excreted in the urine as a non-specific reaction to many poisons, including lead, aniline, arsenic, acetaldehyde, aspirin, phencacetin, and sulphonamides. Coproporphyrins are also excreted in eirrhosis of the liver, haemolytic jaundice, pernicious anaemia, chronic alcoholism, and pellagra.

The author has improved the de Langen and ten Berg test for coproporphyrin by adapting it for photofluorometry. The modification is described. The author believes that coproporphyrinuria is a reliable sign of lead poisoning and that coproporphyrinuria occurs earlier than stippling of the erythrocytes. [The value of his interpretation of the procedure is lost because he does not distinguish between lead absorption and lead poisoning.] He suggests that a high level of coproporphyrin in the urine and the presence of lead in the urine should be regarded as serious signs, even in the absence of symptoms. T. A. Lloyd Davies.


It is known that carbon bisulphide poisoning may cause symptoms similar to those of Parkinson's disease. Richter (1945) exposed four monkeys to this gas and saw histological evidence of extensive bilateral necrosis of the globus pallidus and of the reticular structure of the substantia nigra. All movements of the animals were reduced in amplitude and there was incoordination without paralysis. Muscles were held in flexion and there was tremor. This was the first experimental evidence of the creation of a striate syndrome by attack on the basal ganglia.

A workman aged 29, previously well, had worked in a textile mill for 3 years; during the last 3 months he was more exposed to carbon bisulphide than before. He then complained of tremors of the legs, a dragging sensation in the axillae and shoulders, nervousness, excessive fatigue, and sweating. He had stopped work in January and had a neurological examination in June. By that time automatic movements had ceased, the facies was somewhat fixed, and the gait was dragging. All voluntary movements were slow; the thumbs were adducted and in opposition but their first joint was not flexed. There was a rhythmic tremor of the right arm at rest. Tendon and cutaneous reflexes were almost normal and sensation was not affected; there was some stiffness of all limbs. Examination of chronaxie showed that distally it was little altered but proximally somewhat increased. Similar cases had occurred among other workmen in this factory and the general picture was that of post-encephalitic Parkinsonism. The chronaxie readings were not like those described by Bourguignon in some extrapyramidal lesions with rigidity. In general the right upper limb was most affected in these workmen. It is thought that carbon bisulphide was the cause of the condition described. G. C. Pether.


Psychoses and polyneuritis are well known results of carbon bisulphide poisoning but other manifestations are less often recorded. The authors suggest that the neurological lesions are secondary to vascular degeneration caused by the poison. They investigated 16 cases which occurred in workers in viscose factories. All were young and most came under observation between the ages of 45 and 55, having worked about 20 years in
their trade. Some of them had encephalopathies of arteriosclerotic type with dementia, others had hemiplegia, bulbar palsy, or mixed lesions of varying severity. Many died and at necropsy areas of cerebral softening and degeneration were found, arteriosclerotic kidneys were seen several times, and also nerve lesions affecting the limbs but not of central origin.

The onset of symptoms was invariably gradual with asthenia, paraesthesias, progressive impairment of gait, and mental deterioration resembling that in pseudobulbar palsy. Arterial hypertension was detected in a high proportion of these patients and histologically the intimal and subintimal tissues were thickened.

It is considered that the evidence strongly suggested that the cases were due to chronic intoxication by carbon bisulphide.

G. C. Pether.


Of 33 patients admitted to hospital with carbon-monoxide poisoning 23 did not appear likely to make a spontaneous and rapid recovery and showed persistent neurological or psychological abnormalities. These were given intravenous injections of procaine hydrochloride, the usual dose being 0.5 g. in 500 ml. of 5% dextrose, repeated daily as required up to [apparently] five doses. Occasionally a dose of 10 ml. of a 1% solution of procaine was used, but was less effective. The patients were tested previously for sensitivity to the drug. If they were conscious and with no respiratory depression, they were given 130 mg. of sodium pheno-barbitone intramuscularly. Of the 23 treated 17 made a complete recovery and 6 either died or did not entirely recover. Among these were 2 who did not come for treatment until long after exposure and in whom permanent brain lesions had probably already occurred, 2 who had previous brain injuries, and several who were aged. It is suggested that in these last arteriosclerosis may have assisted in the untoward result. In these cases, in several of which there was a history of previous lesser exposures to poisoning before that which led to their hospital admission, there seems to have been little or no carboxyhaemoglobin in the blood when treatment was started. In general improvement began very soon after the administration of procaine commenced. In several cases electroencephalograms showed changes pari passu with the clinical improvement. No serious reactions to procaine were observed, although the rate of injection, 250 ml. per hour, had to be reduced occasionally owing to the appearance of muscular twitches. It is not thought that the bulk of fluid was concerned in the improvement, as the patients were not dehydrated.

No explanation is offered of the strikingly beneficial results of the treatment, though it is pointed out that procaine can relax vascular spasm and that carbon monoxide poisoning seems to affect the cerebral vessels. Again, procaine and disopropyl fluorophosphonate are both anticholinergic agents, and it has been shown that the latter can revive medullary centres some time after complete interruption of the cerebral circulation.

Reginald St. A. Heathcote.


During 1941-5 the explosive tetryl was handled in powder and pellet form in a small factory that had no controlled ventilation. Only 7 to 11 men were engaged on the work at a time, but the turnover of labour was large, mainly because of dermatitis. Three of these men were seen in hospital in 1948 or 1949 and 2 of them died there. Only one necropsy was obtained; the findings confirmed the clinical diagnosis of cirrhosis of the liver. The clinical diagnosis in the case of the other patient who died was advanced hepatitis or cirrhosis, causing hepatorenal failure, together with mitral stenosis due to rheumatic heart disease. The third patient apparently suffered from emphysema of the lungs; an aspiration biopsy examination of the liver revealed no abnormality.

Seven other workers and the widow of an eighth man who died of pulmonary tuberculosis were interviewed. Several of them reported symptoms which were relieved soon after ceasing to work with tetryl, but no permanent damage was detected.

From this evidence and a survey of the literature the authors conclude that prolonged exposure to high concentrations of tetryl may produce systemic poisoning.

H. E. Harding.


The effects on dogs of the intermittent inhalation over long periods of cadmium oxide and cadmium sulphide were studied. Ten dogs were exposed to an average concentration of 4 mg. per cm. of cadmium sulphide, and 10 to the same concentration of cadmium oxide for 6 hours a day on 5 days a week. Of the particles in the air in the exposure chambers 98% were less than 3 μ in diameter. Ten control animals were exposed to air which passed through the chamber at the same linear velocity (10.5 m. per minute) as that in the exposed chambers. The average total exposure to the sulphide was 895 hours, and to the oxide 1,102 hours. During the period of exposure a variety of estimations were carried out on blood and urine, and finally the dogs were killed and subjected to necropsy. No significant abnormalities were discovered which might indicate serious injury due to the cadmium compounds. While most of the cadmium dust was found to be stored in the lungs, liver, and kidneys, no associated pathological change was found in these organs. No evidence of damage accompanied cadmium levels as high as 0.22 mg. per 100 ml. in the blood, and 0.357 mg. per litre in the urine.

In view of their findings, the authors suggest that the commonly accepted figure for the maximum allowable concentration of cadmium, 0.1 mg. per c.m., is lower than is necessary, and that this might well be raised to 1 mg. per c.m. without producing deleterious effects. They point out, however, that the compounds of cadmium...
vary considerably in solubility and absorbability, and suggest that the allowable concentration should differ for different compounds and for different physical states of the same compound.  

A. Lloyd Potter.


Experiments are described in which the toxicity to piebald rats of cadmium-sulphide and cadmium-sulphoselenide pigments, given by mouth, was determined. These pigments are used in the manufacture of paints and coloured chalks, and are therefore a potential toxic hazard to children. The authors found that no adverse symptoms developed in the experimental animals ingesting cadmium-sulphide pigments, and that the amount of this pigment introduced into the food seemed to make little difference to them. When the pigment containing selenium was ingested in proportions greater than 1% of the diet it was noticed that a depression of appetite resulted, but this could be attributed to taste aversion as it did not decrease the efficiency of utilization of the food consumed. The conclusion is drawn that no danger exists for children who might ingest paint containing cadmium-sulphide pigment, and that ingestion of chalk containing the cadmium-sulphoselenide pigment might lead to a slight depression of appetite only.  

A. Lloyd Potter.


The first section of this paper records a study of 18 workmen, employed under good conditions of ventilation, in spraying with a paint composed of equal parts of cellulose paints and of organic solvents—ethyl alcohol, methyl alcohol, methyl acetate, butyl alcohol, butyl acetate, methylcyclohexane, methylethylketone. It contained no benzoil. Clinical and haematological examinations were made over a period of 14 to 15 months. The results are given in the text, and illustrated by tables and graphs. The erythrocyte count was little affected; in 3 cases only was there a slight anaemia, which persisted in one case. The leucocyte count showed considerable variations from the normal; in some cases there was a fairly rapid diminution in number, in others the number of leucocytes was increased, while in a third group there was an increase in the number of these cells, followed by a decrease. In general the percentage of the polynuclear leucocytes was lowered, in 5 cases falling below 50%. No clinical signs of systemic poisoning were discovered.

The second section of this paper deals with the effect on guinea-pigs of inhalation of these solvent vapours. The animal was placed in a glass chamber of 16-litre capacity and was exposed to the vapour for one hour at a time, three times in the 24 hours. The air led into the chamber was bubbled through a vessel containing the solvents, of which between 52 and 68 c.c. was evaporated on each occasion. The experiment was continued for 6 days with one animal, which was then accidentally killed. It showed signs of poisoning: uneasiness, sweating, bristling hair, pruritus, and loss of appetite.

A second guinea-pig showed marked signs of intoxication from the third day, with intense pruritus and paralysis of the hind quarters with loss of equilibrium; this was followed by clonic jerking movements of all four limbs and death ensued within 2 hours. The chief variation from the normal in the blood was in the neutrophil leucocyte count, 27%, at the start, 87% at the time of acute intoxication, and 17% at the time of death. Necropsy revealed some congestive lesions at the base of the lungs and loading of the liver with fat.

A third animal received the same dose per hour but only for 2 separate hours in the 24, for about 14 weeks. The only sign of chronic poisoning was an intense pruritus. Its weight fell from 570 to 520 g. There was a reduction in erythrocyte count, and the leucocyte count increased from 8,700 to 9,600 per c.mm.; polynuclears formed 57-55% at the start and 20-90% at the finish; there was a definite lymphocytosis. Inflammatory and degenerative changes were found in the lungs, suprarenals, and testes.  

M. A. Dobbin Crawford.

Acute Toxicity of Zirconium, Columbium,(10.1136/oem.8.1.35 on 1 January 1951. Downloaded from http://oem.bmj.com/ first published on 10.1136/oem.8.1.35 on 976. Protected by copyright.}

ABSTRACTS
89 mg. of cesium per kilogram. Yttrium appeared to be relatively nontoxic; the LD 50 values of three yttrium compounds ranged from 117 to 395 mg. of yttrium per kilogram.

Lanthanum chloride (molar concentration, $1 \times 10^{-3}$) was found to be able to replace aluminium as an activator for the succinic dehydrogenase system. Strontium chloride (molar concentration, $4 \times 10^{-4}$) was partially effective in replacing calcium in this system. Columbium (5 x $10^{-4}$ molar potassium colubmate) caused approximately a 50% inhibition and 1 x $10^{-4}$ molar yttrium chloride produced a 25% inhibition of the succinic dehydrogenase activity of mouse liver in vitro.

Cesium chloride failed to inhibit the adenosine triphosphatase activity of mouse liver in vitro, while salts of other metals caused 50% inhibition at the following molar concentrations: columbium chloride, $4.2 \times 10^{-4}$; potassium colubmate, $5.8 \times 10^{-4}$; lanthanum chloride, $4.4 \times 10^{-3}$; strontium chloride, $8.3 \times 10^{-4}$; yttrium chloride $4.5 \times 10^{-4}$; zirconyl chloride, $1.05 \times 10^{-3}$.—(Authors’ summary.)


During an investigation of the effects of exposure to the insecticide “parathion” (diethyl p-nitrophenyl thiophosphate) by the California State Department of Public Health, the authors studied the personnel of a factory manufacturing the material in an attempt to correlate the concentration of parathion in the atmosphere with the cholinesterase activity of blood plasma and erythrocytes. The methods of estimation used are described in detail, and the results are tabulated. Twelve subjects who had intermittent contact with parathion-contaminated air were included in the investigation, but from only 5 of them were successive blood samples obtained. One subject who was not exposed to parathion served as a control.

Air samples showed a maximum concentration of 8 mg. per 10 c.m. and an estimated average exposure of 2 or 3 mg. per 10 c.m. The results of estimation of the cholinesterase activity in blood plasma, although not compared with an adequate number of control specimens, suggest that there is a decrease during exposure and a pronounced increase within 5 months of removal from exposure. The estimation of cholinesterase activity of erythrocytes in the same group of people gave results which were not nearly so convincing. The authors conclude, however, that continuous exposure to parathion-contaminated air in concentrations of 2 to 8 mg. per c.m. is potentially dangerous. A. Lloyd Potter.


Periodical examinations of the personnel working in a steel foundry showed that a considerable percentage of the workers were suffering from manganese poisoning. The latter was clinically manifested by general debility, backache, and aches in the limbs.

It was found that the air of all the compartments of the foundry was to a certain degree contaminated with manganese. The following recommendations were therefore made.

Thorough and direct ventilation should be installed above the places where manganised steel is heated. The roofs of the foundry buildings must be high up and walls provided with sufficient windows to promote air movements. The chimneys should be built sufficiently high to secure the ventilation in this way. Periodical examinations of the personnel of the foundry is necessary to detect early cases of manganese poisoning.

**E. W. Collis.**


Brief reports of 10 cases of men poisoned by trichloroethylene suggest that symptoms are due to intoxication of the central nervous system. On the basis of chemical studies of blood one month, 2 months, and 3 months after exposure the author claims that a mild rise in blood calcium level is caused by trichloroethylene.

**T. A. Lloyd Davies.**


**INDUSTRIAL PHYSIOLOGY**


Breath velocity was determined during rest and exercise in 12 subjects, breathing oxygen at 30,000 feet (9,000 m.) and a helium-oxygen mixture of the same density at ground level; the results were compared with those obtained in subjects breathing oxygen at ground level. In both cases breath velocity was increased and the completion of expiration hastened. The helium-oxygen mixture had a more marked effect. A post-expiratory pause appeared in some subjects and was accentuated in those normally showing this feature. Post-inspiratory pauses were also observed.

**D. H. Sproull.**


Arterial blood-gas and expired-air analyses were made on 77 coal miners with emphysema and pulmonary fibrosis before and during positive-pressure breathing for 10-minute periods; the positive pressure used caused an
average rise of 5 mm. Hg in the mean inspiratory pressure. In patients with abnormally high mean oxygen pressure gradients from alveoli to arterial blood (20 mm. Hg or more), the gradient was reduced on positive-pressure breathing in the non-emphysematous and to a lesser extent in the emphysematous group. It is suggested that this effect is due to inflation of alveoli the ventilation of which would otherwise have been impaired, and that increased resistance of the alveolar membrane to diffusion is less important than uneven distribution as the cause of the increased oxygen gradient in anthracosilicotic pulmonary fibrosis.

D. H. Sproull.

The Immediate and Accumulative Effect on Psycho-
motor Performance of Exposure to Hypoxia, High
Altitude and Hyperventilation. SCów, J., Krasno,

Psychomotor performances of subjects, who were repeatedly exposed to altitude anoxia and hyperventilation, were measured. The tests used were: (1) Measurement of flicker fusion frequency threshold. (2) Use of a device in which the subject followed the movement of an irregular slot in a revolving drum by means of a pointer—the "pursuitmeter". Touching the side of the slot with the pointer electrically actuated a scoring device. (3) Use of a tremor detector. (4) Measurement of the rate at which a flat metal plate could be tapped with a pointer. Performance deteriorated during a state of anoxia, but repeated exposure caused no progressive deterioration. Subjects became more irascible during repeated exposures to high altitude.

Daily repetition of one hour's hyperventilation in 7 subjects led to no accumulation of fatigue. No progressive deterioration in performance occurred in 7 subjects exposed to an altitude of 35,000 ft. (10,500 m.) while breathing 100% oxygen three times a week for 5 weeks. The performance was not decreased during individual runs.

K. E. Cooper.

Studies on Acid-Base Balance Before and During
Repeated Exposure to Altitude, or to Hypoxia and
Hyperventilation. Boutwell, J. H., Farmer, C. J.,

Twenty-four hour urine specimens of 18 subjects were analysed before and after repeated short exposures of the subjects to altitudes of 18,000 ft. (5,400 m.) without supplementary oxygen and 35,000 ft. (10,500 m.) with oxygen. After an initial decrease, total excretion of fixed base increased with further exposure to 18,000 ft.; this is attributed to hyperventilation. The exposure to 35,000 ft. with oxygen increased total fixed base excretion. In all cases excretion of acid metabolites, ammonia, and phosphate ran parallel to that of total fixed base. It is suggested that a rebound acidosis follows the acapnic alkalis.

D. H. Sproull.

Effect of Repeated Exposure of Human Subjects to
Hypoxia on Glucose Tolerance, Excretion of Ascorbic
Acid, and Phenylalanine Tolerance. Boutwell, J. H.,
Cilley, J. H., Krasno, L. R., Ivy, A. C., and Farmer,

Six subjects whose daily intake of ascorbic acid was 91 mg. were exposed to an altitude of 18,000 ft. (5,400 m.) without supplementary oxygen for periods of 17 hours. The excretion of ascorbic acid was markedly decreased. Phenylalanine tolerance was not affected.

D. H. Sproull.

The Capacity to Maintain a Sustained Effort under
Normal and Anoxic Conditions. Daoù, F., and

Continuous records showing the rate of exhaustion when maximal effort was sustained during a period of 1 minute were obtained with a recording dynamometer operated by a rubber bulb grasped in the hand. Under normal conditions and in 37 normal subjects the average reduction in force exerted during the period was 35% of the initial value; it was not related to the maximum attained. A definite increase in the rate of exhaustion was found when the same subjects were breathing air containing less than 12% oxygen. It is suggested that the method provides a quantitative measure of perseverance.

D. H. Sproull.


At the Institute of High-altitude Biology, Mina
Aguilar, Argentina, a study was made of the blood picture in 84 healthy subjects, mostly Andean natives, living permanently at 4,514 metres above sea level. The average haemoglobin concentration, erythrocyte count, and haematocrit value were found to be increased, but there were wide individual variations. No relation was found between duration of residence at a high altitude (which ranged from 3 months to 47 years) and the haematoipoietic response. The polycythaemia observed was found to be of the normocytic type. The proportion of lymphocytes and monocytes in the differential leucocyte count was increased and that of the neutrophils decreased. Without there being any change in the total count. The erythrocyte sedimentation rate was lower than that found at sea level.

Studies on Blood Formation and Destruction in the
Blood, 5, 1.

The author examined three groups of subjects: (1) 9 healthy adult male doctors or medical students, aged 20 to 42 years, in Lima at sea level; 6 were re-examined after residence for varying periods at an altitude of 4,540 metres, and of these were later again examined on return to sea level; (2) 8 Peruvian natives (aged 18 to 24 years) who had lived more than 6 years at an altitude of 4,540 metres, 2 of whom were re-examined during 35 and 38 days' residence respectively at sea level; (3) 2 male subjects, aged 42 and 51 years respectively, who had lived for many years at high altitudes (4,450 m. and 4,000 m. respectively) and had developed symptoms and signs of chronic altitude sickness, having lost their altitude adaptation. From these investigations it is concluded that anoxia due to exposure to a low-pressure environment causes a greater activity of the haemato-
poietic mechanism which is observed within 48 hours and results in polycythaemia. The earlier slight blood
changes are probably due to haemoconcentration. The blood changes include increases in erythrocyte count, haemoglobin concentration, total circulating haemoglobin, haematocrit, reticuloocyte count, erythrocyte volume, and serum bilirubin level. There is little alteration in the leucocyte count and a fall in the platelet count; these last findings contrasting with those in polycythaemia vera. An increased blood volume was found in all subjects at high altitudes, being due to increased erythrocyte volume, the plasma volume being unaffected.

An increase in faecal urobiologen content was found in group (1) subjects on transfer to high altitude, but this did not exceed the normal (sea-level) limits and was proportionate to the increase in circulating haemoglobin mass—the haemolytic index remaining normal. A similar relation was found in group (2), whereas in the 2 cases in group (3) urobiologen excretion was considerably higher and the haemolytic index was abnormally high. Hyperbilirubinaemia, probably due to diminished hepatic function, was found in subjects of group (3) and group (2). A diminution of the polycythaemia occurred in all subjects on return to sea level, due to diminution of erythropoiesis and increased blood destruction—the latter starting at once and lasting only a few days—with some hyperbilirubinaemia. The two men with chronic altitude sickness improved clinically immediately on descending to sea level, although recovery was incomplete in one case at the end of 41 days. The author concludes that the polycythaemia occurring in normal individuals at high altitudes is due to a direct and proportional increase in the processes of blood formation and destruction. On the other hand, those losing their altitude adaptation and developing chronic altitude sickness with an abnormally high polycythaemia show an increase in blood destruction proportionally greater than the increase in erythropoiesis, which may be regarded as a possible diagnostic criterion.

John F. Wilkinson.


Two groups of human subjects on a controlled diet were intermittently exposed to simulated high altitudes. The first group (11 subjects) was exposed to 18,000 ft. (5,500 m.) without oxygen; the second group was subjected first to a series of hyperventilations at ground level and then exposed to 35,000 ft. (10,660 m.) altitude with oxygen. Determinations of the neutral 17-ketosteroids and of chromogens were made on the urine of all subjects during the exposure periods and during the control periods at the beginning and end of each experiment. During intermittent exposure to 18,000 ft. without oxygen ketosteroid excretion was at first decreased, but as exposure was continued it returned to the original control level. On hyperventilation the ketosteroid excretion tended to be increased. Intermittent exposure to 35,000 ft. with oxygen also caused a temporary increase in ketosteroid excretion followed by a return toward the control level. However, the post-exposure level was higher than the pre-exposure level. This suggests that the effect of O2 inhalation on 17-ketosteroid excretion should be studied further.

Excretion of chromogenic substance or substances, the nature of which is unknown, was increased by exposure to high altitude, but was not altered by hyperventilation at ground level. The results show that some alteration in ketosteroid excretion occurs in the response of the human subject to conditions of simulated altitude. These results alone, however, cannot be considered proof that the adrenal cortex is functionally involved in this response.—(Authors' summary.)


Over a period of one year the authors studied 20 pilots and 77 of the ground crew from R.A.F. stations equipped in whole or in part with jet aircraft. Before the investigation these subjects had spent an average period of 5-5 months on jet aircraft; by the end of the investigation the total average time was 15-5 months. For the majority of the subjects the duration of exposure, within 5 yards of an aircraft running-up, was under an hour a day. All the pilots wore helmets when flying, but no consistent ear protection was used by the ground crew. At high revolutions per minute some of the subjects noticed discomfort in the ears during the actual running of the engines. Deafness and tinnitus were noted in some cases after running-up. The main features of the symptoms were mildness and lack of continuity. Audiograms showed on the whole no deterioration in hearing during the year, and the electroencephalograms were within normal limits.

The survey revealed no significant effects, but it is a preliminary investigation only. "Deafness or other manifestations may take a much greater time interval to reveal themselves and yet be apparent before such changes develop in workers on reciprocating engines."

Stephen Suggit.


A brief review of the psychological disorders which may occur in flying personnel is given. Although the tendency to classify these disorders into already established categories is probably necessary, it is criticized on the grounds that the labelling of a case in this way may result in incorrect handling therapeutically and socially. Some aspects of these psychological changes which, although insufficient to give rise to a clinical entity, do require some differentiation from the other psychoneuroses are described. There are hysterical and obsessional changes peculiar to aircrew, in which the symptoms and ideas present are merely exaggerations of those symptoms and fears normally present in members of aircrew subjected to the changes and dangers of operational flying. In aircrew the dramatic hysterical manifestation and absurd obsessional idea are usually absent. Another point made is the comparative ease
ABSTRACTS


The responses to positive "g" of 16 men piloting a dive bomber were compared with their own responses as passengers in the aeroplane, and in the centrifuge. When piloting, vision was dimmed, lost peripherally, and lost completely at averages of 4.6 "g", 5.0 "g", and 5.4 "g" respectively. Loss of eye pulsation occurred at 5.3 "g". These values are 0.7 "g" higher than the "g" tolerance of the subjects as passengers in the aeroplane and 1.4 "g" higher than those in the centrifuge. The higher "g" tolerance of pilots is attributed to posture, lower temperatures in the cockpit, and the effort of controlling the aeroplane. The cardiovascular responses of the pilots and passengers were similar, but differed from those of the subjects in the centrifuge. In the centrifuge pulse rates before and during acceleration were slower, and the compensatory reactions occurred one or two seconds later, than in the aeroplane. There was striking similarity in the visual and general symptoms, irrespective of the type of exposure. D. H. Sproul.


The administration of deoxygenicosterone acetate to 4 unacclimatized subjects who were exposed to a hot environment (50-5°C; 15% relative humidity) was associated with plasma sodium concentrations which were higher, and sweat sodium and chloride concentrations which were lower, than in controls. No significant effect was found on heart rate, oxygen consumption, rectal and skin temperatures, or blood volume.

D. H. Sproul.

INDUSTRIAL LUNG DISEASES


Experimental studies on inhalation of mixtures of iron oxide and silica dust demonstrated that iron oxide in the lungs of the experimental animals with an almost complete absence of fibrotic changes. The experiments were performed on guinea-pigs, rats, and other experimental animals for a period of up to 3 years. It is shown that the radiological changes were due to the radio-opacity of the iron oxide and not fibrosis produced by the crystalline free silica present in the dust. The resistance of the guinea-pigs to tuberculosis infection (R.I) was unchanged, and the authors conclude that the dust should be included amongst those known as "inert".

A. J. Amor.


The authors consider that prognosis and the estimation of any changes in the condition are difficult in silicosis. For about 10 years they had used erythrocyte sedimentation estimations and Arneth counts in the hope of obtaining useful information. Other tests, notably that of Weltmann, were also used but with disappointing results.

Boselli then studied various turbidity and flocculation tests on serum and later developed his own technique for estimation of euglobulin and a method of electrophoresis for euglobulin and pseudoglobulin.

In cases of silicosis admitted to the industrial medical clinic in Milan the following are now carried out: (1) Total protein (Kjeldahl) estimation on blood. (2) Electrophoresis of serum and calculation of protein fractions. (3) Boselli's reaction. (4) Various flocculation and turbidity tests to confirm evidence obtained by the previous tests. (5) Erythrocyte sedimentation estimation by Westergren's method. It is considered that the results given can be related to the degree of activity, inflammation, or destruction in various body tissues. Thus an indirect picture of the pathological processes is obtained. Many hundreds of patients have been
examined. In the illustrations given, pulmonary and other changes are related to the serological picture.

Boselli demonstrated the significance of variation in the \( \alpha, \beta, \) and \( \gamma \) euglobulins. The serum proteins are changed in most cases of silicosis; with active associated infection the \( \alpha \)-globulin content increases, but without it the \( \gamma \)-globulin content tends to rise. Tissue changes in the lungs, kidneys, and other organs may thus be assessed from time to time by examination of the serum, and a guide to prognosis obtained. This is related to the degree of proliferative and exudative changes as estimated by the serum reactions.

G. C. Pether.


Pellegrini stated that, "silicosis is not only a pneumoconiosis causing injury by mechanical action but beyond and above this it is an intoxication". Detailed results are given, in the text and in table form, of the examination of blood and bone marrow in 12 silicotics in whom there were no complications, the presence of tuberculosis being ruled out by clinical and laboratory tests. Radiological and clinical examination showed that in 4 cases there were reticulation and occasional nodules in the pulmonary field, in 7 there were diffuse nodules, and in one there was a tendency to confluence of the nodules with shadows resembling those of a lung tumour. There was a slight degree of anaemia in 10 cases; in 2 of these the erythrocyte count was less than 4,000,000 per c.mm., in the remainder between 4,000,000 and 5,000,000. The presence of target cells in 7 cases is specially noted and discussed. The haemoglobin value was reduced to between 75% and 95%. The white cell count varied between 3,800 and 8,400 per c.mm.; a neutropenia was present with a relative lymphocytosis. Eosinophilia was seen in 2 cases only; this has been reported by other observers and the subject is discussed. Platelets were slightly reduced in number. In all cases neutrophil granulocytes were seen with fine and scarce granules; in 10 cases there were also cells with large scanty granules; in only 2 were there cells containing large and numerous granules.

A detailed table is given of the analysis of marrow cells obtained by sternal puncture in all 12 cases. Variations in the marrow cells were rare but toxic granules were seen in the myelocytes and their precursors and in the polynuclear cells. Cell production was slowed.

Silica, having entered the blood stream, has a particular affinity for the reticulo-endothelial system, where it is absorbed by phagocytic action of the tissue cells; it has been found in cells of the liver, spleen, and veins, and in the lymph nodes of the mediastinum.

M. A. Dobbin Crawford.


This is a record of observations by bronchoscopy in 41 cases of pneumoconiosis, in 39 of which the condition was due to silica and in 2 to asbestos. The radiological findings grouped these patients into three categories:

1. those in whom micronodular shadows were visible;
2. those with nodular shadows;
3. those with massed shadows resembling the shadows cast by lung tumours.

Bronchoscopic observation in all these cases revealed marked injection of the bronchial mucosa, redness, swelling, oedema and vascularization, with narrowing of the lumen and, in some cases, obstruction at the orifice. The bifurcation of the trachea showed marked oedema with resulting deformation of the tracheal spur. This tendency was controlled by the local application of adrenaline and no accidents occurred. In no case was bronchial spasm observed nor was any nodule seen in the interior of a bronchus.

The authors conclude that bronchoscopy in silicosis is not indicated, since it merely reveals the bronchitis which is always present in these cases. They deny that the procedure has any therapeutic effect, as claimed by other observers. They find, however, that the inflammatory lesions visible through the bronchoscope conform in degree of severity to the radiological findings. These inflammatory lesions are also in accord with the histological findings of Policard, who showed that the cartilaginous bronchi present the usual signs of chronic inflammation, with hypertrophy of the muscle coat and atrophy of the elastic tissue. The mucosa is congested, oedematous, and infiltrated with round cells.

M. A. Dobbin Crawford.


The excitability of the respiratory centre was judged by requiring subjects to breathe air containing increasing proportions of carbon dioxide; respiratory movements were measured mechanically, and the concentration of CO\(_2\) was noted at which a considerable increase in amplitude of respiration occurred (an earlier and slighter increase in some subjects was discounted, as probably resulting from direct irritation of pulmonary sensory nerve endings). In normal subjects the depth of respiration increased when the CO\(_2\) content of the inspired air was 2 to 4%. Of 55 untreated miners with silicosis, 54 showed no response to 4% CO\(_2\), while 8 required over 8% for increase in respiration. A similar group of miners who had been treated in hospital for several months showed reactions at levels closer to the normal.

Compression of the abdomen led to rise in systemic diastolic pressure and diminution in systolic pressure in 108 out of 127 silicotic miners who had received no treatment. This type of reaction is interpreted by the authors as evidence of hyperexcitability of sympathetic vasoconstrictor nerves in the pulmonary circulation. A similar type of reaction was observed in 21 of 36 miners who appeared to have early silicosis and were still able to work.

The authors suggest that these modifications of nervous excitability may precede the radiological appearance of
silicosis, and may afford the earliest means of diagnosis. On the other hand, it is possible that subjects who possess an abnormal excitability may be more prone to develop silicosis.

**Impairment of Pulmonary Function in Anthracosilicosis.**


A series of 180 anthracite miners and 32 bituminous coal miners with symptoms of anthracosilicosis were subjected to tests of pulmonary function. Measurements were made of: (1) maximum breathing capacity (the maximum quantity of air which can be moved in and out of the lungs in unit time); (2) residual air, determined by an open-circuit oxygen method; (3) vital capacity; (4) oxygen and carbon-dioxide content of the expired air; (5) oxygen saturation and oxygen and carbon-dioxide tension of arterial blood; (6) degree of dyspnoea. Emphysema was estimated throughout by expressing the volume of residual air as a percentage of total lung volume, the upper limit of normal being taken as 35%. Vital capacity was found to be an unsatisfactory isolated measurement and showed poor correlation with the degree of emphysema, but a closer correlation existed between emphysema and maximum breathing capacity, for which a figure of 40 litres per minute or less was taken as significant, the normal being 100 to 150 litres per minute. Spiromgrams recorded before and after a period of intermittent positive-pressure breathing with inhalation of a bronchodilator drug showed that bronchospasm was frequently present. No correlation was found to exist between radiological appearances and degree of emphysema determined as above, but there was some correlation between the latter and electrocardiographic evidence of right-heart strain. At rest most patients had an arterial-blood oxygen saturation of 90 to 93%, regardless of the degree of emphysema, but after slight exercise the percentage fell appreciably, especially in the presence of marked emphysema: the authors regard this change as an important test of disability. The partial pressure of carbon dioxide in arterial blood was found to increase, and conversely the alveolar oxygen partial pressure, as determined by indirect means, to fall, with increasing emphysema. The gradient between the partial pressures of alveolar oxygen and arterial oxygen was increased above normal in most cases, but was independent of emphysema. This might be due to difficulty of diffusion of gases through the pulmonary membranes, but the authors consider that it is due to unequal alveolar aeration and perfusion as a result of fibrosis, this being more important than the dilution effect of increased residual air. Analyses of expired air showed that no correlation existed between the degree of emphysema and the quantities of oxygen taken up and carbon dioxide released, but these were usually below normal both at rest and during exercise. Dyspnoea was measured in terms of its duration after a simple stepping test, and was found to be related to emphysema, though there was wide individual variation. In none of the tests could the response of anthracite miners be distinguished from that of bituminous-coal miners.

The authors suggest that the assessment of emphysema from residual air and total lung volume is a satisfactory basis for comparison, and that it is of value in the measurement of disability. In 30% of their cases the ratio of these measurements was within normal limits; in these cases, therefore, disability was thought to be due to fibrosis and inequality of alveolar aeration, and not to emphysema. Treatment by intermittent positive-pressure breathing and inhalation of bronchodilator drugs is recommended.

**Studies in the Critical Evaluation of Disability in Anthracosilicosis.**


The authors, working in Pennsylvania, have investigated intensively the pulmonary function of a group of 375 coal miners with silicosis, using clinical, radiological, and pathological methods and correlating the results with those of studies of respiratory physiology in each case. Their object was to assess as accurately as possible the degree of disability present.

They consider that the factors reducing arterial oxygen saturation in silicosis are: (1) decreased ventilation due to diminished maximum breathing capacity and vital capacity; (2) the presence of emphysema; (3) decreased efficiency of ventilation due to diminished oxygen absorption from, and lessened carbon-dioxide addition to, the air breathed; and (4) unequal alveolar aeration and perfusion. It is pointed out that any or all of these factors may contribute to the total disability in varying degree. Only the first two can be estimated clinically, so clinical examination alone is of limited value in assessing the degree of functional impairment. Indeed, in only 60% of cases in this series was the clinical estimate of degree of disability confirmed by subsequent physiological studies. A marked disparity between the patient's complaints and the degree of impairment indicated by the tests was not uncommon; moreover, patients with apparently the same amount of dyspnoea often showed markedly different degrees of objective functional impairment. A further limitation to the usefulness of clinical assessment lies in the fact that in only 50% of cases was it possible accurately to estimate from clinical and radiological findings the amount of emphysema present.

One point of some importance observed in this study was that the degree of respiratory functional impairment, as measured by physiological methods, seemed to bear little or no relationship to the radiological stage of the silicosis or to the length of exposure to dust.

**John Forbes.**


A case of beryllium (pulmonary) granulomatosis is reported from the Royal Victoria Hospital, Montreal, in which treatment with pituitary adrenocorticotrophic hormone (ACTH) was tried in view of its known effect
in reducing excessive cellular and fibrous tissue reactions and hyperglobulinaemia, all of which occur in this disease.

The patient, a man of 27, had been employed in a fluorescent-lamp factory for 2½ years, and 7 years later developed cough, progressive dyspnoea, and deterioration in his general condition. Radiographs showed diffuse nodular shadows in both lungs, with hilar-node enlargement. There were polycythaemia and a slightly raised serum globulin level (3·65 g. per 100 ml.). After a 2-week control period 100 mg. of ACTH was given daily in four doses over a period of 4 weeks. Symptomatic improvement began within the first week and continued throughout the period of treatment; vital capacity increased markedly and the radiological changes gradually receded, though the nodular shadows did not entirely disappear. Ten days after treatment was discontinued shadows reappeared in the radiograph, but the improvement in clinical condition was maintained. Remissions have not been obtained in this disease with other therapeutic agents and it was felt unlikely that such a regression could have occurred spontaneously. 

Robert de Mowbray.


Three more cases of chronic pulmonary granulomatosis associated with beryllium compounds have been studied with reference to pulmonary and circulatory functional capacity. Despite obvious variations in clinical patterns of disease between patients, certain nonspecific general trends of functional disturbance appear common to most of these patients. They are restricted complemenial air volume, increased mid-capacity-arterial oxygen gradient, hypoxaemia, and hyperventilation on exertion. The complexity of factors contributing to the widened oxygen gradient is discussed. A general quantitative estimate of disability in relation to moderate exercise is expressed in terms of the physical fitness index. Untoward responses to continuous oxygen therapy are recorded.—(Authors' summary.)


The literature is reviewed and it is stated that no case of lipid pneumonia due to industrial exposure has previously been recorded. A case of this condition is reported, in a patient aged 40 who had for 17 years worked at cleaning and lubricating cash registers. The machines were sprayed with a naphtha solvent and then with mineral oil for lubrication, the operation being carried out in a three-sided booth. Clinical and ancillary data are given (suitably stained sputum specimens showed large numbers of globules of mineral oil). The case has been under observation for nearly 4 years, with only moderate deterioration.

L. W. Hale.


The author has examined the workers employed for 10 years or more in the Varnamo timber industry (81 in all). Apart from radiological evidence of calcified primary foci and old pleurisy (6 cases) only 2 men were found to have abnormal signs in the chest: one had asthma, the other chronic bronchitis with emphysma and pulmonary fibrosis. The author considers that exposure to sawdust is unlikely to have been an aetiological factor in either of these cases and that there is no risk of pneumoconiotic changes associated with such employment.

W. G. Harding.


This is a report on 25 cases (11 being fatal) of severe pulmonary fibrosis in men employed at the smelting ovens where bauxite or pure calcined alumina is processed to a fine corundum. These oven workers were exposed for protracted periods to corundum dust, which contains a proportion of Al₂O₃ up to 99·3%, together with small quantities of the oxides of iron, silica, titanium, and sodium. At certain stages of the smelting process the atmosphere is very hot.

It is suggested that this condition is a new industrial disease, for the men so injured were exposed not to aluminium metal but to its oxide, Al₂O₃. The question whether or not lung damage is caused by the inhalation of aluminium dust is considered and the literature reviewed. The pulmonary condition is referred to as the corundum lung. The clinical signs and the radiological findings in the 25 cases here reported closely resembled those described by Goralewski and other observers who recognized the aluminium lung: (1) The disease was of acute onset and made very rapid progress. (2) The clinical signs did not correspond with the radiological picture. (3) In many cases a spontaneous pneumothorax developed. Radiography revealed a fine network of shadows with a marked tendency to shrinkage or collapse of the air cells, in contrast to the nodular appearance in silicosis. Histological sections taken at necropsy showed changes typical of the aluminium lung—thickening of the alveolar septa with some hyaline degeneration of the alveolar walls and a tendency to obliteration of the alveolar spaces by the increase in fibrous tissue. There was, moreover—in contrast to silicosis—no definite sclerosing fibrosis of the hilar lymph nodes. The pigment in the lung was found to consist principally of Al₂O₃. Three cases are described in detail and radiographs are reproduced. The pathology of the condition is discussed. The first known illness began in 1942; the first case was reported in 1945. In Germany, in 1947, as a result of these reports, pulmonary disease caused by aluminium and its compounds was included in the list of occupational diseases for compensation.
INDUSTRIAL SKIN DISEASES


An investigation of the dermatological hazards in the cigar industry was carried out at one very large and two smaller manufacturing plants in the U.S.A. The cigar manufacturing processes, described in considerable detail, call for strict control of temperature and humidity. Mechanization has changed the industry, the various processes being now carried out exclusively by women. The agents responsible for skin affections are tobacco, friction and moisture, machinery (trauma), and dust and vapours. In 1940 in the large plant, eruptions began to appear on the hands of the girls who applied the wrapper layer of leaf and of the examiners. These workers apply gum tragacanth paste with the fingers to minor defects in the cigar. Tobacco sensitivity, observed only infrequently in the industry, and sensitization to other substances, including the paste, were eliminated by patch testing. Observation of the examiners at work suggested that the skin eruptions were caused by the wetness of their hands and the alkaline reaction of the towelling constantly in use. Determinations of the pH of the hands of the affected employees, their towelling, and the paste, indicated abnormal alkalinity of all three. In contrast to these findings, no case of hand eruption occurred in the smaller plants where boric acid was incorporated in the paste and where paper towels were used and then discarded. It was concluded that the alkaline medium, together with constant exposure to moisture, lessened the alkali-neutralizing capacity of the skin and this, “with the keratin solvent and degreasing action of the alkalis, favoured the formation of the dermatitis”. It was more common in the winter, and it was suggested that exposure to the winter air outside the working environment may have been the exciting factor. In 9 years 1,065 cases were seen, the majority being mild and only rarely necessitating absence from work; during one year the hand eruptions were the cause of only 0.04% of all visits to the works surgery. A. J. Amor.


The authors find solar dermatitis common among outdoor workers, and note that fluorescent lighting may provoke or aggravate the condition in indoor workers. These dermatoses cannot be classified according to the activating wave-length of the radiations or according to age of onset. Classification into three groups is suggested, the first consisting of polymorphic light-sensitive eruptions, the second of urticarial rashes, and the third of rare types, such as hydraaestivale. Periods of immunity may be observed in patients suffering from these dermatoses, and different regions of the body may not be equally sensitive. The type of reaction may change in the same patient. Patch tests to weeds did not suggest that they played an important part in light sensitization. Histological appearances are described at length.

Injection of gonadotrophic hormone from pregnant mares’ serum gave promising results in male patients under 50 years of age. John T. Ingram.

ENVIRONMENT


This is believed to be the first report of Q fever on the eastern seaboard of the United States. The outbreak occurred early in 1948 amongst the personnel employed in a plant processing wool and goat hair; the origin of the outbreak could not be determined. The highest incidence occurred in the dyeing and warehouse department among the mechanics. The office workers escaped and there were no known cases amongst the contacts or families of the workers. There was no relation between the occurrence of cases and the ages of the workers, nor was there any difference in severity of disease in young and old.

The outbreak was recognized through the routine testing of serum specimens from one patient with an upper respiratory illness. The episode points to the importance of testing, with the several viral and rickettsial antigens, sera from patients with undifferentiated infections in the upper respiratory tract or with pneumonia. Tests with the Q fever antigen are especially important when the patient is known to have had contact with raw wool, meat, or milk, or with sheep, goats, or cattle. The complement-fixation test was used in a survey of 152 workers employed in the factory; in 48 there were titres of 1 in 32 or higher, and in 19 titres of 1 in 128 or higher.

Although the disease in this episode was mild, it caused great loss in man-hours. The authors feel that Q fever should be recognized as an occupational hazard and should be made a reportable disease; they also suggest preventive measures directed largely towards dust control. In relation to this episode it is reported that not all wool was scoured and that the plant operations produced a great amount of dust. W. H. Bradley.


In relation to the eye, nose, and throat irritation caused by the Los Angeles “smog”, several experiments have been performed. Although the maximal concentration of SO₂ found in the Los Angeles atmosphere is far less than that producing irritation of the ocular mucosa, it is known that the atmosphere contains a large number
of other materials (dust, oil fumes and sodium chloride in aerosol form) apart from the more obviously toxic organic and other compounds. It appeared possible that the limitation of irritation to the eye, nose, and throat might be due either to the slow build-up of an irritant concentration by surface adsorption or to agglomeration of the particles to such a size (5 to 10 μ) as to prevent penetration to the lungs. Accordingly, 84 subjects were exposed for periods of 10 minutes to various concentrations of known eye irritants, with or without the addition of particulate matter (carbon black) or aerosols of motor oil or sodium chloride. Such additions always increased the irritant effect of SO₂ and SO₃.

Low concentrations of SO₂ and SO₃ not causing irritation of the eye after 10 minutes did cause definite irritation of eye, nose, and throat when particulate matter or oil or sodium chloride aerosols were also present. Atmospheres containing 0.2 to 0.3 p.p.m. of carbon black (containing 10% of diesel oil) or aerosols of used motor oil (1.3 to 2.2 p.p.m.) were by themselves irritant. On the other hand, fresh mineral oil aerosols even up to 300 p.p.m. had no irritant effect. It is considered that the eye, nose, and throat irritation during smog days is more closely related to the presence of particulate matter than to the irritant gases and vapours known to be present. The temperature conditions on such days are such as to increase at ground level the concentration of particulate matter discharged into the air. Water sprays effectively remove from the atmosphere particles greater than 1 to 2 μ in size. A decrease in temperature and an increased relative humidity bring about the formation of large droplets and aggregates in sodium chloride aerosols, and this may be an important factor in the production of large particles in atmospheres near the sea. It is believed that if the amount of particulate matter in the Los Angeles atmosphere could be reduced during smog days, then the vapours and gases present would not themselves be irritant.

Derek R. Wood.

GENERAL


This survey of a number of representative catering establishments was carried out to determine how far wartime shortages, structural defects, and other imperfections tended to facilitate the transmission of food-borne infection, and what improvements could be made under present circumstances.

The premises visited included restaurants and cafés catering for the general public (including public houses and a civic restaurant), canteens attached to industrial and commercial firms, and canteens attached to schools. Particular attention was paid to structural conditions, equipment, and methods.

In general, the structural condition was good, though the absence of wall plaster or other smooth finish rendering to the interior brickwork of the wall, especially of the newer buildings, meant that cleanliness could be obtained only at the expense of more time and trouble than if the surfaces had been smooth. Quarry tiles seemed the most suitable floor covering; concrete did not wear well and special asphaltic coverings are not a suitable base for heavy free-standing kitchen equipment. In contrast to wooden floors with or without linoleum, these materials allow of construction which permits free run-off and drainage of washing water. Even where cookers were locally served by hoods, trunking, and extraction fans, the atmosphere was markedly humid and condensation occurred because arrangements were seldom made for the removal of the steam from the dish-washing sink. Condensation could be diminished by making better provision for structural insulation and by the use of open-textured wall and ceiling coverings or finishes. Lighting in general was satisfactory; and sanitary accommodation good. The arrangements for washing and drying the hands were, in many instances, not satisfactory; although in most of the larger premises there was a separate cloakroom for the outdoor clothing of the staff, the arrangements in the smaller establishments were not good.

There were many shortcomings in the equipment. Too often, the working surfaces such as table tops and drainage boards were of wood, only a few having smooth non-absorbent surfaces which could be easily washed and sterilized. Glazed stonework sinks were common and at a number of places the sinks were made of teak. The use of gas geysers was a common method of providing a hot water supply when boiler water was not available; rarely however, was the water from the geyser, when delivered in large quantities, at a temperature above 140° F. This point is of importance because the examination of swabs from washed articles shows that the lowest bacterial counts are obtained from crockery washed in water at a temperature of 170° F. to 180° F., and allowed to drain without wiping. At too many of the premises there was no refrigerated storage space. Cold storage in general was inadequate. The practice of cooking certain foods, especially meats, the day before it was to be eaten was very common; this usage allows spore-bearing anaerobic organisms, which survive cooking, to germinate and multiply overnight, with infection or intoxication next day from the meat. Subsequent heat treatment given in the process of warming up, or of cooking the necessary pastry for pies or pasties, is insufficient to destroy the organisms. The need to cool rapidly meat and milk foods which are cooked some hours before being eaten does not seem to be appreciated. Well ventilated cold or cool rooms, where hot meat, gravies, stews, and other food could be placed for a short time before being transferred to the refrigerator, would be a real help. In those canteen school kitchens where large insulated food containers were used for carrying cooked foods in bulk to neighbouring schools, the containers were washed but there were no facilities for steam sterilization. High bacterial counts are common from containers which are washed in the ordinary way and then dried by mopping out with a cloth. Because warm food is carried out in these containers for possibly long periods of time, it is essential that everything should be done to reduce the numbers of residual bacteria on the inner walls, so that steam sterilization followed...
by drainage without further wiping is essential.

There were less important findings in some places, such as smoking by members of the kitchen staff, and the presence of cats in food-preparing rooms, a practice to be deprecated especially as it is now known that 1 to 2% of dogs and cats carry organisms of the salmonella group. Little was done to prevent the engagement, as members of the kitchen staff, of carriers of typhoid, paratyphoid, and dysentery; while any measures taken to deal with cuts, burns and other septic lesions, or significant illness, seemed to bear a closer relation to the aspect of workmen's compensation than to an appreciation of the risk of the transmission of infection from open wounds to foodstuffs.  

Caryl Thomas.

Canteen Hygiene. Use of Detergents and Chemical Sterilizing Methods for Washing up.  


The author, from the Public Health Laboratory, Oxford, gives an account of an investigation made in a large hospital canteen in order to estimate the efficiency of a proprietary hypochlorite-detergent mixture for dish washing, and to compare its action with that of washing soda.

The methods of washing up used in the canteen are described, and the tests employed in the investigation. It was proved that the recommended routine fulfilled all the claims made for it by the manufacturers and that it brought the standard of cleanliness well within that recommended by the Public Health Service of the U.S.A. The method was found to be excellent provided that the rules for the use of the mixture were strictly followed. The disadvantages of the method are enumerated, in particular its unsuitability for cleansing poor-quality cutlery, and the need for a rigid routine of dosing time.

The method recommended by Knox and Waller in which washing with a detergent is followed by rinsing in hot water was, however, found to be equally effective and to possess advantages over both the above methods.

E. V. Saunders-Jacobs.

Food Contamination from the New Insecticides.  


J. Amer. diet. Ass., 26, 325.

Since 1942 two classes of chemical agents have been introduced as insecticides, the chlorinated hydrocarbons and related chlorinated compounds, and the organic phosphorus-containing compounds.

Chlorinated hydrocarbons rarely cause acute poisoning, but when sprayed on fruit they remain active for long periods and are potential sources of chronic poisoning. In addition, these fat-soluble compounds tend to be secreted in the milk of cows fed on treated pastures, and if contaminated milk or fruit be ingested the chlorinated hydrocarbons may become concentrated in the lipid tissue, causing damage. Thus experimentally chronic intoxication has been produced in animals. So far the tolerance dose over long periods of ingestion has not been ascertained.

The organic phosphorus compounds in common use are hexaethyl tetraphosphate, tetraethyl pyrophosphate and "parathion" (p-nitrophenyl diethyl thiono-phosphate). These insecticides, particularly tetraethyl pyrophosphate, are highly toxic, and may give rise to acute poisoning by an inhibitory action on cholinesterase, producing stimulation of the central and peripheral nervous systems with possible death. Fortunately, these compounds are rapidly hydrolysed in contact with moisture, so that spray residues on plants are usually non-toxic before the food is consumed. No cases of chronic poisoning have been reported.

Among the organic phosphorus insecticides developed in Germany during the recent war is a systemic group. This type differs from others in being taken up by the plant from the soil. Before absorption by the plants, these systemic compounds are non-poisonous, but the plants convert them into toxic insecticidal substances, which theoretically may give rise to poisoning in man. However it is found that as the plants mature the toxicity of the systemic compounds lessens, so that by the time the plants are ripe they are harmless. Experiments are now in hand to determine the effects of acute and chronic poisoning caused by the ingestion of unripe plants contaminated with one of these compounds (octamethyl pyrophosphoramide : "OMP A" : "pestox III"). Until the toxic effects of these systemic insecticides are determined, these products should be employed with great caution.

A. Michael Critchley.

The Idea of the Sheltered Workshop.  


Occup. Therap., 29, 73.

For a long time the employment of severely disabled persons has been a problem to both medical men and social workers. In Glasgow, where industry is predominantly heavy, there is little prospect of obtaining satisfactory work for them along "outwork" lines, so that energies have been concentrated on an effort to set up a workshop to employ some 40 disabled persons, with the possibility of subsequent expansion and the provision of outwork for the house-bound, centred on the factory. This was established on an industrial estate at Hillington because there was a diversity of trade which might provide sub-contracts, the factory could be leased at an economic rent, land was available for further building, and a sheltered workshop established there would operate amidst normal surroundings and conditions as part of the general industrial activity of the estate. A non-profit-making company was formed and an initial sub-contract obtained for a period of 3 years to manufacture electrically-heated blankets. It was arranged that machines should be made with controls that would lend themselves to adaptation to the individual requirements of paralysed men, while benches were constructed so that a chairbound worker could manœuvre into a comfortable working position. Doors were of such a width as to allow the passage of invalid chairs, rest rooms were provided, and special attention was paid to suitable lavatory accommodation for chairbound employees, supporting rails being conveniently placed with overhead trapeze to enable a chairbound patient to make full use of his arms. Ample lighting was provided and canteen facilities were already available on the estate. The factory was opened in 1946 and a 5-day working week of 40 hours was adopted—8.30 a.m. to 12.15 p.m., and
1.15 p.m. to 5.30 p.m., with a 15-minute break for tea at 10 a.m. and 3 p.m.
In choosing workers, consideration was given to the applicant’s capabilities in relation to the work available in the factory, while due weight was given to relevant social considerations and place of residence. Of the 48 men employed 3 had gunshot wounds of the head, 3 of the spine, and 4 suffered from other spinal conditions. Fourteen had organic disease of the nervous system, 3 suffered from heart disease, 2 from nephritis, one from rheumatoid arthritis, one from congenital muscular wasting, and one from cataract following injury. Six had lost one leg, 3 had had both legs amputated, and 5 had sustained severe injuries of a hand or arm. The average age of the men was 32, and 25 of them were married. Four travelled to the workshop in motor chairs and 15 were brought by ambulance. Attendance of the men was regular, absence from sickness and other causes amounted to some 7-5% of the total number of working days.

The output was low in the early months, as was only to be expected from an entirely new and untrained staff, but it became stabilized at a satisfactory level after 8 months and the financial results showed a sufficient margin to justify reasonable confidence in the continued success of the enterprise. The best testimony to the value of the workshop is the striking change which has taken place in the men themselves, the happiness, the enthusiasm, and the sense of corporate life in the workshop being quite unmistakable. K. M. A. Perry.


The tests described in this paper were made at the Lagos Airport in Nigeria during the height of the dry season. Experimental spraying was carried out in two types of aircraft: the “Dove” used for local communications and having a capacity of 400 cubic feet (11.3 c.m.) and the “Wayfarer” used mostly for inter-colonial communications and having a capacity of 1,700 cubic feet (48 c.m.). The test insects were Aedes aegypti and Anopheles gambiae, cages containing the mosquitoes being placed in three situations in the machines—the cockpit, the cabin, and the tail. Two types of aerosol dispensers filled with insecticide were tested, a CO₂-propelled dispenser and a low-pressure “freon”-propelled dispenser.

The results obtained under these conditions suggest that: (1) A. gambiae is more sensitive to the formulae tested than is A. aegypti; (2) a smaller proportion of the mosquitoes occupying the tail of an aeroplane is killed than is the case in the cabin or in the cockpit; (3) the temperature at 10 a.m. in the passenger cabin of a “Dove” recently landed at Lagos was found to be 97 to 105° F. (36 to 40.6° C) and the humidity 60%. Such conditions could hardly be inflicted on passengers for any prolonged period, and the authors therefore recommend that the usually advocated 5- to 10-minute exposure time after spraying should be reduced to a maximum of 3 minutes; they consider, however, that this shortening of the period should be coupled with an increase in dosage amounting to at least 15 g. of a standard insecticide aerosol per 1,000 cubic feet (28.3 c.m.) ; (4) the low-pressure freon-propelled dispenser filled with 0.3% pyrethrin formulation compared favourably with the CO₂ dispenser filled with the insecticide “R.587”, containing approximately 0.4% pyrethrins; (5) in order to produce an adequate kill a dosage of at least 0.06 g. pyrethrins per 1,000 cubic feet should be employed. R. M. Gordon.


Filters of the furnace type made from hog’s hair or from fibre glass were used for experiments. Triethylene glycol 1 oz. (4 ml.) was painted on to the 10-inch (25 cm.) square filter which was then fitted into the middle of a rectangular tunnel having a fan at one end. A culture of Staphylococcus aureus or Serratia marcescens was then atomized on to the outlet side of the filter. A sample was taken from the filter immediately after atomization and was plated out in nutrient agar by the serial dilution technique. Counts were made 24 hours after incubation at 37° C. Samples of the air coming out of the filter were taken at regular intervals with an electrostatic bacterial air sampler.

In control experiments with hog’s hair filters impregnated with purified petroleum oil the average count of Staph. aureus was reduced by 35 to 40%, and that of Serratia marcescens by 95% in 3 hours. Repetition of the experiments with filters impregnated with triethylene glycol gave reductions of 99% plus with either organism.

With the same technique and fibre glass filters impregnated with tricresyl phosphate, the count of Staph. aureus was reduced by 97%, and that of Serratia marcescens by 99%. When filters were impregnated with glycol, the reduction was 99% plus for both organisms. A glass filter impregnated with glycol still gave 99% reduction after 216 hours’ continuous use.

In business premises the filters reduced the count by 75% when 15-minute settling plates were used, but it is not recommended that such filters be employed in schools or offices unless more work has been done. P. A. Nasmyth.


By flying test subjects in an aircraft in which the pilot manoeuvred the machine to simulate the effects of passage through turbulent air, a realistic test for airsickness susceptibility was obtained. This method showed “dramamine” (β-dimethylaminobenzhydryl ether 8-chlorotheophyllinate) to be effective in the prevention of airsickness. Under similar conditions hyoscine hydrobromide in doses of 0.65 mg. was found to be about 10% better as an airsickness preventive. In these tests the distribution of subjects taking placebos and taking the test drug in the aircraft was carefully controlled. Studies on 20 susceptible subjects showed that dramamine was no more effective than the placebo in the prevention of swing sickness.
ABSTRACTS

The side-effects of dramamine, of relatively minor degree, were found in only 8.7% of 266 recipients. The drug had no adverse effects on the ability to perform a complex coordination test or on reaction time. This latter finding was also true of hyoscine hydrobromide, and the only side-effect of the latter was some dryness of the mouth in 15% of 88 subjects.

The authors think that the terms vagotonia and sympathotonia were rarely applicable to subjects on these experiments.

[A good discussion of previous work on airsickness is included.]

K. E. Cooper.


Tests of the absorptive faculty of the walls of dwelling houses were carried out with four common gases: lead tetraethyl, dichlorethene, benzole, and sulphur dioxide. The walls were exposed for varying times to various concentrations of these gases and the amount deposited in them estimated. It was found that the quantity of gas absorbed was directly related to the time of exposure and the concentration of the gas under investigation. Temperature had a definite influence on the amount of deposit, more being deposited at lower temperatures than at higher temperatures, while increase of ventilation and air movement decreased the amount of deposit.

Experiments showed that it was possible to make an alabaster-like plaster which was less porous and less likely to absorb the gaseous toxic materials than the type commonly employed. Another way of preventing absorption of toxic gases by walls which was examined was by means of a covering paint. Oil paints seemed to be more protective than water paints and for practical purposes provide the most efficient protection against the deposit of toxic substances in construction materials.

E. W. Collis.


Meat-packing workers engaged in work in the freezing chambers at a temperature between —3° and —30° C. were investigated for allergy to cold. About half of the 100 studied complained of dyspnoea, rhinitis, headaches or limb pains when entering the chambers, but only one-quarter showed objective signs. Most of these (22 out of 27) were found to have an increased number of eosinophil cells in their nasal smear on exposure. The symptoms appeared in subjects with and without an allergic history, and were improved in all cases by antihistamine therapy.

H. Herxheimer.


The authors report 7 cases of virus hepatitis (3 in 1946-7 and 4 in 1949) which occurred among personnel handling blood and blood derivatives at the Cutter Laboratories, Berkeley, California. The course and clinical features conformed to the usual type. No case occurred in other departments and none in the families of the infected workers. In contrast with the occurrence of 7 cases among an average of 700 employees, the annual average number of cases of infective hepatitis in the general population was as follows: Berkeley (population, 100,000) 5, Oakland (400,000) 7-8, and Alameda County (700,000) 21-4. These facts strongly suggest that the infection of the workers was associated with their employment. Various possible routes of infection are discussed: oral (direct or via the hands), intranasal (when the products have been desiccated), conjunctival, through pricks and scratches, and through the intact skin. The authors point out that the disease among those who handle human blood samples and blood derivatives should be considered as an occupational risk and accordingly deserve compensation. They review the British and American literature on the subject of accidental infection among doctors, nurses, and technicians. The preventive measures suggested are careful washing of the hands, the wearing of rubber gloves, and the prophylactic treatment of exposed workers with "periodic injections of immune globulin". Various means of sterilizing plasma are briefly discussed.

L. J. M. Laurent.


A study was made to determine whether an industrial hazard of cancer does or does not exist in the manufacture of carbon black, a commercially produced form of soot. In a company employing on the average 476 carbon black workers annually, 1 man died of cancer of the stomach during a 10-year period, 1939 to 1949, and cancer of the skin developed in 2 other employees during a 5-year period, 1944 to 1949. The observed death rate from cancer among carbon black workers, 0.21 per thousand per work year, is low as judged by the rates observed among other comparable groups of the industrial and general population. The morbidity rate of 1.0 new case annually per thousand workers per work year is likewise low and no higher than expectancy. The available clinical and epidemiologic evidence indicates that the carbon black worker faces no more than the ordinary risks of cancer encountered by other groups of the male working population. —(Author's summary.)


In 6 out of 9 rabbits receiving repeated injections of beryllium intravenously osteogenic sarcoma developed. This finding confirms the work of Gardner and Heslington. Very little beryllium was present in the tumours, which could be transplanted to the anterior chamber of the guinea-pig eye.

D. M. Pryce.

Non-industrial poisoning by carbon tetrachloride was the unsuspected cause of nausea, vomiting, diarrhoea, and anuria in 12 patients out of 5,000 admitted to the U.S. Marine Hospital, Staten Island. The drug had either been swallowed or inhaled, but the fumes proved dangerous only in persons under the influence of alcohol. A lower nephron nephrosis with fatal azotaemia developed, unless the patient could be tided over the critical anuric period of about 12 days—the recovery time for the damaged tubular epithelium—by a regimen of restriction of salt-free fluid intake to 800 ml. daily and removal of excess non-protein nitrogen from the blood. Of the various methods recommended, only peritoneal lavage was tried: a fluid containing (in g. per litre) sodium chloride, 6·0; potassium chloride, 0·2; calcium chloride, 0·1; magnesium chloride, 0·1; sodium acid phosphate, 0·05; sodium bicarbonate, 2·0; sodium citrate, 1·57; and dextrose, 20·0, was used in amounts of 30 litres daily. Penicillin, 10 units to each ml., and heparin 1 mg. to each litre, were added. Of the first 12 patients 5 died; of the next 14 “approximately 80%” [presumably 11] recovered.

L. H. Worth.


A series of 200 cases of meniscectomy performed on miners is reviewed. Re-calculation of data given in the paper shows that the relation of observed to expected injuries to semilunar cartilages expressed as a percentage is 172 in coal-face workers, 69 in workers employed on roads, 50 in putters, 90 in safety men, firemen, and charge-men, and 32 in craftsmen. Of the whole group, 94% returned to their pre-accident work and 6% (11) were unfit to resume their pre-accident work. Injuries are more common in young adults (though this may be because they are doing the heaviest work). The average period of disability was just over 80 days after medial and lateral meniscectomy and nearly 200 days after bilateral meniscectomy. Young miners made the quickest recovery. The period of disability is not affected by the nature of the individual miner’s work. Whilst minor degrees of arthritic change do not seriously affect operative results, results of meniscectomy in joints affected by severe arthritis are discouraging. Osteo-arthritis or associated ligamentous injury causes permanent partial disablement.

T. A. Lloyd Davies.


A series of 184 cases of myocardial infarction occurring among 30,000 employees during a 20-year period ending December, 1948, has been analysed. After the first infarction 8% died immediately, but of the remainder 86% returned to work. The period of convalescence varied from 2 to 6 months and care was taken to rehabilitate the patient, when necessary, either by giving temporary part-time employment or by changing the nature of his work. Of the total number 72% were alive at the end of 1948, and 51%—or 71% of those living—were still working. The presence of concomitant hypertension affected adversely the chance of a man returning to work and his expectation of life. None with hypertension lived more than 8 years, while 5 without it were alive more than 10 years later. C. W. C. Bain.