BOOK REVIEWS

A TEXTBOOK OF THE PRACTICE OF MEDICINE

By various authors
Edited by Frederick W. Price. Seventh edition (Oxford University Press. 1946. Pp. 2034. £2 2s.)

To have produced yet another new edition of 'Price's Medicine' during war is a wonderful achievement, especially in view of the great amount of new material included. The various authors have brought their sections up to date. The use of penicillin are well covered. The thiourea and thiouracil treatments of hyperthyroidism, the latest diagnostic techniques in Addison's disease, thyroidectomy sections up to recent developments; the exhibition of drugs including croton oil! One author deprecates the giving of milk to cases of vascular thrombosis because of the well known effect of calcium on the coagulation of blood. Another confides to us that he has always been disappointed by mistletoe. When readers as ignorant as the present reviewer have never known that any substance of value in therapeutics can be obtained from mistletoe, such a statement constitutes a mild psychic shock. The volume is still handsome, and the quality of the paper and print very good indeed. The only evidence of the difficulties encountered in war-time production is the slight increase in misprints; these are particularly noticeable in the section on diseases of the skin. As the editor states, the sale of this book abroad almost equals that in the United Kingdom. He rightly regards this as evidence of the international prestige of British medicine, but all will agree that medicine owes him, and his devoted collaborators, a great debt of gratitude for enhancing that prestige.

D. H.

BRITISH AND FOREIGN OFFICIAL PUBLICATIONS

TOXICITY AND POTENTIAL DANGERS OF AEROSOLS AND RESIDUES FROM SUCH AEROSOLS CONTAINING THREE PER CENT. DDT


Two aerosols samples containing respectively 2.5 and 3.0 per cent. of DDT were first used, but later experiments were restricted to the latter since no appreciable differences were noted. Single exposure to high concentrations in a sealed chamber caused nasal irritation, restlessness, tremors and death in convulsions for some mice, particularly the younger ones. Rats were less affected and guinea-pigs less still; dogs only showed signs referable to the constituents of the aerosol itself. The DDT concentration was 26.4 to 32.9 mg. per litre and was maintained for 45 minutes.

Repeated daily exposures, for 45 minutes a day, over a period of 8 weeks with 33 mg. DDT per litre of air caused no injury to dogs beyond the symptoms of narcosis by the solvent, and exposure of monkeys, in the same conditions, for 22 weeks caused no signs of DDT intoxication or liver damage. When exposed three times daily, dogs died of pulmonary injury due to the solvents. The residue of the aerosols from which the propellant was omitted was easily absorbed through the skin of mice and 0.1 ml. was usually fatal by this route. Even applications of 0.012 ml. (2 mg. of DDT) were toxic and cumulative in under 3 weeks. Dogs died only after 12-21 weeks of daily repeated skin applications and, in contrast to the mice which died in convulsions, they died in severe depression, showing at autopsy jaundice and depletion of the fat depots only. The application of DDT here was massive.

Instillation of DDT aerosol into the conjunctival sac in rabbits caused irritation due to the solvents. Similarly local irritation followed subcutaneous injections, and only minor DDT intoxication resulted even after 200 mg. per Kg. were used.

Autopsy findings in general showed fatty degeneration of liver and kidney cells, and minor changes in the anterior horn cells of the mice. In those experiments the concentration of DDT put up was 3000-4500 times that usually used for entomological purposes, which is 0.004-0.001 mg. per litre. There is not likely to be danger to human beings from skin contamination under these conditions, but might occur from careless handling while filling aerosol bombs.

J. N. Agate.

REPORT ON AN INVESTIGATION INTO DUST AND VENTILATION CONDITIONS IN THE COPPER MINES IN NORTHERN RHODESIA, WITH PARTICULAR REFERENCE TO SILICOSIS.

By J. de V. Lambrechts, M.Sc. (Government Press, Lusaka. 1945. Pp. 42. 2s. 6d.)

This work comprises a study of environmental and technical considerations in four copper mines and one
mine producing lead and zinc. The environmental study includes chemical analyses (a) of rock samples from working-places, (b) of dust samples from the sides and roof of airways, and (c) of airborne dust samples collected on filter paper. (The country rock was mainly quartzite, granite and sandstone.) X-ray diffraction equipment was not available, so that the free silica figures are possibly inaccurate, and in the case of airborne samples this estimation was not attempted. With this exception figures for total and free silica are given; while the free silica content of rock samples varied from 32.9 per cent. to 71.8 per cent., that in the settled-dust samples was from 22.6 per cent. to 53.6 per cent.

In the dust study the Kotze konimeter was mainly used, and the Thermal Precipitator occasionally. It is stated that although the T.P. is an instrument of precision, its bulk and slow working-rate are drawbacks; the konimeter enabled a much larger number of working-places to be visited and this should more than compensate for the short sampling-time and any lack of accuracy in counting. Slides were treated by the standard (Ignition-Immersion-Ignition) treatment of the Union Mines Department. Good correlation was obtained between the konimeter and T.P., and a curve is given (fig. I)

\[ \text{Fig. 1.} \]

from which konimeter counts may be converted into approximate equivalent T.P. counts, provided that the particle-size grading is of the order found in this survey, and considered by the writer typical for wet or damp mines. It is indicated that correct interpretation of konimeter counts, especially high counts, is only possible by some such correlation, e.g. that a konimeter count of 1500 p.p.c.c. is not merely three times as bad as one of 500 p.p.c.c., it is about 4.4 times as bad.

Lambrechts deprecates the giving of average dust concentrations for a mine because (a) the averaging of very high and very low figures is arithmetically unsound, (b) the kornimeter figures for the safe places, the majority, with a few unsafe ones tends to mask the latter, though they may be causing most of the silicosis. The Standard of Permissible Dustiness suggested is a maximum of 200 particles per c.c. (konimeter).

It is stated that the chief dust-risks in order of importance, arise from:

(I) Primary Blasting. It is recognized that this should be dealt with on the usual lines, i.e. primary blasting only at the end of shift, followed by thorough ventilation to exhaust dust, and an adequate re-entry time.

(II) Secondary blasting, which in Rhodesia goes on intermittently throughout shifts, to break up very large pieces of rock to a size convenient for handling. This should be dealt with by specialized ventilation and use of water-blasts.

(III) Rock drilling. Axial waterfeed pneumatic percussion-drills are almost solely used, and a number of important observations on the use of fronthead-vented drills is given, thus (Table I).

<table>
<thead>
<tr>
<th>Rockdrill</th>
<th>Konimeter average p.p.c.c.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhodesian Mines</td>
<td>Non-vented</td>
<td>1210</td>
</tr>
<tr>
<td>Witwaters-rand</td>
<td>Vented</td>
<td>300</td>
</tr>
</tbody>
</table>

Vented drills reduce to a minimum the blowing of air as well as water down the channel in the drillsteel; a new non-vented drill may create ten times the dust that a new vented drill does; a vented drill without auxiliary ventilation produces about the same dust that a non-vented drill does with 1700 cu. ft./m. of ventilating air. (N.B. In New York State a statute governs the amount of ventilation to be supplied when rock-drilling: this amount depends on the relative rates of water and air flow through the drillsteel—the more air through the steel, the more ventilation required.) The writer suggests that 'an adequate flow of water through the steel should be defined as, at a water-pressure of 15 lbs. per square inch for vented, and 30 lbs. for non-vented drills.

Vertical-drilling stopers are deliberately designed to pass air up the drillsteel with the water, and have the additional disadvantage that they atomize the falling sludge-water from drill-holes, giving konimeter counts of 1500-5000 p.p.c.c. (3500-20,000 p.p.c.c. T.P.). The 'impact dust' from these machines can be minimized by fronthead venting, and the 'atomized-slug dust' by directing the main exhaust port forward instead of backward (thus blowing the sludge away before it encounters the highest-velocity air at the port). Tables are given showing that the introduction of fronthead venting and changing the direction of the main exhaust port have resulted in 60-70 per cent. improvement.

(V) Ore-transporting (mechanical-scrappers, hoppers, shaft loading boxes). These should be provided with adequate exhaust ventilation.

**Ventilation.** Fans are used; it is suggested that (a) the total air-circulation in the mine and (b) the rate of air-movement in each working-place, should be ascertained; and that dust-sampling results should decide whether ventilation is adequate.

**Thermal Conditions.** The relative humidity in working places is generally over 95 per cent. Curves are given showing rise of temperature with increase of depth. Attention is drawn to the conflict between the tendency to use water freely to minimize dust; and to use it sparingly to avoid humid conditions. No solution of the difficulty is offered.

*Work in Surface Operations* is considered (it is of interest that sidero-silicosis has occurred in drillsteel sharpeners on the Rand); and a section containing proposals for further legislation concludes this extremely interesting and instructive report.

_L. W. Hale._
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