

K-171(-100) 1975

R&S 134327

An International Journal published for the
British Industrial Biological Research Association

CONTENTS

RESEARCH SECTION

- Long-term toxicity of indigo carmine in mice (Jean Houson, I. F. Gaunt, Ila S. Kiss, P. Grasso and K. R. Butterworth) 167
- Saccharin: Lack of chromosome-damaging activity in Chinese hamsters *in vitro* (G. F. van Wente-de Vries and M. C. T. Krugten) 177
- Short-term toxicity of isoamyl salicylate in rats (J. J.-P. Drake, I. F. Gaunt, K. R. Butterworth, Jean Houson, Joan Hardy and S. D. Gangolli) 185
- Studies on degraded carrageenan in rats and guinea-pigs (P. Grasso, S. D. Gangolli, K. R. Butterworth and M. G. Wright) 195
- Studies on the metabolism of dimethylnitrosamine in the rat. I. Effect of dose, route of administration and sex (J. C. Phillips, B. G. Lake, Christine E. Heading, S. D. Gangolli and A. G. Lloyd) 203
- Aflatoxin B₁ hydroxylation by hepatic microsomal preparations from the rhesus monkey (R. I. Krieger, A. S. Salhub, J. I. Dalezais and D. P. H. Hsieh) 211
- A procedure for the extraction and estimation of rubratoxin B from corn (A. W. Hayes and H. W. McCain) 221
- Absorption, distribution and excretion of [¹⁴C]CTAB, a quaternary ammonium surfactant, in the rat (R. Isomaa) 231

see 232 for NAME

SHORT PAPERS

- Effect on guinea-pigs of feeding nitrosomorpholine and its precursors in combination with ascorbic acid (F. J. Ahin and A. E. Wasserman) 239
- Mutagenic evaluation of an alcoholic extract from γ -irradiated potatoes (H. V. Levinsky and M. A. Wilson) 243
- Induction of cholangiocarcinoma following treatment of a rhesus monkey with aflatoxin (T. B. G. Tilak) 247

REVIEW SECTION

- Environmental factors in the origin of cancer and estimation of the possible hazard to man (H. B. Jones and A. Grendon) 251

Continued on inside back cover

ISSN 0015-6266

FCTRAY 13(2) 167-306 (1975)

R&S 134328

Photocopy
linked

Photo 275-276
Photo abt 287-3
2874
2876
2878
Photo page 247-8+9

have been augmented by others from Sweden and Germany and also by one case in the U.S. (Kneave & Harry *loc. cit.*) have provided full details of the latter patient, who died when 71 years old and who had been for 20 years a process worker engaged in the polymerization of vinyl chloride.

Because of the long periods of exposure to which this and the other haemangiosarcoma patients had been subjected, it seemed likely that the cancer could be attributed to prolonged and persistent exposure to low levels of vinyl chloride. However, the possibility that the tumours arose as a result of brief periods of high-level exposure many years before cannot be altogether dismissed. All the American cases reported in detail had at one time been "pot cleaners", and Block (*loc. cit.*) makes the interesting observation that in this capacity they were, in their early years in the PVC factory, required to enter large polymerization tanks, approximately 10 ft high and 6 ft in diameter and with a 2-ft oval opening in the top, in order to chip the reaction residues from the walls. The potential for exposure was particularly great in the early years, because the residue often contained pockets of trapped gas which was liable to be released literally into the cleaner's face during the chipping operations. The subsequent development of improved cleaning techniques and stricter attention to industrial hygiene measures, including the use of respirators, has undoubtedly reduced this type of exposure considerably in more recent years, but it remains to be seen how significant this factor alone may have been in the induction of haemangiosarcoma.

Meanwhile, a recent paper (Monson *et al.* *Lancet* 1974, II, 397) has extended the question of vinyl chloride carcinogenicity beyond the narrow confines of haemangiosarcoma. It has already been remarked (*British Medical Journal loc. cit.*) that the apparent carcinogenicity of vinyl chloride would probably have been much less readily recognized if the resulting tumours had been of a more common type. The possibility that vinyl chloride exposure may also have an effect on the incidence of other forms of cancer was not lost on Monson *et al.* (*loc. cit.*), who carried out a proportional-mortality analysis of the 161 deaths recorded between 1947 and 1973 among past and present workers in the Louisville vinyl chloride polymerization plant associated with the first haemangiosarcoma reports and in the same company's production plant for vinyl chloride monomer. The mortality patterns for the two plants were similar, so all the deaths were considered together. The survey revealed that the number of deaths due to cancer of any type was 50% higher than the number to be expected on the basis of the relevant figures for the comparable section of the whole U.S. population. The highest excess over expected mortality was found in the deaths from cancer of the liver and biliary tract, and the incidence of tumours of the brain was also unexpectedly high, as to a less marked extent was that of lung tumours. The excess incidence of fatal cancer was seen mainly in men who died before the age of 60 years. Also observed was a clear trend in the time pattern of the ratio of observed to expected deaths. No excess of deaths due to cancer was observed in the workers dying before 1965, but subsequently the proportion of these deaths increased and since January 1970 cancer has accounted for over twice as many deaths as would have been expected. While the inherent drawbacks in this type of study must not be overlooked, this report does provide an indication that some forms of vinyl chloride exposure may induce tumours in organs other than the liver.

[JAMES BIRRA]

R&S 134330

During the heavier burst of Barry & I saw the commonism I Children possible than a lead poisoning due, in part, to the in the home (Barry & Monson seems likely to be more in children vulnerability to be able for comparison

Normal lead intake

The lead intake derived partly from food intake of a child so that on the basis of adults the normal (King, *loc. cit.*) from King, *loc. cit.* rather less than child. As regards the 24-hour average about 6 m³. Take free from hazard the revised estimate, namely 100-140 the daily lead intake for the latter value. Production, Springfield, represents 90-100 mg by a 15

This level was gastro-intestinal (King, *loc. cit.*) has been reported by environmental Health the European 1973, 209, 1204 an average reference indicated that