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Dermatitis associated with the wearing of a new pair of spectacles has been attributed to ethylene glycol monomethyl ether acetate used to cement the nose pads to the frame (BIBRA Bull. 1972, 11, 96). Further examples of allergy to hearing aids, the frames of sunglasses, ball-point pens and shoe resins containing cellulose esters have now been investigated.

Six patients with allergic contact dermatitis attributed to cellulose ester plastics were subjected to patch testing with the various components of the plastics. This demonstrated that three of the patients were allergic to resorcinol monobenzoate, which is incorporated into plastics as an ultraviolet absorber. Two others were allergic to Solvent Yellow 3 (C.I. (1956) no. 11160) in a black dye, and one of these was also sensitive to Solvent Red 26 (C.I. (1956) no. 26120) in the same dye and to *p*-tert-butylphenol, an antioxidant. One patient reacted to the ethylene glycol monomethyl ether acetate used as a cement.

The authors point out that the ageing of cellulose plastics and their exposure to ultraviolet radiation could result in the formation of new compounds, such as 2-hydroxybenzophenone derivatives from resorcinol monobenzoate and phenyl salicylate. Thus, at least in theory, allergic contact dermatitis could be induced by a decomposition product (see p. 494). Coating articles with a polyurethane film has been shown to be a practical method of preventing some cases of dermatitis.

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2500. TWENTY-FIVE YEARS OF VINYL CHLORIDE

Kramer, C.G. & Mitchler, J.E. (1972). The correlation of clinical and environmental measurements for workers exposed to vinyl chloride. *Am. Ind. Hyg. Ass. J.* 33, 19.

Prolonged exposure of rats to vinyl chloride (I) at an atmospheric level of 50,000 ppm has resulted in tumours at several sites (BIBRA Bull. 1972, 11, 41), while at 20,000 ppm liver damage and reduced spleen weight have been observed (*ibid* 1965, 2, 649). In man, no adverse effects were found after exposure to 500 ppm for 7.5 hr (*ibid* 1970, 2, 307) although various other studies have indicated that under certain circumstances industrial exposure to I may be associated with angioneurosis, acro-osteolysis, neurasthenia, circulatory disturbances and hepatomegaly. Vinylidene chloride (dichloroethylene; II) has caused mortality and weight loss in animals continuously exposed for 90 days at levels of 5 and 15 ppm, and hepatic and renal damage at higher levels (*ibid* 1968, 1, 295).

The present study is an assessment of the chronic effects of industrial exposure to I and to small amounts of II in 93 men employed for up to 25 yr in two plants using I in polymerization processes. In the case of the most heavily exposed individuals, the time-weighted average concentration (TWAC) of I in the early part of their careers was approximately 300 ppm, although overall the mean TWAC varied from 155 ppm when the study was initiated in 1950 to only 10 ppm at the end. At this latter stage, II was frequently detectable only in trace amounts, and practically always below 5 ppm.

The exposed men differed in certain aspects of medical history from employees in other departments, but none of these differences was re-

2501. A USEFUL II

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flected in final diagnostic categories and no exposure-related effects on general health could be identified. On the other hand, when the technique of stepwise multiple linear regression analysis was used to assess the significance of variations in 21 clinical parameters studied during regular medical examinations, five parameters—systolic and diastolic blood pressures, β -protein, bromsulphthalein and icterus index—appeared to be positively correlated with TWAC and dose and one (haemoglobin) was negatively correlated. The first four parameters also correlated with obesity and the first two and haemoglobin with age. All the regression models for these variables were significant at the $P=0.001$ level, except the icterus index model which was significant at the $P=0.03$ level. However, neither the blood pressures nor the haemoglobin values were outside normal limits, and the significance of a change in the β -protein ratio is unknown. Only the increases in icterus index and bromsulphthalein gave some cause for concern, suggesting that liver function might have been affected after prolonged exposure to I at a TWAC of approximately 500 ppm. One of the most severely affected men had a history of hepatitis prior to exposure, indicating that prolonged contact of such individuals with I may be undesirable.

The techniques used in this study are of general significance, and are offered as a possible aid in the validation of industrial hygiene standards.

[In line with this study, the American Conference of Governmental Industrial Hygienists has lowered the threshold limit value recommended for vinyl chloride from 500 to 200 ppm. That for vinylidene chloride however, remains at 200 ppm, on the basis of an unpublished 1955 study which showed no adverse effects in animals chronically exposed to an atmospheric concentration of 1000 ppm.]

NATURAL PRODUCTS

2501. A USEFUL TEST FOR FOOD ALLERGY

Haddad, Z.E. & Korotzer, J.L. (1972). Immediate hypersensitivity reactions to food antigens. Detection of human IgG antibodies in vitro and exploration of immunologic mechanisms using the rat mast cell system. *J. Allergy* 49, 210.

A study was made of the rat mast cell degranulation test using the sera of 25 patients (ranging in age from 13 months to 29 yr) who had a clear-cut history of immediate hypersensitivity reactions to milk, eggs, shellfish, other fish, walnuts, peanuts or chocolate. The reactions were marked by symptoms ranging from urticaria to anaphylactic shock, and occurred within minutes of ingestion of the offending food.

The test was carried out by incubating the test serum with equal aliquots of a rat mast cell suspension and a specific antigen (peanut, chocolate, egg and so on, obtained in concentrations of 10 $\mu\text{g}/\text{ml}$) for 3 min. The test was deemed positive when the percentage of degranulated mast cells was more than 2.5 times higher than that seen in control

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