

CORRESPONDENCE

TO THE EDITOR,

7th December, 1946.

NITROBENZENE DANGERS

In my Wilbur Wright lecture in May, 1946, I mentioned the use of a china clay coating on wind tunnel models, subsequently sprayed with nitrobenzene, as an effective means of making visible the demarkation between the laminar and turbulent parts of the boundary layer. It has since been pointed out by the Chemistry Division of the R.A.E. that nitrobenzene is highly toxic. I quote the relevant paragraph from their report:—

“Nitrobenzene is one of the most toxic substances known. Sir Thomas Legge, Medical Adviser to the Trades Union Congress and late Senior Medical Inspector of Factories, gives the ‘maximum allowable for prolonged exposure’ to nitrobenzene vapour as 1/500th part per 10,000 parts of air—equivalent to 1 part in 5 millions of air. The same toxicity is given by Fieldner, Katz and Kinney. This makes nitrobenzene the most toxic substance known, and 5 times as toxic as phosgene and 500 times as toxic as carbon monoxide. Henderson and Haggard give the toxicity as 1 to 5 parts per million, the same as phosgene. We do not think that this American figure would be acceptable to our Home Office.”

It is evidently desirable to avoid the use of nitrobenzene, and this letter is written to give the facts a wider circulation. Fortunately other substances can be used, it being merely necessary to choose one which evaporates slowly and whose refractive index is near that of the china clay crystals. Substances which have been suggested, in order of increasing slowness of evaporation, are ethyl benzoate, methyl salicylate, ethyl salicylate, safrole, chloronaphthalene, Iso safrole, and eugenol, and some of these are doubtless quite safe.

One can also use the technique devised by W. E. Gray at R.A.E., in which the model, preferably black, is wiped with a rag carrying an oil such as kerosene. The differential evaporation of the oil shows the turbulent region quite well under suitable illumination, although the contrast is nothing like so striking as it is with the china clay method.

Yours faithfully,

ERNEST F. RELF, C.B.E., F.R.S., Fellow.

BOOK REVIEW

Human Factors in Air Transport Design.

Ross A. McFarland. McGraw-Hill Company, Inc., New York and London, 1946. 670 pp. \$6.50.

The successful development of any machine cannot leave out the ultimate object of that machine, its use by man. The human factor plays an increasing part with the increasing use of the machine. In the early days of the motor car, for example, the human factor was neglected. Now, and rightly so, the human factor has become dominant, from the provision of fool-proof devices, ease of driving, and reliability, to the comfort of passengers.

These factors have long been recognised in the development of aircraft, but the effort to solve the problems involved has been somewhat spasmodic in the past and certainly not