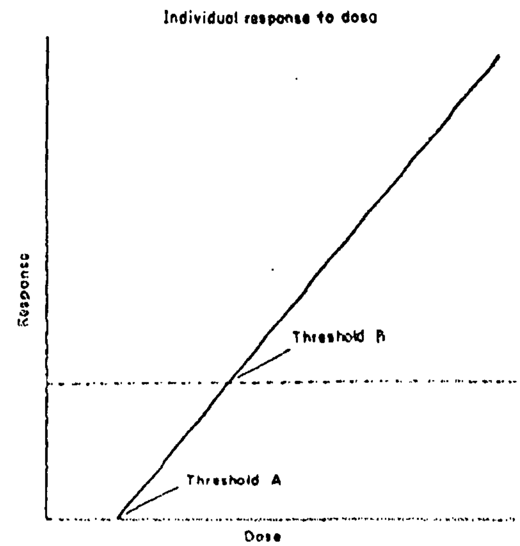

FIG. 1. Individual response to dose.

different threshold dose and a different slope. A particular population under study is represented by a family of dose-response lines centred around the line for the average man.

In a real population the threshold dose will vary from one individual to another about an average value, as in other medical norms. It is to be expected that the size frequency distribution of threshold doses would be a hump-shaped curve tailing away on either side of the central value, as shown in the Fig. 2a.

In a real field study it is established whether a man has or has not been affected. Exactly when or in what concentration he first developed the characteristic response is usually not known. A graph showing exposure against the total number of people affected by it would be a cumulative sigmoid curve, illustrated in Fig. 2b, derived from the size frequency distribution in Fig. 2a. This tails away down to zero response at zero exposure.

An air quality standard is still associated with a small but non-zero probability of men being affected by the contaminant in question. The risk of people being affected can be made as small as one wishes. Zero risk is the ultimate target and an air quality standard has to be a compromise between the costs of bearing a health risk and the costs of air contaminant control.

A curve was fitted to the data from the textile factory on asbestosis, detected clinically and the exposure in fibre years per cm^3 of all the individuals under study over their years of employment up to 1966. The bottom end of the fitted curve is shown in Fig. 3. The three points relate to three of the groups of workers studied. The exposure