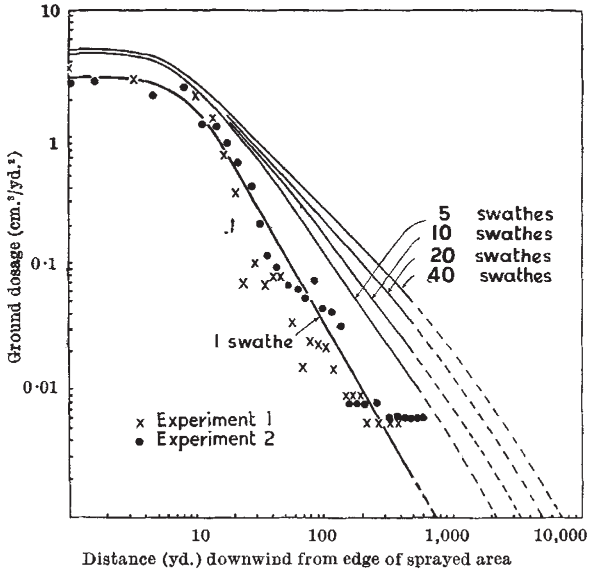

Fig. 1. The variation in ground dosage with distance downwind

example, applications of herbicides in crops, and, using this swathe width and the basic graphs of Figs. 1 and 2, the build-up of dosages has been calculated for various distances downwind from the downwind edge of areas subjected to 5, 10, 20, and 40 successive swathes. An increase in the number of swathes from 1 to 5 increases the ground deposit and the airborne concentration at the downwind edge of the target area by about twice, but a further increase in the number of swathes to 40 results in only a slight further increase. At 100 yd. downwind the swathes are still not additive, the hazard from 40 swathes being only 8–10 times that of one; at 1,000 yd. the hazard from 40 swathes is about 30 times that of one swathe, while it may be inferred that at 10,000 yd. the swathes would be nearly additive, in any event for an involatile liquid.

The results indicate the hazards to be expected for distances of up to a mile or so downwind from a sprayed area. It would be more generally useful to extend the sampling for a few miles downwind, and it is hoped that this will be possible. Variations in droplet size and meteorological conditions are likely to have an effect upon dosage distributions, and their influence is being investigated.

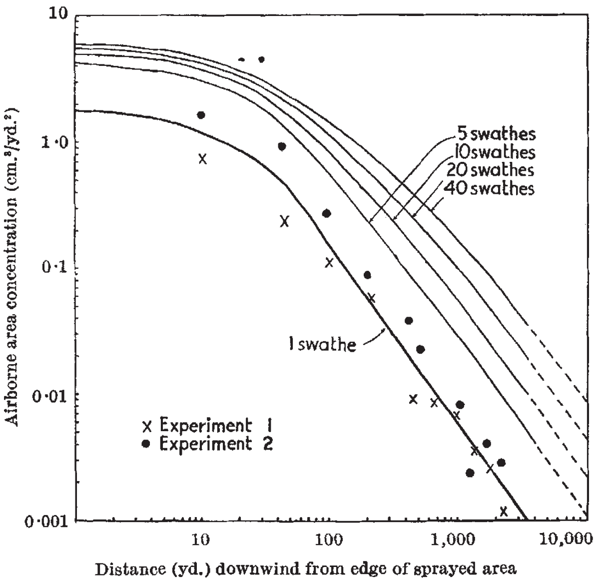

Fig. 2. The variation in airborne concentration with distance downwind

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[1] May, K. R., *J. Sci. Instr.*, **22**, 187 (1945).
[2] Yeo, D., and Thompson, B. W., *Nature*, **172**, 168 (1953).

World Variation in Annual Rainfall

The following analysis is based on the figures given by Conrad[1] which cover 358 stations in the belt 60° N.–60° S. The aim of the work was to test the validity of the statement frequently quoted that rainfall variation is much greater in the tropics than in the temperate regions. The broad result of the investigation shows that this is not strictly true.

Conrad has used the mean deviation as the variance factor, v_a, relating this to p, the mean annual precipitation, so that $v_a/p = v_r$. First, the stations were zoned within 20° belts and the differences of the mean of v_r examined.

Table 1. Values of Probability versus Difference of Means of v_r

	60°–40° N.	40°–20° N.	20°–0° N.	0°–20° S.	20°–40° S.	40°–60° S.
60°–40° N.	—	< 0·001	0·06	< 0·02	< 0·001	>0·2
40°–20° N.	< 0·001	—	< 0·001	>0·2	0·13	0·09
20°–0° N.	0·06	< 0·001	—	0·10	< 0·001	>0·2
0°–20° S.	< 0·02	>0·2	0·10	—	>0·2	0·16
20°–40° S.	< 0·001	0·13	< 0·001	>0·2	—	< 0·02
40°–60° S.	>0·2	0·09	>0·2	0·16	< 0·02	—

Table 1 shows the probability values obtained, and makes clear the fact that there is no significant difference between areas symmetrically placed north and south of the equator. It was therefore permissible to add the respective zones.

Table 2

	Mean of v_r	Variance of v_r	Mean p (mm.)	v_r calculated	n
60°–40° N. and S.	15·5	22·0	799	17·0	125
40°–20°	22·9	110·9	958	16·5	154
20°–0°	19·3	128·8	1,936	15·0	79

From Table 2 it can be shown that the mean of the 40°–20° belt is significantly higher than the other belts, and that 20°–0° is higher than 60°–40°. Conrad has derived an equation connecting v_r and p, and from this v_r was calculated. Columns 1 and 4 in Table 2 stress the fact that it is within the sub-tropics that annual rainfall variation is the greatest.

It was, unfortunately, not possible to test differences of v_r within narrow annual rainfall groups, as the number of stations was too few; but a detailed analysis will soon be made using European and African stations.

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Nov. 8.

[1] *Monthly Weather Rev.*, **69**, 5 (1941).