and 0·05 μgm./insect with DDT, it is not surprising that air virtually saturated with vapours of any of these three insecticides proved to be non-toxic to those insects.

The experiment was arranged as follows: Air was passed through two U-tubes filled with powdered insecticide at a rate of approximately 20 l. in 24 hr. On leaving the first tube, which was kept at a temperature of approximately 80° C., the air would be nearly saturated with insecticide at that temperature; in the second, held at about 18–20° C., the excess insecticide would recondense, leaving the air just saturated at that lower temperature. The vapour was then led through a container held at a temperature of 23–24° C., holding *Drosophila melanogaster* and *Aedes aegypti*. At this temperature the vapour is thus just not saturated. No deaths were observed among insects exposed in this way for 24 hr.

Further investigations have shown that the toxic effect often observed in experiments estimating vapour toxicity is mainly caused by insecticide acquired by the insects in an indirect way, namely, via a condensed film formed on the body of the holding cage. It is thought that appreciable condensation will take place only in a system containing saturated vapour and not in the system described above. The following experiments demonstrate the condensation phenomenon in systems with saturated vapours.

Some 10 mgm. of crystalline insecticide was evenly distributed over the bottom of a Petri dish from a solution in hexane. After evaporation of the solvent, this dish was covered by a sheet of filter paper which was larger than the rim of the dish, and covered by a second, untreated dish placed upside down on the filter paper. Care was taken that neither the filter paper nor the top dish was contaminated during this procedure. Remaining in this position overnight, the filter paper and the top dish were then separated from the dish holding the insecticide. *Drosophila melanogaster* were then exposed to the filter paper (both sides) and the top dish, the result being complete kills in all cases. Exposing metal, plastic and muslin fabric in a similar way also gave high kills of *Drosophila melanogaster* exposed to the condensed films.

The actual amounts condensed on the glass were estimated as follows: the top dishes of the combinations just mentioned (without filter paper this time) were exposed over-night to vapours from the insecticide in the bottom dish. The top dish was then removed and the condensed insecticide dissolved in hexane and dilutions of it applied on to the bottom of clean Petri dishes. Houseflies (*Musca domestica* L.) were exposed to the dry residue and the results compared with those obtained simultaneously with known amounts of insecticide. In this way the condensates of dieldrin were found to amount to a little more than 1 μgm./dm.^{2}; the condensates of DDT and γ-BHC were of the order of a few μgm./dm.^{2}. The condensates actually found on an area of 1 dm.^{2} contained, except in the case of DDT, sufficient insecticide to give a complete kill of 20 female houseflies exposed for 24 hr. With more susceptible insects such as *Drosophila melanogaster* and *Aedes aegypti*, complete mortality was also obtained with DDT.

It can be concluded from this that, in closed systems, the vapours of DDT, γ-BHC and dieldrin may condense on various materials in concentrations of a few μgm./dm.^{2}; this is sufficient to kill susceptible insects. The consequence is that where cases in the literature in general do refer to the 'vapour effect', in fact the effect is of such surface deposits of condensed vapour plus the effect of an eventual condensate directly on the insect.

It need not be stressed that this condensation can be influenced by a great number of variables, and thus that the results provided are of highly questionable value.

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Moisture Content of Whole Bread and Bread Crumb

In order to secure that bread is properly baked, the statutory regulations and laws prescribe maximum permissible moisture content of the baked product. In some countries the law is based on the water content of the whole loaf; in others the maximum permissible moisture content of the crumb only is laid down.

In order to compare the value of these methods in judging proper bread baking, the following sets of experiments were made (in each case with both white and high-extraction flour).

(*A*) Three pieces from one dough were scaled at 580 gm. each, fermented, panned and baked to variable final weight; (*B*) three doughs of various consistencies, and water contents, were scaled at 580 gm. and baked to a weight of 500 gm. in each case.

In all loaves the moisture content of the whole loaf and of the crumb only was determined.

Table 1. Moisture Content of Bread and Bread Crumb

No.*		Weight of baked bread (gm.)	Moisture of crumb (per cent)	Moisture of whole bread (per cent)
A	1	520	45·6	40·8
	2	500	45·4	38·4
	3	481	44·8	36·2
	4	520	45·8	41·0
	5	500	45·8	39·1
	6	480	45·9	36·0
B	7	500	46·1	39·5
	8	500	45·1	37·9
	9	500	44·6	37·6
	10	500	46·2	39·8
	11	500	45·9	37·8
	12	500	44·8	37·3

* 1–3, 7–9, dark wheat bread; 4–6, 10–12, white bread.

The results (Table 1) seem to show that prolonged baking has little, if any, influence on moisture content of the crumb, and that the latter is rather a measure of water content of dough from which the bread was baked than a criterion of adequate baking and proper crust formation.

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