

food intake as a result of supplementing with zinc leads to the suggestion that the lowered fat content of livers in rats of these groups may be due to the lowered intake of same. This, however, is not the case. From the results presented in Table I, it is seen that for a decrease in food intake of 18 and 34 per cent. in groups 2 and 3 respectively there is a corresponding decrease in fat content of approximately—56 and 71 per cent. in the liver. Details will be published elsewhere.

Thanks are due to Major-General Sir S. S. Sokhey, Kt., Director, and Dr. K. Ganapathi, D.Sc., Assistant Director, for their interest in the work.

Dept. of Chemotherapy, V. SADASIVAN.  
Haffkine Institute,  
Parel, Bombay-12,  
September 12, 1949.

1. Sutton, W. R., and Nelson, V. E., *Proc. Soc. Exper. Biol. and Med.*, 1937, 36, 211. 2. Smith, S. E., and Larson, E. J., *J. Biol. Chem.*, 1946, 163, 29.

#### EFFECT OF CONCENTRATION ON TEMPERATURE COEFFICIENT OF DDT ACTION ON INSECTS

THE author (Pradhan, 1949)<sup>1</sup> reported recently:

- (1) That insects' resistance to poisons increases with rise of temperature upto a certain degree and then decreases with any further rise of temperature.
- (2) That the amount of poison reaching the site of action in unit time also generally increases with rise of temperature.
- (3) That apparent rise or fall in toxicity with increase of temperature is the resultant of the above two factors.

These generalisations fitted under one general plan most of the apparently discordant observations of various workers. After sending these to press there appeared a contribution (Fan, Cheng & Glenn Richards, 1948)<sup>2</sup> reporting that "following external application, highly susceptible arthropods show either a positive or a negative temperature coefficient for mortality as a function of DDT concentration or dosage". "At high concentrations this is positive" and "at low concentrations this is negative". They conclude that "at low concentrations DDT

penetrates the arthropod cuticle more effectively at low temperatures".

The present note suggests another interpretation of the phenomenon.

The contact between the chemical DDT and the insect body is likely to initiate some sort of physico-chemical reaction resulting in the death of the latter. At constant temperature the rate of this reaction should be proportional to the concentration of DDT. Further, at any concentration rise of temperature increases the reaction velocity. Temperature may also favour diffusion of DDT into the insect body which may enhance the reaction. Thus according to physico-chemical principles the reaction between DDT and the insect leading to latter's death should have positive coefficient both for temperature and for concentration.

Further let us make a simple supposition that the poison enters the insect system along with its carrier and that the carrier entering per unit time increases with each degree rise of temperature by 100 units (Fig. 1, K). Now if the concentration of

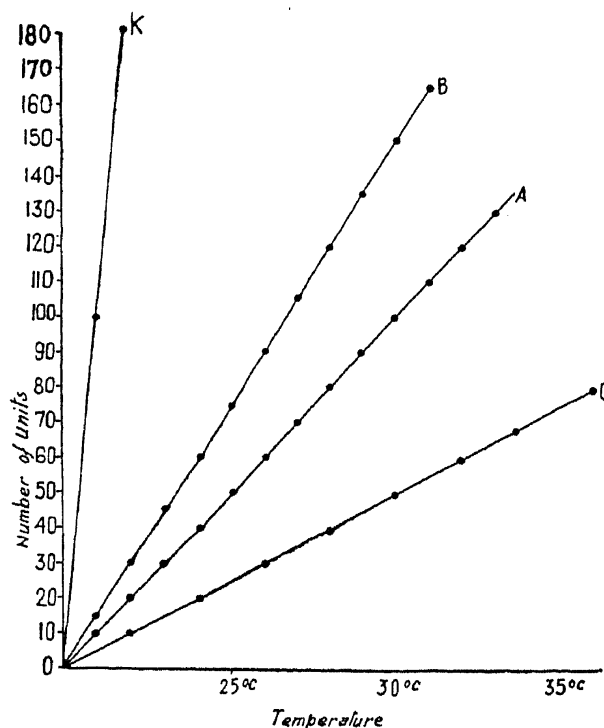


FIG. 1.\* Number of Units (hypothetical) of DDT (A, B, C) and carrier (K) entering insect system per unit time at different temperatures.

DDT in the carrier is 5%, the entry of DDT per unit time will increase by 5 units per degree rise (Fig. 1, C) but if the concentration of DDT in the carrier is 10% or 15% the increase will be 10 or 15 units per degree rise respectively (Fig. 1, A, & B). Further, supposing the entry of an extra unit of DDT can bring about an additional 1%