guished—larva, post-larva, pre-pupa, and pupa. When the diapause factor is present the organism remains normally in the quiescent larval stage for several weeks before developing. Such organisms when irradiated with 300-400 R. Units at the beginning of diapause remain in that condition several weeks longer than the controls. Higher intensities of irradiation (600-700 R. Units) shorten, and may even destroy the diapause factor, allowing the larva to develop at once. Still higher intensities (800-1500 R. Units) destroy diapause and permit of development which is subsequently inhibited.

Organisms in which the diapause factor is no longer present are accelerated by irradiation of 300-400 R. Units. The respiratory rate is higher and the time required to reach the pre-pupal stage is much shorter than in the controls. Six hundred to 700 R. Units inhibit, and 800-1000 R. Units are lethal before the pupal stage is reached.

Irradiation may affect (within limits) the physiological stage, active at the time of the treatment, without affecting following stages. If the physiological stage, dominant at the time of irradiation, is of such a character as to be antagonistic to development, then the response is not only quantitatively different from that of the developing stages, but will be apparently opposite in nature.

6711

Relationship Between Surface Activity of Homologous Carbamates and Effects on E.M.F. and Oxygen Consumption of Frog Skin.

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The effects of different concentrations of methyl, ethyl, n-propyl, n-butyl, i-amyl, and phenyl carbamate in Ringer's solution on the electric potential of frog skin have been quantitatively and comparatively studied.

The skin of each frog used was divided into 11 pieces which were fastened over the mouths of tubes by means of rubber bands, and were bathed in Ringer's solution maintained at a temperature of 25° ± 0.5° C. Determinations of E.M.F. were made potentiometrically. After a preliminary period of approximately 2 hours in Ringer's solution, the skins were transferred to one containing a certain percentage of carbamate and were finally again placed in Ringer's.

Inasmuch as the magnitude of the electric potential of different pieces of skin, from the same or from different frogs, varied widely, but since the electromotive behavior of different skins was qualitatively similar, the E.M.F. in millivolts was transposed to per cent in order to permit of quantitative evaluation of the effect of carbamate. The potential at the time of application of carbamate (at which time electromotive equilibrium had been established) was arbitrarily designated as 100%. In terms of per cent, the skins from the same or from different frogs behaved quantitatively alike.

The normal E.M.F. of frog skin gradually decreases with time. The application of carbamate to skin causes a reversible diminution of E.M.F. which is a function of the duration of application and of concentration. The activity of the members of the homologous series conforms to the rule of Traube which states that the activity of the individuals of a series accords with the ratio 1- 3- 3^2- 3^3 etc.

The relative depression of E.M.F. by a carbamate parallels its action in lowering the surface tension of water. Stalagmometric and tensiometric measurements of the surface tension (air/water interface) were made at a temperature of 25° ± 0.2° C.

Measurements of the oxygen consumption of frog skin as influenced by carbamates were also made using the differential manometer. A diminution of oxygen consumption was found to accompany a decrease in potential. The per cent reduction of E.M.F., however, is generally greater than the per cent reduction of oxygen consumption.