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Narcosis and temperature.

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If the lipoid theory of narcosis is true, we should expect to find the narcotic power of a substance and its oil water partition coefficient similarly affected by changes in temperature. Thus, benzamide and salicylamide should increase in efficiency as the temperature falls, while chloral hydrate should increase as the temperature rises. The experiments here reported were made in 1921-22 at Woods Hole (M. B. L.) and at the University of Buffalo in order to test the question, since recent literature has reported rather conflicting evidence.

My experiments showed that in some cases, (swimming movements of *Loligo* and *Gonionemus,* and heart-beat of *Perophora*) the rule holds at least over the range of concentrations tested. In other instances (swimming of toad and frog tadpoles, *Bdelloura* and *Arbacia* gastrulæ) the rule holds for chloral hydrate at all concentrations, but for benzamide and salicylamide only at low concentrations. In still other cases (cilia of *Nereis* gastrulæ, gill cilia of *Venus* and *Pecten,* tentacles of *Metridium,* chromatophores of *Loligo*) the rule holds only for chloral hydrate; benzamide and salicylamide, instead of increasing in efficiency as temperature falls, regularly decrease at all concentrations tested. With a few tissues (hearts of *Nereis* and *Limulus,* chromatophores of *Fundulus,* cilia of *Arenicola* larvæ) a fall in temperature increases the efficiency of chloral hydrate as well as of salicylamide and benzamide; but as these tissues are easily narcotized by cold alone, the results are of doubtful significance.

From these experiments it would seem that the lipoid theory of narcosis holds true, at least for many tissues, provided that dilute solutions are used. With stronger solutions other factors than lipoid solubility may enter in and so cloud the results.