

Department of Mental Health

Research Division

FROM THE PSYCHOLOGY LABORATORY
DOROTHEA DIX HOSPITAL
RALEIGH, N. C. 27602

February 12, 1969

Dr. Viktor Hamburger
Department of Biology
Washington University
St. Louis, Missouri 63130

Dear Viktor:

Thank you for sending the legless embryo ms. There is a little delay in responding since we did not get it out of the Post Office till Tuesday, February 11. I will pass it on to Ron now--I have made pencil comments in the margin of the ms. itself. I want to make some general comments here in order to facilitate communication in the permissive environment (relationship) that you and I have managed to establish. (Facilitation means that I can't put anything into you that wasn't "already there", so to speak. We are both searching for truth and that is there in both of us, and we can help each other to discover it.)

1. Effects of self-stimulation and other kinds of stimulation on embryonic movement.

In my theoretical review paper to be published soon in the Schneirla memorial volume, I made three essential points relating to your work. (a) The effects of stimulation need not be excitatory only--they could be inhibitory at certain stages, if not all stages. I cited the Russian evidence on the effects of non-visual photic sensitivity (inhibitory at certain stages, excitatory at others). I also cited Ron's re-analysis of his amnion study (i.e. without 10-sec. criterion). I further cited Kuo's amnion study (excitatory on certain movements, inhibitory on other movements). The legless ms. repeats the assumption that stimulation can have only excitatory effects on motility. (b) Regarding qualitative features, in the Gottlieb-Kuo (1965) paper we make a definite statement that the head turns away from stimulation by the feet (and maybe yolk sac?).
too

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The present study should have examined directional head turning or head movement up to Day 17 to examine this point--this was an important oversight. (c) The 10-sec. criterion may obscure more subtle effects of stimulation (as it did in Ron's amnion study, Ron and C. H.'s study, and current duck embryo study here using both methods simultaneously). Absolute frequency of movement is a much better measure on this point, though I realize it is more difficult to extract cycles.

2. Facilitation.

This idea should not be lumped with structuring effects--I have always made a deliberate and clear separation of the two. (I do not think that Zing-Yang has made explicit such a separation prior to our 1965 paper.) Facilitative effects are: something happens sooner, faster, better. Take away a known facilitator, the something may still happen. However, it will occur either (or all) slower (latency), later (in time), and not as perfected. This requires careful quantitative measurement of latency, accuracy, and timing of a given response. While structuring assumes that behavior (A) is dependent upon structuring event (a), facilitation refers only to above 3 features of (A) and does not demand that (A) not occur at all. One can look at "environmental" or sensory stimulative or neuromuscular exercise as either permissive, facilitative or structuring events. In each case, a different sort of evidence is required to infer which interpretation is true.

3. Sensory and motor development.

In all of the work I have written up since 1963 regarding the embryology of behavior, I have consistently tried to place your contribution in the proper perspective--this was necessary to keep confusion to a minimum since I have been finding that stimulation does have effects on the things I have been studying and you have been generally showing that stimulation has no effect on what you have been studying. This happens to be my "style"--you may not like to do this just now or, perhaps, since my most important work on this point is unpublished, you may feel there is no need to keep the various issues separate and clarified.

As I wrote Ron in 1965, in terms of philosophy I am personally much closer to nativism and your point of view than might be suspected. I just believe that an undue emphasis on one part of the coin is not realistic (true). When I make fine measurements of the behavior I find that my belief is justified. Natural selection

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has operated on phenotypes which have had a particular developmental background--natural selection has thus operated on the entire developmental manifold. The developmental manifold entails permissive, facilitative, and perhaps structuration factors.

Back to the ms.: It is not clear if leg movements were recorded in the various control embryos (present and other study controls)--if so, increase in legless would be even more striking.

Sincerely,

Gilbert

Gilbert Gottlieb

Enclosure