

November 22, 1943

Dr. Viktor Hamburger
Department of Zoology
Washington University
St. Louis, Mo.

Dear Dr. Hamburger:

Many thanks for the reprints from your laboratory. Your analysis with Gayer of the potentialities of the optic vesicle of homozygous Creeper fowl embryos is an important contribution to the physiology of the action of genes in development, which interested me very much.

I read also with special interest your review of Needham's "Biochemistry and Morphogenesis;" I think you are too generous with him considering the many points of divergence in your views. Frankly, I have never been pleased with Needham's views on development; it is really not his field, and he has not thought the subject through in spite of wide reading. His revival of "formative stimuli" (Herbst) is short sighted. Needham does not know his substratum; I believe it has not been shown that stimuli play an essentially different role in morphogenesis than in the adult and hence that there is no gain in postulating an embryonic segregation of inductors rather than in the substratum. I find Child's views much more reliable and mature than anything Needham has written, and yet he neglects him almost entirely. Needham has apparently no theory of how inductors act.

There is of course no doubt about the existence of inductors and of inductive action. As I told you last summer Wang and I have been working on the subject in the development of the feather. The paper should appear about the first of the year and I shall send you a copy. We conclude that in our case the action is primarily acceleration of growth and development in the substratum.

I don't see how one can make a whole theory of development out of inductors, or even inductors and genes.

With best greetings to you and your family.

Sincerely yours,

Frank R. Lillie

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