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Mr. J. Lederberg
Dept. of Genetics
University of Wisconsin
Madison 6, Wisc.

Dear Mr. Lederberg:

The evidence for the influence of the father's preconception diet on the health of the child is rather diffuse, which is why I used the language which I did in the pamphlet you read.

First, there is a vast body of evidence to show that, in accordance with Murphy's dictum, the factors which influence the germ plasm do not spring into action after conception takes place, but operate at all times. With these literatures I am sure you are acquainted.

Second, in Weston Price's "Nutrition and Physical Degeneration", published by the American Academy of Applied Nutrition, Monrovia, California, you will find details of an experiment in which a deficient diet, fed to a male dog, which was subsequently mated with four normal females on adequate nutrition, resulted in litters of puppies marked by "congenital defects" of the order of cleft palate, hare lip, spinal deformities, and club feet. The defective male puppies, on good nutrition, mated with the same females, sired normal young.

Third, there is (unpublished) experimental research in which we have demonstrated that allergies in the young animal can be induced by manipulation of the paternal pre-conception diet for three generations. This work was performed with cats.

Fourth, we must not ignore the body of evidence which can be accumulated by observation of primitive practice. To some of these practices, you will find reference in the Price text previously cited, where, it is observed, special diets for both sexes are demanded prior to conception of a child.

In the Australian medical literatures you will find references to impaired fertility in the male, observed in the Australian soldiers engaged in the Port Moresby campaign, as a result, apparently, of Vitamin E deficiency in the rations, inducing degeneration of the testicular tissue which is indistinguishable from that produced in the male rat by a similar degree of deficiency.

Here is the point at which the evidence becomes somewhat diffuse. Does the work of Warkany, discarding the "all or nothing" principle in the effect of nutrition on reproductive efficiency, extend to the male? Is there then a threshold at which fertility remains unimpaired, but reproductive efficiency is lowered? The literatures are suggestive of the tenability of such a tentative conclusion.

Last, my medical colleagues and I have observed repeated instances where a normal mother, properly fed, has born a defective child - physically or mentally aberrant -

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after her husband had been subjected to a prolonged period of malnutrition, for one reason or another. In some of these cases we have observed a sequence: an abnormal child after paternal malnutrition; a normal child following, when the father was well fed; and then, after another period of paternal malnutrition, another defective child.

From these combined observations, were it not for scientific caution, I should be inclined to use stronger language than the enclosed pamphlet has implied. I so indicated in a recent address before the Society for the Study of Sterility, here in New York, and found to my surprise, that many of the geneticists and many of the obstetricians are ignorant of the small body of evidence which I have here partially outlined.

I think you will recall also that there have been sports produced by x-ray irradiation of fruit flies, which breed as true mutations for a number of generations, when normalcy is restored by a change in the nutrition of the flies.

There is, accordingly, some evidence in research with the nutrition of the female, to indicate that heredity is not immutable, nor the germ plasm uninfluenced by the internal environment of the host. It seems to me that there is no logical reason for denying that a similar possibility exists with the male.

Sincerely yours,



CARLTON FREDERICKS

CF/bm