May 21, 1952

Dear Dr. Edwards:

Zinder and I have managed to get motile derivatives from the O-form cultures you sent us some time ago. We find that very few cultures indeed are completely stable in the O-form. By really intensive selection in semi-solid agar, we have gotten back motile derivatives from almost all the cultures tested (including the classic typhi O-901 from two different sources). However, some cultures are sufficiently stable that there can be little doubt that typhimurium FA has a real effect.

In general the picture is probably this: there are separate factors, one for whether the flagella will be developed at all, another for the antigenic type if a flagellum appears. We expect that the application of typhimurium FA to an O-form of another serotype will simply restore its motility, and show up the flagellar antigens it had before. But we will have to study a wider range of material to verify this picture.

The group B non-motile 2294/49 and 117/51 are probably S. typhimurium. Motile selections were obtained from both, using typhimurium FA, and all of them were i--1,2.... 2294/49 is extremely stable, and has not shown any spontaneous H-variants to date; 117/51 gave some motile forms in the absence of FA.

1524/51 was so rough in appearance we did nothing more with it.

The group D 1520/51 responded to FA to give motile cultures we could not type with our limited reagents. I am sending these to you under separate cover, so that the diagnosis of this culture could be completed--they are SW-563 and -564 on our label.

We received a culture labelled S. paratyphi B nonmotile from Kauffmann, and this was a great surprise. With typhimurium FA, we obtained two motile types: i--- and b---. We did not expect the i phase on the basis of our theory of FA constitution, but it now seems likely to be inherent in the para B culture, for it has cropped up once, after persistent selection, as a spontaneous variant. We do not know whether the nonmotile culture was derived from var. java, which might explain our getting b--- rather than b-1,2.... With the material we have at hand, I have some hope that these obscurities will eventually clear up.

Yours sincerely,

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