October 15, 1951.

Dr. P. R. Edwards,
Enteric Bacteriology Laboratory,
Communicable Disease Center,
Box 185, Chamblee, Ga.

Dear Dr. Edwards:

Firstly, Mr. Zinder and I wish to record our thanks for the large set of Salmonella cultures, and the gift of d-serum, which have arrived in good condition and are being actively used.

A preliminary survey shows that there is a very close correlation between the presence of the XII somatic antigen and the capacity of the cells to adsorb a filtrable agent with "transforming" activity from preparations from S. typhimurium. Further experiments are under way to determine whether this absorption is actually succeeded by serological or cultural changes between so many distinct serotypes. The only exception to the correlation is that S. pullorum and gallinarum may adsorb very slowly or not at all. The XII-carrying S. coli types should be very interesting experimental material in view of their cultural distinctiveness.

In an earlier letter, I mentioned Mr. Zinder's experiments with S. typhimurium. The only extension to inter-type recombinations so far has been with typhimuirum x typhi. Previously, we had been able to secure alterations of typhi in the direction of rhamnose- or of arabinose-fermentation. With the help of your d-serum, a possibly more interesting experiment was carried out. In the presence of d-antiserum in soft agar, typhi cells,exposed to FA (filtrable agent) from typhimurium,produced new flagellar types in 2/4 trials. The new types resemble typhi culturally, but do not react with d-antiserum. #2 carries the "i" antigen, presumably from typhimurium. We were unable to diagnose #1 with the few sera at our disposal. Cultures of these types, as well as of the "parental" bacteria are enclosed: Typhimurium LT-2 (Phage Type 2 from Lilleengen) and Typhi SY79 (received from Kauffmann as the Watson strain). We would appreciate it if you could scrutinize these cultures more adequately with the typing sera at your dispoaal. The possibility is not completely eliminated that the new types are "artificial phases" occurring independently of treatment with FA. This seems unlikely, but we are multiplying our controls to cover this contingency.

Yours sincerely,

Joshua Lederberg,
Associate Professor of Genetics

P.S. The cultures are dried on silica gel to preserve them and facilitate their shipment. The bacteria may be resuscitated by breaking the tubes below the label and pouring the granules into broth. Most of the cells are on the granules nearer the rounded end of the tube.

Mr. Zinder worked out a very satisfactory and simple modification for Gard's technique, based upon the growth tubes used in mycological work. About 3 ml. of serum agar is added to tubes of the form illustrated. The inoculum is then introduced at one end. Phase alterations result in migration to the other. The method is especially welcome for its economy in serum.

J.L.