Edwards Feb 1, 1961

Dear Joshua - Many thanks for your note of 1/23/61 and LT2 and LT22 which arrived safely. It was very stupid of me to have misplaced these cultures and all our l, w transductants. At this late date I've given up hope of finding them. I hope this is our last moor. Each succeeding one seems more difficult. Just old age catching up with me, I suppose.

It was quite a coincidence that I met the Kanai's the very day your letter arrived. They were being shown around the laboratories by one of the C&C staff. They seem very nice and very cordial. I hope we can impose on them for a little advice in the future.

As to our present work, we are faced with the following anomalous serotypes:

1,3,19 : g,s,t ← $z_{27}$
gst ← $z_{43}$
gst ← $z_{45}$
g,s,t ← $z_{46}$

3,10 : g,s,t ← $z_{43}$
gst ← $z_{45}$

4,12,27 : gst ← $z_{43}$

1,13,23,37 $z_{29}$ ← $z_{37}$
d ← $z_{37}$
$z_4 z_{23}$ ← $z_{37}$
$z_4 z_{23}$ ← $z_{45}$
!! z ↔ l, w ← $z_{43}$

3,15 : g,s,t ← $z_{45}$
!! e,h ↔ 1,2 ← $z_{27}$

Arrows indicate direction of variation which can be accomplished ē sera
Most of these variations also have been observed to occur spontaneously.

You can see that these forms pose an intriguing problem. We intended to attack it thru transductions but thus far have had no luck.

$z_{27}$, $z_{37}$, $z_{43}$, $z_{45}$, and $z_{46}$ apparently are not ordinary phase 2 antigens and all this "one directional" variation is something new.

Young Douglas (a mid office acquaintance) has worked faithfully at it and is a little discouraged. I thought I'd let him take a fling at some easy transductions with PLT22 to prove to himself that transduction was not just a figment of the imagination.

I hope to be able to talk to you about the monsters outlined above and perhaps dig some ideas out of you.

With kindest regards to you and Esther,

As ever,

Phil