Dr. Albert B. Sabin  
The Children's Hospital Research Foundation  
Elland and Bethesda Avenues  
Cincinnati 29, Ohio

Dear Albert:

This is in reply to your letter of the 22nd.

First, contrary to your statement, our results are not very different from those I obtained with your material at NIH.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>Paralysis</th>
<th>Histological:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cervical</td>
</tr>
<tr>
<td>NIH</td>
<td>4</td>
<td>2 (4 transtc)</td>
<td>2</td>
</tr>
<tr>
<td>Rhesus</td>
<td>4</td>
<td>1 (traumatic)</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>3 (12)</td>
<td>2</td>
</tr>
</tbody>
</table>

Results of Intraspinal Inoculation of Undiluted Virus Containing $10^{6.3}$ TCD$_{50}$

Baylor Cynomolgus 10 8 3 severe, 5 mild* 10

* Might well have been missed if fewer sections were taken.

If we look at the differences in the groups done at NIH and at Baylor, there is no significant difference between paralytic rates of 3/8 and 8/10, between the severe cervical cord lesions 2/8 and 3/10, and between the severe lumbar cord lesions 7/8 and 10/10, respectively.

Also, I have tabulated in the next table the results of intraspinal inoculations carried out with your virus after multiplication in the human alimentary tract. This material was diluted and inoculated at the dose level of $10^{4.3}$ TCD$_{50}$, and, therefore, can be compared with the $10^{-2}$ dilutions of your vaccine (which also contained $10^{4.3}$ TCD$_{50}$), in the present experiments at Baylor. I see no differences in the behavior of the viruses at this dose level.
Results of Intraspinal Inoculation of $10^{4.3}$ TCD50 of Virus

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>Paralysis</th>
<th>Cervical</th>
<th>Lumbar</th>
<th>Brain Stem</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIH*</td>
<td>Rhesus</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Baylor#</td>
<td>Cyno.</td>
<td>6</td>
<td>5</td>
<td>1 severe, 3 mild</td>
<td>6 severe</td>
</tr>
</tbody>
</table>

* After passage in human subjects and on additional passage in monkey tissue culture.

# Original LSc vaccine.

As regards the size of the needle, the important factor might well be that with the smaller opening produced with the #27 gauge needle which I use, more of the inoculum remains in the spinal cord than with your larger #20 gauge needle. This can be investigated by measuring the amount of virus present in different levels of the cord at brief periods after inoculation, but perhaps more simply by following the spread of India ink or some labelled (radioactive) protein inoculated intraspinally. We used India ink for this purpose to get our bearings when we started our work on intraspinal inoculations some 15 years ago (J. Infect. Dis. 77: 13, 1945).

The answer to your question of the effect of one or two intracerebral injections is shown in the detailed tables enclosed. For what it may be worth, with such small numbers, all the polio lesions were found in monkeys inoculated with 0.5 ml in each side of the thalamic region.

The sections of the monkeys inoculated with your vaccine will be sent to you next week.

In regard to further testing, I spoke to Dr. Cox the day after our conference. He felt, and I agreed, that we should continue the inoculations with Type 3, to see whether the discrepancies which I found extended to all 3 types.

I would like to send copies of the enclosed tables to Dr. Roderick Murray in order that he may be kept abreast of developments. I hope that you will have no objections.

With all good wishes for 1959,

Sincerely yours,

Joseph L. Melnick

cc: Drs. Cox, Carey, Parker