copies to G.S.
J.D.W.
A.R.

Medical Research Council Unit
Cavendish Laboratory,
Free School Lane,
Cambridge.

11th October, 1956.

Dr. Jerry Donohue,
University of Southern California,
Department of Chemistry,
3518 University Avenue,
Los Angeles 7, California.

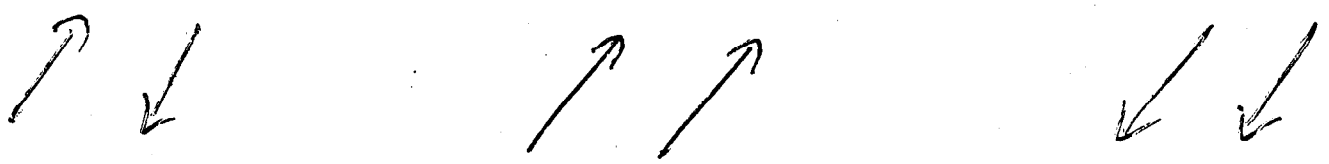
Dear Jerry,

I'm sorry not to have written before, but we have only just got round to polyglycine II again. I enclose the results of our old calculations. They are essentially the same as yours (you accidentally omitted the spacing 2.40 in your letter). On the same sheet I have put the very rough measurements that Alex and I made from the Nature picture, together with those made by Elliott from the original. Unfortunately he only sent us these after the paper had been published. You will see that our measurements, which are presumably inaccurate, agree well with our calculations, if the reflections are assumed to be diffuse, whereas your measurements agree very well with Elliott's. Very tiresome! We are now doing further calculations and I will let you know when we arrive at some conclusion.

Gunther was here last week and I promised that I would write to you about your joint paper. Our criticisms are much as before except that we can now make them precise.

1. We do not like the tautomeric shift in guanine. You nowhere point out that if guanine does undergo a tautomeric shift it can just as well pair with adenine as with another guanine.

2. It is not true that there are two different possible structures based on your pairing. In theory there are three. They can be symbolised as



The last two are not the same. It is just this sort of ambiguity which makes us question the acceptability of your model building. Have you, or have you not got acceptable coordinates for one of these structures; and if so, which is it?

Finally I should point out that while we believe that poly A forms something like the type of structure you describe, there is good evidence that poly U is amorphous.

All the family are well, except that Gabrielle broke her arm recently, but it is mending well. There is a Faraday Society Nucleic acid conference in London at the end of this week, and we are expecting Paul Doty to visit us after the conference.

With best wishes to both you and Pat.

F. H. C. Crick.

Polyglycine II

Calculated film intensities; point atoms plus a temperature factor, exp $(-3 \sin^2\theta)$, on intensity.

spacing	4.15	3.78	3.10	2.48	2.40	2.32	2.13	2.07	2.02	1.895
film intensity	60	10	25	6	2	3	4	0	$4\frac{1}{2}$	6

observed spacings

F.H.C.C. and A.R.	(4.15)	3.8	3.08	2.40	2.08	1.89
A.E.	4.15	3.80	3.11	2.48	2.13	1.89
	v.s.	w	s	m broad	m broad	m broad