January 15, 1962

Dr. Francis H. C. Crick
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Dear Dr. Crick:

David Davies has made all of the arrangements for your talk here in February and we are all looking forward to seeing you. Your paper on the General Nature of the Genetic Code is beautiful. Your findings with this system certainly agree well with our results. We have recently found that the code is partially degenerate, at least with respect to leucine, for both poly UC and poly UG stimulate the incorporation of leucine into protein. Also, we were able to show that nonsense exists for a number of polynucleotides, including poly A, do not code for any amino acid. We revised our manuscript which is in press in Biochemical and Biophysical Research Communications to include the results on degeneracy. Also included are the nucleotide compositions of coding units corresponding to two additional amino acids.

We tested the ability of many preparations of poly C to stimulate proline incorporation. About six preparations gave a 5- to 10-fold stimulation; three preparations gave a 75- to 100-fold stimulation, and four or five preparations did not stimulate proline incorporation. We have also found that poly CU stimulates proline incorporation effectively, more so than poly C. When we analyzed the base ratios of our polynucleotides, we could not find traces of uridylic acid in poly C. Since we now know that the code is partially degenerate, it seems likely that both poly CU and poly C will code for proline and that this is another example of degeneracy. Probably an E. coli coding unit corresponding to proline would contain both U and C.

I haven't seen the English newspapers but the American press has been saying that this type of work may result in (1) the cure of cancer and allied diseases (2) the cause of cancer and
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the end of mankind, and (3) a better knowledge of the molecular structure of God. Well, it's all in a day's work.

Sincerely yours,

Marshall W. Nirenberg

MWN:lh