Southampton

11th May 1964

Dear Tom,

Thank you for your letter. Turkey sounds fascinating to me. I was very sorry that I only had one day in Constantinople last summer, and certainly intend to return there sometime. Your new flat sounds very fine. You were very lucky to walk into the agents just as the flat became available. I hope that you manage to get some more flowers before you return. A few Eremurus would be a nice thing to bring back.

Now for news from here — some good and some not so good. The thing which is exciting me most is the prospect of pushing through a homotopy theory for the category of dynamical systems. Associated with a pair (X, S) of a space and a homeomorphism of the space onto itself is a semi-group which corresponds to the fundamental group of a space. Spaces analogous to loop spaces give rise to relative and higher 'homotopy' semi-groups. Under very weak conditions — it appears that the restriction X Hausdorff is enough — these higher order objects turn out to be ordinary homotopy groups. There is an exact sequence similar to the homotopy sequence. Everything is 'natural' in the categorical sense. Under certain conditions the fundamental semi-group is isomorphic to the fundamental group of the quotient space of X modulo

the orbits of S, but there are also some nice examples in which they are not isomorphic, and for these cases the semi-group is best described in terms of a peculiar structure on a graded sequence of ordinary fundamental groups. Keep your fingers crossed for me and hope that I have not left some horrible gap right at the beginning of the work. I have kept on writing out the work in full, but since the notation has had to be changed as the work has progressed, it is possible that there is a slip somewhere.

The three copies of the book have arrived safely. I have given one to my mother and one to my brother. The third is still on my shelves. I have not seen even one review of it. Geoff Rye tells me that it has been put on the list from which most libraries choose their books. The publishers representative told him that the book is going quite well to libraries.

The only piece of bad news is that I have not been able to visit Foulness. I sent on a letter from Pat Shuldham-Shaw together with one of my own to the schoolteacher there asking for assistance in obtaining a military permit, but I have had no reply. Pat had told me earlier that if I had any difficulty he would help me to get a permit direct from the military authorities, but I have recieved no reply to my letter back to him. Add to this my preoccupation with mathematics and you'll see why I have not been there yet. I may be able to get something out of Pat within the

next few weeks. If not, then I shall have to leave it until the autumn because it will take too long to fix it on my own. No doubt the army will require references for such an odd request.

I go to America on July 6th and return on Sept 28th. I am glad that I have some work to do while I am there which will not require me to carry lots of books with me. I have not yet arranged a detailed programme; indeed I don't think that I shall because I want to leave things open for a possible trip into North Canada. So far as I can see I shall be there at quite the wrong time for collecting plants, but I shall do what I can. I certainly hope to bring some ladies slipper orchids from the woods of the Institute Princeton.

Best wishes

Frank.