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Victoria Barracks,  
MELBOURNE. S.C.1.

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Dear Mr. Moriarty,

Many thanks for your long and interesting letter of 26th March, with its encouraging news that you are really getting moving with a scientific and technical team. We, too, have made big strides in the last few months, which should get us somewhere by the time your first representative reaches us in the autumn.

As you ask about our attachment to the Royal Naval Scientific Service I will begin by giving you a little of our history, our present situation and intentions in the immediate future.

From the time we came to Eastcoast (January 1946) until the end of 1950 machine work got on as well as it could with a handful of staff who chose to stay on after the end of the war. We had separate engineering parties on Tabulating and Electronic equipment, the former under Mr. L. Page who could appropriately be called a Senior Experimental Officer (although he was in a G.C.H.Q. grade) and the latter under Mr. A. Bruce, a Senior Scientific Officer from the Ministry of Supply. There was no other Scientific Officer at all, the equivalent of 8 to 10 Experimental/Assistant Experimental Officers, and about 15 technicians - the former occupied largely with development and the latter with maintenance.

Apart from numerous 'small' electronic/relay equipments we were able in that period (1946-1950) to design and complete one large electronic machine - Colossus (Red), 5,000 valves - and largely complete the design and construction of another - Johnson 6,000 valves.

Our failure, in 1947.8.9, to recruit a single further scientific officer, or equivalent, led us in December 1949 to affiliate to R.N.S.S. in respect of all staff in scientific, experimental and assistant grades. The initial request was for 4 (PSO/SSO) posts only, but you can judge how well we think of the scheme when I say that the current affiliation is for 42 posts (from SP80 to Ass. Sci.) and that we are about to negotiate for nearly 200 of which around 100 are already filled by staff in G.C.H.Q. grades. You must understand that these numbers include X (machines) and T (interception), as well as a few posts for H and L.

Harper comes into this picture in January 1951 as a P.S.O., the first recruit found by R.N.S.S. He came from G.P.O. (Dollis Hill) and had wide experience as an electrical and radar officer in the R.N. throughout the war. In May 1951 I was able to proclaim him Chief Engineer in X, with unified control of Bruce and Page and their parties. The venture has been a great success; and we are at last recruiting some more good material into EO/AEO posts and even beginning to fill scientific posts.

Apart from the 'permanent' branches under Harper - Engineering office, supplies and stores, and Engineering Services (Drawing Office, Workshop and Assembly) - we shall have a small research team (under a P.S.O.) and a variable number (4 to 6) of development teams each responsible for the progress of a machine from conception to operational use.

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One of these teams has already begun (with inadequate staff) to carry out experimental and design work for a much improved version of Colossus. It is this machine which would be most relevant to your work in D.S.B. and we should intend to attach Robinson to this team when he arrives. We shall see to it, of course, that he gets wider experience in addition. In particular we can introduce him to the computer engineers outside G.C.H.Q.

I have been writing so far exclusively about the engineering side of the work. There are two other modes of activity in X - research and methods, and operations. As far as possible we keep the three modes distinct, with separate bodies of people specialising in their own fields. I have four mathematicians (equivalents of P.S.O. to S.O.) in research/methods already and shall add two more shortly. They will not be responsible either for engineering or (directly) for operations, although working in the closest co-operation with those who are.

It may be a distinct advantage that Robinson is a mathematician turned engineer, in that he will more readily talk the language and think the thoughts of both sides. But my own experience has been that the two modes of thinking diverge considerably and that it has paid to be clear where a man's allegiance is. I am not for a moment suggesting that this is how another organisation also must arrange its affairs, so please regard this as a comment on our own experience. But I do suggest you should consider making one of the two S.O.'s you think of sending later a mathematician to concentrate on the methods side. Don't doubt that it is a full time job! If he were a new recruit to you, and if it were possible when he arrived, I should like to put him on the H long course before he settles down to work in X. But there is plenty of time to think this over and discuss it again. At the risk of overstepping the bounds of decorum I would emphasise that two of the three you send should be engineers (not theorists or experimentalists) with a burning desire to make things work.

You ask about our opinion of the value of University consultants. We can speak from considerable and valuable experience. The most important point to remember is that B.P., our war-time station, was in itself a small university; and our consultants are in the first place, men who took a distinguished part in our war effort. For mathematical advice we have not gone outside this circle. On the engineering side we have necessarily done so, and repeatedly called on Prof. F.C. Williams, F.R.S. the distinguished expert on radar, servo-mechanisms and computers. In this way we not only get new and illuminating suggestions of a positive nature but the invaluable check that our own work is well founded and that we are not wasting effort in a wrong direction. Since we consult about our major difficulties we are thus disclosing our innermost secrets and we therefore restrict our contacts to the very best.

I very much hope that your anticipated visit in September comes off. There will be much to discuss. I would rather leave until then any consideration of where your machine will be built. It is not an easy one. The size of the task is not less than a dozen man-years. I should tell you that our anticipated design includes some £20,000-worth of magnetic and associated equipment from Ferranti.

May I refer again to Overheu, who is in very much the same position (of age, experience and temperament) as an engineer from G.P.O. who is at present seconded to us - Ridlington. Both of them worked at Dollis Hill in the same group that Harper came from, and Ridlington has been able to step straight into a project leader post with us, and fill it with remarkable success. From personal knowledge Harper feels sure that Overheu would be equally helpful to you; and he reminds me that we get each individual member of our own staff only by extreme importunity!

I look forward to seeing you in the autumn.

~~TOP SECRET~~ (Signed) G.W. Morgan

Head of Machine Department