St John's College
Cambridge.

1939 May 26.

Dear Fisher,

I have just been talking to Wishart about his application. I think we all have very similar views about Comrie - he made an interpolation job of mine of about 2400 entries take about three months recently and charged £40 for it, which Lenox-Conyngham had to pay ; and you will know the history of the B.A. Tables committee. So there will be some opinions on that side of the matter on the committee. On the other hand Wishart comes from the right country to get a thing out of Comrie as cheaply as it can be got.

I had not really gathered before how scrappy M.S.P.'s table really is. There are values only for 2,5,10 and 20 observations, and the intervals of the argument even for those are so wide that they could not be interpolated. I had thought that the proposal was just to check a rather doubtful method of computation used to get a table that in itself was complete ; and in that case I should not have favoured a computation from scratch until the existing table was shown to be badly wrong. But as it is it seems to me that the present table is very little help. The Admiralty apparently wanted it enough for one of their men to compute for one value of n himself, and then passed the job to M.S.P., who got some means of interpolation, but I certainly should not trust the result myself. (I had occasion to use the table myself in my law of errors paper in Biometrika, but Hartley found the place for me and I only wanted a specimen value as an awful warning.)

The reason for bringing Comrie in at all is, of course, that there is no National or Hollerith machine here. The Maths faculty is getting a Bush machine and has a Mallock and a few Brunsvigas, but what it shows

no sign of getting is a few computers that would do some of my jobs for me ; and most of my jobs want more figures than a Bush will give and I can do them quicker on my Marchant anyhow.

On the whole I think that the thing is worth doing, and Wishart has apparently considered other ways of doing it pretty thoroughly ; he certainly is not making the suggestion out of affection for Comrie.

I wish I could get somebody to work out the numerical values for my significance test for one new function where the standard error is initially unknown. I have a steepest descents approximation, and such things are usually very good, but I should like the cases of 2 to 6 observations done numerically as a check. One observation gives identically K = 1, as it should. The others are double integrals as they stand, but can be reduced to rather nasty-looking single ones.

My book has gone off to the Oxford Press. At the last minute I stuck in a table for fitting a Type VII of index 4, which should replace the habit of rejecting observations.

I have just bought your tables. You really shouldn't say that the ratio of the electromagnetic and electrostatic units of charge is the velocity of light. Even physicists have seen at last that they got this result only by identifying a magnitude to have measure 1 by a suitable choice of units with the actual number 1. Perhaps the turning point was when Eddington made the constant of gravitation and the velocity of light unity, and said that the mass of the sun was 1·5 kilometres. $6{\cdot}658 \times 10^{-8}$ for the constant of gravity was got by methods you would not approve. Boys made 9 observations, rejected 7, and took the mean of the survivors. The mean of the lot was 6·663 ; comparison with Heyl's determinations suggests $6{\cdot}670 \pm 0{\cdot}005$, and from the consistency I should put the standard error a bit higher

myself. It is only on 3 d.f. anyhow.

Gravity : the standard determination of the absolute value is Potsdam 981·275 gals. Most others are observed as differences from Potsdam by carrying pendulums about. Greenwich is 981·189 (Bullard and Jolly, M.N.R.A.S. Geophys.Suppl.3,471). Washington is shaky. It has been compared with Potsdam three times and the results differ more than they have any business to. (The standard error attainable is about 1 milligal, and I think the determinations differ by about 10.)

Corresponding to the above value of the constant of gravitation I get for the mass of the earth $5{\cdot}976 \times 10^{27}$ gram ; mean density $5{\cdot}517(1 \pm 0{\cdot}0008)$ g/cm^3.

Middle C of piano : shouldn't this be 261 ? Lamb's Sound gives c"(upper c) = 528. This is the Old Philharmonic, 522 the new. But there is a muddle because musicians think in terms of the half-period. Still Lamb is quite explicit in saying that he means the number of whole periods and writing

I am sending you some papers, largely illustrative of intraclass correlation. In your job it seems to have some virtues, but I have not yet found any in mine.

Yours sincerely,

Harold Jeffreys