8 April 1931.

Dr A.C. Aitken,
2 Sycamore Terrace,
Corstorphine,
Midlothian.

Dear Dr Aitken,

I worked with a "Millionaire", but Murray's tests were carried out on a "Marchant". I have had no experience with an Archimedes, which may perhaps give a different result, if each process is carried out in the quickest way ~~available~~ suitable for routine calculations.

I give a typical series of timings for 8-figure interpolation, in which he made two adjacent interpolations to 3 places of the independent variable, such as .355 and .356, such as are ~~usually~~ often necessary in interpolating to the full accuracy of the tables.

His average timings for the Everett method are:-

	Seconds
Copying two central tabular values	16
Differencing and writing down 6 second differences, 4 fourth differences, 2 sixth differences	225
Two sets of multiplication by Everett coefficients	260

Against these using the Jordan method he gives

3 pairs of linear interpolation, writing down the interpolates	261
Differencing the interpolates	70
2 multiplications by central coeffivients	124

The average totals for (a) Everett with differences supplied was 260, (b) Jordan without differences 455, (c) Everett without differences 501.

I do not myself think that a great deal depends on the exact results of such timing tests, but that when opinions are quoted they should be based on extremely careful trials. A large part of the value of Jordan's contribution seems to lie in encouraging users of tables who are not specially well equipped, and possibly have no machine at all, to obtain the full accuracy of the table by using a familiar process like linear interpolation. However, this may be partly psychological, and the immediate question is whether Jordan's method is to be discredited among English computers as of no practical service when differences are not available. If you feel any practical doubts, it might be as well to try a few cases of 4-point interpolation with which it is with me as quick as (a) Everett with differences provided.

The pairs of linear interpolations are of course done together, by adding and subtracting the two tabular entries, for which the machine is already in the right position, one only need write down the relevant portion of the interpolate. Judging from Murray's timings the writing down assumes the greater part of the time in the Jordan method. One would like to try it on one of the machines with a spare register, in which this could be reduced.

As an example of my own experience I give the averages of tests in duplicate I have just done, while writing to you with a single two-point interpolation

	Seconds	
Everett copying and differencing	155	
Multiplication	120	(a)
	275	(c)
Jordan linear interpolation	94	
Differencing	35	
Multiplication	48	
	180	(b)

$\frac{c - b}{c - a} = \frac{95}{155}$ about 60 per cent.

Yours sincerely,