

St John's College
Cambridge

March 17 1951

Dear Fisher,

Is this any use to you
for the Annals? It really arose
out of a bad method of Eddington's
that I am criticizing in the M.N.R.A.S.,
but they don't seem to want non-
astronomical illustrations, & I think
that there should be examples of
the method as shown somewhere.

Do you know Haldane's present
address?

~~I~~ I believe without any fitted
sense of Miss Newbold's date by notation
likelihood, but I don't know if he ever
published the results. Also would
you fill in the reference to Poyys -
I took the date from a borrowed copy
of your book.

Yours sincerely
Harold Jeffreys

Dear Fisher

I suppose you should publish this. But I would like to comment on the statement that for fitting negative binomials 'the method of maximum likelihood is difficult'.

If the generating function is $(1+p-pt)^{-n}$, so that $p = \frac{a}{1-a}$, $n = \frac{\rho(1-a)}{a}$ in Jeffreys' terminology, then ~~the method of M.L. gives~~ if a_r be the observed frequency of r , and $R = r_{\max}$, $N = \sum_r a_r$,

$np = \frac{1}{2} \bar{r}$, and

$$\frac{a_0}{n} + \frac{a_1+a_2}{n+1} + \dots + \frac{\sum_{r=1}^{s+1} a_r}{n+s} + \dots + \frac{N-a_0}{n+R-1} = N \log(1+p) = N \log\left(1 + \frac{\bar{r}}{n}\right)$$

The latter equation can be solved without serious difficulty, using $n_1 = \frac{(\bar{r})^2}{\bar{r}^2 - \bar{r}}$ as a trial value. I should like to put a note on this, with the actual time taken

J.B.S.H