28 April 1943

Dear Kendall,

I was naturally interested in your letter of the 17th. I have looked again at the paper with a view to misprints, but it is all right as it stands.

The general principle for a single parameter, \( \theta \), is that if you have an estimate, \( T \), which is exhaustive, or, Varadhan's people say, i.e. is either sufficient or is used in conjunction with exhaustive ancillary information, then there is a function \( f(T, \theta) \) giving the probability of the estimate exceeding any value \( T \) for a condition having any value \( \theta \), and this function will also be a function of \( n \), the sample number, and of any ancillary statistics that may be used.

Then the frequency-distribution of \( T \), if the function is differentiable, is given by the frequency-element

\[
\frac{2}{\theta} f \frac{d\theta}{\theta}
\]

but the fiducial frequency-element for \( \theta \) is

\[
-\frac{df}{d\theta}
\]

The formulae may be checked otherwise by substituting \((n-1)\frac{\theta^2}{\alpha} \) for \( X^2 \), and in one case taking

\[
d(\frac{1}{\alpha}X^2) = \frac{1}{\alpha}X^2 \frac{2\alpha \theta}{\theta}
\]

and in the other case

\[
d(\frac{1}{\alpha}X^2) = \frac{1}{\alpha}X^2 \frac{2\alpha \theta}{\theta}
\]
The concordance of these procedures is what I mean by saying "the floccial distribution ........ may be found by substitution", in the last paragraph of the section.

Yours sincerely,