Dear Anscombe,

If you agree that the sampling process you have in view is the same as mine, in which

\[ \text{Variance of } N = E(N) = M \]

\[ \text{Variance of } S = \alpha \log \frac{M + \alpha}{M} \]

\[ \text{Covariance of } S \text{ and } N = \frac{\alpha M}{M + \alpha} \]

and if \( \alpha \) is expressed implicitly in terms of \( N \) and \( S \) by the equation

\[ S = \alpha \left\{ \log(N + \alpha) - \log \alpha \right\} \]

then putting \( M \) for \( N \) after differentiation

\[ \log \frac{M + \alpha}{\alpha} = \frac{M}{M + \alpha} \quad \text{d} = \frac{M}{M + \alpha} \quad \text{d}N \]

whence

\[ \log \frac{M + \alpha}{\alpha} = \frac{M}{M + \alpha} \quad V(\alpha) \]

\[ = V(S) - \frac{2 \alpha}{M + \alpha} \quad CV(S, N) + \frac{\alpha^2}{(M + \alpha)^2} \quad V(N) \]

\[ = \alpha \log \frac{2M + \alpha}{M + \alpha} - \frac{\alpha^2 M}{(M + \alpha)^2} \]

*CP 1:73. JMF*
leading to my formula

\[ V(\lambda) = \lambda^3 \left\{ \frac{(M + \lambda)^2 \log \frac{M + \lambda}{M + \mu}}{(M + \lambda + E - M)^2} - \lambda M \right\} \]

where \( \lambda \) observed is to be used for its expectation \( \lambda \) and \( \mu \), of course, the observed values of \( \lambda \) and \( \mu \) are also to be inserted.

Yours sincerely,