

29 November 1932.

Dr. J.O. Irwin,
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Keppel Street,
Gower Street,
W.C. 1.

Dear Irwin:

I expect the right answer to the actuaries is that the data are not genuine, but have been cut down from larger numbers, or graduated, like the ^{celebrated} calculated example on page 193. χ^2 would almost certainly be much diminished by reasonably efficient fitting, in fact in large sample theory $-\frac{1}{2}\chi^2$ and L are proportional, a point you will find in "The conditions under which χ^2 ..." page 449.

It is not a question of high theory, but of common sense, that $P = .999$ does not mean that the data accord excellently with the hypothesis, except in the sense that they have been cooked.

You are safeguarded against using Q^2 with bad estimates since it is only equal to χ^2 when the estimation is at its

best. The mistake of minimising χ^2 lies in the fact that Q^2 will not in general be absolutely constant for variations of the parameter, so that the minimum χ^2 is influenced by whether x and y happen to be of the same sign or not. Both χ^2 and Q^2 have well defined meanings apart from Maximum Likelihood theory, and minimising $\chi^2 - Q^2$ might have been arrived at as a method of fitting, eliminating the part of χ^2 which is irrelevant, on a quite independent basis.

Yours sincerely,