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Contribution to the discussion of the paper by D R Cox and N Reid on 8.10.86
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1. Full address where you wish to receive proofs of your contribution for checking (i.e. where they will reach you, approx. 3 months after the date of the meeting)	1. University of Toronto Department of Statistics Toronto, Ontario M5S-1A1
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Conditional inference, introduced by Fisher, generally neglected, but nurtured tenuously through connections to fiducial, ancillarity, and structural, is now receiving the attention it has seemingly long deserved and the present paper is a welcome and thorough examination of aspects of the topic.

The first three sections propose the information orthogonalization of nuisance parameters to a primary real parameter in order to obtain asymptotic independence for the corresponding m.l.e. estimates; this leads to the analysis of the primary parameter conditional on estimates of the nuisance parameters. Unfortunately, the authors do not directly pursue such conditional inference, which involves a real variable and real parameter with some minimum effect from nuisance parameters. Such inference on-the-real line is direct and straight forward leading to tests and confidence regions, and a likelihood criterion is not needed.

Some recent work on conical tests (H. Massam and D.A.S. Fraser, Statistical Papers, 26, 1985; also see H.M. Skovgaard, Saddlepoint expansions for directional test probabilities, 1986) and fibre analysis (D.A.S. Fraser, Fibre analysis and tangent models, submitted to Statistical Papers, 1986) lead (in joint work with a Toronto colleague) to a sample space development of one-dimensional conditional tests; these seem to show agreement with the

orthogonal-parameter approach when it is available. The majority of the examples in Section 3 are location/transformation models; some compounding of conditional distributions shows promise for further reducing the effect of nuisance parameters.

Sections 4 and 5 develop modifications to profile likelihood to obtain a likelihood assessment of parameter valves, but do not provide conditional tests or confidence regions in any direct sense: the 'conditional inference' in the title of the paper might reasonably be changed to 'conditional likelihood'. The modifications to profile likelihood represent an insightful use of conditional distributions to address the difficulties found with profile likelihood itself.

The vectors for the regression model as given in Section 3.5 are of length n which indicates a modification to some formulas. The log-likelihood ratio statistic is essentially a negative of log likelihood; thus in several places 'conditional (profile) likelihood' needs to have 'ratio statistic' added to be correct and not misleading. The powers of are inconsistent in Example 4.2.2.