This can raise issues which are largely external to the ordinary statistical model and deserve more attention from the scientific side of statistics. It seems necessary in this development to use the physical context as a guide to the choice of operating model. In such contexts the issue of marginal optimality is not of interest: only the conditional calculations matter. Our statistician in Section 4 who advertises the shorter confidence intervals is guilty of professional misconduct.

Recent directions in conditional inference have deemphasized the "principle" aspect of conditioning. One motivation for this is that conditioning can provide a means to eliminate nuisance parameters and focus on the parameter of interest. Another is that conditional distributions are often much easier to calculate, which is especially useful in high-dimensional problems.

REFERENCES

COX, D. R. and HINKLEY, D. V. (1974). *Theoretical Statistics*. Chapman and Hall, London.

EVANS, M., FRASER, D. A. S. and MONETTE, G. (1985). Mixtures, embedding, and ancillarity. *Canad. J. Statist.* **13** 1–6.

EVANS, M., FRASER, D. A. S. and MONETTE, G. (1986). On principles and arguments to likelihood. *Canad. J. Statist.* **14** 181–200.

FRASER, D. A. S. (1968). A black box or a comprehensive model. *Technometrics* **10** 219–229.

FRASER, D. A. S. (1979). *Inference and Linear Models*. McGraw-Hill, New York.

FRASER, D. A. S. and McDUNNOUGH, P. (1980). Some remarks on conditional and unconditional inference for location-scale models. *Statistische Hefte* **21** 224–231.

KALBFLEISCH, J. D. (1975). Sufficiency and conditionality. *Biometrika* **62** 251–259.

LEHMANN, E. L. (1983). *Theory of Point Estimation*. Wiley, New York.

REID, N. and FRASER, D. A. S. (1989). Comment on "The geometry of asymptotic inference," by R. E. Kass. *Statist. Sci.* **4** 231–233.

WELCH, B. L. (1939). On confidence limits and sufficiency with particular reference to parameters of location. *Ann. Math. Statist.* **10** 58–69.

DEPARTMENT OF MATHEMATICS
YORK UNIVERSITY
DOWNSVIEW
CANADA M3J 1P3

DEPARTMENT OF STATISTICS
UNIVERSITY OF TORONTO
TORONTO
CANADA M5S 1A1

LEON JAY GLESER[1]

Purdue University and University of Pittsburgh

Put briefly, Brown's paradox is that an estimator can be conditionally admissible given each value of an ancillary statistic, but inadmissible unconditionally. Brown is to be congratulated for his insight in pointing out the conflict between frequentist criteria of good performance for point estimators and widely held notions concerning ancillary statistics. Brown supports use of unconditional frequentist measures to guard against "inconsistency" (uncon-

---