

Tennant, Neil

On the degeneracy of the full AGM-theory of theory-revision. (English) Zbl 1103.03017
J. Symb. Log. 71, No. 2, 661-676 (2006).

Author's abstract: "A general method is provided whereby bizarre revisions of consistent theories with respect to contingent sentences that they refute can be delivered by revision-functions satisfying both the basic and the supplementary postulates of the AGM-theory of belief revision."

Reviewer's comments: Certain cases of this phenomenon have been noted since the very beginnings of the AGM account of belief change. As early as 1982, Alchourrón and Makinson noted that both maxichoice and full meet contraction and revision (which are allowed as limiting cases by the full set of postulates formulated by Alchourron, Gärdenfors and Makinson in 1985) are undesirably large and small, respectively. The author's contribution in the paper under review is to show that such anomalous behaviour is not confined to those two limiting cases.

The main result is Theorem 3, from which others flow. It tells us that if X is any consistent set of sentential formulae (no matter how chosen), there is an AGM belief revision function $*$ (satisfying all postulates from $K * 1$ through $K * 8$) such that for every theory K and input formula a (with K, a separately consistent but jointly inconsistent) we have $K * a = Cn(X, a)$ if a is consistent with X , else $K * a = Cn(a)$. Such revisions are certainly bizarre in several respects: the output is independent of K , will contain material that is undesirable (given K, a) if X does, may lack material that is desirable (given K, a) if X does, and all of this in a systematic manner. The author's work thus reveals that many intuitively irrational revisions may satisfy the AGM postulates.

On the other hand, it should be noted that the AGM postulates were never intended to bar *all* maverick contractions and revisions, as claimed by the author (page 664, last paragraph). They are no more than *minimal formal constraints*, which still allow in a wide variety of strange fish (both the limiting cases noted by Alchourrón and Makinson 1982 and the wider range noted in the paper under review) and, in the case of contraction with its use of the recovery postulate, may perhaps exclude some that could be admitted (as has for long been observed). The quotation that the author provides from *P. Gärdenfors's* book [Knowledge in flux. Modeling the dynamics of epistemic states. Cambridge, Mass.: MIT Press (1988)] appears to have given rise to a misunderstanding. AGM contraction is there described as an "ideal representation of the intuitive process" in the sense of an *idealized* one, not one that is perfect in all imaginable respects.

Nevertheless, after more than twenty years, no further conditions of a strictly formal kind on one-shot contraction and revision (as opposed to iterated operations) have been forthcoming. It would appear that any further tightening of the net would have to be carried out on the level of applications, taking account of specific content and perhaps pragmatic considerations as well as form.

Reviewer: [David Makinson \(London\)](#)

MSC:

[03B42](#) Logics of knowledge and belief (including belief change)

Cited in **1** Review
Cited in **5** Documents

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