Review— *Collective Decisions and Voting* by Nicolaus Tideman

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This is a very worthwhile book containing a wealth of useful information.

I have seen it said that, when making a speech, it should be divided into three parts: (1) tell them what you are going to tell them; (2) tell it to them; (3) tell them what you have told them. This book certainly follows that plan, not only overall but also within each chapter. It is divided into two parts — Collective Decisions, chapters 1 to 6, and Voting, chapters 7 to 16, before a short summing up in chapter 17. I feel that chapter 16 should really be included in part 1, rather than part 2. Chapters 1 to 6 and 16 are really more suitable for review in economics journals rather than in *Voting matters*, and I shall therefore concentrate here on chapters 7 to 15.

The book seems a little unbalanced in the degree of mathematical knowledge expected of the reader, who is expected to cope happily with $\int$, with ! (in its mathematical usage), with *ln*, with *iff*, etc., so it is surprising that $\prod$ and $\sum$, as multiplying and adding operators, apparently need explaining. Certainly anyone who struggles with mathematical notation will have to skip some parts but could still gain a lot from reading the surrounding plain text; it is unfortunate that those struggling to understand the notation will run into some misprints, that will make their understanding harder because they may not recognise them as being misprints but suspect that the fault is theirs.

I also found it unbalanced in having an 80 page chapter discussing various rules for electing to a single seat, yet only a 26 page chapter for the multi-seat case, which surely deserved more than that.

There are detailed discussions and proofs of how voting cycles can arise, of Arrow's theorem, and of the Gibbard-Satterthwaite theorem. It is useful to have these together for reference. Even those who do not wish to go into the detail of the proofs will gain knowledge of the facts that it is impossible to have a voting system without unsatisfactory features, and impossible to have one that is immune to strategic voting. Personally I find it a pity that Woodall's theorem [1] is not also given a place. I have found Woodall rather than Arrow to be the more convincing, both to myself and to explain to others. However part of this preference is because Arrow deals with trying to form an overall ranking of options whereas Woodall is more specifically about dividing candidates into those elected and those not elected. The book does deal with that point, giving a variation of Arrow's theorem to deal with it.

I also regret that there is no mention, to go with Gibbard-Satterthwaite, of the work of Bartholdi and Orlin [2] who show theoretically that STV is remarkably strategy-proof. This is certainly known in practice by those who vote using it for multi-seat elections. Careful study of the votes after the event may sometimes show where strategic voting could have succeeded, but to know what to do, other than vote honestly, at the time of voting, is virtually impossible.

There is discussion of properties used to evaluate the various proposed methods, under the headings of Domain, Consistency, Responsiveness, Stability and Qualitative Attractiveness: 18 different properties altogether. It would help in reading the book if short definitions of these properties were available on a separate card that could be kept handy. Then those who, for example, do not know their Smith consistency from their Schwartz consistency, or who wish to be reminded of exactly what is implied in this context by Homogeneity, would find things easier. I felt this in particular when finding a mention of non-negative responsiveness. Looking in the index it was not there, so where is it to be found? I found positive responsiveness and had to make the obvious guess from that.

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Many of the particular methods discussed for a single seat elect the dominant option (often called the Condorcet winner) if there is one, while the differences between those methods apply only when seeking to sort out whom to elect when, because of cycles, there is no dominant option. It is a pity that the casual reader might not realise that, in real elections, there usually is a dominant option, and much of the detail of what to do when there is not is then irrelevant. I have too often seen Condorcet voting dismissed as a useful method because this fact is not understood.

Among the methods discussed there is no mention of Supplementary Vote, as now used in Britain to elect town mayors. Perhaps it is thought too silly to deserve serious discussion by adults. If so I agree, but it would be worth just a sentence or two to say so.

Another reference that I should have liked to see is to Moulin's devastating work [3], showing that any system that elects the dominant option if there is one cannot also guarantee that turning out to vote at all is going to be helpful. It is unlikely in practice that abstaining could be better, but the fact that it is theoretically possible is worrying.

In evaluating the methods the author uses both technical considerations and, where preferences are used, a practical look at the voting patterns in a collection of real elections, mostly from the ERS, conducted by STV. In particular he uses these to evaluate the frequency of cycles. It is recognised that to take multi-seat elections and use the data as if for a single seat may not always be realistic. He is wrong in saying that in these elections voters are asked to rank all candidates. It is standard doctrine within ERS that voters should have total freedom to rank as many or as few as they wish.

At the end of the long chapter on single-seat methods, there are 5 pages headed "Summary". This is surely the wrong heading; a summary should refer briefly to what the chapter has already said, not introduce new material. Yet here we find the author's recommendations on the comparative value of the methods. These do not seem to me to concentrate enough on what I believe to be the main point to consider — namely whether one wishes to preserve a promise to voters that putting in later preferences cannot upset the chances of their earlier preferences, or whether one is willing to forego that promise so as to avoid the problems caused by successive eliminations. In the first case it is doubtful whether anything better than Alternative Vote is available; in the second case it makes sense to go for electing the dominant option if there is one, while what to do in the event of a cycle for top place, while it must be decided, is really a secondary matter as such cycles are rare.

The evaluations are mainly in objective terms of whether or not a method possesses each particular property, but for the properties contained in the Qualitative Attractiveness category the evaluations are necessarily subjective and it is easy to disagree with some of them. It is always difficult to find names for such features that will not be misunderstood but, for example, under "ease of use" the author appears to be considering only the relative difficulty of marking a cross against one candidate compared with recording a preference ranking against all candidates, and not to take into account the different degree of strategic thinking that may be needed for properly thought-out votes. Surely that is also a considerable part of ease of use.

Turning to multi-seat elections the author is wrong in saying that "European systems of proportional representation of the party-list type all have added features to give voters some voice in the selection of representatives within parties". British voters in European Parliament elections are not given any such voice.

The main discussion in this section is of STV, mostly well done, but I find the eventual preference for Warren counting rather than Meek counting surprising. Taking the example given, carefully devised so that Newland & Britton, Warren and Meek give three different answers, there are 5 candidates (R, S, T, U, V) for 3 seats. Meek elects R, S, T where Warren elects R, S, U. It is clear from this that, in this case, V is just a nuisance candidate and a useful comparison can be made by treating V as withdrawn [4]. If that is done Warren switches to the Meek result. Furthermore using the author's own CPO-STV method, he finds that the Meek result is the dominant outcome. These facts are not in themselves conclusive because they relate to only one example and it may well be possible to find another example that does the opposite. But I suggest that they are enough to call for further thinking from the author. His view seems to be only that "the Warren variation ... accords with my conception of fairness" rather than any detailed technical analysis. Fairness is a difficult concept and my own view of it points strongly in the reverse direction.

In considering the problems caused by eliminations he includes a mention of a suggestion that I made nearly 20 years ago and regards it as "too *ad hoc* to be satisfying". So do I. But he ignores the fact that it was a very tentative suggestion that was subsequently developed to become Sequential STV

[5]. I should love to see his views on that, even if unfavourable, but it gets no mention.

In considering the refinement-comprehensibility trade-off, he appears to think that more refinement always leads to less comprehensibility. When merely tinkering with rules in minor ways, this is usually correct, but when a major rethink occurs, such as the move from methods designed for hand-counting to the Meek method, I do not believe it to be true at all. Meek is not only more refined but also far more comprehensible. Those who promote hand-counting methods, and claim them to be easy to understand, usually pass over the messy details in their descriptions of them. He also claims that the Meek rules are faster, which is not so in my experience, but it is in any case unimportant. Compared with the time, trouble and expense of conducting an election, what are a few extra seconds in calculating the result?

In the end he favours a hybrid system of allowing STV preferences only for a maximum of perhaps 10 or 12 candidates, followed by a party-list for the rest. I think that this is very inferior to STV throughout and, to echo back his own words, is too *ad hoc* to be satisfying.

On the whole the book is well set out and easily readable, but I do dislike the modern custom of putting footnotes at the end of the chapter, where they have to be searched for, rather than in their proper footnote place.

But for all my criticisms, I should like to end by repeating my first sentence and say again that this is a very worthwhile book containing a wealth of useful information.

1 References

[1] D.R. Woodall (1987) An impossibility theorem for electoral systems. *Discrete Mathematics*, 66, 209-211.

[2] J.J. Bartholdi III and J.B. Orlin (1991) Single transferable vote resists strategic voting. *Social Choice and Welfare*, 8, 341-354.

[3] H. Moulin (1988) Condorcet's principle implies the no show paradox. *Journal of Economic Theory*, 45, 53-64.

[4] I.D. Hill (1994) The comparative steadiness test of electoral methods. *Voting matters*, issue 3, 5.

[5] I.D. Hill and S. Gazeley (2005) Sequential STV a further modification. *Voting matters*, issue 20, 6-8.

Collective Decisions and Voting
by Nicolaus Tideman
Ashgate Publishing Ltd., Aldershot, 2006
ISBN-13: 978-0-7546-4717-1
ISBN-10: 0-7546-4717-X