

Interactive comment on “Constructal theory of pattern formation” by A. Bejan

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We have received 6 review comments on the paper by Dr Adrian Bejan, 3 supportive and 3 unsupportive. I find it interesting that the supportive comments are rather brief and unsubstantial and the unsupportive comments are detailed and quite substantial. Thus, the supportive comments in fact do not do justice to the debate.

The negative comments take the stance that: 1) the claims of the author are unsubstantiated, plain wrong or misleading; 2) the author has not made the effort to evaluate or review previous approaches to the development of general organizing principles or laws governing natural self-organization, and has not demonstrated that "constructal law" is an advance over these; 3) does not explain the constructal law sufficiently to the hydrological audience, and 4) that there is nothing new in relation to what is already

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available in the literature (the authors journal articles and books).

My own view is that the debate over the possible existence of organizing principles governing observed patterns in nature, the possible existence of optimality principles and their usefulness in overcoming the present intractable problem of landscape heterogeneity, is a welcome one. I certainly do not want to emasculate this debate nor do I want the blooming of new ideas in hydrology, or the import of new ideas from other cognate disciplines.

However, in this case there are serious concerns regarding the publication of this paper in its present form, given the nature of the comments received. In the spirit of the debate we need to have, I will still be supportive of publication of this paper, provided that substantial revisions are made to reflect 1) an awareness of the nature of heterogeneity and patterns of self-organization in hydrology beyond what is presented in the current manuscript; 2) an acknowledgement of previous approaches to discovering the organizing principles and principles of optimality that may underlie such heterogeneity; 3) an effort to make the new "constructal law" accessible and understandable to the hydrological community to an extent that hydrologists can begin to apply and test its predictive capability.

I also would like the author to respond seriously to the well thought-out comments by three reviewers - these cannot be simply dismissed as the prejudiced comments of "non-believers" - these are from serious scientists, some of whom do actually work in the application of various optimality principles.

I hope the author makes a genuine attempt to address these concerns and submits a revised manuscript. This will really enrich the special issue to the special issue on "thresholds and pattern dynamics" and will make it interesting and appealing to a wide cross-section of hydrologists and earth scientists.

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