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Reaching for the Extreme: How the Quest for the Biggest, Fewest, and Weirdest Makes Math

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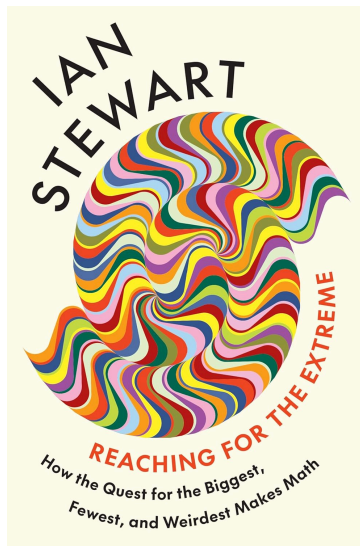
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Author: Ian Stewart

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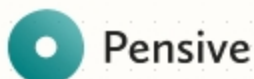
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[Reviewed by Frédéric Morneau-Guérin, on 05/15/2026]

Every mathematician is both an heir and a steward of a living tradition.

An heir, in that they belong – whether fully aware of it or not, working in relative isolation or within a community – to a long and layered intellectual inheritance. Over time, this tradition has brought into view abstract structures and forms, clarified concepts, stabilized definitions, developed notations and terminologies, articulated axioms, established theoretical frameworks, stated results, and refined the proofs that support them. Contemporary mathematical work does not arise *ex nihilo*: it extends, reshapes, and at times quietly reconfigures what has been handed down.

A steward, in that this inheritance is not merely preserved but carried forward through use, interpretation, and communication. While the subject matter of mathematics – as a formal enterprise – may lay claim to a certain objectivity, mathematical knowledge itself is irreducibly intersubjective. It must be presented, argued over, taken up, and ultimately recognized within a community. Writing, explaining, popularizing, teaching; these are not ancillary to mathematical practice; they are among the means by which the tradition endures and is renewed.



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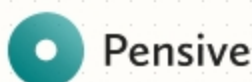
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different project. Across eighteen themes, each marked by some form of extremality, he develops a series of mathematically grounded case studies, often tracing the historical evolution of specific problems and the successive generalizations they have inspired. Discussions of planetary motion, for instance, move from Kepler's empirical laws to Newton's reformulation in terms of gravitation, illustrating how patterns are first discerned, then conceptually reorganized. Elsewhere, discussions of sphere packings – culminating in the recent resolution of the Kepler conjecture and striking advances in higher dimensions – illustrate how longstanding extremal problems evolve through the interplay of geometric insight, combinatorial structure, and, increasingly, computational verification. Even more internally driven topics – such as geometric extremal problems or classical questions about optimal configurations – are used to show how mathematical ideas develop through abstraction, generalization, and the search for structural clarity.

These excursions into substantive areas of mathematics are not ends in themselves. Rather, they serve as vantage points from which Stewart reflects on the practice of mathematics: how problems arise, how ideas evolve, how communities of mathematicians shape and are shaped by their subject. In this way, the book opens onto broader questions in the sociology and philosophy of mathematics, touching – often suggestively rather than systematically – on the psychology of the “typical” mathematician and on the historical development of mathematical thought, even of mathematical consciousness.

A particularly structuring idea appears early on, when Stewart proposes a typology of the sources from which new mathematics emerges. He distinguishes three: the search for structure in the natural world, the practical demands of human affairs, and a more elusive form of internal exploration; a curiosity directed toward patterns for their own sake. To these he adds, more reflexively, a fourth source: the existing body of mathematics, which generates its own extensions and problems. This classification, though not meant as a systematic theory, nonetheless points to a clear underlying claim: mathematical activity cannot be reduced either to a



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less to present results – though many are discussed, including quite recent ones – than to offer a way of making sense of mathematics as an activity.

The book also stands out for the range of examples it brings together. One readily recognizes the breadth – and coherence – of Stewart's interests, well known from his many earlier publications. Despite this variety, the guiding thread remains clear: extremality serves as a unifying theme, while a reflective perspective runs throughout without weighing down the exposition or distracting from it.

The historical background, for its part, is presented in a deliberately accessible manner, but without significant loss of substance. The non-specialist reader will find intelligible points of reference, while the professional mathematician may appreciate, if not technical depth, then at least the quality of the synthesis, the aptness of the connections drawn, and the discernment shown in the choice of topics.

In the end, Stewart offers a thoughtful and engaging book that reads less like a disciplinary introduction than like an essay on mathematical practice. Its strength lies in its ability to bring together historical, conceptual, and cultural considerations without heaviness, and to do so through well-chosen examples. It is a book that can be readily recommended to anyone interested in what it means, beyond results themselves, to do mathematics.

Frédéric Morneau-Guérin is a professor in the Department of Education at Université TÉLUQ. He holds a Ph.D. in abstract harmonic analysis.



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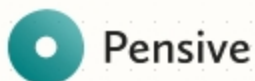
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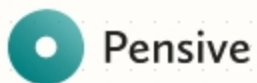


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