FOREWORD

A book about the Four Color Problem, in color. Wonderful! Robin Wilson's *Four Colors Suffice* has been one of my favorite popular mathematics books ever since it was first published, but back then the constraints of the publishing business implied that it had to be printed in black and white. It thereby became a sort of mathematical *Four Shades of Grey*. It was still a terrific read and the mathematical ideas were perfectly clear, but it stands to reason that a book about coloring maps ought to be in color. And now—it is.

I like *Four Colors Suffice* because it manages to tread a very difficult tightrope with consummate ease. It balances the need to entertain with the need to inform. It combines the remarkable and often bizarre history of one of the most celebrated and baffling questions in the whole of mathematics with a masterful presentation of the underlying mathematical ideas. And it achieves this in a way that is accessible to everyone with an interest in mathematics, whatever their level of knowledge might be.

The result is a tale that is readable and gripping, yet manages to possess genuine intellectual depth.

We now know that the answer to the Four Color Problem is indeed “four.” This is the smallest number of distinct colors that will color any map drawn on the plane so that regions sharing a common length of boundary have different colors. So now we can call it the Four Color Theorem.

What is so fascinating about this problem is that while anybody can understand the question instantly, and simple experiments with pencils and paper all support the result that everyone thought must be true, it took the world's mathematicians more than a century to answer it. What was needed, to be precise, was a complete, logically impeccable proof that four colors suffice. And that turned out to be extraordinarily hard. Much harder than most mathematicians expected, or imagined.

Right now, all known proofs require serious computer assistance, but as Robin shows us, it wasn't just a simple matter of “putting it on the computer.” It never is, in real mathematics, because the interesting problems require a lot more than arithmetic or algebra. They're about structure and ideas, and this one also involves visual reasoning. Often

the really hard part, when solving a mathematical problem on a computer, is to massage the question into a form that a computer can work with. That was absolutely the case for this problem.

But let me not anticipate Robin's extraordinary story. I'm happy to include a spoiler that gives away the answer, because Robin does that himself before you even open the book. It's there on the front cover. But I don't want to spoil anything else. I'd rather let Robin take you through it at his own carefully chosen pace and in his own inimitable style.

In color.

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