1106-C5-1594 **Reuben Hersh*** (`rhersh@gmail.com`). *Mathematicians' proof: "The kingdom of math is within you".* Preliminary report.

A mathematician's informal proof works by enabling others to perceive internally what he/she is trying to show them. I give a simple example, that $S_p(n)$, the sum of the pth powers of the first n integers is a polynomial in $S_1(n)$, if p is an odd number. (*Experiencing mathematics*, starting on page 89.)

English philosopher Brendan Larvor asks, "What qualifies mathematicians' informal proofs as proofs?" A mathematician seeking a proof is working with internal mental models of mathematical entities (numbers, spaces, algebraic structures and so on). You have direct access to your own internal mental models. You observe some properties of theirs, you manipulate them, you relate them to each other and to other mathematical entities. Your separate individual internal mental models match mine well enough that we communicate about them successfully. In mental struggle with your internal mental models, you notice something interesting. Then you want me to "see" what you "see." You hunt for a sequence of steps which will lead me to share your insight. That sequence of steps, which enables me to "see" what you "see", is what mathematicians call "a proof." (Received September 14, 2014)