Mathematical Infallibility: A Consideration of Crowe's Ten Misconceptions About Mathematics [MAS]

David M. Davison
Department of Mathematics, Montana State University - Billings 59101

In recent decades, questions have been raised about the rules of evidence for verifying mathematical truth. Does the use of computer technology expand our options? When is a historical problem such as Fermat's Last Theorem or the Four Color Map Problem considered to be solved? Can modern technology help us to prove the Goldbach Conjecture? Michael J. Crowe, in his "Ten 'laws' concerning patterns of change in the history of mathematics", challenges traditional views of the nature of mathematical truth. He does not, for example, deny that deduction plays a major role in mathematical methodology, but he asserts that it cannot be the sole method of mathematics. He points out that many errors have occurred in work published by mathematicians, thereby raising a question about one aspect of infallibility. He questions the claims that mathematical knowledge has developed in a strictly cumulative manner and that standards of rigor have remained uniform. Rather, he sees strong parallels between the methodology of mathematics and the hypotheticodeductive methodology of science. The history of mathematics has focused on western developments with less attention to non-western mathematics. In

the spirit of Greek mathematics as the beginning of the era of deductive mathematics, it is natural to charge that non-western contributions are "less mathematical". I claim that denigration of the contributions of non-western mathematicians, both in terms of their results and their methodologies, renders a disservice to an understanding of ways of thinking mathematically and will hinder us in our efforts to advance mathematical knowledge.