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Book Review: Ethnomathematics--Challenging Eurocentrism in Mathematics Education,

Arthur B. Powell and Marilyn Frankenstein, Editors

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Ethnomathematics: Challenging Eurocentrism in Mathematics Education. Powell, Arthur B. and Marilyn Frankenstein, eds. State University of New York Press: Albany, 1997. 440p. ISBN 0-7914-3351-X.

In recent years, more mathematicians and mathematics educators have been introduced to the field of ethnomathematics. While many believe the field embraces the study of the mathematics of different ethnic groups or "race" mathematics, ethnomathematicians hold the view that the field is much broader. Professor Ubiratan D'Ambrosio, perhaps the most eminent scholar in the field, tells us, "...ethnomathematics invites us to look into how knowledge was built throughout history in different cultural environments." He goes on to describe ethnomathematics as "a comparative study of the techniques, modes, arts, and styles of explaining, understanding, learning about, and coping with the reality in different natural and cultural environments."

Ethnomathematics - Challenging Eurocentrism in Mathematics Education is a book which joins, in one volume, articles containing the diverse ideas of a group of respected ethnomathematics scholars. Each article is a classic in the field having made a significant contribution to the field of ethnomathematics. The authors attempt to challenge the Eurocentric opinion that "all significant historical development in science and technology developed in Europe." Those who hold an Eurocentric bias perhaps do not know that G.G. Joseph tells us that "recent studies of India, China, and parts of Africa would suggest the existence of scientific creativity and technological achievements long before the incursions of Europe into these areas."

The book is divided into six sections. Each section has an in depth introductory article by the editors of the book followed by articles by authors such as M. Ascher and R. Ascher, G.G. Joseph, U. D'Ambrosio, D.J. Struik, P. Gerdes, and C. Zaslavsky, to name a few. The sec-

tions are directed toward ethnomathematical knowledge, uncovering distorted and hidden history of mathematical knowledge, interactions of culture and mathematical knowledge, what counts as mathematical knowledge, ethnomathematical practices in the curriculum, and ethnomathematical research. The intent of each section is to focus on certain challenges to Eurocentrism in mathematics education.

The reader not acquainted with ethnomathematics must approach this book with an open mind. Among some in the mathematics community, there has already appeared concern that the editors, Powell and Frankenstein, advocate an approach to mathematics education that would further erode the pathetic background in mathematics that many of our students presently exhibit. These people believe that introducing "primitive" mathematics into the curriculum would further reduce the time spent on "worthwhile" mathematics. The United States would thus fall further behind other nations on studies such as the TIMMS Report. I have found in discussion groups that most criticism of the book is based not on having read the book, but on assumptions that are made about academic mathematics versus ethnomathematics. There is no denying the reality that Eurocentric mathematics is the mathematics of academia. However, the authors in the book are not suggesting that Eurocentric mathematics is without value. Rather, they want people worldwide to see Eurocentric mathematics as one important piece in the large picture of mathematics.

The editors write that according to the "Eurocentric account, Europe...has always been and currently is the superior Center from which knowledge, creativity, technology, culture, and so forth flow forth to the inferior Periphery, the so-called underdeveloped countries." I believe this to be an excellent definition of Eurocentrism. What the book and its editors try to do is challenge this notion and define mathematics in a much broader context. There are those in the academic

community who view the emergence of such vocabulary as Eurocentrism as threatening to the integrity of mathematics. An example of the general attitude of many mathematicians toward ethnomathematics can be revealed in an incident that happened to me. Several years ago at a major mathematics conference, I was presenting a paper entitled "Celebrating the Mathematics of Native Americans." In the audience, I was pleased to observe an internationally respected Princeton University professor. Following the presentation, the gentleman was asked what he thought of the paper. He said that he found it interesting but containing very little mathematics. The mathematics of traditional peoples is not Eurocentric mathematics and, thus, was not destined to be included in academic mathematics. Fortunately, the editors of the book address the question "What counts as Mathematical Knowledge?"

The beauty of the book is that it offers much nourishment for thought in different areas. For me, a mathematics educator, the most important part of the book was the implications for mathematics education. This was found in Section V entitled "Ethnomathematical praxis in the curriculum." The first author in this section, Marcelo C. Borba, looks at relationships between ethnomathematics and academic mathematics. He proposes a system of education based on starting with the ethnomathematics of the group. This leads to his suggestion that the "problems to be solved would be chosen by both students and teachers in a dialogical relationship which fosters a critical consciousness." Knowledge is the result of such a dialogical relationship. Borba goes on to remind the readers that the relationship of teacher and students does not mean that the role played by both is the same. An equal relationship does not mean uniform. "In the classroom dialogue, the teacher can learn from the ethnomathematics 'spoken' by the students, just as the students are learning from the academic ethnomathematics of the teacher."

In Section V, Munil Fasheh encourages using culture to make mathematics learning more effective and meaningful. He describes mathematics education in Third World countries as being "taught as a set of rules and formulas that students have to memorize and a set of problems - usually nonsensical to students - that they must solve." I suggest that this also may describe the mathematics education in a good portion of the

United States today, especially our impoverished areas. Fasheh adds that the "objective of teaching mathematics should be to discover new "facts" about one's self, society, and culture, to be able to make better judgments and decisions; and to build the links again between mathematical concepts and concrete situations and personal experiences." He believes that when math is taught without a cultural context and when it is said to be absolute, abstract, and universal, the result is the "alienation and failure of the vast majority of students in the subject."

A third article in Section V discusses the curriculum developed by its author, S. E. Anderson. He relates that after twenty years of developing a non-Eurocentric approach in his teaching of mathematics, he found his students to have a more positive, self assured attitude toward their ability to do mathematics. He found his students were interested enough in mathematics to try courses that they had not originally considered.

Claudia Zaslavsky finishes the section by encouraging the introduction of multicultural, interdisciplinary perspectives into the mathematics curriculum. Such a curriculum helps students realize that mathematics practices arose out of people's real needs and interests. It helps children take pride in their own heritage and helps develop their own self-esteem. Linking mathematics to the other disciplines gives the study of mathematics more meaning.

I highly recommend reading *Ethnomathematics - Challenging Eurocentrism in Mathematics Education* for several reasons. First, it brings together the views of a highly regarded group of ethnomathematicians. There is integrity in their scholarship. Secondly, it helps one realize how complex the notion of Eurocentrism is. As a caveat, I will remind the reader that some of the book may be discomfoting to read. I was not comfortable with all the articles. However, recalling Piaget, remember "disequilibrium" is necessary for one to move to a different level of thought and understanding.

If the reader is further interested in ethnomathematics perspectives, I recommend looking at *Multicultural Mathematics—Teaching Mathematics from a Global Perspective*, Nelson, Joseph, and Williams, Oxford University Press, 1993.