

Zbl 0881.01002

Gerdes, Paulus**Women and geometry in southern Africa. (Femmes et géométrie en Afrique Australe.)** (French)

Paris: L'Harmattan. 218 p. (1996).

In the present book, the author continues his investigations of the mathematical – in particular geometrical – thought of African cultures and of its possible utility in mathematics teaching in an African context. It concentrates on women's geometrical creations, in part because women students may need extra encouragement in Africa as elsewhere in order to counterbalance the model mathematician normally presented in cosmopolitan mathematics education, but mainly because women are the sophisticated geometers in the cultures that are dealt with in the book: they decorate the houses, they weave bags and baskets from coloured straw, they make tattoos – and some of them are experts who guide others. Here as elsewhere, sophisticated mathematics is a specialist's business, as reported in various places in the book.

The notion of “sophisticated mathematics” is justified, even though the specialists in question do not look at themselves as “mathematicians”, a role for which traditional society has no space; but many of the patterns shown in the book exhibit symmetries that bear witness of intense reflection on formal properties of patterns. These are not restricted to invariance under the combination of reflections in lines and points, translations, and rotations, but also involve abstract invariances under combinations of spatial transformations and colour inversion (or even switches between monochrome and hatched) and symmetry breakings that arise when locally symmetric configurations are inserted in a global pattern with a different symmetry.

The diagrams take up more than half of the book, and most of the text discusses them as geometry; this is evidently useful for mathematics educators (in Africa and elsewhere) who want to use them in teaching. In various places questions are asked that intend to stimulate the reader's reflection on the geometrical properties of the patterns that are shown. But succinct accounts of the ethnographic context are also present – and, more important, suggestions for problems that might be investigated in field work, both regarding the view and approach of the artists and the social setting. It is also pointed out that many of the traditions that are presented are threatened, and that stimulation of their survival is important if this possible resource shall not be lost.

The book restricts its view to certain traditional cultures in southern Africa (Angola and Moçambique and southwards), namely to those which the author knows directly. That does not mean that the kind of geometry it deals with is restricted to the area in question – it characterizes much of Sub-Saharan Africa, and can be found as far as Kabylia (but is not approached by anything in Europe, which might contradict Martin Bernal's theses about the importance of the African inspiration for Greece – if they know about these sophistications, the Greeks were unable to adopt them). Gerdes' book will be very useful for anybody trying to work up similar understanding of the geometry of other African regions.

Two chapters summarize books which the author has published in 1994 at the Instituto Superior Pedagógico, Moçambique, and which may not be easily accessible: African Pythagoras. A study in culture and mathematics education (1994; Zbl 0840.01001) and *P. Gerdes and G. Bulafo*, Sipatsi: Technology, art and geometry in Inhambane (1994; Zbl 0863.01002).

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