



AFRICAN MATHEMATICAL UNION

COMMISSION ON THE HISTORY OF MATHEMATICS IN AFRICA

AMUCHMA-NEWSLETTER-21

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1. OBJECTIVES

The A.M.U. Commission on the History of Mathematics in Africa (AMUCHMA), formed in 1986, has the following objectives:

- a. to improve communication among those interested in the history of mathematics in Africa;
- b. to promote active cooperation between historians, mathematicians, archaeologists, ethnographers, sociologists, etc., doing research in, or related to, the history of mathematics in Africa;
- c. to promote research in the history of mathematics in Africa, and the publication of its results, in order to contribute to the demystification of the still-dominant Eurocentric bias in the historiography of mathematics;
- d. to cooperate with any and all organizations pursuing similar objectives.

The main activities of AMUCHMA are as follows:

- a. publication of a newsletter;
- b. setting up of a documentation centre;
- c. organization of lectures on the history of mathematics at national, regional, continental and international congresses and conferences.

2. MEETINGS, EXHIBITIONS, EVENTS

2.1 First International Congress on Ethnomathematics

The International Study Group on Ethnomathematics organized from 2 to 5 September 1998 in Granada (Spain) the First International Congress on Ethnomathematics. The following papers related to Africa were presented:

- * Marcos Cherinda: Basketry and using a weaving board in mathematics education (Mozambique);
- * José Barrios García: The Canary Islands also count: on the ancient number systems of North-West Africa;
- * Franco Favilli: Teaching geometry in Somalia: Linguistic and cultural aspects;
- * Chonat Getz: Fractals and South African basketry;
- * Abdulcarimo Ismael: The effect of the use of cultural games in the teaching of probability on students' performance, motivation and attitudes towards mathematics (Mozambique);
- * Jama Jama Musse: The role of ethnomathematics in mathematics education: cases from the Horn of Africa;
- * Beatrice Lumpkin: Ethnomathematics and the beginnings of mathematics (Central and Southern Africa);
- * Colin Purkey and Mogege Mosimege: Using ethnomathematics material (South Africa);
- * Teresa Vergani: Ethnomathematics and symbolic thought: Dogon's culture (Mali).

Paulus Gerdes was unable to travel to Granada to present his plenary conference on “From ethnomathematics to ethnomathematicology: perspectives”. For more information on the conference and the proceedings, contact Luisa Oliveras (see address below).

The venue for the Second First International Congress on Ethnomathematics will be in 2002 in Rio de Janeiro (Brazil) at the Santa Ursula University. The coordinator is Eduardo Sebastiani Ferreira (see address below).

2.2 Papers presented at recent meetings

- * At the International Conference “New Trends in the History and Philosophy of Mathematics” (August 6-8, 1998), realized at the University of Roskilde (Denmark), Paulus Gerdes presented the paper “Ethnomathematics as a new research field, illustrated by studies of mathematical ideas in African history.” For more information on this conference and its proceedings, contact Tinne Kjeldsen (see address below).
- * At the Avicenna Study days (September 24-26, 1998, Marrakech, Morocco) Ahmed Djebbar presented the paper “Mathematics in the work of Avicenna”.

3. CURRENT RESEARCH INTERESTS

- * No new research interests were reported.

4. NOTES AND QUERIES

This section is reserved for questions that readers would like to have answered; these are the 'queries'. The answers will be the 'notes'. If you have questions or answers about sources, dates, names, titles, facts, or other such matters related to the history of mathematics in Africa, frame them in clear and concise language and send them to the editors. If you are answering a question, make clear reference to that question. All readers may send both questions and answers. Each will be published with the name of the sender.

- * No new queries were reported.

5. THESES

5.1. Ph.D. theses concluded and in progress

- * Alex de Voogt (Leiden University, Netherlands) earned in 1995 a doctoral degree with a thesis on the memory feats and calculating skills of master players of the four-row mankala game known as ‘bao’ in Zanzibar

- (Tanzania). The thesis is entitled “Limits of the mind: towards a characterisation of Boa mastership”.
- * Ignacio Reyes García is preparing, under the direction of José Barrios García (Universidad de La Laguna, Tenerife, Canary Islands), a Ph.D. thesis on the ancient Canarian mathematical-astronomical-cosmological vocabulary, from an ethnolinguistical point of view.
 - * E. Segujja-Munagisa (Institute of Teacher Education Kyambogo, Uganda) is doing research for a Ph.D. on ethnomathematics in Uganda, under the direction of P. Mangheni (Makerere University, Kampala, Uganda) and Paulus Gerdes (Universidade Pedagógica, Mozambique).

5.2 ‘Habilitation’ of Ahmed Djebbar

- * Ahmed Djebbar defended successfully on December 10, 1998, at the School of High Studies in Social Sciences (EHESS, Paris) his ‘habilitation’ thesis entitled “**Contribution to the study of mathematical activities in Muslim West (9th-16th centuries)**”. The international jury was constituted by Jean Dhombres (University of Nantes, France), Jan Hogendijk (University of Utrecht, Netherlands), Julio Samso (University of Barcelona, Spain), Jean Ceylerette (University of Lille II, France), Baber Johansen (EHESS, France) and Menso Folkerts (University of Munich, Germany).

The habilitation is composed of the following documents:

1. A report (pp. 183) containing:
 - * List of publications and of research projects in preparation (11-19);
 - * Description of the research experience in the history of mathematics (21-30);
 - * Evaluation of the research in the history of mathematics of Andalusia and of the Maghreb since the middle of the 19th century until 1980 (31-60);
 - * Presentation of the contents of Djebbar’s and others’ research on the same theme from 1980 to 1998 (63-110);
 - * Appendix entitled “The cultural, economic and political context of scientific activities in Andalusia and the Maghreb” (121-153);
 - * Bibliography (155-183).
2. A collection of papers published or to be published, written after the defence of the ‘doctorat d’état’ thesis in June 1990 (PG: The readers of the AMUCHMA newsletter may remember that Ahmed Djebbar was also during several years in this period Minister of Education of Algeria):
 - [1] Mathematical activities in the cities of the Central Maghreb (9th - 15th centuries);
 - [2] Figurate numbers in the mathematical tradition of Andalusia and the Maghreb;
 - [3] Scientific activities and intercultural relationships in the Middle Ages: the example of Andalusia;

- [4] On the history of mathematics in North Africa. Part 1: Mathematics in the medieval Maghreb from the 9th century onwards;
- [5] Some comments on the Arab versions of Euclid's Elements and on their transmission to the Muslim West;
- [6] The redaction of the 'Istikmal of al-Mu'taman' (11th century) by Ibn Sartaq, a mathematician from the 13th-14th centuries;
- [7] The arithmetic book of Euclid's Elements in a treatise of the 11th century: the 'Kitab al-Istikmal' of al-Mu'taman (d. 1085);
- [8] The appearance of the concept of a positive real number in the epistle of al-Khayyam (1048-1131) on the explanation of the problematic premises of Euclid's book;
- [9] The life and work of a 14th century mathematician: Ibn al-Banna (1256-1321).

6. HAVE YOU READ?

6.1 On the History of Mathematics in Africa

- #265 **Actes du 5e Colloque Maghrebin sur l'Histoire des Mathematiques Arabes** [Proceedings of 5th Maghrebian Colloquium on the History of Arabic Mathematics], Imprimerie Impak, Tunis (Tunisia), 1998, 257 pp.

Proceedings of the 5th Maghrebian Colloquium on the History of Arabic Mathematics (December 1-3, 1994; cf. the report by Ahmed Djebbar, AMUCHMA 14:3.1).

- #266 **Actes du Colloque de Marrakech sur "Le raisonnement géométrique, enseignement et apprentissage"**. [Proceedings of the Marrakech Colloquium on "Geometrical Reasoning, Teaching and Learning"], Imprimerie Walili, Marrakech (Morocco), 1998, 214 pp.

These proceedings of an international colloquium held in Marrakech (May 28-31, 1997; cf. AMUCHMA 19:2.1) include the following papers related to the history of mathematics in Africa:

- * Ahmed Djebbar: Geometrical reasoning in the Arab mathematical tradition (9th-15th centuries), pp. 89-121;
- * A. El-Idrissi: The instruments used in geometrical reasoning: history and didactics, pp. 134-144.

- #267 **García, Ignacio Reyes: Estudio Etnolingüístico de los antiguos numerales canarios**, Baile del Sol, Tenerife (Canary Islands, Spain), 1998, 120 pp.

This study is a philological analysis of the transmitted names of some cardinal numbers of the old Canarian numeration system. It combines a linguistic, ethnological and historic focus (cf. AMUCHMA 19:4.1, 21:5, # 161, 171).

- #268 García, José Barrios: **Sistemas de Numeración y Calendarios de las Poblaciones Bereberes de Gran Canaria y Tenerife en los Siglos XIV-XV** (Number systems and calendars of the Berber populations of Grand Canary and Tenerife in the 14th-15th centuries), Universidad De La Laguna, Tenerife (Canary Islands, Spain), 1997, 244 pp.

Doctoral thesis. See summary in AMUCHMA 19:4.1.

- #269 Gnaedinger, Franz: **Im Haus der Seschat, Vol. 1, Geometrie und Mathematik in alten Aegypten. Von den Errungenschaften der vordynastischen Aera über die Pyramiden zum Papyrus Rhind** (Geometry and Mathematics in ancient Egypt. From the results of the predynastic period via the pyramids to the Rhind papyrus), Private edition, Zürich (Switzerland), 1998, 134 pp.

Includes a discussion of the use of Pythagorean triples in Egyptian architecture, and hypotheses on the calculation with unit fractions and the approximation of the area of a circle.

6.2 Publications on the History of Mathematics, Ethnomathematics and Mathematics Education

- #270 Ascher, Marcia: **Ethnomathematics: A multicultural view of mathematical ideas**, Brooks/Cole, Pacific Grove Ca (USA), 1991, 203 pp.; Chapman & Hall/CRC, 1994.

See #271.

- #271 Ascher, Marcia: **Mathématiques d'ailleurs**, Editions du Seuil, Paris, 1998

French edition of the already classical study #270. Translation and afterword by Karine Chemla and Serge Pahaut. Sections 2.3 and 2.4 deal with mathematical aspects of sand drawings among the Kuba (Congo / Zaire) and the Chokwe (Angola); section 4.8 deals with mathematical aspects of river-crossing puzzles (cf. # 34, 73, 252).

- #272 Gerdes, Paulus: **On some Geometrical and Architectural Ideas from African Art and Craft**, in: Kim Williams (Ed.), *Nexus'98: Relationships Between Architecture and Mathematics*, Mantua (Italy), 1998, 121-132

Presents some examples of geometrical ideas in traditional African building, as well as some further suggestions for architectural shapes inspired by African art and craft.

- #273 Gerdes, Paulus: **The Study of African Sona Geometry as an Example of Ethnomathematical Research**, in: *Ethnologie Heute*, Münster, 1998, Vol. 2, 10 pp.
[<http://www.uni-muenster.de/EthnologieHeute>]
Presents an introduction to the author's studies on Sona Geometry (Southern Central Africa) (cf. #96, 97, 98, 109, 120, 172, 173, 174, 236, 241).
- #274 Gerdes, Paulus: **Women, Art and Geometry in Southern Africa**, Africa World Press, Lawrenceville NJ / Asmara (Eritrea), 1998, 244 pp.
New edition of the book "Women and Geometry in Southern Africa. Some suggestions for further research" (1995, cf. 18:6.4, # 175, 193, 221), with an appendix by Salimo Saide on "The Geometry of Pottery Decoration by Yao Women (Nyassa Province)."
Review by Walter Sizer published by MAA Online: <http://www.maa.org/reviews/wagsa.html>
- #275 Lange, Robert; Maurice Bazin and Modesto Tamez: **Playing games: Madagascar solitaire**, in: Bazin, Maurice & Modesto Tamez: *Math across cultures*, Exploratorium Teacher Activity Series, San Francisco (USA), 1995, 15-22
Suggestions for teachers on how to use a solitaire board game from Madagascar in the mathematics classroom (cf. #200).
- #276 de Voogt, Alex: **Seeded Players**, in: *Natural History*, Feb. 1998, 18-22
Discusses the memory feats and calculating skills of master players of the four-row mankala game known as 'bao' in Zanzibar (Tanzania)

6.3 Other publications on the History of Mathematics by African mathematicians

None were reported.

6.4 Publications on the History of Mathematics and the African Diaspora

#277 Dean, Nathaniel: **African Americans in Mathematics**, American Mathematical Society, Washington, 1998, 205 pp.

This book is the report of a Discrete Mathematics and Theoretical Computer Science (DIMACS) workshop (June 26-28, 1996). It includes the invited research talks by Jonathan D. Farley, Carolyn R. Mahoney, Curtis Clark, Walter M. Miller, Nathaniel Whitaker, Isom H. Hernon, Floyd L. Williams, and Scott W. Williams (cf. AMUCHMA 20:6.2), poster presentations, and the following historical articles:

- * Lee Lorch: Yesterday, today and tomorrow (157-168);
- * Etta Falconer: The challenge of diversity (169-182);
- * Patricia Kenschaft: What next? A meta-history of black mathematicians (183-186);
- * Donald Hill: A personal history of the origins of the National Association of Mathematicians' "Presentations by recipients of recent Ph.D.'s" (187-193);
- * Nkechi Agwu and Asamgah Nkwanta: Dr. J. Ernest Wilkins, Jr.: The man and his works (195-205).

7. ANNOUNCEMENTS

- * **CIMPA School on the History of Mathematics** (cf. AMUCHMA 14:7.3)

The International Center for Pure and Applied Mathematics (CIMPA) organizes, in collaboration with Unesco-Egypt, from January 23 to February 7, 1999 in Mansurah (Egypt) a school on the **History of Mathematics in the Mediterrenean from Antiquity to the 18th century**. "The aim of the school is to allow mathematician participants to renew the memory of their science and to see this science in a new perspective." The scientific program includes the following themes: Introduction to the history and the historiography of mathematics; Ancient mathematics and its transmission; Arabic mathematics, its Hebrew and Latin transmissions; Renewal of mathematics in Europe (end of the 16th and 17th centuries); Consolidation of mathematics and mathematization of physics. For more information, contact the scientific director Roshdi Rashed.

Other CIMPA schools in Africa in 1999 are:

- * Computer tools in the research area of complex dynamical systems, Yaoundé (Cameroon), April 5-19;
- * Analysis on Lie groups and representation theory, Kénitra (Morocco), July 19 - August 4;

and a local activity supported by CIMPA is the following seminar:

- * Symbolic computation, Marrakech (Morocco), May 10-14.

* **Fifth Pan-African Congress of Mathematicians**

The fifth Pan-African Congress of Mathematicians (PACOM2000) will be hosted in the year 2000 by the University of the Western Cape near Cape Town, South Africa. Jan Persens, vice-president for Southern Africa of the African Mathematical Union and President of the South African Mathematical Society (SAMS), heads the local organising committee

* **Other mathematical conferences in Africa**

- * Effectivity in Algebra and Geometry, January 25-29, 1999, Niamey (Niger). For more information: Philipe Saux-Picart or Harouna Warou.
- * 23th Statistics Study days, May 19-24, 2000, Fez (Morocco). For more information: Rifi (estfes@fesnet.net.a) or Jean-Louis Soler (JeanLouis.soler@imag.fr).

* **25 Years “Africa Counts”**

Claudia Zaslavsky’s classic “Africa Counts: Number and Pattern in African Culture” was published for the first time in 1973. A quarter century has elapsed and the publisher Lawrence Hill invited Claudia Zaslavsky to write an introduction to the new edition of the book. She wrote this introduction, placing the book in its historical context. The new introduction contains the following subsection: “Africa Counts” and Ethnomathematics; The Work of Paulus Gerdes; Prehistory, Ancient Egypt, and Northern Africa; Africa South of the Sahara; Ethnomathematics and Mathematics Education; Revisions in the Text, Actual and Desirable, References. The new edition will be published in 1999. Hungarian and French versions of the book were published in 1988 and 1995 (cf. #20, 199).

* **Mathematics Across Cultures: A History of Non-Western Mathematics**

Helaine Selin is editing a series on the history of science in ‘non-western’ cultures. The second volume is on mathematics, and will include papers by Ahmed Djebbar (on the Maghreb and North Eastern Africa), Paulus Gerdes (on Central and Southern Africa), James Ritter (on ancient Egypt), and Helen Verran (on Yoruba). This volume is expected to be published in 1999 by Kluwer Academic Publishers (cf. #237).

- * **String Figures in Africa**
(cf. AMUCHMA 9; #175, 193, 214, 223, 228)

Recent issues of the String Figure Magazine contains the following information related to the African continent:

- * The Moon Gone Dark, collected by W. Cunnington from the Marungu people of Congo / Zaire [Vol. 1(4), dec. 1996, 5-7];
- * Nose Slip Trick, collected by M. Griaule from the Dogon people of Mali [Vol. 2(1), mar. 1997, 5-6];
- * ‘Mangbongobo’ or Flying Fox, collected by E. Smith from Congo / Zaire [Vol.3(1), 10-12];
- * A Gun, collected by H. Treleven from the people of Offa, Nigeria [Vol. 3(2), jun. 1998, 7-8];
- * The Fishing Net, collected by James Hornell (1928) from the Mende of Sierra Leone [Vol. 3(3), 12-15].

- * **Information on African journals on or related to mathematics**

- * **Journal of the Southern African Association for Research in Mathematics and Science Education**

The Southern African Association for Research in Mathematics and Science Education (SAARMSE) launched in 1997 its journal JOSARMSE. For information, contact the editor, M. Ogunniyi (see below).

- * **Journal of the Mozambican Association for Research in Mathematics and Science Education**

The Mozambican Association for Research in Mathematics and Science Education launched in 1997 its journal AMIEMAC. For information, contact Carlos Lauchande (see below). The first issue contains the paper of a talk “Ethnomathematics: A Theoretical Overview” (pp. 33-48) given in Maputo by Bill Barton (University of Auckland, New Zealand).

- * **Pythagoras**

The Association for Mathematics Education of South Africa (AMESA) publishes the journal PYTHAGORAS, “intended as an academic forum for the presentation and critical discussion of current research and developments in mathematics education at national as well as international level.” For more information, contact the editor Zain Davis (see below). Number 44 (Dec. 1997) contains a paper by Vanessa King, student the University of Witswatersrand, on “The impact of Dogon religious beliefs on their

concept of numbers” (pp. 24-26), based on information contained in M.Griaule’s “Conversations with Ogotemmel” (Oxford University Press, 1965).

*** Creation of the Mozambican Ethnomathematics Research Centre – Culture, Mathematics, Education (MERCCME)**

Ethnomathematics is the scientific field that studies mathematics and mathematical education in their historical-cultural contexts. Ethnomathematics analyses the socio-cultural influences on the development of mathematics and mathematical education, and, conversely, it analyses the influences exercised by mathematics and mathematical education on the development of cultures and societies. Ethnomathematics analyses both mathematical ideas involved in cultural practices as it explores the mathematical and educational potential of these same practices.

Ethnomathematical research started in Mozambique in 1978 with the proposal of the Research Project “Empirical Mathematical Knowledge of the Bantu Populations”, and was consolidated with the implementation and realisation, since 1987, of the Research Project “Ethnomathematics in Mozambique”. The development and expansion of ethnomathematical research since the independence of the country in 1975, led to the creation on December 9, 1998,, in Mozambique, of a research centre specifically dedicated to ethnomathematical research.

The Mozambican Ethnomathematics Research Centre - Culture, Mathematics, Education (MERCCME) has the following objectives:

- * contribute to the valuing of the cultural-scientific heritage both of the peoples of Mozambique and Africa as of humanity;
- * promote the reflection on the interrelationships between culture, science and education;
- * promote the reflection on the interrelationships between culture — language, art, games, technology, and gender, in particular — and mathematics and education;
- * realize ethnomathematical research and divulge its results;
- * promote postgraduate studies in the field of ethnomathematics;
- * promote and realize formative activities, of teachers and other cultural agents, in the field of ethnomathematics;
- * promote the incorporation of ethnomathematical research results in education— in particular, in school programs, school books, in teaching method, and in teacher education and the training of other cadres for the educational and cultural fields;
- * cooperate, at national and international level, with research centres and other organisations with similar objectives.

In the context of the activities of MERCCME new organic units may be created affiliated to or integrated in MERCCME, like a Nucleus of Mathematical Art, a Nucleus for the History of Mathematics, a Nucleus of

Mathematical Games and a Geometrical Museum. For more information, contact Paulus Gerdes.

8. ADDRESSES OF SCHOLARS, INSTITUTIONS AND PUBLISHERS MENTIONED IN THIS NEWSLETTER

- * Africa World Press: P.O.Box 1892, Trenton, NJ 08607, USA (Fax: (609) 844-0198; E-mail: awprsp@africanworld.com); P.O.Box 48, Asmara, Eritrea (Fax: +291-1-123369)
- * Agwu, Nkechi: Department of Mathematics, Borough of Manhattan Community College, City University of New York, 199 Chambers Street, New York, NY 10007, USA (E-mail: nmabm@cunyvm.cuny.edu)
- * AMESA: P.O.Box 12833, Centrahill 6006, South Africa
- * Ascher, Marcia: 524 Highland Road, Ithaca, New York 14850, USA (E-mail: aschaca@clarityconnect.com)
- * Baile del Sol: Apdo. Correos 133, 32280 Tegueste, Tenerife, Islas Canarias, Spain (E-mail: bailesol@yahoo.com, bailesol@idecnet.com)
- * Barrios-García, José: Dpto. de Análisis Matemático, Universidad de La Laguna, 38271 La Laguna (Tenerife), Canary Islands, Spain (Tel.: + 34-22-603547; Fax: +34-22-604023; E-mail: jbarrios@ull.es)
- * Barton, Bill: Department of Mathematics, The University of Auckland, PB 92019, Auckland, New Zealand (E-mail: b.barton@auckland.ac.nz)
- * Bazin, Maurice: Rua Pau de Canela 1101, Campeche, 88048-330 S. C., Brazil (E-mail: mauriceb@exploratorium.edu)
- * Cherinda, Marcos: Departamento de Matemática, Universidade Pedagógica, C.P. 4040, Maputo, Mozambique
- * CIMPA: Le Du Bellay Bât B, 4 Av. Joachim, 06100 Nice, France (Fax: +33 492 070502; E-mail: cimpa@unice.fr; Web-page: <http://www-mathdoc.ujf-grenoble.fr/CIMPA/>)
- * Davis, Zain; Editor PYTHAGORAS: School of Education, University of Cape Town, Private Bag, Rondebosch 7700, South Africa (Fax: (021) 650 3489; E-mail: zd@education.uct.ac.za)
- * Djebbar, Ahmed: Département de Mathématiques, Bâtiment 425, Université de Paris-Sud, 91405 Orsay Cedex, France (Fax: 33-1-47015917; E-mail: ahmed.djebbar@wanadoo.fr, Ahmed.Djebbar@math.u-psud.fr)
- * Falconer, Etta: Department of Mathematics, Spelman College, Atlanta, GA 30314, USA (E-mail: efalcone@spelman.edu)
- * Ferreira, Eduardo Sebastiani: UNICAMP-IMECC, Caixa Postal 6065, CEP 13083-970 Campinas SP, Brasil (E-mail: eduardo@ime.unicamp.br)
- * Gerdes, Paulus: Universidade Pedagógica, C.P. 915, Maputo, Mozambique (Fax: 258-1-422113; E-mail: paulus@virconn.com)
- * Getz, Chonat: University of the Witwatersrand, South Africa
- * Gnaedinger, Franz: Hafnerstrasse 60, CH-8005 Zürich, Switzerland (E-mail: circle@access.ch)

- * Hill, Donald: Mathematics Department, Florida A&M University, Tallahassee, FL 32307, USA
- * Ismael, Abdulcarimo: Departamento de Matemática, Universidade Pedagógica, C.P. 4040, Maputo, Mozambique (E-mail: ismael@fcnmp.uem.mz)
- * Jama, Jama Musse: Via di Pretale 103F, 56100 Pisa, Italy (E-mail: jama@beti.dm.unipi.it)
- * Kenschaft, Patricia: Department of Mathematics and Computer Science, Montclair State University, Upper Montclair, NJ 07043 (E-mail: kenschaft@math.montclair.edu)
- * King, Vanessa: Department of Mathematics, University of Witswatersrand, Wits 2050, South Africa
- * Kjeldsen, Tinne: IMFUFA, Roskilde Universitetscenter, Postboks 260, DK-4000 Roskilde, Denmark (E-mail: thk@mmf.ruc.dk)
- * Lange, Robert: The Martin Fischer School of Physics, Brandeis University, Waltham, MA 02254-9110 (E-mail: lange@binah.cc.brandeis.edu)
- * Lauchande, Carlos: Chairman AMIEMAC, c/o Departamento de Matemática, Universidade Pedagógica, C.P. 3276, Maputo, Mozambique (E-mail: lauchand@mined.uem.mz)
- * Lorch, Lee: Department of Mathematics and Statistics, York University, North York, Ontario, Canada M3J 1P3 (E-mail: lorch@mathstat.yorku.ca)
- * Lumpkin, Beatrice: 7123 S. Crandon, Chicago, IL 60649, USA (E-mail: Bealumpkin@aol.com)
- * Mosimege, David Mogege: Manager Indigenous Technologies CSIR, Building 41, P.O.Box 395, Pretoria 0001, South Africa (E-mail: mmosimeg@csir.co.za)
- * Nkwanta, Asamoah: Department of Mathematics, Howard University, Washington, DC 20059 (E-mail: nkwanta@scs.howard.edu)
- * Ogunniyi, M.: SAARMSE Secretariat, School of Science and Mathematics Education, University of the Western Cape, Private Bag X17, Bellville 7535, South Africa (Fax: +27-951 2602; E-mail: ogunniyi@cse1.uwc.ac.za)
- * Oliveras, Luisa: , Dpto. de Didáctica de la Matemática. Facultad de Ciencias de la Educación, Universidad de Granada, 18071 Granada - Spain (Fax: 34-58-246359 /34-58-243949; E-mail: oliveras@platon.ugr.es; Website: <http://www.ugr.es/~oliveras/ICEM1IN.htm>)
- * Persens, Jan: Director of International Relations, University of the Western Cape, Private Bag X17, Bellville, 7535 South Africa (Tel: +27-21-959-2884/3340; Fax: +27-21-9592655; E-mail: jpersens@uwc.ac.za)
- * Purkey, Colin: The Centre for Research and Development in Mathematics, Science and Technology, University of the Witswatersrand, South Africa
- * Reyes-García, Ignacio: C/ San Martín 75, 7º Izda., 38001 Santa Cruz de Tenerife, Canary Islands, Spain. (E-mail: jbarrios@ull.es)
- * Ritter, James: Département de Mathématiques, Université de Paris 8, 2 Rue de la Liberté, 93526 Saint Denis Cédex 02, France

- * Saux-Picart, Philippe: KIT129, Université de Bretagne'occidentale, Laboratoire d'Algèbre et Géométrie, 6 avenue Le Gorgeu, 29299 Brest, France (Fax: +33 2 98 016790; E-mail: kit129@univ-brest.fr)
- * Segujja-Munagisa, E.: Institute of Teacher Education Kyambogo, P.O.Box 1 Kyambogo, Kampala, Uganda (Fax: 256-041-220464; E-mail: itek@starcom.co.ug)
- * Selin, Helaine: Science Librarian, Hampshire College, Amherst, Massachusetts 01002 (Fax: 413-559-5419; E-mail: hselin@hampshire.edu)
- * String Figure Magazine, editor Mark Sherman: P.O.Box 5134, Pasadena, California 91117, USA (Fax: 818-305-9055; E-mail: marksherman@isfa.org; Web: <http://www.isfa.org/~webweavers/isfa.htm>)
- * Tamez, Modesto: The Exploratorium, 3601 Lyon Street, San Francisco, CA 94123, USA (E-mail: modestot@exploratorium.edu)
- * Voogt, Alex de: Onderzoekinstituut CNWS, Rijksuniversiteit Leiden, Postbus 9515, NL-2300 RA Leiden, Netherlands (Fax: +31 3554 30697; E-mail: boardgames@iname.com)
- * Verran, Helen: Department of History and Philosophy of Science, University of Melbourne, Parkville, 3052, Victoria, Australia (E-mail: h.verran@hps.unimelb.edu.au)
- * Warou, Harouna: Département des Mathématiques, Université Abdou Moumouni, Niamey, Niger
- * Williams, Kim: Via Mazzini 7, 50054 Fucecchio - Florence, Italy (E-mail: k.williams@leonet.it; Web: <http://www.leonet.it/culture/nexus/98>)

9. NEW RECIPIENTS

In issue 6 of the AMUCHMA Newsletter, we included its distribution list. In the meantime the distribution list has undergone many changes. Both hard copies and electronic versions of the AMUCHMA-Newsletter are distributed, as well as it is now accessible on the world-wide-web. It seems useful from now on to present in each issue the list of new recipients in Africa, in order to stimulate contact within and between countries. Here follows the list for issue #21:

- * African-Cariibbean-Network for Science and Technology: Ishango House, 447 Chester Road, Old Trafford, Manchester M16 9HA, UK (Fax: 0161 877 1481)
- * Ahiakwo, Macson: Faculty of Technical and Science Education, Rivers State University of Science and Technology, Nkpolu-Oroworukwo, P.M.B. 5080, Port Harcourt, Nigeria
- * Baroni, Rosa: Departamento de Matemática, IGCE-UNESP, Av. 24-A, no. 1515, 13506-700 Rio Claro SP, Brazil
- * Beal, Susan: Saint Xavier University, 3700 west 103 street, Chicago, Illinois 60655, USA (E-mail: beal@sxu.edu)
- * Bolaji, C.: Institute of Education, Ahmadu Bello University, Zaria, Nigeria (E-mail: cabolaji@abu.edu.ng)

- * Bullock, Barbara: 230 23rd Ave E #305, Seattle WA 98112, USA (E-mail: bebullock@sprynet.com)
- * Callaghan, Casey: P O Box 70160, Die Wilgers, 0041 South Africa (E-mail: nadines@icon.co.za)
- * Cilliers, Michael: Computer Coordinator, St. George's Grammar School, Richmond Road, Mowbray 7700, South Africa (Fax: +27 21 6899361, E-mail: mike@sggs.wcape.school.za)
- * Favilli, Franco: Dipartimento di Matematica, Universita di Pisa, Italy (E-mail: favilli@dm.unipi.it)
- * Flesner, David: Department of Mathematics/CS, Gettysburg College, Box 402, Gettysburg, PA 17325, USA (E-mail: dflesner@gettysburg.edu)
- * Fung, Karen: Africa Collection, Hoover Library, Stanford, CA 94305, USA (E-mail: kfung@stanford.edu)
- * Henson, Sandra: 3400 Stevenswood Ct., Baltimore MD, 21244, USA (E-mail: MathHen@aol.com)
- * Karangwa, D.: Mathematics Department, University of Rwanda (E-mail: kist@rwandatell1.rwanda1.com, subject: Karangwa)
- * Mukhopadhyay, Swapna: 122 Miller Hall, Box 353600, University of Washington, USA (E-mail: swapna@u.washington.edu)
- * Nash, John: 52 Wallace St., Somerville, MA 02144, USA (E-mail: john@africancrafts.com)
- * Ndyajunwoha, Gaston: Mathematics Department, Cuyahoga Community College, 2900 Community College Avenue, Cleveland, Ohio 44115 (Fax: 216-987-4484, E-mail: gaston.ndyajunwoha@tri-c.cc.oh.us)
- * Onumah, Nnenna: Box 2377, Oberlin College, Oberlin, Ohio 44074, USA
- * Sahraoui, Lazhar: BP 109, DZ-35320 Bordj El Bahri, Algeria
- * Stewart, Grisha: SPS #745 Box 10006, Saipan, MP 96950, USA (E-mail: GrishaS@nmcnet.edu)
- * Talabi, Olukayode: Department of Mathematical Sciences, University of Agriculture, Abeokuta, Nigeria
- * Wastiau, Boris: Section of Ethnography, Royal Museum of Central Africa, B-3080 Tervuren, Belgium (E-mail: wastiau@africamuseum.be)
- * Zatarain, Felipe: (E-mail: fzatarai@csulb.edu)

10. SUGGESTIONS

What are your suggestions for improving the AMUCHMA Newsletter?

What are your suggestions for other activities of AMUCHMA?

Send your suggestions, comments, information, questions and any other contributions to the chairman or secretary of AMUCHMA.

Send articles, books and manuscripts for the AMUCHMA Documentation Centre to the Chairman or Secretary.

11. DO YOU WANT TO RECEIVE THE NEXT AMUCHMA-NEWSLETTER?

The AMUCHMA Newsletter, published in Arabic, English and French, is available free of charge upon request.

Send requests to the Chairman

Paulus Gerdes: Universidade Pedagógica, C.P. 915, Maputo, Mozambique
(Fax: 258-1-422113; E-mail: pgerdes@virconn.com)

for the **English** version;

or to the Secretary

Ahmed Djebbar: Département de Mathématiques, Bâtiment 425,
Université de Paris-Sud, 91405 Orsay Cedex, France (Fax: 33-1-
47015917; E-mail: Ahmed.Djebbar@wanadoo.fr)

for the **French** and **Arabic** versions.

Readers who would like to receive the **AMUCHMA Journal in Portuguese** should contact the chairman, C.P. 915, Maputo, Mozambique.

12. AMUCHMA-NEWSLETTER website

Thanks to Scott Williams, the English language edition of all issues of the **AMUCHMA Newsletter** is also accessible on the following website:

http://www.math.buffalo.edu/mad/amu_chma_announce.html

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