AFRICAN MATHEMATICAL UNION

COMMISSION ON THE HISTORY OF MATHEMATICS IN AFRICA

AMUCHMA-NEWSLETTER-2

Eduardo Mondlane University, Maputo, Mozambique, 01.05.1988

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1. REACTIONS TO AMUCHMA-NEWSLETTER 1987-1

The Editors of AMUCHMA-Newsletter 1987-1 received many and always positive reactions. As an example that will speak for the other reactions, we cite Abdul-Razzak Kaddoura, Assistent Director-General of UNESCO for Science:
"I read this Newsletter with great interest and I have been impressed by the high quality of this publication and the complete information it provides on recent meetings, publications and research activities dealing with the history of Mathematics in Arab and African countries...".

2. OBJECTIVES OF AMUCHMA

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 an 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 eurocentristic bias in the historiography of mathematics;
d. to cooperate with any and all organisations pursuing similar objectives.
The main forms of activity of AMUCHMA are as follows:
a. publication of a newsletter;
b. setting-up of a documentation centre;
c. organisation of lectures on the history of mathematics at national, regional, continental and international congresses and conferences.

3. MEETINGS

* 28th Oberwolfach Meeting on the History of Mathematics

The 28th Oberwolfach Meeting on the History of Mathematics was held at the Mathematical Research Institute of Oberwolfach (F.R. of Germany), April 27 - May 2, 1987. 58 Scholars from 18 countries took part in the event. The central theme was the historical development of mathematics in non-European cultures. The following were the contributed papers related to the history of mathematics in Africa:

1. W.Kaunzer: On the influence of the Islamic mathematics on medieval western mathematics.
2. R.Franci: Probable influences of Arabic algebra on the development of algebra in Italy in the 14th and 15th centuries.
3. A.Djebbar: Some aspects of number theory in the Maghreb as revealed in chapter 8 of 'Fiqh al-Hisab' of Ibn Munᶜim (...-1228).
4. K.Jaouiche: Analysis and synthesis: the book of Ibn al-Haytham.
5. D.King: Mathematics in the service of Islam.
6. E.S.Kennedy: Iterative algorisms in medieval science.
7. A.P.Juschkevitch: "Eastern" and "Western" mathematics in the Middle Ages.
8. M.M.Rozhanskaya: Arabic Statics.
9. Y.Dold-Samplonius: Quadratic equations in Arabic mathematics.

4. THESES IN PROGRESS OR COMPLETED

* Walter Reineke (Humboldt University, Berlin, German D.R.) completed a D.Sc. thesis, entitled: "Thoughts and materials on the early history of mathematics in Egypt".

5. CURRENT RESEARCH INTERESTS

* A team headed by Sayon Oulare (University of Conakry) is doing research on the numeration systems used by the principal linguistic groups in Guinée.

* J.N.Mutio (Kenyatta University) is organising a research project on counting among the various ethnic groups in Kenya.

* Marcia Ascher (Ithaca College, USA) is doing research on mathematical-logical aspects of story puzzles. Her forthcoming paper "River crossing problems in cross-cultural perspective"

includes an analysis of the logical structure behind traditional story puzzles from Algeria, Ethipia, Liberia and Tanzania.

* Mathematical aspects of traditional sand drawings from Zambia and Angola are at present studied by Marcia Ascher (USA), Paulus Gerdes (Mozambique), and by Gerhard Kubik (Austria) together with Moya Aliya and Lidiya Malamusi (Zambia). Some forthcoming studies are:
1. M.Ascher:Graphs in Cultures II: a study in ethnomathematics (to appear in: Archive for History of Exact Sciences).
2. P.Gerdes: On possible uses of traditional Angolan sand drawings in the mathematics classroom (to appear in: Educational Studies in Mathematics).
3. P.Gerdes: Reconstruction and extension of lost symmetries: examples from the Tchokwe of North-East Angola.
4. G.Kubik: Tusona-Luchazi Ideographs. A graphic tradition as practised by a people of West-Central Africa (to be published by: Verlag Stiglmayr).

6. EDUCATION

* A 1 week course (15 hours) on the history of mathematics for the 4th year students of the National Institute for Statistics and Applied Economics took place from 29.11.87 to 6.12.87 in Rabat (Morocco). The course, attended by 17 students, was given by A.Djebbar (Algeria) and treated the following themes:
1. The context of the awakening and development of mathematical activities in the arabic-islamic civilization (7th-14th centuries);
2. Different arabic algebraic traditions;
3. Combinatorics in the Maghreb countries during the 12th, 13th and 14th centuries.

* For the second time in Algeria a 1 semester course on the history of mathematics is given in 1988 by A.Djebbar for the 4th year students of the 'École Normale Supérieure' (ENS, Kouba-Alger). This time the course includes 2 hours on mathematical activities in Subsaharian Africa.

* The Ministry of Higher Education (Algeria) decided to create a Masters degree in Didactics of Science with the option 'History of

Mathematics'. Two students will complete their master theses in the history of mathematics in september 1988, and six will do so in 1989.

* A 1 semester course on the history of mathematics started for the first time in Mozambique in august 1987 for the 1st year students of the Faculty of Mathematical Sciences at the Eduardo Mondlane University (Maputo). The course was given by Paulus Gerdes. The programme gives a historical introduction to the mathematical subjects to be studied during the 5-years master degree course and underlines that in all societies mathematical ideas have been and are developing. At the nd of the course, the students were required to write a paper of about 10 pages. Six students choosed a topic related to the history of mathematics in Africa:
1. C.Nhambire: Mathematics in Ancient Egypt (Volume of truncated pyramid);
2. J.Monteiro: Mathematics in traditional games in southern Mozambique;
3. G.Libombos: Relationship between ancient African multiplication methods and the binary number system;
4. M.Magane: Mathematics in the history of the Niassa province;
5. B.Manguele: Mathematics in the history of the Chope population (Southern Mozambique);
6. B.Marcos: Generalization of Abu Zacariya al-Hassar's method for extraction of square roots.

7. HAVE YOU READ?

7.1 On the history of Mathematics in Africa

22
Aballagh, M. and A. Djebbar: Decouverte d'un écrit mathématique d'al Hassar (XIIe S.):Le livre I du Kamil, Publications d'Orsay, Vol.86-14, Paris (France), 1986, 20 p.

Informs about the recent discovery in Marrakech (Morocco) of the first book of "al-kitab al-Kamil" (Complete Treatise on the Art of Number), a manual written by Abu Bakr (or: Abu Zakariya) al-Hassar (11th century, Maghreb). This treatise together with the little book "Kitab al-Bayan wa t-Tadhkar" of the same author played an

important role in mathematics education in the Maghreb from the 12th century until the beginnings of the 16th century. Probably they constitute the oldest written proofs of mathematical activity in this region of north Africa.

23
Campbell, Paul: An experimental course on African mathematics, in: Historia Mathematica, New York (USA), 1976, Vol.3, 477-478.

Describes an experimental liberal arts mathematics course (St.Olaf College, Northfield, USA) on African mathematics: consideration of numeration systems, geometry in art and architecture, and mathematical games; together with an analysis of important concepts of 'western' mathematics they suggest.

24
Careccio, John: Mathematical heritage of Zambia, in: The Arithmetic Teacher (USA), 1970, 391-395.

The author compiled information on traditional ways of measuring time, distance, weight, and volume in Zambia. The information was collected by "using University students who sought out the oldest people of their villages to find out how these things were done before the European types of of measurement replaced the African methods".

25
Lumpkin, Beatrice: Senefer and Hatshepsut, Dusable Museum Press, Chicago (USA), 1983, 130 p.

Novel about Egypt in the time of Hatshepsut (1500 B.C.) with information on ancient Egyptian mathematics (numerals, arithmetics, measurement, progressions).

26
Seidenberg, A.: On the eastern Bantu root for six, in: African Studies, 1959, Vol.18, No. 1, 28-34.

"The almost universal stem for 3 in Bantu is -tatu, or a variant, in particular -datu. In the northeast the dominant form for 6 is -tandatu. It has been asserted that -tandatu is a duplication of -datu. This etymology is rejected. Instead the etymology -tandatu = 5+3 is suggested. Evidence is presented to show that -tandatu was originally in position 8 but then fell into position 6".

27
Seidenberg, A.: On the eastern Bantu root for six: correction, in: African Studies, 1963, Vol. 22, No. 3, 116-117.

"In a previous article it was argued that the Eastern Bantu stem -tandatu for six originally meant 8, but later fell into position six. In the argument, the -tan of -tandatu was compared with the Bantu stem -tano for five. To this it has been (validly) objected that the t of -tano is of the palatal variety whereas the t of -tanda is not. The proposed comparison with -tano is abandoned, but the rest of the thesis maintained".

28
Seidenberg, A.: km , a Widespread Root for Ten, in: Archive for History of Exact Sciences, Berlin (FRG), 1976, Vol.16, No.1, 1-16.

The word kumi (root km) is nearly universal as the word for 10 in the Bantu languages. In Africa, the equations km =1, km =10 and km =100 all occur. In Bantu, kumi =10, kama =100. keme =1 occurs in Bagrimma. Keme =100 occurs to the far west (Mande), e.g.kome =1 occurs in Ga (Ghana). Tha author relates the km root to the ancient Indo-European sound dekm for ten and suggests a common origin. Also examples from other continents are given.

29
Shawki, Galal: Formulation and development of Algebra by Muslim scholars, in: Islamic Studies, Islamabad (Pakistan), 1984, Vol.XXIII, No.4,337-352.

Highlights of some Muslim contributions to the development of algebra (8th-16th centuries) are pointed out: solution of quadratic, cubic and biquadratic equations,addition theorem of exponents,

numerical approximation,introduction of algebraic symbolism, binomial theorem.

30
Zaslavsky, Claudia: Tic Tac Toe and other three-in-a-row games, from Ancient Egypt to the modern computor, Harper& Row, New York (USA) and Fitzhenry & Whiteside, Toronto (Canada).

"Games suitable for all ages, reading level ages 9-12. Includes many African versions: Achi (Ghana), Shisiba (Kenya), Murabaraba (Lesotho), Dara (Mali, Morocco, Niger, Nigeria), Akidada (Nigeria), Tsoro Yematatu (Zimbabwe).

7.2 On mathematicians of African descent

31
Kenschaft, Patricia: Black men and women in mathematical research, in: Journal of Black Studies (USA), Vol. 18, No. 2, December 1987, 170-190.

The article is the result of numerous interviews with and letters from "leading black men and women in mathematics and their friends". It includes short biographies on the black north-americans to receive a doctorate in mathematics.

32
Newell, V., Gipson, J., Waldo Rick, L. and Stubblefield, B. (ed.): Black mathematicians and their works, Dorrance & Company, Ardmore PA (USA), 1980, 327 p.

The first part of the book consists of scholarly articles published by North-american mathematicians of African descent. The second part is a biographical index of all mathematicians surveyed. Appendices are included, among them articles and letters concerning discrimination against blacks in the field of mathematics.

33
Rouse Ball, W.: Calculating prodigies, in: J. Newman (ed.), The World of Mathematics, Simon & Schuster, New York (USA), 1956, Vol. 1, 467-487.

Contains (p.470) brief information on Thomas Fuller (1710-1790), born in Africa and brought as a slave to Virginia (USA) in 1724. Fuller was a prodigy in mental arithmetic. E.g. he could multiply nine-digit numbers.

8 ANNOUNCEMENTS

8.1 2nd Maghrebian Colloquium on the History of Arabic Mathematics

The Study Group on the History of Arabic Mathematics of the University of Tunis will organise, in colaboration with the Tunisian Association of Mathematical Sciences, an International Colloquium on the History of Arabic Mathematics, at the University of Tunis (Tunisia) from 1 to 3 December 1988. This Colloquium is the continuation of the first Colloquium on the History of Arabic Mathematics that took place in 1986 in Alger (Cf. AMUCHMA 1987-1: 2.2). For more information, contact: Mahdi Abdeljaoud I.S.E.F.C. 43 Rue de la Liberté, 2019 Le Bardo, Tunis, Tunisia (tel. 01-261.329)

8.2 Algerian Journal on the History of Mahematics

The 'École Normale Supérieure' of Kouba-Alger (Algeria) will launch in 1988 a journal on the history of mathematics. Its first volume will contain some of the papers presented in 1986/1987 at the 'Ibn al-Haytham' Seminar on the History of Arabic Mathematics (Cf. AMUCHMA 1987-1: 5).

8.3 Bibliography on Ancient Egyptian Mathematics

"I am currently preparing an annotated Bibliography of Ancient Egyptian Mathematics. This is seen as a continuation and completion of the classic bibliography created by Raymond C.Archibald and published in Chace and Manning, The Rhind Mathematical Papyrus in 1927/1929. Both the enormous increase in

the secondary literature since that time and the decision to extend the scope of such a bibliography to include works on such topics as metrology, mathematics education, uses of mathematics in economics, construction, etc. appear to me to justify such a project now. The work will be organised thematically with complete indices by author and year of publication. Each entry will be provided with a brief, clear and non-judgemental résumé and complete cross-references. To this end, I would like to appeal to the readers of AMUCHMA Newsletter to assist if they can in such a compilation. I am particularly interested in papers or books which may not be readily available in European or American libraries on any or all of the subjects surrounding Ancient Egyptian Mathematics. If the work is not in any European language, a brief résumé in English, French, Portuguese or Spanish would be appreciated." Reprints, photocopies or references should be sent to:
James Ritter, Département de Mathématiques, Université de Paris 8, 2 Rue de la Liberté, 93526 Saint Denis Cédex 02, France.

8.4 Research Seminar on Ethnomathematics

A 5 week research seminar on Ethnomathematics and its relevance for the history and didactics of mathematics will take place in May / June 1988 at the State University of Saâo Paulo (Rio Claro, Brasil). The seminar will be conducted by Paulus Gerdes (Eduardo Mondlane University, Maputo, Mozambique).

8.5 Mathematics in traditional African games

Salimata Doumbia (Ivory Coast) will present at the 6th International Congress on Mathematical Education to be held in Budapest (Hungary), July 27- August 3, 1988, a paper entitled "On the mathematics in traditional African games".

8.6 International Congress of the History of Science

The 18th International Congress of the History of Science will take place in Hamburg and Munich (F.R. of Germany),August 1-9, 1989. The general theme of the Congress will be Science and political Order. For more information, write to: C.J.Scriba, Bundesstr. 55, IGN, D-2000 Hamburg 13, F.R. of Germany.

9. INFORMATION ON INTERNATIONAL STUDY GROUPS AND COMMISSIONS

9.1 International Commission on the History of Mathematics

The International Commission on the History of Mathematics (ICHM), chaired by Joseph W.Dauben, edits the journal Historia Mathematica (Editor: Eberhard Knobloch, Fachbereich 1 und 3, Wissenschaftsgeschichte-Mathematik, Technische Universität Berlin, Strasse des 17.Juni 135, D-1000 Berlin 12, F.R. of Germany). Scholars teaching or doing research in the history of mathematics are invited to send their names, addresses, and fields of interests to the Editor to be added to the Directory File and included in future editions of the World Directory of Historians of Mathematics.

9.2 International Study Group on the Relations between History and Pedagogy of Mathematics (HPM)

The International Study Group on the Relations between History and Pedagogy of Mathematics (HPM) is an affiliate of the International Commission on Mathematical Instruction (ICMI). It promotes the use of history in teaching mathematics. The HPM-Newsletter with debates and information on meetings and publications is available free of charge upon request. Send requests to the Editor: Charles Jones, Department of Mathematical Sciences, Ball State University, Muncie, Indiana 47306 (USA).

9.3 International Study Group on Ethnomathematics (ISGEm)

At the initiative of Ubiratan D'Ambrosio (State University of Campinas, Campinas, Brasil) was formed in 1985 the International Study Group on Ethnomathematics (ISGEm). It publishes twice a year a Newsletter with information on conferences and bibliography. For ISGEm, Ethnomatics lies at the confluence of mathematics and cultural anthropology: "...Ethnomathematics suggests a broad conceptualization of mathematics and 'ethno'. A broad view of mathematics includes ciphering, arithmetic, mensuration, classifying, ordering, inferring and modeling.

'Ethno-' encompasses identifiable cultural groups, such as national-tribal societies, labor groups, children of a certain age bracket, professional classes, and so on and includes their jargon, codes, symbols, myths, and even specific ways of reasoning and inferring." (Newsletter ISGEm, Vol. 1, No. 1, p.2). For more information, write to: Gloria Gilmer (chair ISGEm), 2001 West Vliet Street, Milwaukee, WI 53205 (USA) or to: Patrick Scott (Editor Newsletter ISGEm), College of Education, University of New Mexico, Albuquerque, NM 87131 (USA).

10. ADDRESSES OF SCHOLARS AND INSTITUTIONS MENTIONED IN THIS NEWSLETTER

1. Aballagh, Mohamed: Maison du Maroc, ch. 306, 1 Bd. Jourdan, 75014 Paris, France
2. Abdeljaoud, Mahdi: I.S.E.F.C., 43 Rue de la Liberté, 2019 Le Bardo, Tunis, Tunisia
3. Aliya, Moya: Institute for African Studies, University of Zambia, P.O.Box 30900, Lusaka, Zambia
4. Ascher, Marcia: Mathematics Department, Ithaca College, Ithaca, New York 14850, USA
5. Dauben, Joseph: Department of History, Herbert Lehman College CUNY, Bedford Park Blvd. West, Bronx, New York 10468, USA
6. Djebbar, Ahmed: Département de Mathématiques, Université Paris-Sud, 91405 Orsay Cedex, France
7. Dold, Y.: Türkenlouisweg 4, 6903 Neckargemünd, F.R.of Germany
8. Franci, R.: Centro Studi della Matematica Medioevale, Universita di Sciena, Via del Capitano 15, I-53100 Siena, Italy
9. Gerdes, Paulus: C.P.915, Maputo, Mozambique
10. Gilmer, Gloria: 2001 West Vliet Street, Milwaukee, WI 53205, USA
11. Jaouchi, K.: 128 Rue de la Croix Nivert, 75015 Paris, France
12. Jones, Charles: Department of Mathematical Sciences, Ball State University, Muncie, Indiana 47306, USA
13. Juskevitch, A.P.: Institute for the History of Science and Technology, Staropanskii 1/5, Moscow 103012, USSR
14. Kaunzer, W.: Zollerstrasse 9, 8400 Regensburg, F.R.of Germany
15. Kennedy, E.S.: Institüt für Geschichte der Arabisch-Islamische Wissenschaften, Universität, Beethovenstrasse 32, 6000 Frankfurt 1, F.R. of Germany

16. Kenschaft, Patricia: Department of Mathematics and Computer Science, Montclair State College, Upper Montclair NJ 07043, USA
17. King, D.: Institut für Geschichte der Naturwissenschaften, Universität, Beethovenstrasse 32, 6000 Frankfurt 1, F.R.of Germany
18. Knobloch, Eberhard: Fachbereich 1 und 3, Wissenschaftsgeschichte-Mathematik, Technische Universität Berlin, Strasse des 17.Juni 135, D-1000 Berlin 12, F.R. of Germany
19. Kubik, Gerhard: Burghardtgasse 6/9, A-1200 Wien, Austria
20. Lumpkin, Beatrice: 7123 S.Crandon, Chicago IL 60649, USA
21. Malamusi, Lidiya: Institute for African Studies, University of Zambia, P.O.Box 30900, Lusaka, Zambia
22. Mutio, J.N., Chairman Mathematics Department, Kenyatta University, P.O.Box 43844, Nairobi, Kenya
23. Oulare, Sayon: Doyen de la Faculté des Sciences, Université de Conakry, B.P.1147, Conakry, Guinée
24. Ritter, James: Département de Mathématiques, Université de Paris 8, 2 Rue de la Liberté, 93526 Saint Denis Cédex 02,France
25. Rozhanskaya, M.M.: Institute for the History of Science and Technology, Staropanskii 1/5, Moscow 103012, USSR 26. Salimata, Doumbia: Institut de Recherches Mathématiques, 08 B.P. 2030, Abidjan 08, Ivory Coast
27. Scott, Patrick: College of Education, University of New Mexico, Albuquerque, NM 87131, USA
28. Scriba, C.J.: Bundesstr. 55, IGN, D-2000 Hamburg 13, F.R. of Germany
29. Seidenberg, A.: Department of Mathematics, University of California, Berkeley, California 94720, USA
30. Shawki, Galal: Dean Faculty of Engineering, Qatar University, P.O.Box 2713, Doha-Qatar, Arabian Gulf
31. Verlag E.Stiglmayr: Wienerstrasse 141, A-2822 Föhrenau, Austria
32. Zaslavsky, Claudia: 45 Fairview Avenue, 13-1, New York, NY 10040, USA

11. 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.

12. 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, C.P.915, Maputo, Mozambique for the English version, or to the Secretary Ahmed Djebbar,Département de Mathématiques, Université Paris-Sud, 91405 Orsay Cedex, France for the Arabic and French versions.