AFRICAN MATHEMATICAL UNION

COMMISSION ON THE HISTORY
OF MATHEMATICS IN AFRICA

AMUCHMA-NEWSLETTER-8

Instituto Superior Pedagógico, Maputo (Mozambique), 7.9.1992

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0. NOTE OF THE CHAIRMAN

The Secretary of the A.M.U. Commission on the History of Mathematics in Africa (AMUCHMA), Prof. **Ahmed Djebbar**, has been appointed on 19.7.1992 **Minister of National Education** of the Democratic and Popular Republic of Algeria. On behalf of AMUCHMA, I would like to congratulate Prof. Djebbar and wish him success in his new and very responsible position.

Paulus Gerdes
Chairman AMUCHMA

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 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 a documentation centre;

c. organisation of lectures on the history of mathematics at national, regional, continental and international congresses and conferences.

2. MEETINGS

2.1 Third Pan-African Congress of Mathematicians

The 3rd Pan-African Congress of Mathematicians was held at the Kenyatta Conference Centre, Nairobi (Kenya), August 20-28, 1991. The following were contributed papers concerning the history of mathematics in Africa:

* Gerdes, P.: On the History of Mathematics in Subsaharan Africa, an overview of recent research;
* Ismael, A.: On the origin of the concepts of 'even' and 'odd' in Macua culture (Northern Mozambique);
* Doumbia, S.: African games and mathematics.

The General Assembly of the African Mathematical Union honoured during the Congress the following three mathematicians who have pioneered the development of mathematics in their countries and their subregion: **Attia Ashour** (Egypt), **Chike Obi** (Nigeria) and **Paul Mugambi** (Uganda). In his address to the Congress, Mugambi described the historical development of mathematics in Uganda.

2.2 Lectures on the History of Arabic Mathematics at the University of Khartoum (Sudan)

The University of Khartoum invited Ahmed **Djebbar** to give a series of lectures on the History of Mathematics. The following papers were presented:

* The context of the birth and development of Arabic mathematics (8th - 16th centuries) [21.12.1991];
* History of classic algebra from the scribe Ahmose to Evariste Galois [22.12.1991];
* Calculation and demonstration in the Arabic mathematical tradition: History of a double algorithmetical and deductive approach [23.12.1991];
* The great orientations of mathematical activities in the Arab-Islamic civilisation [23.12.1991];
* Mathematics and linguistics: the example of combinatorics in the Arabic mathematical tradition (8th - 14th centuries) [24.12.1991];
* The essential phases in the history of Arab mathematical activities [26.12.1991].

2.3 Papers presented at recent meetings

* At the 14th International Conference on the Psychology of Mathematics Education [PME] (Mexico City, Mexico, July 1990) Hilda Lea presented a paper entitled '**Spatial concepts in the Kalahari**'.

* At the Department of Mathematics of the 'École Normale Supérieure' (Alger, Algeria) Paulus Gerdes presented on 28.11.90 a paper on '**Mathematical elements in the SONA drawing tradition**'.
* At the annual Seminar of the Mathematical Association of Tanzania (September 16-21, 1991 at the Klerruu Teachers College in Southern Tanzania), G.Mmari presented a paper entitled '**The history of the Mathematical Association of Tanzania, 1966-1991**'.

3. CURRENT RESEARCH INTERESTS

* Gizachew **Atnaf** (Dresden, Germany) started research for a Ph.D. dissertation on the cultural history of mathematics in Ethiopia.
* Peter **Ford** (NY, USA) started a research project entitled "The study of the history of traditional, cultural mathematics of East Africa"
* H.**Straley** (Virginia, USA) is currently researching the mathematics understandings of the Mali Empire during the time period from the eleventh through the fourteenth centuries.

4. NOTES AND QUERIES

This section is reserved for questions to which readers would like to have answers; 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 the question. All readers may send both questions and answers. Each will be published with the name of the sender.

4.1 Fractal geometry and traditional African architecture

Ron **Eglash** and Peter **Broadwell** (University of California, USA) concluded a research report on Fractal Geometry in Traditional African Architecture (The Dynamics Newsletter, Santa Cruz Ca., July 1989, 3-8) and would like to know of other researchers who would be interested in studies concerning fractal architectural designs in Africa.

4.2 Numerical representations in San (Bushmen) rock art

Annemarie **Martinson** (University of the Witwatersrand, SA) started a research project of looking for numerical representations in San (Bushmen) rock art. She writes:

> "I have read 'Native American Mathematics' (ed.Closs) in which one chapter is devoted to an investigation into numerical representations in

Mexican petroglyphs. I would like to do a similar study. Do you have any knowledge of similar work done in Africa, and would have suggestions on references or contacts, or procedures?..."

At the South African Art Research Association Conference (August 1991, Drakensberg) she presented a paper entitled '**The role of rock art in mathematics education**'.

5. HAVE YOU READ?

#86 **Actes du Premier Colloque International d'Alger sur l'Histoire des Mathématiques Arabes,** La Maison des Livres (12 rue Ali Boumendjel), Alger (Algeria), 1988.

Proceedings of the first International Colloquium on the History of Arabic Mathematics, held in Alger, Algeria (1986) [cf. AMUCHMA 1: 2.2]. It includes the following contributions:

* Souissi, M: The Maghrebian mathematical school: some examples of its works and certain of its particularities (pp 9-24)
* Sadallah, A.: Some scientific practices in Algeria during the period of scientific retardation (15th-18th centuries) (pp. 25-36)
* Jaouiche, K.: Analysis and synthesis in the Arabic-Islamic mathematics: the book of Ibn al-Haytham (pp.37-50)
* Hogendijk, J.: The king-geometer Al-Mu'taman ibn Hud and his book of perfection (Kitab al-istikmal) (pp. 53-6)
* J.Sesiano: The "Liber Mahamaleth", a Latin mathematical treatise composed in the 12th century in Spain (pp. 67-98)
* Djebbar, A.: Some aspects of algebra in the mathematical tradition of the Mussulman West (pp. 99-124)
* Bebbouchi, R.& Taleb, K.: The infinitely great quantities of Thabit Ibn Qurra (pp. 125-132)
* Aballagh, M.: The foundations of mathematics in 'Raf al-Hijab' of Ibn al-Banna (1256-1321) (pp. 133-154)
* Abdeljaouad, M. & Hedfi, H.: Towards a study of the historical and mathematical aspects of the open problems of Ibn al-Khawwam (13th century) (pp.155-178)
* Guergour, Y.: A Maghrebian mathematician: Ibn Qunfudh al-Qasantini (740-809 / 1339-1406) (pp.179-190)
* Zemouli, T.: The poem of Ibn al-Yasamin on irrational quadratic numbers (pp. 191-203)

#87 **Actes du Deuxième Colloque Maghrebin sur l'Histoire des Mathématiques Arabes,** Maghreb-Éditions (5 rue Borj Bourguiba), Tunis, 1991, 206 p.

Proceedings of the second Maghrebian Colloquium on the History of Arabic Mathematics, held in Tunis, Tunesia (1988) [cf. AMUCHMA 4: 2.1]. It includes the following contributions:

* Atik, Y: The algebraical epistle of Sinan ibn al-Fath (10th century) (pp.5-19)
* Bebbouchi, R.: The infinite and the arab mathematicians (pp. 20-26)
* Borowczyk, J.: Proof and complexity of the algorithms for the solution of polynomial equations by Al-Tusi and Viète (pp.27-52)
* Djebbar, A.: Some new elements on the Arabic mathematical activities in the east Maghreb (9th - 16th century) (pp. 53-73)
* Dold-Samplonius, Y: Al-Kashi's measurement of Muqarnas (pp.74-84)
* Folkerts, M.: The Arabic Euclid in the Latin West (pp.85-94)
* Guillemot, M.: From Egyptian arithmetics to Arabic-Islamic arithmetics (pp.95-105)
* Jaouchi, K. : Some aspects of the evolution of the role of geometry and algebra from the 9th to the 13th century (pp.106-124)
* King, D.: An overview of the sources for the history of astronomy in the medieval Maghrib (pp. 125-157)
* Lorch, R.: Remarks on Greek mathematical texts in Arabic (pp.158-163)
* Martzloff, J.: The contacts between Arabic and Chinese astronomies and mathematics principally seen from Chinese sources (pp.164-182)
* Sesiano, J.: The place of geometry in establishing the foundations of Islamic algebra (pp.183-194)
* Abdellatif, A.: The lunes of Ibn Al-Haitham (in Arabic; French summary p.195)
* Bruins, E.: Mathematics before and after the so-called Islamic period (in Arabic; French summary p.196)
* Hadfi, H.: The book of data (al-Mafrudhat) of Thabit Ibn Qurra (in Arabic; French summary p.197)
* Hamzaoui, R.: The unification and normalisation of Arabic scientific terminology (in Arabic; French summary p.199)
* Kane, A.: Arabic alphabetic numeration and decimalisation of the Mandé numeration systems (West-Africa) (in Arabic; French summary p.200)
* Laib, A.: The geometrical instruments in the Arabic mathematical tradition (in Arabic; French summary p.202)
* Saydan, A.: Mathematics between the Islamic West and East (in Arabic; French summary p.203)
* Souissi, M.: Some problems and their Arabic solutions (in Arabic; French summary p.205)
* Zammouli, M.: Birth and evolution in the Arabic algebraic terminology (in Arabic; French summary p.206)

#88 Benoit, P.; Chemla, K. & Ritter, J. (ed.): **Histoire de fractions, fractions d'histoire**, Birkhäuser Verlag, Basel (Switserland), 1992, 436 p.

Proceedings of the international colloquium on the History of Fractions held in Paris, France (1987) [cf. AMUCHMA1: 2.3]. The following chapters concern the history of mathematics in Africa:

* J.Ritter: Metrology and the prehistory of fractions (pp.19-35);
* M.Caveing: The arithmetic status of the Egyptian 'quantième' (pp.39-52);
* M.Guillemot: Do notational and operational practices allow us to speak of Egyptian fractions? (pp.53-70);
* A.Djebbar: The treatment of fractions in the Arab mathematical tradition of the Maghreb (pp.223-246);
* M.Aballagh: Fractions between theory and practice in the work of Ibn al-Banna al-Marrakusi (1256-1321) (pp.247-259)

#89 Bronshtehn, V.A.: **Claudius Ptolemy. Second Century A.D.**(in Russian), Nauka, Leningrad, 1988, 24p.

Edited with a preface and an afterword by A.Gurshtein. An overview which, besides the contributions of Ptolemy to astronomy, includes discussions of his work in optics, music, geography, and astrology.

#90 Christianidis, Jean: **'Aristhmetikè Stoicheíosis': Un traité perdu de Diophante d'Alexandrie?**, in: Historia Mathematica, New York (USA), Vol.18. No.3, 1991, 239-246

"The author suggests a conjecture about the existence of a lost theoretical treatise of Diophantus, entitled *Teaching of the Elements of Arithmetic* His claims are based on a scholium of an anonymous Byzantine commentator".

#91 Doumbia, Salimata (ed.): **Mathématiques dans l'environne-ment socio-culturel Africain, Vol. 1: Jeux**, Institut de Recherches Mathé-matiques, Abidjan (Côte d'Ivoire), 1984, 240p.

Studies mathematical aspects of traditional games of Côte d'Ivoire:

1. Verbal games: memory and counting games (S.Doumbia, J.Garin & T.Nguyen);
2. Simple calculation games: Lokoto and Abikou (T.Nguyen);
3. Board games: Awalé (S.Doumbia), Tiouk-Tiouk (F.Carpentier & T.Nguyen), Dili (T.Nguyen), Kpanê and Kro Konono Kpanê (S.Doumbia & T.Nguyen);
4. Gambling games: Kélio (F.Carpentier & S.Doumbia);
5. Games of chance: weight game (T.Nguyen), Nigbé, a game with cauris (S.Doumbia).

#92 Dundas, Charles: **Chagga Time-Reckoning**, in: Man, London (UK), Vol.87-88, 1926, 140-143

Describes pre-colonial time-reckoning among the Wachagga (Kilamanjaro-region, east Africa): the year is divided into twelve months; each month has thirty days and is divided into six periods of five days each. Describes also the belief in the influence of the day and the hour in which a person is born, on his character and life.

#93 El-Abbadi, Mostafa: **The life and fate of the ancient Library of Alexandria**, UNESCO, Paris, 1990, 250p. (published in English, French and Arabic)

Describes the background and the history of the Library of Alexandria: from its creation in the early third century B.C. to the destruction of the Royal Library in 48 B.C. and of the Daughter Library in 391. Particular attention is given to the type of scholarship cultivated at Alexandria. Eratosthenes of Cyrene, author of 'On the Measurement of the Earth', was the chief librarian from 245 to 204/1 B.C. Other mathematicians that are referred to, are Euclid (86), Heron (90), Claudius Ptolemy (141), Theon and Hypathia (159).

#94 Euclid of Alexandria: **Les Élements (traduits du texte de Heiberg): Vol.1, Livres I-IV: Géométrie plane**, Presses Universitaires de France, Paris, 1990, 531p.

General introduction by Maurice Caveing. Translation and commentary by Bernard Vitrac of Euclid's *Elements* based on the text by Heiberg.

#95 Gerdes, Paulus: **Ethnogeometrie. Kulturanthropologische Beiträge zur Genese und Didaktik der Geometrie** (Ethnogeometry. Cultural-anthropological contributions on the genesis and the didactics of geometry), Franzbecker Verlag, Bad Salzdethfurth (Germany), 1991, 360p.

After a critical analysis of the phenomenon of curriculum export from the North to the South, the author stresses the need to incorporate mathematics education into the cultural/scientific contexts of Africa. The book is intended to contribute towards this aim by studying the (historical) relationships between (the development of) geometrical knowledge and socially important activities as mat and basket weaving, pot making and house building. In the second part of the book hypotheses on the early development of geometrical thinking are formulated. The last part presents examples of didactical experimentation with the aforementioned incorporation. Peter Damerow (Max Planck

Institute for Educational Research, Berlin, Germany) wrote the preface, entitled 'Ethnomathematics and Curriculumexport'.

#96 Gerdes, Paulus: **On Mathematical Elements in the Tchokwe "Sona" Tradition**, in: For the Learning of Mathematics, Montreal (Canada), Vol.10, No.1, 1990, 31-34

#97 Gerdes, Paulus: **On mathematical elements in the Tchokwe drawing tradition**, in: Discovery and Innovation, Journal of the African Academy of Sciences, Nairobi (Kenya), Vol.3, No.1, 1991, 29-36

#98 Gerdes, Paulus: **On Mathematical Elements in the Tchokwe 'Sona' tradition**, in: Afrika Mathematika, Journal of the African Mathematical Union, Ibadan (Nigeria), Series 2, Vol.3, 1991, 119-130

These three related papers present a summary of the author's research findings on the mathematics in the sanddrawing ('sona') tradition of the Tchokwe people (Angola): symmetries and monolinearity, classes and geometrical algorithms, rules for the construction of monolinear 'sona'; and discuss the educational and mathematical potential of this tradition. The examples given in the papers vary.

#99 Joseph, George Gheverghese: **The Crest of the Peacock: non-European Roots of Mathematics**, Tauris Publishers, London (UK) /New York (USA), 1991, 368p.

The author states in chapter 1 that the "standard treatment of the history of non-European mathematics exhibits a deep-rooted historiographical bias in the selection and interpretation of facts, and that mathematical activity outside Europe has as a consequence been ignored, devalued or distorted" (p.3). In the subsequent chapters he contributes to an alternative perspective. With respect to Africa, it is noted that "Much research needs to be done..." (p.22). Information is given on the Ishango bone (23-27), on Egyptian mathematics (57-90, 125-129), on the Zulu counting system (43-44) and on Yoruba arithmetic (44-46).

#100 Klein, Herbert Arthur: **The science of measurement, a historical survey**, Dover, new York (USA), 1988, 736p.

Contains little information on measurement in Africa: Egyptian length measures ('cubit' and 'foot', 59-61); Egyptian weigth 'ratl' (86); 'Cape foot' from South Africa (63).

#101 Lea, Hilda: **Informal Mathematics in Botswana: Mathe-matics in the Central Kalahari**, Faculty of Education, University of Botswana, 1990, 9 p.

"A good example of what mathematical ideas were used before recorded history, can be seen today in the daily activities of

Bushman society. They carry out mathematical activities suitable for their traditional way of life, and their highly developed spatial abilities are very necessary for survival in their harsh environment" [p.1]. The paper describes counting (one, two, two-one, two-two, two-two-one etc.), measurement, time reckoning, classification, tracking and mathematical ideas in technology and craft. "Bushmen have the oldest pattern of life found in the world today... A hunting and gathering community does not have need of counting precise measurement though requires basic skills for survival, and very special skills to interpret the environment. They need very good visual discrimination and visual memory" [p.7].

#102 Lea, Hilda: **Informal Mathematics in Botswana: Spatial concepts in the Kalahari**, Faculty of Education, University of Botswana, 1990, 9 p.

"Hunters and herdsmen in the Kalahari, who have never been to school and who have lived in very remote areas all their lives, were interviewed on two occasions to ascertain how far their spatial concepts have developed. When asked how they recognised animal footprints, and how they found their way in the desert, they were seen to have a very good visual memory, and to be aware of the minutest detail in recognising shapes. When given a visual thinking test, they performed with a high degree of skill on items related to their environment".

#103 Mann, Adolphus: **Notes on the Numeral System of the Yoruba Nation**, in: Journal of the Anthropological Institute of Great Britain and Ireland, London (UK), Vol.16, 1886, 59-64

Explains how the addition, multiplication and subtraction principles are used to form the Yoruba (Nigeria) numerals: 15 = 5 less 20, 40 = 20 x 2, 170 = (20 x 9) - 10, 185 = (200 - 10) - 5, 5000 = 200 x 25, etc. The author suggests the origin of this system is found in "the way in which large sums of money (cowries) are counted".

#104 Pater, C.de: **Was Augustine Mathematics-Hostile?**, in: Nieuw Archief voor Wiskunde, Amsterdam (Netherlands), Vol.8, No.1, 1990, 43-45

Criticizes an article by H.Beckers [1988] in the same journal, in which it is asserted that Augustine (354-430), bishop of Hippo (North Africa), warned that "good christians should beware of mathematicians, because the danger exists that they have made a pact with the devil". On the contrary says the author Augustine warned against astrologers: the Latin mathematicus also means astrologer. Augustine considered geometry and arithmetic as useful disciplines.

#105 Washburn, Dorothy: **Style, classification and ethnicity: design categories on Bakuba raffia cloth**, American Philosophical Society, Philadelphia (Box 40098, Philadelphia, PA 19106, USA), 1990

"The study shows that while two kinds of features are used for category definition (object-specific features and basic perceptual properties) the style of a culture is primarily defined by the way the basic properties are specifically manipulated. This thesis is illustrated by a study of named pattern categories on Bakuba raffia cloth. One of the basic perceptual properties is symmetry. Chapter 5 details how a symmetry analysis of the raffia patterns can differentiate patterns produced by the different Bakuba groups".

6. OBITUARY

Prof.Evert **Bruins** of the University of Amsterdam, Netherlands (see AMUCHMA 1: 2.3; 4: 2.1; 7: 5) died 20.11.1990 (born 4.1.1909). E.Knobloch (Technical University Berlin, Germany) wrote an 'In memoriam' (Historia Mathematica, New York, Vol.18, 381-389, 1991) with a bibliography of scientific books and articles compiled by J.Hogendijk. The bibliography includes the following publications refering to the history of mathematics in Africa:

1945 On the approximation of **Error!**in Egyptian geometry (in Dutch), in: Indagationes Mathematica, Vol.7, 11-15

1952 Ancient Egyptian arithmetic: **Error!**, in: Indagationes Mathematica, Vol.14, 81-91

1957 The icosaedron from Heron to Pappus, in: Janus (International Journal for History of Science, Technology, Medicine and Pharmacy), Vol.46, 173-182

1957 Plato and the Egyptian table 2/n (in French), in: Janus, Vol.46, 253-263

1962 Questions of rationality in pyramids (in German), in: Praxis der Mathematik, Vol.4, 281-284

1964 Babylon and Heron versus Euclid (in French), in: Revue d'Assyriologie et d'Archéologie Orientale, Vol.58, 173-181

1965 The Egyptian shadow clock, in: Janus, Vol.52, 127-137

1965 Egyptian astronomy, in: Janus, Vol.52, 161-180

1975 The part in ancient Egyptian mathematics, in: Centaurus, Vol.19, 241-251

1975 Contribution to the interpretation of Egyptian mathematics, in: Actes du XXIXe Congrès International des Orientalistes, Section Égyptologie, Vol.1, 25-28

1977 (with P.Sijpesteijn & K.Worp) Fragments of mathematics on papyrus, in: Chronique d'Egypte, Vol.52, 105-111

1981 Egyptian arithmetic, in: Janus, Vol.68, 33-52
1981 Reducible and trivial decompositions concerning Egyptian arithmetics, in: Janus, Vol.68, 281-297
1983 On some hau-problems: a revision, in: Janus, Vol.70, 229-262
1988 (with W.Liesker & P.Sijpesteijn) A Ptolemaic papyrus from the Michigan collection, in: Zeitschrift für Papyrologie und Epigraphik, Vol.74, 23-28
1990 Ptolemaic and Islamic trigonometry: the problem of the qibla, in: Janus, Vol.73, 125-148

7. ANNOUNCEMENTS

7.1 Study Group on the History of Mathematics at Béjaia during the Middle Ages

A Study Group on the History of Mathematics at Béjaia during the Middle Ages (**GEHIMAB**) has been created (December 1991) in Béjaia (Algeria). The Study Group published a first brochure, that treats the following themes:

* Importance of the mathematical school at Béjaia during the Middle Ages;
* Mathematical contents taught at Béjaia;
* An eminent professor from Bougie: Al Qurashi;
* A famous pupil from Béjaia: Fibonacci (Italy);
* Mathematical linguistics.

President of GEHIMAB is **D. Aissani** (LAMOS, Centre Universitaire de Béjaia, 06000, Algeria)

7.2 Information Bulletin of the Ibn al-Haytham Seminar on the History of Arabic Mathematics

The Department of Mathematics of the 'École Normale Supérieure' (ENS) at Kouba (Algeria) published in December 1991 the first number of its information bulletin called '**Cahier du Séminaire Ibn al-Haytham sur l'Histoire des Mathématiques Arabes**': 36 p. with articles mostly in Arabic. The bulletin is directed foremost to students and former students of the ENS at Kouba, who take part in the Ibn al-Haytham Seminar, that started in 1986 (cf. AMUCHMA 1:5), but it is hoped that the Bulletin may be useful to all in Algeria and elsewhere interested in the history of Arabic mathematics. The number includes information on

*the activities of the Seminar;
*current research;
*bibliography;
*recent theses, books and papers;
*colloquia.

Ahmed **Djebbar** is responsible for the 'Cahier' and Youcef **Guergour** and Touhami **Zemouli** form the secretariat . Adress: ENS de Kouba, Département de Mathématiques, B.P.92, 16050 Vieux Kouba, Alger, Algeria, tel. 581135; telex: 62567).

8. ADRESSES OF SCHOLARS AND INSTITUTIONS MENTIONED IN THIS NEWSLETTER

* Aissani, D.: LAMOS, Centre Universitaire de Béjaia, 06000, Algeria
* Atnaf, Gizachew: Borsbergstr. 34/122, O-8019 Dresden, Germany
* Caveing, Maurice: 13 Bd. Beaumarchais, 75004 Paris, France
* Christianidis, Jean: Chrisanthèmon Street 10, GR-15772 Athens, Greece
* Djebbar, Ahmed: Ministry of National Education, Algiers, Algeria
* Doumbia, Salimata: Institut de Recherches Mathématiques, 08 B.P. 2030, Abidjan 08, Côte d'Ivoire
* El-Abbadi, Mostafa: Department of History, University of Kuwait, Kuwait
* Eglash, Ron: History of Consciousness, University of California, Santa Cruz, Ca 95064, USA
* Ford, Peter: 445 North Street, White Plains, New York 10605, USA
* Gerdes, Paulus: Higher Pedagogical Institute, P.O.Box 3276, Maputo, Mozambique
* Guergour, Youcef: Département de Mathématiques, ENS de Kouba, 16050 Vieux Kouba, Alger, Algeria
* Hogendijk, Jan: Mathematisch Instituut, Rijksuniversiteit Utrecht, Postbus 80.010, 3508 TA Utrecht, Netherlands
* Ismael, Abdulcarimo: Department of Mathematics, Higher Pedagogical Institute, P.O.Box 3276, Maputo, Mozambique
* Joseph, George G.: Faculty of Economic and Social Studies, University of Manchester, Manchester M13 9PL, UK
* Martinson, Annemarie: Department of Mathematics, University of the Witwatersrand, PO Wits, 2500 Johannesburg, South Africa
* Mugambi, Paul: Dean Faculty of Sciences, Makerere University, P.O.Box 7062, Kampala, Uganda
* Lea, Hilda: Faculty of Education, University of Botswana, Private Bag 0022, Gaberone, Botswana
* Mmari, G.: Co-ordinator, Open University Planning office, P.O.Box 9213, Dar es Salaam, Tanzania
* Pater, C. de: Centrum Algemene Vorming, Vrije Universiteit, De Boelelaan 1083, 1081 HV Amsterdam, Netherlands
* Smith, Arthur: Rhode Island College, Providence, RI 02908, USA
* Straley, H.W.: Mathematics Departement, Woodberry Forest School, Woodberry Forest, Virginia 22989, USA
* Wasburn, Dorothy: 120 Pleasant Valley Road, Titusville, New Jersey 08560, USA

* Zemouli, Touhami: Département de Mathématiques, ENS de Kouba, 16050 Vieux Kouba, Alger, Algeria

9. 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.

10. 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
P.O.Box.915, Maputo, Mozambique,

for the English version, or to the Secretary

Ahmed Djebbar
Ministry of National Education, Algiers, Algeria

for the French version, or to Professor

Mahdi Abdeljaoud,
I.S.E.F.C., 43 rue de la Liberté, 2019 Le Bardo, Tunis, Tunisia,

for the Arabic version.