International Union of Soil Sciences

Commission 1.1 Soil Morphology & Micromorphology *Newsletter*

October 2013, vol. 13, p. 1-25

Dear Colleague,

Here you have the October Soil Micromorphology Newsletter. My most sincere thank to all the numerous contributions I received to complete it.
Among the different informations, I want to stress the (new) deadline for presentation of abstracts to the next **World Congress of the IUSS in Jeju** (Korea) next June; and also the Call for Nominations for the **Young Micromorphologist Publication Award**, to be presented there as well. Please send your abstracts and nominations as soon as possible!

Best regards,

Rosa M Poch
Chair Comm. 1.1. Soil Morphology and Micromorphology - IUSS
Department of Environment and Soil Science, University of Lleida, Catalonia.
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PLEASE, VISIT THE COMMISSION 1.1. WEBSITE

… available to share information, send news and pictures, see the latest publications…
http://loess.umcs.lublin.pl/micro.htm

Maintained by Przemyslaw Mroczek, Dept. Physical Geography and Paleogeography, Maria Curie-Sklodowska University, Poland
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YOUNG MICROMORPHOLOGIST PUBLICATION AWARD: CALL FOR NOMINATIONS

DUE November 30, 2013

Commission 1.1: Soil Morphology and Micromorphology will award the Young Micromorphologist's Publication Award every 2 years: at each International Working Meeting on Micromorphology, and at each World Congress of Soil Science.

The purpose of this award is to encourage and promote the use of soil micromorphology by young scientists. The Award will be given to one or more young scientist who has published the proposed research publication in the preceeding 4 years, that is an outstanding contribution to the principles, methodology, or application of micromorphology. The author must be less than 35 years old at the time of acceptance of the publication, and he/she must be the first author. The paper must be published in an international journal with wide distribution, but not necessarily a scientific journal. The award is not restricted to papers published in the English language only.

The selection of the awardees will be the responsibilitiy of the Kubiena Award Commitee.

Applicants should submit the following:

(1) a pdf file of the paper[1] to be considered for the award,

(2) proof of age for eligibility (ex: photocopy of ID or other document with birthdate), and

(3) a cover letter explaining why it should be considered for this award. Letters of support from senior micromorphologists, outlining the qualities of the publication are also welcome.

Applications are due November 30, 2013.

Send to:
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[1] At the Business Meeting of the Commission during the IWMSM Lleida 2012 it was decided that only one paper per candidate could be accepted.

COURSES

http://www.medellin.unal.edu.co/latmicrosoil/ 4-10 august 2014

Objectives:

To extend the knowledge of micromorphology to the Spanish-speaking audiences in Latin America (it is a course taught in Spanish).

To expand the knowledge of different micromorphology techniques to persons belonging to the areas of agronomy, geography, geology, archeology, biology and many other fields of environmental sciences, together with electron microscopy, and clay mineralogy of the coarse fraction.

To address problems associated with the investigation and resolution of environmental problems through the application of micromorphological techniques in tropical regions.

Contents:

- Sampling Procedure
- Preparation of thin sections of soils including the possibility to work with own samples.
- Use of the petrographic microscope for mineral identification, soil fabric concepts, mineral and organic constituents, groundmass, soil characteristics, description schemes, rules of interpretation.
- Soils with emphasis on weathering and pedogenic processes in soils for humid and some examples for temperate and dry regions.
- Micromorphology applied to geoarchaeology and taphonomy.
- Micromorphology applied to dating of paleoenvironments.
- Micromorphometry and image processing.
- SEM applications.
- Clay mineralogy, interpretation with different applications.

The participants will be allowed to work with their own thin sections at the end of the course and in the afternoon in the last four days.

Invited lecturers:

Sergio Gaviria
Juan Carlos Loaiza
Carolina Mallol
Rosa M Poch
Georges Stoops
Kim Robertson

MEETINGS

http://www.20wcss.org/

New deadline for abstract submission: November 30, 2013

!! You are most welcome to submit abstracts to the symposia organised by Commission 1.1.:

C1.1-1

The role of environment on soil formation: morphological indicators.

http://www.20wcss.org/data/topic/Commission%20Symposia/Comm.%201.1-Soil%20Morphology/C1.1-1.pdf

Morphological changes in soils are driven by the classical formation factors –parent material, living organisms, climate, geomorphology, time- together with the human influence that has strongly affected soils during the so-called anthropocene. Knowing the relationship between morphological changes and environment have implications on soil management, soil classification, prediction of future evolution under climate change, or knowledge of past environments among others. Any contribution dealing with those and related subjects are welcome.

C1.1-2

Interactions between soil structure, living organisms and organic matter

http://www.20wcss.org/data/topic/Commission%20Symposia/Comm.%201.1-Soil%20Morphology/C1.1-2.pdf

The study of the interaction between the soil pore system and soil organic matter is of primary importance given the role of soil as carbon pool. The spatial organization of mineral and organic components, only revealed through morphological analyses, can explain many mechanisms of carbon sequestration, either in agricultural or in forest environments. This symposium welcomes any contribution dealing with the application of organic amendments, SOM physical protection, identification of SOM types in undisturbed samples, factors controlling SOM in forest soils, with a morphological approach at any scale.

Moreover, there is a divisional symposium, organised jointly by Commission 1.1. Soil Morphology and Micromorphology; and Commission 1.6. Paleopedology:

DS1

Micromorphological Answers to Palaeopedological and Polypedogenetic Questions

http://www.20wcss.org/data/topic/Divisional%20Symposia/DS1.pdf

Soil development and soil properties depend on environmental conditions in which soils have formed. Hence, paleosols are archives of past environments. Micromorphological analysis is particularly valuable for identifying soil properties on a micro-scale that are indicative for specific environmental conditions. This tool is also extremely valuable for identifying the polygenetic nature of surface soils because even if the major part of the solum has responded to a changing environment and has approached a new equilibrium corresponding to the present environment, micromorphological analysis may still identify some relict features that can be only explained by different former environmental conditions. Contributions presenting such micromorphological indicators for various types of environmental conditions are welcome. In addition, examples of palaeo-environmental reconstructions of particular regions based on such indicators may be presented.

İSTANBUL CARBON SUMMIT:
CARBON MANAGEMENT, TECHNOLOGIES & TRADE
4-6 April, 2014, İstanbul / TURKEY

The Carbon Management, Technology and Trade Conference will be held in 4-6 April 2014 at İstanbul Turkey. The conference aims to bring together Carbon Technologists, Economists and Soil Scientists. The conference outcomes seek to integrate the contemporary scattered discussion that has been going on the individual grounds of Carbon Capture and Storage along with Clean Energy Technologies, Economics and developments in carbon markets and Management of Carbon Sequestration in Soils. You are kindly requested to submit your 250 word abstract by the 30th of November 2013. Further information may be reached from the web-page of the conference: http://www.istanbulcarbonsummit.com/

First announcement

International Workshop on Archaeological Soil Micromorphology
2014, May 26 - 29
Cultural Heritage Agency of the Netherlands
Amersfoort, The Netherlands

The Cultural Heritage Agency of the Netherlands will be hosting the 2014 Workshop on Archaeological Soil Micromorphology in their new building in Amersfoort. Like the previous workshops , most of the time will be reserved for "microscope time". Therefore presentations will mostly be in the form of posters. There will be room for a limited number (6 max.) of short (10 min.) oral presentations only.

All participants are strongly encouraged to bring along their own thin sections. E.g. slides they are currently working on, that they want to discuss or that may be instructive for other participants.

The preliminary excursion programme includes celtic fields, terps (living mounds in a tidal landscape) and the UNESCO World Heritage site of the former island of Schokland.

We hope to see you in Amersfoort!

On behalf of the organizers,
Hans Huisman
h.huisman[AT]cultureelerfgoed.nl

Preliminary programme:

Monday 26:	*Evening registration & reception*
Tuesday 27:	*Sessions*
Wednesday 28:	*Sessions; dinner*
Thursday 29:	*Excursion*

We have room for 40 participants max.
Costs are 50 EURO pp. (incl. lunches, excl. dinner and excursion)

Announcements and registration will appear on: www.cultureelerfgoed.nl/en/micromorphology

REPORT ON THE:

XIIth International Symposium and Field Workshop on Paleopedology "Paleosols, pedosediments and landscape morphology as environmental archives" was held in Kursk and Voronezh regions of Russia, August 10-15, 2013. ISFWP-XII was organized by IUSS Commission 1.6, International Focus Group PASTSOILS within the INQUA Commission on Terrestrial Processes Deposits and History TERPRO, by Commissions on Paleopedology, and Subcomission on Micromorphology, Dokuchaev Soil Science Society, Russia. Local organizers of the event are the Institute of Geography of Russian Academy of Sciences, Ecological Soil Science Institute, Moscow State University, V.V. Dokuchaev Soil Science Institute, Institute for the History of Material Culture of Russian Academy of Sciences, Kursk State University, Lipetsk State Pedagogical University, Ecological Department of the Kursk region Government, V.V. Alekhin Central-Chernozemic State Biospheric Reserve, Natural Architectural-Archaeological Museum-Resort "Divnogorie".

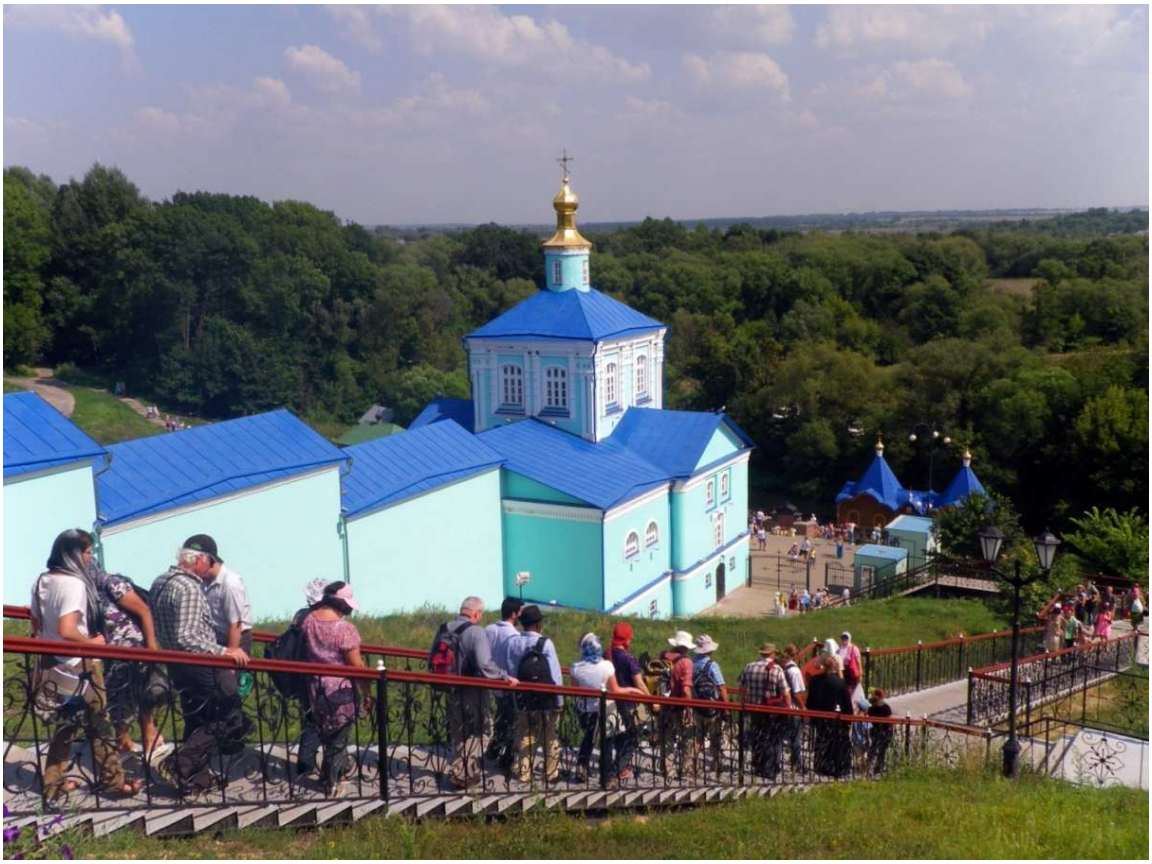
Joint scientific symposiums and field seminars on paleopedology is the traditional activity of IUSS Paleopedology Commission 1.6. A backbone issue both for field and academic parts of the event are soil, geomorphic, sedimentary records of Pleistocene and Holocene climatic changes.

The symposium held in Kursk included 6 sessions: Loess- and tephra-paleosol sequences, Alluvial and colluvial soil-sedimentary sequences, Paleosols and pedosediments of human habitats, Surface paleosols and relic features in modern profiles. Chernozems as paleo-environmental archives, Pre-quaternary paleosols: paleoecology and post-burial changes, Biological markers in paleosols. 86 participants from 12 countries (Russia, Ukraine, Germany, Poland, Mexico, USA, Canada, Australia, Switzerland, France, Brazil, Nigeria) contributed 35 oral and 25 poster presentations.

The main task of the field seminar was to demonstrate the unique loess-paleosol sections, Palaeolithic sites, alluvial and colluvial pedosedimentary sequences including Late Pleistocene and Holocene paleosols. A special attention was paid to famous Russian Chernozems. Classical views and modern concepts concerning their genesis were discussed near spectacular sections of these soils. The field part of the event was exiting and important opportunity for getting joint field experience and open discussions on paleosol genesis and paleoenvironment.

Group photo XIIth International Symposium and Field Workshop on Paleopedology "Paleosols, pedosediments and landscape morphology as environmental archives"

Alexandrov quarry: explanations on the loess-palaeosol stratigraphy (MIS5-MIS1)



Excursion in the Korennaya Pustyn' Monastery

Palaeolithic site Kostenki-14

Palaeolithic site Kostenki-14

Archaeological site Dinogorie-9

The Field Workshop consisted of the pre-conference tour in Kursk region (August 10, 11) and the post-conference tour in Voronezh region (August 14, 15). During the pre-conference tour ISFWP-XII participants have visited geological monument Alexandrov quarry with the most comprehensive soil-sedimentary sequence of the Late Pleistocene; herbaceous meadow steppes - the unique patch of never ploughed Russian

Chernozem in Central Chernozemic State Biospheric Reserve; Mid-Holocene buried soils in Senovaya balka; Korennaya Pustyn' Monastery, military memorial of the Battle of Kursk (World War II), Valdai loess section with a contemporary surface Chernozem.in Kursk biosphere station. MIS3 and MIS2 cultural layers and paleosols of the world famous Palaeolithic site Kostenki-14 (Markina gora), Palaeolithic museum (Palaeolithic dwelling built of mammoth bones and Palaeolithic art); Divnogorie-9 site: Late Palaeolithic location of numerous horse bones and within an archaeological site, overlaid with paleo-lacustrin sediments and weakly developed MIS2 soils; the same age archaeological site Divnogorie-1, Natural Architectural-Archaeological Museum-Resort Divnogorie famous due to beautiful views of Cretaceous plateau with valleys of Tikhaya Sosna and Don rivers, "Divy" – residual erosion forms of Cretaceous rocks, the mediaeval cave church Mayatskaya, relic Neogene plants were demonstrated during the ISFWP-XII post-tour.

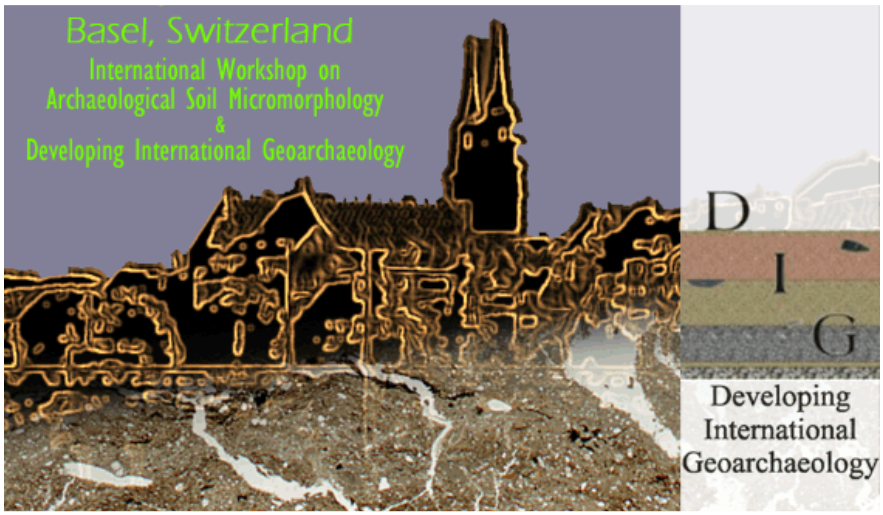
Both during the Symposium and the Field Workshop micromorphological issues of paleosols and contemporary soils were widely discussed as it is traditional for events of the IUSS 1.6 Commission.

On behalf of ISFW-XII Organizers:

Maria Bronnikova, Secretary of ISFWP-XII Organizing Committee

Irina Kovda, Secretary of Comission on Micromorphology, Dokuchaev Soil Science Society, Institute of Geography, Russian Academy of Sciences

ABSTRACTS AND PICTURES OF THE:



Developing International Geoarchaeology conference 2013 and
International Workshop on Archaeological Soil Micromorphology
Basel, Switzerland, 2nd to 6th September 2013

Can be downloaded from:

http://geoarch.ipna.unibas.ch/WASM&DIG/pictures.html

PUBLICATIONS AND RESEARCH NOTES

The first issue with the proceedings of the 14th IWMSM – Lleida 2012 appeared last July as the Issue 2 of Volume 3 of the Spanish Journal of Soil Science, with Curtis Monger and Irina Kovda as guest editors, and dedicated to Prof. Ulrich Babel.

The open-access papers can be downloaded from:

http://sjss.universia.net/verRevista.jsp

- **1** Soil micromorphology and the Anthropocene—Cross-scale connections and technology trends - Curtis Monger - Peter H. Cooke
- **2** A micromorphological evaluation of pedogenesis on Isla Santa Cruz (Galápagos) - Georges Stoops
- **3** Micromorphological characteristics reflecting soil-forming processes during Albeluvisol development in S Norway - Daniela Sauer - Isabelle Schülli-Maurer - Ragnhild Sperstad - Rolf Sørensen
- **4** Soil micromorphogenesis and Early Holocene paleoclimate at the desert margin of Southern Arabia - Peter Kühn - Dana Pietsch
- **5** Benchmark soils on alluvial, fluvial and fluvio-glacial formations of the upper-Segre valley - Rosa María Poch - Iolanda Simó - Jaume Boixadera
- **6** Paleoclimatic implications of micromorphic features of a polygenetic soil in the Monegros Desert (NE-Spain) - David Badía - Rosa María Poch - Clara Martí - María Teresa García-González
- **7** Micromorphological analysis on the influence of the soil mineral composition on short-term aggregation in semi-arid Mediterranean soils - Inigo Virto - Oihane Fernández-Ugalde - Pierre Barré - Maria José Imaz - Alberto Enrique - Paloma Bescansa - Rosa Maria Poch

The second issue will be published on November the 15th 2013.

QUATERNARY INTERNATIONAL
Special issue dedicated to Nicolas Fedoroff

Site formation processes in archaeology: soil and sediment micromorphology. Proceedings of the 14th IWMSM Session 5, Lleida, Spain, July 2012

Guest editor: Richard I Macphail[a]
[a]Institute of Archaeology, University College London, 31-34, Gordon Square, London, WC1H 0PY, UK (r.macphail@ucl.ac.uk)

13 articles out of 15 papers submitted, were accepted after refereeing (each paper had 4 readers) and revision. Each paper has now been published individually on line (please contact individual authors), while the whole *Quaternary International* volume, is now in press and due out in the very near future.

List of Chapters for JQI

Title	**Authors**
1. Human Actions Performed on Simple Combustion Structures: An Experimental Approach to the Study of Middle Palaeolithic Fire	Carolina Mallol, Cristo M. Hernández, Dan Cabanes, Jorge Machado, Ainara Sistiaga, Leopoldo Pérez and Bertila Galván
2. Phosphate location and reaction in an Archaeoanthrosol on shell-mound in the Lakes Region, Rio de Janeiro State, Brazil	Guilherme Resende Corrêa, Carlos Ernesto Schaefer and Robert Gilkes
3. Formation processes at a high resolution Middle Paleolithic site: Cueva Antón (Murcia, Spain)	Diego E. Angelucci, Daniela Anesin, Davide Susini, Valentín Villaverde, Josefina Zapata and João Zilhão
4. Climate and environmental changes recognized by micromorphology in Paleolithic deposits at Arene Candide (Liguria, Italy).	Ivano Rellini, Marco Firpo, Gabriele Martino, Julien Riel-Salvatore and Roberto Maggi
5. Microstratigraphy of the Magdalenian sequence at Cendres Cave (Teulada- Moraira, Alicante, Spain): formation and diagenesis	M. Mercè Bergadà, Valentín Villaverde and Dídac Román
6. Manufacturing technical differences employing raw earth at the protohistoric site of Sant Jaume (Alcanar, Tarragona, Spain): construction and furniture elements	Marta Mateu, M. Mercè Bergadà and David Garcia i Rubert
7. Weathering of carbonated materials in ancient Maya constructions (Río Bec and Dzibanché): limestone and stucco deterioration patterns	Luisa Straulino, Sergey Sedov, Dominique Michelet and Sandra Balanzario
8. River floodplain aggradation history and cultural activities: geoarchaeological investigation at the Yuezhuang site of the Lower Yellow River, China	Yijie Zhuang, Wenbo Bao and Charles French
9. Soil micromorphological evidence from Iron Age land use at Tornby and Mörtlösa in Linköping, Sweden	Barbara Maria Sageidet
10. Integrated microstratigraphic investigations of coastal archaeological soils and sediments in Norway: The Gokstad ship burial mound and its environs including the Viking harbour settlement of Heimdaljordet, Vestfold	Richard I. Macphail, Jan Bill, Rebecca Cannell, Johan Linderholm, Christian Løchsen Rødsrud
11. Studying urban stratigraphy: Dark Earth and a microstratified sequence on the site of the Court of Hoogstraeten (Brussels, Belgium). Integrating archaeopedology and phytolith analysis	Yannick Devos, Cristiano Nicosia, Luc Vrydaghs and Sylvianne Modrie
12. A soil micromorphological study on the origins of the early medieval trading centre of Antwerp (Belgium)	Yannick Devos, Barbora Wouters, Luc Vrydaghs, Dries Tys, Tim Bellens and Anne Schryvers
13. Living in the cold: geoarchaeology of sealing sites from Byers Peninsula (Livingston Island, Antarctica)	Ximena S. Villagran, Carlos E.G.R. Schaefer and Bertrand Ligouis

Stoops, G.
The "Fabric" of soil micromorphological research in the 20th century — A bibliometric analysis[2]
Geoderma 213, (2014) 193–202

More than 5000 titles of publications (papers in journals, transactions and books) on soil micromorphology, or containing micromorphological research, covering a period from the beginning of the 20th century up to now, were collected and analysed. The parameters evaluated are number of publications, the number of authors per publication, languages, publication media (journals, books and congress transactions), research topics and research centres. For more than 4000 references published between 1900 and 2000 a chronological analysis on the base of a five-year period was carried out. The results presented in a set of tables and graphs illustrate the evolution of micromorphological research during the 20th century.

The number of papers strongly increased till 1986/90, and thereafter slightly declined. Whereas papers authored by one scientist prevailed in the early years, multi-authored ones became more important in the last decades. The multilingual tradition that existed in micromorphological publications till the nineteen seventies is practically completely replaced by a monolingual English one. The wide range of national journals and proceedings used to publish micromorphological material is narrowed to a relative small amount of international journals. The percentage of papers dealing with soil genesis and classification decreased the last decades, whereas those dealing with palaeopedology and archaeology show a spectacular increase. In the last decennia little efforts have been made to develop new concepts and techniques (except for some submicroscopic techniques and image analysis in the 1970s) and accent was mostly set on applications. The evolution of the topics covered matches general tendencies in soil science and technical development. Several centres with a regular and considerable output of micromorphological publications (Bibliometric Identified research Centres, BIC) are identified and discussed. These BICs in many cases ceased to exist and were dismantled when the leading micromorphologist left.

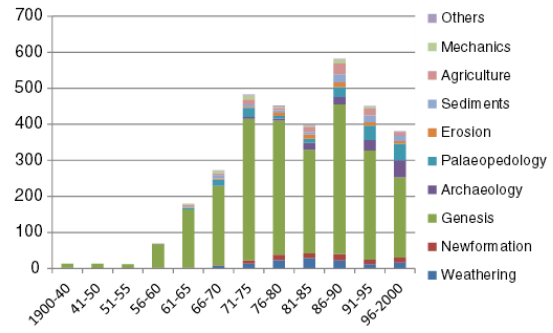


Fig. 8. Number of micromorphological papers devoted to different applications.

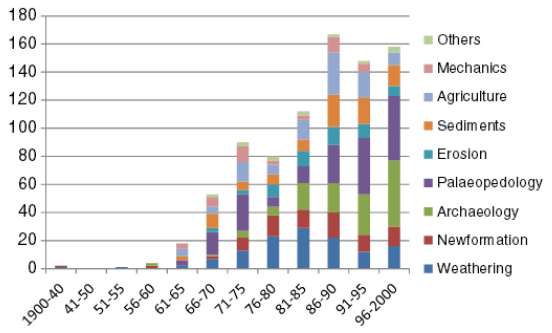
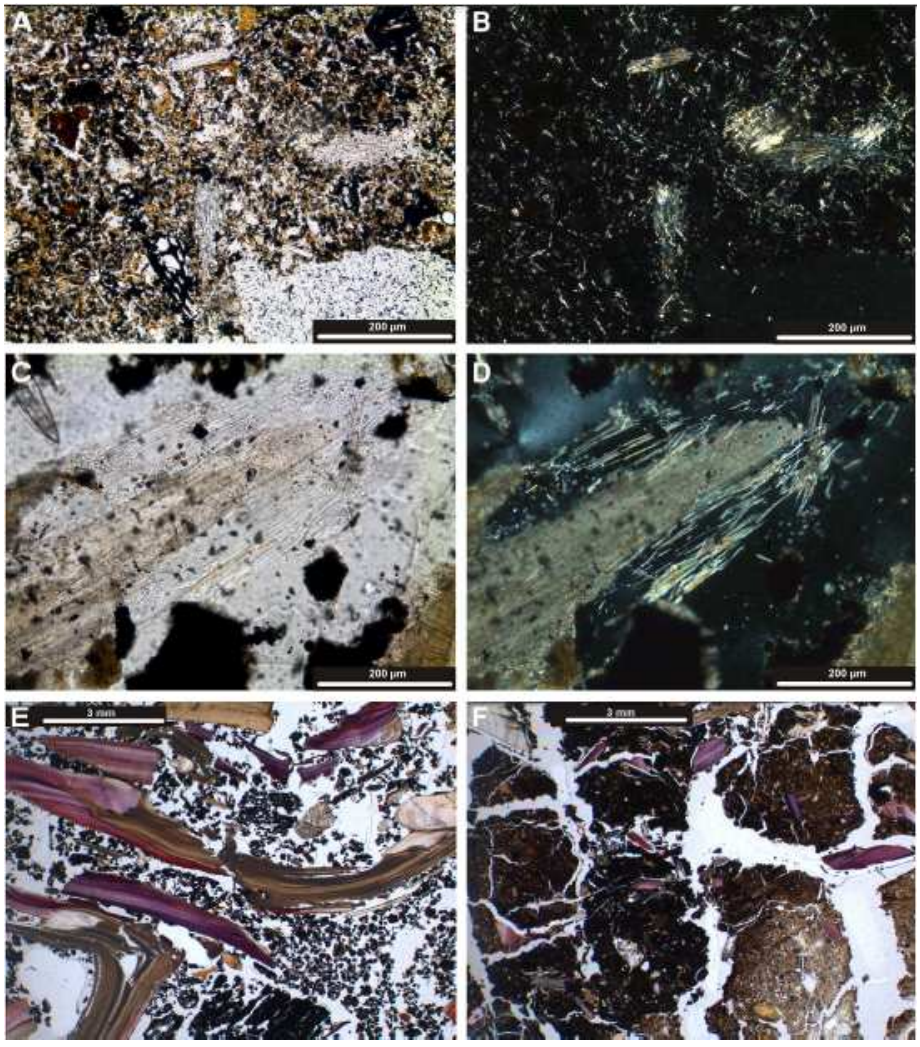


Fig. 9. Number of papers about specific applications other than soil genesis and classification.

[2] Presented at the **Opening Session** of the **14th International Working Meeting on Soil Micromorphology** – Lleida, July 2012.

Ximena S. Villagran, Rosa M. Poch
A new form of needle-fiber calcite produced by physical weathering of shells
Geoderma 213 (2014) 173–177

Needle-fiber calcite is a common crystal form in soils and sediments from diverse environmental settings, and it has been used as evidence of a specific soil development either past or present. However, it can have either a physicochemical or a biological origin and its ubiquity prevents straightforward use as an environmental proxy. In this paper, we present a new form of needle-fiber calcite, derived neither from biologically mediated mineralization in the soil nor from physicochemical precipitation. This needle-fiber calcite is monocrystalline and prismatic, and is associated with the physical weathering of *Mytilus edulis* (Linnaeus) bivalve shells found in soils fromanthropic shellmiddens located on the northern coast of the Beagle Channel (Argentina). The effects of freeze–thaw cycles can be observed in the local soils and would be responsible for the release of the calcite crystals that make up the outer layer of the shell. In this respect, the new form of needle-fiber calcite would be specific for this process in anthropogenic soils in cold climates, and could provide information on past climatic conditions.



Photomicrographs of samples collected fromthe shell ring at Tunel VII. Blocky soil aggregate developed after abandonment of the shell ringwith bundles of parallel rods and single rods of acicular carbonates, in PPL (A) and XPL (B). Shell fragment with associated acicular carbonates, in PPL (C) and XPL (D).Microfacies of shell tossing events in the shell ring,with shell, charcoal and fine mammilated black aggregates, in PPL (E).Microfacies of blocky aggregates made of clay, organic matter and small fragments of shell, bone, charcoal and plant tissue, in PPL (F).

Fédoroff N, Courty MA
Revisiting the genesis of red Mediterranean soils.
Turkish J Earth Sci (2013) 22: © TÜBİTAK doi:10.3906/yer-1205-10
Access: http://journals.tubitak.gov.tr/earth/

This work, aside from being a classical discussion on the processes of rubefaction and illuviation, is an attempt to cross the abundant literature on red Mediterranean soils (RMSs) written by pedologists, and also by paleopedologists and geologists, with the climatic frame established by paleoclimatologists for the Quaternary. Such an approach leads us to consider that the development of the RMSs was discontinuous, occurring during periods of environmental stability, i.e. interglacials, characterized by a humid climate (precipitations exceeding evapotranspiration) with dry and hot summers. The impact of glacial intervals on the RMS covers is presently only partially documented. Aeolian processes during atmospheric instability episodes played a dominant role; however, hydric erosion and resedimentation cannot be ignored. Severe wind storms have reworked the RMS covers locally, but long distance dusts were also incorporated into the soils. Outbursts are proposed to explain the disruption observed in pre-Holocene red B horizons. Calcite from aeolian dusts was dissolved in surface horizons and recrystallized in deeper horizons in the form of discrete features and calcrete. During the more humid phases of these intervals, RMS became waterlogged in presently humid areas of the Mediterranean basin. The impact of frost on the RMS covers has been exaggerated. Precise correlations between the climatic fluctuations identified by paleoclimatologists and features and facies in the soil covers generated during the glacial intervals are almost impossible to establish.

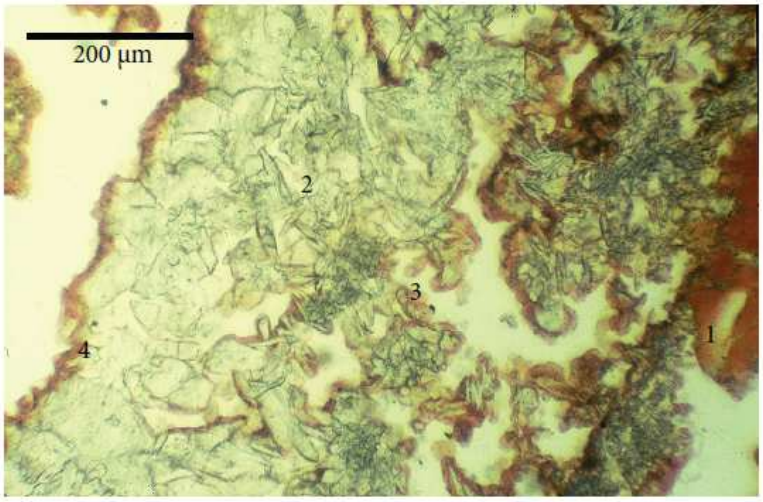
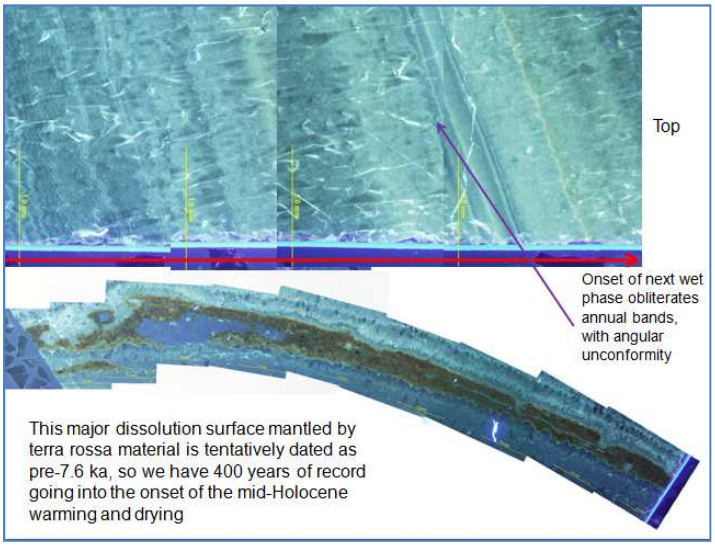


Figure 6. Transition red argillic horizon to calcrete. Morocco, Casablanca. Thomas Quarry, north Sidi Abderrahmane section. 1) Thick, clay feature – first phase of clay illuviation; 2) calcitic aggradation; 3) partial calcite dissolution; 4) thin, dusty clay coatings on secondary calcite surface and in dissolution voids – second phase of clay illuviation.

Driese, S.G., Li, Z.-H., Cheng, H., Harvill, J.L., and Sims, J.,
High-resolution rainfall records for Middle and late Holocene based upon speleothem annual UV fluorescent layers, Raccoon Mountain Cave, TN
Submitted for oral session to Geological Society of America Annual Meeting in Denver, CO, October 26-30, 2013.

Speleothems are valuable archives of climate change but resolution of annual records has been elusive. We analyzed 4796 counts of annual UV fluorescent (UVf) laminae observed in polished thin sections of a speleothem, as well as 305 stable carbon and oxygen isotope measurements, using both time-series and spectral analysis, to refine interpretations of mid- and late Holocene paleoclimate records in the southeastern US. The 15 cm-long speleothem RM0710, collected from Raccoon Mountain Cave near Chattanooga, TN with 11 U/Th dates spanning the past 15 ka, has exceptional preservation of mid- and late Holocene annual records that permits semi-continuous time-series of UVf laminae thickness. Speleothem UVF laminae average15 µm/yr, identical to the average determined for the middle and late Holocene portions of the speleothem (7600-796 yr BP) based on the U/Th ages and interval thicknesses. UVf laminae counts between paired U/Th ages are also consistent with determined ages and their uncertainties. In contrast to the incomplete records of the very latest Pleistocene to early Holocene attributed to wet conditions and intermittent speleothem submergence, the mid-Holocene Thermal Maximum is manifested by long periods (100-400 yr) of drought with thin deposits (3-10 µm/yr) punctuated by shorter periods (5-20 yr) of higher rainfall with thicker deposits (30-80 µm/yr), and with occasional high-rainfall "extreme" events (annual deposits as thick as 150-170 µm). The Late Holocene, in comparison, is characterized by overall wetter conditions and more regular (sinusoidal curve) behavior suggesting 50-100 yr cycles of higher and lower rainfall, with deposits ranging from 5-30 µm/yr. Possible millennial-scale (1500 yr) Bond Cycle events are also recorded (Little Ice Age, B1-B5) manifested by major dissolution surfaces abruptly overlain by thick annual deposits. Statistical analyses will test these interpretations of variable periodicities for rainfall. Rainfall records established for the speleothem are in agreement with recent carbon isotope records from floodplain deposits and buried soils from both the Great Plains and eastern US. This method should be used to examine other speleothems in order to resolve detailed paleo-rainfall records, provided preservation of UVf laminae exists.



More information:

Driese, S.G ., Li, Z.-H., Cheng, H., Stinchcomb, G.E., Kocis, J.J., Horn, S.P., and Boehm, M. S., 2012, Speleothem micromorphology improves interpretations of floodplain paleoclimate records and enhances interpretations of the timing and structure of the mid-Holocene warm period: GSA Annual Meeting in Charlotte, NC, November 2012. GSA Abstracts with Programs Vol. 44, No. 7.

Driese, S.G. , Li, Z.-H., and Cheng, H., 2013, Speleothem micromorphology enhances interpretations of the timing and structure of the mid-Holocene warm period: South-Central GSA Meeting in Austin, TX, April 2013.

Abbas Farshad

Geopedology Reports Historical Changes in Climate and Agroecology: A Case Study from Northwestern Iran

ECOPERSIA, (2013),1 (2), 145-158 http://ecop.modares.ac.ir

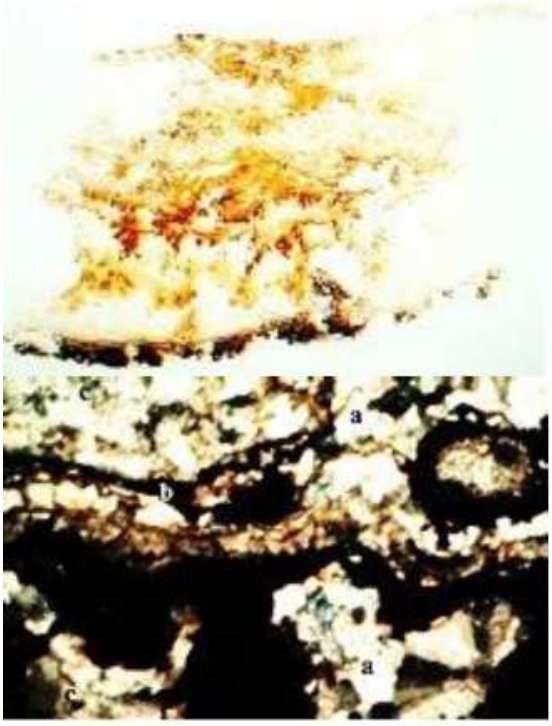
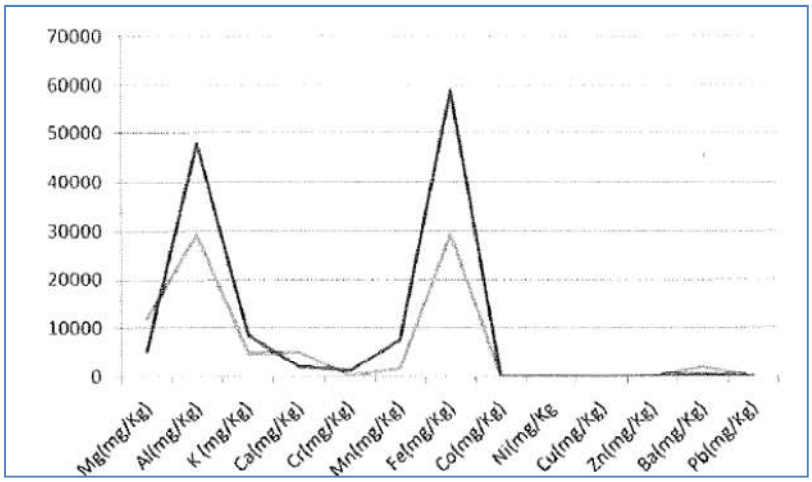


Figure 9 Coated travertine specimen (up), micrograph of the thin section prepared from the specimen shown (down) under XPL (Crossed Polalizers) at magnification of x 2.5: a and c =Phenocrystals of calcite and b= dark layer containing organic material and some rancienite.

Global warming is claimed to be the cause of climate change, which is often held responsible for water shortage. Let geopedology represents the complex process of soil formation, out of which much can be learnt about paleoecology; soil formation being a dynamic interaction between the atmosphere, biosphere, lithosphere, and the hydrosphere. In a multidisciplinary sustainability-oriented study in northwestern Iran, geopedologic data were analyzed and cross-referenced with some historic and archaeological information to reconstruct paleoecologic conditions in several time periods, through which the changes both in climate since upper Pleistocene, and in landuse and their consequences in terms of land degradation could be concluded. The occurrence of a (sub-) surface layer of travertine, dated 27,000 y BP that is coated by a thin organic layer with traces of rancienite (mineral), dated 13,000 y BP, implies a humid environment, corresponding with the pluvial uppermost Würm. The geopedologic survey, supported by soil micromorphology, revealed that between 6,000 and 2,600 years ago the area was subject to cycles of erosion and sedimentation that have led to glacis formation. A type of climate that is characterized by the alternation of wet and dry periods is also supported by the occurrence of Petrocalcic and Argillic horizons in the soils. Cultivating rice, tobacco and cotton, which was practiced until over a century ago, also implies relatively wetter conditions. The study concludes that aridification has never been as degrading as it is today, due to the over-exploiting of the non-renewable fossil groundwater.

Magaldi D, Afgaioli P, Ungaro F, Benedetti G, Centofanti M, Ferrante F, Ranalli D.
Natural uranium content of Fe/Mn nodules from some old soils of Central Italy and relationship with the soil trace elements.
Agrochimica, (2013), Vol. LVII (2), 178-192

The present research deals with a measure of the uranium contents of the soil Fe/Mn nodules in order to assess the relationship between uranium content of nodules and trace element distribution in the bulk soil. Fe/Mn nodules were collected from B-horizons of 50 palaeosoils (mainly Alfisols and Ultisols) from Tuscany and Abruzzo regions and their alpha natural radioactivity measured by autoradiography method. Results revealed that U tends to concentrate into Fe/Mn nodules without relation with the degree of soil evolution but clearly conditioned by the parent material composition of soils. Its concentration in a single nodule can be 2 or 3 times greater than values obtained for the bulk of palaeosoils of the same area. Moreover it was possible to highlight some interesting relationships between uranium content and the frequency of soil trace elements that could suggest the existence of Fe/Mn nodules with different microchemical composition.



Comparison of X-ray fluorescent data between the averages of three bulk soils (lighter line) and the averages of corresponding “big” nodules (darker line); vertical axis in ppm.

NEW BOOKS

ENCYCLOPEDIA OF ARCHAEOLOGICAL SOIL AND SEDIMENT MICROMORPHOLOGY

In 2009 a group of micromorphologist/archaeologists started, as editors, a book named "**Atlas for Archaeological Soil and Sediment Micromorphology**", illustrating the use and possibilities of micromorphology in archaeological research. For several reasons this project failed, although many invited authors prepared excellent contributions. As the expectations, both amongst archaeologists and micromorphologists were very high, abandoning the project was not an option.

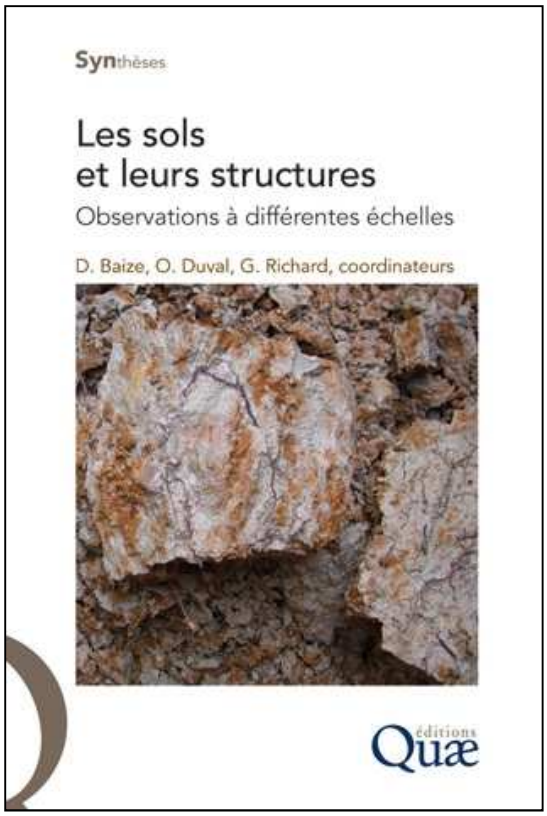
Since last autumn Cristiano Nicosia (Italian working at Université Libre de Bruxelles, Belgium) and Georges Stoops (Belgium) restarted the project as editors, modifying significantly the original concept and the structure of the book. The new title proposed for the book is "**Encyclopedia of archaeological Soil and Sediment Micromorphology**", which better reflects its new structure. It contains three major parts: *Part I, "Inclusions*", dealing mainly with components that can be singled out in thin section, such as bone, pottery, metal slags, building materials. *Part II "Main topics in archaeological soil micromorphology"* treats a series of major topics selected among the most recurrent in literature about archaeological soil micromorphology (e.g. "trampling", "Dark Earth", "cave and rock shelter sediments", etc.). *Part III "Instrumental methods in archaeological soil micromorphology"* deals with special analytical tools employed on thin sections, such as SEM/EDS, image analysis, fluorescence microscopy, mass spectrometry.

Authors have been identified for all entries (in total more than 40 scientists are contributing), and manuscripts already available are handled now by the editors, with advise of anonymous referees.

C. Nicosia and G. Stoops

Les sols et leurs structures.
Observations à différentes échelles
D. Baize, O. Duval, G. Richard (coord.)

2013, Éditions Quæ
Collection *Synthèses*
264 pages
ISBN 978-2-7592-2038-0, ref. 02398
37 €
Available at: www.quae.com



Educational summary on the soil structures and their major role in hydric, physical and biological functioning of soils. The work firstly reviews the definition of the concept of structure and the problems in quantifying it. It then summarises the laboratory methods that give access to the microscopic organisations and field methods characterising the evolution dynamics of structures, mainly based on agricultural systems.

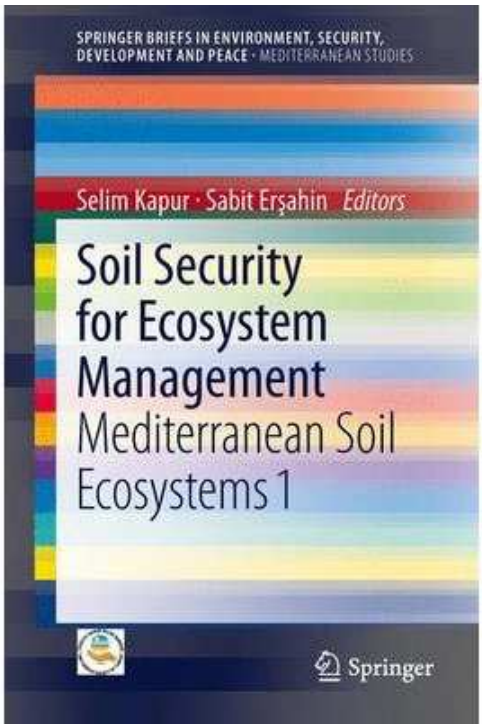
Contents:

Partie I – Définition, importance et origines
- Chapitre 1. **Des volumes emboîtés à toutes échelles d'espace** *Denis Baize*
- Chapitre 2. **Structures et porosités Importance pour les fonctionnements des sols Naissance et destruction des agrégats** *Denis Baize, Folkert van Oort*
- Chapitre 3. **Structures des sols et êtres vivants** *Jean-Michel Gobat, Claire Le Bayon*

Partie II - Sur le terrain
- Chapitre 4. **Description des divers types d'agrégats et de la structuration des horizons non labourés** *Denis Baize*
- Chapitre 5. **La structure des sols forestiers : spécificités, état, conséquences et enjeux** *Bernard Jabiol*
- Chapitre 6. **Maîtrise de la structure des sols cultivés : tassement et travail du sol, avec et sans labour** *Jean Roger-Estrade, Hubert Boizard, Guy Richard*
- Chapitre 7. **Le profil cultural : une méthode d'étude in situ de la structure des sols cultivés** *Joséphine Peigné, Jean-François Vian, Olivier Chrétien, Yvan Gautronneau*
- Chapitre 8. **Caractérisation au champ de la structure des horizons de surface des sols cultivés** *Hubert Boizard, Bruce C. Ball, Graham Shepherd, Jean Roger-Estrade*
- Chapitre 9. **Applications de méthodes électriques pour l'identification sur le terrain des états structuraux – Principe, exemples et limites** *Arlène Besson, Isabelle Cousin*
- Chapitre 10. **Croûtes de battance, ruissellement, érosion hydrique** *Frédéric Darboux, Baptiste Algayer*

Partie III– Au laboratoire
- Chapitre 11. **Organisations pédologiques à l'échelle des minéraux argileux** *Daniel Tessier, Folkert van Oort*
- Chapitre 12. **Associations matières organiques/matières minérales** *Remy Albrecht, Éric P. Verrecchia*
- Chapitre 13. **Les structures des sols analysées en microscopie optique et par des techniques submicroscopiques** *Folkert van Oort, Toine Jongmans, Eddy Foy*

Partie IV – Approches de quantification
- Chapitre 14. **Quantification et reconstruction 3D de la structure au laboratoire** *Isabelle Cousin*
- Chapitre 15. **Tests de stabilité structurale, de percolation et d'évaluation de la sensibilité à la battance** *Denis Baize, Frédéric Darboux*
- Chapitre 16. **Relations entre structure, porosité et minéralogie**



Soil Security for Ecosystem Management: Mediterranean Soil Ecosystems 1. Series: Springer Briefs in Environment, Security, Development and Peace, Vol. 8. Subseries: Mediterranean Studies. Kapur, Selim; Erşahin, Sabit (Eds.). 2013, Springer. ISBN 978-3-319-00698-7. Softcover, 143 pages. Price $49.99.

The term "Soil Security" is used in the context of maintaining the quality and quantity of soil needed in order to ensure continuous supplies of food and fresh water for our society. Topics in this unique book on the management of soil sustainability in the Mediterranean region include: soil information, land degradation, land desertification, pedoenvironments, and the carbon cycle and sequestration. One main focus of the book is the description of new approaches that have been adapted with regards to interdisciplinary soil ecosystem management to combat and mitigate desertification. The contributing authors are renowned experts in their fields which cover the subjects on traditional as well as innovative land use and management.

ARCHAEOLOGICAL SOIL MICROMORPHOLOGY WORKING GROUP

International Workshops in Archaeological Soil Micromorphology

Successful workshops were held in Cambridge, UK (9th-11th May 2013) and Basel, Switzerland (2nd to 6th September 2013 – including the Developing International Geoarchaeology [DIG] conference). Charly French (Cambridge), and the Geoarchaeology team at Basel (Philippe Rentzel, David Brönnimann, Kristin Ismail-Meyer, Christine Pümpin and Philipp Wiemann, see page 12) are hugely thanked for all their hard work in organising and running these workshops.

Future International Workshops in Archaeological Soil Micromorphology

2014 - last week of May in Amersfoort (The Netherlands); organiser: Hans (D.J.) Huisman (Cultural Heritage Agency of the Netherlands) h.huisman@cultureelerfgoed.nl (See page 6)

2015 – Suggested workshops at: York, UK or Sardinia (organiser: Raimonda Maria Usai, University of York, UK) // Beijing, China (October 2013; organiser: Yijie Zhuang, Institute of Archaeology, University College, UK)

2016 – Suggested workshop at: Mexico City, Mexico (to coincide with the 15th IWMSM: chief organiser Sergey Sedov, Universidad Nacional Autónoma de México, Mexico).

TRAINING in Archaeological Soil Micromorphology – Institute of Archaeology, University College London

This annual 2 week course continues to run – next training – November 2013 (4th-8th, 11th-15th)

Week 1: Intensive course on the application of soil micromorphology to archaeology, ranging from buried soils (wildfires), hunters and gatherer sites, clearance, cultivation, animal management (byre remains), activity surfaces, settlement morphology (prehistoric – Roman – medieval; tells; graves), dark earth and industrial traces.

Full programme available. ~20 attendees expected overall; 2nd week of tutoring is unfortunately already full.

Contact: Dr Richard I Macphail (r.macphail@ucl.ac.uk)

Best wishes
Richard Macphail

Dr Helen Lewis (UCD School of Archaeology, Ireland) is informing us about the **archaeological soil micromorphology facebook group** for those who are interested:

https://www.facebook.com/groups/25311198697/

Join it!

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