Number 21 – September 2014

NEWSLETTER

International Union of Soil Sciences

Soil Science Society of America

Commission on the History, Philosophy and Sociology of Soil Science
International Union of Soil Sciences
and
Council on the History, Philosophy and Sociology of Soil Science
Soil Science Society of America

Editors Notes

A Welcome from Tom Sauer

This is my inaugural newsletter for the International Union of Soil Sciences Commission on the History, Philosophy, and Sociology of Soil Science (Commission 4.5) and the Soil Science Society of America Council on the History, Philosophy, and Sociology of Soil Science (Committee S205.1). After several years of outstanding effort, Eric Brevik has handed over the editor role of the C4.5/S205.1 newsletter over to me. I thank Eric for his years of dedicated service to the commission and council. I will strive to continue to provide an interesting and informative newsletter on matters relating to the history, philosophy, and sociology of soil science.

Much of the information in this edition concerns events at the World Congress in Jeju, Korea this past June. I was fortunate to be able to attend the congress on wonderful Jeju Island. The setting provided both a beautiful physical surrounding and many fascinating cultural activities.

The hosts did an excellent job of blending the scientific sessions with social and cultural events. The next IUSS World Congress will be in Brazil in 2018.

Newsletter # 21

INSIDE THIS ISSUE

Leadership Transitions in the Commission

The Jeju Congress brought to a close the terms of C4.5 Chair Jock Churchman and Vice-Chair Ed Landa. They went out in force with a session on their book "The Soil Underfoot" (details of book and abstracts from congress below). Jock and Ed did an excellent job of leading C4.5 for 4 years and of being outstanding ambassadors for the commission's activities. Many thanks to both of them for their service to the Commission. New officers for 2014-2018 are myself as Chair and Richard Doyle as Vice-Chair. The Chair of IUSS Division 4 (former Vice-Chair of C4.5), Christian Feller is currently soliciting input on any planned activities for the upcoming year and through 2018. If you have any ideas for potential activities (conference sessions, publications, webinars, etc.) relating to the history, philosophy, and sociology of soils please send Richard Doyle or myself a message (Tom.Sauer@ars.usda.gov or Richard.Doyle@utas.edu.au). One activity already underway is a discussion concerning creation of an award for contributions to the history, philosophy, and sociology of soil science in honor of the late Dr. Dan Yaalon. Details regarding the award should be available in early 2015.

Fieldtrip Pictures From Jeju Congress

Cheonjiyeon Waterfall

Seogwipo Daily Olle Market

In case you've not been at the IUSS website recently, here is the current home page address:

http://www.iuss.org/

C4.5 doesn't have its own web page but some details on the commissions can be found here:

http://www.iuss.org/index.php?option=com_content&view=article&id=84%3Adivisions-and-commissions-description&catid=7%3Adivisions-a-commissions&Itemid=7#role_of_soils_in_sustaining

Regarding S205.1 (C4.5's equivalent in the Soil Science Society of America), the home page is at:

https://www.soils.org/about-society/committees/S205.1

Maxine Levin is the current Chair of S205.1 and her email address is:

maxine.levin@wdc.usda.gov

News and Announcements: Renewed Focus on Soils

Soil science and soil scientists are increasingly in the popular media. Several recent and new opportunities are available to showcase the importance of soils for food security and ecosystem services.

International Year of the Soil 2015. The General Assembly of the United Nations has declared 2015 the International Year of Soils (IYS). Numerous activities are being planned and promoted to take advantage of this opportunity to highlight the value and importance of soils and the work of soil scientists. IUSS has assigned the four divisions each one quarter of the year to focus their activity. Division IV was given the last quarter (Oct.-Nov.-Dec.). If you have any ideas for activities or events that showcase aspects of C4.5 interests please contact me or Richard Doyle. More information on the IYS can be found at these web sites: http://www.fao.org/globalsoilpartnership/iys-2015/en/ and https://www.soils.org/IYS

World Soil Day December 5. Since 2010 World Soil Day has been celebrated each year on December 5 in honor of the birthday of His Majesty Bhumibol Adulyadej, King of Thailand. Initiated by IUSS and supported by the United Nations Food and Agriculture Organization (FAO), The United Nations General Assembly in 2013 officially designated December 5 as World Soil Day. King Adulyadej is honored for his "untiring efforts in the promotion of soil science and soil resources conservation and sustainable management". More information can be found at:
http://www.iuss.org/index.php?option=com_content&view=article&id=405
http://www.fao.org/globalsoilpartnership/iys-2015/en/

3rd Global Soil Week April 19-24, 2015. Global Soil Week is a biennial celebration that "invites all stakeholders to join forces to encourage sustainable soil management and responsible land governance at global, regional and local level and jointly put soils and land on the new sustainable development agenda!

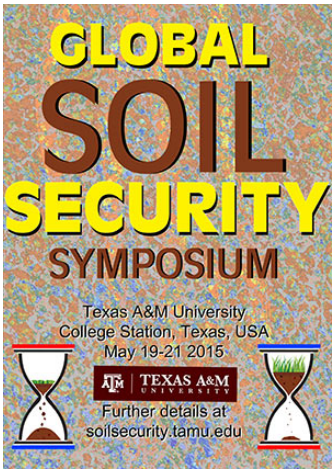
We invite you to share your story, your experience, research and your feelings about sustainable soil management and responsible land governance."

For more information please see:

http://globalsoilweek.org/

Global Soil Security Symposium May 19-21, 2015. From the conference website:

https://globalsoilsecurity.tamu.edu/



Soil security involves maintenance and improvement of the soil resource to produce food, fiber, and fresh water, to contribute to sustainable energy production, adapt to climate changes, and to maintain biodiversity and function in ecosystems. Those concerned with achieving soil security recognize that attainment will involve scientific, economic, and political engagement to effectively and credibly inform political and legal frameworks.

We are convening experts and innovative thinkers from a range of disciplines including agricultural and resource economics, (rural) sociology, information technology, soil science, and agronomy to further develop the concept of soil security, and to work toward assessment and implantation strategies. The three-day discussion will address five dimensions of soil security:

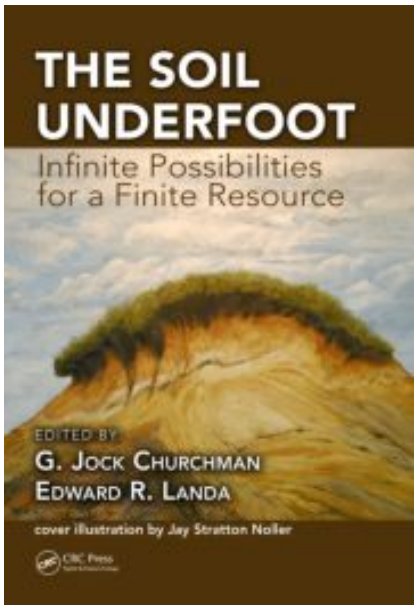
1. Capability--the intrinsic capacity of a soil to produce products and ecosystem services;
2. Condition--the current state of the soil as modified by human activities;
3. Capital--economics of soil services to Health, Environment and Food production;
4. Connectivity--the social connection of soil managers and custodians and users of soil products and services to the soil (and to each other); and
5. Codification - Policy frameworks to secure soil.

Note that 4) Connectivity involves social aspects of communication regarding soil products and services.

2014 European Geosciences Union meeting, Vienna, Austria

Beginning in 2012 the European Geosciences Union (EGU) has established an active history of soil science presence at their meetings. This continued at the 2014 meetings with a session titled "Soil mapping, classification, and modelling: history and future directions". This session was composed of 28 oral and 27 poster presentations including contributions from Africa, Asia, Australia, Europe, North America, and South America. Abstracts from the oral session can be viewed at http://meetingorganizer.copernicus.org/EGU2014/orals/14522 and abstracts from the poster session can be viewed at http://meetingorganizer.copernicus.org/EGU2014/posters/14522. Geoderma has also approved a special issue based on this session that is currently being developed.

A New Book to Add to Your Collection



Published:

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Content:

454 Pages | 150 Illustrations

Editor(s):

G. Jock Churchman, Edward R. Landa

http://www.crcpress.com/product/isbn/9781466571563

Features

- Explains the need to maintain and improve the quantity, quality, and productivity of soils to support a changing environment
- Presents several solutions to the challenge of sustaining soils to maintain humanity's future
- Presents information from diverse cultural and geographical sources, along with current ideas for the wise management of soils
- Outlines some practical steps towards sustainable yet greater use of soils, including methods of conserving water
- Describes a range of philosophical and ethical frameworks that have either sustained soils or led to soil degradation in the past
- Features a preface written by Peter Kareiva, The Nature Conservancy

Book Summary

The largest part of the world's food comes from its soils, either directly from plants, or via animals fed on pastures and crops. Thus, it is necessary to maintain, and if possible, improve the quality—and hence good health—of soils, while enabling them to support the growing world population. **The Soil Underfoot: Infinite Possibilities for a Finite Resource** arms readers with historical wisdom from various populations around the globe, along with current ideas and approaches for the wise management of soils. It covers the value of soils and their myriad uses viewed within human and societal contexts in the past, present, and supposed futures.

In addition to addressing the technical means of maintaining soils, this book presents a culturally and geographically diverse collection of historical attitudes to soils, including philosophical and ethical frameworks, which have either sustained them or led to their degradation. Section I describes major challenges associated with climate change, feeding the increasing world population, chemical pollution and soil degradation, and technology. Section II discusses various ways in which soils are, or have been, valued—including in film and contemporary art as well as in religious and spiritual philosophies, such as Abrahamic religions, Maori traditions, and in Confucianism.

Section III provides stories about soil in ancient and historic cultures including the Roman Empire, Greece, India, Japan, Korea, South America, New Zealand, the United States, and France. Section IV describes soil modification technologies, such as polymer membrane barriers, and soil uses outside commercial agriculture including the importance of soils for recreation and sports grounds. The final section addresses future strategies for more effective sustainable use of soils, emphasizing the biological nature of soils and enhancing the use of "green water" retained from rainfall.

Recent Publications of Interest

Bhattacharyya, T., D.K. Pal, C. Mandal, P. Chandran, S.K. Ray, D. Sarkar, K. Velmourougane, A. Srivastava, G.S. Sidhu, R.S. Singh, A.K. Sahoo, D. Dutta, K.M. Nair, R. Srivastava, P. Tiwary, A.P. Nagar, and S.S. Nimkhedkar. 2013. Soils of India: historical perspective, classification and recent advances. Current Science 104(10):1308-1323.

Bockheim, J.G., A.N. Gennadiyev, A.E. Hartemink, and E.C. Brevik. 2014. Soil-forming factors and Soil Taxonomy. Geoderma doi.org/10.1016/j.geoderma.2014.02.016.

Brevik, E.C., and Lynn C. Burgess. 2014. The Influence of Soils on Human Health. Nature Education. In press.

Brevik, E.C., and Tom J. Sauer. 2014. The Past, Present, and Future of Soils and Human Health Studies. SOIL. In press.

Brevik, E.C., and Alfred E. Hartemink. 2013. Soil Maps of the United States of America. Soil Science Society of America Journal 77:1117-1132. doi:10.2136/sssaj2012.0390.

Doolittle, James A., and Eric C. Brevik. 2014. The Use of Electromagnetic Induction Techniques in Soils Studies. Geoderma 223-225:33-45. doi:10.1016/j.geoderma.2014.01.027.

Feller, C. 2013. Georges Aubert and the soils, a biography. IRD Editions, Montpellier, France. ISBN : 978-2-7099-1751-3. (published in French)

The remainder of the newsletter summarizes activities from the Jeju World Congress. Dirt Dialogues provided a soil art exhibition and soil film screening program, both of which were very well organized and received by conference attendees. Our congratulations to Alexandra Toland, Gerd Wessolek, and colleagues for their unique and innovative foray into the art of soils.

Dirt Dialogues – Integrated Art and Film Program at the 20th World Congress of Soil Science, 2014, Jeju, Korea

Alexandra Toland and Gerd Wessolek, Technische Universität Berlin, Department of Soil Protection

Artists not only raise critical issues regarding the use and cultural relevance of the soil, they provide new means of envisioning and understanding the soil. As co-chairs of the German Soil Science Society's (DBG) Commission VIII Soils in Society and Education, and founders of soilarts.org, Gerd Wessolek and I have been working for over ten years on integrating artistic perspectives into the soil science research community. From June 8-13, 2014, we hosted two special events at the 20th World Congress of Soil Science in collaboration with our Korean partners at the International Union of Soil Sciences: a soil film screening program and a soil art exhibition. By integrating the arts into one of the largest and most prominent scientific conferences on soils, particularly in this critical moment leading up to the 2015 UN Year of Soils, the goal was to bring differentareas of expertise together to inspire new opportunities for interdisciplinary collaboration, and to expand the practical horizons of soil protection, communication, and education.

A central poster exhibition of over thirty art projects functioned as the main presentation area in the lobby of the Jeju International Conference Centre. Each day individual posters were removed from the main exhibition and featured in selected scientific sessions. The film program, screened in a large conference meeting room during lunch and coffee breaks, provided diverse perspectives on agriculture, resource extraction, desertification, and fieldwork. The program included works by award-winning documentary filmmakers, media artists, soil scientists, and NGOs that assembled narratives of soil stewardship from around the world. Below is a short overview of the program.

Soil Cinema

Cinema can be an effective instrument for generating debate and communicating environmental issues to a broader public. From the deserted expanses of Pare Lorenz's *The Plow that Broke the Plains* (1936), a documentary of unregulated farming practice that led to the great Dust Bowl, to the delicate watercolor animations of Deborah Koons Garcia's *Symphony of the Soil* (2012), distinct imagery of soil conservation issues have reached the imaginations of audiences by way of the silver screen.

The first day of our program featured four "case studies" on *Desertification*, a form of large-scale soil degradation in which dry regions become increasingly drier, resulting in loss of waterways, surface vegetation, wildlife, and biodiversity. The program opened with the full-length feature film, *The Man Who Stopped the Desert* (2010) by Mark Dodd. It presented the heroic story of a peasant farmer, Yacouba Sawadogo, who started a movement to fight desertification in the Sahel region of northern Africa by adapting traditional zai pit agriculture and tree plantings. Especially with regard to desertification it was important

Soil Cinema: *Continued*

Aral – the Lost Sea (2011), by Isabel Coixet, retold the tragic story of the rapid retreat of one of the world's largest freshwater lakes on account of industrial expansion of cotton fields and the construction of a 500-kilometer long canal system in the former Soviet Union. Narrated by Sir Ben Kingsley, the film alternates between nostalgic images of family vacations and lively harbor scenes and current glimpses of cracked, salt-caked soil and ghostly, corroded ships anchored in expansive desert.

When the Water Ends (2010), by Jennifer Redfearn & photographer Evan Abramson exposed the daily plight of pastoral tribes as they fight for existence along the shrinking Omo River and Lake Turkana in Kenya and Ethiopia. *Desertification* (2009), by Yann Arthus Bertrand presented images of large-scale desertification in a worldwide aerial perspective. The 6-minute film was distributed as an excerpt from the full-feature documentary, *Home,* for the United Nations Environment Programme (UNEP). All of these films seek to show desertification as a humanly caused phenomena caused by poor land and water management, overgrazing, deforestation, and erosion of topsoil, that can be stopped and even remediated by sustainable agricultural practice and ecological sensibility.

The theme of the **second day**, *AgriCultures – From Plot to Plough,* took a detailed look at agricultural politics, practice, and management issues around the world, picking up on many issues presented in Monday's program. The first part opened with Lorenz's (1936) *The Plow that Broke the Plains*, followed by two short films that presented one of the biggest current challenges to agriculture in the United States – urban development. *The Corner Plot* (2010), by Ian Cook and Andre Dahlmann, pictured the story of an 89 year farmer who still grows food despite suburban encroachment outside his home in the D.C. area; *3 Acres in Detroit* (2013) by Nora Mandray and Helene Bienvenu, followed the struggles of two men who take up organic farming in the middle of an abandoned lot in a poor neighborhood in Detroit.

The second part of Tuesday's program featured a series of short films by activists, artists, and small-scale farmers that focused on the unique challenges of sustainable agriculture worldwide. These included: Patrick Lydon and Suhee Kang's *The Final Straw* (2014), *Soil is a Diamond* (2011), by the Green Resistance Group in South Africa, Future Farmers' *Soil Kitchen* (2011), and two films by Jason Taylor and Chintan Gohil of the Source Project, *Agricultural Philosophy* (2011) and *Upendra has Worms* (2011). Two experimental films visualizing the action of composting worms and the growth of vegetable crops showed that farming can also be a matter of aesthetics: Justin Rang's *Light & Dark Worms* (2011) and Matthew Moore's *Lifecycles* (2010). Finishing up Tuesday's program was a special evening screening of *The Symphony of the Soil* (2012) followed by a talk with filmmaker Deborah Koons Garcia and the film's narrator and scientific advisor, Dr. Ignacio Chapela. During the talk, Garcia spoke about the distribution of the film, which has made its way to schools, libraries, universities and even supermarkets to help people connect with where their food comes from. One scientist in the audience said he wished he had seen *The Symphony of the Soil* when he began his studies, as it presented the complexity of the pedosphere in such a simple and beautiful way.

The **third day** focused simply on digging, looking at extraction of the earth's surface materials as an issue of commercial exploitation and social justice, but also individual enlightenment, artistic exploration, and urban bioremediation. The feature film of the day, Denis Delestrac's documentary, *Sand Wars* (2013), posited not oil or copper, but sand as one of the most precious and endangered resources that is being mined at an exorbitant pace for construction projects and urban expansion at the cost of beaches and fragile coastlines worldwide. A series of artists' films picked up on ideas of extraction for more sustainable and creative uses later in the day, including: Elvira Wersche's *Sands of the World Qutri* (2008), Joel Tauber's *7 Attempts to Create a Ritual* (2000), Maria Michails' *S*OIL* (2012), Kasha Guzowska and Nance Klehm's *Soil* (2012), Jean Marie Offenbacher's 6 ocumentation of Lillian Ball's *Waterwash ABC* (2012), and Veronique Maria's *Orogeny* (2011). The final day picked up on the main theme of the congress, *Soils Embrace Life and Universe,* and featured two well-known and beloved documentaries – Gene Rosow and Bill Benenson's *Dirt! The Movie* (2010), inspired by Bill Logan's book of the same name, and I Chunglyeol and Go Yeongjae's portrait of an old ox and an elderly farming couple, *Old Partner* (2008).

Soil Art

The formal visual language of the world soils congress, as with most scientific conferences, was that of neat rows of posters and tightly orchestrated PowerPoint presentations. The first question we had when we started brainstorming about an art event for the world congress was, "should we break out of that format or use it as an advantage?" We decided to take an integrated approach and appropriate the visual language already in place to introduce artistic content into the given format. When the call for abstracts was sent out by the WCSS, we put out a mixed call for art works that were in some way related to specific scientific session topics. The focus was on artistic experimentation and *visual research*, rather than simply visualizing the decorative or aesthetic qualities of the soil. In this way we sought to challenge intellectual barriers between art and science by juxtaposing artistic approaches with state-of-the-art scientific research. The result was an exhibition of 36 artists' posters documenting projects that used soil materially or symbolically to address issues of food security, soil degradation, land use management, and more.

A permanent block of artists' posters hung in the 3rd floor lobby and served as point of conversation and interaction, while each day seven to nine posters were rotated within the different scientific poster sessions. For example Berlin and Tokyo based artist, Ayumi Matsuzaka's, artwork with Terra Preta was placed in the session on *Biochar Soil Amendments*, or Dan McCormick's willow-sculptures to control hillside erosion in the session on *Physical Restoration of Soils*. A few more examples are highlighted below to give readers a taste of the different artistic positions and practices presented at the exhibition. Images and descriptions of all projects can be found on www.soilarts.org. We are grateful to the following artists and artist collectives for submitting works: Ulrike Arnold, Betty Beier, Margaret Boozer, Jackie Brookner, Center for Land Use Interpretation, Georg Dietzler, Chris Fremantle, Future Farmers, Ekkeland Götze, Sarah Hirneisen, Ellie Irons, Mathias Kessler, Anneli Ketterer, Nance Klehm, Helen Lessick, Patrick Lydon & Suhee Kang, Ayumi Matsuzaka, Maria Michails, Myriel Milicevic & Ruttikorn Vuttikorn, Matthew Moore, Daro Montag, Jay Noller, Bonnie Ora Sherk, Laura Parker, Aviva Rahmani, Smudge Studio, Tattfoo Tan, Alexandra Toland, Urbaniahoeve, Ken Van Rees, Peter Ward, Elvira Wersche, and Gerd Wessolek.

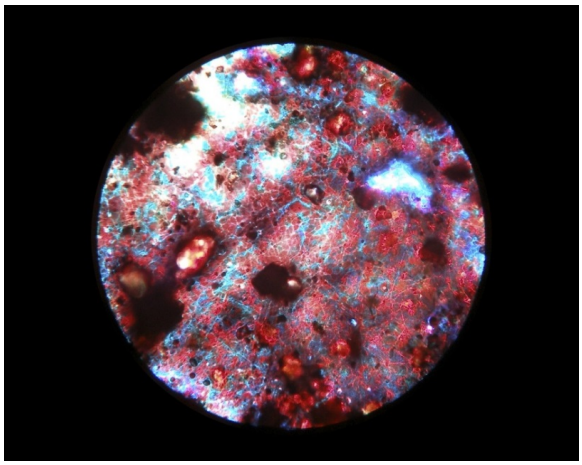
Sarah Hirneisen

For the session C2.4-1, *Minerology and Reactivity of Soil Microsites*, we invited Sarah Hirneisen to present a few of her projects casting soils in glass. When we think of the reactivity of the soil we usually think about the availability of nutrients or mobility of pollutants based on pH measures, precipitation levels, and organic content. Hirneisen thinks of reactivity in terms of how different soils will react in the kiln. Hirneisen has collected the cremated ashes of people's personal belongings, dust from vacuum cleaners, contaminated soil from Superfund sites, soil samples people have collected for her in their travels, and soil donated by soldiers stationed in Afghanistan and Iraq. The artist shows how these materials are not only physically and chemically reactive but also symbolically and culturally reactive.

CLUI

For the Session IDS4, *Critical Issues of Radionuclide Behavior in Soils and Remediation*, The Center for Land Use Interpretation (CLUI), led by multimedia artist Matthew Coolidge presented a project by Aurora Tang called *Perpetual Architecture: Uranium Disposal Cells of the American Southwest* (2012). This project visualizes the disposal cells, sometimes up to half a square mile in size, that contain the remains of uranium mill buildings and tailings, constructed to limit contact with their surroundings for a thousand years. These "land art" monuments resemble pyramids or relics from a geometrical mound-building culture that are built to minimize erosion and other potential threats to their stability, but exist as surface features that are at some level open to atmospheric forces and will one day erode like any other monument. (CLUI, 2012)

Soil Art: *Continued*



Daro Montag

For the Session C2.3-2*2, *Life in Soils – Distribution and Function of Soil Microorganisms in a Changing Environment*, Dr. Daro Montag contributed images of his *Bioglyph* series. Combining knowledge of photography and soil biology, the UK-based artist and director of the Research on Art, Nature & Environment Program (RANE) at Falmouth University creates snapshots of the earth not with a camera, but with the soil itself. Rather than photographing the soil, Montag allows soil microorganisms to eat away the gelatin surface of film strips laid directly on the soil profile, resulting in brilliantly colored records of microbial action in the soil, which vary according to depth, pH value, bulk density, and moisture content.

Matthew Moore

Several artists in both the film and art poster parts of the program focused on agricultural issues. For the session C3.3-4.2, *Soil Management Strategies for Enhancing Crop Yields*, Matthew Moore presented *Moore Estates* (2005), a project he created on his family farmland outside of Phoenix, AZ that looks at yield as a fundamental value of the American dream. Using conventions of land art, Moore created a scaled outline of a suburban settlement of 253 plots out of sorghum and wheat crops that prophesized the fate of his family's land and questioned the politics of soil protection in the United States, where valuable farmland is often sold to speculating developers.

Dirt Dialogues

Only if the discipline of soil science is open for dialogue will interdisciplinary work become possible. Soil protection is relevant for society at large and not only for famers, ecologists, and geoscientists. Beyond art, there are many other disciplines investigating soil topics (history, religion, economics, anthropology, sociology, communications…) and could add richness and depth to division sessions, scientific meetings, and world congresses. Scientific meetings are a format for open dialogue, sharing of methodological experience and development of ideas. When we sent out the call for art contributions to the 20WCSS, many artists and filmmakers expressed an interest in "being present" in some way beyond the film or poster session and framework of the conference. In response, we are currently working with the Soil Science Society of America to publish a coffee-table-style book on the occasion of the upcoming UN Year of Soils in 2015 to document many of the works shown in the poster exhibition as well as dialogues between artists and scientists on particular topics and challenges of soil protection. With a section of introductory essays by renowned arts researchers and leading soil scientists and a resource section for classroom and field exercises, this book is oriented at a wide audience of readers to inspire creative conservation and soil communication. The idea of the book is to harvest the momentum of the congress in a way that can be shared and further developed in other formats that will ideally lead to new collaborative networks of creative soil conservation. To join the dialogue, please contact the authors and go to www.soilarts.org to discover more examples.

C4.5 sponsored two oral sessions at Jeju; Session 31: The Soil Underfoot: Infinite Possibilities for a Finite Resource and Session 75 Cultural Perspectives on Soils and Soil Science. Both were well-attended and provided a stimulating range of topics and discussion.

The 20th World Congress of Soil Science Abstracts
Soils Embrace Life and Universe
June 8-13, 2014 Jeju, Korea
Session 31: The Soil Underfoot: Infinite Possibilities for a Finite Resource

Bread and Soil in Ancient Rome: a Vision of Abundance and an Ideal of Order based on Wheat, Grapes, and Olives

Bruce James[1*], Winfried Blum[2] and Carmelo Dazzi[3]

[1] *Environmental Science & Technology*, *University of Maryland*, *USA* (brjames@umd.edu)

[2] *Institute of Soil Research*, *University of Natural Resources and Life Sciences (BOKU), Vienna*, *Austria*

[3] *Department of Agricultural and Forest Sciences*, *University of Palermo*, *Italy*

"If the theory of the insidious decline of the soil as the result of human cultivation is correct, would humanity not have met its demise a long time ago? Is humanity's survival for thousands of years and its enormous growth in numbers since the invention of agriculture not proof enough that there must be elements of sustainability not accounted for by this theory?" - Joachim Radkau.

The words of the environmental historian Joachim Radkau speak cogently to the underlying, mysterious roles of soil in the sustainability, resilience, and continuity of human civilizations based on agriculture; in particular, that of ancient Rome. The soils of the Mediterranean Basin were a source of political power, economic wealth, and surplus food; all of which were essential for the growth and evolution of the Roman civilization over millennia.

A common refrain written by many over centuries since 500 CE is that the ancient Romans misused, exploited, or abused soils on erodible landscapes of fragile Mediterranean ecosystems. As a result, the Roman Empire as a "monster-state" and "vicious and ridiculous system" ultimately fell, and the civilization of the western Mediterranean region collapsed in the 5th century CE into a society controlled by barbarians. A "ruined landscape" remained with low soil fertility, eroded soils, and little native vegetation characteristic of the bio-region. Have we overlooked a narrative of sustainability in Roman times by focusing too much on the oft- told, historical drama of the 5th century CE? What can we learn from events in earlier centuries of Roman history that speak to the rise and resilience of their culture, and not just their presumed demise based on soil exploitation?

A close reading of the environmental and agricultural histories of ancient Rome, linked to modern soil science and interpreted with new theories of the dynamics of ecosystem disturbance and recovery, leads to a more heuristic narrative of cultural and ecological change in Roman history. This is particularly germane to our understanding of the dramatic transition period of approximately 240 years of Roman Antiquity starting with the onset of the Punic Wars in 264 BCE. This time of social change encompassed the years of the Crisis of the Republic (133 to 44 BCE), including civil wars and the assassination of Julius Caesar (44 BCE). It ultimately set the stage for the two centuries of Pax Romana that gave birth to the nascent Roman Empire under the first emperor, Caesar Augustus, who ruled from 27 BCE to 14 CE.

We explore this particular period of Roman history as a time of dynamic cultural evolution based on a mosaic of resilient ecosystems supported by soils that were used and managed for agriculture. We focus on the peninsula of Italy, the island of Sicily, and the Mediterranean coastal zones of North Africa where wheat for bread, grapes for wine, and olives for oil were produced. This unusual triad of foods that was and still is the core of the Mediterranean diet based on the seeds of a non-native, annual grass and the fruits of two native, woody perennials was produced on a challenging landscape that required considerable creativity to provide

enough food to feed burgeoning metropolises, especially Rome, and a mighty military machine spread over a vast geographic region. Land stewardship practices varied regionally and changed temporally from small farms owned and worked by peasants to huge estate farms (latifundia) controlled by absentee owners and supported by an abusive, but profitable, system of slave labor.

Our transdisciplinary study leads to the conclusion that the Romans of this period did not create a degraded landscape and eroded soils. The climate, topography, and diversity of the biogeography of the region appear to have contributed a resilient resource and biophysical system that was supportive of the Romans, and that was resilient in the face of natural and cultural change over centuries.

Keywords: *civilization, soil resilience, environmental history, ecology, erosion*

Climate Change-an Underfoot Perspective

Kevin Tate
Ecosystems and Global Change, *Landcare Research*, *New Zealand*
Kevin Tate and Benny Theng
Research Associates
Landcare Research, Palmerston North, New Zealand

Life on Earth has been sustained by soils since its emergence about 4.5 billion years ago. During this time climate has been a key soil-forming factor and, conversely, soil processes have been regulating the climate. As soils and climate are inextricably linked, our use of soils can be both a cause of climate change and an answer to meeting this great challenge of our age.

Natural climate changes have in the past been the cause of large-scale human crises, including famines. Now the excessive use of fossil fuels and the exploitation of land in order to feed an expanding population, projected to reach 9 billion within 30-40 years, are contributing to widespread increases in flooding, droughts, and heat waves, as well as the melting of glaciers and ice caps. Accordingly, there is an urgent need to replace fossil fuels with renewable forms of energy, halt deforestation, prevent the loss of productive soils, and improve the resilience of our land-management practices. The problem is compounded by our current economic systems, which rely heavily on massive subsidies from the environment, including our soils, and on the use of outmoded indices of progress like GDP.

The biological turnover of carbon and nitrogen in soils is central to our understanding of how soils act as a source or sink for atmospheric CO_2, CH_4, and N_2O, as well as support food production and regulate climate, water supplies, and biodiversity. Better understanding and management of these processes are essential if we are to reduce greenhouse gas emissions. While our knowledge of key soil processes is incomplete, some of these processes can already be applied to mitigate greenhouse gases, and to adapt to the future impacts of climate change. Examples include the use of clays and soil bacteria to mitigate CH_4 emissions, and the use of microorganisms for biofuel production. Although our soils can continue to provide many of the services we need, with careful management and innovation, we must make the appropriate changes to our underfoot perspective.

Keywords: *Soil underfoot, greenhouse gases, climate change*

Picturing the Soil: Artistic Approaches to Raising Soil Awareness

Alexandra Toland* and Gerd Wessolek
Dept. of Soil Protection, Technical University of Berlin / German Soil Science Society (DBG) Commission VIII, Germany
a.r.toland@googlemail.com

Covered by layers of rotting leaves on the forest floor, the golden stubble of fields and meadows, or the weed-and-litter-fringed concrete slabs of city sidewalks, soil is hidden by default. The most common images we have of the soil come from two main sources- the scientific community, with its numeric graphs and analytical descriptions, and popular media. Both are powerful and informative, but insufficient in providing imagery to truly inspire stewardship or stop soil degradation.

In the practice of image-production, contemporary artists are expert craftspeople who use innovative techniques to make the invisible visible. For this reason, soil enjoys a special place in painting, printing, and photography and its representation throughout art history has been analyzed (Busch 2002, Feller et al 2010, Hartemink 2009, van Breemen 2010,) as well as taken on as an expressive medium within the soil science community (e.g. Gerd Wessolek, Jay Noller, Ken Van Rees). Bachmann (2001) emphasizes the ability of artists to bring to the surface more than mere facsimiles of the soil profile: "The aesthetic portrayal of soil is more than just representation of what is found in nature, rather it is an image charged with metaphors and meanings. …To bring the sound of the earth to vibration …to make the color of time visible, to learn to read the soil again - the arts could show us the way…"

This paper presents a range of contemporary artworks with the aim of expanding the scientific portrait of soil as a pedogenetic body. Together, the artworks deconstruct conventions of genetic classification by inventing new methodologies of understanding defined by sensory experience, cultural contextualization, and an intuitive collaboration with the soil itself as material guide. From the pioneering works of Herman de Vries and Walter de Maria to the experimental bioart of Daro Montag, the sediment paintings of Mario Reis and street art of Jesse Graves, these works restore "a sense of emotion and spirit to the understanding of the substance that underpins our existence," (Lines-Kelly 2004), introducing concepts of the soil beyond scientific and economic rationalism or popular imagery.

While the works presented here allude to issues of environmental and social justice, soil protection and diverse underlying cultural contexts, what they mainly have in common is an aesthetic entry to the hidden realms of the pedosphere. With aesthetic entry a formalist aesthetic reading is implied, i.e., the appreciation of that which may be physically referenced not only in the formal compositions of artworks, but also in soil environments: color, texture, form, contrast, rhythm, balance, topography, etc. (see Zangwill 2001 for discussions on aesthetic formalism and the environment). All of the works presented are produced in highly aesthetic styles to expose the beauty, diversity and uniqueness of the soil and the landscapes from which soils develop. The works are loosely organized by genre, including: painting, pigmenting, printing, and artists' archives. Beyond these categories, aesthetic awareness is also created with installation, performance, and different types of participatory engagement. By blending a range of contemporary artistic positions with scientific concepts, an attempt is made to re-imagine and re-evaluate the soil. References: Bachmann, G. 2001: Terra preciosa: Boden und ihre Wahrnehmung in Kunst und Kultur. Online: http://www.bodenwelten.de/bod_kunst/pdf/preciosa.pdf.

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Keywords: *art, painting, archiving, visualizing, raising soil awareness*

The Finite Soil Resource for Sustainable Development: the Case of Taiwan

Zeng-Yei Hseu[1*] and Zueng-Sang Chen[2]

[1] *Department of Environmental Science and Engineering*, *National Pingtung University of Science and Technology*, *Taiwan*

[2] *Department of Agricultural Chemistry*, *National Taiwan University*, *Taiwan*
zyhseu@mail.npust.edu.tw

In order to anticipate the kinds of challenges and problems we will all face, it is pertinent to examine the case of Taiwan, which is a relatively small island nation in area, but with a high density of population and which is quite highly developed, both agriculturally and industrially. As a result, the soils and those who manage them have experienced many challenges and problems. This case study of the way that these are being met by soil scientists and society in Taiwan can provide lessons for us all for the future. Human-induced processes that markedly change soil properties and result in diagnostic horizons or properties are termed 'anthropogenic processes'. In the case of soils affected by human activity in large-scale farming, the anthropogenic processes have operated in Taiwan for approximate four hundred years. They have particularly involved the numerous agricultural activities in soils, such as puddling of surface soils (mechanically stirring and mixing surface soil with water and making it into a muddy paste) for paddy rice production by human beings. Paddy soils (rice-growing soils) are developed from various other soils. Land leveling and terracing produce changes in the soil moisture regime for paddy rice production. The recognition of paddy soils is mainly based on the obvious impacts of anthropogenic activities on the soils. Artificial and seasonal water saturation often led to the formation of special layers characterized by Fe and Mn distribution. Puddling is often necessary practice for easy transplanting of seedlings, and it results in a poor soil structure in the plow layer and a compacted plow pan. This latter is good for saving irrigation water as long as it does not adversely affect the growth of roots. Therefore, a principal distinction of paddy soils from upland soils is the variation in their oxidation and reduction status. The agricultural soils have been intensively cultivated for crop production to fulfill the needs of the large population in Taiwan, especially in the last four decades. Soil degradation has occurred as a result of both natural hazards and human activities. The total area of cultivated soils in Taiwan is 0.85 million ha (24% of the total area in 2012), while over 30% of the cultivated soils are potentially degraded. The major types of degradation of soils in Taiwan are soil erosion, soil acidification, soil compaction, high salinity and heavy metal contamination, especially in last three decades. Rapid development makes soil contamination an inevitable problem and a big challenge for scientists and environmental policy makers. In order to sustain soil health for future generations around the whole globe, the soil resource worldwide should be protected against slow and insidious poisoning by contaminants released from industrial development and intensive agricultural activities. We are standing at the cross roads for the development of pedology in Taiwan. Basic pedology courses, including basic soil science, soil morphology, genesis and classification and soil survey techniques, are still offered by four national universities of Taiwan. However, in the last decade in Taiwan, most graduate students have

shifted their interests to other fields in order to find jobs, especially on soil survey, and on the prevention and remediation of potentially highly contaminated sites for environmental consultant companies in Taiwan.

Keywords: *Anthropogenic process; soil degradation; heavy metal contamination; land use*

Seeing Soil

Deborah Koons Garcia*
Lily Films, *USA*
deborah@lilyfilms.com

Most people are soil-blind. They walk on soil, they see it in the distance, they appreciate its bounty, but they have no awareness of soil as a complex living organism. If we are to move towards a world in which we treat soil with respect, finding ways to bring soil alive to the general public is essential. And treating soil with respect is essential to our survival.

Several years ago I decided to make a film about soil and I soon found myself in a dilemma: how to create a film, a medium which is about light and movement, about soil, a medium which is dark and seemingly inert. So I began the process of figuring out how to see soil: as an organism, as an ecosystem, as a community, microscopically, from a satellite, as evolving in time and as developing in unique spaces. I came to see soil from the point of view of the farmer who works his land, the scientist who studies her samples and the philosopher whose work connects heaven and earth. Ultimately, I came to see soil as heroic, a protagonist of our planetary story.

As the film took shape, I had a revelation as to what the perfect title would be: Symphony of the Soil. A symphony is complex, with many cycles, rhythms and textures just as soil is complex. A symphony is made up of different parts which come together as a satisfying whole, as I hope my film does. And by choosing to call the film a Symphony, I could bring together the worlds of science and art. Making Symphony of the Soil was a deeply rewarding experience. In order to appreciate soil, one has to understand it. Figuring out how to use highly technological means to help people connect with nature and with soil, which resonates deeply within our human nature, was not only a fascinating challenge, it was fun!

The Soil Underfoot: the Concept of the Book and its Realization

Jock Churchman[1*] and Edward Landa[2]
[1] *School of Agriculture, Food and Wine*, *University of Adelaide*, *Australia*
[2] *Department of Environmental Science and Technology*, *University of Maryland*, *USA*
jock.churchman@adelaide.edu.au

The book 'The Soil Underfoot: Infinite possibilities for a finite resource' (CRC Press, 2014) is an edited volume that originated in Commission 4.5, the History, Philosophy and Sociology of Soil Science. It therefore belongs to the tradition of producing books that has been maintained by this Commission. Previous books in this tradition were edited by Yaalon and Berkowicz (1997), Warkentin (2006), and Landa and Feller (2010). The two earlier books dealt with the history of soil studies, while Landa and Feller's volume was concerned with the cultural aspects of soils. In The Soil Underfoot, we have set out to search for and compile views of our greatest natural asset from far and wide, past and present for attitudes, ethics and evidence in order to help sustain humankind into an uncertain future.

We saw the need for this book coming from the challenge we face to enable humankind to survive into a future when there are >9 billion of us, while many changes continue to occur in the global environment. There is a need for us humans to enable our survival while maintaining the best that the earth can offer in terms of biodiversity and a healthy environment. If this is to occur, we consider that it will be necessary to maintain, and if possible, improve the quantity, and productivity (and therefore, quality) of soils in order to be able to support more people in a changing environment. Other books have attempted a technical analysis of the means by which we can sustain soils for the future requirements of humankind; but this present book is not primarily technical in nature. Instead, it is a collection, from diverse cultural and geographical sources, of descriptions of attitudes to soils, including philosophical and ethical frameworks, which have either sustained them, or led to their degradation, in the past. These are combined with current analyses, and with examples of what may be required- some from different scientific viewpoints, and some from niche user viewpoints. It obtains its inspiration from Leonardo da Vinci's statement "We know more about the movement of celestial bodies than about the soil underfoot."

We were fortunate to be able to include 30 chapters in the book, with their authors coming from 13 different countries. The book comprises sections on Future Challenges (5 chapters), these also include threats; Valuing Soils (6 chapters), including some continuation of themes from Landa and Feller's 2010 volume; Cultures and History (11 chapters), which is the bulk of the volume; Technologies and Uses (5 chapters), these include non-agricultural uses of soils; and Future Strategies (3 chapters), including informed crystal-ball gazing.

This paper will outline the background and scope of the book. The aim of the paper is to introduce the main themes that have emerged from the collection of expert contributions to the book. These include the fragility, yet wonder, of soils and their requirement for our stewardship; their essential biological nature and the need to investigate and devise new and ingenious ways of the more efficient use of water in soil to grow plants and sustainably supply more food. In the book, these questions are approached by interrogating the 'wisdom of the elders', especially those from past civilizations, as well as their follies. In addition, they are pursued through new approaches, both technological and those borrowed from other land uses besides large-scale agriculture. The paper will summarize these various aspects of the major challenge that is posed for soil scientists to feed a burgeoning population while sustaining soils into the foreseeable future.

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Keywords : *Burgeoning population; sustaining; survival; future; civilizations; water; environment*

Session 75: Cultural Perspectives on Soils and Soil Science

Gods of Soil

Budiman Minasny
Environmental Sciences, *The University of Sydney*, *Australia*

The gods of soil or earth can be found in many civilizations. This paper will discuss a couple of gods of soil in the Chinese culture. The first is Yu the Great (大禹) which was attributed for making the first soil map around 2000 BC by several authors. However early Chinese dynasty is usually filled with mythical figures. Yu is a demigod that was an emperor and founder of Xia dynasty in China (around 2100 BC). He is famous for

controlling the great flood in China, and used a divine substance self-expanding soil 息壤, which is capable of self-regeneration. Later Yu is able to channel the water to form irrigation, allowing the flourish of agriculture in China. Yu's "soil map" was recorded in a 26 paragraphs chapter of the Book of History (around 500 BC), titled The Tribute to Yu (Yu Gong). It described Yu's accomplishment in dividing the world into (mythical) nine provinces within the four seas. He was said to travel over numerous mountains and lands, charting land, topography variation (the first topography map), and quality of soil, names of local tribes, their sources of revenue, and articles of tribute. So Yu classified soils to determine the tax quota.

"Between the Ji and the He was Yan Zhou. The soil of this province was blackish and rich; the grass in it was luxuriant, and the trees grew high. Its fields were the lowest of the middle class. Its contribution of revenue was fixed at what would just be deemed the correct amount; but it was not required from it, as from the other provinces, till after it had been cultivated for thirteen years. Its articles of tribute were varnish and silk, and, in baskets, woven ornamental fabrics."

As noted by Anne Birrell (1993) while the record has some actual locations, most were mixed with mythical names and locations, making it a mythical geography.

The ancient soil god is known as She 社, one of the most important deities associated with agriculture and fertility. The word "She" is a combination of altar and soil, with evidence of worship as far as the Shang dynasty (1500 BC). In later times, the god of soil is worshipped together with the god of grain, Ji, together known as She Ji 社稷, a combined patron deity of soil and harvests. However the supreme god She Ji is only worshipped by the emperor or high officials. For common people, the god of soil is more popularly known as Tu Di Gong (土地公) literally means Grandpa Soil. Its existence is recorded in the early Han dynasty (around 141-87 BC). Rather than the god, Tu Di Gong is a local god, which symbolised the agrarian-based community. He is still a popular deity and can be found today in many places in China, Taiwan and South East Asia. Tu Di Gong is considered to have a lower position in the world of gods with limited power, but a humble, friendly guardian of nature, agriculture and land. Tu Di Gong is also known as Hou Tu (后土 or the Earth deity), or Di Zhu Gong (lord of the land) can be found nowadays as small shrines, commonly located on the ground. Alessandro Dell'Orto considered that TuDi Gong functions as an anthropologist, as a witness, and recorder of events occurring in the places where he was placed, similar to soil recording history of human and environment.

Keywords: *gods, fertility, culture, mythology, soil map*

Soil and the Development of Agricultural Systems in South Korea since the Neolithic

Heejin Lee*
Institute for Archaelogy and Environment, Korea University
ddangpa@korea.ac.kr

This paper addresses two aspects related soil and past agriculture in geoarchaeological research. One is soil conditions for ancient and historical agricultural practice and its management techniques over time to alter soils and its consequences. Role of soil and long-term changes regarding three forms of cultivation modes, slash and burn agriculture, dry cropping and paddy field, are examined. The second is to understanding the interaction between local soil conditions and various modes of agricultural practice, which plays a role to determine localized agricultural system and its long-term sustainability.

During the Neolithic, the cultivation mode remains questioned but slash and burn cultivation and dry cropping of millets are assumed, hinted by the recently excavated Neolithic field, Munam-ri site. Through soil analyses on the prehistoric dry field soil and ethnographic record regarding Korean indigenous slash and burn agriculture,

the climatic conditions, vegetation types and role of soils for prehistoric dry cropping and certain modes of swidden agriculture appears to have been plausible but its sustainability is in question. Possibility of reduced fallow cycle and presence of various manuring schemes is also assumed, but their intensity is not known.

In Bronze Age, commencement of wet rice cultivation had begun and spread all over the Korean peninsula. Wetland and reclaimed lowland were used as rain-fed paddyfield, and advanced irrigation canals and reservoir were discovered in few archaeological sites.

50% of Bronze Age paddy field locales were also used as historical and modern paddyfields as well. However, the irrigation scheme and cultivation techniques changed as well as local hydrological regimes, which highly influenced the development of paddysoil as an anthroposol. The soil micromorphological and geophysical and geochemical analyses including ICP-AES, EDX and microprobe at two Archaeological sites, Gulhwa and Pyunggeo sites suggests evolution of paddysoil over time. It shows that Bronze Age paddysoil had been subject to the mechanical disturbance with common redoximorphic processes, but historical and modern paddysoil are physically and chemically altered by intensive hydrolysis in association with development of rice farming techniques advanced over time.

Based on results of such soil analyses applied to archaeological research, potential and limitations of soil research in reconstructing past agricultural practice will be discussed.

Keywords: *soil, agricultural system, slash and burn cultivation, evolution of paddy soil, dry cropping*

The Soil Legacies of 18th and 19th C Illicit Scotch Whisky

Clare Wilson[1*] and Hazel Ramage[2]

[1] *Biological and Environmental Sciences*, *University of Stirling*, *United Kingdom*

[2] *Biological and Environmental Sciences*, *School of Natural Sciences, University of Stirling, Stirling*, *United Kingdom*
c.a.wilson@stir.ac.uk

Whisky has an important place in both the national identity and economy of modern Scotland (£ 4 billion / year GVA). Traditional Scotch whisky is made from malted barley and its manufacture involves multiple processes including malting, mashing, fermenting and distilling.

The rise in popularity of whisky in Scotland coincided with a boom in illicit whisky production in response to increased taxation and still regulation. However, although illicit whisky is mentioned frequently in literature, historical texts and court documents there is little documentary evidence concerning the organization of the processes involved, and the part it played in local Scottish economies and social structures. Indeed, there has been a systematic romanticizing of the industry in Scottish folklore. Getting to the truth of this trade is difficult as due its illicit nature there is little direct documentary evidence and still sites were concealed, either in remote locations in the highland glens, or in domestic and other unlikely locations, beneath the excise men's noses. As such the archaeological remains are also scant. However, there are potentially important lessons to be learned relevant to contemporary black market economies.

This study attempts to explore and understand the history of illicit whisky production in Scotland through its chemical and physical soil legacy. GIS analysis, multi-element soil analysis, soil characterization and magnetic susceptibility have been used to explore the chemical pollution legacy of 18th and 19th Century whisky production in highland Scotland. The aim was to determine whether chemical soil legacies could be used to identify evidence of the whisky producing history of these sites and elucidate the nature and organization of the production process.

The sites investigated to date include the supposed site of the famous legal Ferintosh distillery in Ross-shire, possible late 18th C illicit still sites in Strathconon Valley and Arran, remote highland areas both renowned for illicit whisky production, and a domestic barn in a pre-clearance settlement at Caen, Sutherland, which may contain the remains of in-situ distilling apparatus.

Promising results from the soil chemistry and magnetic susceptibility appear to confirm distilling activity at some of these sites and in some cases has helped to locate the still position. GIS analysis has also helped identify remote still locations in Arran based on proximity to resources, view sheds and transport links. However, further research is required to identify more subtle clues as to other parts of the process such as grain procurement, malting, mashing, fermenting, and distribution to unlock the more complex stories attached to this historically important black market activity.

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The 'Living Soils' Project - Journey into the Earth

Winfried E.H. Blum[1] and Beatrice S. Voigt[2]

[1] *Institute of Soil Research*, *University of Natural Resources and Life Sciences*, *Austria*

[2] *Beatrice Voigt Art and Culture Projects & Edition*, *Germany*

Approach to a secret dimension of life by building bridges between sciences, fine arts, cultures and education

With its incredibly wealthy and diverse inner life the pedosphere forms a 'Critical Zone' whose mechanisms maintain the global equilibrium between hydrosphere, biosphere, lithosphere and atmosphere. Soils enable life on earth! - The 'Living Soils' project is a transdisciplinary model for education, research and design aiming to impart knowledge and understanding of the complex structure of living soils.

The starting point of our journey is the relationship of humans and soils from the archaic myths of humanity leading to today's age of globalization and climate change. Soils are a merging world of phenomena and of life in dimensions and processes on a scale reaching beyond human life and comprehension. Against this backdrop, coordinates for a sublime approach to living soils are illustrated enhancing awareness and creating sustainable responsibility for humans managing soils and shaping life in innumerable scenarios.

The following subjects outline the general ideas of our contribution in three parts: Soils - Basis for creating sustainable values by individuals and society.

The relationship of humans and soils is fundamental. Each civilization's approach to soils is determined by contextually developed patterns of orientation. Thus the conception of humanity and world derived from the individual understanding of nature and culture shape values, on the basis of which we interpret the world. In view of an almost infinite diversity of human identities and systems in our globalized society the question arises whether there is a resilient basis for supporting the development of individual and societal values. In this sense the goods and services generated by soils are existential.

Soils - Experts for modeling dynamic complex systems in time and space The diverse and complex relationship between living organisms and the phenomenal world occur as dynamic processes in space and time. The geographic location as well as geological, biological and climatic conditions play an equally important role as human beings. The pedosphere with its highly sensitive microbial life is the essential driving force for sustaining the biosphere. The concurrence of all life processes involved and their interaction constitute the basis for a holistic quality of life. This interplay is characterized by processes of self-organization following universal principles.

Soils - Source for bridge building between nature and technology

A beneficial dialogue between nature and technology is based on the recognition and understanding of natural processes and their significance for diverse manifestations of life. The interface between nature and technology forms a creative potential for bridging ecology and aesthetics and its own quality and beauty. This can be perceived as an essential element of ecological aesthetics inspiring philosophy and fine arts to enter unknown territory. Human beings, as mediators in this dialogue, can experience themselves as a part of nature and so become aware of their role and responsibility in shaping culture in harmony with nature and technology.

The 'Living Soils' Project - Journey into the Earth is conceived as an itinerary for laying the foundation and raising awareness of a culture (Latin cultura "cultivation", derived from "cultivate, worship, till, farm") of soil, a limited resource that must be protected. The concept expands economic, ecological and social aspects of a sustainable approach to our precious base of life to include cultural-aesthetic and cultural-ecological dimensions, thus promoting the development towards a culture of sustainability.

Keywords: *Building bridges between soil science, fine arts, culture and education; Enhancing consciousness for the holistic cultural dimension of soil;*

Developments and Departures in the Philosophy of Soil Science

Thomas Sauer*
National Laboratory for Agriculture and the Environment, *USDA-ARS-NLAE*, *USA*
tom.sauer@ars.usda.gov

Traditional soil science curriculums provide comprehensive instruction on soil properties, soil classification, and the physical, chemical, and biological processes that occur in soils. This reductionist perspective is sometimes balanced with a more holistic perspective that focuses on soils as natural, interactive, and vital components of the earth's terrestrial ecosystems. In western culture, all science was once considered a single field of study, which was termed philosophy. This arrangement was consistent with the most inclusive definition of philosophy, i.e. the pursuit of wisdom (philosophy = lover of Sophia, the Greek goddess of wisdom). In the 19th century however, science and philosophy began to disconnect into mutually exclusive fields of study. The social and natural sciences, chemistry, physics, and medicine became disciplines within science while logic, aesthetics, ethics, metaphysics, and epistemology came under the sphere of philosophy. Today, science and philosophy remain on largely divergent paths with only limited or infrequent interaction, usually restricted to specialists particularly interested in this relationship. One notable exception relevant to soil science began in the mid-20th century with publication of Aldo Leopold's The Land Ethic. Leopold proposed that there were ethical principles that applied to soil that should affect how we treat soil resources. This view represented a sharp contrast with the prevailing position that ethical treatment is reserved for living, sentient beings. Leopold was influenced by the writings of an eccentric Russian mystic named P.D. Ouspensky's whose book Tertium Organum, proposed 'A living and rational universe'. The concept of soil as a living entity was followed on by Rene Dubos in The God Within and ultimately James Lovelock with The Gaia Hypothesis. Each author supported a much more holistic view of the earth and soil where everything is connected and distinctions between 'living' and 'nonliving' and their relative value are much less clear or important. This world view presents an opportunity to take a closer look at the philosophy of soil science and soil scientists beyond the now established field of environmental ethics. Philosophy of soil science in the present context, referring to the fundamental beliefs, concepts, and attitudes of the profession, will be explored.

Call for news and interesting items to share in 2015

We're always searching for new and interesting items to include in the newsletter. Given that 2015 is the International Year of Soils, we are particularly interested in consolidating compelling information on the History, Philosophy and Sociology of soils that we can share with the general public to increase awareness of some of the more human aspects of soil systems. If you find something you feel other readers would enjoy, please email your suggestions to the newsletter editors.

Tom Sauer (tom.sauer@ars.usda.gov)
Morgan Williams (morgan.williams@berkeley.edu)

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Soil Science Society of America

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