



Soil Classification IUSS Commission 1.4

Newsletter No. 8

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In This Issue—

Incoming Chair and Vice Chair.....	3
Guy Smith Medal Recipient: Dr. Peter Schad	3
Fourth Edition of WRB is now Available	5
Japan to Host the 2024 International Soil Classification Congress (ISCC).....	6
Mexico’s ISCC (March 23 to April 1, 2022) — Success Despite COVID Setbacks.....	6
Images and Stories from Dr. Richard Arnold	10
Updated Website of Commission 1.4	14

Cover photo: The “perfect soil pit” from [“PEDS - A Reflective Journal”](#) (PDF; 17.3 MB) – Images and stories from Dr. Richard Arnold, former director of the USDA-SCS Soil Survey Division.

Incoming Chair and Vice Chair

The incoming chair of Commission 1.4 Soil Classification is **Cornelius van Huyssteen** (South Africa) and vice chair is **David Badía-Villas** (Spain). Their terms began on August 3 at the business meeting during the 2022 World Congress in Glasgow. Each will serve a 4-year term until the end of the next World Congress of Soil Science, which is scheduled for Nanjing, China in 2026. They can be reached at Cornie van Huyssteen vanhuyssteencw@gmail.com and David Badía-Villas badia@unizar.es.

The outgoing chair is **Curtis Monger** (USA) and vice chair is **Bipin Bihari Mishra** (India). They can be reached at cmonger@nmsu.edu and bbsmsoil@rediffmail.com. Both wish to thank the organizers of conferences within Commission 1.4 and the officers of allied commissions, such as Paleopedology and WRB, and Division 1, Erika Micheli, for their collaboration.

Guy Smith Medal Recipient: Dr. Peter Schad

Laudation by the Guy Smith Medal Award Selection Committee.

Distinguished delegates, Ms. President of the IUSS, Ms. Chairman of the IUSS Division 1, Soil in Space and Time, honored guests, soil scientists and students. It is an honor for us to provide this laudation for Dr. Peter Schad at the occasion of the presentation of the sixth Guy Smith Medal Award for soil classification. (Photo below courtesy of Martin Wiesmeier).

Upon launching the call for the sixth Guy Smith Prize, the selection committee received numerous outstanding nominations. After a thorough scrutiny of the submissions by the Guy Smith Committee, Peter Schad came out as the strongest candidate. Incidentally, Peter follows Rudi Dudal, Hari Eswaran, Otto Spaargaren, Juan Comerma and Dick Arnold, who were awarded the previous Guy Smith Prizes.



Dr. Peter Schad is Professor and Chair of Soil Science at the Technical University of Munich.

- He was vice chair of the IUSS working group The World Reference Base for Soil Resources (WRB), from 2002 to 2010.
- He has been Chairman of the WRB working group since 2010 until now.

- His main achievement is the development and promotion of the international soil classification system WRB.

Peter has participated in and guided numerous field excursions in many (at least 26 outside Europe) countries. These efforts have greatly contributed to the acceptance, understanding and use of WRB.

Peter was extremely active on the international scene as evidenced by the none-exhaustive list of WRB-research stays and scientific excursions and meetings outside Europe: Argentina (1997); Australia (2010, 2012); Bolivia (1991-1993, 1994, 1995, 1999, 2000, 2001, 2002, 2004); Brazil (2002, 2003, 2004, 2010, 2012, 2013, 2015, 2017, 2018); Burkina Faso (1998); Chile (2008); China (1998, 2008, 2010, 2012); Colombia (2018); Côte d'Ivoire (1998); Ecuador (1999, 2016); Georgia (2014, 2019); Indonesia (2010, 2012); Kenya (2005); Korea (2014); Malaysia (2005); Mexico (1995, 2003, 2005, 2006, 2007, 2008, 2009, 2013, 2016, 2019); Mongolia (2019); Namibia (2003); Peru (2014, 2018); Russia (1996, 2004, 2013); Singapore (2005); South Africa (1996, 2003, 2016); Tanzania (2005); Thailand (2017); USA (2006, 2007, 2008, 2011, 2012, 2016, 2019); Vietnam (1998).



Pic@Deckers, S.; Australia

Peter Schad has taught soils of the world and their use, management and conservation to generations of students not only in Germany but also at universities around the world, such as Singapore, Mexico, Spain, Ecuador, and Brazil.

Peter has (co)authored many (50+) scientific publications on the classification, geography and management of soils. Among them are scientific articles on soil genesis, WRB manuals (in various languages), and scientific books on soils of the world with his German colleagues (German and English), such as the “Essentials of Soil Science” (English) and, recently, “Soils of the World” (German and English).

Peter Schad is dedicated to the belief that it should be possible to satisfactorily characterize and classify all soils that can be encountered in the world through one common classification system. His long-term efforts as (vice) chair of the WRB working group have been instrumental to that goal. He interacted with many soil scientists at all levels. These discussions have led to further developing WRB and getting acceptance for WRB as a world soil classification system. In addition, he carefully re-worded the WRB into a precise but understandable language for laypersons. He aligned under one umbrella soil description, classification and soil mapping.

Peter Schad has many followers among his students and scientific peers. He obtained the Award for “Good University Teaching,” granted by Bavarian State Minister of Science, Research

and the Arts (2009).



Pic@Gerasimova, M.; Latvia, 2017

May I, on behalf of the IUSS Guy Smith Medal Award Committee, now request Prof. Erika Michéli, Chair of IUSS Division of Soil in Space and Time, [Curtis Monger, Chair Commission 1.4] to hand over the Guy Smith Medal Award to Peter Schad.

With heart-felt congratulations from the IUSS Guy Smith Medal Award Committee:

Jozef (Seppe) Deckers
Chair, IUSS Guy Smith Prize Selection Committee
KU Leuven University, Belgium

Prof. Lúcia Helena C. Anjos
Soils Department, Federal Rural University of Rio de Janeiro (UFRRJ) Seropédica, Rio de Janeiro, Brazil

Prof. Maria Gerasimova
Department of Soil Geography and Landscape Geochemistry, Faculty of Geography
Moscow Lomonosov State University, Russia

NOTE: A video recording of Peter Schad's acceptance speech is available at this link:
<https://gigamove.rwth-aachen.de/de/download/ed8cebffe48af85b022db7fb96c73260>
The download is available until 26.08.2022.

Fourth Edition of WRB is now Available

The link to the fourth edition of the WRB published on July 22, 2022 (and with minor corrections on August 5, 2022) is <https://www3.ls.tum.de/boku/?id=1419>. This link always connects to the most recent version. The document is an electronic publication with an ISBN number ISBN 979-8-9862451-1-9. The publisher is the IUSS. The recommended citation is the following:

IUSS Working Group WRB. 2022. World Reference Base for Soil Resources. International

soil classification system for naming soils and creating legends for soil maps. 4th edition. International Union of Soil Sciences (IUSS), Vienna, Austria.

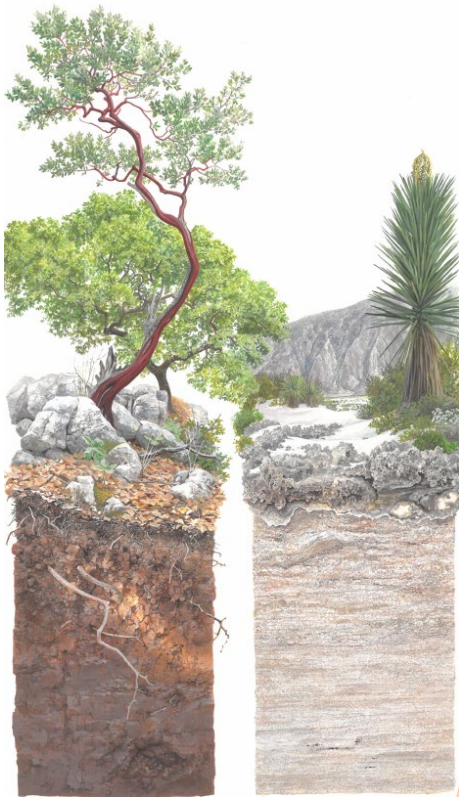
The Soil Description Sheet and the Guidance for Database Set-Up mentioned in Annexes 4 and 5 will soon be provided as separate documents on the WRB homepage.

Japan to Host the 2024 International Soil Classification Congress (ISCC)

Our Japanese colleagues presented a proposal at the C.1.4. Business Meeting in Glasgow to host the ISCC in 2024. The proposal was unanimously approved by the Chairs of Commission 1.4 and Chair of Division 1. The time of the meeting will probably be sometime in the month of May; details are developing.

Mexico's ISCC (March 23 to April 1, 2022) — Success Despite COVID Setbacks

In 2018 at the World Congress in Rio de Janeiro, if someone had said “Two years from now most of the world will be wearing masks, children will not go to school, and most people will be working from home,” it would have been unbelievable. But that's what happened.



One of the COVID casualties was the 6th International Soil Classification Congress (ISCC) that was initially scheduled for 2020 in Mexico. It was postponed until 2021 because of the pandemic, and in 2021 it had to be postponed again. Still, Norma Eugenia García Calderón and her colleagues persisted, and we are very happy to report that the conference did take place as planned on March 25 to April 1, 2022. The conference's name was affectionately changed to “ISCC 2020+2.” Erika Micheli, Chair IUSS Division 1, informed us that ISCC 2020+2 was the only in-person conference in Division 1 that managed to meet.

The field excursion capitalized on steep topography and abrupt climatic gradients by crossing back and forth across the Sierra Madre Oriental. West of the mountains, the moisture regimes are aridic and ustic; in contrast, they are ustic and udic in the mountains and ustic east of the mountains. Geologic parent materials were derived from structurally complex bedrock units of sedimentary and igneous bedrock as residual, alluvial, colluvial, eolian, and lacustrine sediments in ecological settings that included desert, grassland/forest transitions, forests, and agriculture.

This diverse environment produced many soil taxa. Thirteen pedons were visited and classified by the participants using the WRB, Soil Taxonomy, and Australian systems. Diagnostic horizons included gypsic, petrogypsic, salic, calcic, petrocalcic, argillic, chernic, protovertic, vertic, mollic, and ochric horizons that were used in combination with the lab and field data to classify the soils as Solonchak, Gypsisol, Phaeozem, Chernozem, Vertisol, Alisol, and Leptosol according to WRB and Entisols, Ultisols, Mollisols, Alfisols, and Aridisols using Soil Taxonomy.

An excellent guidebook (including the front-cover watercolor paintings above by Aslam Narvaez Parra) provided an overview of each site, photographs of the soil profiles, descriptions of horizon morphology with thin section photomicrographs, and lab data of the physical, chemical, and mineralogical properties needed for soil classification. All of this provided an opportunity to

have thorough discussions about each soil's classification and genesis.

The 5-day field excursion ended at Querétaro, where the conference was held at the UNAM Juriquilla Campus. Some 25 classification talks were presented by scientists from Hungary, Mexico, Germany, Poland, Cuba, Australia, Russia, Brazil, and the Netherlands. Roughly half were in-person and the other half were virtual.

We would like to thank the organizing committee, our Mexican hosts, including the students, for their hard work, hospitality, and generosity and for showing us very interesting soils.

Organizing Committee

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(SEE PHOTOS BELOW)



Participants of the 6th ISCC 2020+2 at gypsum dunes near Cuatro Ciénegas. The gypsum dunes classify as Haplic GYPSSOL (Pantoarenic, Ochric, Aeolic, Gypsiric) in WRB and as hypergypsic, hyperthermic Typic Torripsamments in Soil Taxonomy. (Photo courtesy of Marcin Świtoniak)



Participants listen to descriptions of the soil profile and rationale for classification at a grassland-woodland transition at Sierra Hermosa, where the soil classifies as a Luvic Vertic Endocalcic PHAEOZEM (Chromic, Katoclayic, Epiraptic) in WRB and as a fine, smectitic, thermic Torrertic Haplustalf in Soil Taxonomy. (Photo courtesy of Marcin Świtoniak)



Arriving at a site after dark? No problem. Everyone has phones with flashlights and the petrocalcic horizon shows up well in this Petrocalcic CHERNOZEM (Clayic) (per WRB) or fine, mixed, thermic Petrocalcic Argiustolls (per Soil Taxonomy). What if the police arrive with guns to investigate the activity? No problem. Just start telling them about the soil horizons and they'll leave. (Photo courtesy of Marcin Świtoniak)



Edgar Vladimir Gutiérrez Castorena explains the properties of this vineyard soil that classifies as a Calcic CHERNOZEM (Aric, Pantoclayic, Protovertic) in WRB or as a fine, smectitic, hyperthermic Pachic Calcicustoll in Soil Taxonomy. (Photo courtesy of Marcin Świtoniak)



The geomorphic surface of this steep slope is stable enough for an O-A-E-Bt profile to form. The soil classifies as a Haplic ALISOL (Katoctylic, Cutanic, Humic, Epiraptic, Episiltic, Protostagnic) in WRB and as a fine, mixed, isothermic Typic Paleudult in Soil Taxonomy. (Photo courtesy of Curtis Monger)

Images and Stories from Dr. Richard Arnold

[“PEDS - A Reflective Journal”](#) (PDF; 17.3 MB)

Dr. Richard (Dick) Arnold, now in his early 90s, was very active in international soil science, both as a professor at Ontario Agricultural College and Cornell University, and during his leadership period in the Soil Survey Division, USDA. He held several positions in IUSS and served as a member of various committees. He was involved in the AID-sponsored Soil Management Support Services, which worked with soil scientists in many developing countries to assist them in better understanding and interpreting their soil resources. He was also special liaison and Fulbright Scholar to Russian and former Soviet Soil Science societies to maintain scientific contacts and work on current issues in soil science and global change.

“PEDS” (Pedologically Exciting Discovery Stories) is a collection of scanned slides and the stories they prompted him to tell from his life as a pedologist. PEDS is in four parts: 1) Looking at nature, 2) Man’s invasion of the pedosphere, 3) Into the realm of Pedology, and 4) Random perceptions of a pedologist. Below are excerpts from each part.



In areas where volcanic ash is common the ash often weathers rapidly because many of the compounds are poorly crystallized and organic acids cause them to dissociate and move within the material - usually downward with percolating water. When the water stops due to absorption or a restricting barrier - contact with denser underlying materials - the soluble silica coats particles or surfaces of pebbles and rocks and as it crystallizes it forms bridges among the particles cementing them together as "duric" materials. As more silica accumulates a "duripan" is formed. All of this is believed to take place where moisture is periodic - that is, both a dry season and a wet season are present. This favors times of solution or transformation and times of crystallization. Xeric and Ustic soil moisture regimes have such periodicity. Solubilized iron oxides and organic matter commonly exist in perhumid conditions giving rise to "placic" horizons - thin layers, almost membranes that move from near surface layers of soils - often highly organic (peaty or mossy materials) and move downward with percolating

waters. Such soil conditions are generally acid to strongly acid. The Fruitar soil in southern Chile (Valdivia region) has more recent ash over a mixture of glacial debris and volcanic debris of former times. And for the first time experience for a number of visiting scientists on a soils field trip here was a placic horizon overlying a duripan - an anomaly of genetic contradictions. The cemented duripan is weakly calcareous. The overlying acid ash marks a major change of sedimentation, vegetation, and chemistry - landscape evolution that holds the key to pedogenesis of this multi-layered soil where climate change - at least the internal pedoclimatic - has experienced drastic changes. This Fruitar soil has been, for me, a reminder that adherence to old concepts is somewhat analogous to having sacred cows that eventually are slaughtered. Here new facts become information that destroys old models - yet permits the adaptation and acceptance of other realities. An open mind about soil genesis is a good thing.



The steppe regions of our world have a fascination of their own. There is a sense of unfettered view - an opportunity to see forever. It is similar in one way to watching the ocean and wondering how far away the horizon is. When you look at the ocean and see the top mast of a sailing ship and then it gets taller and taller and the ship becomes bigger and bigger - suddenly you realize something the ancients learned eons ago - the world is not flat - you will not fall off - it is curved. And so too when you stand in the prairie grasses as they wave and nod all around you and you know the world is curved and there is continuity beyond your view. You are so small in this place - it has an enormity of its own - mysterious, at times frightening, yet soothing. The moods of seasons are played out - strong blasting winds sweep across broad open expanses with nothing to challenge them. On a gray day or in rain or snow, there is a loss of your sense of direction - you know the feeling of a pilot flying in a "white-out" where there is an unsure up and down, or left or right, or forward and backward. It is a sensation of being swallowed up like one more sand grain on the shore. But the season changes and the passage of spring rights bring forth a plethora of colors, sizes, shapes, of the niche oriented herbs, forbs and higher plants that inhabit this tightly woven ecosystem. The root mat beneath your feet is simply amazing - difficult to dig through - this teeming factory of biodiversity for centuries withstood the onslaught of human invasion. Bison and deer, wolves and rabbits,

owls and mice - they found a home - their migrations marked the passage of time. But man is impatient and actually believes that he is to control.

The indigenous knew the sanctity of this environment and accepted their role in the partnership of life. I grew up at the transition of forest and prairie. Although the tall prairies had been tamed and largely disappeared - there were islands of salvation and if you lay on your back in such a pasture to watch the clouds painting and sculpting forms in the sky you could travel the world to counterpart landscapes. The dreaded Mongols, and then the Tatars thundered on horseback across the Russian steppes of yesteryear. The Sioux and Shawnee welcomed the annual harvest of bison for the winter's supply of furs and food. The sod-busters with new steel plows advanced across this region changing forever the tranquility and wilderness of nature's steppe. What did I learn - many things. The biodiversity of life is essential and absolutely marvelous in every niche of this world of ours. The constant ebb and flow of color, growth, death, renewal, release, change, seasons - each in its own microcosm that is merely a piece of a bigger piece of a greater whole. You can see about 8 miles ahead on a flat land that is actually a curve - you can check that out by sighting grain elevators. There are still prairie wildernesses and they are a source of renewal to the spirits and souls that need this kind of landscape and ecosystem for their sustenance.



This artist's rendition of a country road is a view from the road to Terrapaima - a high hill south of Barquisimeto in west central Venezuela. The high ridge in the upper left is a terrace of Rio Turbio and is also the east edge of the urban area of the city. In the river valley are some light green corn fields. This painting was made by a friend of the Briceno family who owned a summer home on top of Mt. Terrapaima. We lived on the edge of that terrace during a sabbatic stay and could look across the river valley to that hill. Several times we were driven up that road to visit the Briceno estate. It was open, refreshing

and a sharp contrast to the hustle and bustle of downtown Barquisimeto with its narrow one way streets and honking traffic. Three or four miles to the west on the terrace was the other end of the city and there the agricultural campus of the University Occidente was located in a number of barrack's style one story buildings. Interesting how a painting realistic of a familiar landscape releases a flood of memories. This painting for me lets me stand on the road and be absorbed into the environment - a picture warmer than a photo would ever be.



Patterns are also symbols and analogies if we choose to let them be. Do you live where there are termites? At the time in the early 1970s I lived in New York State - glaciated and without termites. Puerto Rico was my first out-of-country (more or less) experience with the subtropics. An old barn board etched and weathering - but biologically enhanced by termites - the softer tissues removed and the more resistant portions like veins in a flat leaf. Durability - resilience - resistance - persistence - concepts of nature whether applied to a wooden door or a soil in its unique environment and ecological development of features with the passage of time. The joys of instant gratification are not enduring - they are limited and transitory. The waste - the remains - have a resonance - a beauty of their own - but only if we choose to observe, to examine, to see something else. The cyclicity of the universe has many scales in both time and space - and we miss most of them as we trample through the morass of daily cares. Take time to capture a few glimpses of other worlds.

Updated Website of Commission 1.4

The Commission 1.4 website is hosted by Dr. John Galbraith at Virginia Tech University at the following link: https://sites.google.com/a/vt.edu/iuss1-4_soil_classification/home. The website describes the goals and structure of Commission 1.4, as well as the duties of its officers. The site also serves as a forum for announcing field excursions and conferences, provides links to allied commissions and working groups, and serves as a repository of previous newsletters and reports.