The Soil Science Collections at the University of Alberta & Curator Recognition

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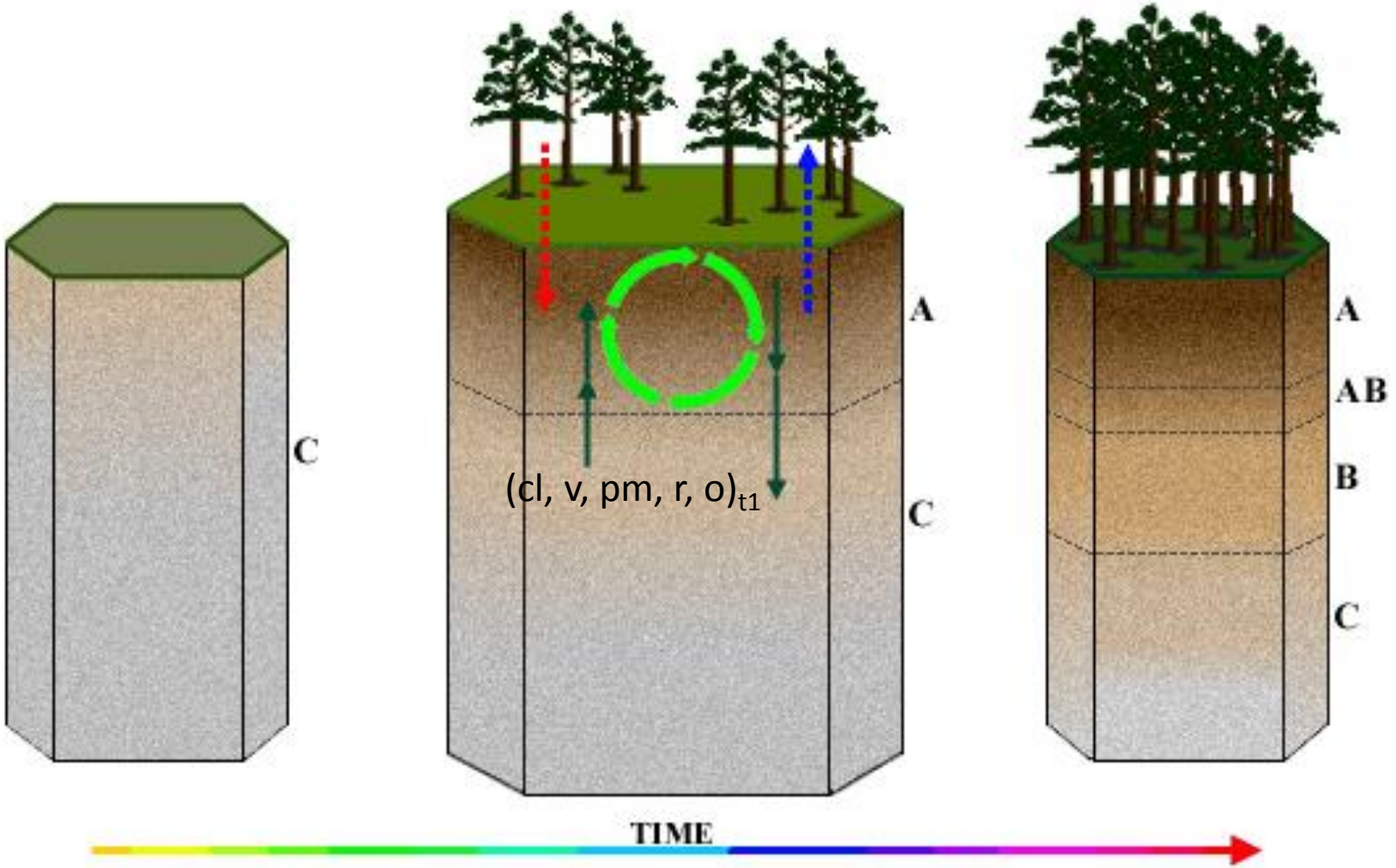
How is Soil different from Top Soil?

- Most of us are used to seeing top soil. You may have noticed that soil in Edmonton is darker than the soil in Calgary.
- Soils form in response to soil forming factors: climate, vegetation, parent material, position in the landscape, soil biota and time.
- Soils are dynamic, natural bodies in the landscape and one must look at a soil profile to a depth of at least 3 feet to see the whole soil.
- Soils evolve over decades and centuries.

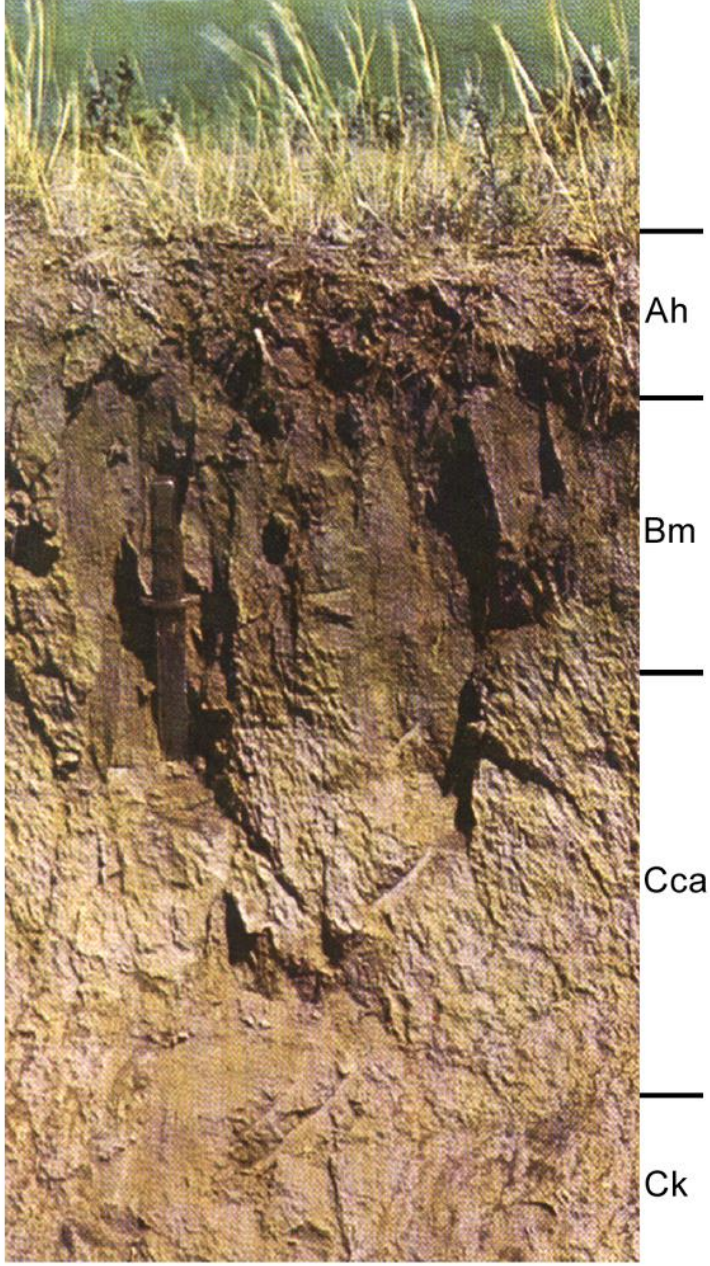


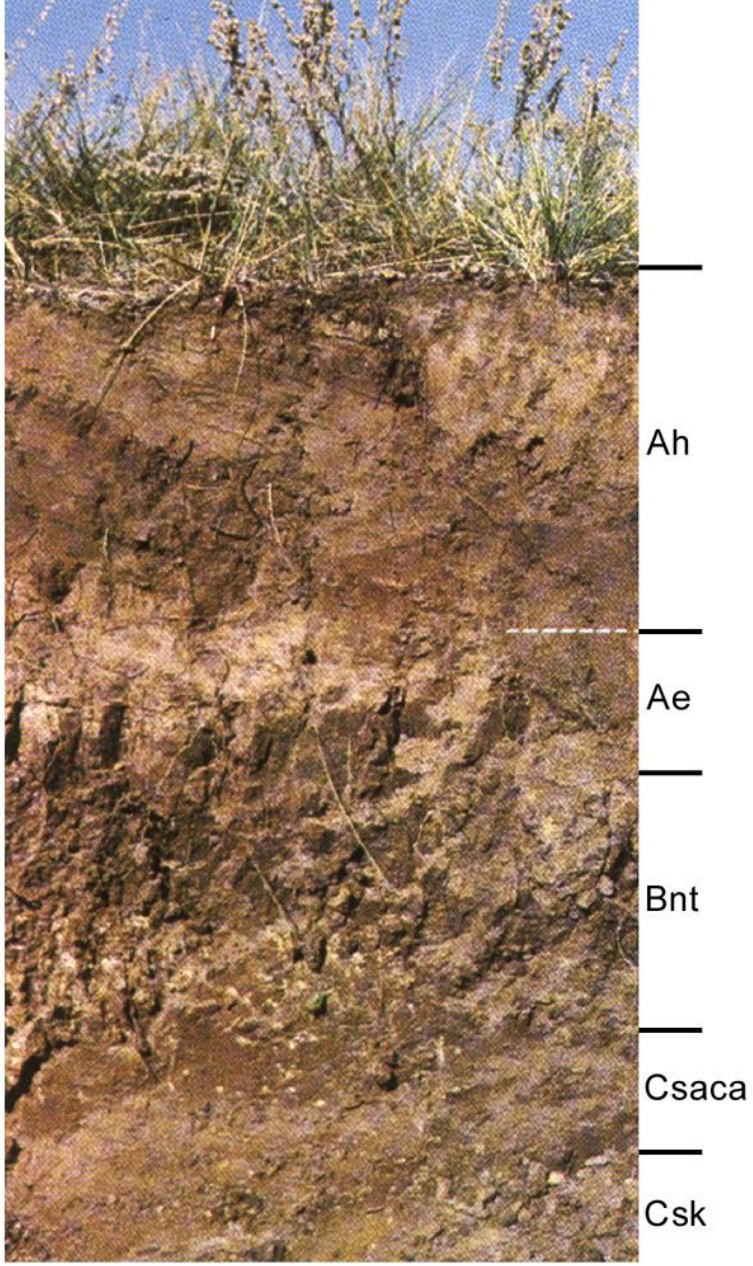
Dynamics of Soil Formation in Nature

Juma & Nickel

About 10,000 years ago, the Canadian land mass was under the influence of ice which was one mile in height. When the glaciers retreated, the soil mass was parent material identified as 'C' in the block shown on the left. Soils evolve slowly and distinct horizons (layers) are formed as shown in the middle block: A master horizon is different from C. Today, a model soil may look like the block on the right. This soil has the following master horizons : A, AB, B and C. Pictures of real soil profiles are shown in the next slide.

Credit: pedosphere.com





Soils are classified by properties of soils themselves, e.g. horizon sequences. The lowercase case denotes a specific kind of horizon, e.g., Ah is a soil horizon rich in soil organic matter.

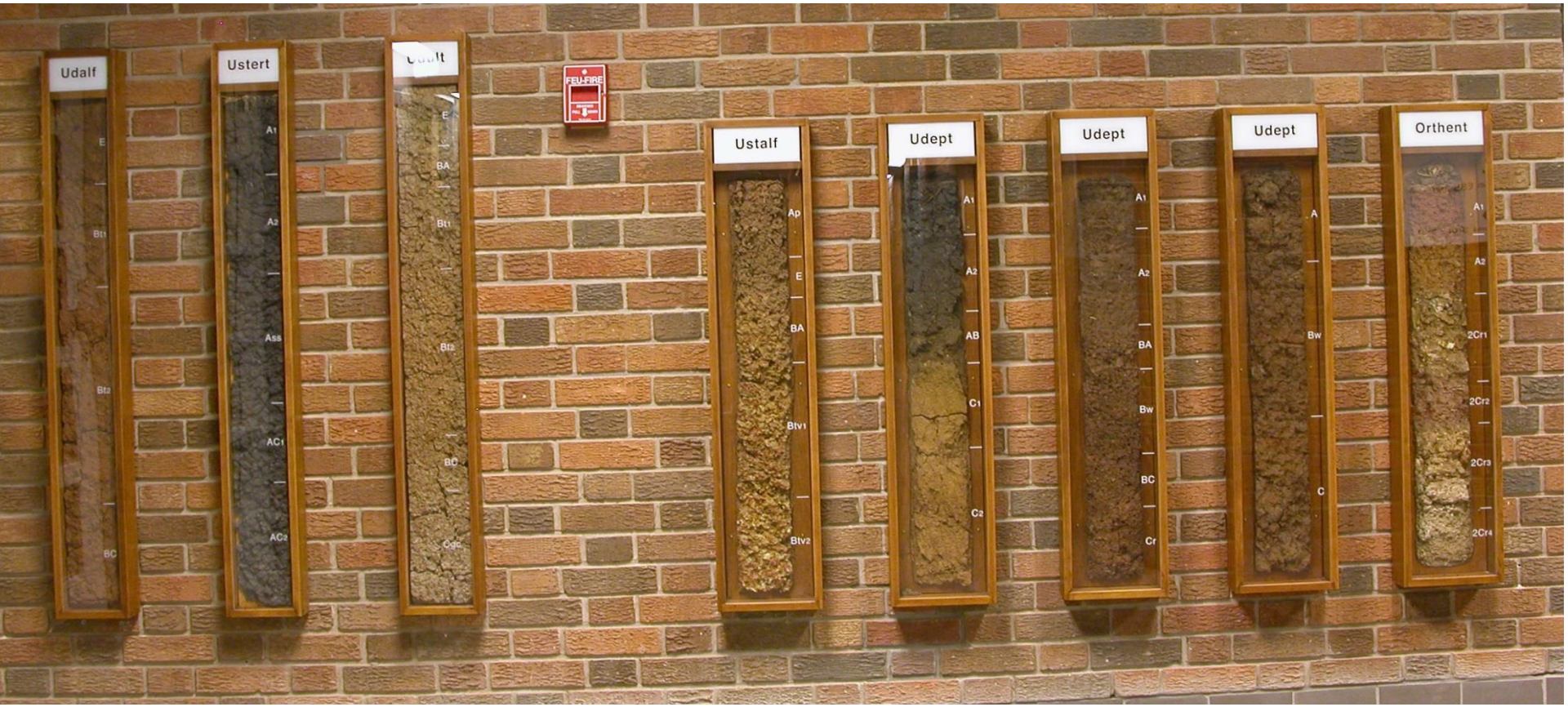
Credit: pedosphere.com

What is a Soil Monolith?

- Soil has a tendency to crumble.
- In order to display the soil with all its horizons, one has to bring it to the lab in an open box.
- The sampling procedure is shown in the next two slides

The first step of obtaining a boxed monolith is to fit an open wooden box over a vertical column and then dig in front of the box to a depth of 60 cm or more in order to dislodge the monolith from the landscape.

The above is a sample of a boxed monolith. It represents a part of a natural body taken from the field. Notice that horizons are intact. Smaller versions of such samples have been impregnated with resins and mounted on boards. Please see next slide.



Monoliths are preserved, mounted on boards, encased and then installed on walls. The artifact is then described scientifically according to methods of soil classification.

The Museums at the University of Alberta

The University of Alberta Museums is a distributed network of 29 diverse museum collections located in faculties and departments across campus where they are used daily in teaching, research and community outreach programs. Museums and Collections Services (MACS) is an academic support unit that is the central source of professional museum information, services, programs, and expertise.

The Soil Science Monolith Collection consists of a series of monoliths - blocks of soil as they appear in nature – from across Alberta, Canada, Indonesia, Sri Lanka and Thailand. The Canadian collection reveals how soils develop in diverse landscapes, their characteristics and classification according to the Canadian System of Soil Classification, and is particularly useful for researchers, instructors, and students focused on renewable resources and environmental sciences.

The Soil Science collections also have other items such as historic maps, soil thin sections, reprints, theses, soil survey reports, scientific journals, knowledge of the long-term Breton Plots experiment and educational posters on second, third and fourth floors of the Earth Sciences Building. See the next two slides to see list and samples of artifacts.

SOIL SCIENCE COLLECTIONS
Acknowledgements

The Soil Monolith Collections are a part of the University of Alberta Museums, a network of 35 interdisciplinary museums and collections across campus, ranging from art to zoology. The collections are used on a daily basis to fuel discovery and advance knowledge through teaching, research, and community outreach. To learn more about our collections and programs, please visit our website at www.museums.ualberta.ca.

Soil Monolith Collectors:
Dr. Frank Wyatt
Dr. John Newton
Alberta Soil Survey
Soil Survey Units of Canada
Dr. Fred Bentley
Bryan Hamman
Peter Geib

Soil Monolith Curators:
Alberta Soil Survey
Dr. Steve Pawluk
Dr. Jim Robertson
Dr. Noorallah Juma

Technical Support:
H. O. Ritchie
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Pauline Rennick
Bernd Hildebrandt
Jim Whittome
Jonathan Meakin
Jennifer Kuchta
Chantelle De Martin
Ellen Cunningham

Dr. Stephen Pawluk's Soil Thin Section Collection
Dr. Steve Pawluk
Michael Abley
Dr. Pawluk's graduate students and research associates

Book Donors
Dr. Frank Wyatt
Dr. John Newton
Dr. Fred Bentley
Dr. John Toogood
Dr. Nick Holowaychuk

Display Donors
Helene Nyborg
Searle Grain Company

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University of Alberta Museums
Alberta Research Council
Agriculture and Agri-Food Canada
Department of Soils
Department of Soil Science
Department of Renewable Resources
Faculty of Agricultural, Life & Environmental Sciences
Friends of Dr. Noorallah Juma

J. D. Newton Soil Science Collection (Earth Sciences Building 4-42B)
Reprints
Theses
Books
Soil Survey reports
Books

Poster Donors
USDA-NRCS
Alberta Agriculture, Food and Rural Development
Agriculture and Agri-Food Canada

In addition to all those mentioned above, we would also like to thank hundreds of people who have generously donated their time and knowledge as well as physical and material resources.

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RENEWABLE RESOURCES

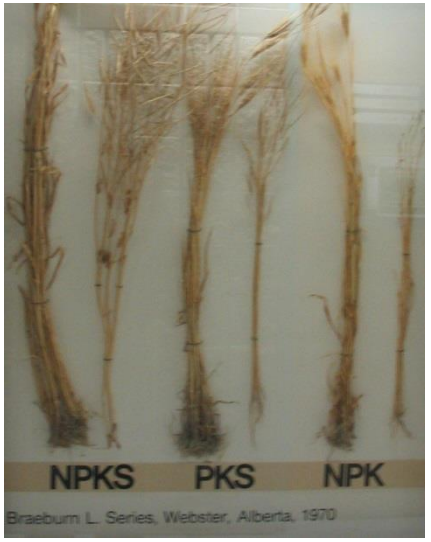
Recognition of Soil Science Pioneers

Dr. F. A. Wyatt

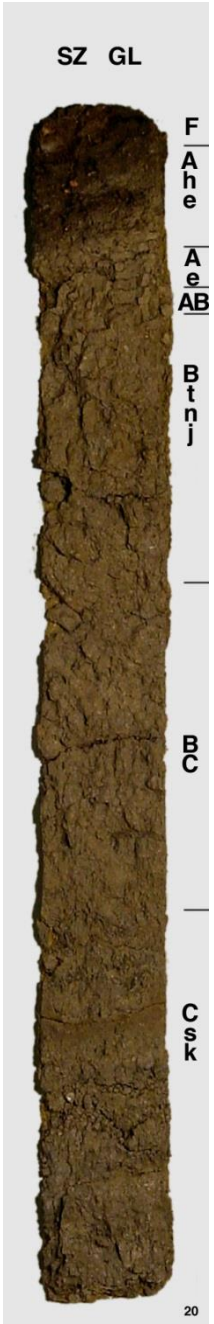
Dr. J. D. Newton

Historic maps

Soil productivity

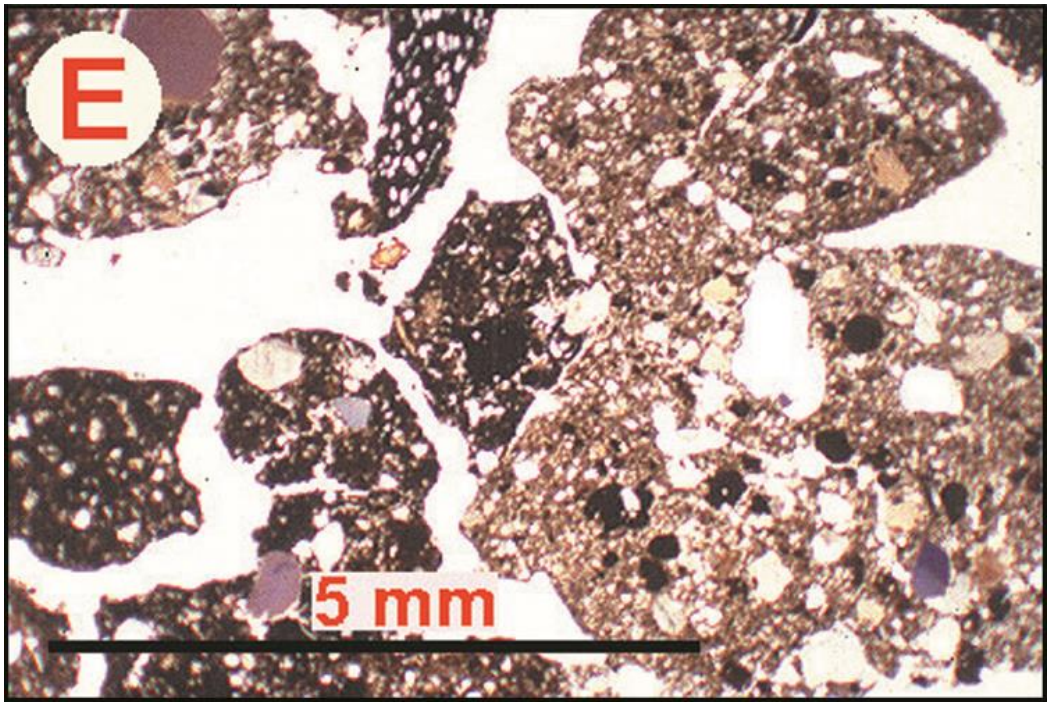


Monoliths



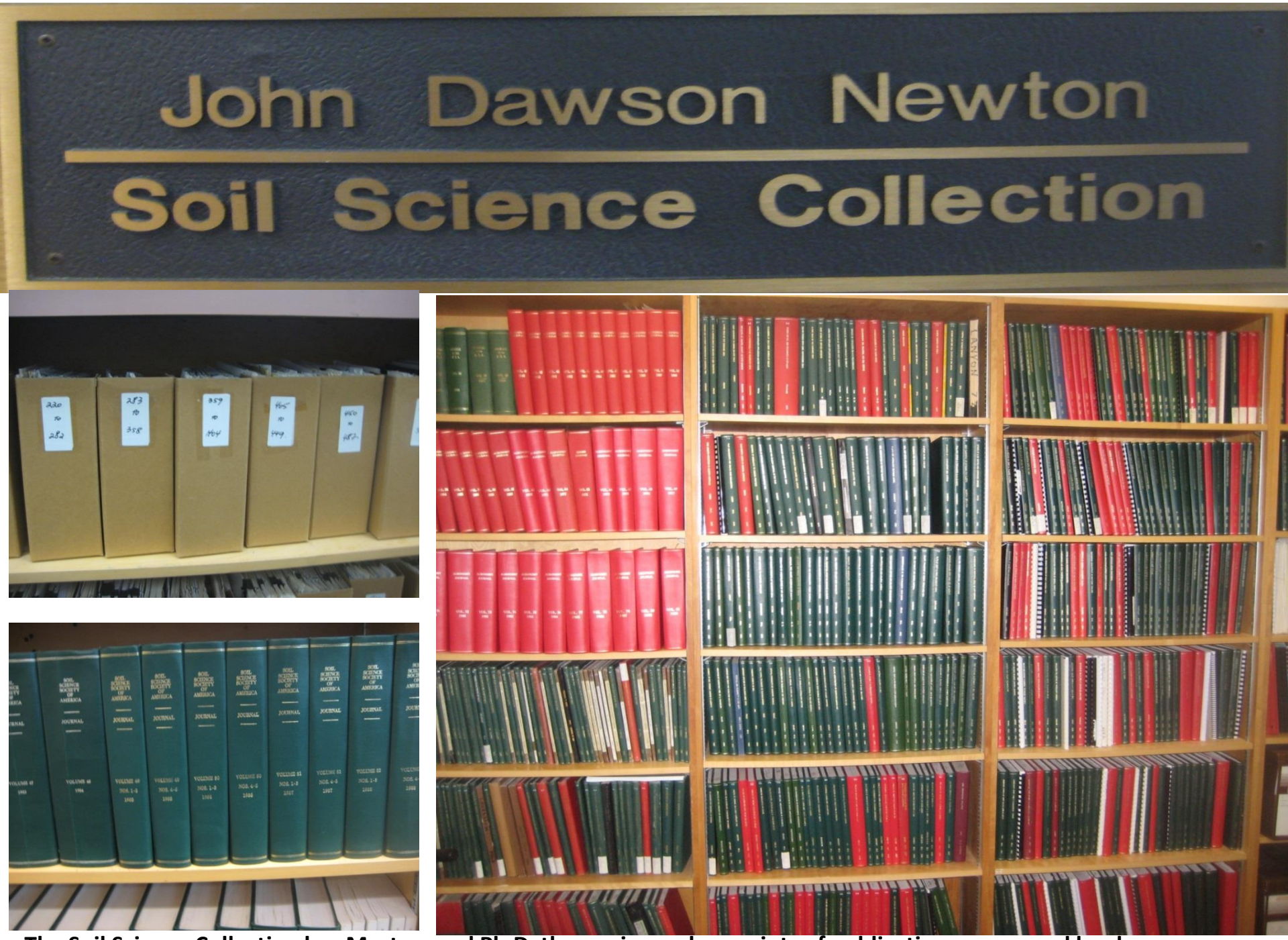
Dr. Pawluk's soil thin section collection

Soil microstructure in a thin section



A Historical Record of Research, Discovery and Outreach at the Breton Plots (1929-present)

The settlement of land started about 100-150 years in the Canadian Prairies. As the settlers moved to western part of Alberta, they encountered forested land. It was converted into farmland (top right slide), As it was very difficult to work with these soils, **Mr. Ben Flesher** (top left slide) provided the land for the first plots in 1929. Dr. Wyatt and Dr. Newton started long-term experiments at this site. Currently, at the age of 85 years, the Breton Plots are the only continuous, long-term plots on Gray Luvisols in Canada and possibly in the world. The plots are being used to assess the interaction among global environment, crop productivity and soil quality.



The Soil Science Collection has Masters and Ph.D. theses, journals, reprints of publications, maps and books

The Induction into the Curator Hall of Fame

The newest honourees into the
University of Alberta Museums Hall of Fame
were inducted on **Tuesday, April 8, 2014** at the
15th Annual U of A Museums Celebration,
Enterprise Square Galleries (10230 Jasper Ave).

2014 Curator Hall of Fame Awards:
Dr. Noorallah Juma, Curator, Soil Science Collection (far left)
Dr. Joseph Nelson, Curator, U of A Museum of Zoology (Ichthylogy) (second from left) (posthumous induction)


museums
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2013 | CURATORS HALL OF FAME
Alan Bryan | Ruth Grunn
2011 | CURATORS HALL OF FAME
Ronald Burwash
2011 | CURATORS HALL OF FAME
Anne Lambert
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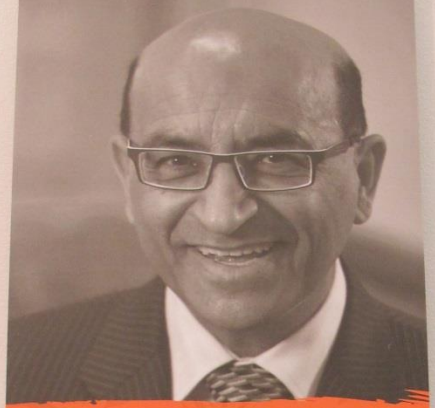
John A. Allan
2012 | CURATORS HALL OF FAME
George Ball
2013 | OUTSTANDING SERVICE
Danny Shpeley
2013 | OUTSTANDING SERVICE
Dorothy Fabjan
2014 | CURATORS HALL OF FAME
Noorallah Juma
2014 | CURATORS HALL OF FAME
Joseph Nelson
2014 | OUTSTANDING SERVICE
Andrew Locock
2014 | OUTSTANDING SERVICE
Shirley Harpham

2014 | CURATORS HALL OF FAME



Noorallah Juma

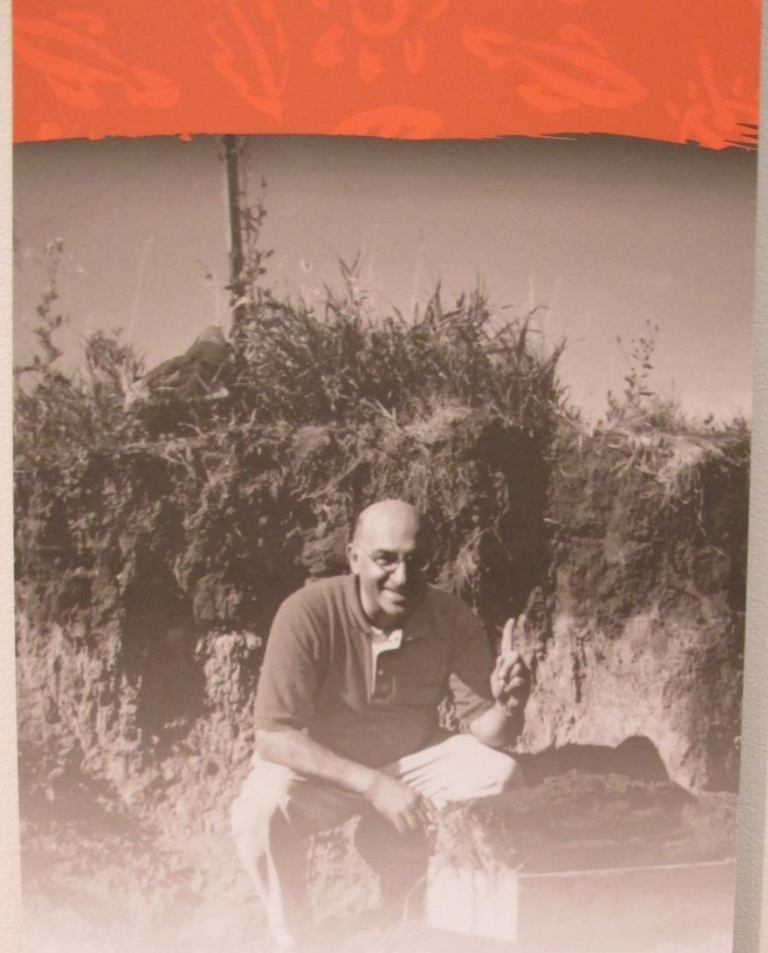
SOIL SCIENCE COLLECTION

CURATOR

Dr. Noorallah Juma served as the Curator of the Soil Science Collection from 1999 to 2008. As important as soils are in our natural environment, to ecosystems, and to industries such as agriculture and forestry, they are surprisingly poorly understood by the public. They are natural objects with their own distinctive characteristics and properties, elucidated for students by the Soil Science Collection, with which Dr. Juma worked to make accessible to students at all levels. An engaging, charismatic, and passionate individual, Dr. Juma has always advocated that soil is not dirt but rather the "skin of the earth."

Dr. Juma worked to preserve these monoliths, providing access through highly visible and easily understood exhibits and by digitizing the collection, making it available online for researchers around the world. He put enormous energy into conceptualizing, finding funds, and developing a unified and coherent display from a number of disparate collections and sources.

Over his decade of working with the collection, Dr. Juma was instrumental in completing several significant projects, most notably of which are the following: making the inventory of the soil monolith collections accessible online; recognizing the soil science pioneers; mounting the exhibit of more than 100 soil monoliths in the Earth Sciences Building, increasing visibility and accessibility for



"It was through Noorallah's passion and his untiring efforts to fund and develop the Soil Science Collections that the University of Alberta now has a superior collection of soil science materials, preserving the legacy of soil scientists' work over nearly 100 years, making them available for teaching at all levels."

— J. A. Robertson

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" I am very happy to get this recognition but would like to share it with Soil Science community within and outside the University. There were hundreds of people involved in soil survey, teaching, research and extension who have contributed knowledge and artifacts which have been assembled in the Earth Sciences Building. These included professors, graduate students, technical support staff, and professionals in government and the private sector, and many others, whose papers are listed in the J.D. Newton collection.

Over a history of close to 100 years, my contribution is much smaller than those before me. However, I think the assembly of artifacts and posters had to be done for the future because it shows that the University of Alberta, our Faculty and our Department have a significant, long-term, Soil Science record which has been recognized at local, national and global levels. It is this which pleases me the most.“

--Noorallah Juma, Curator, Soil Science Collections (1999-2008), University of Alberta

L-R: Chancellor Ralph Young, Janine Andrews, Executive Director, University of Alberta Museums, Dr. Noorallah Juma, Provost Dr. Carl Amrhein

L-R: Hasina Juma, Dr. Scott Chang (Curator of Soil Science Collections), Adil Juma, Nasim Juma, Dr. Noorallah Juma, Janine Andrews, Executive Director, University of Alberta Museums, Chancellor Ralph Young and Provost Dr. Carl Amrhein

L-R: (back row) Dr. Scott Chang, John Konwicki, Clive and Gina Figueiredo;
(front row) Nasim Juma, Dr. Noorallah Juma, Chung Nguyen, and Denise Erickson-Harmon (AIA)
(Colleagues from U of A)

L: Noorallah with Gordon Dinwoodie (Alberta Environment). I was his M.Sc. Thesis supervisor.

R: Dr. Felix Sperling, Noorallah and Nasim Juma. Dr. Felix Sperling (Professor in Department of Biological Sciences) is the curator of the E. H. Strickland Entomological Museum that houses approximately one million specimens. We worked in the same building.

Dr. Scott Chang, Dr. Noorallah Juma, Dr. M. Charlie Arshad (Colleagues from U of A)

Jennifer Kuchta (Communications and Marketing Coordinator, U of A) and Dr. Noorallah Juma

L-R (back row): Mabs Yusuf, Adil Juma, Azmina Yusuf, Naz Hasham and Yasmin Jivraj
L-R (front row): Hasina, Nasim and Noorallah Juma and Dr. Zaheerali Lakhani
(Friends and representatives from the Ismaili Community, Ismaili Council and Aga Khan Institutions)

L-R : Yasmin Jivraj, Nasim and Noorallah Juma, Arif Karmali and Naz Hasham
(Representatives from the Ismaili Council and Aga Khan Institutions
President Ayaz Bhanji, Ismaili Council for Edmonton also attended)

L-R: Mabs Yusuf, Nasim Juma, Noorallah Juma and Azmina Yusuf
(Mabs and Azmina Yusuf were Mukhisaheb/Mukhianisaheba of Belle Rive JK from 2002-2005)

L-R : Adil, Noorallah, Nasim and Hasina Juma

I would like to thank Ayaz Bhanji, President of Ismaili Council for Edmonton, who also attended the function but is not in the pictures.

I would also like to thank my friends and extended family members for their messages.

My Guiding Principle

"Artifacts and displays create hope,
where ever there is hope, there is Light!"

-- Noorallah Juma