



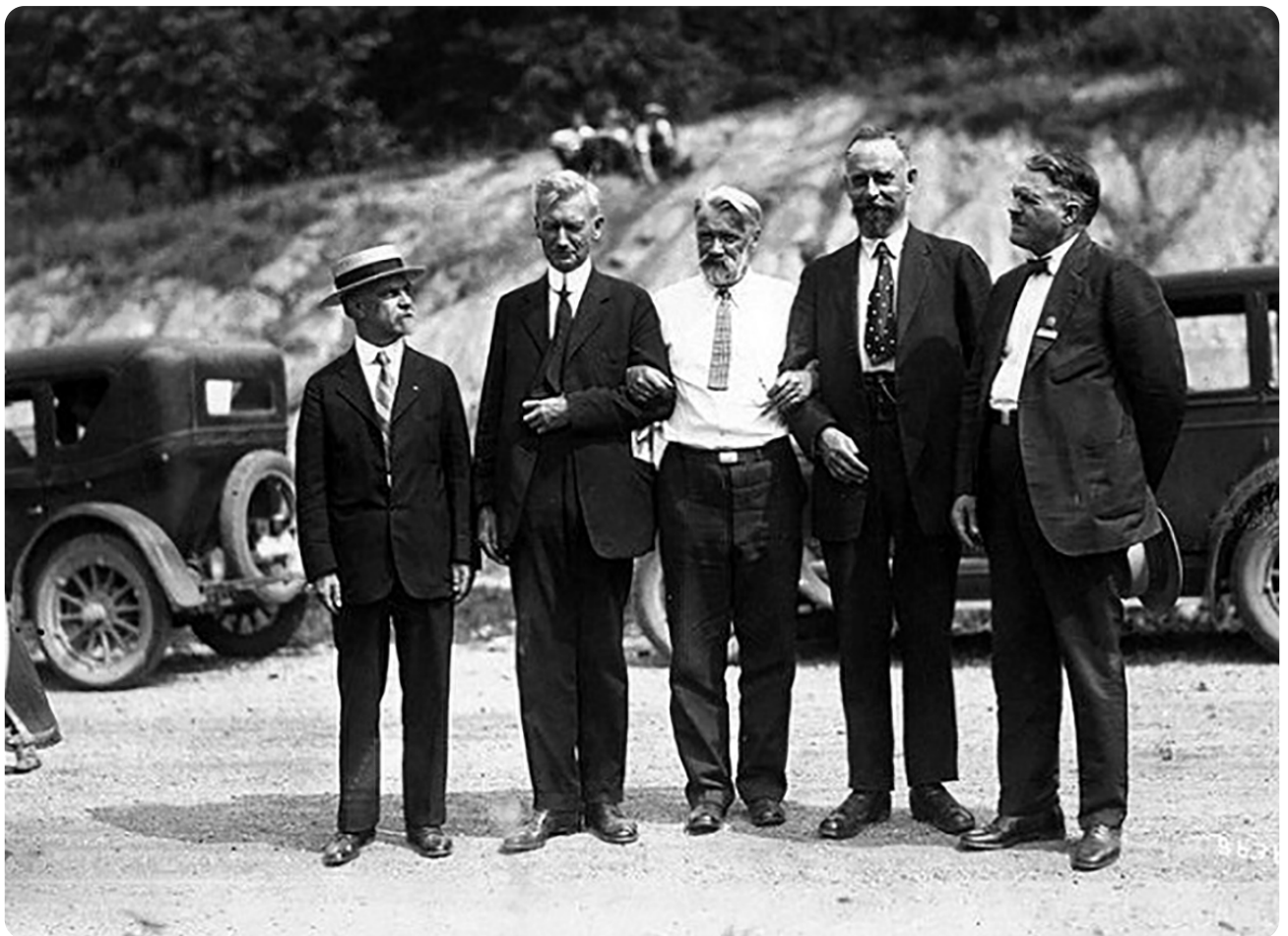
**Science
Societies**

A transformative scientific gathering

Legacy and impact of the 1927 World Soil Congress and field tour

By Maxine J. Levin, Adam Delvin, Alfred E. Hartemink, Eric C. Brevik, Ben Newcomb, Jacyn Fiola, Anna Paltseva, Edward R. Landa, Aaron Daigh, Samina Daroub, and John Kovar

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A transcontinental field tour was organized as part of the First International Congress of Soil Science, held June 13-22, 1927, in Washington, DC. This photo appears to be a field or group setting during the tour and shows Curtis F. Marbut (second from left, a U.S. pedologist who guided much of the tour) and Konstantin Glinka (middle, a soil scientist from the Soviet Union).

The First International Congress of Soil Science, held in Washington, DC in June 1927, marked a pivotal moment in establishing soil science as a formal discipline. Drawing more than 300 delegates from 30 nations, the Congress showcased North America's diverse soils and fostered international collaboration. Led by Jacob G. Lipman, key discussions integrated Russian pedological concepts, especially those of V.V. Dokuchaev, into Western practices. A subsequent 30-day transcontinental field tour highlighted soil diversity across the U.S. and parts of Canada, emphasizing soil classification, fertility, conservation, and management strategies. The Congress produced more than 200 scientific papers, edited by Ralph B. Deemer, which remain foundational in soil science. This event significantly influenced global pedology, bridging Russian and American perspectives, and set the stage for future International Society of Soil Science congresses. A proposed centennial commemoration, "Soil 2027: A Centennial Transcontinental Field Exploration," seeks to honor and build upon these foundational achievements.

Imagine 1927—a moment when the modern world’s land-related knowledge was beginning to take shape, and a new scientific community was forming around shared purpose, collaboration, and visionary leadership. At such a gathering, made possible by improved transportation and communication, seasoned experts passed their insights into emerging scholars, laying the groundwork for soil science as a practical and indispensable discipline. Soil science is truly interdisciplinary, blending chemistry, physics, microbiology, geology, mapping, agronomy, and even climate research. In 1927, these disciplines were just emerging as land-based tools for management, taking advantage of a new technological era of tools, understanding land and its resources, and evolving worldviews.



This integration of multiple disciplines enabled soil science to address practical challenges and fostered its development as a comprehensive field. Pedology, the study of soils in their natural environment, provided a strong scientific foundation and emerged as the cornerstone of the soil science discipline.

By investigating soils both in the field and the laboratory, pedology enabled a deeper understanding of soil formation, characteristics, and management. This approach was instrumental in shaping how soils were studied and managed, supporting the growth of soil science as a recognized and indispensable scientific endeavor.

Jacob Goodale Lipman (November 1874 – April 1939) was a pioneering American soil chemist, bacteriologist, and agricultural scientist, celebrated for his seminal contributions to soil microbiology and nitrogen fixation processes. Undoubtedly, he remains an unsung hero of the 1927 Congress and tour.

The 1927 field tour: Organization and activities

The 1927 field tour was a pivotal transcontinental excursion organized as part of the First International Congress of Soil Science, held June 13–22, 1927, in Washington, DC. Lasting approximately 30 days after the Congress, its core purpose was to showcase North American soil diversity to an international audience of scientists.

The tour was led by American scientist Jacob G. Lipman and drew significant influence from Russian pedology concepts. The Congress itself attracted more than 300 delegates from 30 nations with about 100 to 150 scientists joining the tour.

Traveling by a specially designated train, the group examined soils from east to west across the continent. The journey began in Washington, DC with stops in the coastal plains, followed by investigations of Midwest prairies, particularly the chernozems (Mollisols, U.S. Soil Taxonomy) of Illinois and Iowa. The tour continued through the arid

western soils of Colorado and California with a side trip into Canada to study boreal and prairie soils. Activities throughout the tour included lectures, examination of soil pits, and discussions focused on erosion and fertility.

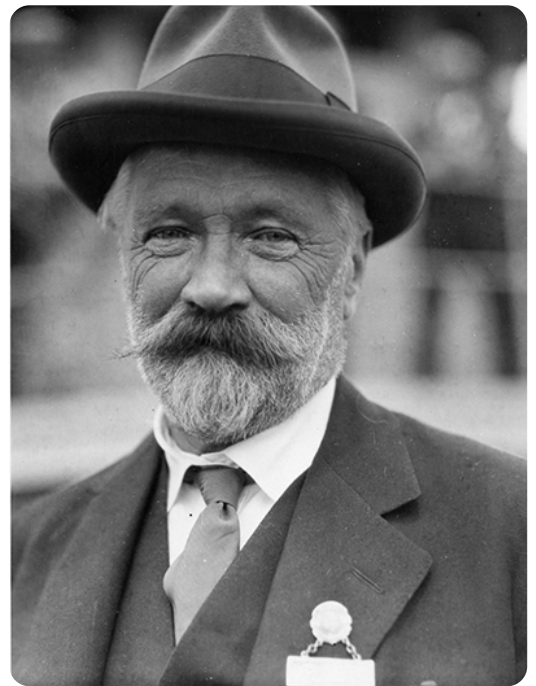
"Ultimately, this event marked the official recognition of soil science as a worldwide discipline."

Concluding in late July on the West Coast, the tour bridged Russian and American soil science, encouraged the development of U.S. soil surveys, and influenced global soil mapping and scientific networks. Ultimately, this event marked the official recognition of soil science as a worldwide discipline.

Organization and logistics

The Congress and tour were spearheaded by American soil scientist Jacob G. Lipman, the first International Society of Soil Science (ISSS; now IUSS) President and Director of the New Jersey Agricultural Experiment Station. Funding totaled around \$75,000, sourced from donations by industry (e.g., Chilean Nitrate of Soda Educational Bureau), the U.S. government, and private contributors. This covered travel, accommodation, and preparation of handbooks like *The New Concept of Soils* by W.W. Weir and *The First International Congress of Soil Science* by J.G. Lipman.

With USDA as the primary sponsor, there was an unprecedented number of field soil scientists and related disciplines present at both the Congress and the field tour on site representing the United States. The largest foreign delegation was from the Soviet Union, led by Konstantin Glinka. Germany and Great Britain followed closely behind. Notable figures in attendance included Curtis F. Marbut, the chief cartographer for the USDA, Sir John Russell, a British agronomist, D.J. Hissink, a Dutch soil chemist, and the young scientist Hanns Jenny, Switzerland. Travelling together on a dedicated excursion train for 30 days compelled participants to collaborate closely at all times, an experience they highlighted as uniquely intense in numerous reports. This formative journey had lasting effects on many scientific careers; for example, Hanns Jenny later credited it as the inspiration for his influential 1941 work, *Factors of Soil Formation*.



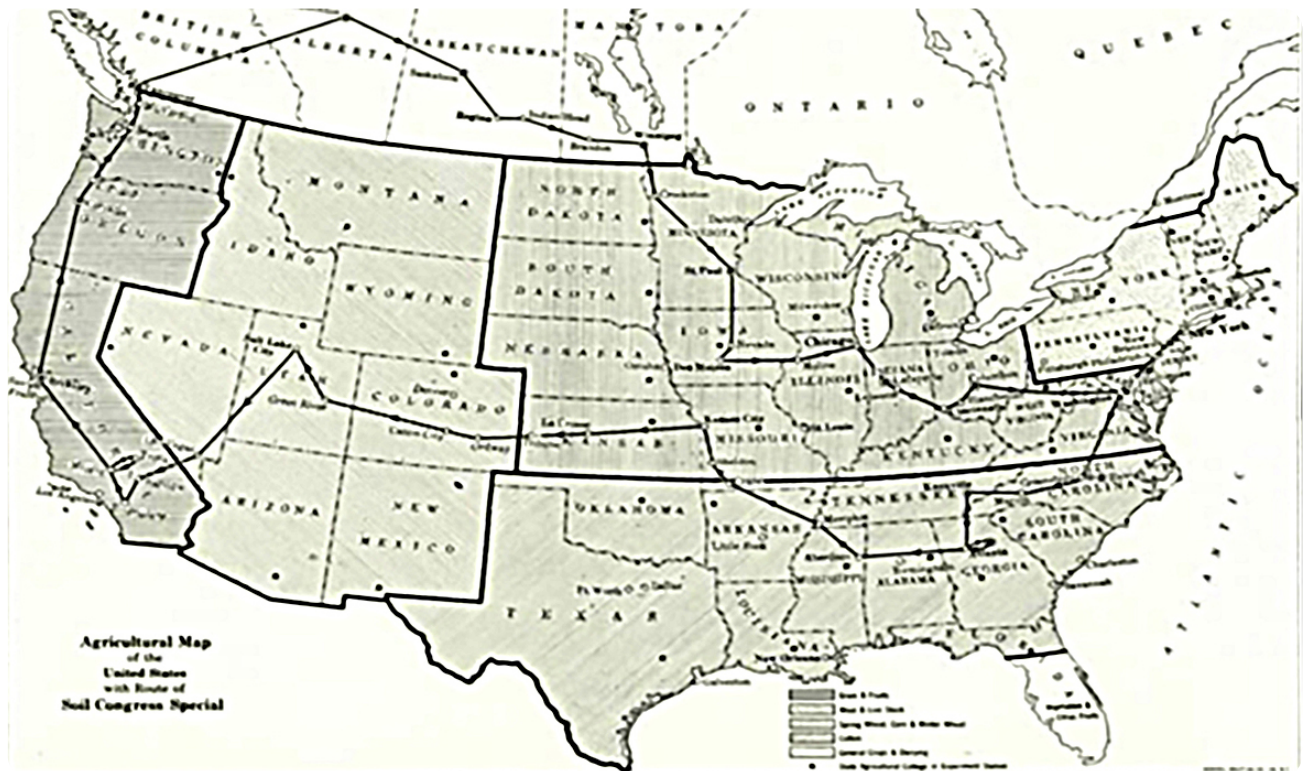
The largest foreign delegation at the First International Congress of Soil Science and field tour was from the

Itinerary and activities

Soviet Union, led by Konstantin Glinka.

The tour was a coast-to-coast traversal of the USA and into Canada, designed to illustrate soil genesis, classification, and agricultural applications across diverse ecosystems. Key stops included:

- Eastern and Midwestern U.S.: Departing Washington, D.C., on June 22, the group examined Atlantic coastal plain soils, Piedmont regions, and Appalachian highlands, focusing on podzols, laterites, and erosion issues.
- Central Plains and Midwest: Stops in Illinois, Iowa, and Nebraska highlighted chernozems (black earths) and prairie soils with field examinations of fertility and mechanical analysis. Marbut presented emerging U.S. soil classification systems.
- Western U.S.: Traversing the Great Plains, Rocky Mountains, and Pacific Northwest, participants studied arid desert soils, sierozems (carbonatic brownish grey semi-arid soils), and irrigated valleys in states like Colorado, Utah, and California. Demonstrations covered alkali soils, irrigation techniques, and erosion control.
- Extension to Canada: A side trip into western Canada (Alberta and Saskatchewan) allowed examination of boreal forest grey soils and parkland black soils, influenced by climate-vegetation gradients. Glinka, Marbut, and Canadian scientist A.L. Seay toured the prairie regions, fostering transatlantic knowledge exchange.
- Culmination: The tour ended in late July on the West Coast (in San Francisco or Seattle) with return travel for the European delegates.



Map of the 1927 field excursion sites by train.

Activities blended lectures on the train, soil pit excavations, monolith displays, and discussions on dynamic soil processes (e.g., Marbut's quote: "The most fundamental soil fact ... is that they are not static unchangeable bodies").

Significance and legacy

The tour solidified soil science as an independent discipline, bridging European (particularly Russian Dokuchaevian) and American traditions. It bolstered U.S. confidence in pedology, influenced national soil surveys, and established a precedent for future ISSS congresses (e.g., the second in Leningrad, now Saint Petersburg, Russia, in 1930, which was organized by Glinka before his death in November 1927). Outcomes

included collaborative maps, publications in the *Proceedings of the First International Congress of Soil Science*, and enduring networks—e.g., the dissemination of zonal soil concepts to Canada. Regrettably, both U.S. soil pioneer Milton Whitney and Konstantin Glinka of Russia passed away shortly after the event (November 1927), underscoring its intensity.

This excursion remains a landmark in soil science history, symbolizing international cooperation amid post-WWI recovery and highlighting soils' role in agriculture and ecology.



#577 Soil examination and sampling, near Athens, Georgia



Dr. Glinka collects his own samples



#579 Cecil soil showing relation to underlying rock.

Field notes in Georgia during transcontinental soils tour of the First International Congress of Soil Science, June 1927.

Overview of the proceedings

The *Proceedings and Papers of the First International Congress of Soil Science*, edited by Ralph Barbour Deemer in 1928, document the key presentations, discussions, and decisions from the inaugural meeting of the ISSS. The Congress emphasized standardizing soil science methods, and its four volumes cover six commissions, general sessions, and business meetings. More than 200 paper abstracts were published separately. While full proceedings are mainly in physical libraries, some abstracts and materials are available online via the Hathi Trust Digital Library. Additional reports, such as K.O. Björlykke's impressions of the congress, were issued separately, often in their original languages.

Structure and content of proceedings by volume

Volume I: Commissions I (soil physics) and II (soil chemistry)

Volume I covered core physical and chemical soil properties, focusing on structure, water movement, colloids, and composition. Key papers addressed standard analytical methods, the role of soil colloids in fertility, and topics like pH, base exchange, and metal compounds. The editors emphasized lab techniques and relevant physical laws, highlighting how new pedological concepts influenced the field.

Volume II: Commissions III (soil microbiology) and IV (soil fertility)

Volume II covered soil biology and practical fertility management, focusing on nitrogen fixation, microbial decomposition, and fertilizer effects. Highlights included Waksman's

presentation on soil microorganisms and plant growth, Soviet work on nitrification, and studies of manures, phosphates, and crop rotation. Delegates stressed the crucial role of microbes in soil health and the growing demand for fertilizers after World War I.

Volume III: Commission V (soil genesis, classification, and cartography)

As the largest section of the proceedings, Volume III underscored the Congress's strong emphasis on pedology and the study of soil as a distinct natural entity. The discussions in this volume concentrated on the principal factors that determine soil formation—namely, climate, parent material, and time. These elements were explored in detail as foundational influences on soil development and characteristics. Furthermore, the volume highlighted the importance of zonal classification and the advancement of sophisticated mapping techniques in understanding soil distribution and diversity.

Leading scientists Curtis F. Marbut from the United States and Konstantin D. Glinka from the Soviet Union played pivotal roles in introducing and elaborating upon Dokuchaev's genetic approach to soil classification. Their joint contributions were highlighted in the major paper "Soil Classification Systems," which outlined the principles and applications of the genetic methodology. This approach provided a framework for interpreting soil formation processes and set a precedent for systematic classification in international soil science.

Volume III highlighted international collaboration on proposals for a world soil map, seeking to standardize global soil classification. It included research on specific soils like podzols, chernozems, and desert soils, offering details on their properties and distribution. The volume also integrated Russian zonal concepts into Western soil science, emphasizing worldwide cooperation. The Congress planned to display 50

USSR soil monoliths ("Glinka Memorial Collection"), but shipping delays left them in USDA storage until the late 1970s; in 1980, the collection was donated to the International Soil Museum in the Netherlands.

Volume IV: Commission VI (application of soil science to land utilization), general sessions, and business meetings

Volume IV covered practical soil science applications like land reclamation, erosion control, and economic uses. Sessions discussed the discipline's history and development with experts presenting on soil surveys for land planning and conservation practices. The proceedings included resolutions for international standards, elected Konstantin D. Glinka as president of ISSS, and chose Leningrad (now St. Petersburg, Russia) for the 1930 Congress. Reports summarized a post-Congress tour.



Participants and female associates of the First International Congress of Soil Science, held June 13–22, 1927, in Washington, DC and the 30-day field tour (Lafayette, IN).

Key outcomes and resolutions

The Soil Congress set out to standardize soil terminology, analysis methods, and classification systems, laying groundwork for global mapping. Influenced by Russian approaches, it highlighted interdisciplinary collaboration and defined soil as a separate natural entity shaped by climate, parent material, and time. Afterwards, participants toured North America to observe different soils and build international connections among field scientists.

A proposed centennial commemoration, "Soil 2027: A Centennial Transcontinental Field Exploration," seeks to honor and build upon these foundational achievements. As the centennial of the Congress and field tour approaches, there are new opportunities to combine the new and old into a universal system and consolidation of world knowledge. Looking ahead, emerging technologies like remote sensing and digital soil mapping, along with international partnerships, are helping scientists share data and find innovative solutions for global challenges. This spirit of collaboration continues to drive soil science forward, making it ever more important for the health and prosperity of our world.

Notes to other soil explorers

There are several historical photographs available from the 1927 First International Congress of Soil Science and its associated transcontinental field tour (often called the "excursion" or "survey tour") across the USA and into Canada. These primarily capture delegates, group portraits, and events rather than extensive fieldwork shots, but they provide visual glimpses into the participants and atmosphere. Most are held in public archives like the Smithsonian Institution Archives and are digitized for free online access.

The Smithsonian holds more Congress-era photos in their broader collection (search “First International Congress of Soil Science 1927” on siarchives.si.edu), but not all are online yet—if interested, contacting them could yield scans.

The *Proceedings of the First International Congress of Soil Science* (available on archive.org) include textual accounts of the tour but no embedded photos; however, it references visual aids like soil monoliths displayed during stops.

Suggested reading

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