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## Geological Society Fellow

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# Geological Society Fellow

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Monday July 22, 2019

Daniel Goldman's to-do list for the next 10 to 12 months should make many University of Dayton faculty and staff feel a little less overwhelmed by their own duties.

Goldman, the outgoing Department of Geology chair, must finish work by Sept. 2 for the 2020 edition of *The Geological Time Scale*, one of the most essential texts for geoscientists worldwide. He will then head to Phoenix to be honored as a Geological Society of America fellow, recognizing him as an exceptional member of the geoscience community.

In October, Goldman will travel to Argentina to conduct field research, as part of his sabbatical year. During spring 2020, he plans to visit the Czech Republic to study fossil collections that originated in Newfoundland, Canada. In between, Goldman will continue work on several scientific manuscripts, begin drafting a National Science Foundation grant proposal for a new project and "become a productive faculty member again" after serving eight years as department chair, he said.

If all that isn't enough, he is doing what the father of the bride does — times two. His eldest and youngest daughters are both getting married within four months of one another this summer and fall. At that point, all four children will have their own families.

While Goldman enjoys a rich family life, his contribution to *The Geological Time Scale* ranks among his highest professional achievements. The multi-volume reference book is crucial in reconstructing the Earth's 4.6 billion-year history. It divides Earth's history into time intervals with boundaries marked by significant events, such as mass extinctions and the first appearance of certain types of animals — as discerned through the study of rocks, fossils and sediments. The book is updated every eight years to reflect advances in research and dating methods.

"*The Geologic Time Scale* is the most fundamental of tools in the geosciences," Goldman said. "It serves earth scientists across disciplines in most everything they do, particularly any research that involves calculating rates of change. Evolutionary rates — or rates of tectonic plate movement, for example — need precise time-calibrated data. Being chosen to work on this project is especially satisfying because it represents significant recognition of my research in paleontology."

Goldman is lead author on the chapter on the Ordovician Period, which began about 488 million years ago and lasted nearly 45 million years — back when Dayton, and most of North America, was south of the equator. The Ordovician Period is best known for encompassing a rapid radiation of marine life, called the Great Ordovician Biodiversity Event, and ending with the second biggest mass extinction in Earth's history.

The chapter will cover new and improved quantitative methods of relating shallow- and deep-water fossil occurrences to time, which will allow scientists to more objectively determine whether fossils discovered at different locations around the globe existed at the same time.

Goldman's chapter co-authors are Stephen Leslie, head of James Madison University's Department of Geology and Environmental Science, and Peter Sadler, earth sciences professor at the University of California, Riverside. They spent the past two years preparing the chapter, working with a lot of new data, including methodological advances, better fossil information and many new radiometric dates.

"The result is better ways of integrating that data to construct a more precise time scale," Goldman said.

Shuang-Ye Wu, associate professor and incoming Department of Geology chair, said Goldman's role in *The Geologic Time Scale* revision indicates his high level of expertise.

"His work will have lasting impact on the geologic profession," Wu said.

Goldman's contributions to the field led to his nomination and election in May as a Geology Society of America fellow. Founded in 1888, the society is an international group of scientists in academia, government and business with more than 20,000 members in over 100 countries. It supports scientific discovery, application of geoscience knowledge, public dialogue on geoscience issues and earth-science education.

Goldman, who joined the University faculty in 1997, is known for his research on a group of fossils called graptolites — ancient zooplankton that are useful in determining the relative age of rocks. Based on his research in Oklahoma, Goldman in 2007 established a new subdivision of the Ordovician Period, called the Katian Stage. He also has produced more than 125 publications, abstracts and field guides.

“Fellows are so named as a reflection of their important and sustained contribution to their field,” said Don Pair, College of Arts and Sciences associate dean for interdisciplinary research and experiential initiatives. “Dan would object to a characterization of this as a career award — he might fear that some could infer that he is at the end of his, which he isn't — but it is truly an honor in the geology community.”

- *Annette Taylor*