

PRESENTATION OF THE 2010 PALEONTOLOGICAL SOCIETY MEDAL TO STIG BERGSTRÖM

WILLIAM I. AUSICH

School of Earth Sciences, The Ohio State University, Columbus, Ohio

THANK YOU Mr. President. I am honored to introduce Stig Magnus Bergström, my good friend and close colleague at Ohio State University for more than 25 years. Stig has simply had an amazing career, and he has significantly impacted the careers of many students, postdocs, and colleagues all over the world. Those who have worked with Stig are much richer scholars, and those lucky enough to have shared the hospitality of Stig and Birgitta are much richer individuals.

Stig received both his undergraduate and graduate degrees from Lund University in Sweden. His first association with Ohio State was as a Fulbright Scholar during the 1960–1961 academic year. He returned to Lund as an Assistant and Lecturer until 1968, when he joined the Ohio State faculty as an Assistant Professor and Curator of the Orton Geological Museum. His first paper in 1961 was on Ordovician conodonts from the Ludibundus Limestone of Sweden—Stig has been publishing papers on paleontology and stratigraphy for 50 years. Fifty years, and there is no end in sight.

His early work was centered on conodonts, graptolites, and chitinozoans from the Ordovician with an emphasis on Ordovician, biostratigraphy, paleoecology, and taxonomy. He helped establish the Ordovician biostratigraphic frameworks for many places throughout the world, and he was instrumental in establishing the multi-element taxonomy of conodonts, thus treating them as whole organisms rather than bits and pieces of phosphate sprinkled into rocks. Early on, Stig established innumerable collaborations with colleagues across the globe, but this early work was notably in collaboration with his Ohio State students and Walter C. Sweet, our Ohio State colleague. Much of our current understanding of conodonts came from this Ohio State program in conodont studies.

His later work has taken these data and combined them with K-bentonites, stable carbon isotopes and Sr and Nd isotopes to develop a global chronostratigraphy for the Ordovician and Early Silurian. Stig has played pivotal role in development of the new Ordovician Time Scale. Additionally during this work, Stig and his colleagues have documented the centers of Ordovician and Early Silurian volcanism affecting North America, Europe, and South America during the initial compressive phases of tectonism closing the Iapetus Ocean. Stig and his colleagues documented what is in all likelihood the largest episode of explosive volcanics during

Earth history based on a single ash bed that can be traced from Minnesota to Estonia.

Further, he defined time slices within the Ordovician and established the existence of aquafacies—the unexpected result that epicontinental seas were stagnant ponds during the Ordovician rather than open, circulating ocean waters. Among many other things, Stig is currently working with Oxygen isotopes from conodonts to delineate temperatures in Ordovician epicontinental seas.

The Ordovician was a pivotal time during Earth history. Many of us in this room are concerned with the Great Ordovician Biodiversification Event that established the Sepkoski Paleozoic Fauna. Further, the end-Ordovician extinctions were the second-most devastating collapse in biodiversity of the Phanerozoic. One can count papers to assess the contributions of a scientist but the true importance of one's work is its impact for others, and this is the significance of Stig Bergström's work. Although an overused cliché, the quote from Isaac Newton, "If I have seen farther than others it is by standing on the shoulders of giants," certainly applies to Stig M. Bergström. None of the twenty-first century research questions on the Great Ordovician Biodiversification Event, Ordovician perturbations in the global carbon cycle, Hirnantian glaciations, end-Ordovician–early Silurian collapse and recovery of the biosphere, and other evolutionary paleoecology and biogeographic research today would be nearly as significant were it not for the pioneering and ongoing Ordovician chronostratigraphy research program of Dr. Bergström. Our ability to offer high-resolution answers to global paleobiological questions of the Ordovician and early Silurian is only possible by standing on the shoulders of Stig M. Bergström.

The Paleontological Society is not the first to recognize the work of Stig. Previously, he has received several teaching awards from Ohio State University, he was elected to the Royal Physiographic Society of Sweden and elected as a Fellow in the Paleontological Society. Further, he received an honorary doctorate from Lund University, the Hadding Prize from the Physiographic Society of Sweden, the SEPM R.C. Moore Medal, the Golden Medal from Charles University in Prague, and the Pander Society Gold Medal.

Mr. President, members of the Paleontological Society, and guests, it is my great honor and privilege to present Professor Stig Magnus Bergström, the 2011 Paleontological Society Medalist.

RESPONSE BY STIG BERGSTRÖM



THANK YOU, Bill, for your kind words. For many years, Bill has been my closest associate at Ohio State and we meet virtually daily and interact in many ways. I deeply admire his outstanding crinoid work but this is a fossil group I have really never understood and crinoid research, like some mysterious moves by Ohio State administrators, appears to be beyond my thinking capacity.

It is a most pleasant duty to express my deep gratitude to the Society for giving me this prestigious award. I have had the privilege to have known about a third of the previous medalists, and it would be a most humbling experience to compare the monumental accomplishments of these scientists with those of my own. I certainly cannot claim any very special medal merit like that of my late friend Harry Whittington, who in his 1983 acceptance speech, noted that he felt a particular pleasure to get this medal because he had designed it.

However, I think it is most appropriate to stress that I like to share this recognition with more than 100 co-workers from many countries, who have joined me in various projects during half a century—without their efforts I certainly would not stand here today. Among these co-workers are many former students and post-docs. Some of these are here today and I like to particularly recognize Stan Finney, Steve Leslie, Dan Goldman, Seth Young, and Brad Cramer. Among dozens of other coworkers, I like to here mention Walt Sweet, Rube Ross, Valdar Jaanusson, Jan Bergström, John Riva, Birge Schmitz, Chuck Mitchell, Anita Löfgren, David Bruton, Per

Ahlberg, Mats Erikson, Anita Epstein Harris, Marshall Kay, Barry Webby, and Art Boucot, all internationally well-known geologists.

My research efforts have been largely based on specimens, field observations, and lab data. I have always tried to decipher previously undiscovered relations of various types, locally and globally. I have also liked to travel outside this continent and see the geology of other countries, not only in Europe and South America but also in Australia, Asia and Africa. I have particularly enjoyed discovering global relationships. I have always felt that to get an adequate grasp of the history of the world, it is not enough to study that of West Virginia although I have always enjoyed visiting that beautiful state. I have always had the attitude to look forward rather than bothering with past mistakes and unpleasant events. This attitude has come handy this early fall with the Ohio State football team having serious troubles. Also, I have not hesitated to branch out into new research areas that appear to have special promise.

My education road into geology was not a straight freeway and perhaps it is of interest to learn a little about its turns and pit stops. I came from the small village of Stenstorp (name meaning rock cottage), which is located within a geologically well-known outlier of lower Paleozoic strata on the Precambrian shield of south-central Sweden. Perhaps I could be what Bill Bryson noted in his recent book: “someone has to come from there”. Straight cephalopods and trilobite pygidia are common in the Ordovician limestones used for rock walls and

walkways in this community. One of Klaus Müller's most prolific orsten localities is located just a couple of kilometers from my boyhood home but these amazing fossils were resting peacefully undiscovered in the upper Cambrian limestone concretions when I grew up. I cannot recall I ever had a lecture on fossils and geology during my school years and I was never a fossil collector. My great interest was recent plants and I spent a large part of several happy summers biking round and making a plant species inventory of an area of several hundred square kilometers for a provincial flora.

I wasted a year in the compulsive military service, where, with the military's wisdom, I was trained to be a gunner on a tank and lost part of my hearing. At the beginning of the 1956 fall semester I ended up at Lund University in southernmost Sweden not really knowing what career path to pick although my real interests were in Botany. At Swedish, and many other European universities, one studies one major subject at a time for half a year, or a full year. Sadly, I was not admitted to Botany because I had not known about a required field course dealing with plant identification that was given early in the summer. Because my extensive experience in field botany, I felt I could take the final course exam without having attended the course but my request to take this exam was turned down by the professor. So I had to find something else to do during the fall semester.

Looking at the university course book, I found that geology had no prerequisites. Assuming that knowing something about soils and rocks would be useful to a botanist, I went to an introductory geology lecture, signed my name on a class list and became a geology student. I gather registration is not that simple these days.

As is the case today, geology was a small subject in terms of the number of students, and it did not take long before I knew all the other students and the instructors. This was helped by the monthly meetings of the Department's geology club, where the schedule was that after a geology lecture, dinner (with drinks) was served in one of the classrooms. My own clean living of not even drinking coffee was changed within a few weeks, and I greatly enjoyed getting to know famous, and not so famous, visiting geologists, some from abroad.

As mentioned by Bill, through the years I have been heavily involved in conodont research. My first exposure to this fossil group was a look at a conodont slide during a paleontology course given by Prof. Gerhard Regnéll, an internationally known expert on non-crinoid pelamatozoans but not much of a microfossil specialist. Shortly afterwards, I had the opportunity to start my first geology project, which became a monumental failure. Maurits Lindström, the internationally known conodont expert, suggested that as an undergraduate thesis, I might look for conodonts in the Upper Ordovician K-bentonite beds in the Fågelsång Valley outside Lund to see if individual ash beds could be correlated using these microfossils. The idea appealed to me and I had no idea that information in the North American literature indicated that such ash beds typically are barren of fossils. After three months of intense work in the field, in the lab, and under the microscope, I could confirm the American experience of the absence of fossils in the ash beds—I found nothing but thousands of mica flakes. However, before heading to Botany, I ran limestone samples from the interval just above the big K-bentonite beds from sections in south-central Sweden. These limestone samples were partly silicified and difficult to break down and the large residues proved to yield only very small numbers of conodonts. I later found out that this interval is

one of the least productive intervals for conodonts in the entire Ordovician succession in Baltoscandia.

Despite these failures I still enjoyed geology and after expanding my collecting efforts, I finally found diverse and previously completely undescribed conodont faunas in giant meteorite craters farther north in Sweden. Based on these collections I worked out a conodont zonation for the Middle and Upper Ordovician that with minor modifications has proved to be applicable in many parts of the world. However, my first paper was rejected, without review, by the editor, who was a Pre-Cambrian hard-rock geologist, of the leading Swedish geological journal. However, I sent it to one of the journals published by the Swedish Academy of Sciences where it was accepted without significant change. It remains one of my most cited papers.

At this time I received an offer from Walt Sweet and ended up in 1960 as a graduate student and as his research assistant at Ohio State. One week after my arrival in Columbus in late August I went on a 2-week collecting trip to northern Kentucky with a graduate student as assistant. I was astonished to learn that in Bourbon County no bourbon or other hard liquors were for sale and that the only available beer, root beer, lacked alcohol. However, this was the beginning of the highly successful Lexington Limestone project. Later during the fall quarter I studied a conodont fauna from the Pratt Ferry Formation of Alabama. Walt had been given a can of residue from Gus Cooper at the U.S. National Museum, who had obtained it during his acid etching to get phosphatic and silicified brachiopods. This conodont fauna was unlike anything described from North America but it contained many taxa familiar to me from Sweden and I could date it precisely in terms of the Baltoscandic conodont succession. In describing this fauna we partly employed multielement taxonomy on isolated conodont elements, a step that later would have far-reaching consequences for the development of the modern conodont taxonomy.

I was back in Columbus during the summer of 1964 when we finished up the Lexington Limestone conodont monograph in which we applied multi-element taxonomy as much as possible. Later that summer, in an effort to expand the Pratt Ferry work, I undertook a long collecting trip through the eastern Appalachians from Alabama to Maryland with the late Tom Schopf. The many samples we collected made it possible to date key Ordovician sections in terms of the Baltoscandic succession and this led to numerous revisions of the prevailing biostratigraphy and re-interpretation of the facies relations all along the Appalachian Valley. This work was subsequently greatly expanded by about a dozen of my graduate students.

Another major break came in 1967 when I was offered a job, without applying, as Assistant Professor and Curator of the Orton Geological Museum at Ohio State. I came to Columbus early in 1968. The Ohio State paleo group at that time included Walt Sweet, Jim Collinson, Aurele LaRocque and also Jim Schopf although he was formally employed by USGS. We met daily at coffee in the morning and the afternoon, and several of us had brown-bag lunch together for many years. I found the wide-ranging discussions with these geologists very stimulating.

During my first years at Ohio State, my research was still focused on conodont multi-element taxonomy, including revision of more than 100 Ordovician genera for the conodont Treatise, but I also did work on global conodont biogeography and biostratigraphy, and the use of conodonts as

paleotemperature tools in the Caledonides in northwestern Europe based on my collections from the British Isles and Baltoscandia. During the 1970s I was also involved in several chitinozoan studies and supervised graduate students doing thesis work on chitinozoans, acritarchs, tentaculitids, and Ordovician magnetic reversal stratigraphy.

As I indicated previously, I have had a long-standing interest in graptolites and since the 1970s I have had the opportunity to deal with these fossils in a variety of projects. It has been a real pleasure to cooperate with leading graptolite workers such as Stan Finney, Chuck Mitchell, Dan Goldman, Jörg Maletz, John Riva, Mike Melchin, Roger Cooper, Chen Xu, and Zang Yuan-Dong.

Ever since my early student years in Lund, I have had an interest in Ordovician volcanic ashes and I got very actively involved in that research field in the late 1980s, when I teamed up with Warren Huff and Dennis Kolata. We investigated various aspects of Ordovician ash beds over much of the U.S. and southern Canada and later continued with similar studies in Sweden, Estonia, Norway, and the British Isles as well as in China. We also worked on Lower Silurian K-bentonites on a regional scale in North America from the Southern Appalachians to Nova Scotia as well as in much of northwestern Europe. In an effort to examine if the Precordillera of western Argentina was a detached fragment of the southern North American continent as had been proposed by some workers, we did work in west Texas and went to Argentina to search for the big Sandbian K-bentonites, the Deicke and the Millbrig. No ashes of that age were found during several expeditions to the Precordillera of western Argentina but we discovered there the possibly greatest Ordovician K-bentonite complex known anywhere in the world in older (Darriwilian) rocks. That ash bed complex has no counterpart in North America suggesting that the Precordillera was unlikely to have been close to North America during that time. Our cooperative K-bentonite work has continued up to this day and I deeply appreciate to have had the opportunity to work with these fine scientists.

Through the years, I have been working in several other research fields. One such field, in which I have become rather heavily involved in recent years, is global ^{13}C

isotope chemostratigraphy in the lower Paleozoic. When Matt Saltzman came to Ohio State in the late 1990s, he established a very active center for this type of research. I have had the pleasure to work with him, and Mark Kleffner, Steve Leslie and Seth Young in this country, Birger Schmitz and Mikael Calner in Sweden, and Oliver Lehnert and others in Germany on a variety of projects ranging from Malaysia and China to Baltoscandia to Argentina and North America. These studies have also included eustasy, depositional environments, and faunal evolution. I view this research field as one of the most stimulating in which I have ever been involved.

During my more than 40 years of teaching at the university level I have had the privilege to serve as official or unofficial adviser to quite a few students, who have become known nationally and internationally. These include, among others, Lennart Jeppsson, Sven Laufeld, and Anita Löfgren in Sweden, and Stan Finney, Chuck Mitchell, Steve Jacobson, Merrell Miller and Steve Leslie in this country. Among the many post-docs we have had during my time at Ohio State, I have worked on joint projects with particularly Dan Goldman, Yngve Grahn, Guillermo Albanesi, and Mats Eriksson. One of my greatest joys as a teacher has been to observe how students get better and better to leave myself behind in scientific understanding and ability. This has given me hope that the paleoresearch of the younger generation will be much superior to that we old timers have been able to produce.

Finally, I like to recognize my wife Birgitta, who has put up with me and my geology work for some 30 years, and has been an enjoyable companion on collecting trips not only in North America and Europe but also in China and Australia.

The day is getting late, and the beer is getting warm, so it is high time for me to stop. Again, I like to thank all of you for this great award, and for your patience to listen to my ramblings.

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School of Earth Sciences
The Ohio State University
Columbus, Ohio 43210