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The SEDIMENTARY Record

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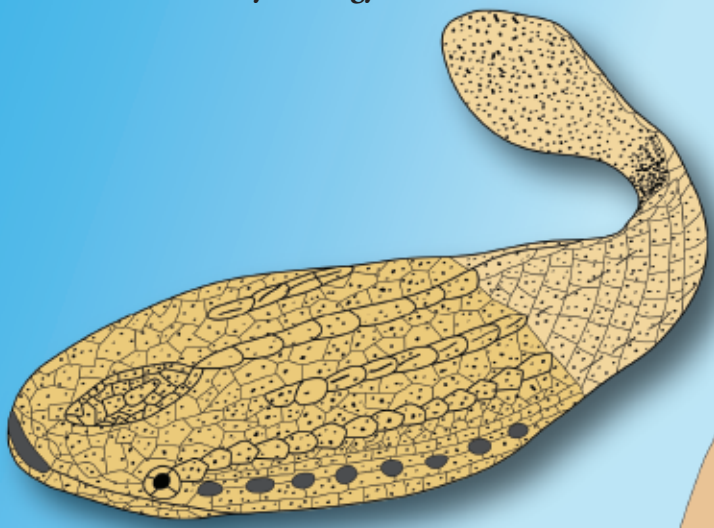
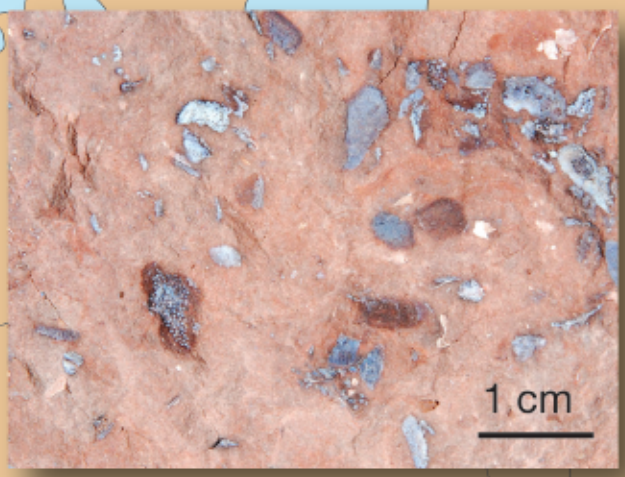
with the Sedimentary Geology Division of GSA



Cañon City



INSIDE: THE HABITAT OF PRIMITIVE VERTEBRATES: THE NEED FOR SEDIMENTARY GEOLOGY IN PALEONTOLOGY

PLUS: RESEARCH CONFERENCE SUMMARIES
PRESIDENT'S COMMENTS
EIGHTH INTERNATIONAL CONGRESS ON RUDISTS

1926 SEPM Society for Sedimentary Geology

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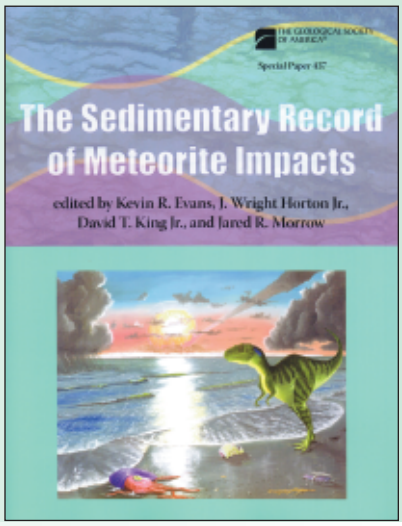
Miscellaneous #9

The Sedimentary Record of Meteorite Impacts

Edited by: Kevin R. Evans, J. Wright Horton Jr., David T. King Jr. and Jared R. Morrow

Although the remains of ancient impacts generally are found on dry land, many, including most of the examples detailed in this volume, actually occurred in marine settings. In addition to the deformation of sedimentary target rocks, the record of meteorite impacts also includes proximal to distal ejecta and tsunami deposits, both of which are typically preserved in sedimentary successions. So, despite general agreement that impactites are metamorphic rocks because they have been exposed to shock-metamorphic pressures, many impacts and their lateral correlates are sedimentary by nature. This publication explores the scope of the sedimentary record of meteorite impacts. A topical session at the 2004 GSA Annual Meeting in Denver, Colorado, November 7-10, and an SEPM Research Conference held in Springfield, Missouri, May 21-25, 2005, provided the impetus for joint publication of this volume. Published as the Geological Society of America Special Paper 437.

Catalog #55009 • SEPM Member Price: $49.00



Back by Popular Demand
Concepts in Sedimentology and Paleontology #8

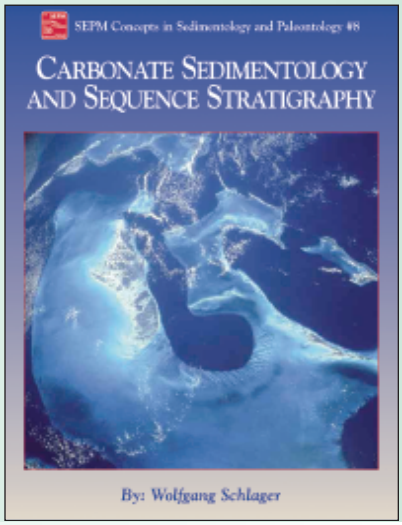
Carbonate Sedimentology and Sequence Stratigraphy

Author: Wolfgang Schlager

Sedimentology and Stratigraphy are neighbors yet distinctly separate entities with the Earth Sciences. Sedimentology searches for the common traits of sedimentary rocks regardless of age as is it reconstructs environments and processes of deposition and erosion from the sediment record. Stratigraphy, by contrast, concentrates on changes with time, on measuring time and correlating coeval events. This book attempts to make progress by combining two different specialties and different lines of reasoning, and by searching for principles underlying the bewildering diversity of carbonate rocks. Originally published in 2005, CSP 8 is also available digitally on CD.

Catalog #85008 • SEPM Member Price: $55.00

Catalog #85108 (CD version) • SEPM Member Price: $40.00



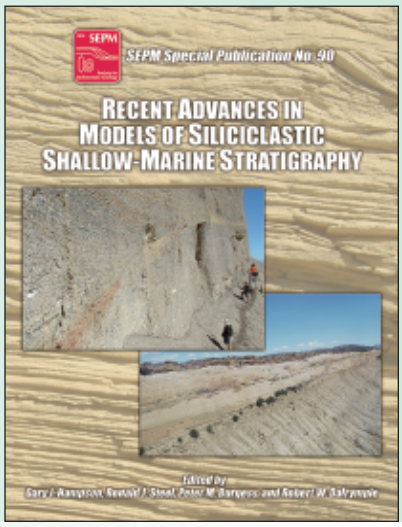
Special Publication #90

Recent Advances in Models of Siliciclastic Shallow-Marine Stratigraphy

Edited by: Gary J. Hampson, Ronald J. Steel, Peter M. Burgess

Siliciclastic shallow-marine deposits record the interface between land and sea, and its response to a variety of forcing mechanisms: physical process regime, the internal dynamics of coastal and shelfal depositional systems, relative sea level, sediment flux, tectonic setting, and climate. These deposits have long been the subject of conceptual stratigraphic models that seek to explain the interplay between these various forcing mechanisms, and their preservation in the stratigraphic record. This volume arose from an SEPM research conference on shoreline-shelf stratigraphy that was held in Grand Junction, Colorado, on August 24-28, 2004. The aim of the resulting volume is to highlight the development over the last 15 years of the stratigraphic concepts and models that are used to interpret siliciclastic marginal-marine, shallow-marine, and shelf deposits.

Catalog #40090 • SEPM Member Price: $95.00



Cover illustration: The Ordovician Harding Formation of central Colorado contains some of the oldest known vertebrates, such as the pteraspidomorph agnathan **Astraspis desiderata** *(reconstruction in upper left, dermal plates in photograph at right). Although the Harding contains a spectrum of shallow marine and estuarine environments (paleogeographic map in background), the vertebrates are found in shoreface settings, and are especially abundant on flooding surfaces (lower left, with upper shoreface deposits overlying bayhead delta facies).*

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The Habitat of Primitive Vertebrates: The Need for Sedimentary Geology in Paleontology

Steven M. Holland
Department of Geology, The University of Georgia, Athens, GA 30602-2501

Jessica Allen
Department of Geology and Geophysics, The University of Utah, Salt Lake City, UT 84112-0111

ABSTRACT

The habitat in which early fish originated and diversified has long been controversial, with arguments spanning everything from marine to fresh-water. A recent sequence stratigraphic analysis of the Ordovician Harding Formation of central Colorado demonstrates that the primitive fish first described by Charles Walcott did indeed live in a shallow marine environment, as he argued. This study underscores the need for analyses of the depositional environment and sequence architecture of fossiliferous deposits to guide paleobiological and biostratigraphic inferences.

INTRODUCTION

For many years, the habitat of primitive vertebrates has been debated, with interpretations ranging from marine to fresh-water, and everything in between. That such a basic interpretation for such an important group of fossils could be unresolved highlights the much broader need for a sedimentological and stratigraphic understanding of the fossil record.

THE CONTROVERSY

In December of 1890, Charles Walcott traveled by train and wagon to Cañon City, Colorado to investigate fish fossils reported from the Ordovician Harding Sandstone by Timothy W. Stanton. The significance of these fossils was immediately apparent to Walcott, as they were substantially older than the oldest accepted fish, which were late Silurian. The Cañon City fossils pushed the origin of vertebrates much earlier, and for over eighty years, they would be the oldest known vertebrates.

Walcott reported the fish to the Biological Society of Washington in 1891 and returned to Cañon City with his wife Helena in May of 1892 for more study. He presented his results to the Geological Society of America in 1892, and in the Bulletin, he named two fish, *Astraspis desiderata* and *Eriptychius americanus*, based on disarticulated plates and an incomplete head. Both are now regarded as pteraspidomorph agnathans, primitive jawless fish that look like scaly tadpoles with armored heads (see cover illustration of a reconstructed *Astraspis desiderata*). Walcott also argued that the Harding Sandstone was a marine deposit, based on the presence of mollusks, abundant burrows, and abraded fish plates (Fig. 1). That these were fish fossils was immediately controversial, with paleontological giants E.D. Cope and E.W. Claypole voicing doubts.

The controversy over habitat soon followed. By 1935, a fresh-water or possibly estuarine environment for early fish was generally preferred, but essentially in disregard for the sedimentology of the Harding (Romer and Grove, 1935). Devonian fish were abundant in fresh-water strata and the lack of fish in demonstrably marine Ordovician strata supported a fresh-water origin. The abrasion of dermal plates in the Harding was considered proof that the fish were transported from a fresh-water habitat to their burial in a littoral environment. The fresh-water interpretation quickly led to paleobiological inference, as armored heads were thought to be a defense against eurypterids living in fresh-water habitats. Paleobiological inference also drove the fresh-water interpretation, with biologists arguing that the physiology of kidneys necessitated a fresh-water origin for fish.

Despite an ongoing debate over the habitat, little new evidence was presented until Fischer (1978) reported an unusual trace and body fossil assemblage in the Harding and, based on the sedimentology, interpreted the depositional environment as a fluvial point bar in an estuarine system. The next year, Nils Spjeldnaes (1979) argued for an intertidal to shallow subtidal setting within a lagoon, estuary, or delta, subject to changing salinity and a warm climate. He based his interpretation on scarce sedimentary structures, quartz grain morphology, boron content in illite, trace fossils, and invertebrate fossils. Graffin (1992) described a new locality of the Harding Sandstone west of Cañon City and interpreted it as fluvial based on the presence of conglomerate, channelized deposits, and lateral accretion surfaces. Reconciling the evidence was difficult. The key was the assumption in all of these studies that the Harding was homogenous. All of these studies interpreted the Harding as a single unit or as a pair of units, but did not consider the numerous internal facies changes. In addition, each of these studies based their interpretation on a single exposure of the Harding, rather than taking a regional perspective.

WALCOTT WAS RIGHT

Allulee and Holland (2005) took a fresh look at the Harding and conducted a facies and sequence stratigraphic analysis across its exposure belt in central Colorado. Their analysis included all of the localities examined by Walcott (1892), Fischer (1978), Spjeldnaes

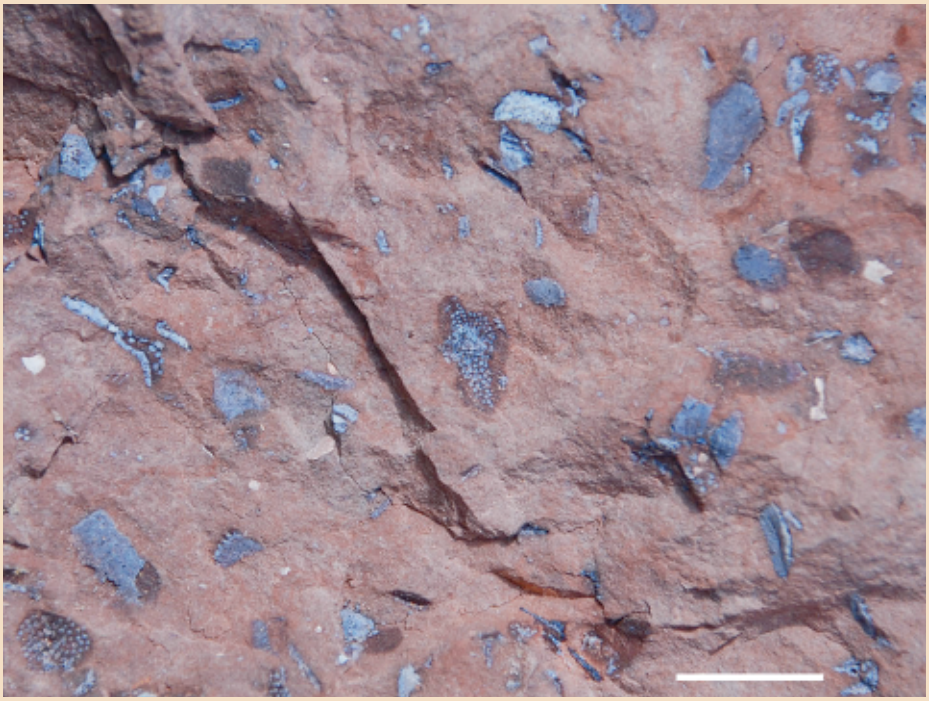

Figure 1. Disarticulated dermal plates of pteraspidomorph agnathan fish from the Upper Ordovician Harding Formation at Cañon City, Colorado. Most fish from the Harding are now disarticulated plates, although four partially to fully articulated specimens have been found. Scale bar is 1 cm.

(1979), and Graffin (1992), as well as several additional localities.

It became clear that the Harding did not represent a single depositional environment, but a spectrum of coastal and shallow marine environments. The Harding also contained numerous flooding surfaces as well as a sequence boundary that divided it, removing the possibility of a strictly Waltherian interpretation. Furthermore, fish plates were not evenly distributed through the Harding, but were concentrated along particular surfaces and facies.

Harding environments

Facies in the Harding comprise two broad associations, one deposited in a shallow-marine setting and the other in an estuarine setting (Fig. 2). Bioturbation is pervasive in the shallow-marine sandstones, with a diverse array of trace fossils from a mixed *Cruziana-Skolithos* ichnofacies. Lingulid brachiopods are the only common invertebrates, but bivalves, gastropods, nautiloids, and even crinoid columnals are present. The shallow-marine facies display upward coarsening and bed thickening on the scale of a few meters, as well as a transition from primarily physical sedimentary structures to mostly biogenic structures. The lower portions of these parasequences contain common wave-ripple lamination, planar lamination, and rare hummocky cross-lamination. The upper portions of these units are more intensely bioturbated, but have small pockets of planar and wave-ripple lamination.

These shallow marine sandstones record an environment in which waves were the primary depositional agent, but one in which wave energy was so weak that burrowing organisms could destroy most laminae, resulting in pervasively bioturbated sandstone. The lower thin-bedded units are interpreted as lower shoreface, with the upper thick-bedded bioturbated units interpreted as low-energy upper shoreface. Among possible modern analogs, the microtidal, low wave-energy coasts of Texas and the Florida panhandle bear a strong similarity. In both of these settings, coarsening-upward parasequences are developed, wave-generated structures are dominant, and the shoreface is intensely bioturbated.

The estuarine facies association is dominated by a thick chocolate-brown mudstone deposited in a lagoonal setting, based on its geographic distribution and facies relationships, along with two sandy facies found in association. Isolated beds of bioturbated sandstone are common within the lagoon facies, particularly near its upper and lower contacts with marine facies, and are interpreted as washover fan deposits and possibly flood-tidal deltas. Also common near the base of the lagoon facies are coarsening-upward sandy facies dominated by current-ripple lamination and interpreted to represent small bayhead deltas. Many beds within the bayhead delta facies have numerous burrows and trackways, including the unusual association described by Fischer (1978), with traces attributed to horseshoe crabs, eurypterids, scorpions, and crustaceans. One trace was also attributed to fish, but without direct evidence and is no longer accepted.

The association of lagoonal facies, common washover fan deposits, and bayhead deltas suggests the presence of microtidal wave-dominated estuaries (Fig. 3). Such estuaries fit well with the analog of the Texas coast and Florida panhandle.

The habitat of the fish

Fish plates are present at many horizons in the Harding, but are especially common in the shoreface facies and on flooding surfaces of the upper Harding sequence (Fig. 2). Their remains are also common near the top of the estuarine complex, but are consistently associated with washover-fan facies, suggesting that these remains may be transported. As Walcott had argued, the fish are found in marine strata.

Fish remains are conspicuously absent from bayhead delta facies and from most of the lagoon deposits. Their absence makes it unlikely that they lived in the brackish to fresh-water conditions of the estuary or the rivers and streams feeding the bayhead deltas. Their absence from the bayhead delta facies also makes it unlikely that their remains were transported from rivers into a marine setting. Romer and Grove (1935) argued for this transport, but the absence of fish in bayhead deltas would require that post-mortem transport effectively removed all remains from the life habitat. The simplest interpretation is that the fish are most abundant where they actually lived, in shallow-marine settings.

More recent work has confirmed and enriched this picture. Davies et al. (2007) found that the Gondwanan Ordovician pteraspidomorph fish *Sacabambaspis* was restricted to sandy shoreface environments, like its relatives in the Harding. More recently, Ivan Sansom and coworkers have found additional vertebrates in the Harding,

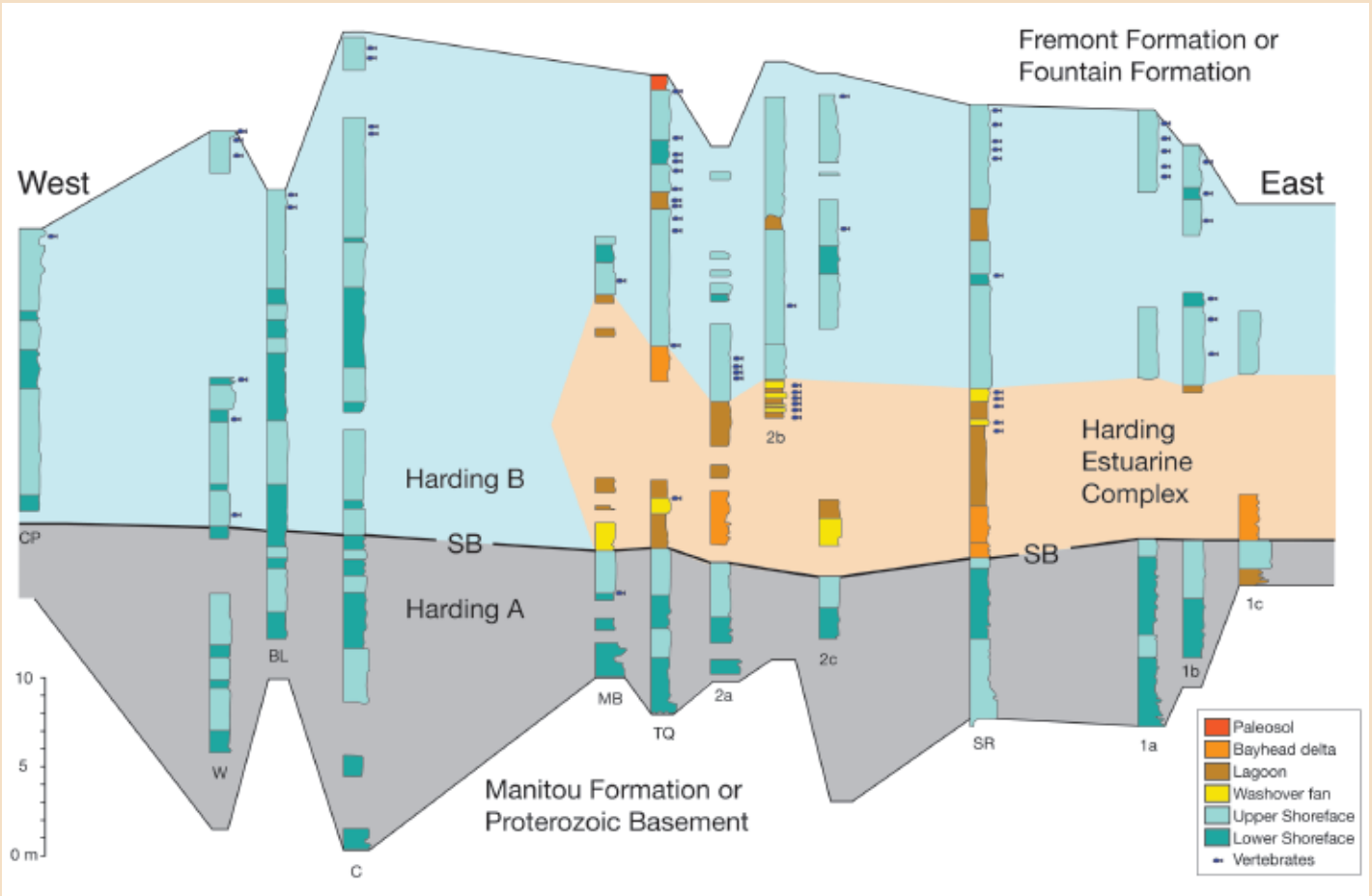

Figure 2. Cross-section of the Harding Formation in central Colorado, showing depositional environments and the occurrence of fish fossils. Sections are arrayed from west to east as in Figure 3, but their lateral spacing is not to scale, owing to the many sections along strike.

beyond the two species that Walcott described. Interestingly, these vertebrates are each found most commonly in a different habitat in the Harding, showing that these shallow Ordovician seas contained a far more diverse and environmentally differentiated vertebrate fauna than previously thought (Sansom, pers. comm.). Collectively, these discoveries enrich our understanding of the origin and diversification of primitive vertebrates.

OPPORTUNITIES ABOUND

The Harding is just one example of how sequence stratigraphy promotes paleobiological interpretation. In the past decade, impressive advances have been made on the depositional setting of many paleontologically significant deposits, especially cases of exceptional preservation (e.g., Gaines et al., 2004; Jiang and Sha, 2007). Knowing the sedimentary environment of such lagerstätte is doubly important, not just because it constrains their paleobiological interpretation, but also because it can lead to the discovery of new deposits (e.g., Hook and Ferm, 1985; Babcock et al., 2001). Solid environmental interpretations are also establishing the framework for biologically critical transitions, such as terrestrialization in the Devonian (e.g., Wehrmann et al., 2005). PALAIOS showcases some of the best of this work on the depositional setting of paleontologically significant strata.

More recently, the sequence stratigraphic context of significant fossiliferous deposits has played an increasing role in paleobiology and biostratigraphy (e.g,, Rogers and Kidwell, 2000; Brett et al., 2007; Egenhoff and Maletz, 2007). Here again, PALAIOS is at the forefront of this research, having recently hosted a special issue on sea-level change and the structure of marine ecosystems. Sequence stratigraphy has gained new value for understanding how changes in sea level shape the composition and diversity of ecological communities (e.g,, Dominici and Kowalke, 2007, Scarponi and Kowalewski, 2007).

Despite this research, ample opportunities abound, not just for spectacular deposits, but also for deposits more typical of the fossil record. For example, half of the 53,000 marine invertebrate collections in the Paleobiology Database (paleodb.org) have no environment recorded or are listed simply as marine, coastal, or carbonate. For some collections, the paleontological report may not specify a depositional environment, even if known to sedimentologists. In other cases, the environment may never have been established, or not established with modern methods. In short, there are ample opportunities for fruitful collaborations between sedimentologists, stratigraphers, and paleontologists. These collaborations will undoubtedly enrich our understanding of the history of life on Earth.

ACKNOWLEDGEMENTS

We thank Drs. D. Kamola, P. Myrow, T. Olszewski, P. Smith, and I. Sansom for insightful discussions and for helpful comments on our Palaios article, on which this article is based.

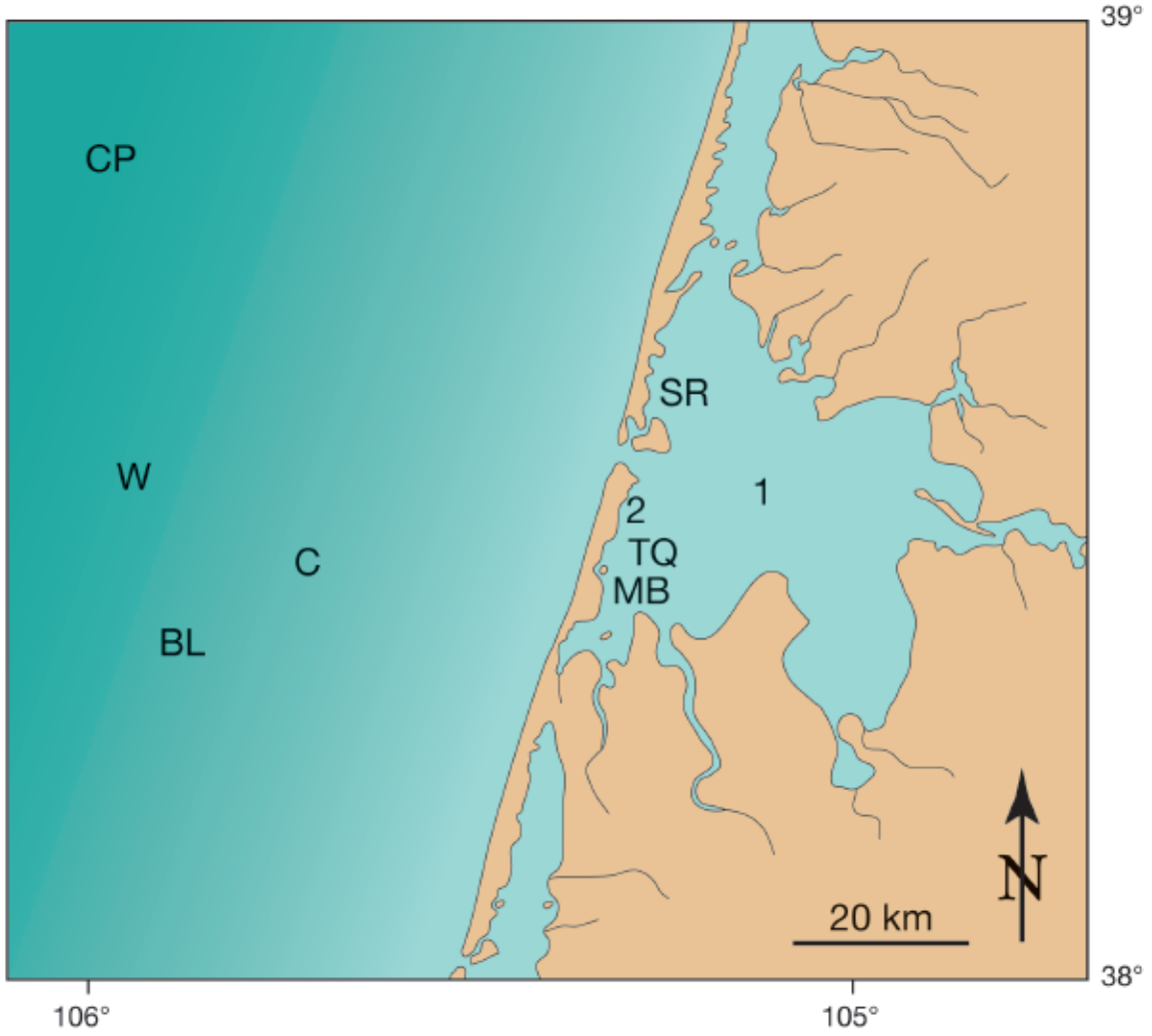

Figure 3. Hypothesized reconstruction of depositional environments in the transgressive systems tract of Harding sequence B. Abbreviations indicate locations of measured sections in figure 2. Numbers 1 and 2 each correspond to a cluster of three localities (1a-c and 2a-c) that are too closely spaced to plot separately.

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Accepted November 2008

SEPM RESEARCH CONFERENCE

"Outcrops Revitalized: Tools, Techniques and Application"
Kilkee, County Clare, Ireland
June 22-28, 2008

Conveners:
Ole J. Martinsen (StatoilHydro), Morgan Sullivan (Chevron), Andy Pulham (ESACT) and Peter Haughton (University College Dublin)

More than 60 participants assembled in Kilkee, Ireland on June 22nd for the SEPM Research Conference **"Outcrops revitalized: Tools, Techniques and Applications"**. The participants were from both academia and industry (45% industry, 55% academics), and came from Europe, United Sates and Canada and Australia.

Since both the use of outcrops and tools used for capturing have developed substantially in the last decade, the goal of the conference was to establish a state-of-the-art understanding in terms of the tools and techniques used and also get an overview of new applications of outcrop data.

The presentations covered a wide range of topics. The tools and techniques papers covered aspects from practical and theoretical insight into LiDAR scanning and photorealistic modelling where texture such a digital photography is draped onto LiDAR scanned topography, to 3D georadar data collection and interpretation, and seismic modelling. The applications presentations showed a broad range of uses, from improved understanding of clastic and carbonate systems on exploration ands production scale, to structural modelling and reservoir modelling. The meeting was a unique chance to meet with professionals covering a wide range of primary disciplines with the common goal of extracting as much useful information as possible out of outcrops for improved understanding of various geological systems.

To provide the participants with a live demonstration of current outcrop data collection techniques, John Thurmond and Trond M. Johnsen of StatoilHydro and Mark Grasmueck of Miami University conducted a combined photorealistic and 3D Ground Penetrating Radar (GPR) survey on an incised valley fill sandstone outcropping near Kilkee. The participants were exposed to challenges with using such techniques, such as strong winds, rain and not least salty sea spray that hampered particularly the georadar collection. A merged dataset was created to show the capabilities of the digital data collection methods. In addition, a photorealistic model was collected over a mud diaper exposed in the cliffs near Kilkee. The mud diapir was also mentioned in the report from a classical Geologist's Assocation Field Conference in Kilkee in 1957 (Brindley and Gill, 1958, their p. 253) and the quest and risk of capturing its details and geometry by a classic approach are described in a very illustrious way: "In the steep cliff could be seen mounds of brecciated siltstone and shale, at least 100 ft across at the base. They were presumably indicating incipient rafting, but as the top of the sandstone was not broken, the space problem seemed difficult to solution. The President's [of the Geologist's Association (editorial note)] exploits on the cliffs in search of contact evidence revealed his remarkable agility and iron nerve". Clearly, today's digital methods remove the need for hazardous climbing on cliffs to capture detail and needless to say neither the SEPM representative, the conveners or any participants of the Outcrops Revitalized conference indulged themselves in climbing quests that would put any oil company's or university's HSE rules into jeopardy…

This virtual diapir model was given to each participant as a demonstration and as virtual memory of the conference. While traditional observation from a nearby cliff left the observer with an unanswered question regarding the 3D shape of the mud diaper (Figs. 1-3), the photorealistic model reveals very clearly the ridge shape of the diapir. The data were collected in 1.5 hours, processed and displayed in another 2 hours with full cm-scale quantitative information and viewable form various perspectives. This example illustrated very clearly to participants the usefulness and applicability of new outcrop data collection techniques.
The Kilkee setting allowed for extensive use of the nearby Mississippian and Pennsylvanian (Late Carboniferous) world-class field analogues as catalyst foer discussion and illustrations of outcrop challenges. The participants were spit into several groups that visited both the deep-water sand-rich stratigraphy of the Ross Formation, the mud-rich slope succession of the Gull Island Formation and the deltaic deposits of the Tullig Cyclothem. The nearby location of the conference to extensive and easily accessible outcrops allowed for a unique flexibility to handle shifting western Irish weather.

In summary, the conference concept of combining detailed presentations of tools and techniques used in outcrop geology data collection with theoretical and practical applications illustrated by hands-on demonstrations seemed to be popular with participants. An SEPM Concepts in Sedimentology and Paleontology Series book, suitable for using as a text book on the subject, will be produced based on the technical content of the conference.

Thank you to the major sponsors: StatoilHydro, Chevron and Nexen.

Congratulations Al Hine

Winner of the 2009 Shepard Medal

SEPM RESEARCH CONFERENCE

"Clinoform Sedimentary Deposits: The processes producing them and the stratigraphy defining them"

Rock Springs, Wyoming
August 15 - 18, 2008

Convenors: R. Steel , C. Nittrouer

Scientific Committee: R. Dalrymple , G. Hampson , S. Kuehl, D. Mohrig, J. Swenson, C. Carvajal (field leader: Fox Hills-Lewis clinoforms), C. Olariu (Field Coordinator), P. Plink-Bjorklund (field leader: Chimney Rock clinoforms)

SEPM's Field Research Conference on **'Clinoform sedimentary deposits: The processes producing them and the stratigraphy defining them'** attracted 71 participants in the Western Wyoming Community College of Rock Springs Wyoming, August 15-18, 2008. The 4-day lecture, poster and fieldtrip conference on siliciclastic clinoforms at delta and shelf-margin scales succeeded in bringing together three research communities: marine geologists on modern deltas, sedimentologists on ancient deltas and shelf margins and sedimentary-process modelers. Their goal was to focus on clinoform landscapes and on the associated clinothem deposits and processes. During two initial days there were keynote and other short talks, as well as poster presentations. Poster presenters gave a brief overview of their posters in the plenum session. The 3rd and 4th days were field trips to areas with well-exposed clinothems.

Keynote talks included the clinoform systems of the modern Ganges-Brahmaputra Delta, Amazon Delta, and Po-Western Adriatic Sea shelf clinoform system. 'Ancient' keynotes reviewed delta-scale and shelf-margin scale clinoforms. Modelers gave keynotes on experimental studies of clinoform patterns and on the modeling of fine sediment transport on shelf clinoforms. There was enthusiastic discussion after all talks. Two entire afternoons were given to the presentation and discussion of some 37 posters, the centerpiece of the Conference. During the two field days, relationships between delta clinoform steepness, facies/processes and grain size were examined in the spectacular Campanian Chimney Rock clinoforms of Minnie's Gap, and in the Maastrichtian Fox Hills shelf-edge deltas of the Washakie-Great Divide Basin near Rawlins Wyoming. The challenge of taking 70 participants into the field went without a hitch.

The Fox Hills river-dominated delta clinothems with overlying fluvial channel deposits

The success of this Clinoform Conference came from the mixing of the three communities. From a brief 'what did you learn' poll of participants, those working ancient deltas were surprised by the amount of new knowledge on modern, muddy subaqueous deltas, and by recent breakthroughs in understanding wave-assisted sediment gravity flows on modern deltas. Modelers and those working the 'modern' gained insights on lowstand landscapes and deltas, and on the possible limitations of the highstand present to understanding the past.

Thank you to the sponsors: Nexen, Shell, BHP Billiton and CSDMS.

PRESIDENT'S COMMENTS

SEPM in the Future

SEPM periodically engages in Strategic Planning meetings to assess its current status, ongoing viability and to consider the future. The overall purpose of these meetings is to evaluate how SEPM can best serve the science, what SEPM Membership requires from its Society and if changes are required, how to enact such changes. Our next strategic Planning meeting is scheduled for February, 2009. One of the goals of this meeting will be to examine membership demographics and to ask whether any changes to SEPM goals, visions or governance should be made in light of those demographics. Did you know that the average age of SEPM Membership is 49.7 years and that 44 % of its members are 44 to 61 years old? Are these data important to the Society in our quest to provide ongoing services to our Members?

I am a fan of Professor Linda Duxbury, of the Sprott School of Business at Carleton University, Ottawa, Canada who studies, among other things, workforce demographics and interactions. For one synopsis of Dr. Duxbury's perspective go, to http://magazine.carleton.ca/2006_Spring/1733pf.htm. As you read the article, instead of demographics in the workplace, transpose the demographics to SEPM membership and the accompanying implications.

SEPM membership demographics broken down into Veterans (born 1946 and before), Baby Boomers (born 1947 – 1964), Generation X (born 1965 – 1974) and Generation Y (born 1975 and after) are shown below:

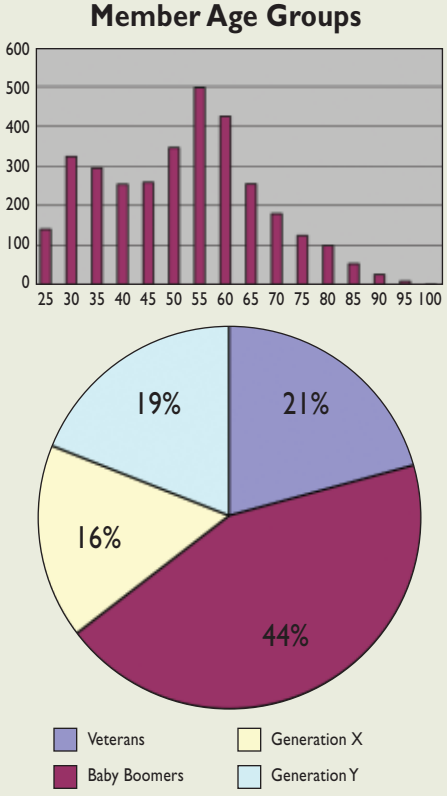
Class	Age (yrs)	Number	%
Veterans	> 62	681	21%
Baby Boomers	61 - 44	1437	44%
Generation X	43 -34	540	16%
Generation Y	< 33	624	19%

Results for 3282 members of SEPM's total membership of 3441.

According to Dr. Duxbury, and if the workplace is any indication, each of these age groups will have different perspectives, requirements and needs from SEPM. The attitudes of each group were shaped by different events and as a result each group is driven by different motivators and needs. Each group may want something different from SEPM and will react differently if the Society does or does not respond to their scientific needs.

This demographic distribution of SEPM is very similar to that of the respective countries that we live in, the companies or agencies we work for, and the faculties of many universities. In the next 5 to 10 years, a large proportion of the work force is likely going to retire and there will be a shortage of skilled workers coming from Generations X and Y to replace the aging Baby Boomers. SEPM membership is not that different. 65% of our members are 44 years and older.

From examination of the Member Age Chart, you can see that in the next ten years, 923 members (now aged 55 – 64 years) will likely be retiring from their place of employment. This is close to one third of SEPM Membership. How will this affect the society and its ability to provide the necessary services that the membership requires – its journals, special publications, research conferences and other activities?



Given this context, demographic diversity and other related issues will be on the agenda at the February Strategic Planning Meeting. The meeting will be attended by current SEPM Council, ballot candidates for next years SEPM Council, SEPM Staff, and representatives from Student members, SEPM Section Presidents and young members. The goal is to discuss issues that may affect SEPM in the future and make recommendations for future plans. Some of these issues may include topics such as: is SEPM Council representative of current demographics?; does SEPM publish materials that effectively reach all of its Members (including our new Members who represent the next generation of leaders?)

We would like you to think about specific strategic issues you consider important. This need not be restricted to the demographic issues as discussed above. Please take the time to consider this request and forward your ideas to Howard Harper, SEPM Executive Director at hharper@sepm.org.

What else is happening with SEPM? Dr. Abhijit Basu at Indiana University, and SEPM International Councilor Dr. André Strasser at University of Fribourg are making considerable inroads for SEPM into networking and collaborating with several sedimentological societies in India and China, respectively, for joint meetings, publications and increasing SEPM membership. Stay tuned for more on this in the future.

Dale Leckie, President

Eighth International Congress on Rudists: Summary

The Rudist (not rudest) workers of the world congregated in Izmir, Turkey June 23-25 for an exchange of research of Cretaceous paleocommunities, stratigraphy of carbonate shelves, and rudist taxonomy. Eighty-five authors and co-authors presented 56 papers on paleoecology, taxonomy, biogeography, and stratigraphy of Cretaceous rudist assemblages as well as new technologies. Dr. Sacit Özer and Dr. Bilal Sari of Dokuz Eylül University hosted geologists and paleontologists from Algeria, China, Croatia, Egypt, France, Germany, Great Britain, Iran, Italy, Jamiaca, Mexico, Puerto Rico, Spain, Tunisia, Turkey, and the United States. The excellent localities of Cretaceous carbonates with rudists were displayed during three field trips. Prior to the meeting the group examined Campanian-Maastrichtian siliciclastic-carbonate sequences in eastern and southeastern Anatolia and collected spectacular rudist specimens. Following the meeting Upper Cretaceous carbonates in southwestern Turkey and Lower Cretaceous carbonates in northern Turkey on the cliffed Black Sea coast were studied.

Depositional and paleoecologic models show that rudists were important elements of Cenomanian to Maastrichtian ramps and platforms in Tunisia, Puerto Rico, Croatia, Turkey, and the Apennines in Italy. New stratigraphic and biogeographic reports of rudists are from Japan, Tibet, Iran, Turkey, Tunisia, Serbia, Egypt, Spain, Mexico, and California. Many rudist taxa are revised with new specimens and new data. This is in preparation for the revised Bivalve Treatise volume. Also a new genus and several new species were presented. The technique of computed tomographic scanning (CT x-ray) of well preserved rudists demonstrated internal morphology and ontogeny of caprinids without destroying the specimens. Another new technology in the study of rudists is the measure of the calcite/aragonite ratio. If this ratio was influenced by seawater conditions, it may be a paleoenvironmental proxy. However such measurements are difficult and tedious and the range of biologic variation is unknown.

The Ninth International Congress on Rudists in 2011 will be hosted by the University of the West Indies in Kingston, Jamaica.

Prepared by R.W. Scott
University of Tulsa, Oklahoma
rwscott@ix.netcom.com
July 10, 2008

SEPM Sustaining Members

Each year some members chose to support the Society beyond the regular membership fees to show their continued desire to push the science of sedimentary geology forward.

Vitor Abreu
Bevan W. Alwin
Donna S. Anderson
A. Paul Baclawski
Lyle F. Baie
Jeff Balliet
Simon J. Beavington-Penney
Edward S. Belt
Arthur E. Berman
Janok Bhattacharya
Sue Ann Bilbey
Graeme R. Bloy
Michael D. Blum
Kevin M. Bohacs
David J. Bottjer
Marshall C. Carothers
Kenneth W. Ciriacks
Marshall C. Crouch
Robert W. Dalrymple
Francois Daugas
Douglas A. Draves
Gregor P. Eberli
David E. Eby
Nancy L. Engelhardt-Moore
Kevin R. Evans
Thomas E. Ewing
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Robert A. Gastaldo
Pamela Hallock-Muller
Reinhard Helmuth Gaupp
Robert N. Ginsburg
Carolyn A. Green
Robbie Rice Gries
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Nobuhiro Imoto
Jonathan R. Ineson
Steven John Johansen
Wladyslaw P. Karpeta
Charles Kerans
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H. Richard Lane
Alan R. Lord
Jeff J. Lukasik
Robert George Maliva
R. P. Major
James Ross Markello
Gale D. Martin
Ronald E. Martin
Donald Francis McNeill
Donatella Mellere
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Jack E. Neal
Colin P. North
Dejan R. Pantovic
S. George Pemberton
Edward B. Picou
Christopher Prince
Walter C. Pusey
John W. Robinson
J. Frederick Sarg
John B. Southard
Edward Leonard Simpson
Roger M. H. Smith
Morgan D. Sullivan
John Robert Suter
Michael L. Sweet
Jon L. Thompson
Scott Ellis Thornton
Peter R. Vail
Ron F. Waszczak
W. Lynn Watney
Lawrence James Weber
Joann E. Welton
Ray A. Wiggins
Dominic K.F. Yap

PALAIOS 2007 BEST PAPER

Zonneveld, John-Paul, Beatty, Tyler W., and Pemberton, S. George, 2007, ***Lingulide brachiopods and the trace fossil Lingulichnus from the Triassic of western Canada: Implications for faunal recovery after the end-Permian mass extinction:*** ***PALAIOS***, v. 22, no. 1, p. 74-97.

PALAIOS 2007 HONORABLE MENTION PAPER

Hembree, Daniel, and Hasiotis, Stephen T., 2007, ***Paleosols and ichnofossils of the White River Formation of Colorado: Insight into soil ecosystems of the North American Midcontinent during the Eocene-Oligocene transition:*** ***PALAIOS***, v. 22, no. 2, p. 123-142.

JSR 2007 OUTSTANDING PAPER AWARD

Benison, K.C., Bowen, B.B., Oboh-Ikuenobe, F.E., Jagniecki, E.A., LaClair, D.A., Story, S.L., Mormile, M.R., Hong, B.Y., 2007, ***Sedimentology of acid saline lakes in southern Western Australia: Newly described processes and products of an extreme environment:*** ***JSR,*** v. 77, p. 366-388.

JSR 2007 HONORABLE MENTION PAPERS

North, C.P., Nanson, G.C., and Fagan, S.D., 2007, ***Recognition of the sedimentary architecture of dryland anabranching (anastomosing) rivers:*** ***JSR,*** v. 77, p. 925-38.

Wells, M.R., Allison, P.A., Piggott, M.D., Gorman, G.J., Hampson, G.J., Pain, C.C., and Fang, F., 2007, ***Numerical modeling of tides in the late Pennsylvanian Midcontinent seaway of North America with implications for hydrography and sedimentation:*** ***JSR,*** v. 77, p. 843-65.

Wood, L.J., 2007, ***Quantitative seismic geomorphology of Pliocene and Miocene fluvial systems in the northern Gulf of Mexico, U.S.A.:*** ***JSR,*** v. 77, p. 713-730.

Rankings by year in the subject category Geology for the Journal of Sedimentary Research and PALAIOS, based on impact factor, as reported by the Journal Citation Reports Science Edition.

Year	Total No. of Geology Journals	JSR Ranking	PALAIOS Ranking
2007	40	5th	4th
2006	37	6th	7th
2005	36	9th	7th
2004	35	9th	10th