M·A·P·S Digest

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MAPS FIELD TRIP

Sunday October 14

Klein Quarry at Coralville, Iowa. Meet at the quarry at 8:45 AM. The club will enter the quarry at 9:00 AM after signing releases and brief safety announcements. The gate will be locked behind the group, with opportunities to leave at noon and 4:00 PM Bring water and food with you.

We will be collecting in the middle Devonian Cedar Valley Fm. Corals, brachiopods, bryozoans, trilobites, sponges and crinoids may be found

To attend, **RSVP** Marv Houg at 319-364-2868, or email Marv at m_houg@yahoo.com.

ABOUT THE COVER

This month's cover photo is a specimen of *Aulocystis frutectosa*, a tabulate coral from the North Vernon Formation of the middle Devonian of southern Indiana.

Photo by John Catalani.

Nov 2-4 Paleontological Society of Austin Fossil Fest 2007. INDOORS. Old Settler's Association Headquarters, Hwy 79, Round Rock, TX, by the Dell Diamond.

Fri 9-5
Sat 9-5
Sun 9-4

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Spnsored by

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Western Hall
Western Illinois University
Macomb. Illinois

April 4-6,2008
Fri. 8:00 – 5:00, Sat. 8:00 – 5:00
Sun. 8:00 – 12:00 Noon

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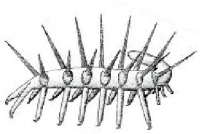


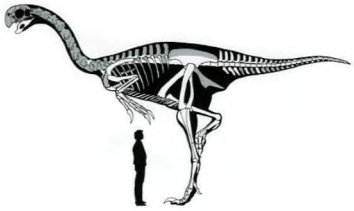
Paleo News Items

By Karen Nordquist

New Basal Dinosauromorph Found at Ghost Ranch – *Dromomeron*

A new dino relative with a Field Museum connection has made the cover of Science (art by Donna Braginetz with *Dromomeron* in lower left, and *Silesaurus*-like animal in bottom center and *Chindesaurus bryansmalli* in top center and coelophysoid theropod in upper right) and adds to the evolution of dinosaurs. It has been named *Dromomeron romeri* (dro-MO-mer-on RO-mer-eye) from the Greek 'dromas' for running' and 'meros' for femur. The species name is for Alfred Sherwood Romer who first described the dinosaur precursors from Argentina, including *Lagerpeton*. Nathan Smith is a doctoral student at the University of Chicago and a research associate at the Field Museum (a student of Peter Makovicky) and is working with Kevin Padian and others on this project at the Ghost Ranch in New Mexico where many fossils of *Coelophysis* dinosaurs have been found. The holotype is a left femur with paratypes including a right femur, and left tibia, a partial right femur, a complete left tibia, a complete astragalocalcaneum, and a nearly complete right femur. These small pre-dinosaurs (18 inches high at the shoulder and 3 feet long) lived at the same time as the early dinosaurs some 215 MYA and it was a side branch. Many of these pre dinosaur species may have survived along with the early dinosaurs until the end of the Triassic extinction event when dinosaurs truly became dominant. With no skull it is not known if it was an herbivore or a carnivore. (Irmis et al in **Science** Vol. 317 7/20/07)

Big Feathered Bird-like Dino from China – *Gigantoraptor*



This new dinosaur was found in the Late Cretaceous Iren Dabasu Formation of Nei Mongol in China. It had an estimated body mass of 1,400 kg (3,80 pounds), making it very large within the Oviraptorosauria, a group which rarely exceeds 40 kg (88 pounds). It has been named *Gigantoraptor erlianensis* and shows many bird-like features in spite of its 17 foot height. It had a beak and no teeth. It is about 8 meters (26 ft) long and is estimated to have been about 11 years old when it died based on a study of the arrested growth lines of its bones. So it had more growing to do. Feathers were not found, but are believed to have been on this animal. (Xu et al in **Nature** Vol. 447 6/14/2007)

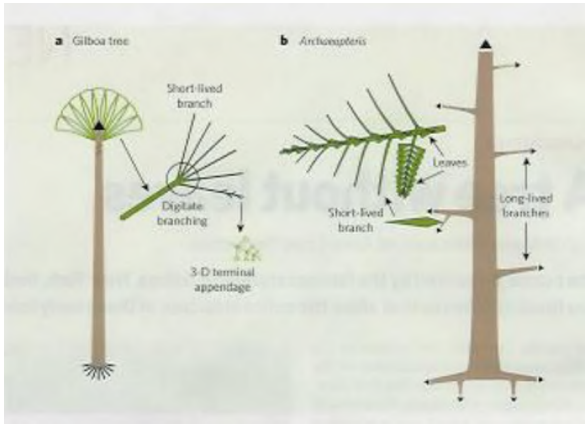
A New Basal Ornithischian Found In South Africa – *Eocursor*

This "early little runner" has been named *Eocursor parvus* and is dated to 220 MYA in the Triassic. The fossil was found in 1993 but has only recently been studied. It has leaf shaped teeth for plant eating and unusually large grasping hands. The lower leg bones are long suggesting it could run fast to escape predators. They have the complete pelvis including the backward facing pubis. This is an early relative of the *Stegosaurus* and *Triceratops*. (Butler et al in **Proc. R. Soc. B**; drawing by Scot Hartman)

New Baby Diplodocid from Wyoming

They found a nearly complete skeleton (missing the tail and the skull) of this juvenile sauropod in the Lower Morrison Formation Late Jurassic of the Howe Ranch in Bighorn Count, Wyoming. It has unfused corocoid and scapula, unfused centra and neural arches in most vertebrae, and other indicators. It lacks growth rings in its bones. Pneumatization of the postcranial skeleton had already started indicating that this was early in the development of sauropods. It was only about 2.25 feet high at the shoulder and about 6.6 feet long. It shows some diplodocid features, but at its young age they are unsure. (Schwartz et al in **Historical Biology** 19)

New First Tree – *Eospermatopteris*



Move over *Archaeopteris* – there's a new first tree on Earth. The actual stumps of the tree were found a long time ago in the 1870's in Gilboa New York, but the rest of the tree was unknown so little could be said about it. The stumps were big and Middle Devonian (397-385 MYA) at 385 MYA and it became known as the world's oldest forest. But *Archaeopteris* was well known from the Middle Devonian (385-359 MYA) and was the first tree. There are some major differences between the two. The Gilboa tree has no branches until the very top; it has many small roots, and it has no leaves. *Archaeopteris* has branches along the trunk, several large roots, and does have leaves. The crown structure at the top of the Gilboa tree was also named as *Wattieza* in the past as plant parts often are before it was recognized as part of this tree. There were two fossils found. One that gave a very good look at the top with some fertile parts attached and one that was an almost complete trunk with the roots attached. They estimate that these trees grew to be at least 8 meters (26 ft) tall or higher. It periodically shed the top branches which added to the litter below that would have encouraged the arthropod fauna. However, without developing leaves to maximize its use of light and with a limited root system, it was not destined to survive and it is extinct as is its group, the Pseudosporochnates. (Stein et al in **Nature** Vol. 446 4/19/07)

The "Amateur" in the History of Geology/Paleontology

By John A. Catalani

In my very first essay (Catalani, 1995) I encouraged across-the-board cooperation between amateur (or nonprofessional, if you prefer) and professional as one method to keep paleontology viable. In another (Catalani, 2000), I mentioned those professionals that were instrumental, during my formative years, in directing and encouraging my research in nautiloids and the Ordovician. Throughout most of this time, the distinction between amateur and professional was fairly obvious. The professional had a Ph.D. and held a position in academia or a state or federal geologic survey. Although the amateur did not make his/her living in the professional geosciences, an intense love of paleontology drove these amateurs to carry out field work, collect and document fossils, and record and document localities often as completely as any professional. This competence was recognized by many professionals who often collaborated with the amateur. This collaboration utilized the information and specimens acquired by the amateur often resulting in a joint paper. In this way, the time and effort the amateur put into amassing a documented collection was not only recognized by the professional community but also contributed to the advancement of paleontology.

In recent years, however, this distinction has blurred and is not as clear-cut as it once was. The reason for this is obvious to those that have degrees in paleontology--no academic positions are opening up and those made vacant by retirement are not being re-staffed. A Ph.D. in paleontology may now, by necessity, be forced to rely on his/her undergraduate chemistry or biology major to secure a position, one that is often non-academic. Their paleontological research must often be conducted on their own time and at personal expense. Based on the definition of "amateur" as "someone who does not make a living full-time from paleontology" used in the Paleontological Society's guidelines (www.paleosoc.org/strimple.html) for the Strimple Award (presented to amateurs in recognition of contributions or achievements in paleontology), these professionally trained paleontologists would themselves be classified as amateurs.

What many of us forget, however, is that the groundwork for all fledgling sciences was, by necessity, formulated by workers that would be classified as amateurs using virtually any definition in use nowadays. When a new "-ology" is first contemplated the fundamentals must be determined and recorded for future generations to build on. (In fact, the term "geology" was not widely used until after James Hutton's death in 1797--"natural philosophy" was the inclusive branch of learning for the "sciences".) The primary laws and principles of geology were determined by interested individuals able to combine an open mind with the power of perceptive observation and who were, of course, trained in other pursuits since the new science was, well, new. Some of these pioneers were physicians, lawyers, farmers, or even Renaissance geniuses (and many were fairly wealthy for the time which allowed them to pursue their interest in geology). Let me illustrate using several, of the many, key workers that were instrumental in laying the foundation for geology and paleontology ending with two amateurs that contributed greatly to modern paleontology.

Although several of these pioneers in the history of geology have been given the appellation "father (or founder) of geology", the initially poorly-educated but later well-read Leonardo da Vinci, the late-15th early-16th century Renaissance genius, would probably have been given this title (along with that of "father of paleontology") had his *Codex Leicester* notebooks been known, translated, and distributed so that later generations could have built on his perceptive observations and insightful conclusions. Alas, these particular notebooks were not made available (and only incompletely) until the 19th century. Among his many geological observations,

Leonardo was the first to notice that rock layers could be matched (correlated) on both sides of river valleys. He also contributed to paleontology by comparing fossils to modern shells found on beaches to determine the degree of transport the shells experienced before becoming entombed in rock layers--from unbroken indicating they were buried essentially where they lived (refuting one popular belief that fossils were carried to mountain tops by the Biblical Flood) to fragmented indicating extensive transport. Also, he concluded by observation that fossils could not have "grown in rocks" (another popular belief) without cracking the rock as they "grew". No, Leonardo's observations and logical interpretation told him that fossils were indeed organic and, since these fossils were similar to shells presently found in the sea, it followed that the shells and the rocks (formerly sediments) that entomb them were once under water. This logic was typical of Leonard's mindset: if the fossil looks like a clam then the simplest explanation is that it was once a clam and there is no need for elaborate scenarios to explain its presence in the rock. One can only wonder how the geological sciences would have progressed had these notebooks been available to those that followed.

Often called the "founder of geology as a discipline", Georgius Agricola earned a degree in medicine in 1526 but his investigations of various geological and related topics such as mining, mineralogy, metallurgy, and paleontology occupied most of his time in what is today Germany. Among his contributions were classifying minerals by their physical properties and observing that rocks occurred in layers and, like Leonardo, that these layers could be matched over distances. Unlike Leonardo, however, he did not conclude that what we call fossils today (remember, at this time "fossil" referred to anything dug out of the ground) were organic remains even though he observed that they did indeed resemble living organisms.

Another candidate for "founder of geology" is Nicholas Steno who was born in 1638 in Denmark. Steno was also trained in medicine and studied the muscular system making several important observations and contributions to medicine. When a shark head was made available to him and he noticed that the teeth were similar to certain fossils, he concluded that these objects (called "tongue stones" at that time) were indeed the shark teeth they resembled and were deposited in sediment now turned to rock. Although the idea that these tongue stones were actually teeth had been proposed much earlier (and summarily rejected due to their occurrence on land), Steno studied not only the fossils but also the rocks that contained them. Steno's observations of how these teeth were incorporated in solid rock and his subsequent investigation of layered rocks led to his greatest contribution to the geosciences--the formulation of the principles of superposition, original horizontality, and lateral continuity. When I presented these principles (along with uniformitarianism mentioned below) to my students to introduce relative time they would often say, "That seems obvious", downplaying their importance. Yes, to us these principles seem obvious but we must view them in the context of the time during which they were written to appreciate their significance. When tenets such as these are first formulated they are viewed merely as observations that no one, due to lack of interest or the inertia of established dogma, had yet bothered to make. It is only in retrospect that we recognize the groundbreaking significance to the advancement of whatever discipline, in this case geology, is under investigation.

Still another "father of modern geology" is James Hutton (he gets my vote), the Scottish innovative farmer turned natural philosopher and active participant in the Scottish Enlightenment. Hutton, too, had a medical degree that stemmed from his love of chemistry but it is doubtful if he ever practiced medicine (apparently none of these guys wanted to be full-time doctors). His keen observations on the slow progress of both erosion and deposition as well as the character of the rocks (volcanic and tilted sedimentary) at Arthur's Seat and Siccar Point, led him to several monumental conclusions about how nature works. He stated that, "No powers are to be employed that are not natural to the globe, no action to be admitted except those of which we know the principle." This is the essence of the principle of uniformitarianism, a concept that would later be expanded by Charles Lyell. His major contribution,

however, was to reject the prevailing belief that Earth was less than 6000 years old stating (in one of the most significant and inspiring quotes in all of geology and my personal favorite), "The result, therefore, of our present enquiry is, that we find no vestige of a beginning, no prospect of an end." Not only is that gutsy for the time, it also relaxed the need to cram all of Earth's rocks, mountains, and life into just 6000 years and allowed future geologists to investigate nature in a temporal context not merely in a descriptive one. This one concept alone, now referred to as "deep time", bolsters the argument for choosing Hutton as the "father of modern geology".

When speaking of the history of geology, one name is usually mentioned first out of respect for the leap our science took when he published *Principles of Geology*, arguably the most influential treatise (eventually three volumes) on geology ever written. I am speaking, of course, of Sir Charles Lyell who was born the same year, 1797, in which James Hutton died. If one wanted to give an appellation to Sir Charles it would probably be "father of historical geology" in recognition of his naming several of the epochs of the Tertiary Period. The sub-title of *Principles*, "Being an attempt to explain the former changes of the Earth's surface, by reference to causes now in operation", indicated that uniformitarianism would be the central theme of these volumes. To Lyell's credit, he acknowledged, early in volume one of Principles, that Hutton was the first "to explain the former changes of the earth's crust, by reference exclusively to natural agents." Lyell obtained a law degree from Exeter College, Oxford, but, due mainly to poor eyesight, he abandoned the practice of law and continued his geological observations and investigations. From his early years, Lyell had a keen interest in the natural sciences. An encounter with Robert Bakewell's *Introduction to Geology* and attendance at many of the geological lectures of William Buckland focused his energies into the natural science with the relatively new name of "geology".

Certainly there are many others (such as William "Strata" Smith who published the first geological map of England and Wales and correlated rock units based on fossil content, Hugh Miller of *The Old Red Sandstone* fame, Robert Chambers who published the controversial pre-Darwin evolutionary volume *Vestiges of the Natural History of Creation* anonymously, etc.) that could be mentioned. However, these, in my opinion, form the core of the "amateurs" that laid the foundation for geology and paleontology.

As examples of dedicated amateurs that have contributed greatly to modern paleontology, I have chosen two individuals--August F. Foerste and Harrell L. Strimple. (My thanks to Ken Klatt and Ken Bork of Denison University and Tom Broadhead of the University of Tennessee, Knoxville, for supplying or suggesting references concerning Foerste and Strimple.)

When I was just starting my investigation of nautiloids and began a search of the literature, two names were preeminent in the references--Rousseau H. Flower (in my opinion the foremost professional nautiloid worker ever) and August F. Foerste. During one visit to a used bookstore, I fortuitously stumbled on several issues of the Journal of the Scientific Laboratories of Denison University. Here, made available to me, were many of the monumental papers of Foerste with Ordovician (and Silurian) nautiloids identified to the species level (including a two-part paper that dealt with the Black River nautiloids--my nautiloids) not just the generic level as in the *Treatise*. (Ken Klatt graciously sent me those Foerste nautiloid papers that the bookstore did not have.) Foerste had continued the work of J. M. Clark (original geologic reports of Minnesota) and R. P. Whitfield (original geological reports of Wisconsin) by analyzing the physical characteristics of nautiloid specimens and erecting a set of more discriminating genera to reflect the diversity that had previously been lumped together in just a few "form genera". Born in Dayton, Ohio, in 1862, Foerste had an initial interest in botany but became interested in fossils after attending a lecture by Edward Orton who eventually became the State Geologist of Ohio. Foerste graduated from Denison University and eventually earned a Ph.D. in petrography from Harvard University. Although he taught physics for 38 years at Steele High School in Dayton (a fact Rousseau would remind me of constantly in encouraging my continued study of nautiloids), it was

his research and publications (over 130) on Ordovician and Silurian fossils, thankfully including nautiloids, which earned him national recognition. After retirement from the high school, Foerste occupied the position of associate paleontologist at the Smithsonian until his death in 1936. He also worked for the United States and Canadian Geological Surveys as well as the State Surveys of Ohio, Indiana, and Kentucky. In addition, Foerste was one of the founders, as well as a past president, of the Paleontological Society. I can think of no one that bridged the gap between professional and amateur as well as August Foerste.

Harrell L. Strimple (for which the Strimple award is named) was born in 1912 in Kansas, graduated from Tulsa Central High School, and briefly attended Tulsa University. He worked as an accountant for Phillips Petroleum and, starting in 1962, as curator and research associate at the University of Iowa. Sometime during his early years, Strimple became interested in crinoids and began his publishing career by privately financing a paper on Pennsylvanian crinoids of Oklahoma. Strimple wrote on many different types of echinoderms but it was crinoids, specifically those from the Pennsylvanian Period, in which he excelled. His publishing legacy is impressive with over 300 authored or co-authored papers and over 700 new species proposed. But it was his work with amateurs that set him apart and he made every effort to bring the amateur and the professional together for the good of paleontology. Therefore, he became very active in the Mid-America Paleontology Society that counts both amateurs and professionals among its members. Wanting to recognize amateurs, Strimple bequeathed a gift to the Paleontological Society so that an award could be established to recognize and honor an amateur paleontologist that made significant contributions to the science of paleontology. He wanted the award to be named after Raymond C. Moore of the University of Kansas, one of his many collaborators, but was convinced to allow the award to be named the Strimple Award.

Once again, I could have chosen many others to illustrate the contributions by amateurs to paleontology (OK, Foerste's work on nautiloids made him a shoe-in). Of these, Charles Schuchert who became professor of geology and paleontology at Yale University, Edward O. Ulrich who worked on and collaborated with Foerste on early Paleozoic fossils, and Thomas A. Greene who amassed a comprehensive collection of mid-west Silurian reef fossils, immediately come to mind.

So, as I have stated many times previously, we are involved in one of the few sciences in which amateurs can make important contributions (astronomy is another where, for example, most comets are discovered by dedicated amateurs). As with the founders of geology/paleontology, the dedication and perseverance of amateurs allow them to contribute significantly to paleontology. With declining positions in academic paleontology, now, more than ever, cooperation between those involved in our science at all levels is essential to our efforts to maintain paleontology as an effective instrument to not only describe past life on Earth but also successfully promote evolution as the unifying scientific principle.

REFERENCES

Anonymous. 1936. Denison Scientist Dies. *The Denison Alumnus*.

Broadhead, T. W. and Frest, T. J. 1986. Memorial, Harrell L. Strimple. *Journal of Paleontology*, 60:192-195.

Catalani, J. 1995. Birds of a Feather? We Should Flock Together. *American Paleontologist* 3(4):7-8.

Catalani, J. 2000. An Opportunity to Reflect. *American Paleontologist* 8(2):9-11.

Sandy, M. R. 1995. August F. Foerste--Paleontologist and Educator. Unpublished paper.

The **M**id-**A**merica **P**aleontology **S**ociety (MAPS) was formed to promote popular interest in the subject of paleontology; to encourage the proper collecting, study, preparation, and display of fossil material; and to assist other individuals, groups, and institutions interested in the various aspects of paleontology. It is a non-profit society incorporated under the laws of the State of Iowa.

Membership in MAPS is open to anyone, anywhere who is sincerely interested in fossils and the aims of the Society.

Membership fee: $20.00 per household covers one year's issues of DIGESTS. All Canadian and Overseas members receive the DIGEST by air letter post. For new members and those who renew more than 3 issues past their due date, the year begins with the first available issue. Institution or Library fee is $25.00. (Payments other than those stated will be pro-rated over the 6 yearly issues.)

MAPS meetings are held on the 2nd Saturday of October, November, January, and February and at EXPO in March or April. A picnic is held during the summer. October through February meetings are scheduled for 1 p.m. in Trowbridge Hall, University of Iowa, Iowa City, Iowa. One annual International Fossil Exposition is held in April or late March.

The MAPS official publication, MAPS DIGEST, is published 6 times per year – January, Feb/March, April, May/June/July, August/Sept, Oct/Nov/Dec. View MAPS web page at http://midamericapaleo.org

CYATHOCHRINITES