M·A·P·S Digest

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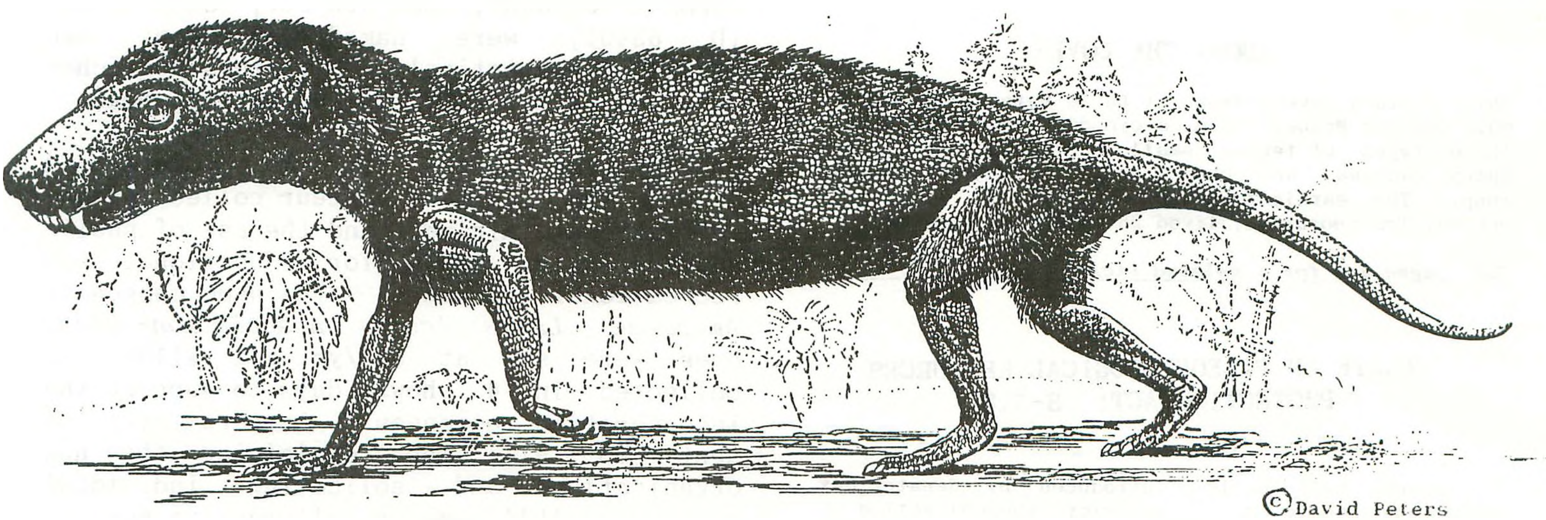

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MARK YOUR CALENDARS

7 NOV MAPS MEETING. Augustana College, Rock Island, IL.

1:00 Board & General Meeting combined.

2:00 Program: Dr. William Hammer from Augustana will present a program on the Antarctica dinosaur find.

15 APR 1993 MAPS NATIONAL FOSSIL
16 EXPOSITION XV--EXTINCT
17 ECHINODERMS

Fri., Apr. 15: 8am - 6pm
Sat., Apr. 16: 8am - 5pm
(Business meeting and auction following)
Sun., Apr. 17: 8am - 3pm

***** 92/11 DUES ARE DUE *****

Are your dues due? You can tell by checking your mailing label. The top line gives the expiration date in the form of year followed by month--92/11 means 1992/Nov. Dues cover the issue of the *Digest* for the month in which they expire.

We do not send notices but will let you know if you are overdue by highlighting your mailing label on your *Digest*. We carry overdues for two months before dropping them from our mailing list.

Please include your **due date** and **name exactly as it appears on your mailing label**--or include a label.

Dues are $15 per U.S./Canadian household per year. Overseas members may choose the $15 fee to receive the *Digest* by surface mail or a $25 fee to receive it by air mail. Library/Institution fee is $25.

Make checks payable to MAPS and mail to:
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ABOUT THE COVER

This month's cover, drawn by David Peters, St. Louis, MO, depicts Probelesodon, a cynodont. Cynodonts have three types of teeth: small nippers in front, large sharp canines, and cheek teeth with more than one cusp. The earliest known cynodont in the fossil record, *Procynosuchus*, lived 250 million years ago.

See pages 2-3 for a related story

UPDATE ON PALEONTOLOGICAL RESOURCES PROTECTION ACT: S-3107

The Senate Bill S-3107 introduced by Senator Max Baucus and designed to restrict the collection of vertebrate (and associated) fossils died in committee for this year. Baucus received quite a bit of correspondence and phone calls opposing the passage of the bill. However, his office is not sure if it will or will not be reintroduced when the new Congress convenes next year. If you are concerned about the bill, it is important that you keep informed about its status and voice your opinion if it is reintroduced.

501(C)4 LOBBYING GROUP FORMED
by: John Boland, MAPS member

The Officers and Directors of the American Federation of Mineralogical Societies approved the formation of a 501 (C)4 non-profit lobbying group at the Brunswick, Ohio, meeting. The restrictions on the new group stated that the new name could not include *American Federation* and no funds of the AFMS can be used. For IRS purposed, the two corporations must be completely separate. In a 501(C)4, contributions are not tax deductible.

Two organizational meetings were held to select a name, statement of purpose, and initial officers and directors so corporation papers could be drawn up. Jon Spunaugle (NWFMS President) and Ed Romack (AFMS President, 655 8th St., Idaho Falls, ID 83401) were named president and treasurer respectively. Directors were chosen from each of the six federation areas.

The stated purpose is: To promote and ensure the right of amateur collecting and recreational mining, and the use of public and private lands for educational and recreational purposes. The name chosen in *American Lands Access Association--ALAA*. Dues were set at $25/yr and $1400 was collected in 4 shows days to support the incorporation expenses. Letters will be sent to all clubs explaining the new organization and soliciting individual members. ALAA members will receive monthly newsletters on pending legislation and congressional and grass roots lobbying will be pursued in a prompt manner. The Federations will maintain their non-lobbying legislation committees to inform all members.

CONFESSIONS OF A CYNODONT

by David Peters
1208 DuBois Ct., St. Louis, MO 63122-5518

PART II

A human is an amniote.
An amniote is a tetrapod that protects its embryo in an amniotic membrane, and sometimes a shell. Amphibians are not amniotes. Living reptiles, birds and mammals are. In addition to the amnion, which does not fossilize, amniotes have solid vertebrae which divide the notochord into segments or disks. Two pairs of ribs connect the backbone to the pelvis, and no fangs descend from the palate, as in rhipidistian fish and early tetrapods. The earliest known amniote, an as yet unnamed lizard-like form, lived 338 million years ago.

A human is a synapsid.
A synapsid is an amniote with an outer skull perforated with a single opening between the rear of the skull and the eye socket. In addition the teeth, particularly the canines, show some variety in size. The term "synapsid" used to be restricted only to the reptilian members of this family. Now scientists realize that if your ancestor was a synapsid, you're a synapsid. Mammals and humans retain a synapsid opening. It's the hole separating the cheekbone from the braincase. The earliest known synapsid in the fossil record, the pelycosaur *Archaeothyris*, lived 300 million years ago.

A human is a therapsid.
A therapsid is a synapsid with enlarged synapsid openings. Therapsids carry themselves higher off the ground than more primitive synapsids do. Each of their outer four digits is nearly equal in length indicating that leg swinging is starting to replace the old method of walking by undulating the backbone. The earliest known therapsid in the fossil record, *Biarmosuchus*, lived 258 million years ago.

A human is a cynodont.
A cynodont is a therapsid without a roof of bones over its jaw muscles. Most amniotes, other than birds and mammals, have a box-like outer skull sheltering and surrounding an inner bony braincase. Jaw muscles separate the two. In cynodonts, the greatly enlarged synapsid openings have done away with the rear of the outer skull above the cheekbones. Cynodonts have a double-headed (rather than a single) ball-and-socket joint attaching neck to skull. They also have three types of teeth: small nippers in front, large sharp canines, and cheek teeth with more than one cusp. In the lower pelvis are holes (fenestra), which remain today in humans. The earliest known cynodont in the fossil record, *Procynosuchus*, lived 250 million years ago.

A human is a mammal.
Once again we're in familiar territory. Mammals are cynodonts that feed their babies with milk from mammary glands. In addition, mammals have hair, one jawbone, three middle ear bones, and only two sets of teeth (milk teeth and adult). They are brainier than cynodonts, have five distinct types of vertebrae (cervical, dorsal, lumbar, sacral and caudal) and a unique pelvis in which the illiac crest has no rear-projecting component. Mammals were the cynodont answer to predatory pressure from early dinosaurs. Only the tiniest, brainiest, most nocturnal and secretive cynodonts, the mammals were able to survive when dinosaurs became widespread. The earliest known virtually complete mammal in the fossil record, shrew-like *Morganucodon*, lived 210 million years ago.

A human is a therian.
A therian is a mammal that gives birth to live young. All but three living mammals do this. Therians are noted for having molar cusps arranged in reversed triangles and for being able to tuck their elbows into their sides rather than keeping them out in the primitive pushup position. Therians have a ridge along the middle of each shoulder blade. Most also have whiskers and external ears. The earliest known therian in the fossil record, shrew-like *Kuehneotherium*, lived 200 million years ago.

A human is a eutherian.
A eutherian is a therian which gives birth via a complex placenta, and without the aid of a pouch, to fully developed young. Some small eutherians (shrews and rodents) are born in an immature state, but never are they as immature as new-born marsupials. The earliest known eutherian in the fossil record, shrew-like *Asioryctes*, lived 84 million years ago.

A human is a primate.
Primates are eutherians with grasping hands, elongated limbs, a shortened snout and forwardly directed eyes. Unlike squirrels, which inhabit the same environment, early primates remained predators. Their food had to be stalked and pounced upon. Among mammals, only the primates reacquired the color vision that had become vestigial during the age of the dinosaur. The earliest known primate in the fossil record, tree-shrew like *Purgatorius*, lived 60 million years ago.

A human is an anthropoid.
Anthropoids are primates with a rounded skull enclosing an enlarged brain. They have flattened faces, well-developed facial muscles, an uncleft upper lip, close-set eyes that look directly forward fixed external ears, a real hand with a thumb that moves independently of the other fingers and a flattened nail on every digit. They have 32 teeth as adults, 5 cusps on certain molars, and a bony plate behind each eyeball separating their eyes from their jaw muscles. The earliest known anthropoid, monkey-like *Aegyptopithecus*, lived 33 million years ago.

A human is a hominoid.
A hominoid is an anthropoid that lacks a tail and has the ability to swing by the hands from branch to branch with the body dangling below. The hominoid chest is wider than deep. The backbone, with fewer vertebrae, is relatively short and stiff. Other than humans, the great apes are also hominoids. The earliest known hominoid in the fossil record, ape-like *Dryopithecus*, lived 18 million years ago.

A human is a hominid.
A hominid is a hominoid with a modified backbone, pelvis and legs which give it an erect stance. The big toe is aligned with the others for walking, not grasping. The canine teeth of hominids are not larger than the other teeth. This enables their jaws to maneuver laterally to grind food. More thickly enameled molars helped hominids grind a wider variety of foods. The earliest known hominid in the fossil record, *Australopithecus*, lived 3 million years ago.

A human is a hominine.
Hominines are hominids with enlarged brains, longer legs, reduced jaw muscles and smaller molars. In addition, hominines fashioned stone tools and use fire. Hominines are essentially human. The earliest known hominine in the fossil record, Homo habilis, lived 2.5 million years ago.

The remaining modifications necessary to bring our ancestral body up to modern standards include a further increase in cranial capacity, a reduction of brow ridges, a protruding nose, a chin, and the ability to speak made possible by raising the roof of the throat.

So, it's true. I confess it. I am a cynodont and proud of it. As you can see, I am also a choanate. And I am also a mammal and a hominid.

What part did nature play in our being? The evidence is clear. What part did a six-day miracle have in our being? The evidence doesn't support this account. Personally speaking, I'm sure that God is still part of the evolution equation, only more subtly than Genesis states.

For more information ask your bookstore for a copy of *From the Beginning, the Story of Human Evolution* by David Peters, William Morrow and Company, 1991 (ISBN 0-688-09476-7).

ORIGIN OF COMANCHEAN AMMONITES OF NORTH TEXAS
by Ronald W. Morin
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***from* Dallas Paleontological Society**
Occasional Papers, *Vol. I, Dec. 1989*

North Texas has provided many fossils to interested collectors. Especially abundant are ammonites from the Comanchean Series of the Cretaceous System. These rock units range in age from about 120 to about 95 million years before present (b.p.) Palmer, 1983; Kent and Gradstein, 1985). In rocks of this age, fossils are so prolific in North Texas that collectors can sometimes walk the length of a creek by using ammonites as stepping stones. This abundance is evidence that North Texas is underlain by sediments deposited at the western edge of Comanchean seas. In these seas, the types of ammonites changed with time as a result of local evolution and the invasion of more successful forms from other areas. The nature of these changes is the subject of this paper.

The origin of North Texas ammonites cannot be discussed without first mentioning the problems in learning their modern names. Time is one of the problems. It has been 61 years since Cretaceous ammonites of Texas received a detailed summary in a single article (Adkins, 1928). Even the most recent revision of ammonites at the generic level by Arkell and others (1957) appeared over 30 years ago. In the decades following the publication of these classic works, major revisions have been made in the names of Texas ammonites. A good example of these changes is found in the genus *Oxytropidoceras*, which has been subdivided into four genera by Young (1966). Finding such revisions is the other problem. Most of these name changes are widely dispersed through the geological literature. A summary of the old names along with their modern equivalents is given in the appendix to serve as a reference in the following discussion.

The Comanchean Series is the lower rock unit of the two subdivisions for the Cretaceous System in North Texas (Hill, 1894). Hill (1894) recognized three groups (smaller rock units) in the Comanchean: the Trinity (the lowest), the Fredericksburg, and the Washita (the uppermost).

In North Texas, the Trinity group consists primarily of marginal marine to continental sediments which were separated from the open ocean by rudistid reefs. Ammonites generally found conditions behind these reefs uninhabitable (Young, 1972). A good example of Trinity sediments can be seen associated with the dinosaur trackways at Glen Rose, Texas. The few ammonites found in the deeper marine sediments behind the Trinity reefs are endemic (restricted to this area) engonocerids (Figure 1). They have been studied by Scott (1940) and Young (1974) but are still in need of taxonomic revision. These endemic engonocerids were replaced by cosmopolitan engonocerids, *Engonoceras* and *Metengonoceras*, in the Fredericksburg and the Washita Groups. Engonocerids (Figure 1) have discoidal outlines, acute to rounded peripheries (edges), and pseudoceratic sutures. In pseudoceratic sutures, the sutures are very slightly frilled on the elements closer to the aperture (mouth) and more frilled away from it. These ammonites cannot be used to correlate the North Texas section to the well documented Trintiy of Central Texas (Young, 1974).

The base of the Fredericksburg Group is marked by the flooding of the Comanchean seas over the continental deposits of the Trinity. The evidence for this lies in the change in rock type, from sandstones to limestones and marls. With this transgression, a *Manuaniceras-Oxytropidoceras* fauna of European affinities (Young, 1977) was introduces. The species now in the genus *Manuaniceras* were originally included in the genus *Oxytropidoceras*. *Venozoliceras*, another genus that was once part of *Oxytropidoceras*, either evolved locally from the *Manuaniceras-Oxytropidoceras* fauna or immigrated here a little later. *Oxytropidoceras* (Figure 1) has a discoidal outline, a high keel on a rounded periphery, and simple ammonitic sutures with three frilled saddles (elements pointing to the aperture). *Manuaniceras* (Figure 1) differs from *Oxytropidoceras* in having flat ribs on its early whorls. Differing from both of these, *Venezoliceras* (Figure 1) has flank and shoulder tubercles (bumps) during its ontogeny. In one group of *Venezoliceras*, the tubercles disappear after being well developed in the early whorls while tubercles do not appear until the later whorls in the other group. All three genera gave rise to endemic species, perhaps as many as seven according to Young (1966), as offshore reefs were rebuilding and cut off communications with cosmopolitan populations.

A change from limestone to calcareous shale marks the Fredericksburg-Washita boundary.

This lithologic change coincides with the immigration of a new cosmopolitan ammonites assemblage. These conditions suggest that the Washita sea flooded over the rudistid reefs which built up during the deposition of the upper Fredericksburg (Young, 1972). The change in ammonites was only minor at the generic level. *Manuaniceras* and *Venezoliceras* were still present but *Oxytropidoceras* was replaced by *Adkinsites*. The bulla (strong umbilical tubercle) of *Adkinsites* (Figure 1) is used to differentiate it from the other three common genera that were originally placed in the genus *Oxytropidoceras*. The big difference in the ammonites of the lowermost Washita is at the specific level. These species are more closely related to species from Madagascar than those from the Fredericksburg Group of Texas (Young, 1966).

Before the lowermost Washita fauna disappeared, it was joined by *Idiohamites* and *Craginites*. Since these ammonites have no ancestors in Texas (Young, 1957), flooding of the Washita seas must have continued for them to get here. *Idiohamites* (Figure 1) is usually found as a candy cane-shaped fragment. Well preserved specimens are curved at both ends and have a single tubercle on their ribs at the ventral shoulder. These tubercles are used to differentiate *Idiohamites* from the genus *Hamites*. *Idiohamites* is reported from most Cretaceous seas (Arkell and others, 1957). *Craginites* (Figure 2) is the first of several cosmopolitan mortonicerine ammonites to immigrate to Texas (Young, 1972). Mortonicerines differ from the *Oxytropidoceras* group in their subquadrate outline and in having fewer ribs. *Craginites* is identified by its two large tubercles on its ventral shoulder and many flank tubercles. These two shoulder tubercles aid in the differentiation of *Craginites* from the genus *Eopachydiscus*, which is the giant ammonites from Lake Texoma and Tarrant County. *Eopachydiscus*(Figure 1) is identified by its strong ribs and umbilical tubercles in the early whorls, both of which weaken in later whorls. These features are also reduced by compaction of some of these large fossils. Compared to most common Comanchean genera, this genus also has a more complex ammonitic suture, with five saddles. Its early ornamentation and the symmetrical first lateral lobe (sutural element pointing away from the aperture) serve to tell it from *Desmoceras*. *Eopachydiscus* has been reported only in Texas and adjacent areas (Arkell and others, 1957). Starting with *Eopachydiscus* and ranging above it were *Mortoniceras* and *Pervinquieria* (Figure 2). These two mortonicerines both have three flank tubercles in their last early whorls (two and three, respectively). *Mortoniceras* was cosmopolitan (Arkell and others, 1957) while *Pervinquieria* had European affinities (Young, 1977). This cosmopolitan fauna was isolated by the buildup of offshore reefs and a locally rare genus in it gave rise to the *Drakeoceras* lineage of Young (1957). *Drakeoceras* (Figure 2) is a mortonicerine with two tubercles on its ventral shoulder. These tubercles and the lack of midflank tubercles are used to distinguish it from other mortonicerines, especially *Mortoniceras*, *Pervinquieria*, and *Prohysteroceras*. *Drakeoceras* became the dominant ammonite in North Texas during the middle of the Washita Group although it is unknown elsewhere (Young, 1957).

The next dominant ammonite of the Washita was *Mariella* (*Plesioturrilites*) which is reported to have had cosmopolitan affinities (Young, 1972; Mancini, 1979) although its greatest abundance was in Texas and adjacent areas (Clark, 1965). Its invasion suggests that the rudistid reefs of the middle Washita had been drowned. As its name implies, *Plesioturrilites* (Figure 2) is coiled more like the snail, *Turritella*, than a typical ammonite. It also has a spiral groove separating two pairs of tubercles which differ it from the ammonite *Turrilites*. *Mariella* (*Plesioturrilites*) was joined by the genus *Stoliczkaia* which was a definite cosmopolitan from (Arkell and others 1957). *Stoliczkaia* (Figure 2) is identified by the loss of early tubercles on its ventral shoulder, ribs that extend onto its venter, and a simple ammonitic suture with three saddles. As Comanchean reefs built up for the last time, *Stoliczkaia* gave rise to the endemic genus, *Budaiceras*, which is unknown outside of Texas and Northern Mexico (Young, 1979). Budaiceras (Figure 2) has tubercles on its ventral shoulders and venter, ribs that do not extend onto the venter, and a simple ammonitic suture. While two relict species of *Stoliczkaia* and three endemic

ORIGIN OF COMANCHEAN AMMONITES..

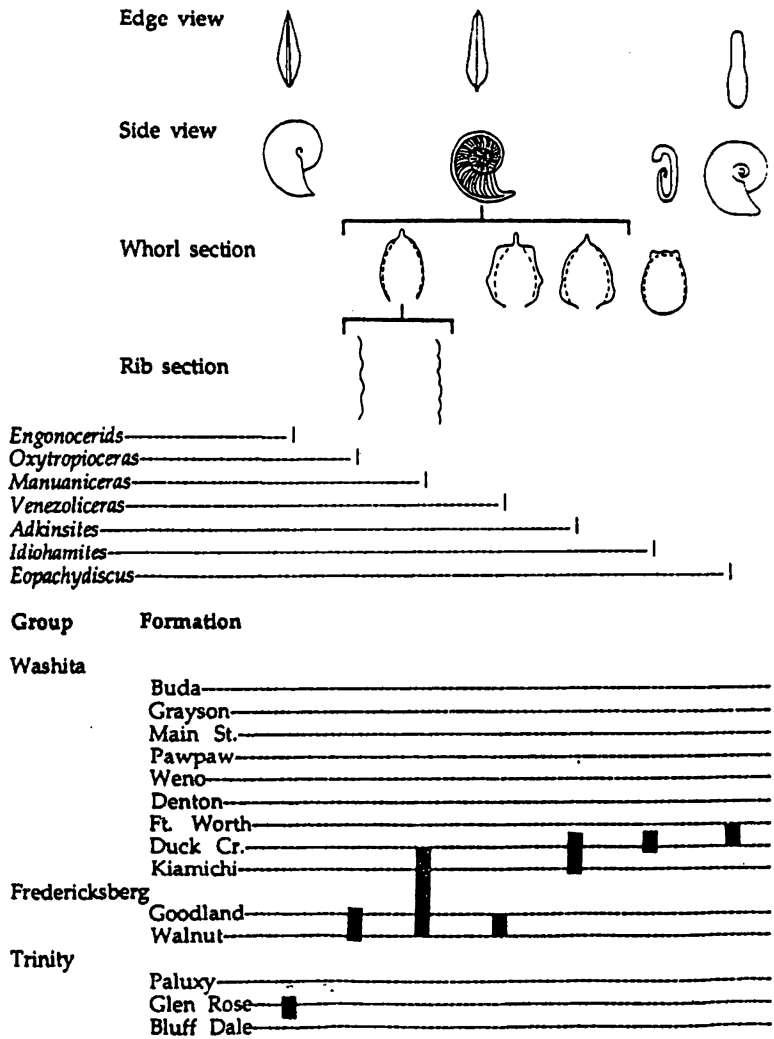

Fig. 1.

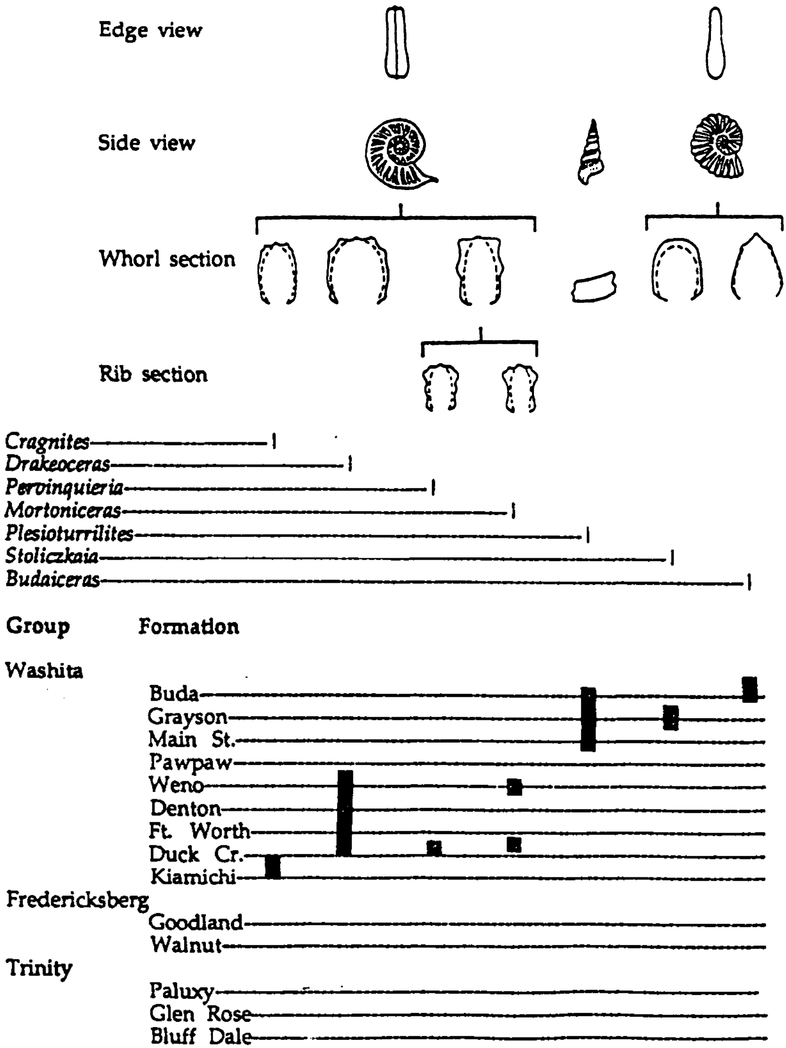
Edge view
Side view
Whorl section
Rib section
Cragnites
Drakeoceras
Pervinquieria
Mortoniceras
Plesioturrilites
Stoliczkaia
Budaiceras
Group
Formation
Washita
Buda
Grayson
Main St.
Pawpaw
Weno
Denton
Ft. Worth
Duck Cr.
Kiamichi
Fredericksberg
Goodland
Walnut
Trinity
Paluxy
Glen Rose
Bluff Dale

Fig. 2.

species of *Budaiceras* were flourishing behind the Texas reefs, all of their kind vanished from the world's oceans.

The upper limit of the Washita Group is placed at the first regressive sands of the Woodbine Formation. This drop in sea level marks the end of the repeated barrier reef buildups which were periodically flooded by the Comanchean seas. As these sedimentary cycles ended, so did the isolation of cosmopolitan ammonites behind these same reefs. It is this isolation which led to the evolution of numerous species, and even two genera, unique to Texas and the adjacent areas.

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Please ADD the Following NEW OR REJOINING MEMBERS to Your Directory:

Herb Crum R#2 Box 102 A Otterbein IN 47970 317-583-2261	Teacher. Will trade. Has for trade ferns. Wants to further pursue fossil hunting and to communicate with hunters.
Sandy Dengler 112 Tahoma Woods Ashford WA 98304 206-569-2662	Free-lance writer. Major interest invertebrates. Does not collect. Will give finds to those who can use them. Interested since childhood.
Michael Hill 301 West T St. #D-5 Tumwater WA 98501 206-357-9506	Broadcast engineer TV. Will not trade. Major interest vertebrate paleontology/preparing/study (since 1982). Wants to learn, make contacts with people of similar interests; interested in volunteer work with digs/expeditions.
Wynn Hopkins 3521 Williams Lane Crete IL 60417 708-672-8823	Chemistry/physics teacher. Major microscopy. Has for trade microscopes, maybe cameras, book press (large).
Jack Loftin Rt. 1 Windthorst TX 76389 817-423-6426	Historian, rancher, author. Major amphibians and reptilians of Texas. Wants to associate with other fossil collectors and learn more about fossils.
Henk van Noordenburg Schaapherder 16 3834 CK Leusden NETHERLANDS 033-945848	Teacher. Will trade. Major interest echinoids. Has for trade mainly echinoids. Member N.G.V. (Dutch geological society). Wants to contact fossil- lovers to exchange fossil and recent echinoids.
Terry Sellari 5555 Pentail Cir Tampa FL 33625	
Kenneth A. Skeem 3220 W 4500 S Oasis UT 84650 801-864-2842	Farmer. Will trade. Major interest creation fossil correlations. Wants Permian belemnites & Permian wood. Has for trade trilobites, Genesis fossil kits, dinosaur bone, algae.
Jerry Rush 4124 Floral Ave. Norwood OH 45212 513-531-5047	Invertebrate fossil dealer/collector. Will not trade. Enjoys pondering the taphonomy and ecology of Paleozoic fauna.

PLEASE NOTE THE FOLLOWING CHANGES OF ADDRESS OR CORRECTIONS:

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West Point IA 52656-9209
319-837-6690

APPENDIX

COMMON COMANCHEAN AMMONITE GENERA

ADKINS (1928)	ARKELL AND OTHERS (1957	MODERN
Engonoceras	*?Knemicera*	*engonocerids*
Oxytropidoceras	*Oxytropidoceras (Oxytropidoceras)*	*Oxytropidoceras*
Oxytropidoceras	*Oxytropidoceras (Manuaniceras)*	*Manuaniceras*
Oxytropidoceras	*Venezoliceras*	*Venezoliceras*
Oxytropidoceras	*Oxytropidoceras (Adkinsites)*	*Adkinsites*
Hamites	*Idiohamites*	*Idiohamites*
Desmoceras	*Eopachydiscus*	*Eopachydiscus*
Elobiceras	?	*Craginites*
Pervinquieria and *Prohysteroceras*	?	*Drakeoceras*
Pervinquieria	*Mortoniceras*	*Mortoniceras*
Pervinquieria	*Mortoniceras*	*Pervinquieria*
Turrilites	*Mariella (Pleisioturrulites)*	*Mariella (Pleisioturrulites)*
Stoliczkaia	*Stoliczkaia*	*Stoliczkaia*
Budaiceras	*Budaiceras*	*Budaiceras*

The Mid-America Paleontology Society (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: One year from month of payment is $15.00 per household. Institution or Library fee is $25.00. Overseas fee is $15.00 with Surface Mailing of DIGESTS OR $25.00 with Air Mailing of DIGESTS. (Payments other than those stated will be pro-rated.)

MAPS meetings are held on the 1st Saturday of each month (2nd Saturday if inclement weather). October & May meetings are scheduled field trips. The June meeting is in conjunction with the Bloomington, IN, Gem, Mineral, Fossil Show & Swap. A picnic is held the fourth weekend in July. November through April (except February) meetings are scheduled for 1 p.m. in the Science Building, Augustana College, Rock Island, Illinois. The February meeting is held at Monmouth College, Monmouth, Illinois. One annual International Fossil Exposition is held in the Spring.

MAPS official publication, MAPS DIGEST, is published 9 months of the year--October through June.

CYATHOCRINITES

MID-AMERICA PALEONTOLOGY SOCIETY

Mrs. Sharon Sonnleitner
MAPS DIGEST Editor
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Dated Material - Meeting Notice

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