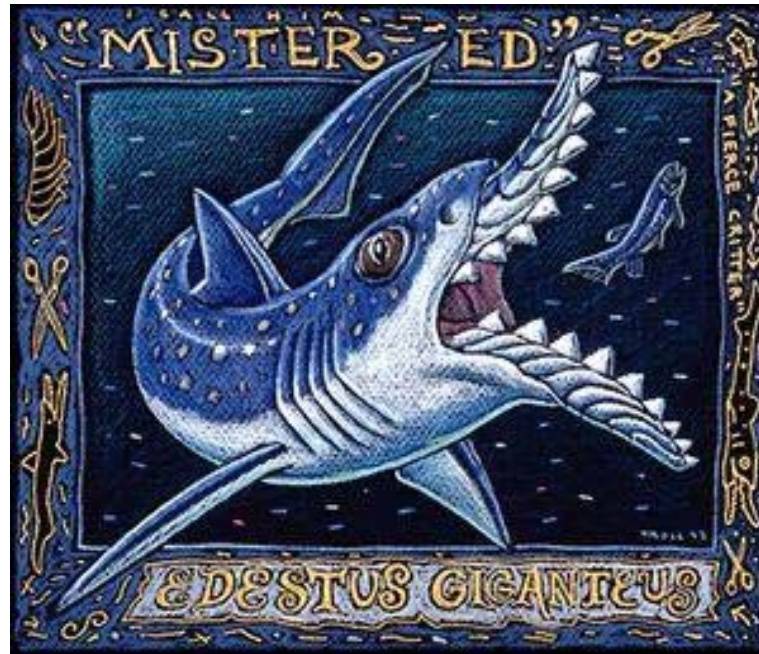


Fossil Sharks of the Rocky Mountains: *Ctenacanthus* and other Chondrichthyan Spines and Denticles



Wayne Itano, Boulder, Colorado
Karen Houck and **Martin Lockley**,
University of Colorado, Denver

Pennsylvanian Paleogeography

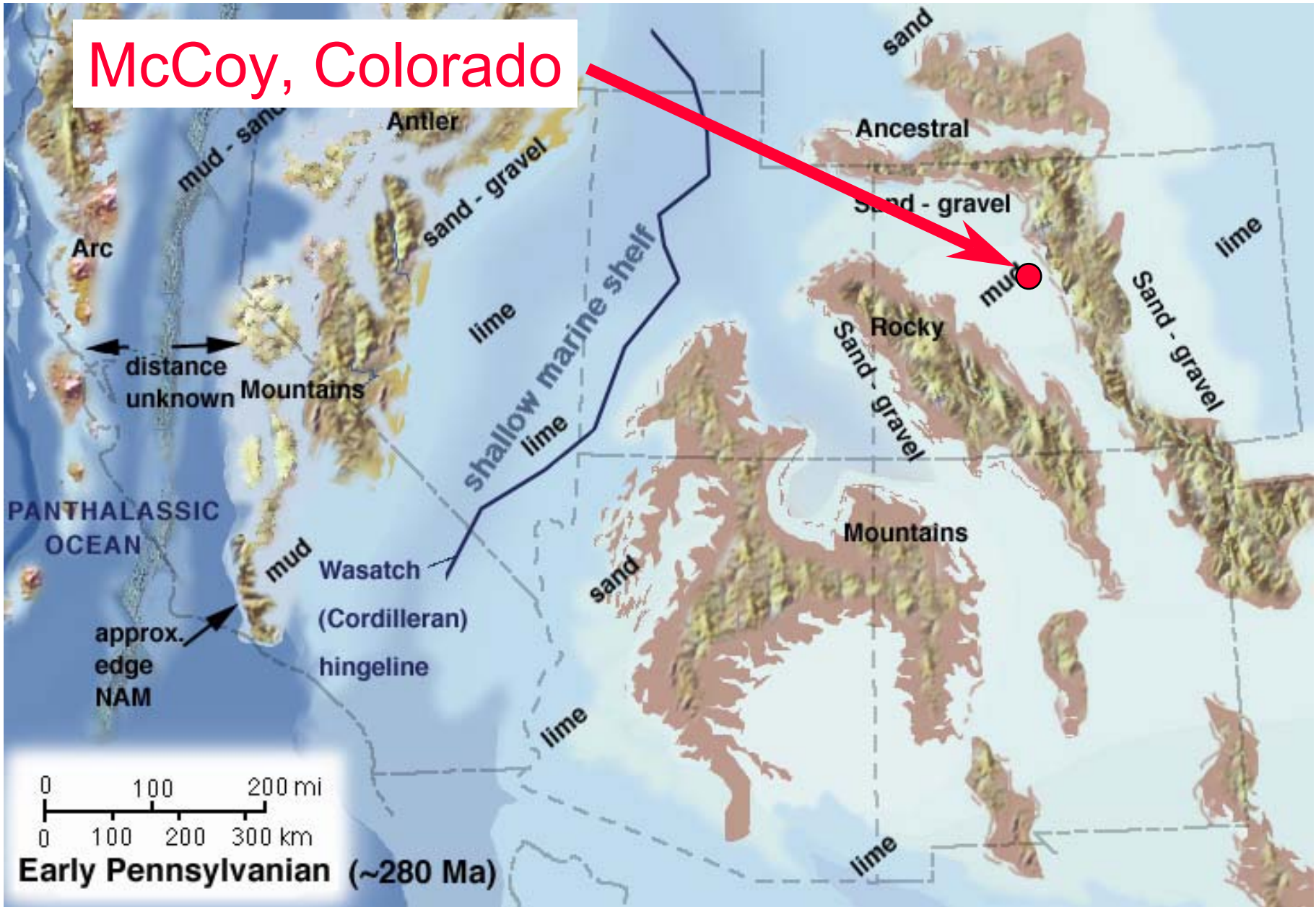


R. Blakey, Northern Arizona University

Southwestern US during the Pennsylvanian

(R. Blakey, Northern Ariz. Univ.)

McCoy, Colorado

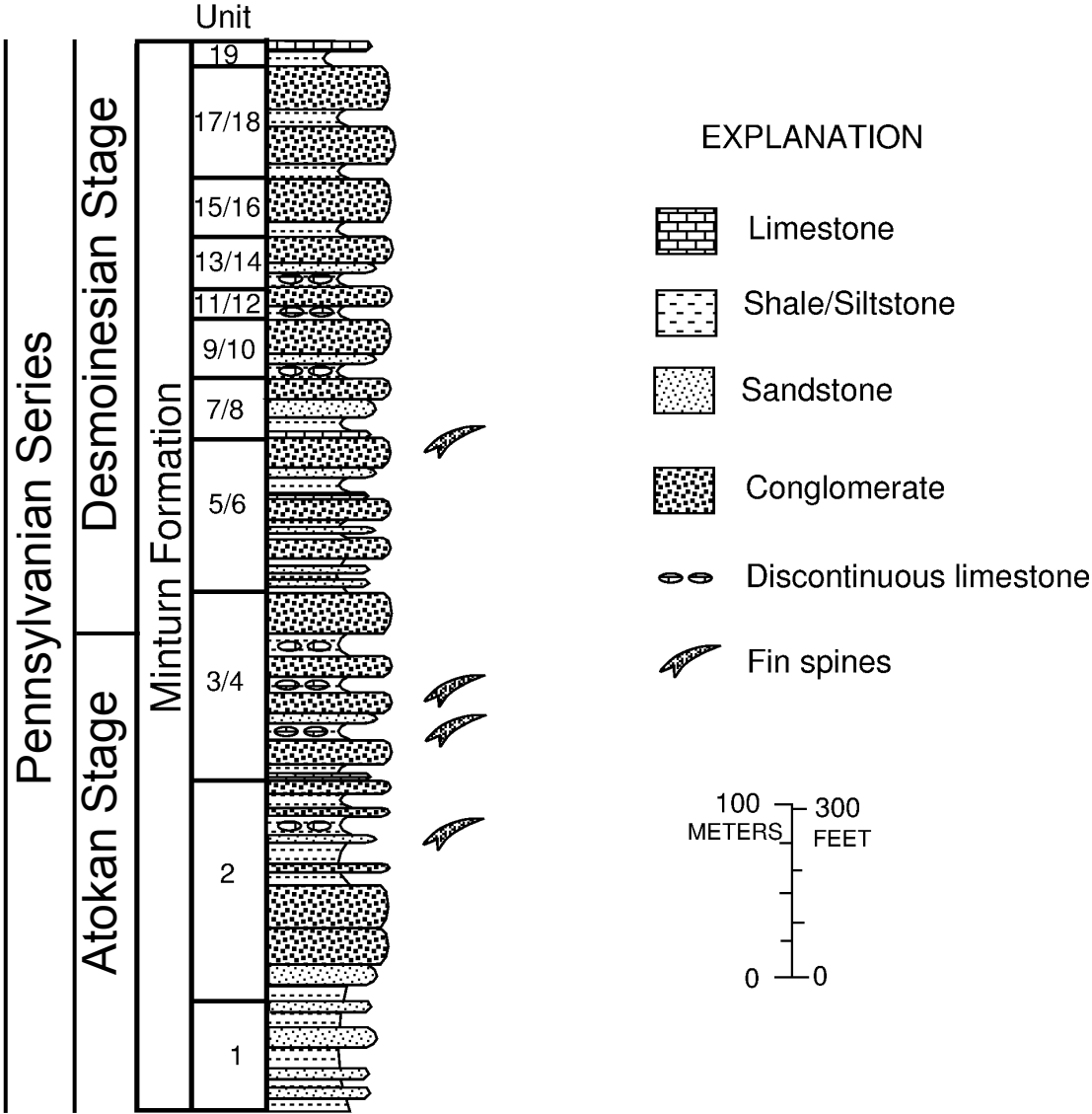


Minturn Formation, McCoy, Colorado



Stratigraphic Column of Minturn Formation at McCoy, Colorado

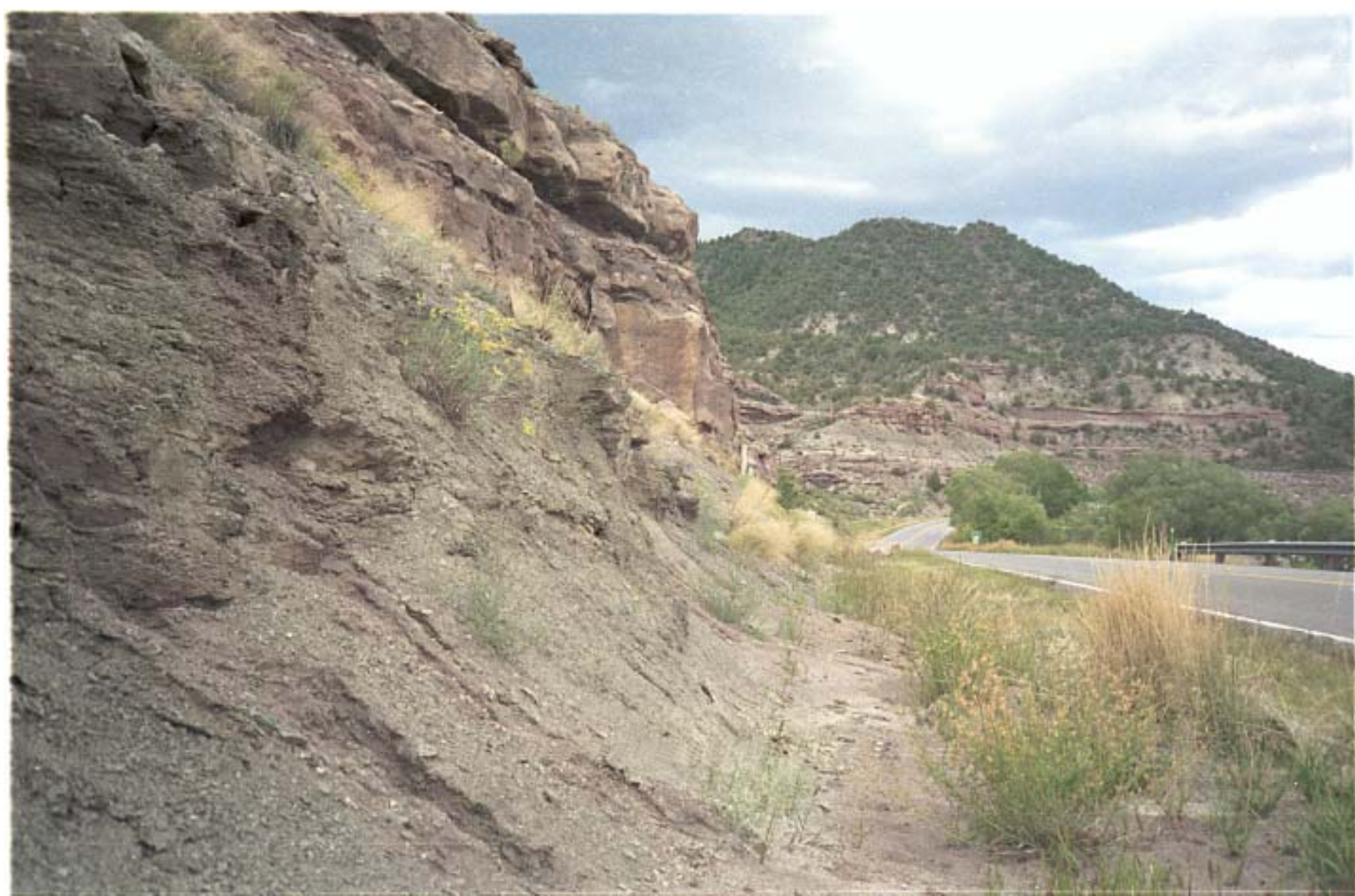
Approx 300 MYBP



Marine Limestone in Minturn Formation



Marine Shale in Minturn Formation



Finding the *Ctenacanthus* Finspine



August 10, 1991

***Ctenacanthus* sp., Minturn Formation,
Pennsylvanian (late Atokan),
Eagle County, Colorado**



← 18 cm →

A Modern Shark with Finspines: *Heterodontus*

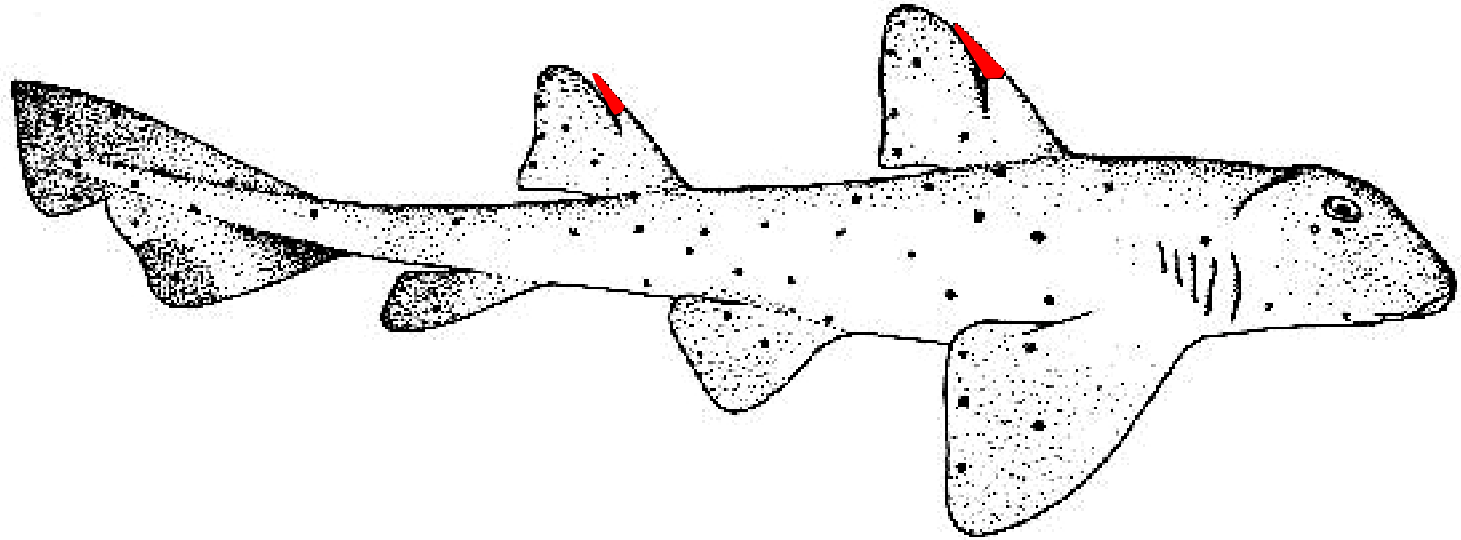
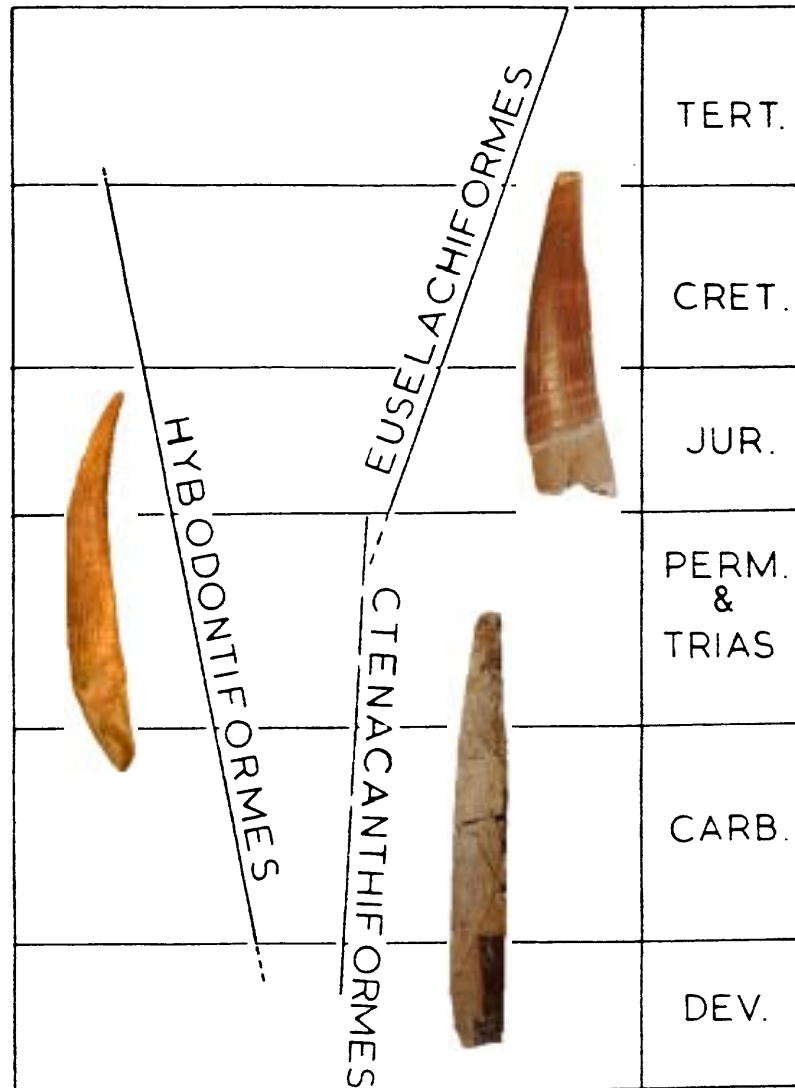


Image: P. O'vendon (c) Australian Museum

Geological Ranges and Possible Relationships of Spine-Bearing Sharks (Maisey, 1975)



A Ctenacanthiform Finspine

Ctenacanthus sp., Oklahoma, Pennsylvanian



Finely-noded (ctenacanthiform) lateral ribs

Posterior denticle rows along lateral margins



Flat to concave posterior face

A Hybodontiform Finspine

Hybodus sp., Morocco, Cretaceous

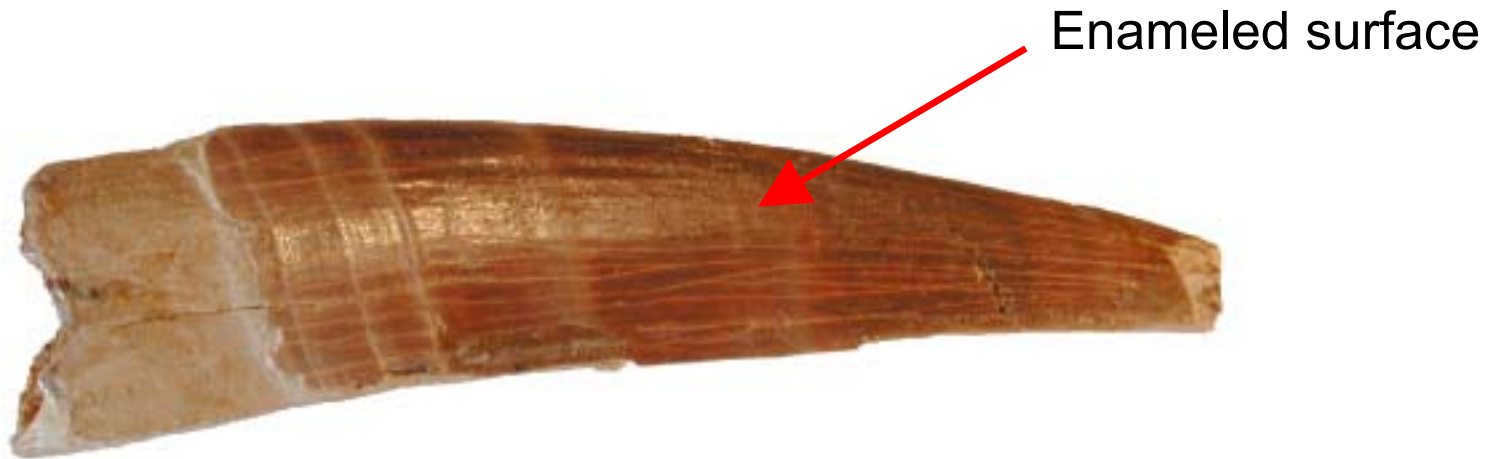


Posterior denticle rows
On posterior face



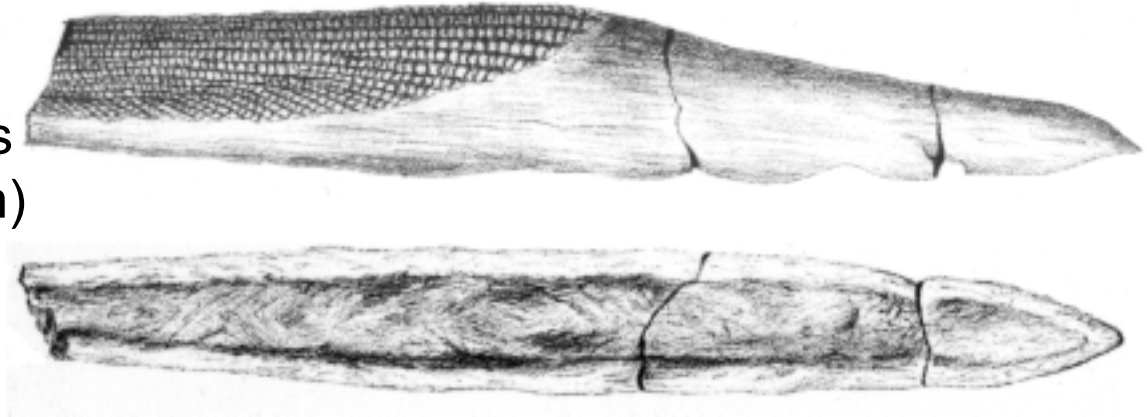
Convex posterior face

A Euselachiform Fin spine
***Heterodontus* sp., Russia, Cretaceous**



***Ctenacanthus buttersi* St. John & Worthen 1883**
Illinois, Pennsylvanian Pd., Desmoinesian Age

Type specimen, Illinois
(Only figured specimen)



Colorado specimen



***Ctenacanthus buttersi* syntype specimen,
Illinois, (Smithsonian Museum)**



Convex posterior face, no posterior denticles

Used in original description, but not previously figured. NMNH16034

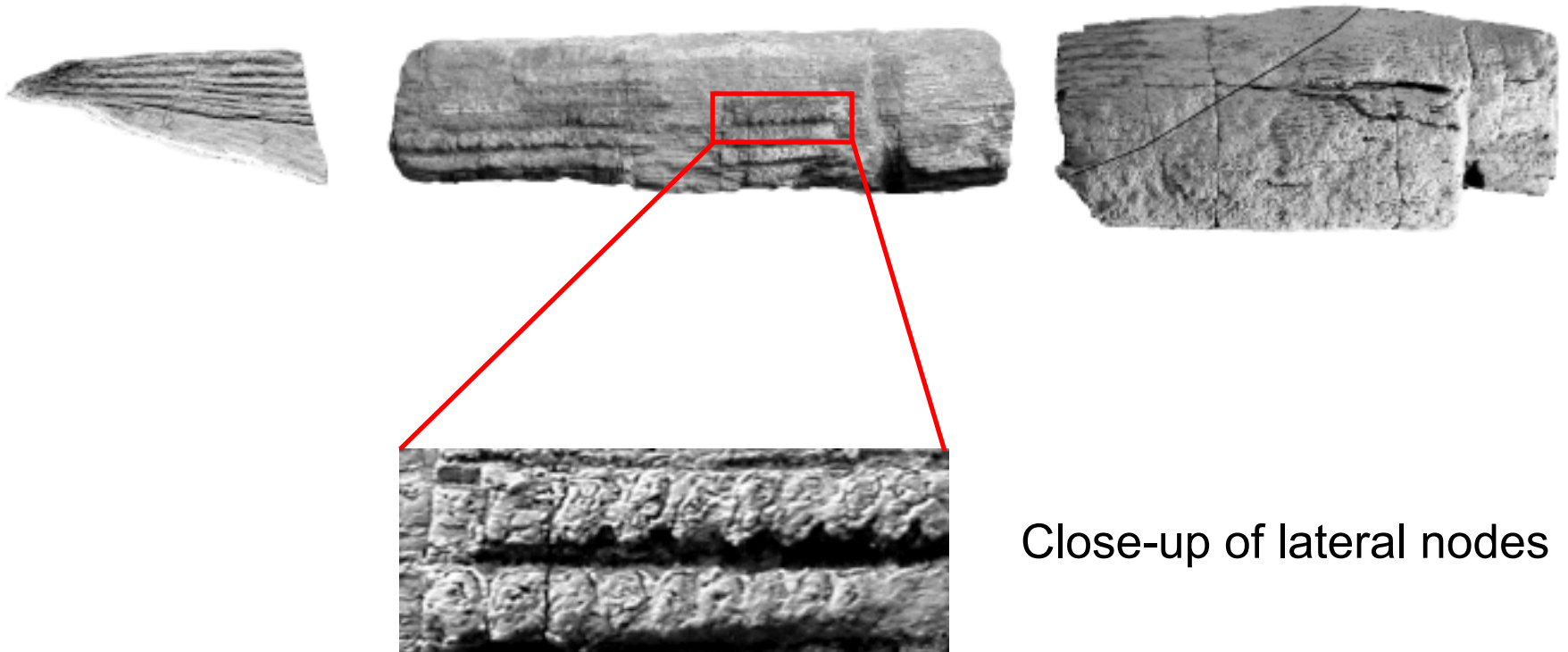
Other *Ctenacanthus buttersi* specimens from McCoy, Colorado



Convex posterior face



***Ctenacanthus* sp. Specimens from
Gray Mesa Fm., New Mexico, Pennsylvanian Pd.
(Lucas & Estep, 2000)**



Close-up of lateral nodes

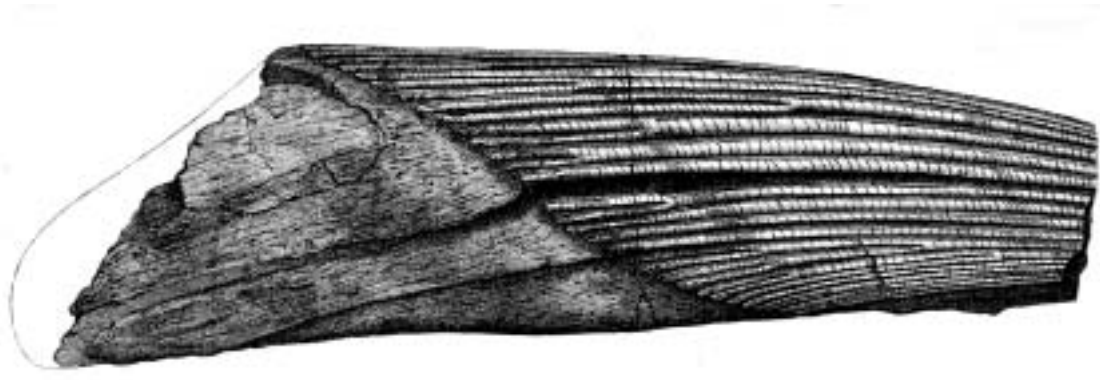
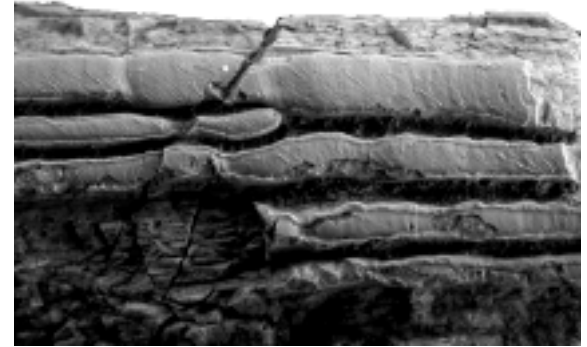
Composite *Ctenacanthus buttersi* Finspine



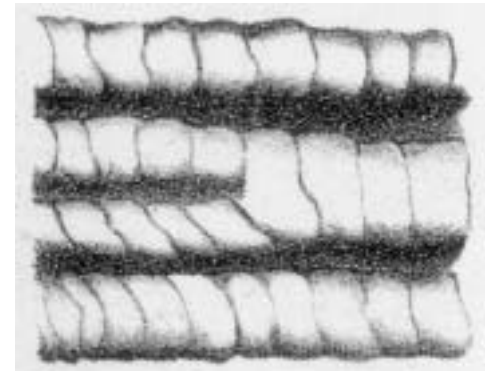
Cf. "*Ctenacanthus*" *furcicarinatus* Newberry



Colorado specimen

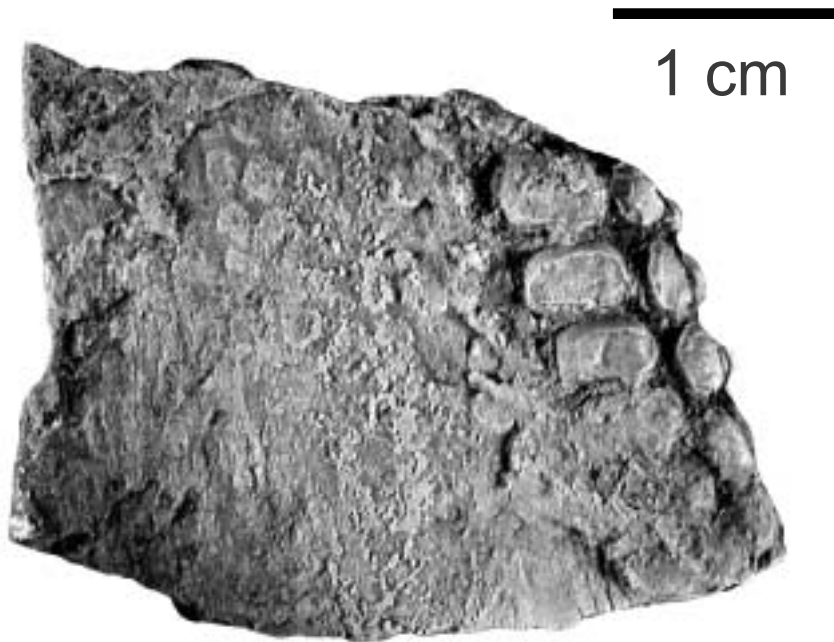


"*Ctenacanthus*" *furcicarinatus*
Kentucky (Mississippian)

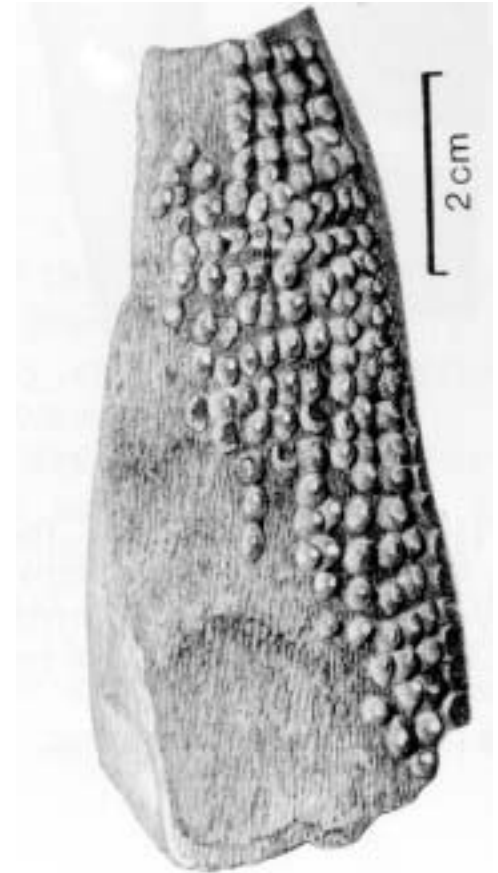


Close-up of ribs

Bythiacanthus sp. 1



Colorado specimen



Bythiacanthus siderius Leidy
Tennessee (Mississippian)

Bythiacanthus sp. 2



Colorado specimen

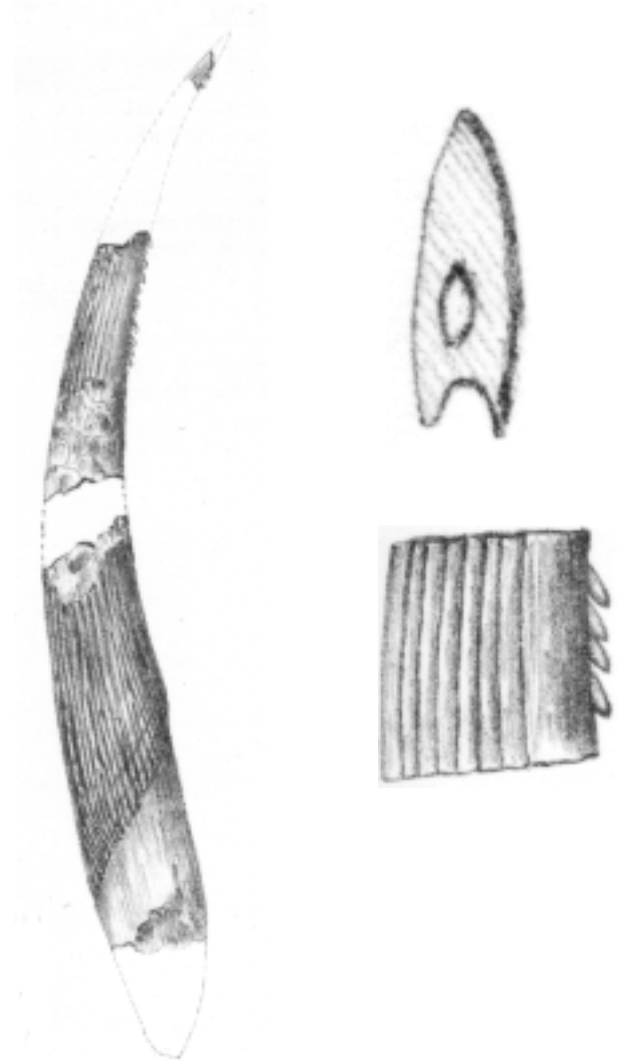


Bythiacanthus solidus Eastman
Iowa (Mississippian)

Acondylacanthus nuperus St. John & Worthen



Colorado specimen

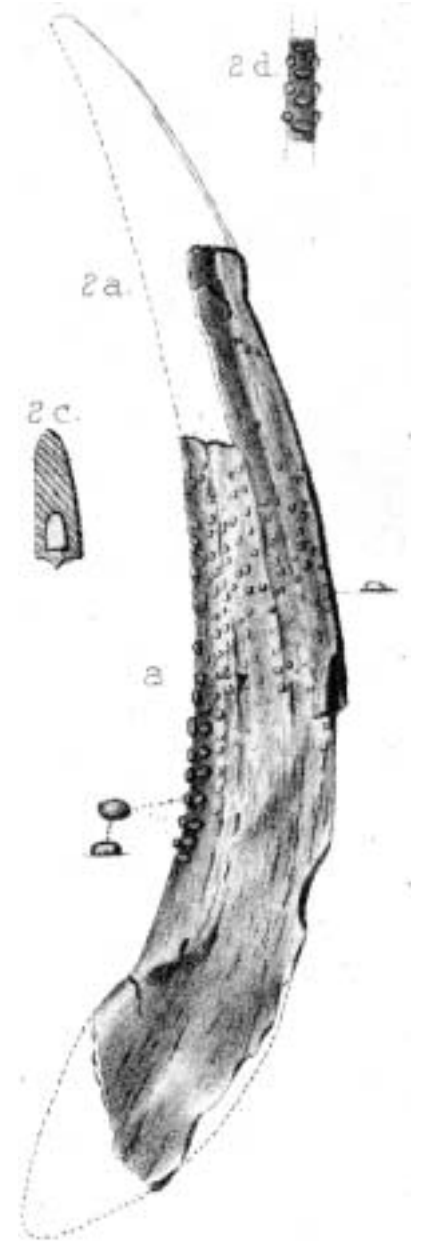


Acondylacanthus nuperus
Illinois (Pennsylvanian)

Physonemus sp.?



1 cm

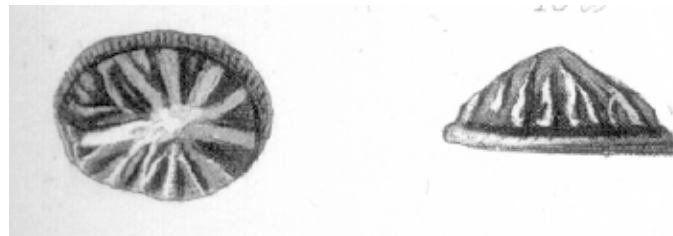


Physonemus acinaciformis

Petrodus patelliformis M'Coy



5 mm

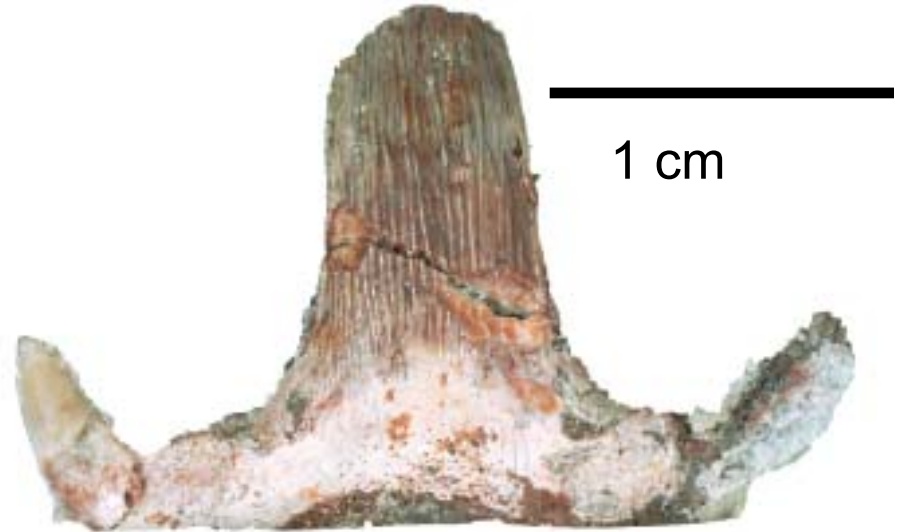


Petrodus patelliformis

“Cladodus” occidentalis Leidy
[Not *Symmorium reniforme* Cope]



1 cm



1 cm

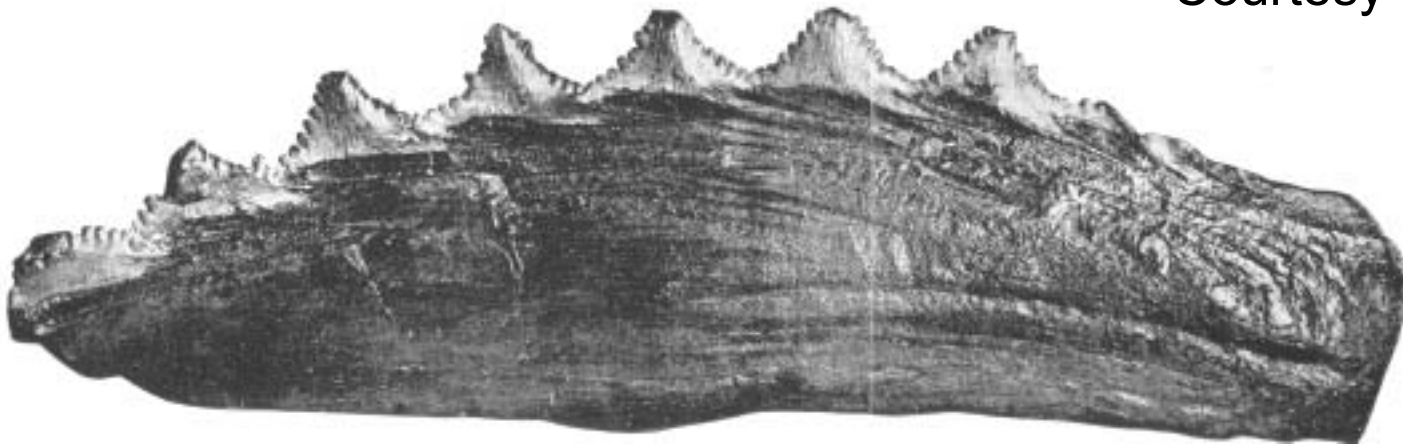
Edestus sp.



1 cm



Courtesy of R. Troll



Edestus heinrichsi

Conclusions

- The Minturn Formation chondrichthyan assemblage, comprising 6 spines and a similar number of teeth, is the most diverse reported from the Pennsylvanian of the Rocky Mountain region
- Most taxa are known from elsewhere in North America (at least at the genus level), though not always from the Pennsylvanian
- It is now possible to reconstruct the entire finspine of *Ctenacanthus buttersi*
- “*Cladodus*” *occidentalis* teeth may be associated with *Ctenacanthus buttersi* finspines

Acknowledgments

Specimens

- Bill Bateman
- Helen Dyer
- Doug Nelson
- Jordan Sawdo
- Steve Thompson

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- Spencer Lucas (New Mexico)

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- John Maisey

Graphics

- Ron Blakey
- Ray Troll