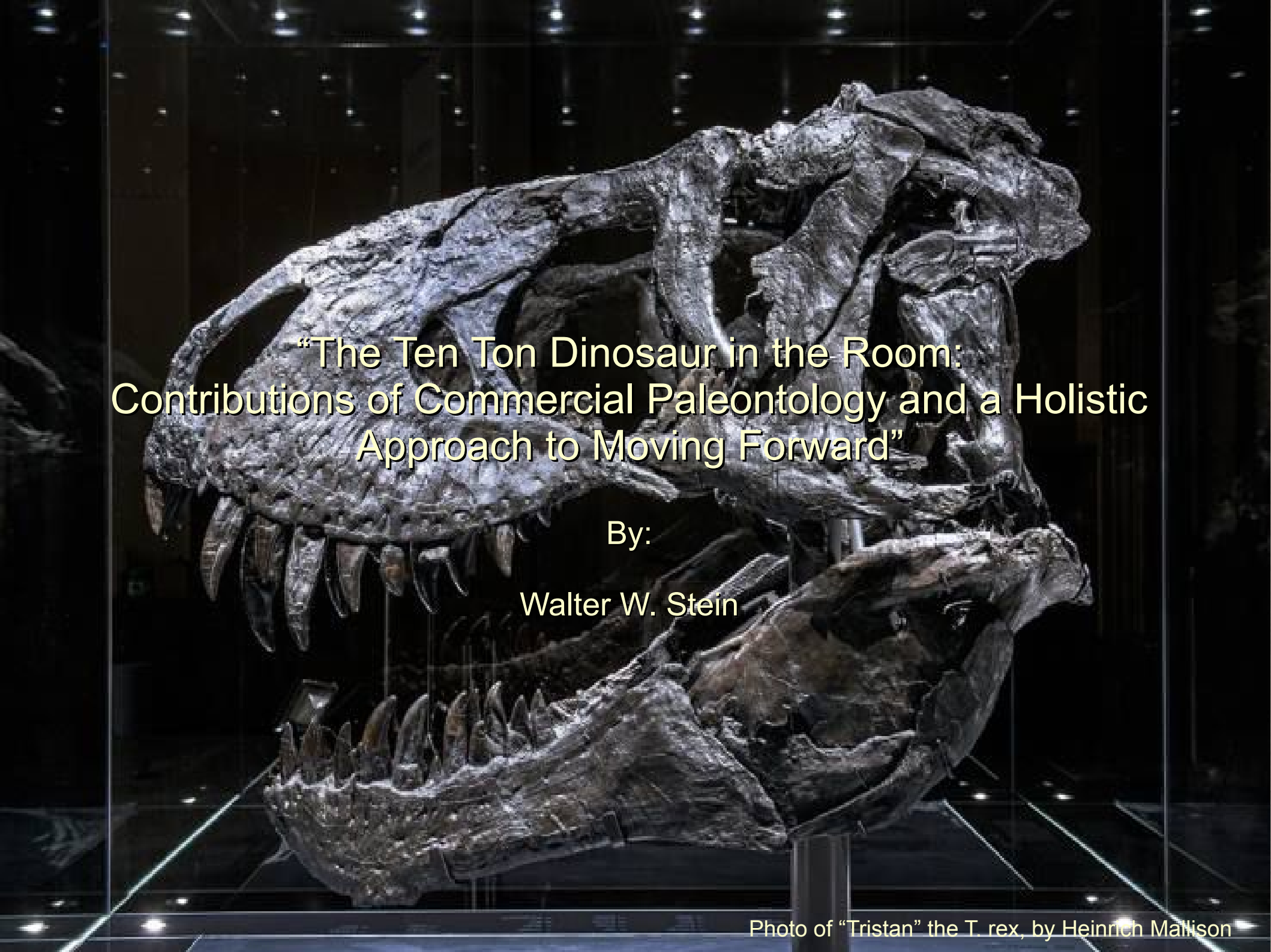

# "The Ten Ton Dinosaur in the Room: Contributions of Commercial Paleontology and a Holistic Approach to Moving Forward"

By:

Walter W. Stein

Photo of "Tristan" the T. rex, by Heinrich Mallison

# Commercial Paleontology's Bad Image Problem

LOCAL

## Gainesville man pleads guilty to smuggling dinosaur fossils

**Skeleton sold for over $1 million; man faces up to 17 years in prison**

Posted: 5:50 PM, December 28, 2012
Updated: 5:50 PM, December 28, 2012

## ThinkGeek selling fossils illustrates the problems of selling fossils

artiofab
11/02/14 4:32pm · Filed to: FOSSILS

39.8K 117 33

Update Note: no longer an active sale, apparently because ThinkGeek has sold all the items they purchased.

So ThinkGeek, for maybe a week and a half or so, has offered up this item for sale.

Read more thinkgeek.com

## Dinosaur Skull Purchased by Nicolas Cage to Be Returned to Mongolia

By GENEVA SANDS · Dec 22, 2015, 4:42 PM ET

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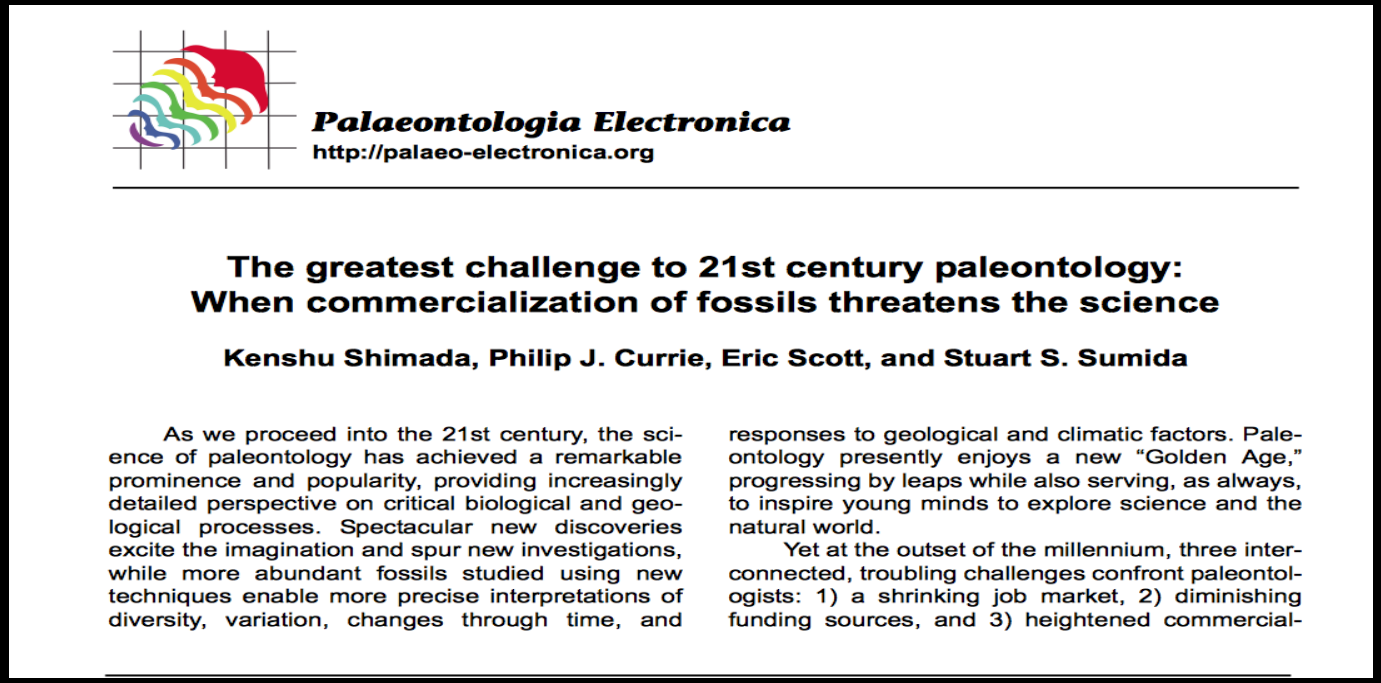
US & Canada US Election 2016


## US fossils dealer jailed for dinosaur smuggling

4 June 2014 | US & Canada

- Recent high profile auctions leading to the rise in prices for fossil specimens.
- Recent illegal imports and exports.
- Hoaxes and Forgeries.
- Vandalism of specimens known from public lands.

# The “Greatest...Threat” to the Science of Paleontology?



*Palaeontologia Electronica*
http://palaeo-electronica.org

**The greatest challenge to 21st century paleontology: When commercialization of fossils threatens the science**

**Kenshu Shimada, Philip J. Currie, Eric Scott, and Stuart S. Sumida**

As we proceed into the 21st century, the science of paleontology has achieved a remarkable prominence and popularity, providing increasingly detailed perspective on critical biological and geological processes. Spectacular new discoveries excite the imagination and spur new investigations, while more abundant fossils studied using new techniques enable more precise interpretations of diversity, variation, changes through time, and responses to geological and climatic factors. Paleontology presently enjoys a new “Golden Age,” progressing by leaps while also serving, as always, to inspire young minds to explore science and the natural world.

Yet at the outset of the millennium, three interconnected, troubling challenges confront paleontologists: 1) a shrinking job market, 2) diminishing funding sources, and 3) heightened commercial-

Since the 1970's there has been a “war” of words and philosophies between the academic and commercial branches of paleontology. What originally began as a turf war over fossil collecting grounds has now escalated into vast differences in opinions over the best uses of fossils and the best methods for preserving and protecting them.

There are many valid reasons and justifications for this conflict. Both sides have logical points that need to be addressed.

Unfortunately, the rhetoric has recently escalated and has become very dangerous.

Avocational groups are often caught in the middle of this “war”.

I would argue that commercialization and sales of fossils does not need to be a threat (if done ethically and managed correctly).

To bring the parties together and help release the full potential of our entire paleo community, we must dispel certain misconceptions about commercialism, understand its beneficial historical contributions and then understand the complex needs of each branch of our community.

# *Paleontology* is... The study of ancient life

Primary motivation...

For Knowledge

ACADEMIC PALEONTOLOGY

For Recreation

AVOCATIONAL PALEONTOLOGY

For Commerce

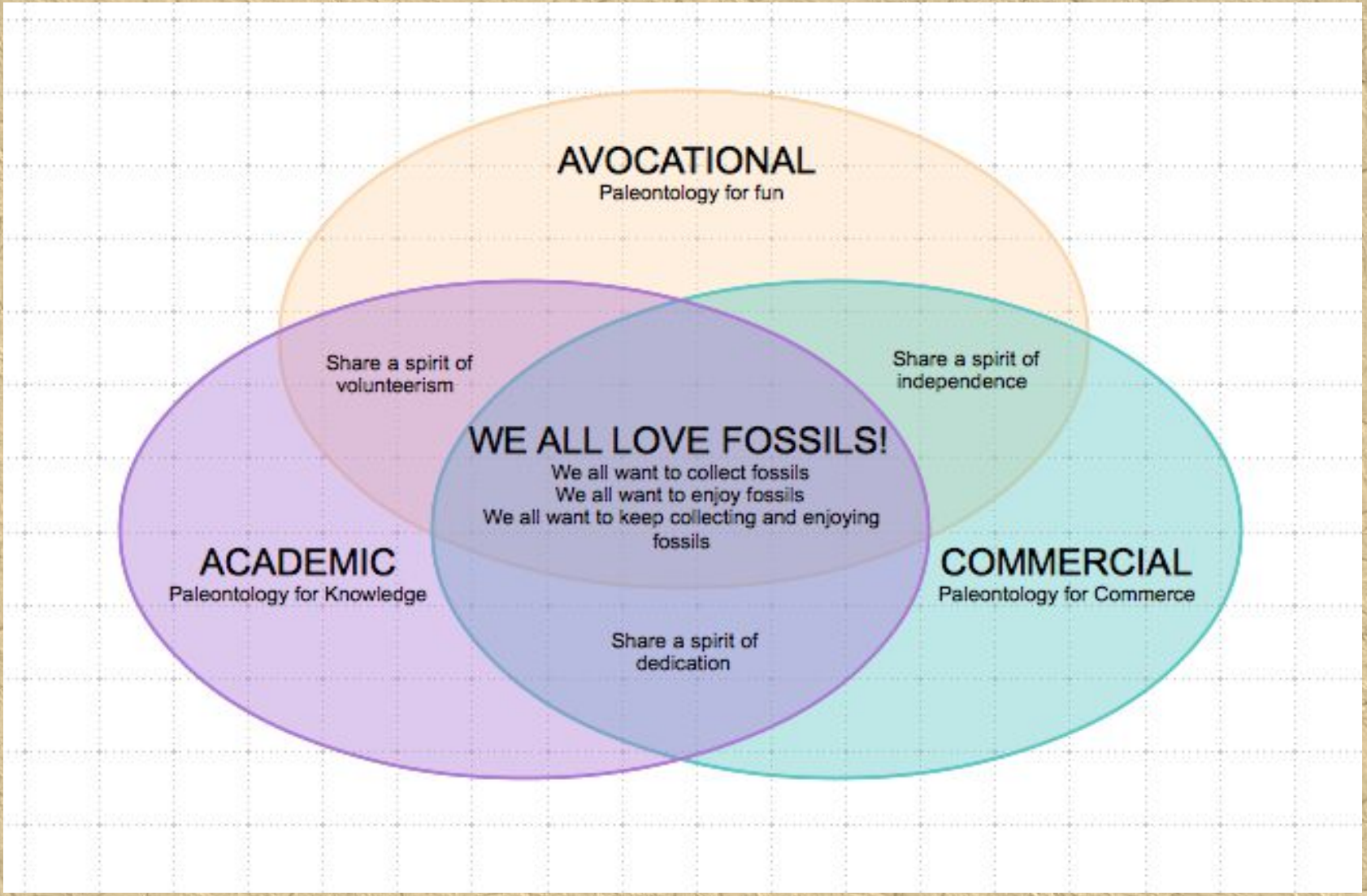
COMMERCIAL PALEONTOLOGY

These are NOT mutually exclusive concepts.

# Branches of our Community Compared

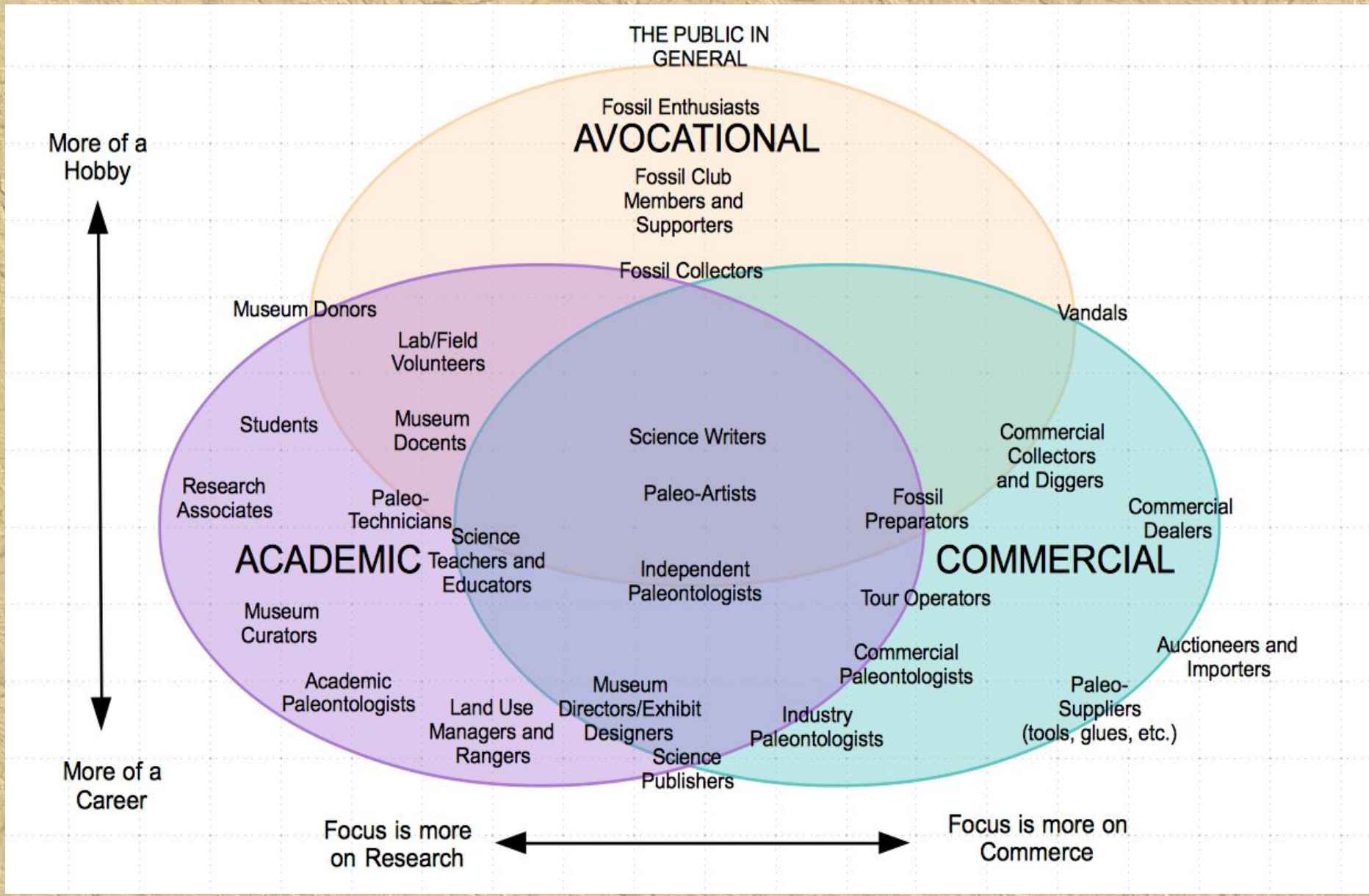
| | ACADEMIC | AVOCATIONAL | COMMERCIAL |
|---|---|---|---|
| Employment | Public and private museums and universities | Not “employed” in paleontology | Private companies and private museums |
| Full or Part Time Paleo involvement | Generally Full time | Part time casual | Full or part time |
| Main Focus | Research and education | Field collection | Field and Lab |
| Training | Extensive formal training | Self taught, but May have some formal training | On the job training, but may have some formal education |
| Funding | University/Museum salaries supported by grants and scholarships | Self funded through other career | Self funded through sales and services |
| Strengths | Well trained and well organized | Enthusiasm | Hard work |
| Weaknesses | Often poorly funded with limited time/manpower | Often disorganized | Lack of formal training Not accepted by mainstream |

# But...We ALL Love Fossils




Aren't we all really shooting for the same things? To not only do something that is incredibly fun, for the benefit of science and education, but also figure out a way to support that work financially?

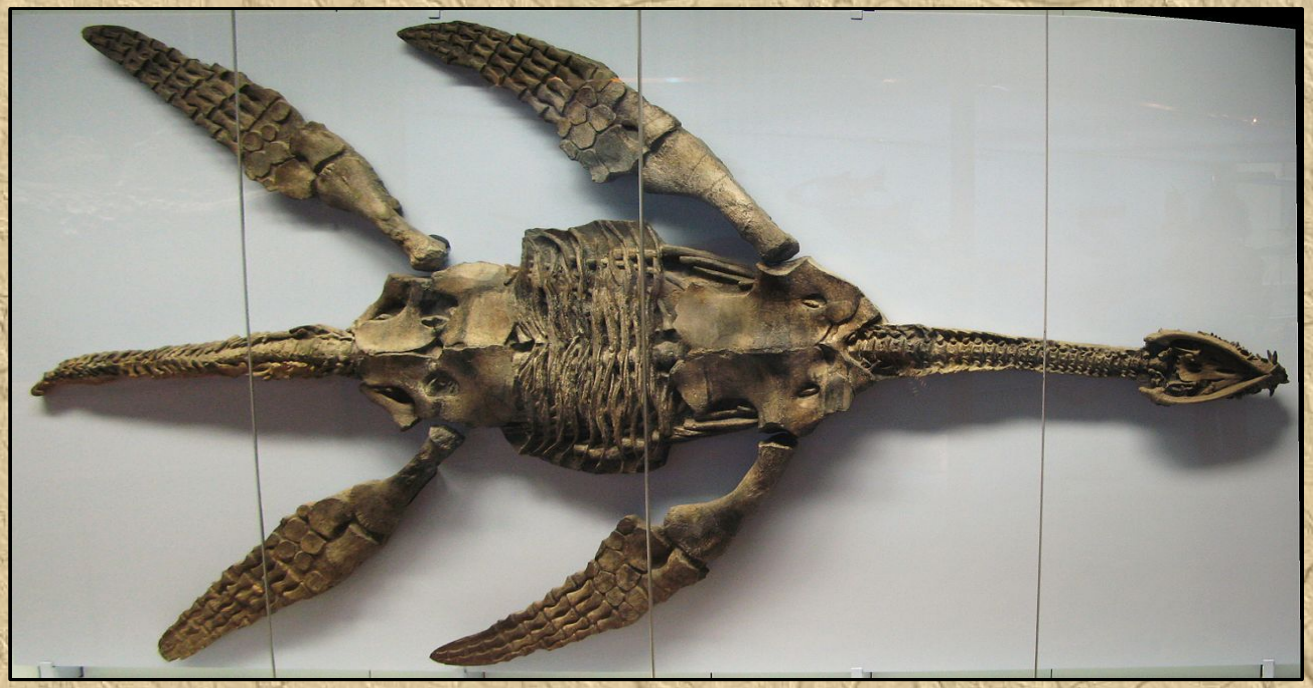
# Where Are You in the Paleo-Community?



# The Contributions of Commercial Paleontology in Ancient Cultures

- Commercial paleontology has had a long and beneficial history that, in many ways, pre-dates the formal study.
- Fossils were often bartered and sold as items of curiosity, for their aesthetic beauty, or as building and ornamental stones, throughout ancient times in various cultures. They had an intrinsic value.
- Fossils were bought, traded, and stolen as prizes of war by Greek, Roman, Byzantine, Egyptian empires. (Mayor, 2000).
- Evidence suggests that people have been discovering, buying and selling fossils throughout China and India in ancient times.
- The vast majority of these early discoveries were accidental, done by peasants, farmers, merchants, quarrymen and stone masons...

# The Posidonia/Holzmaden Shale

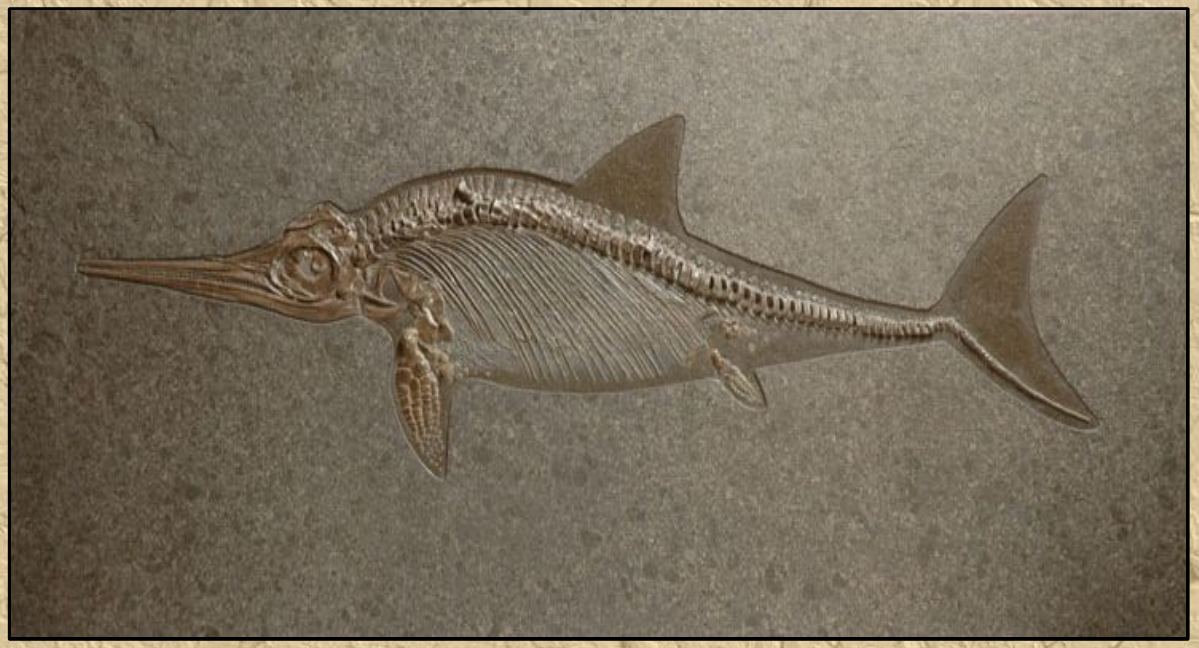


- Fossils from the Posidonia Shale of Holzmaden, Germany were quarried and commercially sold as early as 1668 (Larson et. al., 2014).
- This includes thousands of Early Jurassic marine invertebrates and vertebrates including marine reptiles, pterosaurs, fish, crinoids and ammonites.
- Many of these specimens were sold to universities and museums and form the bulk of important research such as Martil (1993), Maisch (1998), Arratia et al. (2001) and Grossman (2007).

# Early Posidonia/Holzmaden Shale Quarries in Germany

- Bernard Hauff grew up working in his fathers shale quarry during the mid 1800's and really took an interest in the fossils there. He perfected a technique for fossil preparation and much of his collections were purchased by museums. (Selden and Nudds, 2004)

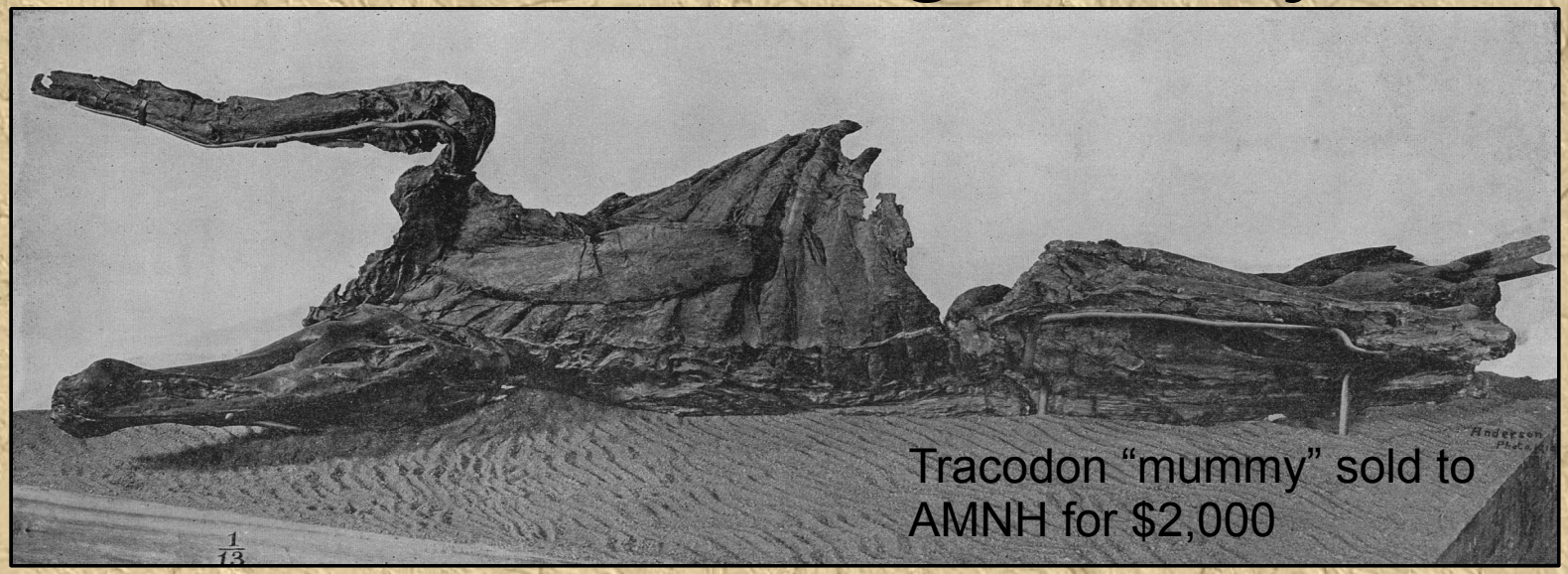
# Jurassic Fossil Discoveries



# Solnhofen Lithographic Limestone

- The Late Jurassic lithographic limestone in Germany has been commercially mined for centuries. Miners frequently encountered fossils and sold them to supplement their income. (Larson et. al., 2014)
- ALL thirteen known specimens of *Archeopteryx* were discovered by commercial or amateur interests and most sold or donated to museums (Ostrom, 1985; Barthel et. al. 1990)
- In 1861, the first specimen of Archeopteryx was sold to the British Museum of Natural History for a sum of 700 pounds. This would be equivalent to around $74,000 dollars today (Barthel et al, 1990).
- The most accessible *Archeopteryx* specimen to date is actually privately owned and on display at the Wyoming Dinosaur Center (Larson and Russell, 2014).

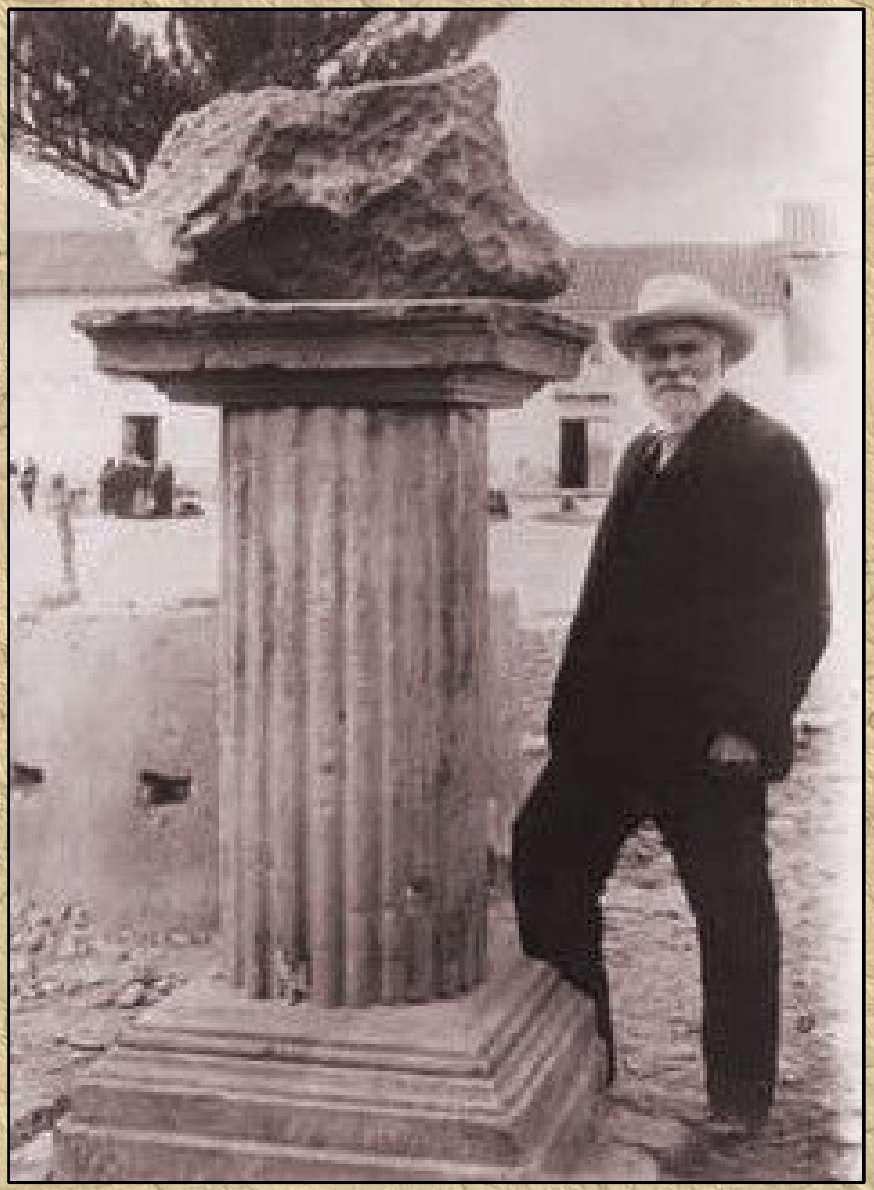
# The Sternberg Family




- The Sternberg family of fossil hunters included the father Charles H and his three sons, Charles M., George F., and Levi. Charles H. worked for E.D. Cope during the “Great Bone Wars”.
- Extraordinarily successful fossil hunters that began hunting in the chalks of Western Kansas in the 1870's and then moved on to dinosaurs in WY, MT, and Canada.
- George F. went on to publish over 45 papers in paleontology with nothing more than a KS high school diploma. Later given honorary doctorates. Help found Dinosaur Provincial Park.

# Wards Natural Science

- Founded by Henry Augustus Ward in Rochester , NY
- Has been selling common fossils for educational purposes since 1862
- Many high school and grade school fossil collections were originally purchased through this company and others like them
- Most of my clients are educators, club members and families with children that want to be paleontologists.



# The Green River Formation

- Originally discovered in the 1850's by various explorers, railroad workers and pioneers.
- Ancient Eocene lake deposit with millions of fossil fish (at least 20 species to date). Rare complete specimens of mammals, reptiles, fish, insects, plants, etc.
- First commercially quarried in the late 1870's by various groups. Including A. Shoomaker (Who sold to Marsh at the Yale Peabody Museum), “Pap” Wheeler, and Chas “Stovepipe” Smith. (Grande, 2013)
- Today numerous commercial groups operate pay-to dig quarries on leased State land and private land around Kemmerer, WY.
- These activities have produced hundreds of thousands of new specimens for science, educational purposes, tourism, and commerce.
- It has been a great benefit to the local communities and to SCIENCE!

# Amazing Green River Preservation


# Mary Anning and the Women of Commercial Paleontology

Commercial paleontology has been a gateway to the sciences for many women including the famous Mary Anning. Anning was a well known British fossil collector during the early 1800's who sold much of her finds to museums.

Marion Brandvold the discoverer of "Egg Mountain"

Ruth Mason was only 7 years old when she discovered a huge bone bed of *Edmontosaurus*.

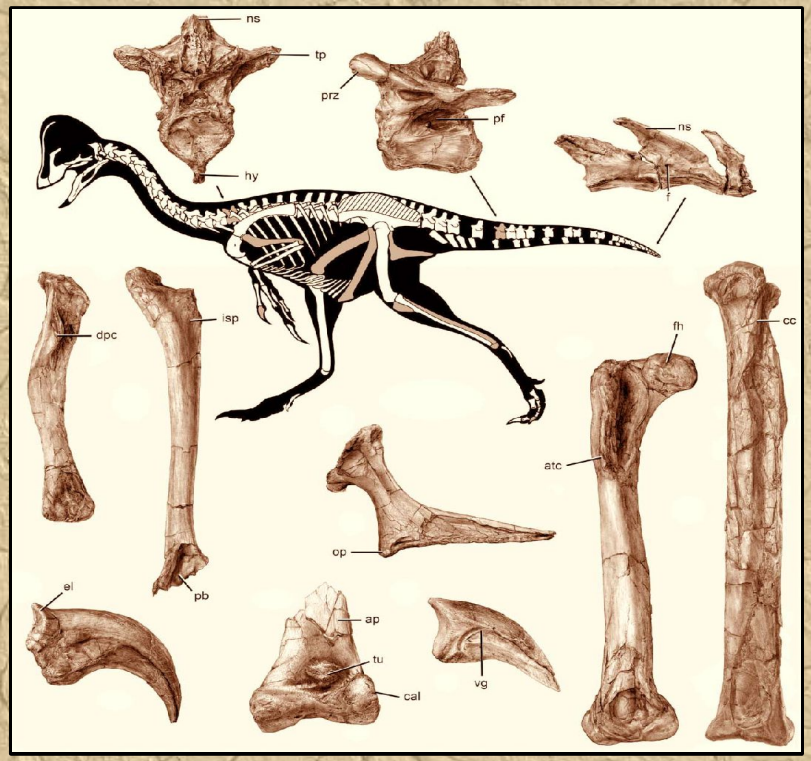
Mary Ann Licking was another local, South Dakota, rancher interested in dinosaurs. While hiking she came across what would become known as the Tooth Draw Quarry

# Sue the *Tyrannosaurus rex*

Sue Henrickson- discoverer of the best Tyrannosaurus to date

- From 1902-1990 there were only 12 known partial skeletons of Tyrannosaurus rex and the vast majority of them were less than 25% complete.
- After the discovery and auction of Sue, we now have nearly 60. Of these, well over half, were found by commercial paleontologists, amateur fossil collectors or ranchers. Our knowledge of this amazing animal and its habitat have greatly improved.
- Because of that “commercial incentive”, ranchers that used to ignore those bones now actively look for them. And when you look... you find.

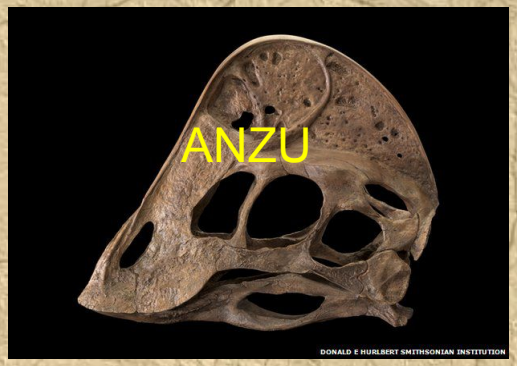
# New Dinosaur Taxa




*Anzu Wyleii- aka "The Chicken from Hell" . Found by Fred and Candy Nuss of Nuss Fossils in 1998. Excavated, documented, prepared, restored and cast by Triebold Paleontology Inc. Sold to the Carnegie Museum in 2004. (Lamana et. al., 2014)*

- Thanks to the efforts of commercial collectors and paleontologists in the USA, multiple new taxa have been discovered, researched and named. Science has been the beneficiary of these discoveries.
- My colleagues and I spent nearly four years working on the two specimens of Anzu. Several thousand man-hours of labor went into their collection, documentation, preparation, restoration and molding and casting.
- This is a great example of how academia and commercial worked TOGETHER to bring this animal into the light of scientific understanding.

# New Dinosaur Taxa

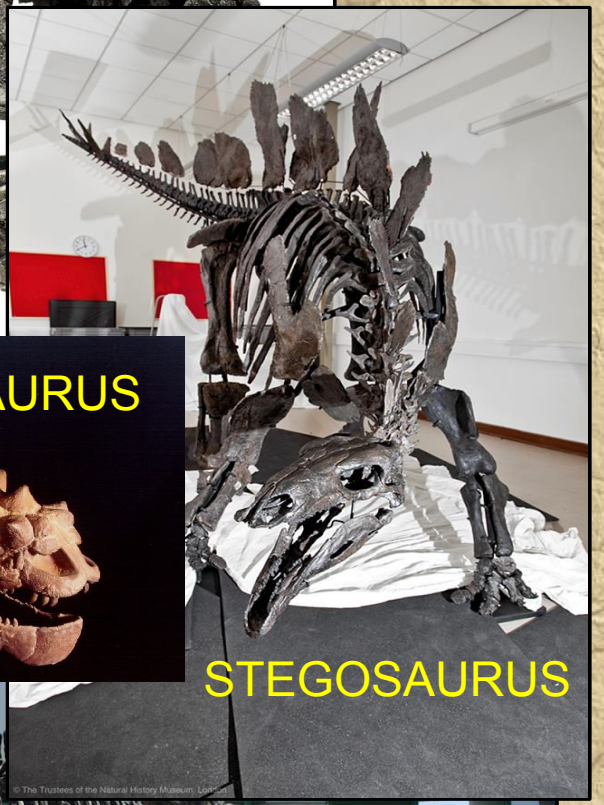




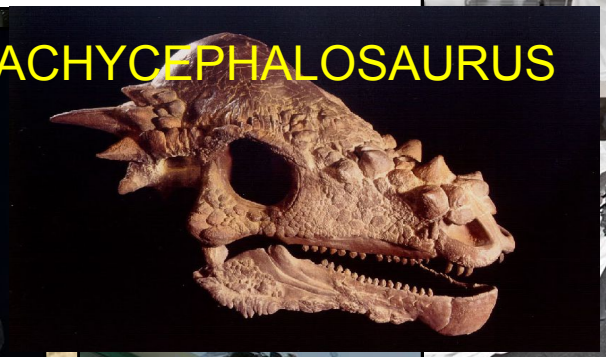



# New Specimens- Some of the “Best” Specimens of Existing Taxa











# Partial List of Commercial Contributions Courtesy of Association of Applied Paleontological Sciences (AAPS)

(Winters et. al., 2014)

## Fossil Specimens Placed in Museums and Universities by Commercial Paleontology

Independent Paleontologists have a long history of providing new and important specimens to museums and universities around the world. Beginning in the late 1700 with Mary Anning and her brother, then in the late 1800s and early 1900s with the Sternberg family, who collected in the western United States and Canada, and placed hundreds of specimens in major museums and universities such as the University of Kansas. The specimens they collected, prepared, mounted and described can still be seen on display today. The tradition of commercial paleontology supplying original fossils for study that the Sternberg family started, continues today with companies such as the Black Hills Institute of Geological Research, Triebold Paleontology, Canada Fossils, Western Paleo Labs, Wards Science, Geological Enterprises and dozens of other companies.

This list is just the tip of the iceberg and a work in progress. Companies such as Canada Fossils and sister company Korite International alone have donated over 900 specimens to just the Royal Tyrrell Museum. These lists do not include the sale or donation of replica skulls and skeleton's to museums for display, Specimens listed are original fossils. Please use the following links to visit specific classifications of specimens, Plants, Invertebrates, Fish, Dinosaurs, Birds, and Mammals.

For additional information on any of the specimens listed, please contact the collections manager of the institutions posted wi the specimen.

### Dinosaurs and Reptiles

| Genus/Species | Repository | Company | Date of Discovery | Reference |
|---|---|---|---|---|
| *Afairiguana avius* skeleton | FMNH Chicago, IL, U.S.A. | Warfield Fossil Quarries | Purchase | Paratype FMNH PR2379 Conrad, Jack L., Olivier Rieppel, and Lance Grande. "A Green River (Eocene) polychrotid (Squamata: Reptilia) and a re-examination of iguanian systematics." *Journal Information* 81.6 (2007). |
| *Albertosaurus sp.* skeleton | Museum of World Treasures Wichita, KS, U.S.A. | Triebold Paleontology | Purchase | |
| *Allosaurus fragilis* "Big Al Two" skeleton with skull | Sauriermuseum Aathal (SMA) Switzerland | Siber & Siber | 1996 Donation | SMA 0005 in progress |
| *Anzu wyliei* 2 partial skeletons | CMNH Pittsburgh, PA, U.S.A. | Nuss Fossils with Triebold Paleontology | Purchase | Holotype CM 78000 Lamanna, Matthew C., et al. "A New Large-Bodied Oviraptorosaurian Theropod Dinosaur from the Latest Cretaceous of Western North America." *PloS one* 9.3 (2014): e92022. |
| *Apatosaurus sp.* "Max" | Sauriermuseum Aathal (SMA) Switzerland | Siber & Siber | 1995 Donation | SMA 0011 |

# And the list goes on and on...

| | | | | |
|---|---|---|---|---|
| *Camarasaurus sp.*<br>"E.T."<br>skeleton | Sauriermuseum Aathal (SMA)<br>Switzerland | Siber & Siber | 1993<br>Donation | |
| *Camptosaurus sp.*<br>skeleton | BYU<br>Provo, UT, U.S.A. | Western Paleontological Laboratories | Donation | |
| *Camptosaurus dispar*<br>"Arky"<br>skeleton with skull | Sauriermuseum Aathal (SMA)<br>Switzerland | Siber & Siber | 2006<br>Donation | SMA 0265 |
| Ceratopsian<br>various bones | Royal Ontario Museum<br>Toronto, ON, Canada | Triebold Paleontology | Purchase | |
| Ceratopsian<br>squamosal (possable new species) | Royal Ontario Museum<br>Toronto, ON, Canada | Triebold Paleontology | Purchase | |
| *Champsosaurus sp.*<br>WILMA | Royal Ontario Museum<br>Canada | Canada Fossils | Purchase | |
| *Champsosaurus sp.*<br>skeleton | Fukui Prefectural Dinosaur Museum<br>Fukui, Japan | Triebold Paleontology | Purchase | |
| *Chasmosaurus sp.*<br>LEONA - Adult | Fukui Museum<br>Fukui, Japan | Canada Fossils | Purchase | |
| *Clidastes sp.*<br>skeleton | National Museum<br>Wales | Geological Enterprises through BHIGR | Purchase | |
| *Diplodocus sp.*<br>"H.Q. One"<br>skeleton | Sauriermuseum Aathal (SMA)<br>Switzerland | Siber & Siber | Donation<br>1990/91 | SMA 0003<br>Schwarz D., Frey E., Meyer CA. (2007):Pneumaticity and soft-tissue reconstructions in the neck of diplodocid and dicraeosaurid sauropods. *Acta Palaeontontologica Polonica*. 52: 167-188 |
| Diplodocid (undescribed)<br>early juvenile<br>skeleton without skull | Sauriermuseum Aathal (SMA)<br>Switzerland | Siber & Siber | 2000<br>Purchase | SMA 0009<br>Schwarz , D., Ikejiri , T., Breithaupt , B. H., Sander , P. M. and Klein , N. (2007): A nearly complete skeleton of an early juvenile diplodocid (Dinosauria: Sauropoda) from the Lower Morrison Formation (Late Jurassic) of north central Wyoming and its implications for early ontogeny and pneumaticity in sauropods. *Historical Biology*, 19: 225-253.<br>Carballido, J. L., Marpmann, J. S., Schwarz-Wings, D. & Pabst, B. (2012): New Information on a juvenile Sauropod Specimen from the Morrison Formation |

| | | | | |
|---|---|---|---|---|
| *Edmontonia rugosidens*<br>DANTE - Adult | Natural History Museum<br>? | Canada Fossils | Purchase | |
| *Edmontosaurus sp.*<br>skeleton | North Carolina Museum of Nature and Science<br>Raleigh, NC, U.S.A. | Triebold Paleontology | Donation | |
| *Edmontosaurus sp.*<br>skeleton | National Science Center<br>Gwaechon, Korea | Triebold Paleontology | Purchase | |
| *Edmontosaurus sp.*<br>skeleton | Fukui Prefectural Dinosaur Museum<br>Fukui, Japan | Triebold Paleontology | Purchase | |
| *Edmontosaurus sp.*<br>skeleton | Museum of World Treasures<br>Wichita, KS, U.S.A. | Triebold Paleontology | Purchase | |
| *Edmontosaurus sp.*<br>Mummy/skeleton | AMNH<br>New York, NY, U.S.A. | George H. Sternberg | Purchase | AMNH FR5060<br>Sternberg, Charles H. (1909). "A new Trachodon from the Laramie Beds of Converse County, Wyoming". *Science* 29 (749): 753-54. |
| *Edmontosaurus annectens*<br>composite skeleton | National Museum<br>Belfast, Ireland | BHIGR through Geological Enterprises | 1981<br>Purchase | |
| *Edmontosaurus annectens*<br>composite skeleton | Toyohashi City Museum<br>Japan | BHIGR through Geological Enterprises | 1984<br>Purchase | |
| *Edmontosaurus annectens*<br>composite skeleton | National Museum<br>Cardiff, Wales | BHIGR through Geological Enterprises | 1987<br>Purchase | |
| *Edmontosaurus annectens*<br>composite skeleton | Seibu Museum<br>Japan | BHIGR | 1990<br>Purchase | |
| *Edmontosaurus annectens*<br>composite skeleton | Museum of Natural History<br>Leiden Netherlands | BHIGR | 1990<br>Purchase | |
| *Edmontosaurus annectens*<br>composite skeleton | Eigado Museum<br>Japan | BHIGR | 1991<br>Purchase | |
| *Edmontosaurus annectens*<br>composite skeleton | University of Tokyo<br>Japan | BHIGR through The Stone Company | 1991<br>Purchase | |
| *Edmontosaurus* | MNS | BHIGR | 1992 | |

| | | | | |
|---|---|---|---|---|
| *Edmontosaurus annectens*<br>misc. bones | Museum of Idaho<br>Idaho Falls, ID, U.S.A. | Western Paleontological Laboratories | Donation | |
| *Edmontosaurus sp.*<br>Bones | Duluth Children's Museum<br>Duluth, MN, U.S.A. | PaleoAdventures | 2013<br>Purchase | |
| *Edmontosaurus sp.*<br>Femur | Dartmouth University<br>Hanover, NH, U.S.A. | PaleoAdventures | 2013<br>Purchase | |
| *Einiosaurus procurvicornis*<br>skull<br>ELLIOT - Adult | L.A. County Museum<br>California, U.S.A. | Canada Fossils | Purchase | |
| *Euoplocephalus tutis*<br>OLIVE - Adult | National Science Museum<br>Tokyo, Japan | Canada Fossils | Purchase | |
| *Euoplocephalus tutis*<br>PEGGY - Adult | Fukui Museum<br>Fukui, Japan | Canada Fossils | Purchase | |
| *Euoplocephalus tutis*<br>UMA - Adult | Royal Tyrrell Museum<br>Drumheller, AB,Canada | Canada Fossils | Purchase | |
| *Garoyleosaurus parkpinorum* | DMNS<br>Denver, CO, U.S.A. | Western Paleontological Laboratories | Donation | Kilbourne, Brandon, and Kenneth Carpenter. "Redescription of Gargoyleosaurus parkpinorum, a polacanthid ankylosaur from the Upper Jurassic of Albany County, Wyoming." *Neues Jahrb Geol Palaontol Abh 237* (2005): 111-160. |
| *Goniopholis sp.*<br>skeleton | Science Museum of Minnesota<br>St Paul, MN, U.S.A. | Western Paleontological Laboratories | Donation | |
| *Goniopholis sp.*<br>complete skeleton | Gunma Museum of Natural History<br>Gunma-ken, Japan | Western Paleontological Laboratories | Donation | |
| *Hadrosaurus sp.*<br>skull, juvenile | Museum of the Rockies<br>Montana, U.S.A. | Canada Fossils | Donation | |
| *Hesperosaurus mjosi*<br>skeleton | Hayashibara Museum of Natural History<br>Okayama, Japan | Western Paleontological Laboratories | Purchase | Carpenter, Kenneth, Clifford A. Miles, and Karen Cloward. "New primitive stegosaur from the Morrison Formation, Wyoming." The armored dinosaurs *Indiana University Press* ISBN 0253339642 (2001): 55-75. |
| *Hesperosaurus mjosi*<br>"Moritz"<br>skeleton with skull | Sauriermuseum Aathal (SMA)<br>Switzerland | Siber & Siber | 1995<br>Donation | SMA 0122 |
| *Hesperosaurus mjosi* | Sauriermuseum Aathal (SMA) | Siber & Siber | 1995/1997 | SMA 0018 |

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|---|---|---|---|---|
| | Belle Fourche, SD, U.S.A. | | Donation | |
| *Othnielosaurus sp.*<br>"Barbara"<br>skeleton with skull | Sauriermuseum Aathal (SMA)<br>Switzerland | Siber & Siber | 1996<br>Donation | SMA 0010 |
| *Pachycephalosaurus sp*<br>SANDY<br>skeleton | NSM<br>Tokyo, Japan | Triebold Paleontology | Purchase | |
| *Platecarpus planifrons*<br>skeleton | Discovery Park America<br>Union City, TN, U.S.A. | Triebold Paleontology | Purchase | |
| *Platecarpus tympaniticus*<br>skeleton | Discovery Park America<br>Union City, TN, U.S.A. | Triebold Paleontology | Purchase | |
| *Plesiosaurus dolichodeirus*<br>skeleton | Muséum national d'Histoire naturelle<br>Paris, France | Mary Anning | 1824<br>Purchase | MNHN A. C. 8592<br>Peggy Vincent and Philippe Taquet, "A Plesiosaur Specimen from the Lias of Lyme Regis: The Second Ever Discovered Plesiosaur by Mary Anning". *Geodiversitas* (2010) 32(3):377-390. |
| *Plesiosaurus sp.*<br>paddle elements | Fort Hays State University<br>Hays, KS, U.S.A. | Triebold Paleontology | Donation | |
| *Plioplatecarpus sp.*<br>skeleton | Seibu Museum<br>Tokyo, Japan | BHIGR | 1990<br>Purchase | |
| *Plioplatecarpus sp.*<br>skeleton | MNS<br>Houston, TX, U.S.A. | BHIGR | 1991<br>Purchase | |
| *Prenoceratops pieganensis*<br>QUEENIE - Adult | Natural History Museum<br>Mokpo City, Korea | Canada Fossils | Purchase | Genotype<br>Chinnery, Brenda J., 2004a, "Description of *Prenoceratops pieganensis* gen. et sp. nov. (Dinosauria: Neoceratopsia) from the Two Medicine Formation of Montana": *Journal of Vertebrate Paleontology*, 24 (3), pp. 572-590. |
| *Prenoceratops pieganensis*<br>REINA - Adult | The Children's Museum of Indianapolis<br>Indiana, U.S.A. | Canada Fossils | Purchase | |
| *Prosaurolophus blackfeetensis*<br>KAREN - Adult | Fukui Museum<br>Fukui, Japan | Canada Fossils | Purchase | |
| *Protostega gigas*<br>Possible fragments of holotype | AMNH<br>New York, NY, U.S.A. | Triebold Paleontology | Donation | |
| *Pteranodon sp.*<br>skeleton | Fort Worth Museum of Natural History<br>Fort Worth, TX, U.S.A. | Triebold Paleontology | Purchase | |

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|---|---|---|---|---|
| | | | | der Baharije-Stufe (unterstes Cenoman). 3. Das Original des Theropoden Spinosaurus aegyptiacus nov. gen., nov. spec" |
| *Steogsaurus sp.*<br>"Sarah" renamed "Sophie"<br>skeleton with skull | British Museum<br>London UK | Dinosaurie International<br>with Siber & Siber | 2004<br>Purchase | Photo |
| *Steogsaurus sp.*<br>baby, partial skeleton | DMNS<br>Denver, CO, U.S.A. | Western Paleontological<br>Laboratories | Donation | |
| *Steogsaurus sp.*<br>pathological spike | DMNS<br>Denver, CO, U.S.A. | Western Paleontological<br>Laboratories | Donation | |
| *Tatankaceratops sacrisonorum*<br>skull | BHIGR<br>Hill City, SD, U.S.A. | BHIGR | Collection | Christopher J. Ott and Peter L. Larson, 2010, "A New, Small Ceratopsian Dinosaur from the Latest Cretaceous Hell Creek Formation, Northwest South Dakota, United States: A Preliminary Description", In: Ryan, M.J., Chinnery-Allgeier, B.J., and Eberth, D.A. (eds.) New Perspectives on Horned Dinosaurs: The Royal Tyrrell Museum Ceratopsian Symposium, Bloomington, *Indiana University Press*, 656 pp. |
| *Thescelosaurus sp.*<br>skeleton | Museum of World Treasures<br>Wichita, KS, U.S.A. | Triebold Paleontology | Purchase | |
| *Triceratops horridus*<br>skull | Seibu Museum<br>Tokyo, Japan | BHIGR | 1990<br>Purchase | |
| *Triceratops horridus*<br>skull | Hayashibara Museum<br>Japan | BHIGR | Purchase | |
| *Triceratops horridus*<br>skull | MNS<br>Houston, TX, U.S.A. | BHIGR | 1991<br>Purchase | |
| *Triceratops horridus*<br>KELSEY - skeleton | The Children's Museum<br>Indianapolis, IN, U.S.A. | BHIGR | 2001<br>Purchase | |
| *Triceratops horridus*<br>skull | ROM<br>Toronto, ON, Canada | BHIGR | 2006<br>Purchase | |
| *Triceratops horridus*<br>LANE - skeleton | MNS<br>Houston, TX, U.S.A. | BHIGR | 2006-2008<br>Purchase | |
| *Triceratops horridus*<br>braincases, bones etc. | ROM<br>Toronto, ON, Canada | BHIGR | 2008<br>Purchase | |
| *Triceratops sp.*<br>femur | Discovery Park America<br>Union City, TN, U.S.A. | Triebold Paleontology | Purchase | |

## Fish Rays and Sharks

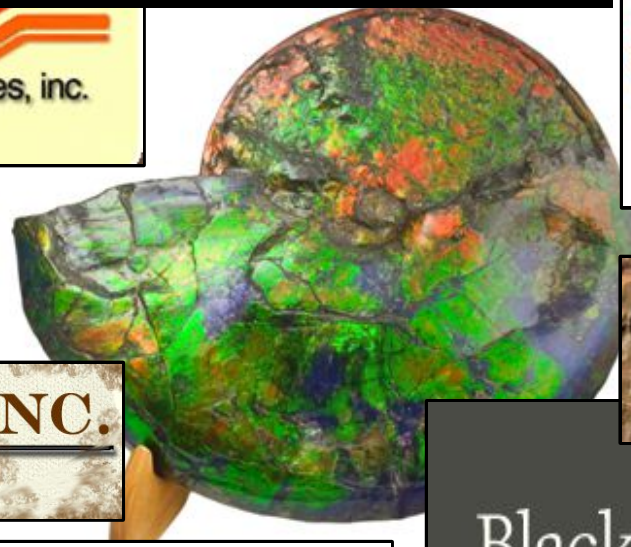
| Genus/Species | Repository | Company | Date of Discovery | Reference |
|---|---|---|---|---|
| *Apsopelix sp.* skeleton | Canadian Museum of Nature Ottawa, ON, Canada | Triebold Paleontology | Purchase | |
| *Asterotrygon maloneyi* | FMNH Chicago, IL, U.S.A. | Warfield Fossil Quarries | Purchase | Holotype PF15166 De Carvalho, Marcelo R., John G. Maisey, and Lance Grande. "Freshwater stingrays of the Green River Formation of Wyoming (Early Eocene), with the description of a new genus and species and an analysis of its phylogenetic relationships (Chondrichthyes: Myliobatiformes)." *Bulletin of the American Museum of Natural History* (2004): 1-136. |
| *Masillostues janeae* | FMNH Chicago, IL, U.S.A. | Warfield Fossil Quarries | Purchase | PF15196 |
| *Masillostues janeae* | FMNH Chicago, IL, U.S.A. | Warfield Fossil Quarries | Purchase | Paratype PF15195 |
| *Megalocoelacanthus* jaw | Sternberg Museum of Natural History Hays, KS, U.S.A. | Triebold Paleontology | Donation | |
| *Megalocoelacanthus* | AMNH New York, NY, U.S.A. | Triebold Paleontology with PaleoSearch | Purchase | |
| *Pachyrhizodus* | North American Museum of Ancient Life Lehi, UT, U.S.A. | Triebold Paleontology | Donation | |
| *Pachyrhizodus* skeleton | LACMNH Los Angeles, CA, U.S.A. | Triebold Paleontology | Donation | |
| *Protosphyraena* pectoral elements | National Museum of Scotland Edinburgh, Scotland | Triebold Paleontology | Donation | |
| Shark new species | LACMNH Los Angeles, CA, U.S.A. | Triebold Paleontology | Donation | |
| *Xiphactinus sp.* skeleton panel mount | Western Wyoming College Rock Springs, WY, U.S.A. | BHIGR | 2012 Purchase | |

| | | | | |
|---|---|---|---|---|
| panel mount | Rock Springs, WY, U.S.A. | | Purchase | |
| *Xiphactinus sp.* skeleton | North American Museum of Ancient Life<br>Lehi, UT, U.S.A. | Triebold Paleontology | Donation | |
| *Xiphactinus sp.* skeleton | University of Nebraska<br>Kearney, NE, U.S.A. | Triebold Paleontology | Donation | |
| *Xiphactinus sp.* 3D skull | LACMNH<br>Los Angeles, CA, U.S.A. | Triebold Paleontology | Donation | |
| *Xiphactinus audax* Skeleton Fish-Within-A-Fish (*Gillicus*) | Sternberg Museum<br>Hays, KS, U.S.A. | George F. Sternberg | 1952<br>Swap | FHSM VP-333, FHSM VP-334 |

## Mammals

| Genus/Species | Repository | Company | Date of Discovery | Reference |
|---|---|---|---|---|
| *Balaenoptera sp.* skeleton on matrix | Gunma Pref. Museum<br>Gunma-ken, Japan | BHIGR | Purchase | |
| *Didelphodon sp.* skeleton | Museum of Nature and Science<br>Houston, TX, U.S.A. | Triebold Paleontology | Purchase | |
| *Didelphodon sp.* skull | Burke Museum<br>Seattle, WA, U.S.A. | Triebold Paleontology | Purchase | |
| *Hoplophoneus sp.* skeleton | National Science Museum<br>Tokyo, Japan | BHIGR | Purchase | |
| *Megachoerus sp.* skull | National Science Museum<br>Tokyo, Japan | BHIGR | Purchase | |
| *Onychonycteris finneyi* complete skeleton | Royal Ontario Museum<br>Ontario, Canada | Bonnie Finney/<br>Fossil Lake Fish Co. | Purchase | Holotype ROM 55351A,B Nancy B. Simmons; Kevin L. Seymour; Jorg Habersetzer; Gregg F. Gunnell (2008). "Primitive Early Eocene bat from Wyoming and the evolution of flight and echolocation". *Nature* 451 (7180): 818â€"21. |
| *Paratylopus sternbergi* complete skeleton | AMNH<br>New York, NY, USA | Charles H. Sternberg | 1878<br>Purchase | |
| *Steneosaurus bollensis* (Holzmaden) skeleton with skull | Sauriermuseum Aathal (SMA)<br>Switzerland | Siber & Siber | 1995<br>Donation | SMA 0078 |
| *Titanothere sp.* | National Science Museum | BHIGR | Purchase | |

# Modern Day Commercial Diggers, Collectors and Paleontologists



# New Techniques

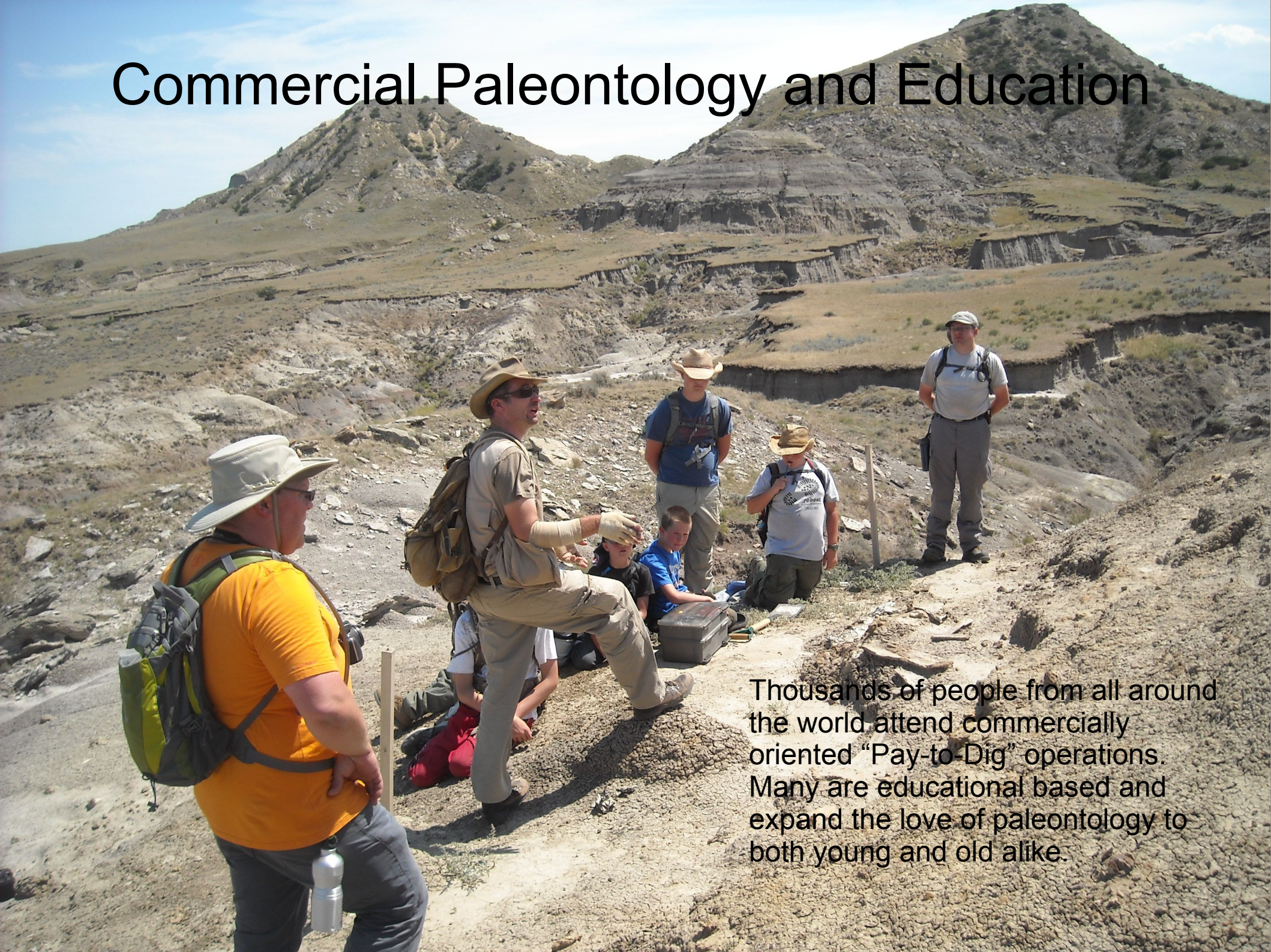
- Plaster Jacketing
- Air Abrasion
- Foam Casts
- Super glues and epoxies
- 3-D technologies
- Renovations to existing tools-

  Air scribes, rotary grinders, etc.
- Molding and Casting
- Mounting



PALEO TOOLS

# Commercial Paleontology and Education



Thousands of people from all around the world attend commercially oriented “Pay-to-Dig” operations. Many are educational based and expand the love of paleontology to both young and old alike.

# These Are the Faces of Fossil Owners

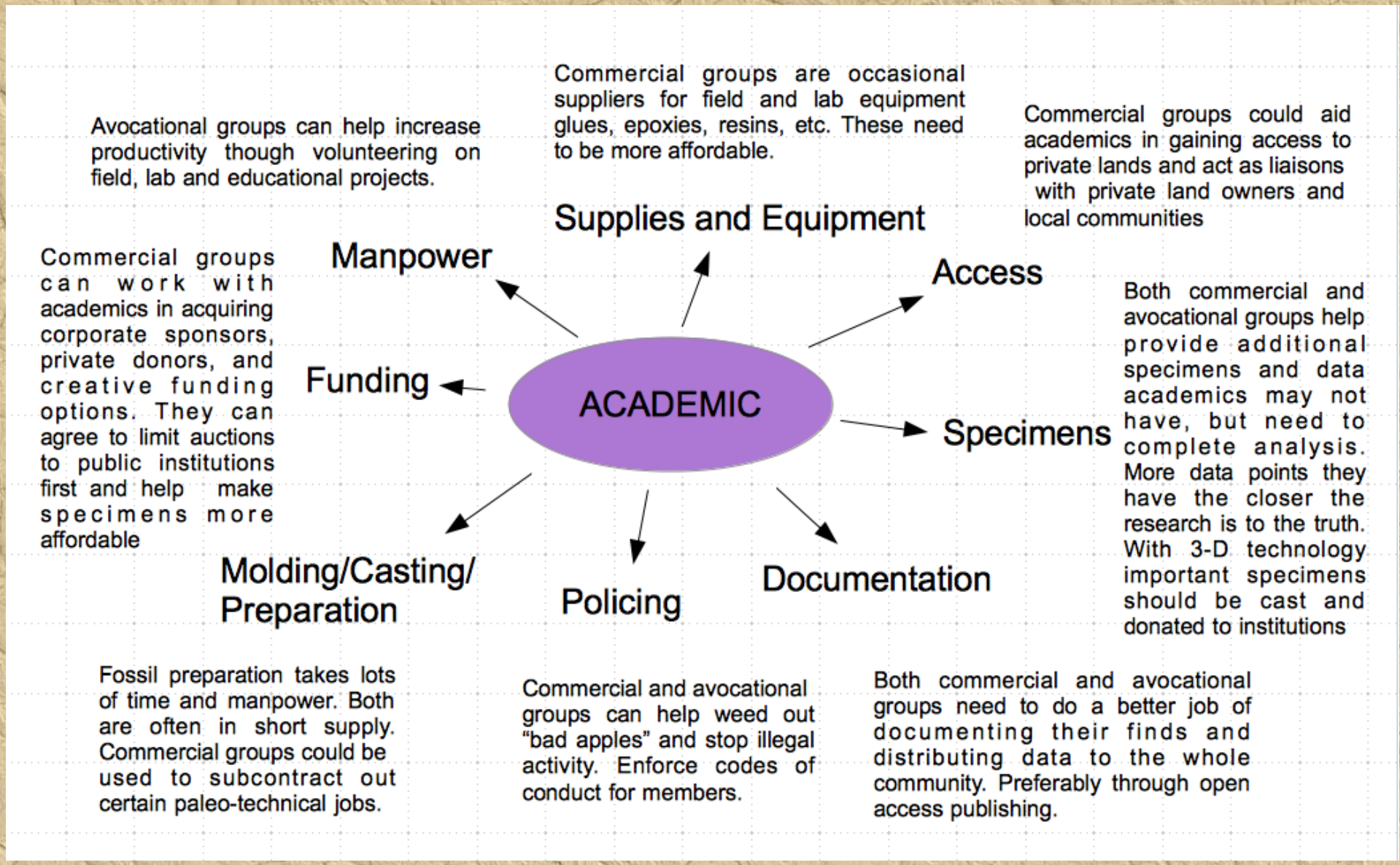
This is not “unethical” or a “threat to the science”. It benefits science.



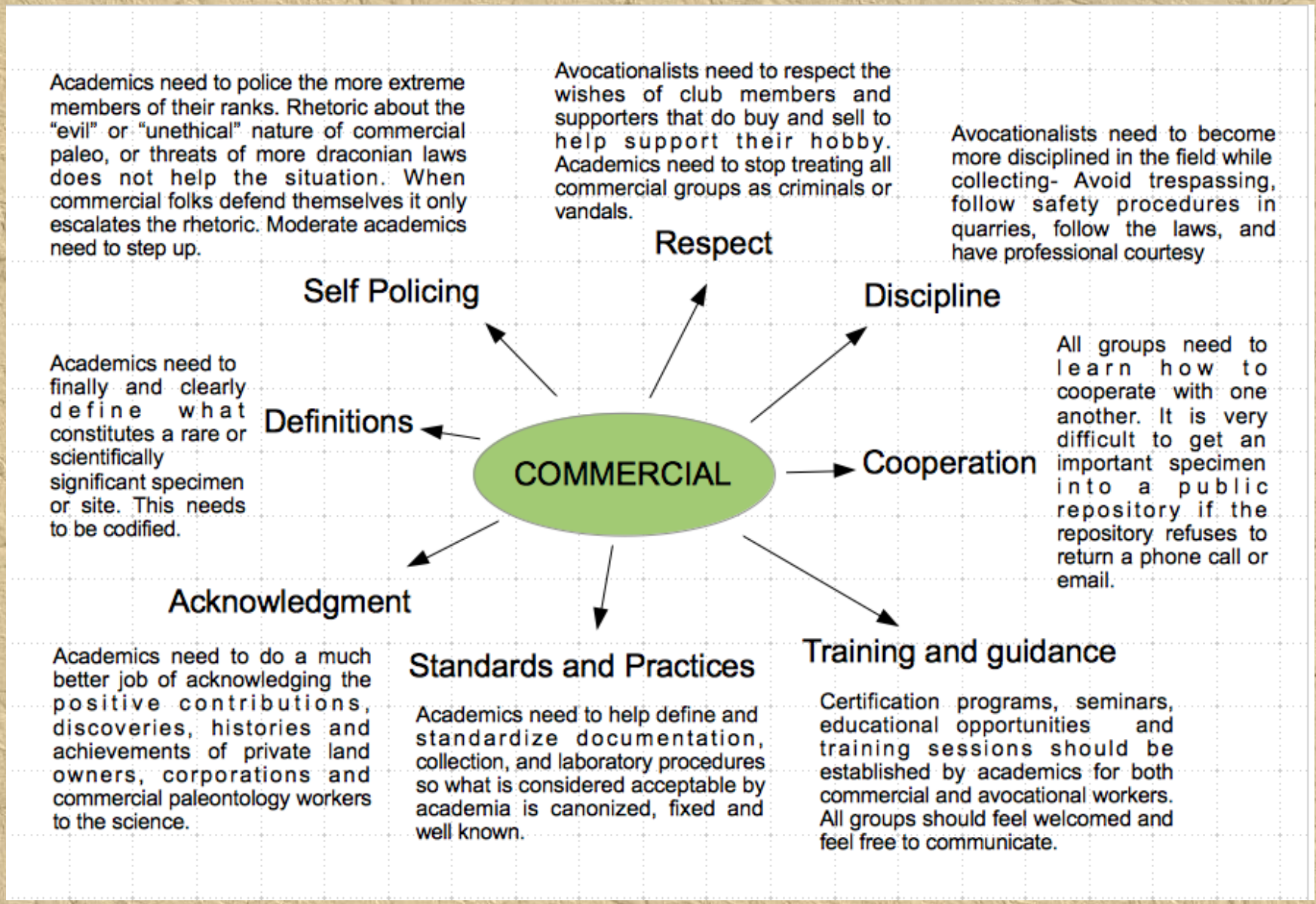
# So How Can We Unite our Community?


Start politely communicating with one another- Building bridges not burning them. The FOSSIL PROJECT has done a great service bringing together the academic and the avocational communities. A similar initiative should be undertaken to bring ethical, science-minded commercial groups into the fold.

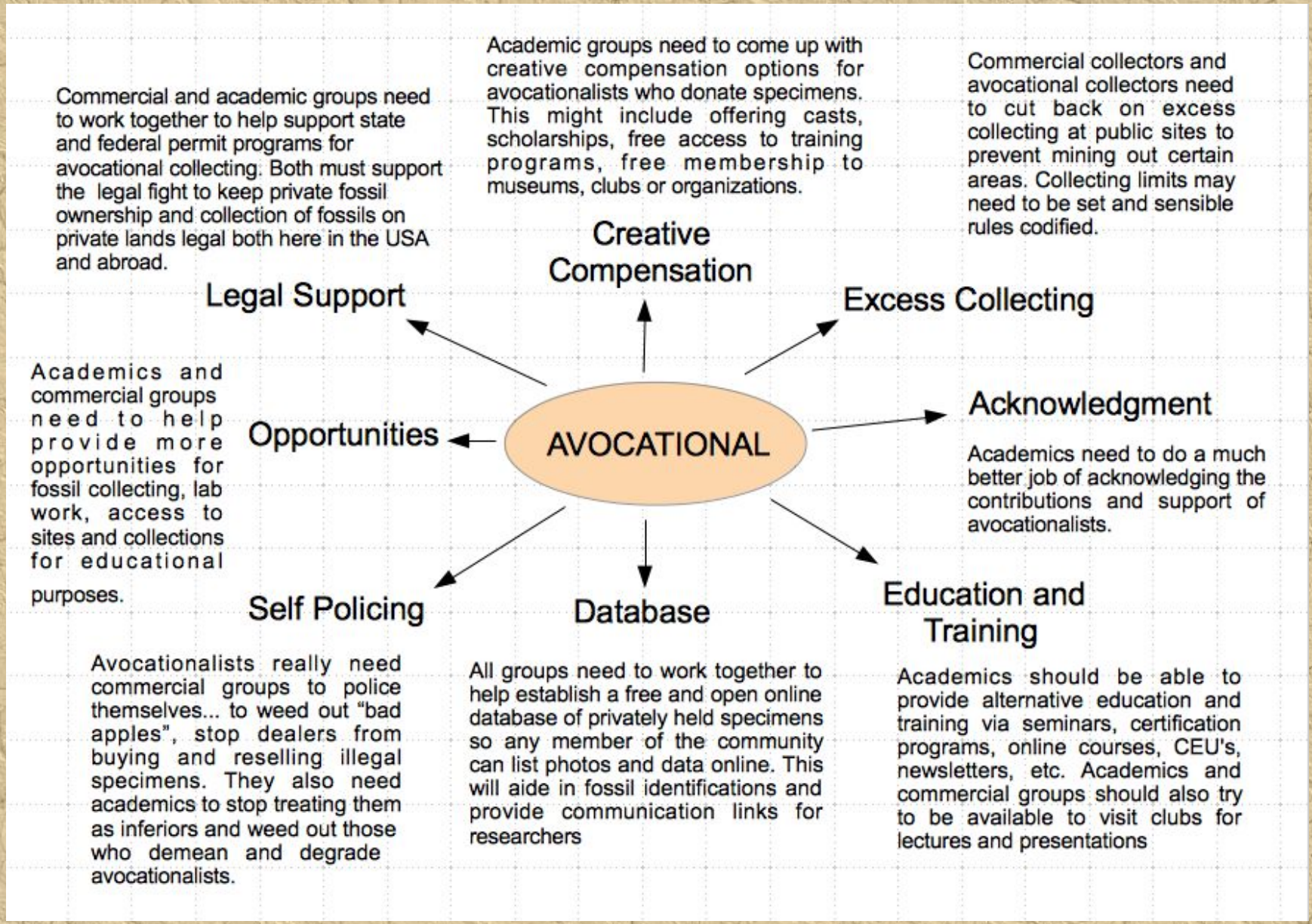
# Academic Needs Assessment



# Commercial Needs Assessment



# Avocational Needs Assessment



# In Conclusion

- Commercial Paleontology has had a long and beneficial history
- The commercial realm certainly has had its share of bad apples and problems that need to be addressed.
- However... the positive far exceeds the negative.
- Rather than dismiss commercial paleo or treat it as unethical we should try to build bridges rather then burn them.
- We do not need to agree on everything, but we should be able to at least communicate and discuss conflicts in a civil and reasonable manner. We must begin to communicate our needs to one another instead of hurling accusations or ad hominem attacks.

As we move further into the 21st century we must understand that a united community can more effectively increase our shared knowledge of ancient life and help reveal the true geologic history of this planet.

THANK YOU!