NORTH CAROLINA FOSSIL CLUB

Janus

The Newsletter of the North Carolina Fossil Club

1993 Number 2

Trip Reports - Spring, 1993

A handful of members participated is the first club trip of the spring to the **Martin-Marietta Quarry at Rocky Point**. The weather forecast was for heavy rain but it did not turn out to be as horrible as predicted since the rain didn't become steady until noon and at that was never heavy. Despite the poor weather some beautiful fossils were found. John Everette found a large but damaged *Carcharodon auriculatis* tooth (see the illustration in Janus, 1993 #1, page 7, figure 13). One lateral cusp was missing as were each corner of the root. This was perhaps the most massive tooth I have seen from this site. It measured approximately 3.5" to 3.75" in height, standing the tooth vertically. I have seen similarly proportioned teeth and equally long teeth but none to combine both proportions. Wayne Morgan found a nice *C. auriculatis* side tooth with a missing cusp and a beautiful large *Dixieus* (sp?) echinoid. I found half a dozen *Linthia* echinoids of varying condition and size but none of the "show stopping" type. Numerous examples of the common, smaller echinoids and a few small shark teeth were found on the trip.

John Timmerman

The spring trip to the **Texasgulf Phosphate Mine** started out badly. The winter "storm of the century" defeated any plans members had for collecting on the date originally set for the trip. Most members who had signed up for the trip arrived at the parking lot prepared for a rainy day of collecting. At approximately 10:00 AM word came from the quarry manager that collecting would not be allowed due to the dangerous conditions caused by the storm.

Texasgulf generously allowed the club to visit the quarry the Sunday a week later to make up for the missed trip. The forecast was for some rain but that never materialized. Instead the sky cleared, making a beautiful clear spring day. I cannot remember a field trip to this quarry that produced so many impressive fossils. Though there had been a group in the quarry the day before there were still plenty of prized fossils to collect. It seemed like the good old days of collecting that people often relate to newcomers such as myself. I will start with the *C. megalodon* teeth which in reality is the primary reason many people come to this quarry. The find of the day, perhaps season, was by the trip leader, Richard Chandler. His tooth was an awesome $5\frac{5}{8}$" slant height and almost as wide. It had a very wide almost blunt looking tip and was extremely thick. Aside from a few drying cracks it was gem condition. He found it almost completely exposed, labial (flat) side up. This is the kind of find that dreams are made of! Richard joined the club of the few

Don't forget the club meeting scheduled for Sunday, June 6, 1:00-5:00 PM at the Powell Drive Community Center in Raleigh (see map on p. 7). This is the first time we have had a meeting apart from a collecting trip or our Fossil Fair since I have been a member. George Powell and Dr. Brett Kent from the University of Maryland will be the guest lecturers, speaking on the remarkable associated set of *Parotodus benedeni* teeth found at Aurora last fall. George now has 90+ teeth, making this the largest (by far) associated set of these very scarce teeth ever found. If you have any suspected *Parotodus benedeni* teeth (see p. 4) bring them to the meeting for comparison. You should be able to determine where your teeth fit in the jaw from the material Dr. Kent and George will have. Light refreshments will be available and there will be plenty of time for trading, socializing, and showing off your special fossils.

people privileged to find a truly giant tooth. Mike Bishop found a particularly beautiful gem condition tooth approximately 4½ inches tall. This was his first large tooth. There were numerous other impressive shark teeth being shown, too many to mention them all but I know their finders are thrilled. My impression was that there far more than the average number of these prized teeth found for a trip.

The find of the day in rarity goes to David Goodman who found a large portion of the maxilla of the rare Squalidonte (a primitive whale) with at least 6 teeth in it. Finding isolated teeth of this species is a prize so one can imagine what finding a portion of a skull with teeth is like. He also takes the prize for most determined collector for carrying out the huge block of limestone in which his find was imbedded. It must have weighed close to 30 or 40 pounds.

There were numerous other types of fossils collected: other species of shark including *Parotodus benedini*, whale vertebrae, teeth and ear bones, mollusks, fish and seal bones. Eric Thompsen found a huge sperm whale tooth. It was the reworked type of black colour and gorgeous. These, to me, are the "other" teeth to be found here. Specimens like Eric's are as impressive to me as large shark teeth.

John Timmerman

Editor's Note. John volunteered to write the trip report for Texasgulf after Trish Kohler expressed some concern that I would be too modest to mention my truly magnificent tooth! After getting home I learned of Val and Jack Gollahon's finds of four *C. megalodon* teeth, one of 4", one of 4½" and two of 5¾"!!!

A total of 24 fossil club members and their guest had a wonderful day to hunt and dig for fossils in the **Martin-Marietta Quarry at Belgrade** on April 3. The weather was a fossil hunters dream, being not too hot or cold. As beginners luck prevailed, it happened this day with Ashley Davis who found a picture perfect alligator vertebra. His daughter found a 2" mako shark tooth. Welcome to the club, Ashley.

Some of the club members chose to roam the quarry with some success and the others dug in the Pleistocene gravel layer with equal success. Some of the members tried both.

The finds of the day were as follows:

- Ashley Davis-Alligator Vertebra and assorted fossils.
- Ashley Davis' Daughter-2" Mako shark tooth.
- Jeff Cohn-1½" Mako tooth, a Pipe Fish Vertebra, and a variety of teeth.
- Lynn Johnson-A nice variety of teeth and bone.
- John Timmerman-Dug out a beautiful 3" *C. megalodon*. of gray and black colors.
- Dwayne Varnam-2½" *C. megalodon*.
- Mark Saunders-4¼" *C. megalodon*, Camel Tooth, and two Alligator (nice find Mark).
- Heather Hamelton-(guest)-Had a nice find of a shark vertebra.
- Karen Catoe-Found a variety of teeth and bone.
- Joy Pierce-Found a variety of fossils.
- Bill (Ole Yellow Knees*) Little-Fossilized wood and a variety of Shark Teeth.
- The writer of this report found-A Horse Tooth, some shark teeth and a few new friends.

Overall it was a fun trip and a learning experience for most of us. Thank you again Bill Little for bringing your camper, the convenience was appreciated.

* The gravel layer which we dig has a red and yellow clay layer which over time can dye the knees of jeans, trousers, etc., hence Ole Yellow Knees. A good set of knee pads is a nice item of equipment when digging at Belgrade.

Richard Tellekamp

Fourteen of us went on the **Onslow Beach** trip on April 17th, and a variety of things were found. Jeff Cohn found a really nice piece of fossilized wood. Jim Baugh had some turtle material, along with a nice assortment of stones. His mother accompanied us, and she had some very pretty Calico scallops, and some perfect little Sea Urchins. I found an alligator vertebra. Richard Tellekamp identified it from his book. It really had us stumped for a while. A good variety of shark's teeth and some whelks and ribs were also found.

Rita McCabe

There were 8 members of the NCFC (and 130 others) who visited the **Giant Cement Company in Harleyville, SC** on April 25. Burt Ardis, the quarry manager, genuinely seems to care about fossil collecting in the quarry and had bulldozers

turn over the spoil piles to try to improve collecting. Unfortunately, the lack of rain spoiled his best efforts and pickings were slim. This relatively small quarry cannot support the collecting pressure it gets.

John Timmerman found the best *C. auriculatis*, a small, almost pure white back tooth. He also had several other fragments and near complete teeth. Nancy Timmerman found a large and very solid horse phalanx(?). John Everette found the largest *C. auriculatis* tooth of the day, a huge front tooth that had suffered some damage while still in the shark's mouth. He also found a small mammal (tapir?) molar and he and John Timmerman found very nice teeth of an Eocene sand shark, *Odontaspis macrota*(?). Mike Hogan found several of the very small cow shark (*Hexanchus agassizi*) teeth he so prizes. Val and Jack Gollahon had several turtle pieces, including two very nice bones (exceedingly curious, turtle bones). I don't know what Joy Pierce found but she was true to her name, practically bursting with enthusiasm. I found another of those broken teeth you almost wish you didn't: a pure white, perfect center *C. auriculatis* tooth which was missing one corner of the root as well as the cusp on that side.

On May 1 fifteen club members and guests arrived at the **Martin Marietta - Castle Hayne Quarry** for a beautiful late spring day of collecting. The weather was partly cloudy so we were spared being fried completely by the sun. Despite no significant rainfall at the quarry for over three weeks there were plenty of nice fossils to be found. I didn't see any foot prints from collectors previous to our group. The quarry operator's effort to limit access seems to be working.

I've said this too often, but Echinoids were the prize finds of the day; they are really the strong point for this quarry. Jill Cohen found several nice examples of the fairly scarce echinoid *Eupatagus carolinensis*, Don Klementz and his family found dozens of the attractive Cretaceous echinoid *Hardouinia mortonis*. His daughter found the largest Echinoid of the day, an Eocene *Linthia wilmingtonensis*. Bill Gilmore and his daughters found a treasure trove of large, branched spines from the scare genus *Phyllacanthus*. Some of the spines were 1.5 inches long! Bill also found a particularly beautiful internal mold of the mollusk *Cypraea* or cowrie shell that this author was very impressed with. I had very good day with a variety of nice Echinoids including a couple of nice *Linthias*. **John Timmerman**

Shark Dentistry

I have spent many enjoyable hours repairing some of the nicer heartbreaks I have found: a beautiful *Isurus hastalis* or *Carcharodon carcharias* except for a missing corner of the root. I have most recently embarked on a more ambitious project: two *Carcharodon auriculatis* teeth I found at Harleyville with missing cusps. You might benefit from my experiences.

Replacing a small portion of the root of a tooth (or the entire root of a small tooth) is fairly easy. I have been using Elmer's *Professional Carpenter's Wood Filler* for this. It is available in hardware and builder's supply stores and comes in a variety of sizes. I got a 4 oz. container for $2. It is light tannish yellow in color, is pliable and easy to shape, and dries without shrinking to a hard yet easily workable final product. In order to approximate the color of the existing root material I have discovered that it is better to tint it in advance. I have been using artist's acrylic colors for this but mixing these with the wood filler results in a material that is almost too liquid to hold its shape. Dry pigment would be better but I haven't tried anything yet along those lines.

After building up the missing portions I allow it to dry overnight. It is then easily workable with an Exacto knife, file, sandpaper, etc. I usually use a complete tooth as a model for shaping purposes. Remember that natural teeth are rarely perfect and their roots are not glassy smooth. After the final shaping you can touch up the color if necessary to get the finished product.

To replace the missing cusp on the pair of *C. auriculatis* I used Bondo *Epoxy Ribbon*, also obtainable from hardware stores. I have seen similar products in a variety of colors but what I have is dark brown. As with all epoxy type products, it comes in two parts which are mixed together to induce hardening. With Bondo it is very firm in about 3 hours and rock hard in 24. Shape it much the same way as the other, paint it with acrylic colors to approximate the other enamel, and put on a final coat of semi gloss fingernail polish to give it that enamel-like sheen.

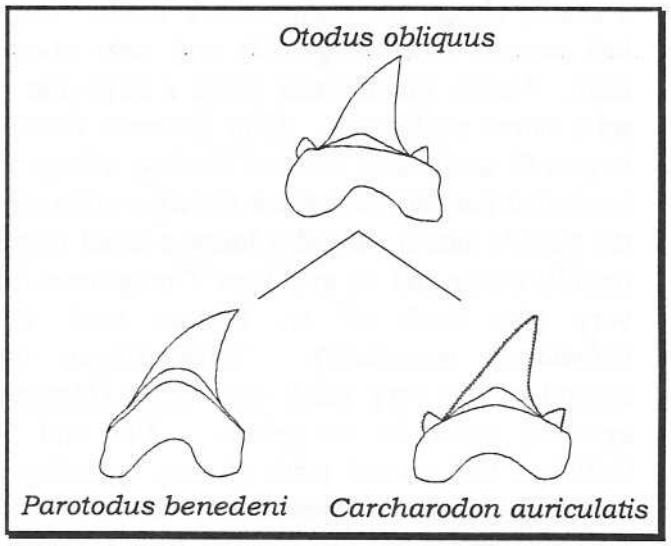
Quarterly Shark Report

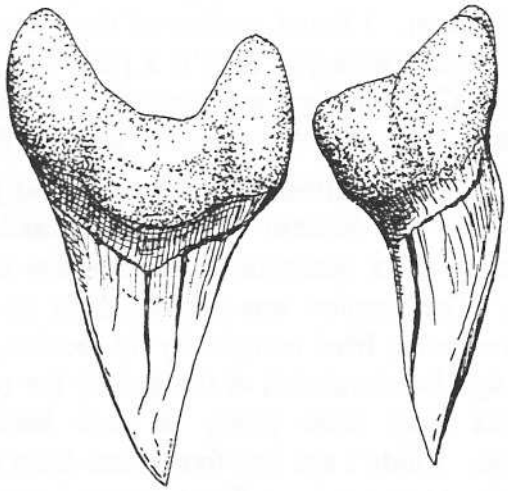
Unbeknownst to you, you may have a treasure sitting in the box (drawer, cabinet, etc.) where you keep the many mako teeth you've found over the years at Texasgulf. The false mako (*Parotodus benedeni*) was classified for many years in the genus *Oxyrhina* (the name preceding *Isurus*) of the true makos. Its teeth are a rare find at Texasgulf as well as other localities world-wide. Cappetta believes it was a pelagic rather than a coastal species, accounting for its scarcity in the fossil record. It is thought that only three associated teeth sets have ever been found, one in New Zealand, one in Australia, and one at Texasgulf (last fall).

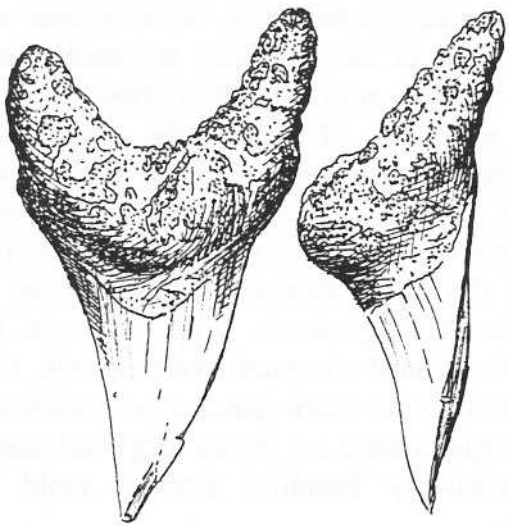
How can you differentiate *Parotodus* from the various makos? First of all, the root is very massive, much bulkier than that of *Isurus oxyrinchus*, which is the mako tooth with the largest root. The crown of most *Parotodus* is very mako-like in general shape but is much thicker near the root. Also the tip frequently has a small but pronounced hook toward the back of the jaw (the distal edge of the tooth). Another distinctive feature of *Parotodus*' teeth is the presence of a bourlette on the inside (lingual) surface of the tooth (the convex side). This is the chevron shaped region between the crown and root which occurs in many species' teeth which have a bulky root. In *Parotodus* the bourlette seems to separate the crown of the tooth from the root.

As rare as it is, it persisted for an uncommonly long time, at least from the middle Oligocene (35 million years ago) to the Pliocene (5 million years ago). There is no contemporary close relative. Because of its longevity as a species it is easy to see an evolutionary change in the teeth. Leriche shows excellent photographs (next page) of specimens from the Middle Oligocene of Belgium. These are consistently less massive with a much less prominent root than the far later specimens found at Texasgulf.

Cappetta makes an excellent case for the development of *Parotodus* from the Paleocene genus *Otodus* whose teeth are very similar, but which have lateral cuspets. In fact, in two of Leriche's pictures one can easily see lateral cuspets. Cappetta believes that *Otodus* developed in two directions: to *Parotodus* with the teeth for the most part losing the lateral cuspets, and to *Carcharodon auriculatis* with the teeth keeping the lateral cuspets (although these are eventually lost with *Carcharodon megalodon*) but developing fine serrations on the cutting edges of the crown and the cuspets.







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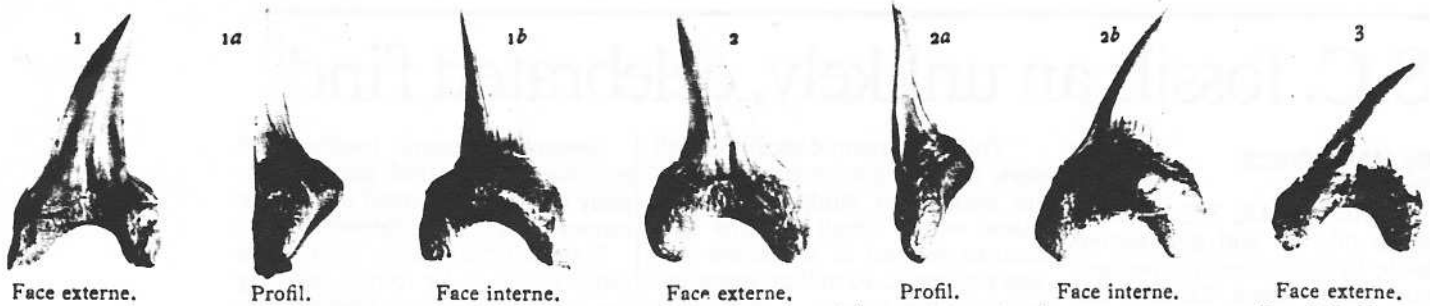

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Dent antérieure (1e file) de la Mâchoire supérieure. Dent antérieure (2e file) de la Mâchoire supérieure. D. intermédiaire.

3a 4 4a 5 5a 5b 6

Face interne. Face externe. Face interne. Face externe. Profil. Face interne. Face externe.

Localité : Niel. *Localité :* Rumpst. *Localité :* Hemixem. *Localité :* Niel.

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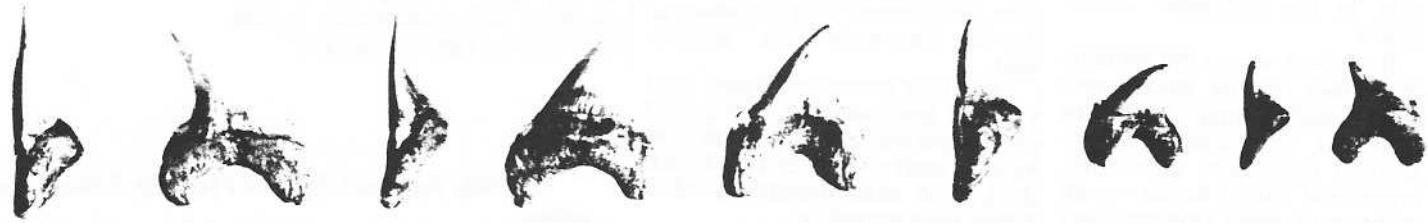

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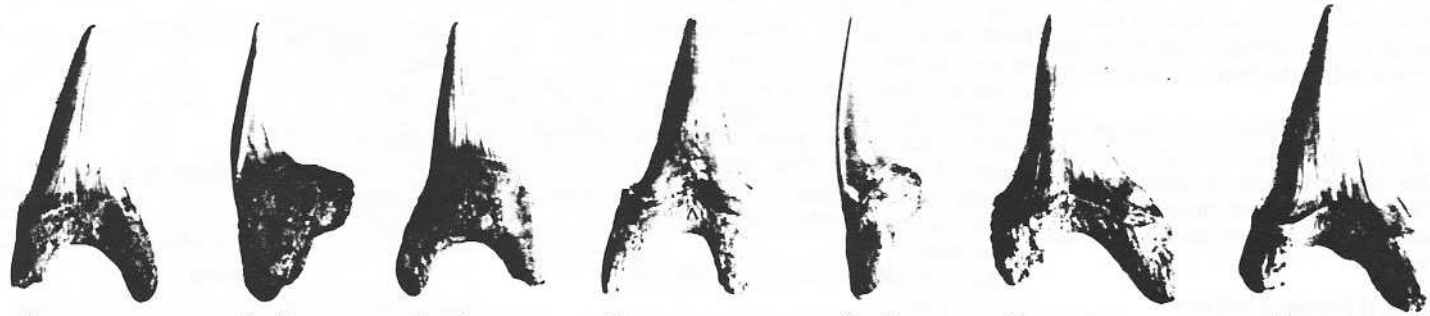

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Localité : Boom. *Localité :* Rumpst.

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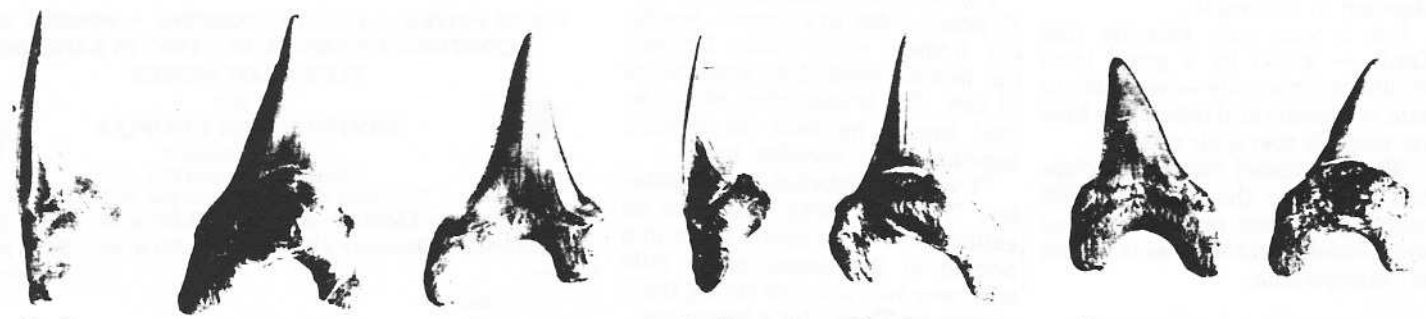

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S.C. fossils an unlikely, celebrated find

By MARK PRICE
Staff Writer

HARLEYVILLE, S.C. — Mysteries pile up and get pushed aside by bulldozers in the canyon where Giant Cement Co. digs limestone.

Miners crunch over eons-old shark teeth without a second look, and backhoes rip up cliffs where the bones of extinct whales stick out like bleached roots.

Geologists take such rubble for granted in a place that 38 million to 40 million years ago was the bottom of an ocean.

It's the unexpected — fossils of land animals — that has scientists calling this mile-long hole in Dorchester County one of the most important fossil sites in the Southeast United States.

In a place where the remains of 30-foot marine snakes and sharks with 3-inch teeth are expected, scientists have unearthed mastodon, mammoth, horse and camel fossils — all millions of years younger than the limestone.

"It was wacky. The fossils were not incorporated in the marine sediments, they were surrounded by it," said Martin Knoll, a Winthrop University assistant professor who studied the site for the state.

"We're talking about some fossils that don't occur anyplace. And the preservation is phenomenal. The fact that we have ribs from snakes that are unbroken is sensational."

Grant boosts effort

The discoveries, including 15,000 snake vertebrae, were uncovered during a yearlong dig and quickly hauled to the S.C. State Museum in Columbia.

But it was only recently that Knoll — aided by a grant from Winthrop University — was able to date the fossils and determine how the animals met their death.

What he found has given scientists insight to the period 19,000 years ago, when oceans receded and glaciers advanced as far south as Pennsylvania.

"This is a stream deposit," Knoll says, rendering a verdict that took six months of study. "This is a place where small caverns and fissures formed in limestone that was deposited 40 million years ago by a shallow ocean . . . and every time this nearby stream or river flooded, it pushed animals in these caves and covered them up."

Some animals crawled in, others may have been hibernating when the floods occurred, but in any case, the scenario was the same: They were buried alive in sand and sealed in a layer of clay.

Conditions were good for preservation, said Curtis Bentley, a University of South Carolina student who collected most of the fossils.

"We were getting fish scales . . . and paper-thin snake skulls with the teeth still in them, teeth less than a millimeter long and sharp as the day they were fresh," Bentley said.

Even frog bones no bigger than a pencil lead survived, along with such larger pieces as the brain case from a wolf's 10-inch to 12-inch skull, and shell fragments of a 7-foot long armadillo.

No dinosaurs here

In all, Bentley found parts of 34 species of mammal, eight species of turtle, and a number of birds and snakes. Some weren't known in the fossil record.

No dinosaur bones were found, but no dinosaur bone bigger than a quarter has ever been found in South Carolina. The state was mostly under water during their reign, which ended 65 million years ago.

Bentley says what they found is just as good.

He's the one who stumbled on the fossils during a routine tour of the quarry, and later volunteered to camp at the site.

For nearly a week, he spent 14 to 16 hours a day in a trench, hosing out tunnels while Giant Cement Co. miners worked on three sides of him. The fossils often materialized intact, he said, as if held together by an invisible force.

"I was in disbelief," said Bentley. "The first thing I saw was an extinct box turtle laying there in a pocket in the limestone; a little way over was another sitting there complete. Then I hit a horse jaw.

"It was like finding gold."

Several thousand fossils were eventually uncovered, before company bulldozers moved in and the tunnel disappeared forever.

State officials claim there were more fossils to be found, but they are grateful to Giant Cement Co. for stalling work for a year.

The company has in 46 years churned up a hole 86 feet deep, three-quarters of a mile wide and a mile long to reach the limestone layer under the coastal plain.

Jim Knight, curator of natural history at the state museum, says researchers will be studying the fossils for years. A sampling is on display at the museum, and a larger selection is destined for the Smithsonian Institution, he said.

"We see the animals that lived there: some no longer exist; others live someplace else in the world," Knight said. "It gives us another piece of the evolutionary puzzle. And that's a very big puzzle."

Research in the Parking Lot

Alan Reiman Tom Stafford

Very early in the morning of Saturday, March 13, we loaded our fossil finding gear, lunches and rain coats into a Chevy Blazer and began our trek to Texasgulf. Although we had made many trips to Aurora, this particular one held a special suspense: the morning papers and radio weather reports had us braced for "the worst storm of the century". Gale force winds were expected on the coast and folks in the N.C. mountains expected 12 - 24 inches of snow. Winds were predicted to gust to 50 - 70 mph. A daunting weather report to say the least.

As we made our way through the driving rain along NC 33, we made predictions about the number of NCFC members who would show up -- 40 tops. By our count just about everyone who registered for the trip was waiting in the parking lot that adjoins Texasgulf. Decked out in assorted blue and yellow rainslicks and waterproof boots, this group could have kept themselves dry while kayaking across the Bering Strait during any "storm of the century". Clearly the Texasgulf mine has a dedicated group in the North Carolina Fossil Club.

Unfortunately, we were unable to enter the mine and folks were pretty disappointed. Turned away, club members saddled back into their respective vehicles and started the long journeys back to their homes. It was at this juncture that we formulated an hypothesis: we surmised that a parking lot this close to Texasgulf might yield some fossils. We could not have predicted the results. A short, meandering walk for approximately 10 minutes yielded 3 sand shark (*Odontaspis cuspidata*) teeth -- ¼" and a mako (*Isurus hastalis*) tooth -- 1". The initial success prompted a more exhaustive and carefully designed study. We divided the parking lot into quadrants with each of us responsible for two of them. We allotted 3 hours for data collection. The results of our careful empirical study are reported below:

- One beautiful chunk of amber -- 1½".
- Over 300 shark teeth ranging in size from ⅛" to 1½". Among the teeth were *Isurus hastalis* (mako), *Hemipristis serra* (snaggletooth), *Odontaspis cuspidata* (sand), and *Galeocerdo aduncus* (tiger).

As we left later that day, we concluded that no pile is too small for investigation when it resides in Aurora.

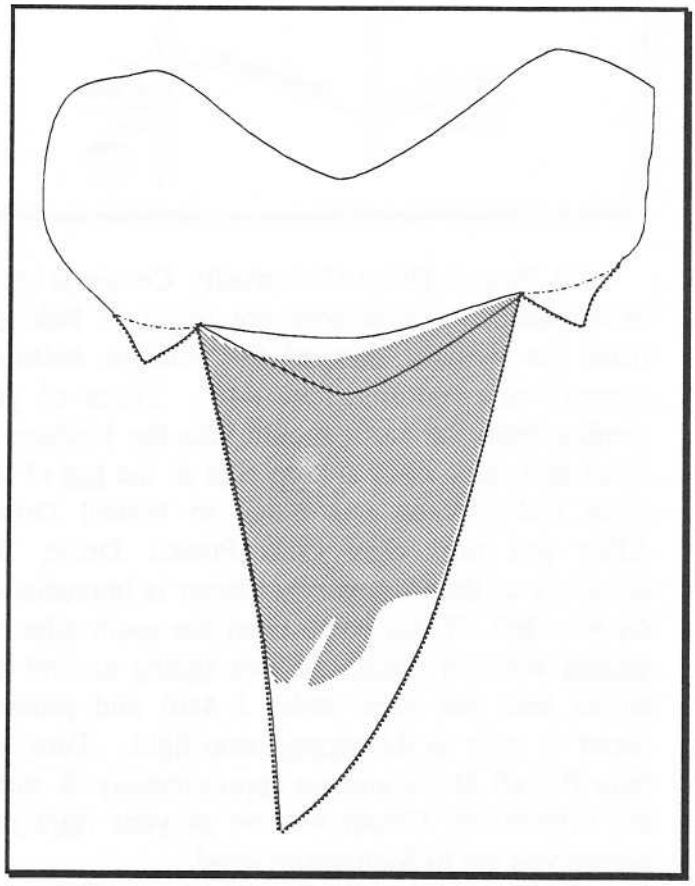
The Powell Drive Community Center is most easily reached (by persons not living in Raleigh) from the western part of the Raleigh Beltline, recently renamed Interstate 440. Those of you coming from the north should take the Melbourne Road exit, turn right at stop sign at the top of the ramp and proceed one block to Powell Drive. After you turn right onto Powell Drive, the driveway of the Community Center is immediately on your left. If you come from the south take the second Western Boulevard exit (going around the clover leaf and back under I 440) and proceed about ½ mile to the second stop light. Turn left onto Powell Drive and go approximately ¾ mile; the Community Center will be on your right just before you get to Melbourne Road.

If you live within reasonable distance from Raleigh, I hope you will make every effort to attend this meeting. We have reserved the Community Center from 1:00 to 5:00 on June 6. There will be an interesting talk followed by ample time for socializing, trading, identification, etc.

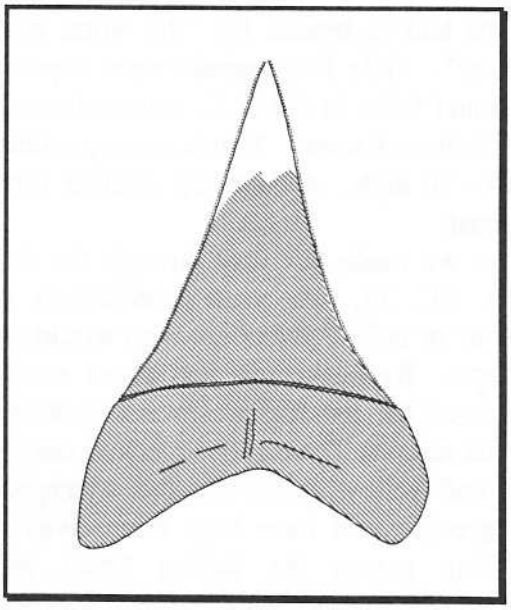
Heartbreak Hotel

We all have stories of the big one that "got away". I thought that I would include a few of my more frustrating experiences – fossil fragments you would almost rather not have found. In each case I have attempted to reconstruct a life-sized approximation to what could have been. I have selected one for size, one for beauty, and one for scarcity. In each case the hatched portion is what I have.

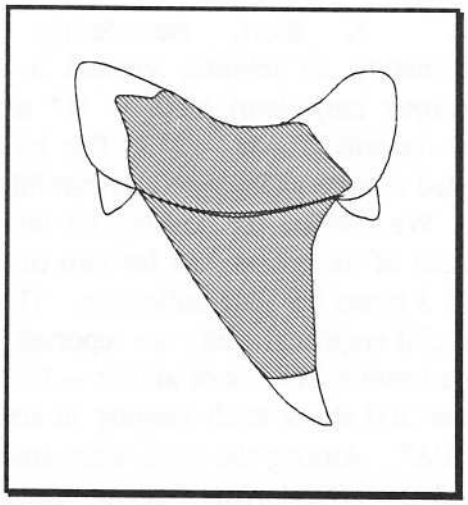
The first of these is a piece of a *Carcharodon auriculatis* tooth that I recently found at the Martin-Marietta Quarry at Castle Hayne. Many of you will know that these Eocene teeth are among the hardest to find in good shape. They are not commonplace anywhere and seem to be particularly scarce at Castle Hayne. Couple all this with the fact that they are my single most favorite find and you can appreciate my frustration with the following world-class fragment.



My second example came from Green's Mill Run in Greenville. If you have ever sieved there, you probably have found some *Carcharodon carcharias* teeth. Usually they are black and worn, with deteriorated roots. The one pictured below is a spectacular (except for the missing tip) lower front tooth. It is a silvery gray color with a perfect root and no wear. The serrations are crisp and particularly distinct. While it is not a giant as these teeth go (I saw John Timmerman find one here which would easily be 3" were it not for a missing ½" from the tip!), it is still large for this species.



My last example was also found at Castle Hayne. When I picked it up I thought it was a not-particularly-great *Carcharodon auriculatis* side tooth. Then I noticed that the cutting edges are sharp and clearly not serrated! I found it in some of the old, possibly Cretaceous, material. Too thick to be a mako, I think that it could be an example of *Otodus obliquus*, which, so far as I know, has not been identified in North Carolina.



North Carolina Fossil Club, Inc.
(Founded 1977)

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1993 Membership Application - N. C. Fossil Club

NAME(S) ____

ADDRESS ____

CITY, STATE, ZIP ____

PHONE(S) (Include Area Code) ____________________________

INDICATE TYPE(S) OF MEMBERSHIP(S) **INDIVIDUAL (NEW)** **$20.00** ________

INDIVIDUAL (RENEWAL) **$10.00** ________

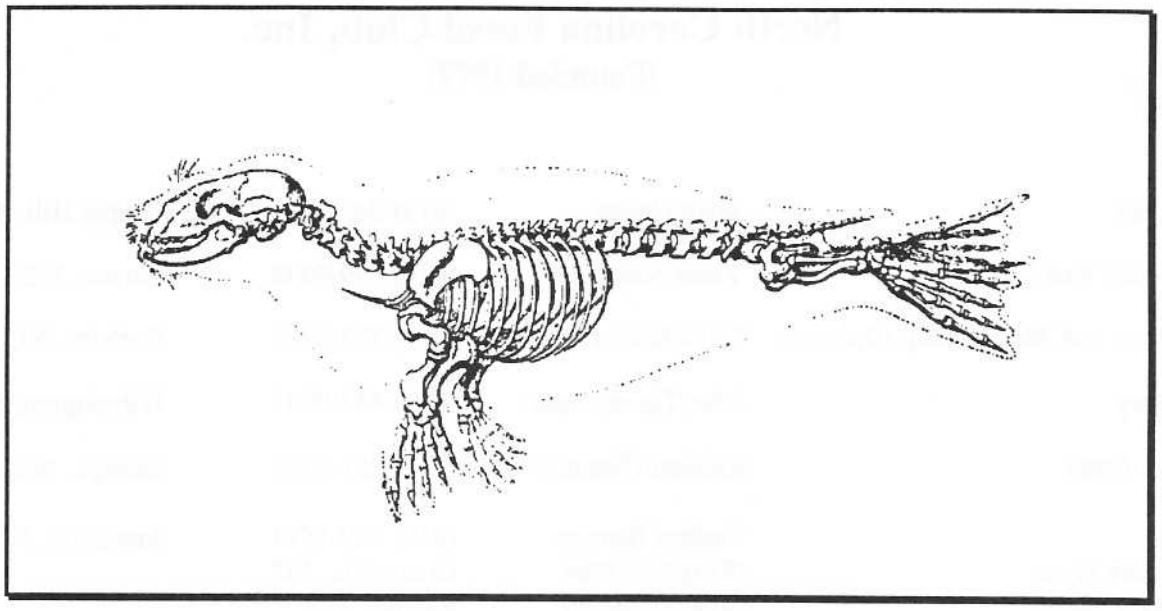
SPOUSE (NEW OR RENEWAL) **$ 5.00** ________

SIGNATURE ______________________________ **DATE** ____________

Children of NCFC members who are dependent minors and living at home may accompany parents on any trip *EXCEPT* Texasgulf or where otherwise noted. Only 15 positions on the Texasgulf trip are available to members who reside outside of North Carolina.

Memberships are effective from January through December of the year (or portion of the year) of the date of application. For example, persons joining in August will need to renew their membership 5 months later in January.

MAIL TO: NC FOSSIL CLUB, P.O. BOX 2777, DURHAM, NC 27705



Phocus groenlandica (Greenland Seal)

North Carolina Fossil Club
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