FOSSIL AND ARTIFACT COLLECTING REPORT

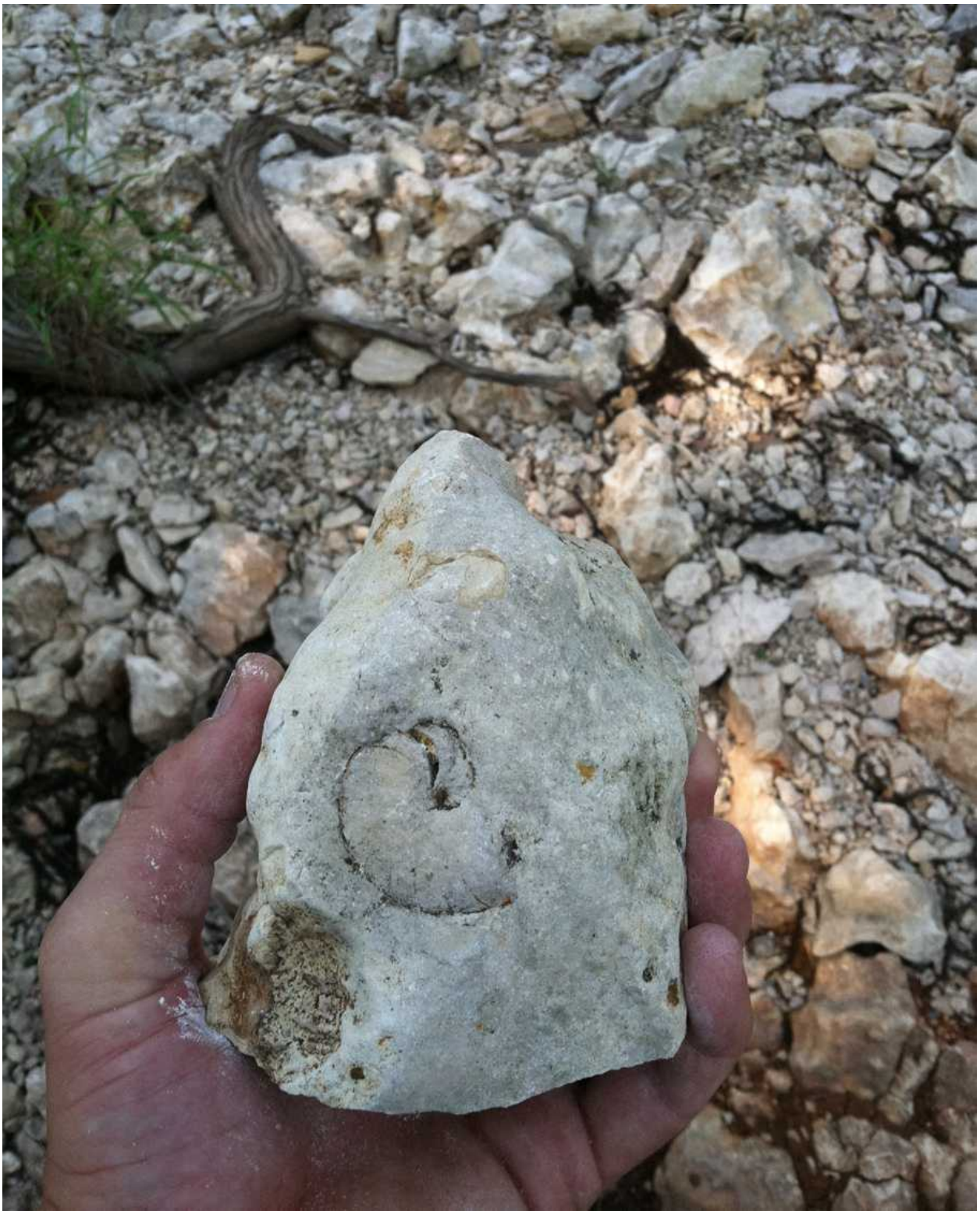
July 2013

Daniel A. Woehr and Family and Friends

July 3, 2013: Upper Cretaceous Marine Outing with a Holocene Bonus

The holiday week afforded me the liberty of a little travel time on a work night, so I seized the opportunity to push farther along an exposure of Pecan Gap Formation marine chalk to see what else might be catching daylight for the first time in 73 million years.

I pushed over a mile downstream through dry stream bed gravels and it became clear to me that the float was composed of the various lithologies present within the Austin Chalk (84 MYA). Rock units could in places be seen bedded in the stream bottom and ranged from blocky to nodular to marly. There was much hematite strewn throughout the float. I could see partial ammonite fragments and impressions, mostly in the orange colored, flaggy limestones peppered with shell fragments. But no whole ammonites were found in situ. Instead I was rewarded with one cute little nautiloid from the nodular Austin float just downstream of its source bedded in the stream bottom.



FIGS 1-2: *Eutrephoceras* (?) nautiloid from the Austin Chalk this and next page (Site 668)

The return leg of my hike found me weaving a path other than where my initial steps had fallen, eyes scanning all new sections of bedded limestones and gravels. A large bluff that ended abruptly instinctively put my artifact detection system on high alert. I guess I'm finally learning to read topography for potential Indian campsites. I reasoned that the flat spot on top of the stream terrace at the downstream foot of the bluff would have been a great campsite, affording a rapid uphill retreat in the event of attack, rising flood waters, etc.

I had seen little or no flint in the stream gravel along the course of my hike, then the first piece I encountered was about 2/3 of a flint blade, not far downstream of said bluff. I had the self control to shoot an in situ photo before grabbing it. It was quite gratifying to actually find a point in an area that my instincts identified as having artifact potential. Who knows how many I've walked by over the years, oblivious to the clues around me, and more recently, focusing more on bedrock outcrops for fossils than on the signs of pre historic habitation. I still have much to learn.

FIGS 3-5: Flint blade this and next 2 pages (Site 668)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The contact between the Austin and Pecan Gap formations here is overwashed by alluvial gravels, but I soon found my way back to the small stretch of bedded Pecan Gap Chalk. I did a little more blind mining and turned up a couple *Hemiaster* echinoids, a *Gyrodes* gastropod, and a few *Neithea* scallops, but no ammonites this time.

FIGS 6-7: Pecan Gap echinoid *Hemiaster* c.f. *texanus* this and next page (Site 154)


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FIG 8: Pecan Gap Formation gastropod *Gyrodes* sp. (Site 154)

FIG 9: Pecan Gap Formation bivalve *Lima* sp. (Site 154)

FIG 10: Pecan Gap Formation bivalves *Neithea* sp. (Site 154)

Three ages of finds, 2 hours, one hike, very little pollution, no people, no big city noise....I am inclined to call that a successful outing.

July 4, 2013: Independence Day Independence

Pleased as punch with the previous day's outing, I returned to the same site to methodically grid search the gravel stretch that gave up the point. I so thoroughly enjoy these self styled adventures...what a perfect way to begin Independence Day while family slept in.

My first find, however, was not an artifact...it was a small Austin Chalk ammonite in a limestone nodule. The rock looks hard but I think I see a few fissures in the right places for me to exploit with my air scribe to pop this specimen out free of matrix.

FIGS 11-12: Unidentified Austin Chalk ammonite this and next page (Site 668)

Subsequent stream meanderings turned up several tantalizingly suggestive chunks and slivers of flint, then finally a large flake that I could confidently see was fashioned into a uniface scraper, as evidenced by the secondary finishing flakes along one edge. Not all lithic artifacts were fashioned in the instantly recognizable triangular, stemmed form. In fact, most may have been single use, purpose-crafted tools made impromptu, and many of these are easy to overlook. While not as sexy as finely crafted blades, these more crude tools still have a place in our collections and deserve a measure of respect.

FIGS 13-14: Flint uniface scraper this and next page (Site 668)

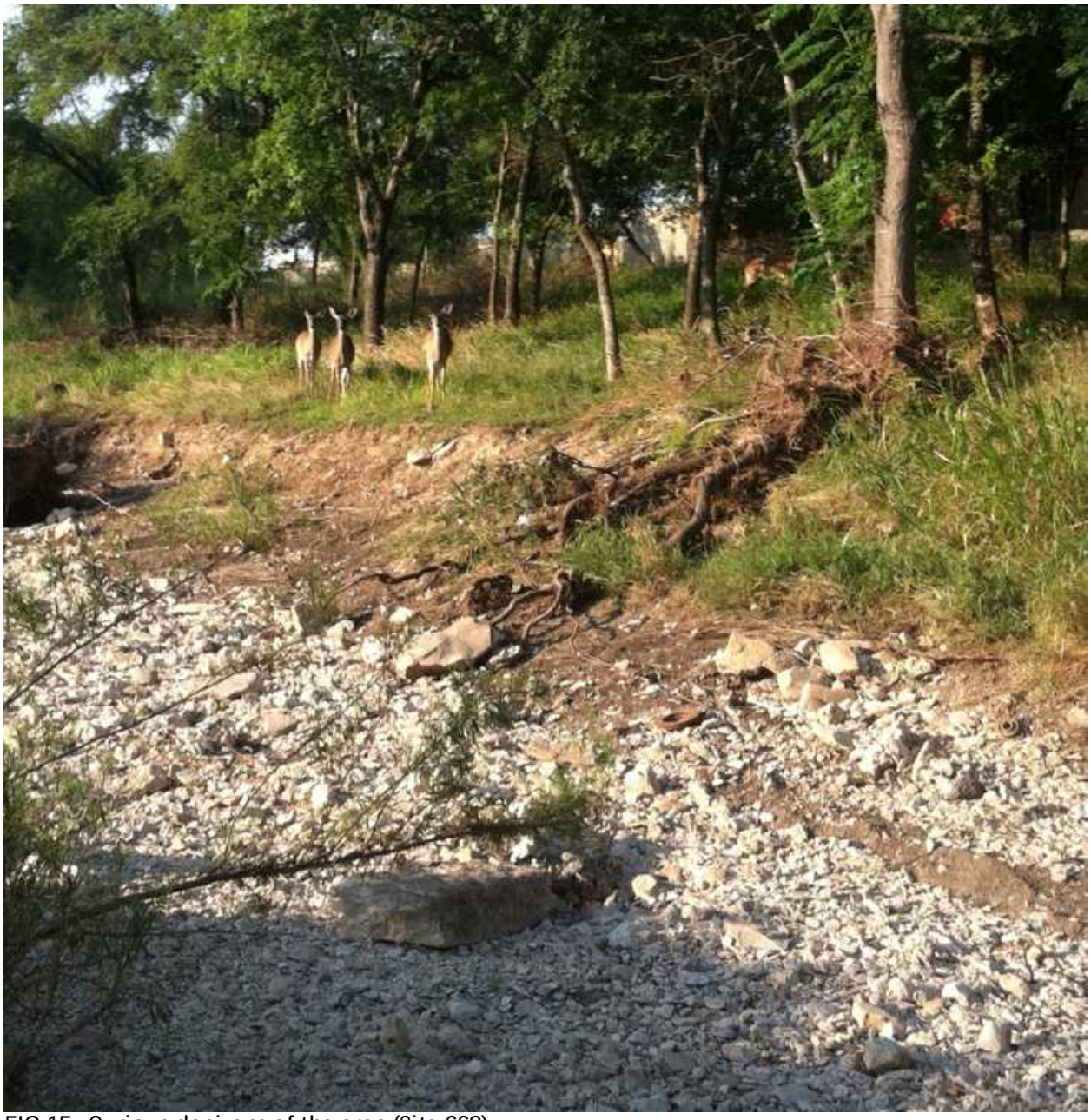

FIG 15: Curious denizens of the area (Site 668)

My short stomp was over with before the heat of the morning sun was upon me, and before long my day was one of tree trimming, wood splitting, BBQing steaks, swimming , feasting, and blasting the night sky with vibrantly colored showers of flame with family…although it's funny how family disappeared for the wood splitting detail.

July 5, 2013: Sun Scorched Ammonites 80

My recent successes in dismissed Pecan Gap exposures motivated me to drop into another long forgotten drainage on this day to see what might be peeking out of the weathering, sun scorched chalk. During my long and sweaty hike, a panting, stray pit bull made my acquaintance and took a shine to my

company...or perhaps just enjoyed the shade that I threw (that shade growing more abundant by the year). A pat on the head was all he required to seal our friendship. With his little tongue hanging out he tried to keep pace with my lanky stride, but then retired to a shady spot in the understory, awaiting my return.

Well hydrated, I finally reached my destination, an isolated bench of yellow and gray chalk forming a nearly vertical stream bank. My first pass down low produced nothing. My second pass up high yielded first a barely exposed *Pachydiscus travisi* ammonite, then 6 feet away, a nice 4-5 inch example of the same taxon, well exposed.

FIG 16: Contact of the Austin Chalk in the foreground and Pecan Gap Chalk in the background (Site 80)

FIG 17: Balling baby catfish (Site 80)

FIGS 18-22: Pecan Gap Formation ammonite *Pachydiscus travisi* in various stages of field extraction and preparation this and next 4 pages (Site 80)

FIG 23: Impression of a Pecan Gap Formation ammonite *Trachyscaphites spiniger porchi* (Site 80)

With a little super glue to stabilize some questionable areas, hand sledges and chisels sprang into action, with chalk chips a-flyin'. Net result: 2 ammonites never to be threatened by floods again, or even the scorching Texas sun, for that matter. One was destined for the donation pile, the other, quite a showpiece.

And “Dan’s best friend”, true to form, with a bustle from a hedgerow, was soon beating 4 paws on the ground to keep up with me, and chaperoned me all the way back to my vehicle. I hope he does well in the heat.

July 6, 2013: Serendipity in the Shade

With 100 degree climes forecast for the afternoon, I took my loving wife out early for a stomp and look in a South Texas stream bed exposing the Pecan Gap Formation (73 MYA). On the way in I warned her that I had dismissed the site years prior due to scant finds, but then again I was rather inexperienced at the time, and paucity of obvious, well exposed megafossils could have biased my recollection.

Slugging water every 10 minutes, we made our way along the lithologically varying beds of the Pecan Gap Chalk and began seeing telltale impressions of 3-4 inch *Inoceramus* clams as well as some oysters. Occasionally we saw exposed and eroded *Baculites* (straight ammonite) sections, and I instructed my wife to blind mine with her hammer and chisel in these areas as my experience suggests that where there are straight ammonites, there could also very well be more desirable coiled varieties.

FIGS 24-25: Mrs. Woehr preparing to explore a Pecan Gap Formation exposure this and next page

(Site 283)

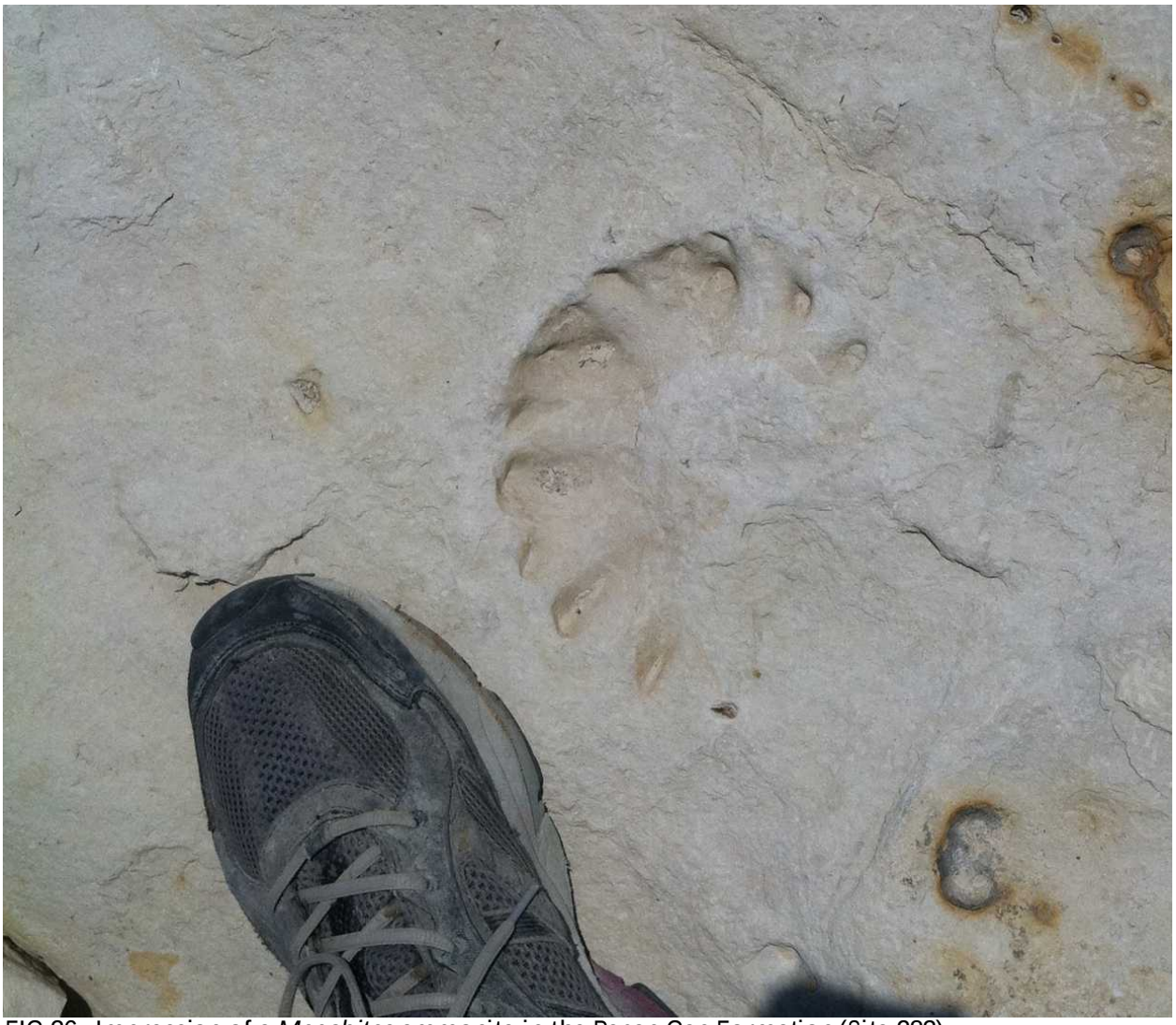

FIG 26: Impression of a *Menabites* ammonite in the Pecan Gap Formation (Site 283)

FIGS 27-28: *Baculites* straight ammonites from the Pecan Gap Formation this and next page (Site 283)


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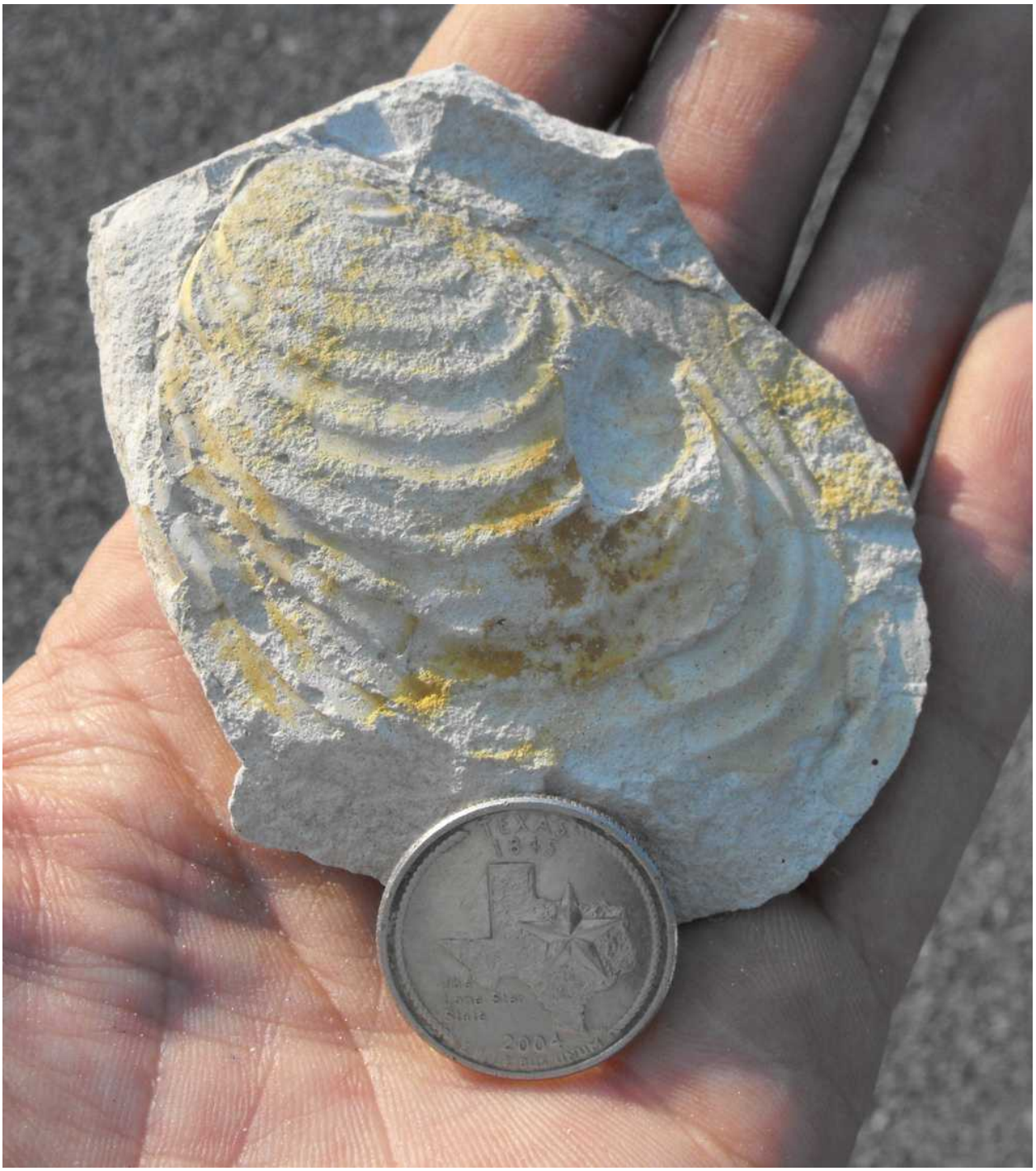
FIGS 29-30: Mrs. Woehr and an *Inoceramus* clam from the Pecan Gap Formation this and next page (Site 283)



I spotted an upside down *Pachydiscus travisi* ammonite, fat in section, and knowing the Pecan Gap's strange way of compressively distorting ammonites in seemingly random orientations, I anticipated this one being vertically squashed…and I was right. Once extracted, it was as if I was viewing its profile in a circus mirror (the laterally stretching variety). Incidentally, while digging wide around this block I exposed 2 *Hemiaster* echinoids frozen in time…squashed but their synergy was complementary.

FIGS 31-32: A distorted Pecan Gap Formation ammonite *Pachydiscus travisi* this and next page

(Site 283)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FIGS 33-34: Rough Pecan Gap Formation echinoids *Hemiaster* c.f. *texanus* this and next page

(Site 283)

Pressing on, I left Brett at a promising looking outcrop while I pushed a little farther. In a hard yellow limestone bench I found a *Menabites* ammonite. I'm glad I took a picture as my trenching efforts with hammer and chisel destroyed the specimen. Next time, rock saw.

FIG 35: Pecan Gap Formation ammonite *Menabites* sp. moments before its unfortunate destruction

(Site 283)

Catching back up with Brett, she had found bits and pieces of a spatangoid echinoid of some sort. I went ahead of Brett, nearly out of drinking water from dumping half of it over my head and shirt. Shade was my prerogative, and I found it under a bush covering part of the chalk bench where I had found my ammonite and echinoids earlier. I enjoyed lying back in the shade with my head on my backpack waiting for my wife to catch up.

When she arrived I gave her a tutorial on blind mining the Pecan Gap as the immediate vicinity appeared uncharacteristically rich in organic remains based on a few things peeking out from the surface. The Pecan Gap is usually stingy so this warranted a closer look. Anyway, this rock tends to weather and split readily into conchoidal fractures, allowing one to exploit the cracks to sometimes reveal well preserved, fragile fossils long protected from the elements.

As I demonstrated slamming my chisel into just such a fissure, a big shard of matrix moved just enough for me to catch a momentary gleam as it passed through a pencil shaft of light sneaking through my shady canopy. That gleam came from the enamel of a *Cretolamna* shark tooth, noteworthy as all shark teeth are locally rare in this formation. I collected it and continued to work this small area.

FIGS 36-37: Pecan Gap Formation shark tooth *Cretolamna* sp. this and next page (Site 283)


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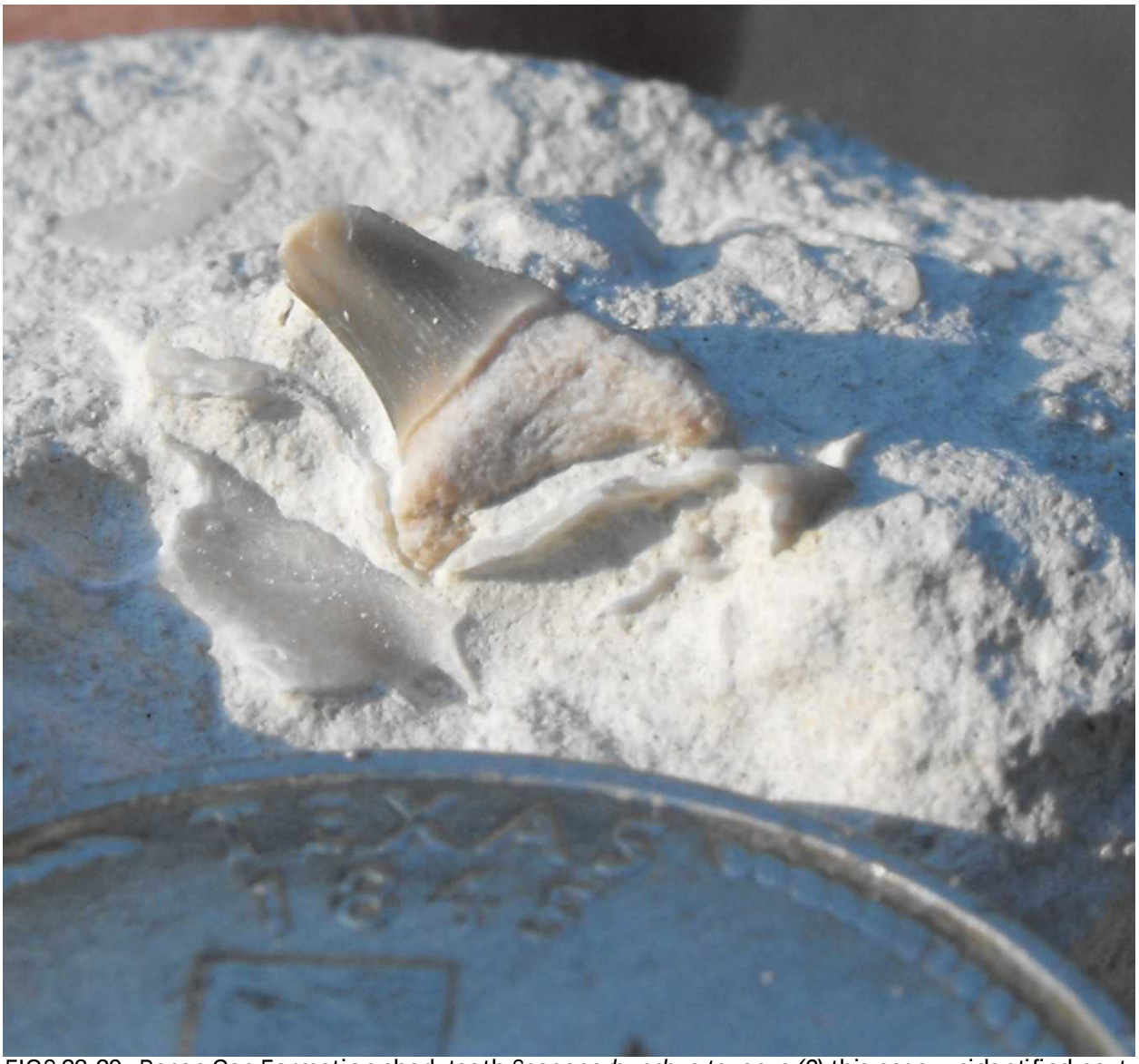

FIGS 38-39: Pecan Gap Formation shark teeth *Scapanorhynchus texanus (?)* this page, unidentified next page (Site 283)

Continuing my blind mining efforts, a strange and quizzically shaped inclusion surfaced as I worked lower in the block, and it came out in 2 pieces which I glued back together. In the sunlight I recognized the prismatic surface structure as that of shark cartilage, a rare and welcome find. Subsequent emails to experts at the Mississippi Museum of Natural Science and American Museum of Natural History revealed it as the rostrum (snout) of a shark or eagle ray...very cool!

FIGS 40-41: Section of rare cartilage from the Pecan Gap Formation representing the snout of a large shark or eagle ray this and next page (Site 283)

This chalk bench proved to be a veritable jambalaya of sea creatures – *Inoceramus* clams, oysters, *Gyrodes* gastropods, 3 more small shark teeth, a fish tooth, 3 fish vertebrae, more *Baculites* ammonites, plus *Trachyscaphites spiniger* and *Pachydiscus travisi* ammonites.

FIGS 42-45: A delightful jumble of fish teeth, vertebrae, and bones in a slab of Pecan Gap Chalk, this and next 3 pages (Site 283)

FIGS 46-47: Views of a Pecan Gap Chalk fish vertebra broken down the center, this and next page

(Site 283)

FIG 48: A rough fish vertebra from the Pecan Gap Chalk (Site 283)

FIGS 49-51: Pecan Gap Chalk ammonites *Trachyscaphites spiniger porchi* this and next 2 pages

(Site 283)

FIGS 52-54: Pecan Gap Chalk gastropod this page, possibly *Gyrodes,* although there may be too many whorls for this genus, followed by the internal mold of a limpet shell next 2 pages (Site 283)


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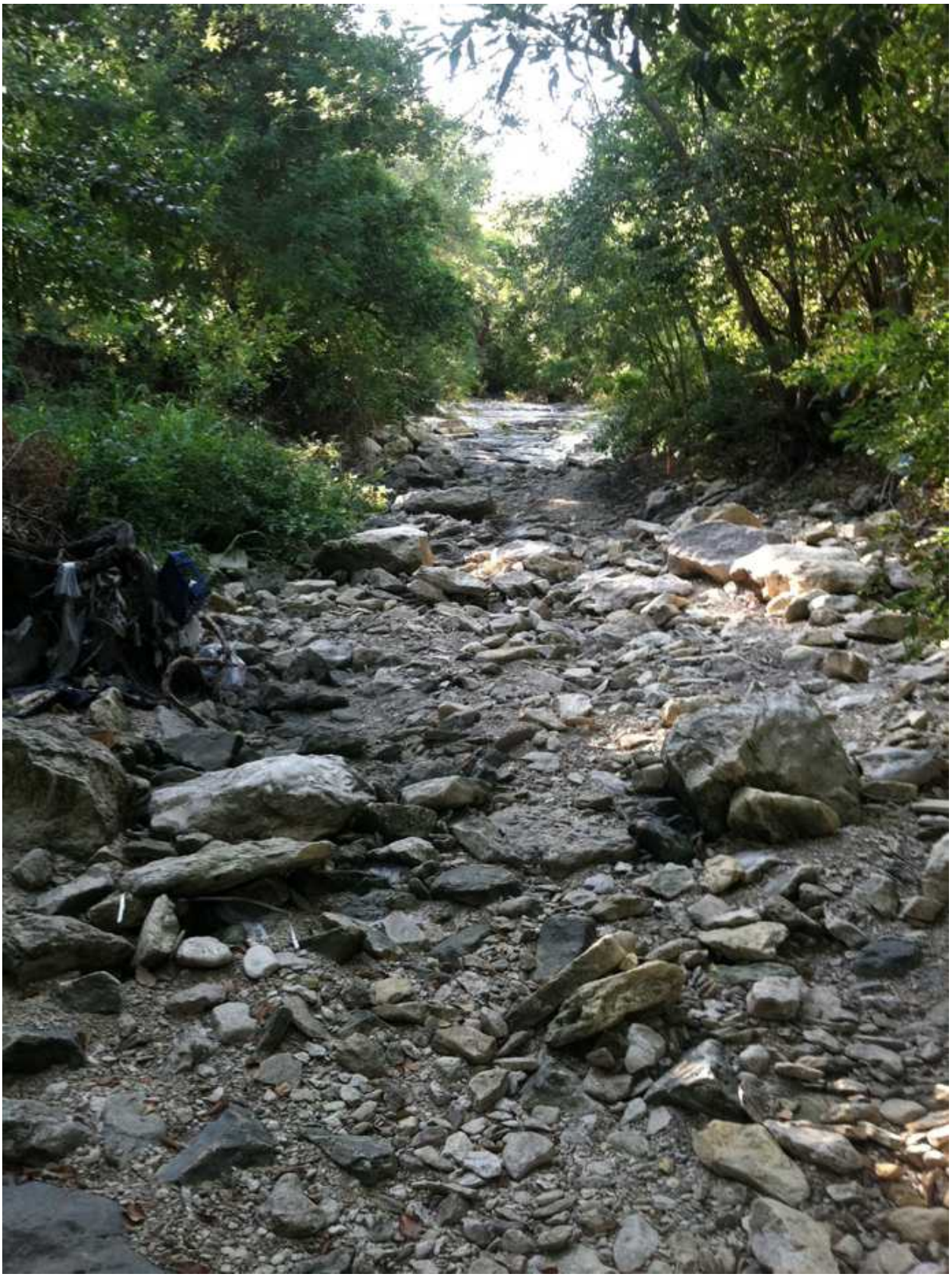
Who woulda thunk that my uninspired intent to find succor from the sun's oppressive rays would lead to the discovery of extremely rare soft tissue preservation, rarely seen in the fossil record? Finds were good enough to make us ignore the heat….I think Brett and I will be returning to this site!

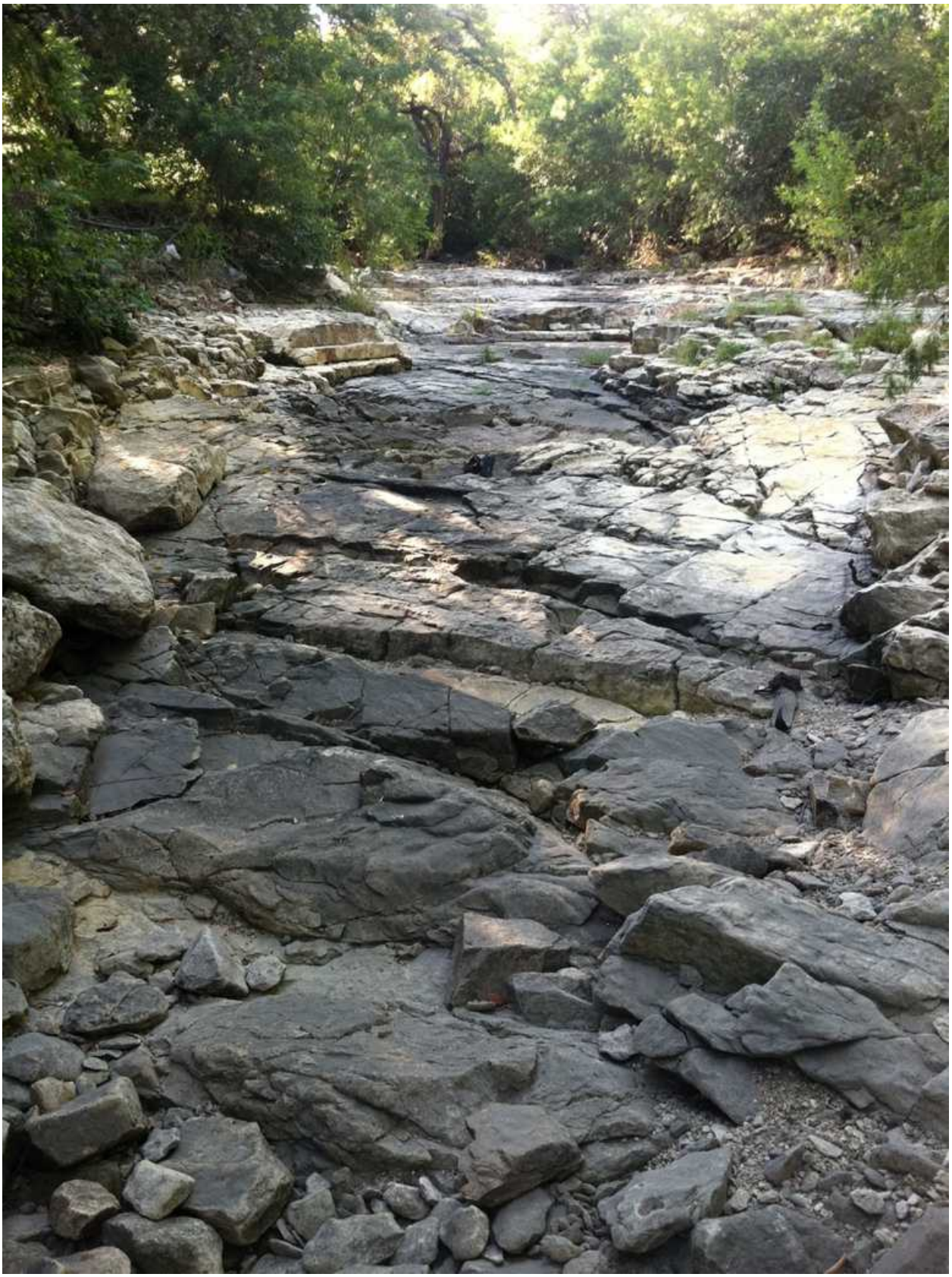
July 7, 2013: Austin Chalk Ammonite Ambush

I had a narrow time slot to explore between church and the prolonged task of tearing every square foot of carpet out of my house, so I slugged a half gallon of water and gave chase in a dry gully I had noticed just the day before on Google Earth. How I had overlooked this for 10 years I'll never know, but the good news is that everyone else had apparently overlooked it too!

Knowing that the Austin is quite a hard limestone locally, I arrived toting heavy hand tools. Fortunately, they got a good workout. The first bench I found had all the clues (lithology, oyster beds, indurated layers) of the Dessau Formation (84 MYA). This put my radar on full attention, and soon I began seeing numbers of large bowling ball sized *Eutrephoceras* c.f. *campbelli* nautiloids in situ. They take a bit of effort to knock loose, and I have many of them, so I left most alone in anticipation of my collecting friend Richard visiting from Dallas.

FIGS 55-58: Vistas of the Austin Chalk, this and next 3 pages (Site 669)





Transition of beds in the Austin Chalk

FIGS 59-61: Austin Chalk nautiloids *Eutrephoceras* c.f. *campbelli* in situ this and next 2 pages (Site 669)

FIGS 62-63: Unidentified Austin Chalk ammonite this and next page (Site 669)

When I spotted a decent ammonite, however, that one had my name on it more so than Richard's! I call it my "finder's fee". I got it out in one piece and moved on to another associated exposure nearby.

Holy smokes, this place was productive! Nautiloids were everywhere, including several in perfect condition. I took one out of a gravel bank, and banged out one big slob of a nautiloid barely hanging onto a few fingers of bedrock. My 3 LB hand sledge was *de rigeur* that day. My cursory search even revealed one ribbed ammonite, possibly *Submortoniceras*. It was broken up in situ, but I dug it up and grabbed all the pieces in anticipation of a modestly successful reconstruction. In the end it proved destined for the donation pile.

FIGS 64-65: Unidentified Austin Chalk ammonite this and next page (Site 669)

FIGS 66-71: More Austin Chalk *Eutrephoceras* nautiloids this and next 5 pages (Site 669)

STANLEY
Target

With a bulging backpack and tugging shoulder straps, I furtively chose my footholds back to the vehicle and made off better than DB Cooper. Now I need to coax Richard back down here before temptation to return sets in.

July 9, 2013: Perambulating Parched Earth

Man, is Texas ever hot in July! I went out for a hike anyway along a stream exposure for a little exploration and exercise. Everything is parched this time of year, so I got to see some patches of rock generally not visible year round. Plus we had some flooding several weeks ago, heightening my interest in re-exploring some sites I vacated years ago.

In short my long hike revealed some benches of Pecan Gap Chalk that were previously covered by water and gravel. No fossils though. However, a certain Austin Chalk bench received enough erosion to reveal a seemingly nice nautiloid, probably *Eutrephoceras campbelli*.

FIG 72: Austin Chalk *Eutrephoceras* nautiloid in situ (Site 80)

I was short on tools when I found it, and a heavy hand sledge and chisel are required to free it from the greedy fingers of the Austin Chalk. But since I have several of these specimens already, I opted to call on a younger, aspiring local collector to bang out the specimen while I stand around taking pictures…as my creaking joints continue to age, there may be more of this!

July 11, 2013: Austin and Pecan Gap Continued

Back to that nautiloid from the other day....On my lunch hour I met up again with Joe Cooper, who with a toddler in the house, was quite happy to break away from work and home briefly to enjoy a little man time in the field. Once our long stomp to the fossil was behind us, this opportunity served as a hands-on excavation tutorial.

FIG 73: An eroding, blocky, sparsely fossiliferous expanse of Austin Chalk (Site 80)

FIGS 74-76: Joe Cooper working on a *Eutrephoceras* nautiloid in the Austin Chalk this and next 2 pages (Site 80)


Target Guard

FIG 77: A *Trigonia* bivalve entombed in extremely hard Austin Chalk (Site 80)

20-30 minutes into the exercise the specimen popped out of the clutches of the chalk, and unfortunately its protected side was not pristine, but hey, it was still an outing and I taught Joe how to read the rock for weak points to exploit with hand tools. I hope this knowledge serves him well in his own upcoming field adventures.

After work I continued my Pecan Gap imperative in the sweltering Texas sun. Uncomfortable as it was, I figured my middle aged physique could benefit from another round of exertion anyway. So in a stream bed far from my lunch time stomp, I resumed my meandering course over the various bedrock and gravel of said stream.

I followed chunks of tumbled and weathered Pecan Gap chalk to its source at the confluence of 2 streams. By randomly splitting these crumbling blocks of white chalk, I was rewarded with a few goodies here and there…a few spatangoid echinoids, a fish scale, a broken fish vertebra, some nice gastropods, and a couple unidentified ammonites.

FIGS 78-81: Unidentified Pecan Gap Formation echinoids this and next 3 pages (Site 670)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Probably a really squashed *Hemiaster texanus*. Pecan Gap echinoids are almost never found well preserved and inflated.

FIG 82: A Pecan Gap Formation fish scale (Site 670)

FIG 83: An unidentified Pecan Gap Formation ammonite (Site 670)

FIG 84: A Pecan Gap Formation gastropod, possibly *Anchura* (Site 670)

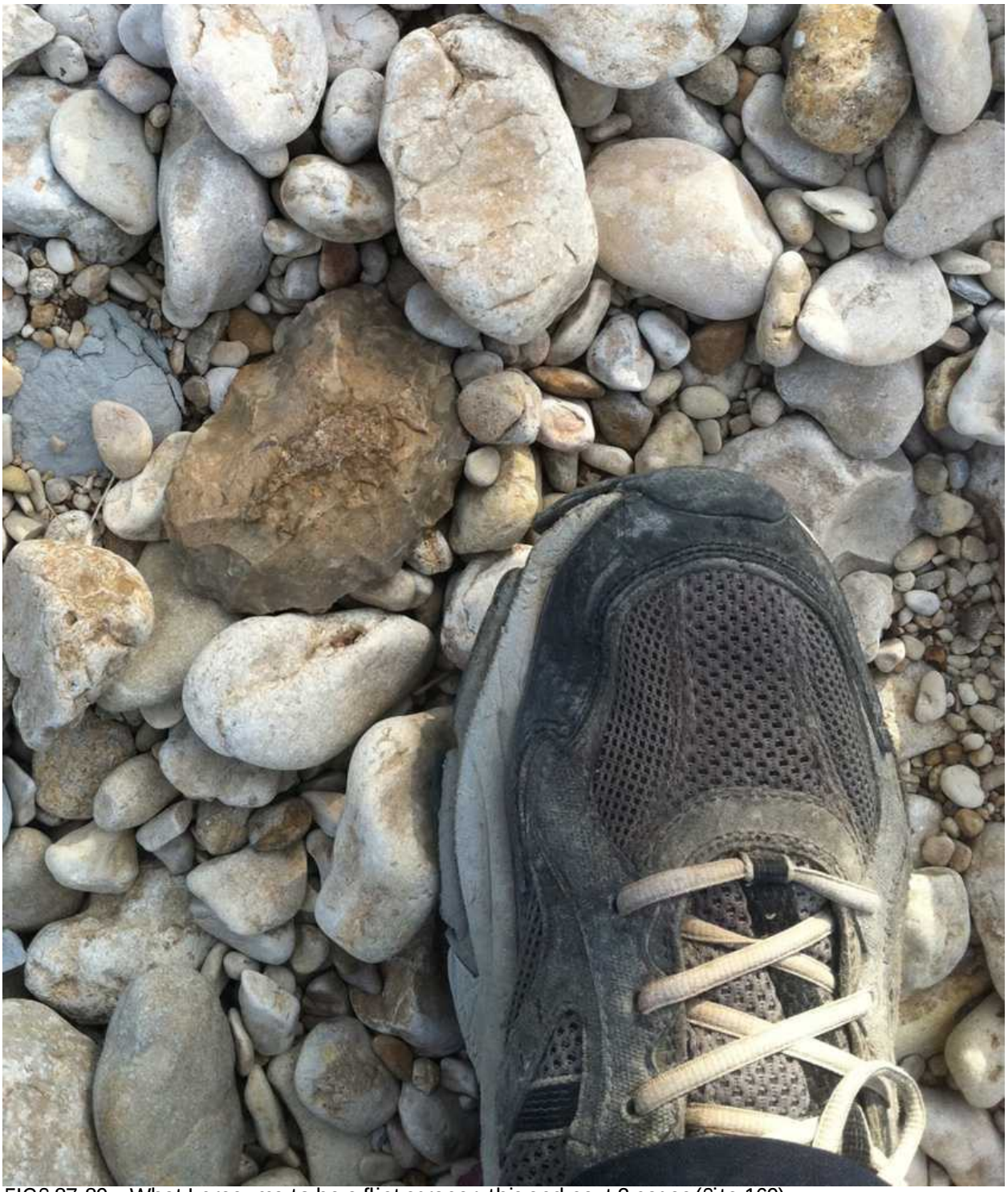
FIG 85: An unidentified Pecan Gap Formation gastropod (Site 670)

FIG 86: A Pecan Gap Formation gastropod of the genus *Gyrodes* (Site 670)

Not a bumper crop of high grade finds this time by any means, but a fun and worthwhile look at a clearly uncollected area.

July 12, 2013: Weekend Kickoff

My wife was coming home from work a little late on Friday night, so I decided to break a sweat and stomp another creek bed. In short, I saw a few *Baculites* ammonites but collected no fossils. I zigzagged a gravel patch and was rewarded with a flint biface scraper, making it all worth the effort.



FIGS 87-89: What I presume to be a flint scraper, this and next 2 pages (Site 169)

July 13, 2013: Opportunistic Onslaught in the Pecan Gap

My lovely wife had some girly primp time lined up for Saturday morning and urged me to find something to do for a few hours. No problem. A Saturday drive took me to a stream bed I had never collected, again in the Pecan Gap Formation.

Things got interesting when I found the phosphatic contact zone between the Austin Chalk and Pecan Gap Chalk. A yellow, smooth, curved shape caught my eye, so I grabbed my phone for a quick pic before going for the hammer. Once my hand sledge and chisel knocked some chalk out of the way, I could see the 8-10 inch *Eutrephoceras* nautiloid take shape in all its yellow phosphatic splendor.

I had the sense to take another couple pics before popping the specimen out of the chalk, and this proved to be a good move because it shattered into pieces toward the end of the process, as is often the case when working this friable Upper Cretaceous chalk. Half a nice yellow, phosphatized *Pachydiscus* ammonite made it into my bag as well, also from this same zone.

FIGS 90-92: An unidentified Pecan Gap Formation nautiloid (*Eutrephoceras*?) during and after a partially successful extraction, this and next 2 pages (Site 671)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FIGS 93-94: Partial phosphatic steinkern of the Pecan Gap Formation ammonite *Pachydiscus*, this and next page (Site 671)

Following a chalk bench along the stream bed, I spotted a couple *Pachydiscus travisi* ammonites heavily eroded on the exposed side. Both yielded to the hand sledge and popped out in one piece, one being much more spectacular than the other. I was several floods too late in finding a couple more ammonites in the stream bed, worn too thin to collect. I saw several echinoids in situ, but only took the best preserved one.

FIG 95: A very sparsely fossiliferous bench of Pecan Gap Chalk (Site 671)

FIGS 96-100: Two Pecan Gap Chalk ammonites *Pachydiscus travisi* this and next 4 pages (Site 671)


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FIG 101: Half of a lovely Pecan Gap Chalk *Pachydiscus* ammonite (Site 671)

FIG 102: A Pecan Gap Chalk *Hemiaster texanus* echinoid (Site 671)

FIG 103: A wonderfully presented Pecan Gap Chalk *Inoceramus* clam (Site 671)

I made it home about the time my wife did…impeccable timing.

July 15, 2013: Peekin' and Pokin' the Pecan Gap

With all this fun going on, Brett let me know she was ready for another visit to "her creek" in the Pecan Gap Formation. Overcast skies threatened us with rain, but we took our chances and enjoyed daytime highs in the 80s for the first time in weeks.

We dug out a few finds like gastropods and echinoids spotted on the surface of the eroded chalk bench, but blind mining was the more productive method, and Brett made the first cool find with a dark brown shark tooth blade highlighted in contrast to the off white matrix. We spent an hour tearing up chalk and found a number of goodies – several spatangoid echinoids, one ammonite, one rough fish vertebra, one *Gyrodes* gastropod, and a dime sized, well preserved fish scale.

FIG 104: Mrs. Woehr's nice Pecan Gap tooth blade in matrix, the first good find of the day (Site 283)

FIG 105: An intriguing fish scale from the Pecan Gap Formation (Site 283)

FIG 106: A fish vertebra in the Pecan Gap Formation (Site 283)

FIGS 107-108: A Pecan Gap Formation echinoid with design cues of *Schizaster* or *Linthia*, this and next page (Site 283)


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FIGS 109-110: Preservation slides downhill once again with these Pecan Gap Formation echinoids, possibly *Hemiaster texanus*, this and next page (Site 283)


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FIGS 111-112: Pecan Gap Formation echinoids, gastropod *Gyrodes* sp. this and next page (Site 283)


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FIG 113: Pecan Gap Formation *Exogyra* c.f. *ponderosa* oyster (Site 283)

FIG 114: A chunk of a huge ammonite, possibly *Parapuzosia* from the Austin Chalk (Site 283)

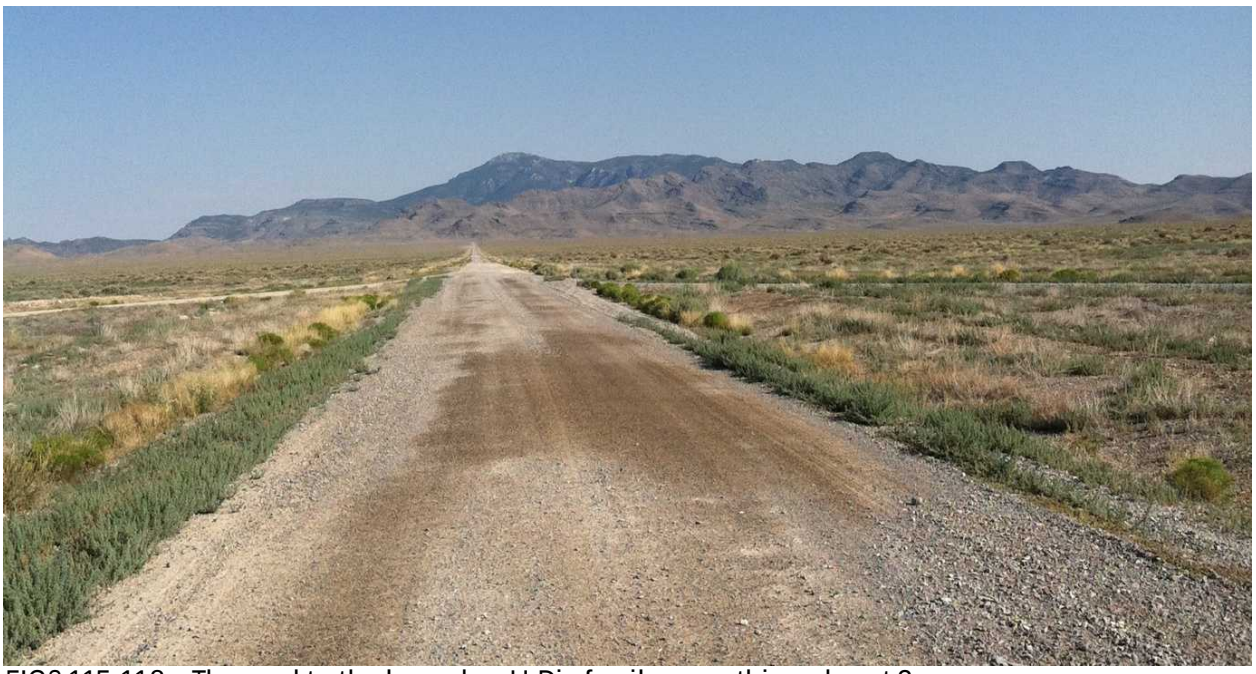
Brett has a renewed interest in collecting now that I'm not making her get up at 2-3 a.m. every weekend for a 24 hour excursion including 12 hours driving. However, with a few local exploits under her belt,

she is now telling me which long distance adventures she is ready to be taken on. And I'll be happy to comply!

July 18, 2013: Cambrian Camaraderie

Young Weston and I were fortunate to catch a nonstop bird from San Antonio to Salt Lake City Wednesday evening, affording us a little time to clip off some miles toward Delta, Utah before we retired for the evening. Thursday morning found us wolfing down breakfast on the run as we kicked up a vortex of dust behind the rental SUV while traversing the miles of gravel back roads west of Delta en route to U-Dig Fossils, a pay quarry situated in the House Range.

We arrived when the quarry opened around 9 a.m., experience telling me to start early when working black shales in summer. After paying for a half day and signing a waiver, we listened to the operator's orientation talk, said hello to the 6 or 8 other diggers on site, then headed off in our own direction to explore the riches of the Cambrian aged Wheeler Formation (550 MYA).



FIGS 115-118: The road to the legendary U-Dig fossil quarry this and next 3 pages


U DIG
FOSSILS
TRILOBITE
QUARRY
8 Miles To Go


WELCOME
TO
U-DIG FOSSILS


Our destination (Site 672)

For best preservation, I urged Weston to target and split the lustrous black shales found low in the exposure. At first his mutterings implied low confidence in his predicted success, but this all changed when he found the first 2 or 3 nice *Elrathia kingii* trilobites up to perhaps an inch in length. The Kid was on a roll and continued to land very nice specimens. I was proud of him, and happy to begin our 4 day odyssey with a measure of instant gratification for the lad.

FIGS 119-128: Weston Woehr leading the charge with several nice *Elrathia kingii* trilobites from the Wheeler Formation, this and next 9 pages (Site 672)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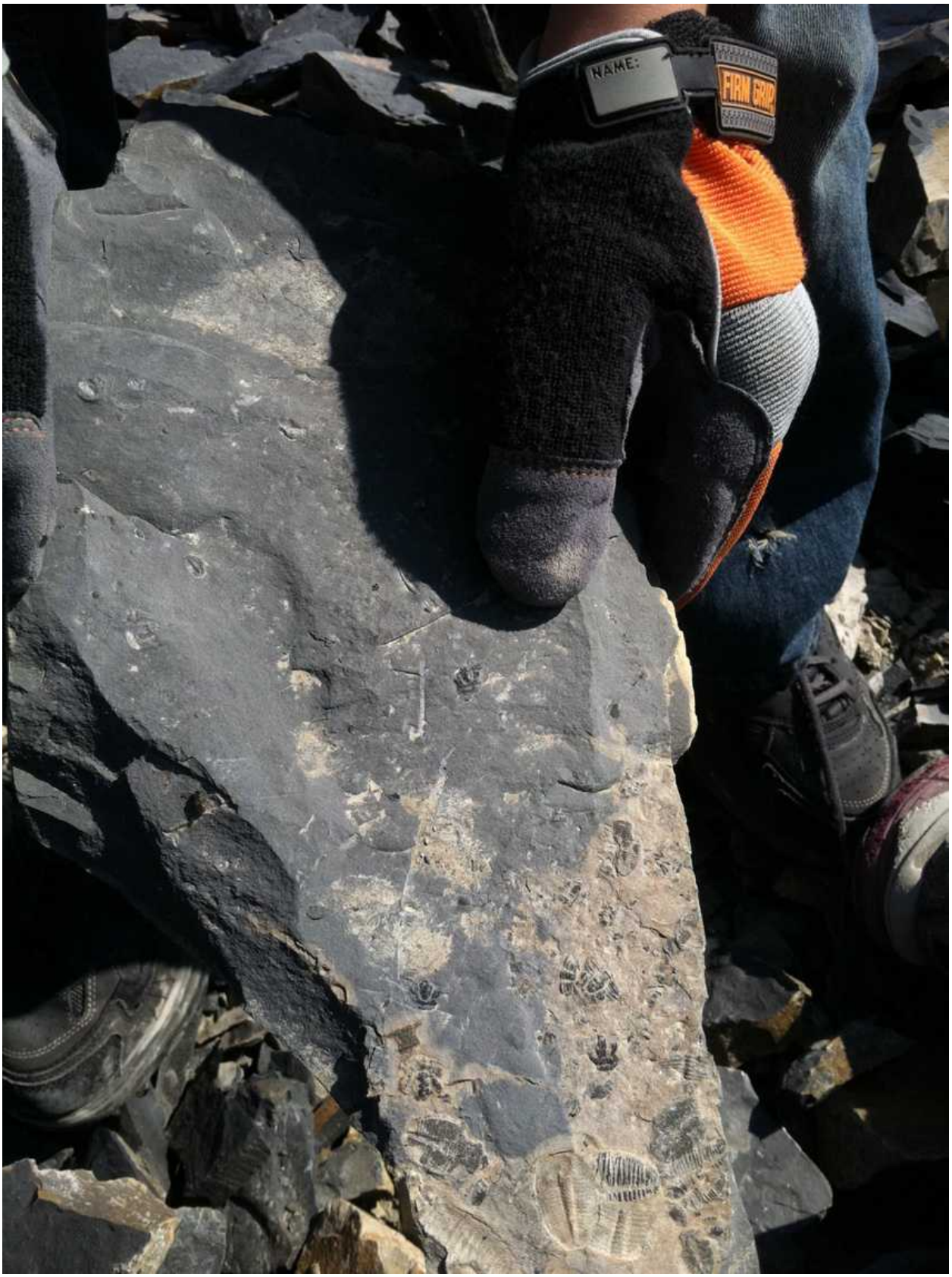
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FIGS 129-130: Weston's *Asaphiscus wheeleri* trilobites from the Wheeler Formation, this and next page (Site 672)

We were doing well at our starting point, and when the sun gradually unleashed its fury on us both from above and from the heat emitting shales below, Weston first switched from splitting to flipping slabs, then ultimately let me know that the sun's oppressive rays were a bit much for him. On that note we moved to the other side of the horse shoe shaped pit, where we found succor in the shade, along with a taste of the Cambrian explosion.

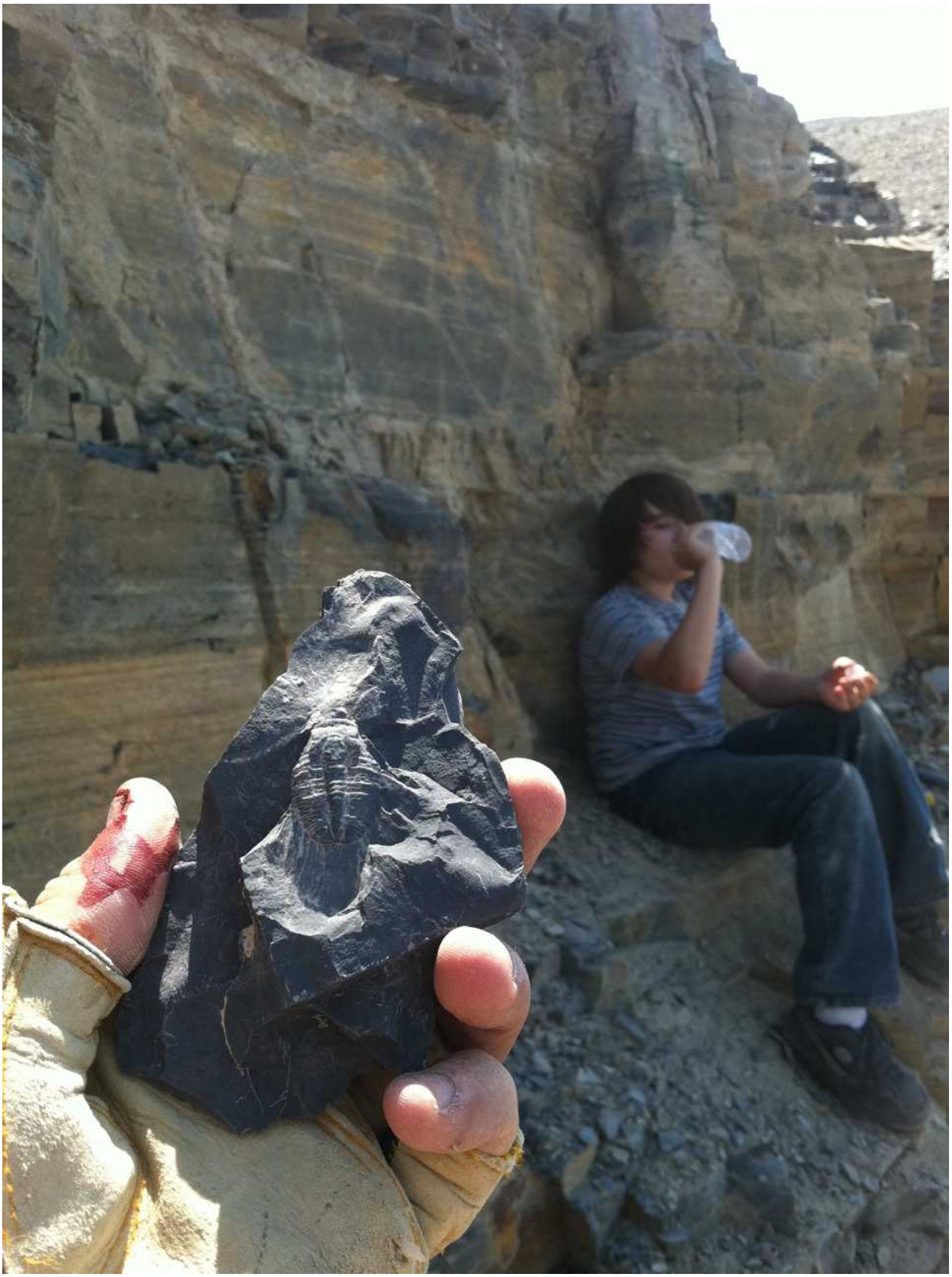
We got into so many trilobites that perhaps I got a bit slap happy. While banging out yet another bug in tight quarters, the butt of my hammer handle hit rock mid swing, shifting the point of impact directly on top of my left thumb! Blood welled from the wound and splattered the rocks with a lovely shade of crimson. Weston uttered prophetic words at that point…"You have to give something up to take something home." And pay, I did, in the form of millions of eurythrocites. On that note, I stepped up my efforts to increase my "return on investment".

FIG 131: Hammertime! (Site 672)

FIGS 132-136: The author's *Elrathia kingii* trilobites from the Wheeler Shale as seen in the field, this and next 4 pages (Site 672)


BIG BLUE
Estwing


22



Asaphiscus, Elrathia, and *Peronopsis* trilobites came to hand both loose and in matrix, the latter in singles, doubles, and multi slabs. I got extended play out of The Kid by having him pour drinking water over his head and onto his shirt. The oppressive climes relegated young Weston to hunting a narrowing strip of shade, and when I shuttled finds to the SUV and returned with water and apples, I found him asleep, upright, and pressed against the quarry wall in the remaining snippet of shade.

FIGS 137-161: The author's *Elrathia kingii* trilobites from the Wheeler Shale as prepped, this and next 24 pages (Site 672)

Growth series, with the largest borrowed from Weston

Love that pyrite!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Not all were whoppers!

FIGS 162-167: The author's *Asaphiscus wheeleri* trilobites from the Wheeler Shale as prepped, this and next 5 pages (Site 672)


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Too much air abrasion

Again, love that pyrite!

FIGS 168-170: The author's *Peronopsis interstricta* trilobites from the Wheeler Shale as prepped, this and next 2 pages (Site 672)


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FIG 171: This kid is finished! (Site 672)

We finished out our 4 hours around 1:30, 100 +/- nice specimens proving plenty. We then made off to our next site, a small quarry in the Marjum Formation, also Cambrian in age. Laziness was the rule at this point in the day, and Weston opted to stay in the parked SUV with the A/C running, playing with his iPod, while I just flipped and inspected the tailings of other diggers, not doing any active mining myself.

Success came at a steady pace, and the presentation of fossils brought a welcome form of variety from the Wheeler. The trilobites were very sharply defined and slightly reddish on tan to pink shale. The matrix was split on well defined, thin bedding planes as opposed to the Wheeler, which often split unpredictably in chunky and at times undesirable ways.

Modocia, Bathyuriscus, *Elrathia* and *Peronopsis* trilobites came at a steady pace, my first whole specimen measuring perhaps an inch, the rest smaller, but the quality was high. I only poked around for 30-45 minutes, but took out at least another 40 trilobites. I owe one of my good friends for this piece of site information.

FIG 172: The Marjum Formation, Upper Cambrian (Site 673)

FIGS 173-174: Marjum Formation trilobites *Bathyuriscus fimbriatus* this and next page (Site 673)


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FIGS 175-176: Marjum Formation trilobite *Ptychoparella* sp. or *Elrathia alapyge* this and next page, different lighting (Site 673)

FIG 177: Marjum Formation pseudofossil dendrites common at this locality (Site 673)

FIGS 178-179: Marjum Formation trilobite *Elrathia* sp. in the field this page and post prep next page (Site 673)

FIGS 180-181: Two more Marjum Formation trilobites *Elrathia* sp. this and next page (Site 673)


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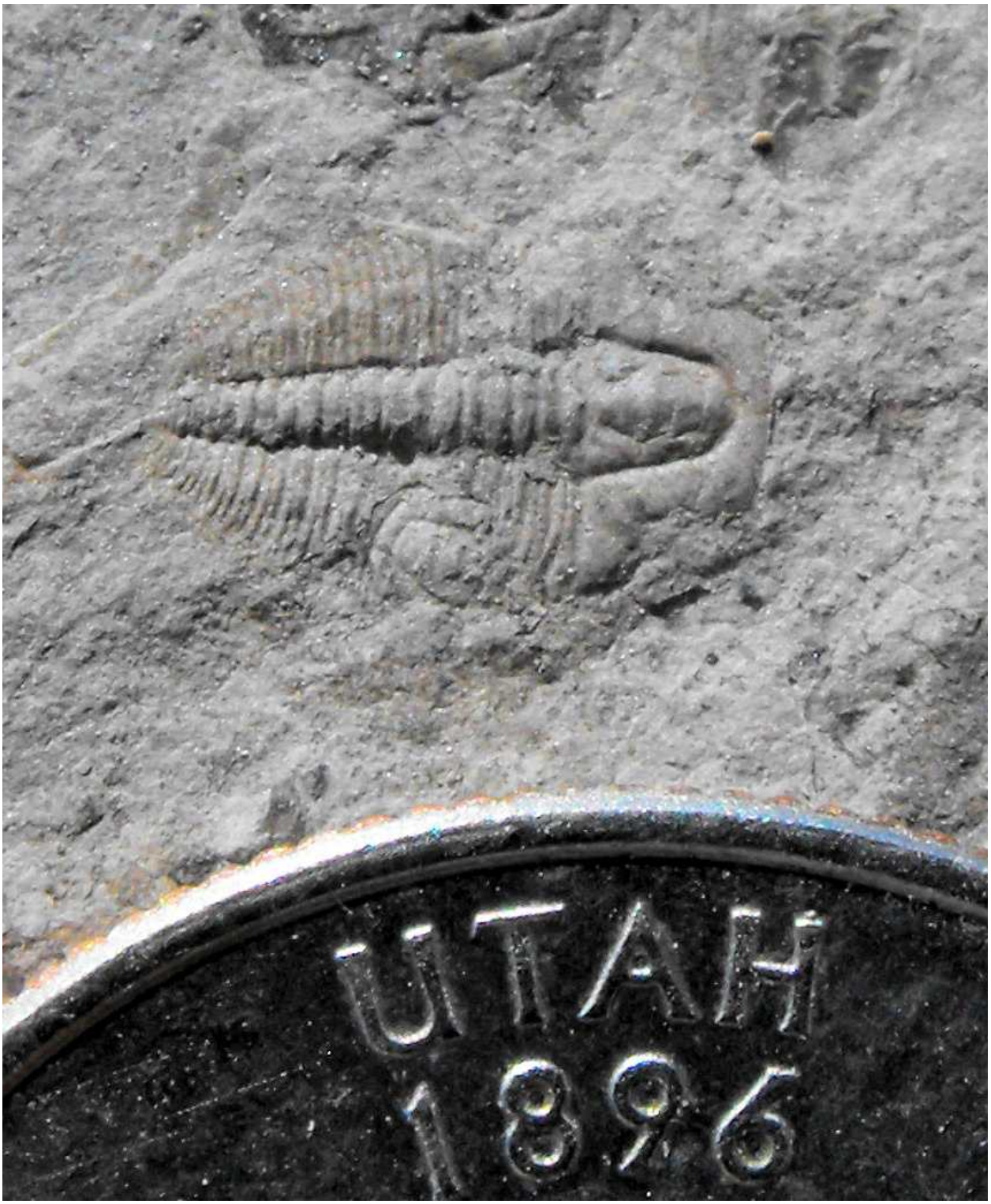
FIGS 182-193: My most common Marjum Formation trilobite find at this locality, *Modocia laevinucha,* this and next 11 pages (Site 673)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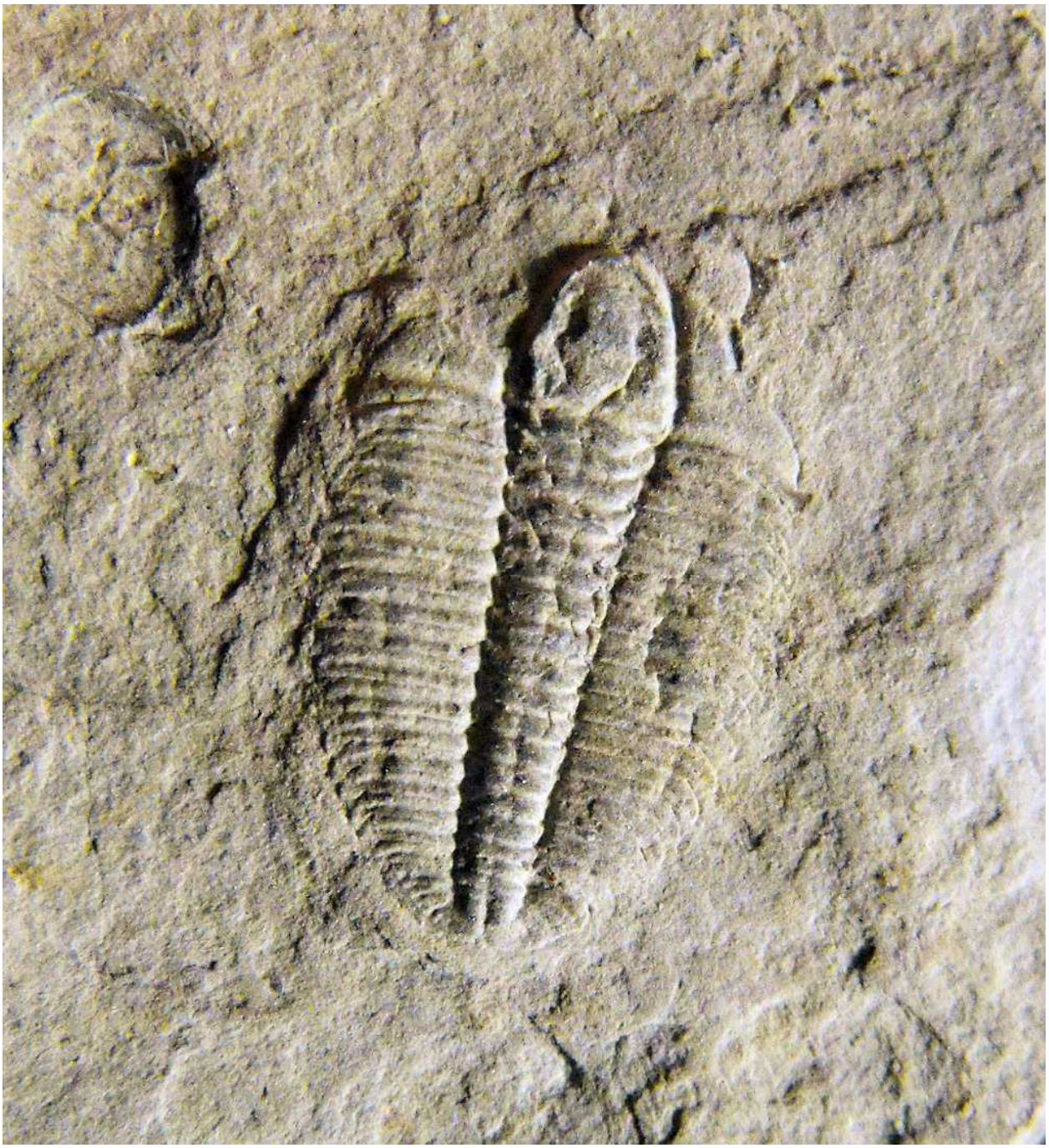

FIG 194: Marjum Formation trilobites *Modocia laevinucha* left and center, *Elrathia* sp. right (Site 673)

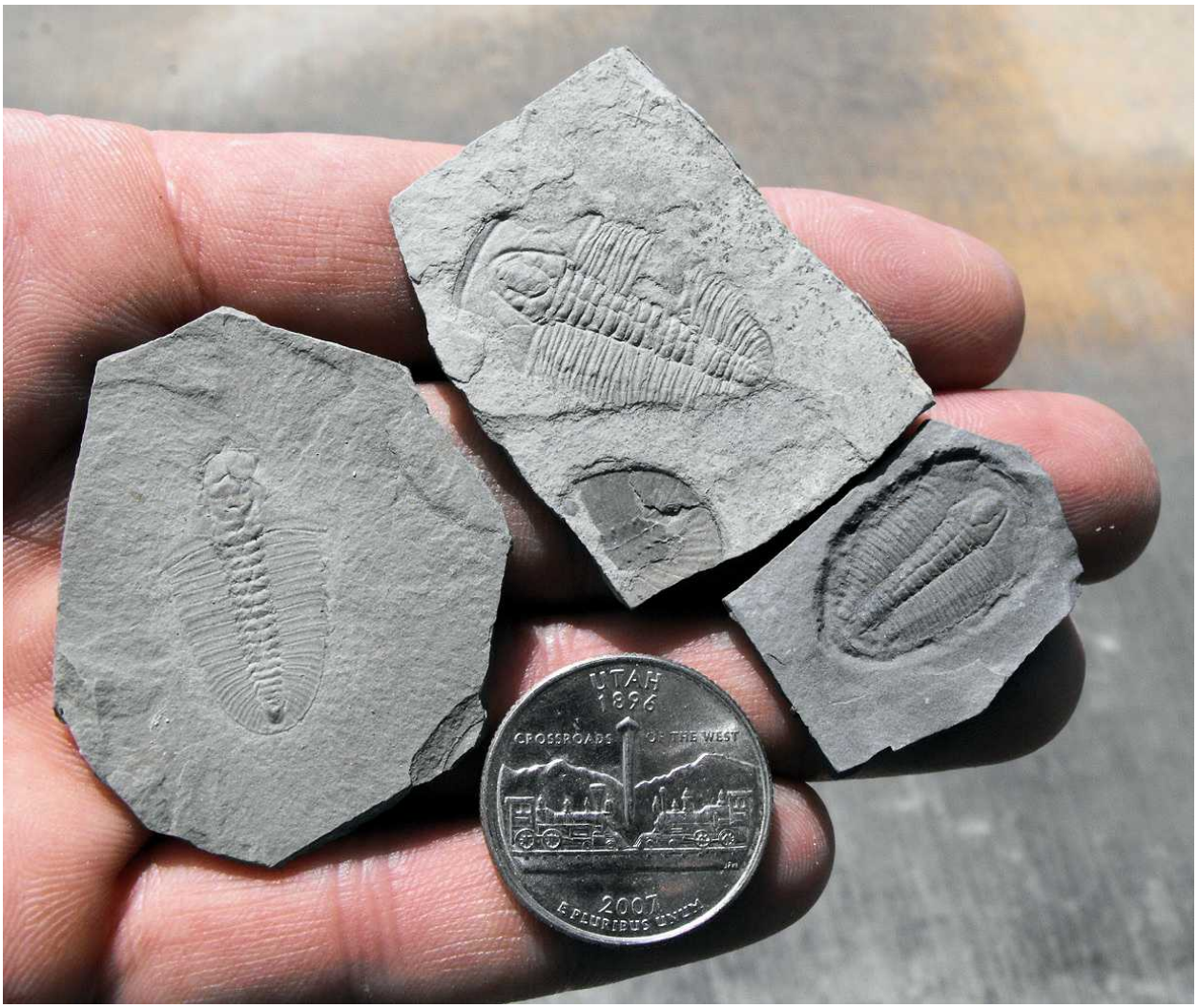

FIG 195: Marjum Formation trilobites *Modocia laevinucha* left and center, *Elrathia* sp. right (Site 673)

FIG 196: Marjum Formation trilobites *Modocia laevinucha* top left and lower left, *Bathyuriscus fimbriatus* top right and lower right (Site 673)

FIG 197: Marjum Formation trilobites *Modocia typicalis* left and *Peronopsis* sp. right (Site 673)

FIGS 198-202: Marjum Formation trilobites *Peronopsis* sp. this and next 4 pages (Site 673)


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FIG 203: Marjum Formation trilobites *Elrathia* sp. right, remainder *Peronopsis* sp. (Site 673)

Around 4 p.m., laziness drove to a declining motivation level for us both. I half heartedly canvassed a site known for *Gogia* eocrinoids, but didn't find success in the 15 minutes spent there. Actually I welcomed the cloudburst that came over the mountains headed directly for us, and decided to pull the plug on the day's festivities before getting caught on potentially sloppy roads in the middle of nowhere.

FIG 204: A quick pic of this slightly out of focus lizard was still worth showing

FIG 205: Sometimes Ma' Nature has a way of letting you know when to head for the ranch…

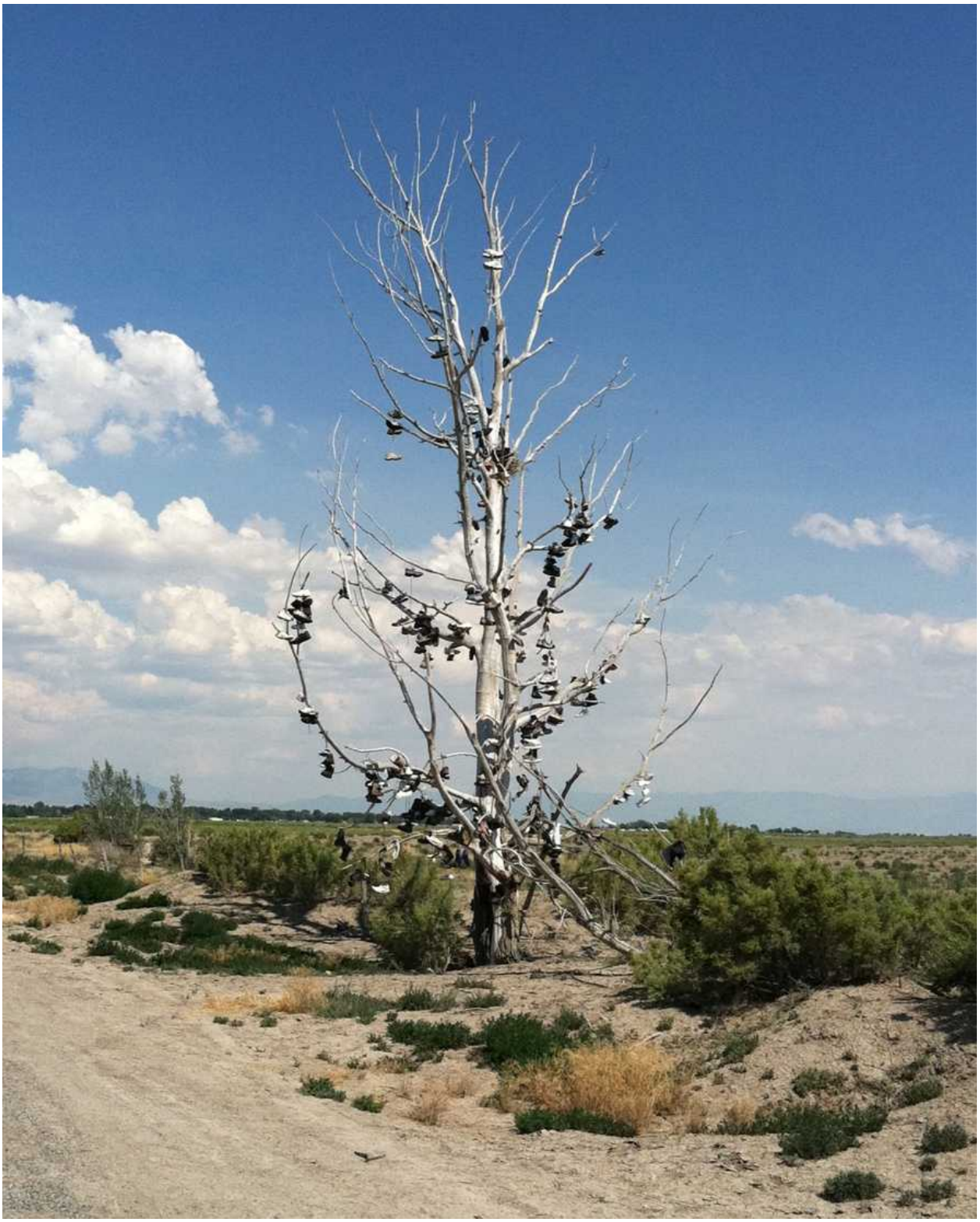

FIG 206: Uncertain of the back story surrounding this ritual and this tree, I thought it was interesting local color out west of Delta, UT

A pronghorn antelope stood sentry over the desert prairie as we headed back east to Delta, and Weston enjoyed running the rear window wiper not for rain, but for the thick dust that we were kicking up as we drove, covering the back half of the vehicle. Soon we were slumped in a booth in a surprisingly good little diner back in Delta, then topped things off with some ice cream before lounging around the motel room for a little lazy Man Time to finish the day.

July 19, 2013: Bonanza Bounty

Friday was our highest mileage day of the trip. Our primary push took us 300 miles from Delta to the Vernal/Bonanza area, and although the scenery was captivating, for extra excitement we can forever recount the narrow miss we had with a young bull moose crossing the highway just 100 yards ahead as we descended a winding mountain stretch at 80 MPH. Then we got to view a whole herd of pronghorns 30 yards off the highway in one of the more open stretches.

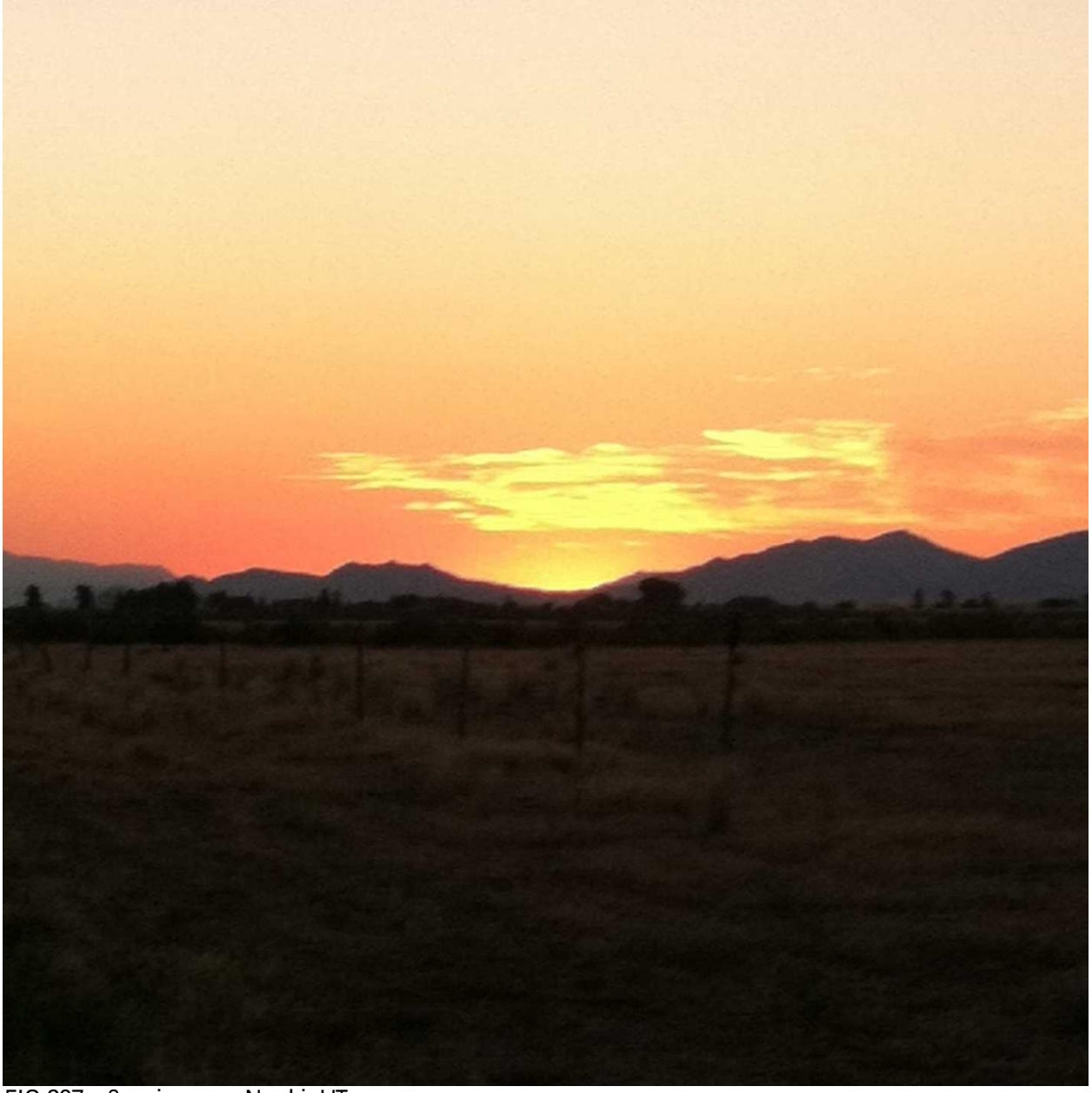

FIG 207: Sunrise near Nephi, UT

At Vernal I took Weston to the Utah Field House, a good museum saluting fossils of the area. In the middle of the lobby there was a cast skeleton of a large herbivore on display. When Weston was about 3, I took him to this museum. Upon seeing the skeleton at that time, he said "Dada you need to shoot that dinosaur so we can have all that meat!" That's my boy…

FIGS 208-212: Goofin' with The Boy at the Utah Field House in Vernal, this and next 4 pages


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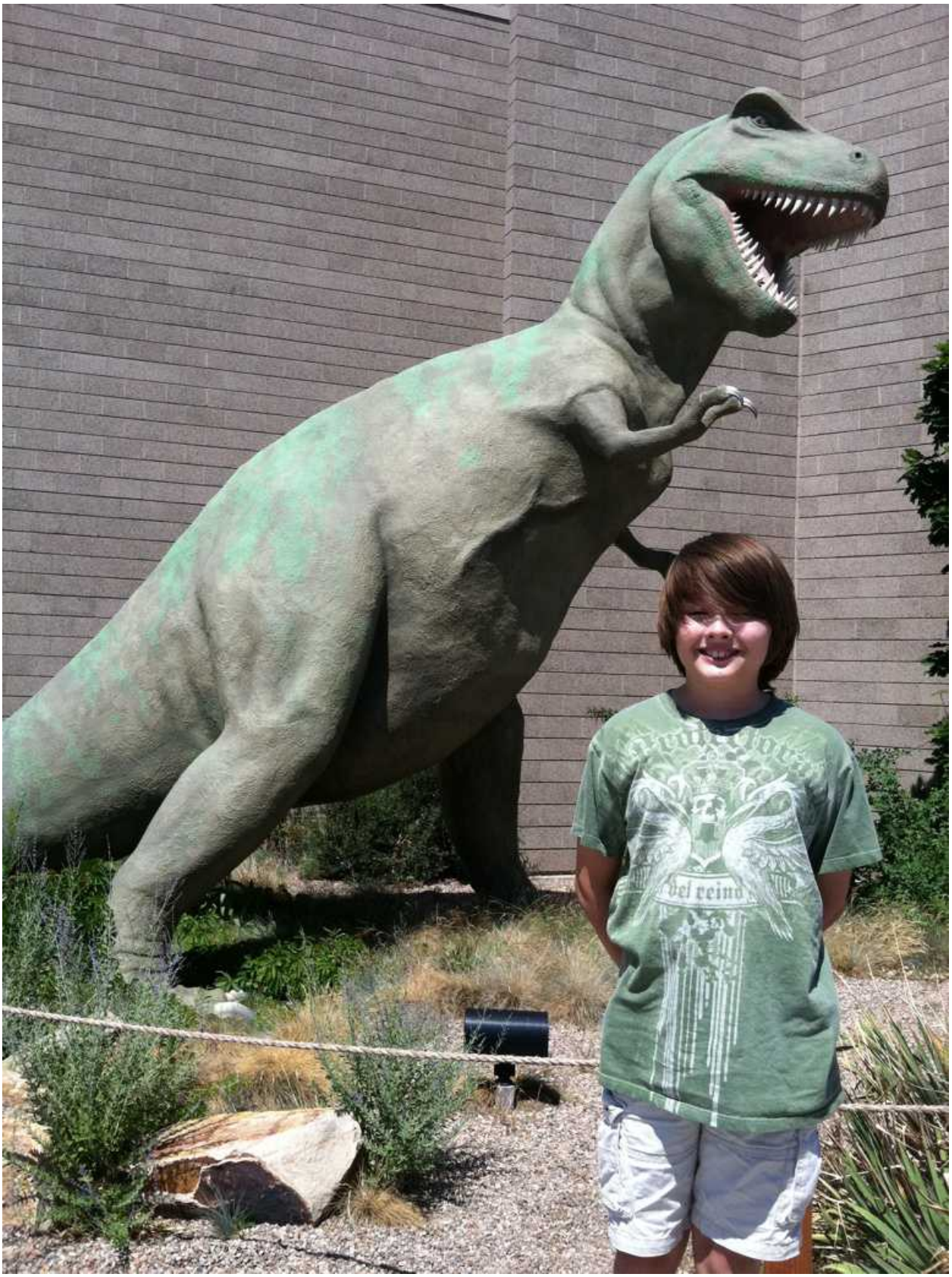
Early Cretaceous Period


del reino

I received a few tips from friends regarding legal collecting sites in the Parachute Member of the Green River Formation, Eocene in age (48 MYA), comprising an extensive stratigraphic section of thin bedded freshwater lake limestones.

The first site was pretty remote and we had expansive topography all to our lonesome, save for a little oil field traffic. Upon hopping out of the SUV I spotted a nearly complete but sun bleached fossil snowbell leaf, and Weston smacked a rock open on a bedding plane using the bladed end of his Estwing hammer to reveal a nice fossil fly, its segmented abdomen clearly visible on both the positive and negative impressions. This was a good start, but things slowed down a bit when the heat turned up, so we moved on to a nearby excavation.

FIGS 213-214: Surveying the Parachute Member of the Green River Formation, this and next page

(Site 674)

FIG 215: Our first Green River Formation find, a snowbell leaf *Styrax* c.f. *transversa* (Site 674)

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FIGS 216-219: Weston's first Green River Formation find, a very nice unidentified fly, this and next 3 pages (Site 674)


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FIG 220: Green River Formation elm leaf *Cederlospermum* sp. (Site 674)

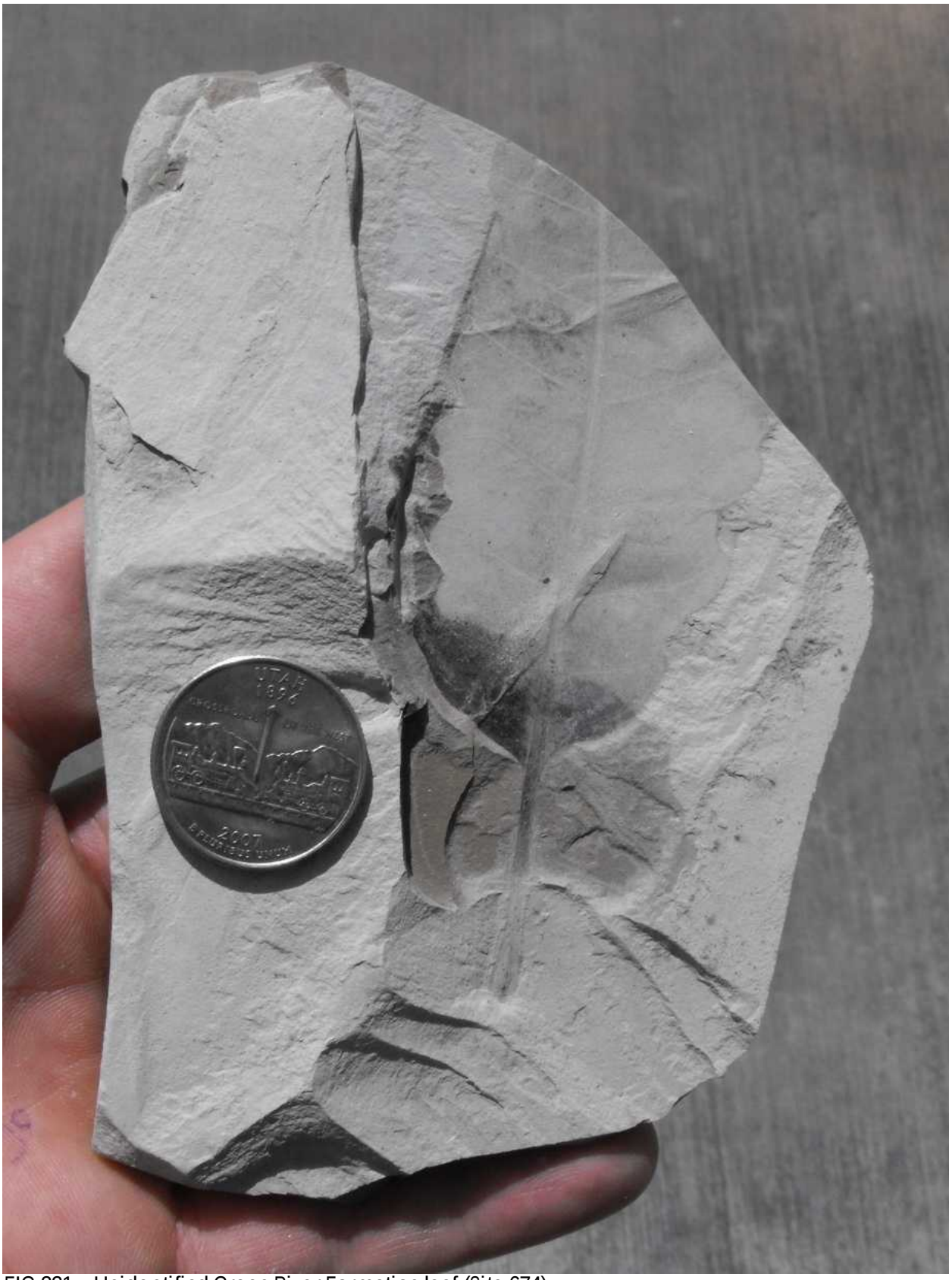

FIG 221: Unidentified Green River Formation leaf (Site 674)

Weston soaked up A/C while I worked the second exposure, flipping and splitting small slabs. A few bugs and small leaves came to hand, but rather than spend too much time here, I opted to push to one final, very remote site in the Parachute Member.

The thin trail had no other tire tracks, and desert vegetation was trying to overtake the track. We wound through the hills, at times just a couple feet from steep drop-offs. But we made it to the site. Weston once again enjoyed the micro climate of the SUV while the sun whipped me like a slave. My extra push however afforded a few nice finds including some cool fossil leaves, water bugs, and small winged insects.

FIGS 222-224: Another Parachute Member locality this and next 2 pages (Site 675)

FIGS 225-226: Two views of my Green River Formation weevil of the family Curculionidae (Site 675)

FIGS 227-231: Positive, negative, and detail views of this Green River Formation slab containing a leaf, possibly willow, *Salix* sp., and two unidentified insects, this and next 4 pages (Site 675)


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FIGS 232-233: Unidentified beetles this and next page (Site 675)

FIG 234: Green River poplar leaf *Populus* c.f. *willmatae* (Site 675)

FIGS 235-236: Green River sycamore leaves *Macginitiea wyomingensis* this and next page (Site 675)


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FIGS 239-240: Green River willow leaves *Salix* sp. this and next page (Site 675)


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FIGS 241-242: Unidentified Green River leaves this and next page (Site 675)

FIGS 243-246: Composite slab of Green River Formation leaves this and next 3 pages (Site 675)

Palm leaves *Sabalites* sp., *Palmoxylon* sp. or *Phoenictie* sp.

Willow leaf *Salix* sp. lying amongst the palm leaves

Elm leaf *Cederlospermum* sp. atop the palm fronds

FIG 247: Green River Formation elm leaf *Cederlospermum* sp.

I'm certain that by spending hours mining slabs, I could have come away with some nice, large leaves and more insects but I was complacent with the day's finds, including a few flies and a weevil, so we packed up and headed north to Kemmerer, WY, which would prove to be the cornerstone of the trip.

But the day's fun did not end there. While in our motel room that night, I took the time to whittle down my slabs for airline transport using nippers, a hammer and chisel. On my favorite palm sized slab of that day which had a couple small, well defined leaves and 3 or 4 insects, I whacked a protruding chunk away from one side…..and revealed a beautiful downy bird feather! This was a rare and welcome find. Can't top that. Good night!

FIGS 248-254: Composite Green River slab containing beetles, leaves, and a rare bird feather, this and next 5 pages (Site 675)


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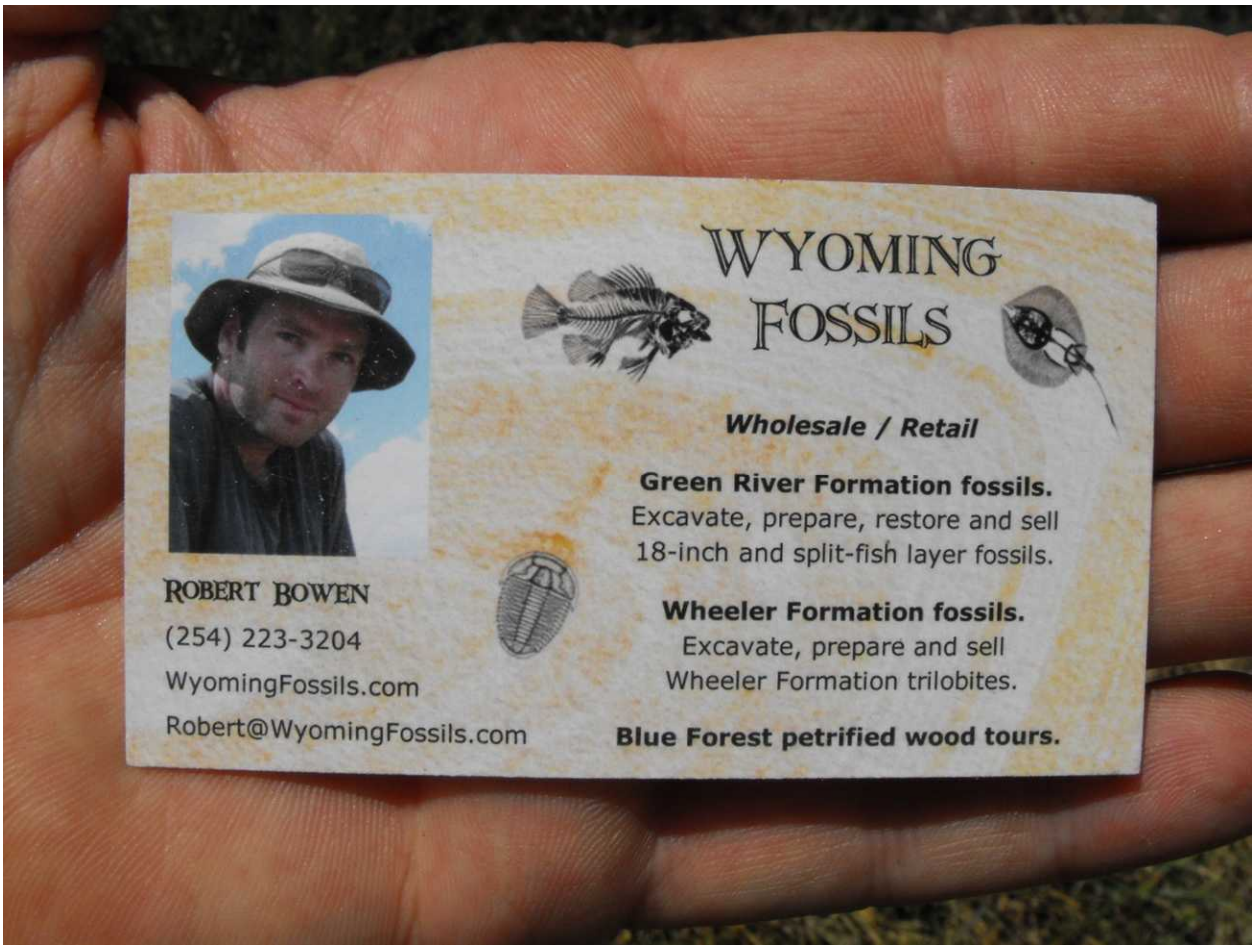
Downy bird feather positive and negative

Willow leaf *Salix* sp.

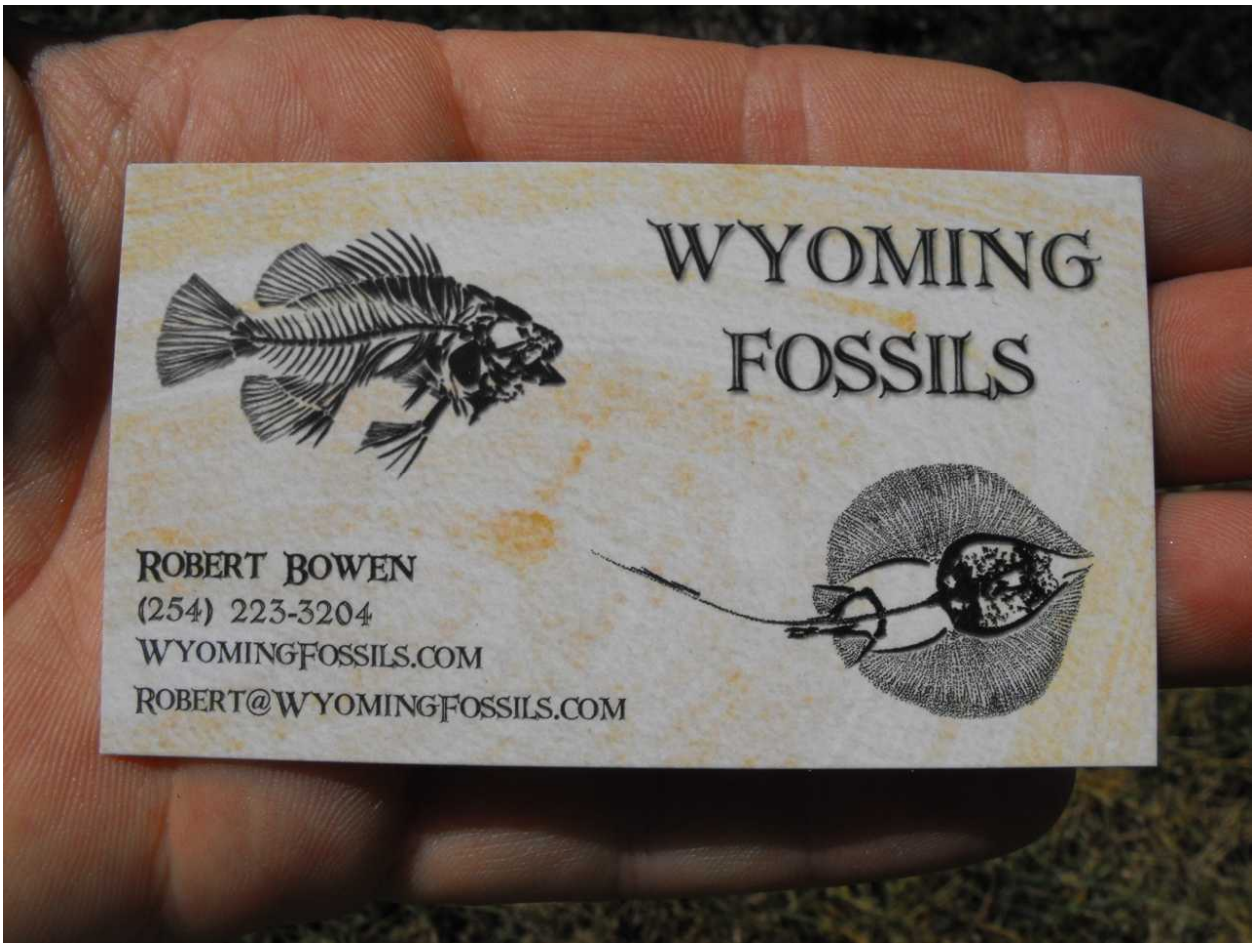
A broader, unidentified leaf

July 20, 2013: Eofishin' Extravaganza

We met my good friend, Robert Bowen, at Café Ritz in Kemmerer, WY around 8 a.m. to kick off the day's adventure. Robert was one of my very first fossil collecting buddies when I got in the game 10 years ago, back when he lived in Goldthwaite, TX. Life has returned him to his native Kemmerer, first for oil field work, now for full time commercial digging of Kemmerer's world famous Green River (Eocene, 50 MYA in this area) freshwater fish. A motivated digger of 32 years of age, he's a shoe-in for this business. In fact, over the course of the weekend I remarked that he could move rock faster than dynamite, and that's not far from the truth, as the ensuing photos illustrate.



FIGS 255-256: For all your purchases of Green River Formation and other area fossils, feel free to contact my good friend Robert Bowen



It is worth mentioning at this point that this was a very special opportunity to dig with my long time friend. Since he does this for a living, and the digging season this far north is only a few months per year in length, I was actually cutting into his bottom line by digging with him. In short, he graciously welcomed Weston and me to enjoy a share digging opportunity that he can't offer to the masses. However, great digging can be had for a fee at several other pits in the area, my suggestion being Warfield's, as they tend to let diggers keep more finds than the other outfits, in my personal experience.

Robert took us to the first of two quarries where he share digs, and the ride up the steep, mountainside dirt road reminded me of the slow, ratcheting ride up the first hill of a big wooden roller coaster. Upon arrival we found his partner digging the "gastropod layer", which presented an interesting mix of freshwater snails associated with fish, when digging in the right horizon. Interesting…I had never really heard much about gastropods in these sediments.

FIGS 257-258: A couple views of the first quarry in the minifish zone (Site 676)

FIGS 259-260: Robert this page and Weston next page getting started in the pad of limestone prepared for us ahead of time by Robert – it proved to be loaded with hundreds of juvenile *Knightia* (Site 676)

FIGS 261-262: Weston hitting Green River paydirt in the form of *Knightia eocaena* this and next page (Site 676)

FIG 263: Every kid enjoys playing King of the Mountain (Site 676)

Robert then hailed me with a brief explanation of the stratigraphy of the area to help me keep it all in perspective as we canvassed the local geology. The sequence of fossil bearing zones is as follows, listed top to bottom:

"Upper Splits"

Gastropod Zone

Mini Fish Zone

18 Inch Layer

"Sandwich Layer"

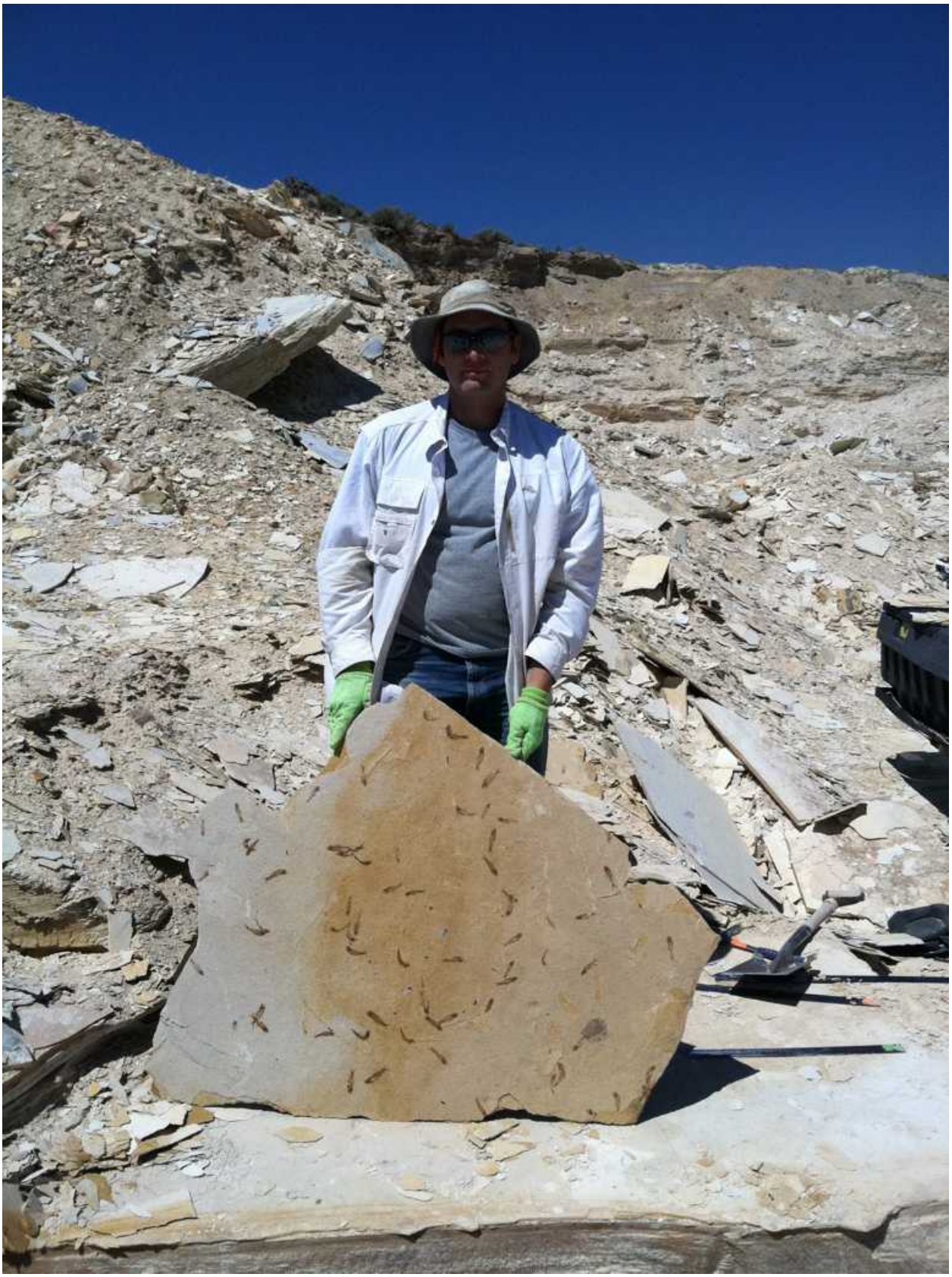
We settled into a pad of limestone in the "mini fish zone" that Robert had most hospitably prepared in advance and saved for us. The three of us settled in on our knees around this piano sized section of limestone and worked together to systematically dissect the slab layer by layer, starting with the thin, weathering sheets on top. First we encountered fish "blown" by weathering, but the deeper we dug, the better preserved and more frequent our finds.

Over the course of a couple hours, we took literally hundreds of well preserved *Knightia* in the 1-4 inch range on fragile, paper thin wafers of limestone. I expect some casualty rate on the ride back to San Antonio, but the numbers still put the endeavor in our favor. Occasionally we encountered a 6 inch fish during our efforts.

Weston wandered off, exploring and climbing the large spoil piles, and proudly came back to have us retrieve his find, a 4-5 inch *Mioplosus*. Back at the slab, Robert and I prepared the next layer down, and I was able to lift in one piece a thin limestone sheet several square feet in size....and found it to be covered by over 40 perfectly preserved *Knightia*! This was a very cool find. We worked methodically with thin chisels to flip the other half of the slab in one piece, and it had over 50 perfect *Knightia* in full splendor.

FIG 264: Weston and his juvenile *Mioplosus labracoides* (Site 676)

FIGS 265-267: The author and Robert after securing adjacent sections of the same mortality layer of juvenile *Knightia eocaena,* this and next 2 pages (Site 676)



We opted to let all these fragile slabs dry out for a day in the sun and wind, as they would pick up more strength that way for handling and transport. Meanwhile, we sauntered back to town for a Chinese lunch, grocery run and a look at Robert's workshop. We got a quick lesson in local history as well. The town's economic backbone has been coal for quite some time, and the very first J.C. Penney store was in Kemmerer, opened in 1902. Weston enjoyed the small town safety and quaintness. I saw way more

people coming out of the convenience stores with ice cream than beer. The moment of respite was much welcomed by us all.

FIG 268: Kemmerer, WY...home of the first J.C. Penney store

FIGS 269-270: Weston was clearly beaming with Texas pride on this day


TEXAS

FIG 271: Rumor has it that young Weston may have learned to drive on some dusty off road trail…

We piled like clowns back into Robert's van and once again headed for the hills, this time to a hyper productive share dig quarry in the fabled "18 inch layer", topped by the "gastropod layer" and "upper splits", as noted previously.

Robert kicked things off by showing us his week's better finds, still in the ground. There was a a 14 inch *Heliobatis* (freshwater stingray), some other outsized fish, and myriad *Diplomystus* in the 15-20 inch range. Robert had also taken a gar and a couple paddlefish that week, all coveted fish, so I didn't feel quite as guilty of stealing food from his kids' mouths as if his week's digging had been less productive.

FIG 272: The scenery was grand from our hilltop paleo parapet (Site 677)

FIGS 273-277: Several Green River fish in the ground, this and next 3 pages (Site 677)

Priscacara

FIGS 278-279: Share diggers' slabs staged for processing, this and next page (Site 677)

FIG 280: Robert's freshwater *Heliobatis* stingray (Site 677)

Then Robert took us to the area we'd be working so we could "pull up some runs". The 15 foot x 40 foot x 6 inch thick section would certainly keep us busy for the remainder of the trip. Now the hard work began. Robert fired up a gas powered, diamond bladed rock saw and relieved a 6 x 15 foot x 2 inch section of the slab as it sat in the ground, then blew it off with a gas powered blower. We created a parting plane halving the thickness by banging stout chisels in place every 12-18 inches, chasing the crack along the full width of the slab. We followed by banging long, thin chisels in between the short, heavy chisels, and drove the thin ones a couple feet back into the fissure, propagating it deeper toward the sawed score line. Again, this was all with the rock still in the ground.

Robert then used the saw to score the section into thirds, so that we could deal with more manageable, smaller sections of rock at a time. We finalized the initial splitting by driving the bladed ends of our Estwing rock hammers into the split to wedge it open far enough to work the ends of shovels and prybars into place, gaining more positive leverage. When the split made its way all the way back to the relief cut, we flipped these huge slabs on end one at a time, studied them, marked hiding fish with a pencil, then with thin chisels split the slab again where it stood on end, marking more fish. We set the slabs aside for future inspection which will be detailed later.

It was cumbersome to word this process, so I'll show it in the following photo sequence.

FIGS 281-288: The process of Eocene fishing, step by step, starting with initial, shallow relief cuts, this and next 7 pages (Site 677)

Intermediate cleanup

Defining a splitting plane – chisels only

Propagating a splitting plane – hammer blades, longer chisels


Scoring the large section into thirds

Flip the slab on end, inspect for fish, mark them with a pencil, split the slab again where it stands

Pint sized supervision

FIG 289: Weston beating the heat where cold air piped constantly out of a small cave in the quarry wall (Site 677)

Repeating this process of sawing, blowing away rock dust, flipping and splitting slabs, and marking fish consumed our entire afternoon. The hard labor didn't exactly draw Weston in, but when he found the small cave belching out cold air from the quarry wall, he hung close to it like a cat soaking up an A/C leak by the back door in summer.

FIG 290: Two whipped pups (Site 677)

FIGS 291-293: Moments in fossil camp (Site 677)

Dusk was approaching, and the others onsite built a nice campfire, quite inviting as the temps plummeted from 93F to 50F. The others brought steak, we brought brats, and the whole bunch of us shared a much needed restful moment around the fire. Weston spotted a couple mule deer does walking the rim of the quarry, and I managed to get a grainy picture of one.

FIGS 294-295: Resuming the drill into the wee hours of night. Lanterns throw low angle shadows that reveal fish that can't be seen by day (Site 677)

The moon came out, Weston went to town on a big bag of marshmallows by the fire, and Robert and I got back to work. With gas lanterns in hand, we reinspected our day's rock slabs, taking advantage of low angle directional lighting to throw shadows of hiding fish which we subsequently marked with a pencil. Taking another break to light some fireworks with Weston, I we roasted the few remaining marshmallows, finished up our heavy labor, and called it quits at around 1 a.m.

Quite an exhausting adventure! Considering the condition of my joints, I view this sort of digging as more of a young man's proposition. I had a blast doing it for a weekend, working about 16 hours the first day with a 2 hour break in between, but I can't fathom maintaining that schedule day after day, week after week. Robert outpaced me by a mile. He earns every penny he makes in this business.

July 21, 2013: Eocene Wrap-Up

With almost 8 hours of solid sleep behind us, Robert, Weston and I reassembled at the Café Ritz for sustenance before our next stab at the Eocene. Our first stop was the mini fish quarry. With nippers and in some cases just fingers, we reduced all the thin fish slabs to minimum size for stability and weight reduction for transport.

We trimmed the edges of my big 40 fish slab down and we stabilized the edges with Paleo Bond in preparation of Robert bonding the back of the slab to a sheet of plywood, then sawing the backing flush with the edges of the slab. We sorted out 3 piles of mini fish – one for Robert, one for Weston and me, and one for the lease holder.

FIG 296: An unidentified Green River Formation leaf (Site 676)

FIG 297: Green River Formation palm leaf (Site 676)

FIG 298: Green River Formation *Priscacara liops* (Site 676)

FIG 299: Green River Formation juvenile freshwater herring *Knightia eocaena* in a custom frame crafted by the author (Site 676)

FIGS 300-301: Weston's best frame of Green River Formation *Knightia eocaena* this and next page

(Site 676)

FIGS 302-331: Father/Son take home share of *Knightia eocaena* from the mini fish layer of the Green River Formation this and next 28 pages (Site 676)

A romantic one for the spousal unit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EYES!

Holy coprolite!

FIGS 332-335: *Viviparus* sp. freshwater gastropods from the Green River Formation, this and next 3 pages (Site 676)


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I felt myself drawn to the 18 inch quarry despite the amount of work that loomed ahead, and declined the opportunity to dig more in the mini fish quarry. We ambled down the bumpy road and back up the hill to the second quarry, and all fell into position: Robert and me working another run of limestone while Weston hung around the mouth of the cave as temperatures climbed.

We turned up another 4-5 big slabs, split them, and marked the fish, then set the slabs out for Robert's inspection later that night. With that behind us, we went about pencil marking around the keeper fish

with rectangular templates, then sawing them out in tiles. We sorted the 2 dozen nice fish tiles out by species, and lay them out in anticipation of the lease holder's arrival.

FIG 336: Robert Bowen with his potential new species of Green River plant (Site 677)

Weston's enthusiasm had waned a bit; perhaps I had stretched out our ManVenture one day too long. But when it was time to alternate picking out fish between the lease holder and me, Weston found renewed interest and I let him negotiate what we would be allowed to keep. We stayed away from the obvious high dollar fish, deferring to the lease holder out of appreciation for the opportunity to dig with these guys. So we let the giant *Mioplosus* go, as well as the double *Priscacara* plate, and the 2 biggest *Diplomystus*. Weston made a lot of the picks, and he expressed interest in hanging some of the prepped fish in his room.

FIG 337: The only *Phareodus testis*, a notorious predatory fish, was found by Robert in the Gastropod layer or Upper Splits, and given to Weston and the author (Site 677)

FIG 338: Weston's tiny fish from the Gastropod Layer (Site 677)

FIG 339: A delightful combination of *Knightia eocaena* and *Viviparus* sp. from the Gastropod Layer (Site 677)

FIGS 340-341: Weston's nice Green River Fm *Viviparus* sp. gastropods (Site 677)


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FIGS 342-347: Green River Fm. march flies *Plecia pealei*, this and next 5 pages (Site 677)


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In short we had so many high grade fish plates that I could only take a few in our luggage after the trilobites had taken up their needed space and weight. Later at the airport, my packing job proved to be good as my single checked bag tipped the scales at precisely 50 pounds, the upper limit before excess baggage fees kick in. Robert will be road tripping to Texas next week for other reasons, very kindly toting all my remaining fish slabs, along with all of my remaining chunky finds from other legs of the trip.

Weston and I expressed our gratitude with the lease holder, and especially with Robert as he slung the bulk of his hard earned finds our way, essentially taking a couple days without pay. I look forward to seeing him again soon in Waco. Too bad he won't have time to hang around and collect.

FIG 348: Another randomly placed *Knightia eocaena* (Site 677)

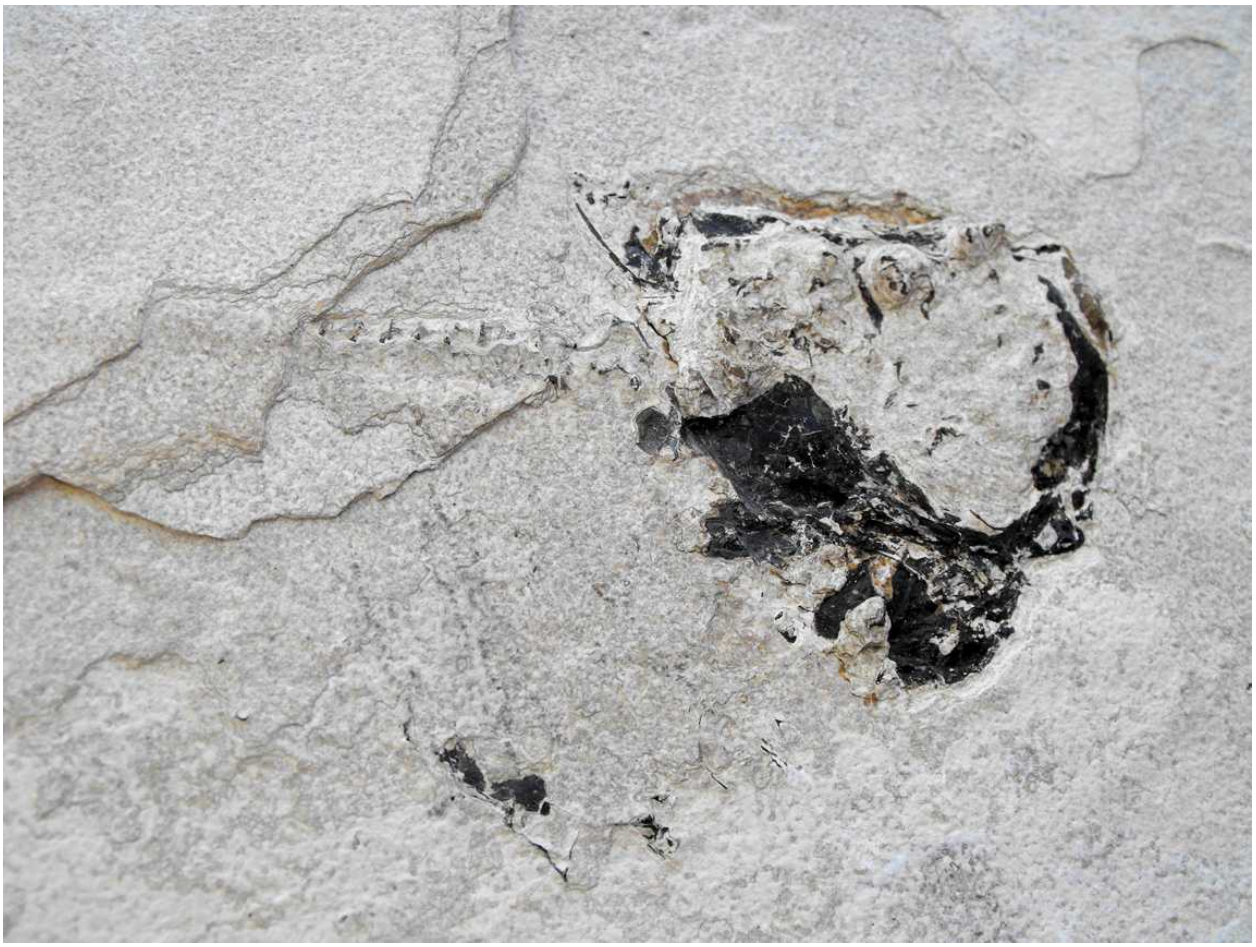
On our way out of town, Weston and I took a drive through the local Arctic Freeze as I've found ice cream to be the ultimate attitude uplifter with kids of all ages. I know that the reality of these hard core trips is often more than an 11 year old kid envisions going in, but memories of the heat and work will hopefully subside, and Weston and I will always remember the father-son trip we shared in the desert as we gaze upon the cool finds on display at the house.

On that note, a mountain of prep work awaits me, and that actually sounds more attractive than collecting still more fossils out in the relentless Texas sun of August. However, I think I'll do a little of both!

Now, the prepped specimens…

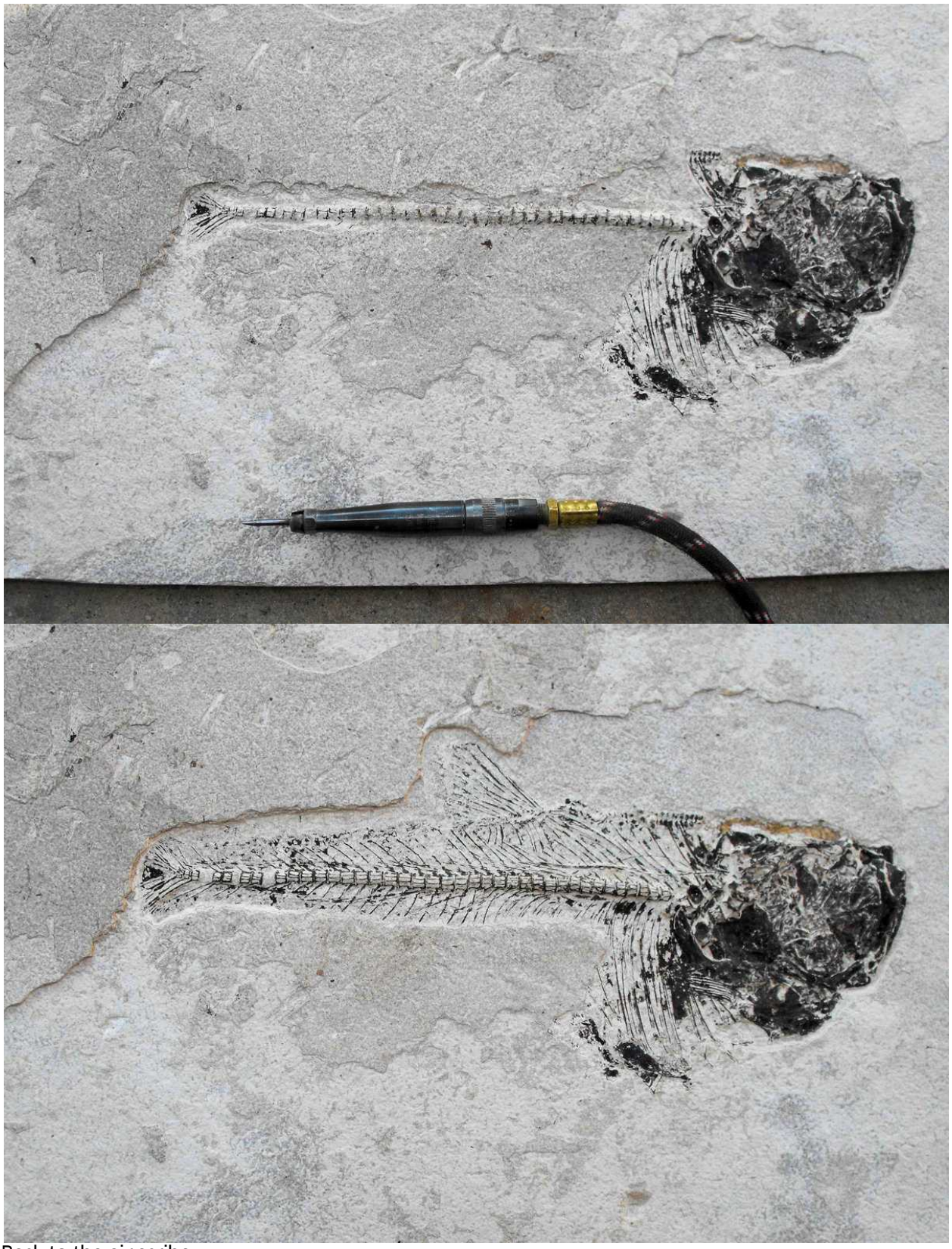
FIGS 349-368: Sequential photos of preparation of a large, 18 inch long *Diplomystus dentatus,* a member of the herring family, from the 18 inch layer of the Green River Formation, hence its name "18 Inch[2]", this and next 17 pages (Site 677)

The head of this fish split in half width wise on the plane that we blind split the limestone, leaving half of the head on either side of the split. The other half of the head was sawed out, superglued in place, and then air scribed to depth



Early on in the air scribing efforts

Bulk matrix removal via hammer and chisel



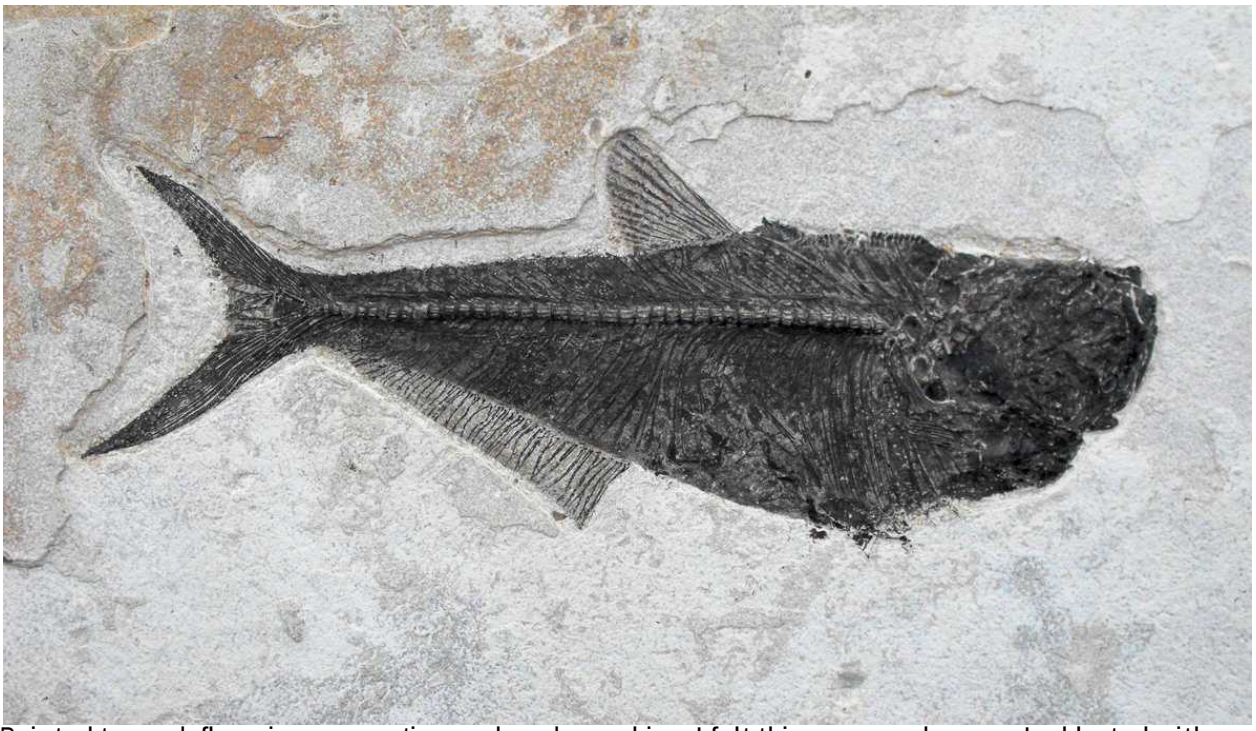
Back to the air scribe

Detailing the tail

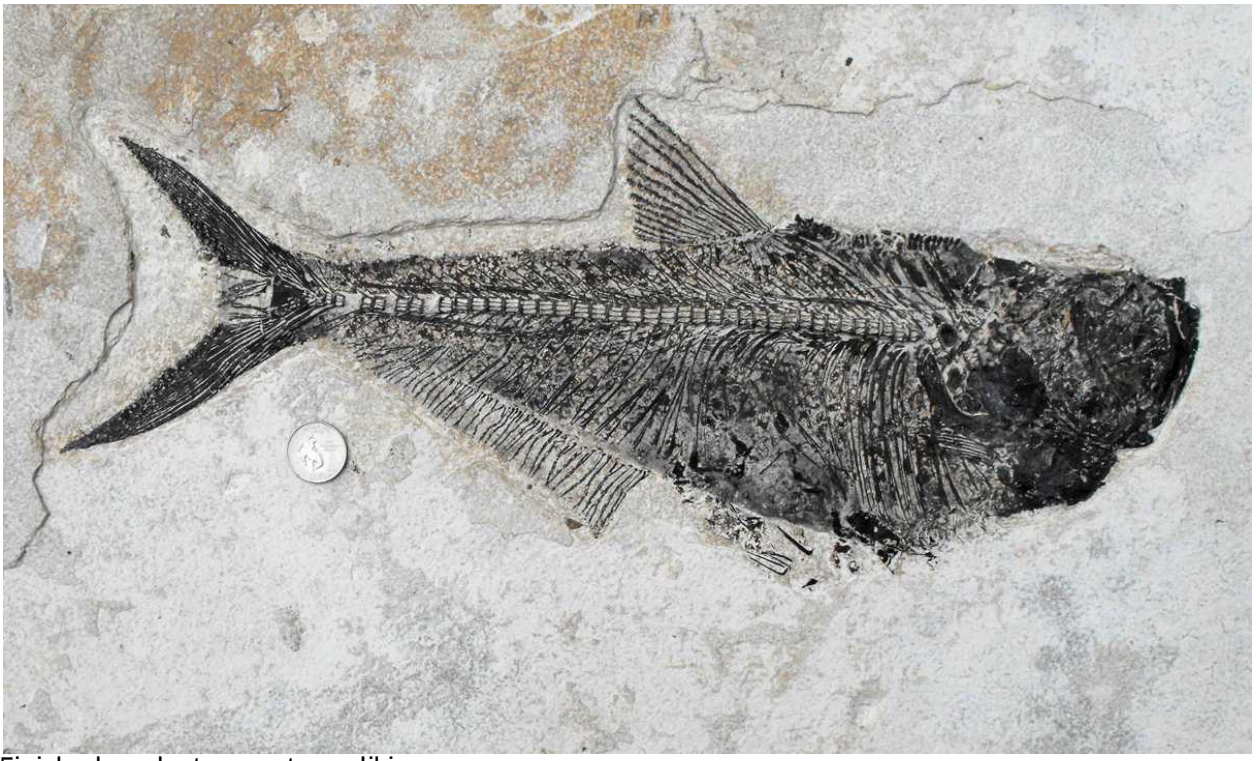
Air scribe roughing complete

Setting up to microblast with powdered dolomite at 100 PSI through a tiny .015 inch orifice

Post blasting



Painted to mask flaws in preservation and workmanship – I felt this was overdone, so I reblasted with dolomite to remove excess paint



Finished product, more to my liking

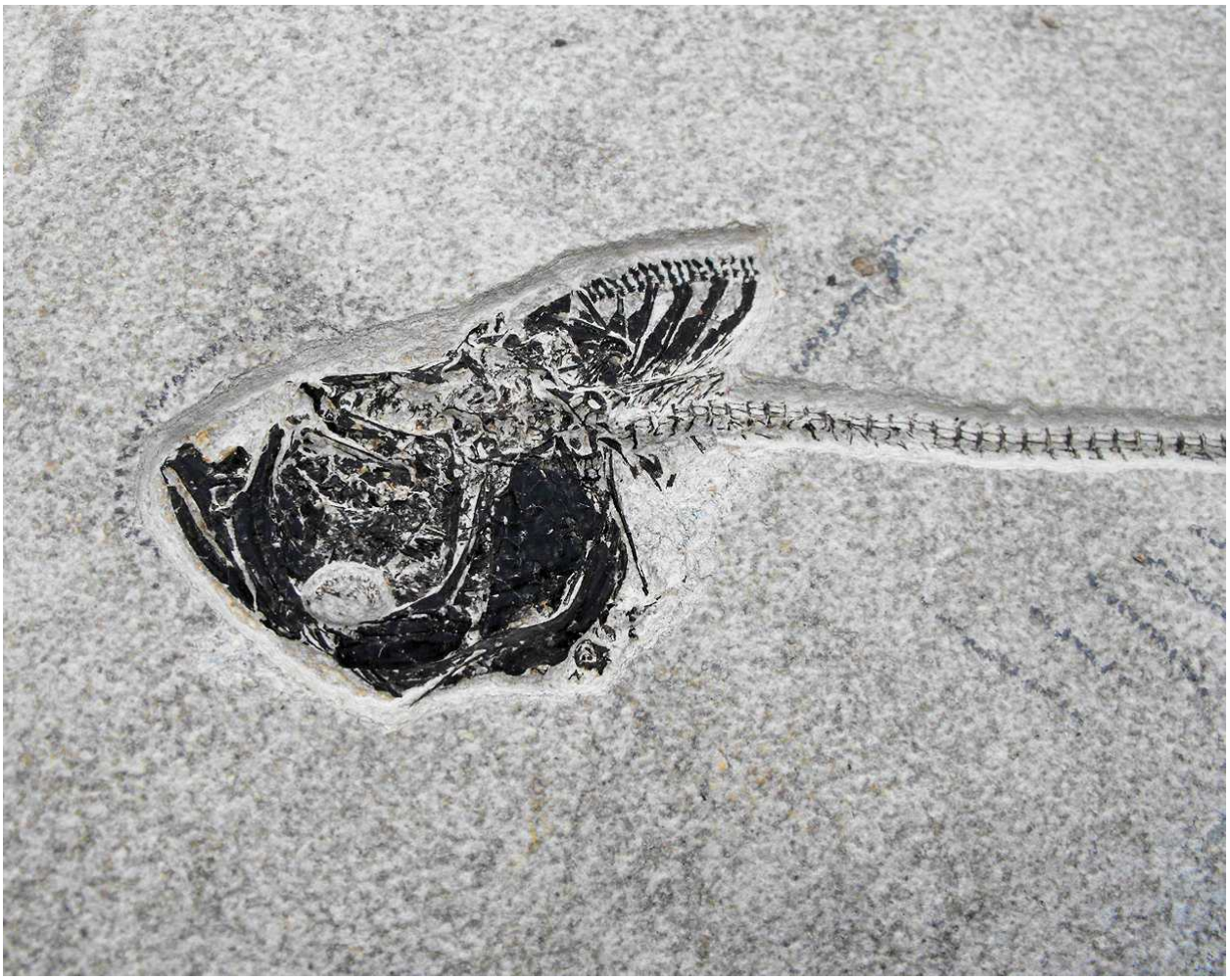
Weston Woehr for scale

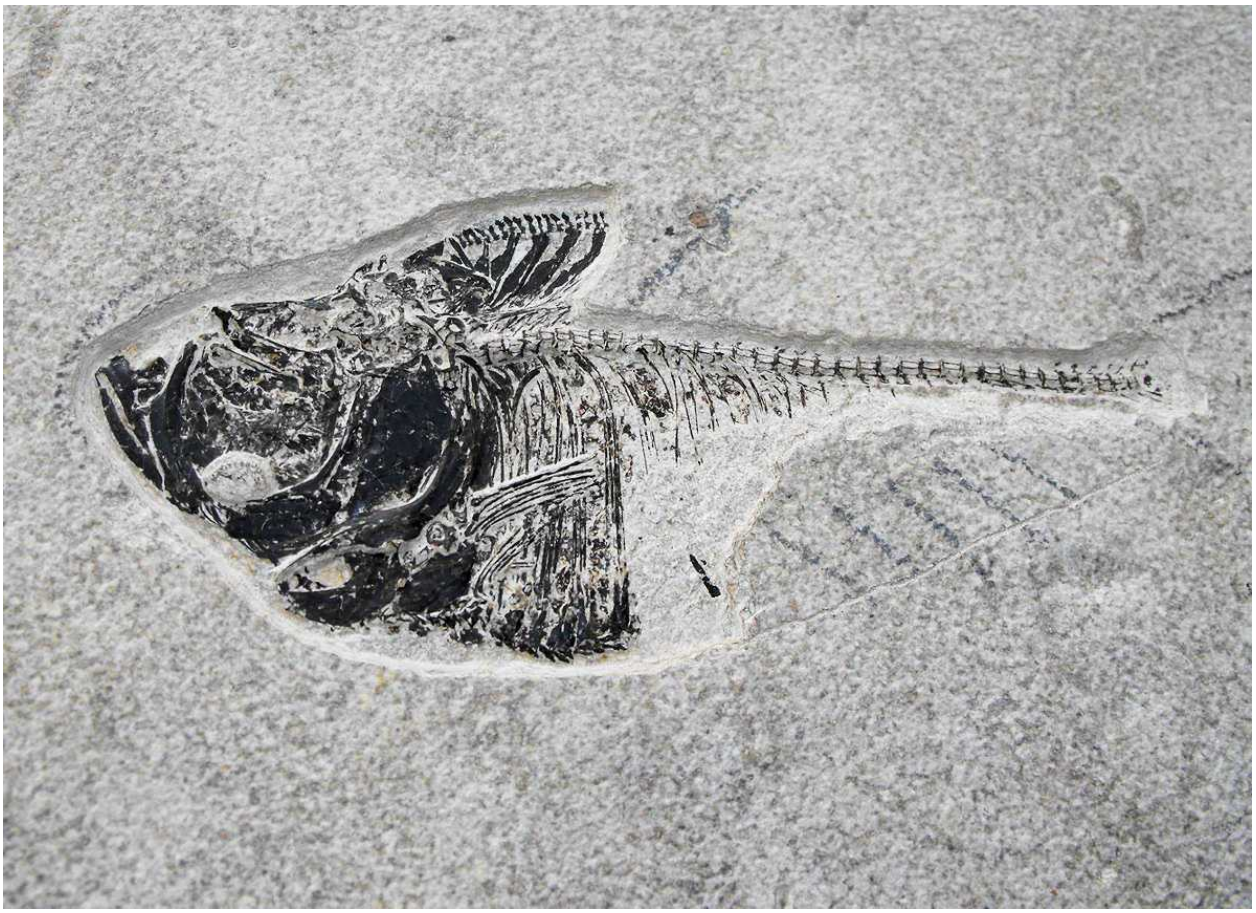
FIGS 369-385: Taking a second Green River *Diplomystus dentatus* through the prep process, this one about 10¼ inches, this and next 16 pages (Site 677)

Slowly exploring with the air scribe

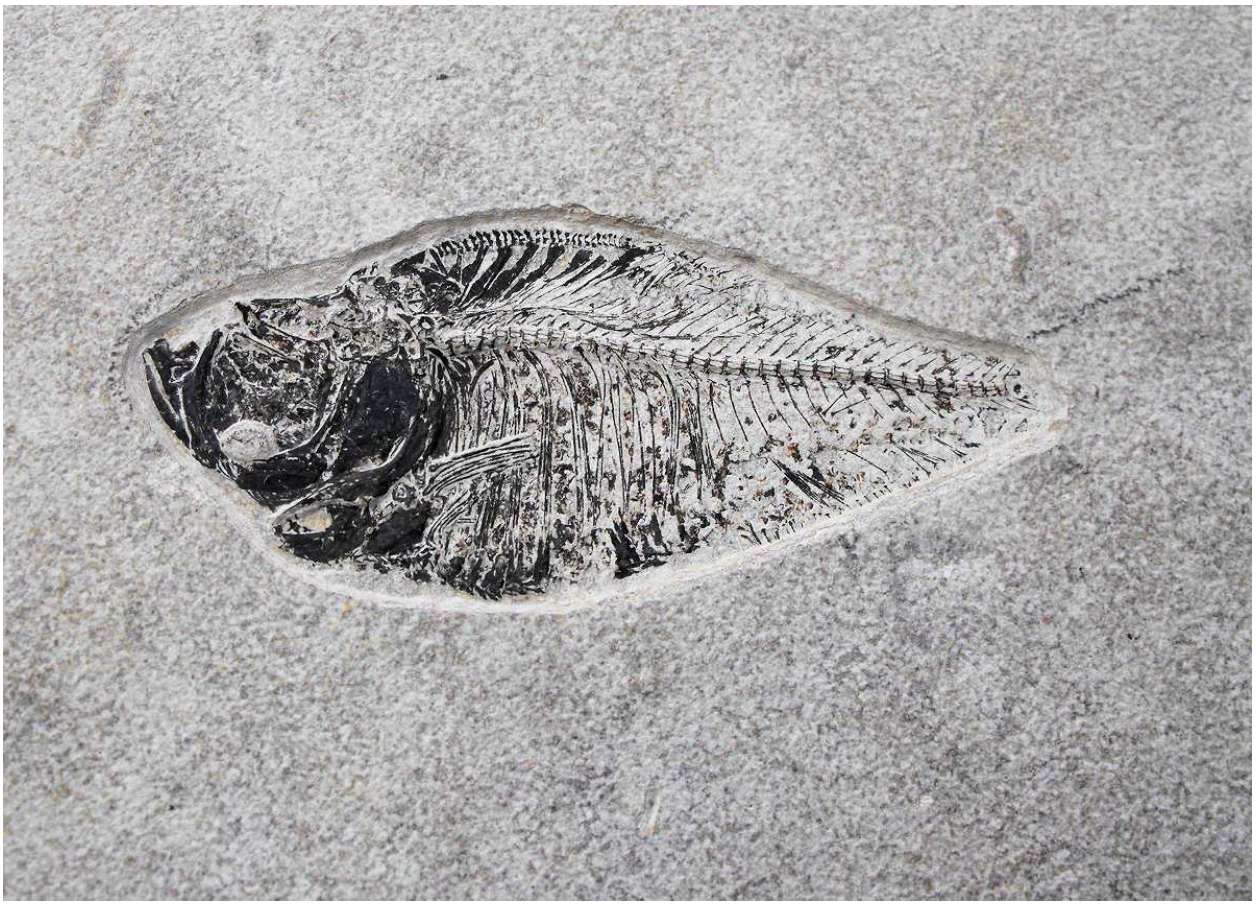
Carefully revealing details with the air scribe

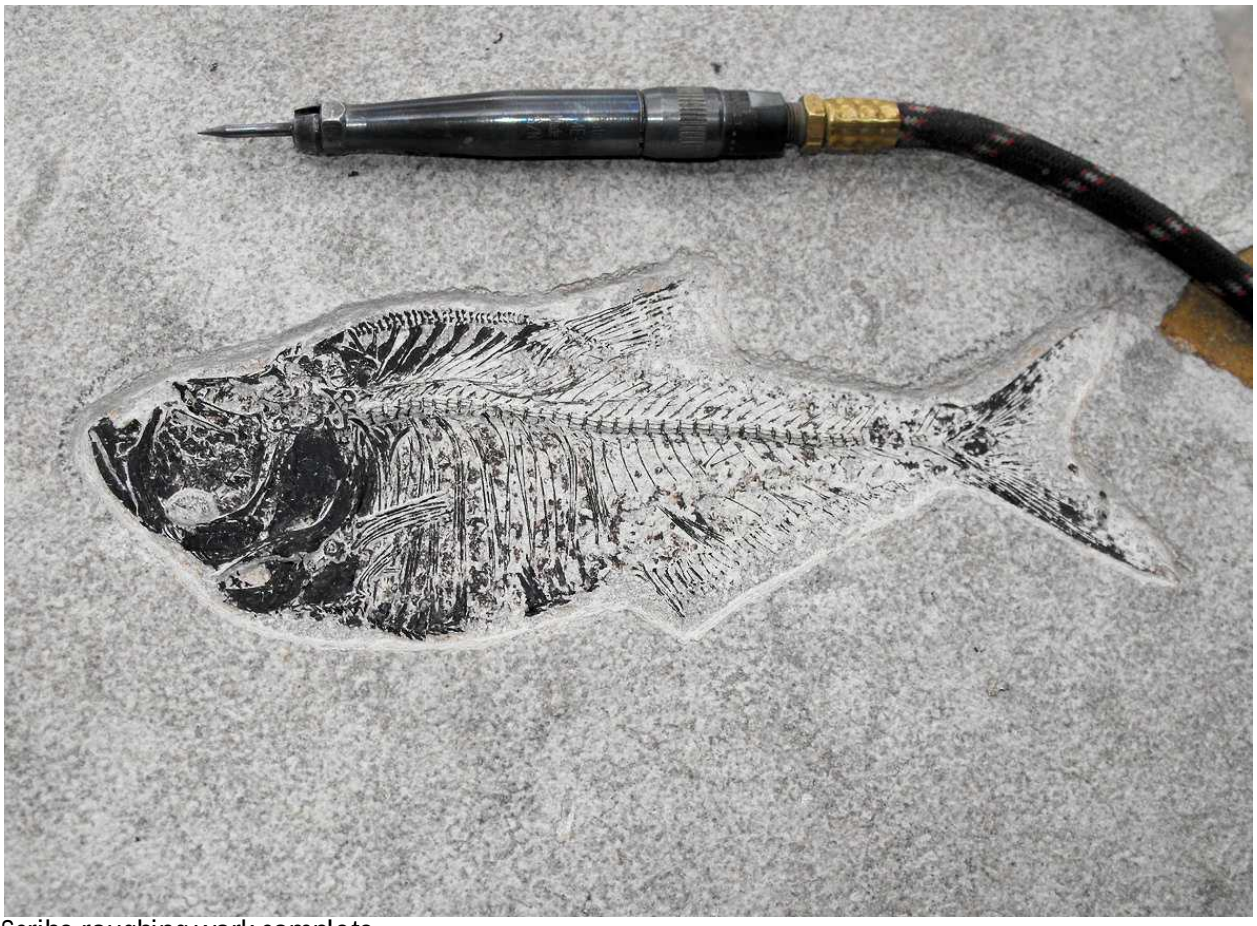
Vert string and ribs of a tiny, decomposed fish found on the Diplo's cheek





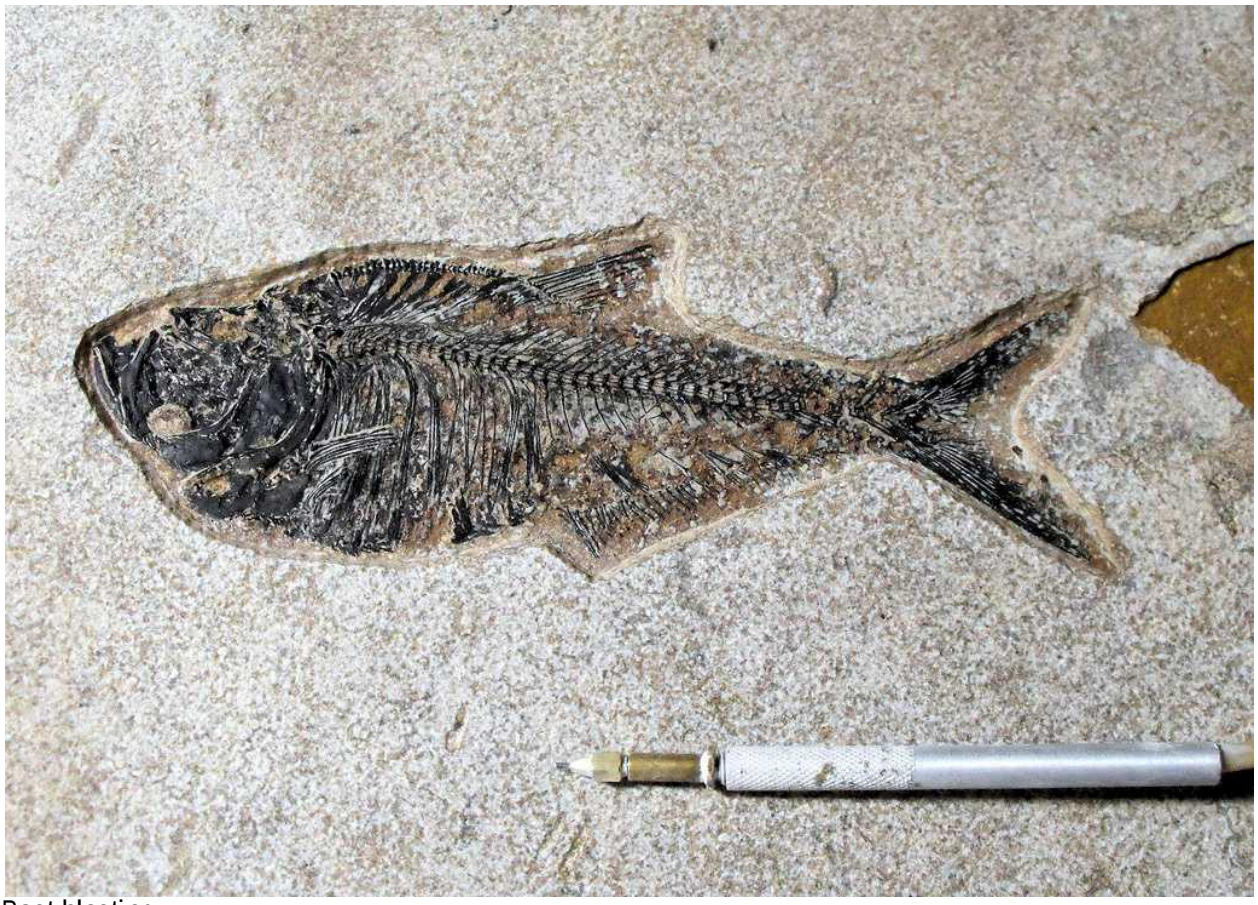
Working my way back





Scribe roughing work complete

”Having a blast”



Post blasting

Finished product after a little touch up paint

FIGS 386-387: Two progress images of the third *D. dentatus* from the 18 inch layer, this one about 5 inches. On the tail is the overlying vert string of a decomposed fish (Site 377)

FIG 388: The first 18 inch layer *D. dentatus* prepped by the author...heavy handed with the scribe and blaster as well as the paint...this one will go to a school (Site 377)

FIGS 389-390: Two more rough *D. dentatus*. I find the decomposing lower specimen intriguing

(Site 677)

FIGS 391-396: Several juvenile *D. dentatus*, “all eyes and verts”, this and next 5 pages (Site 677)

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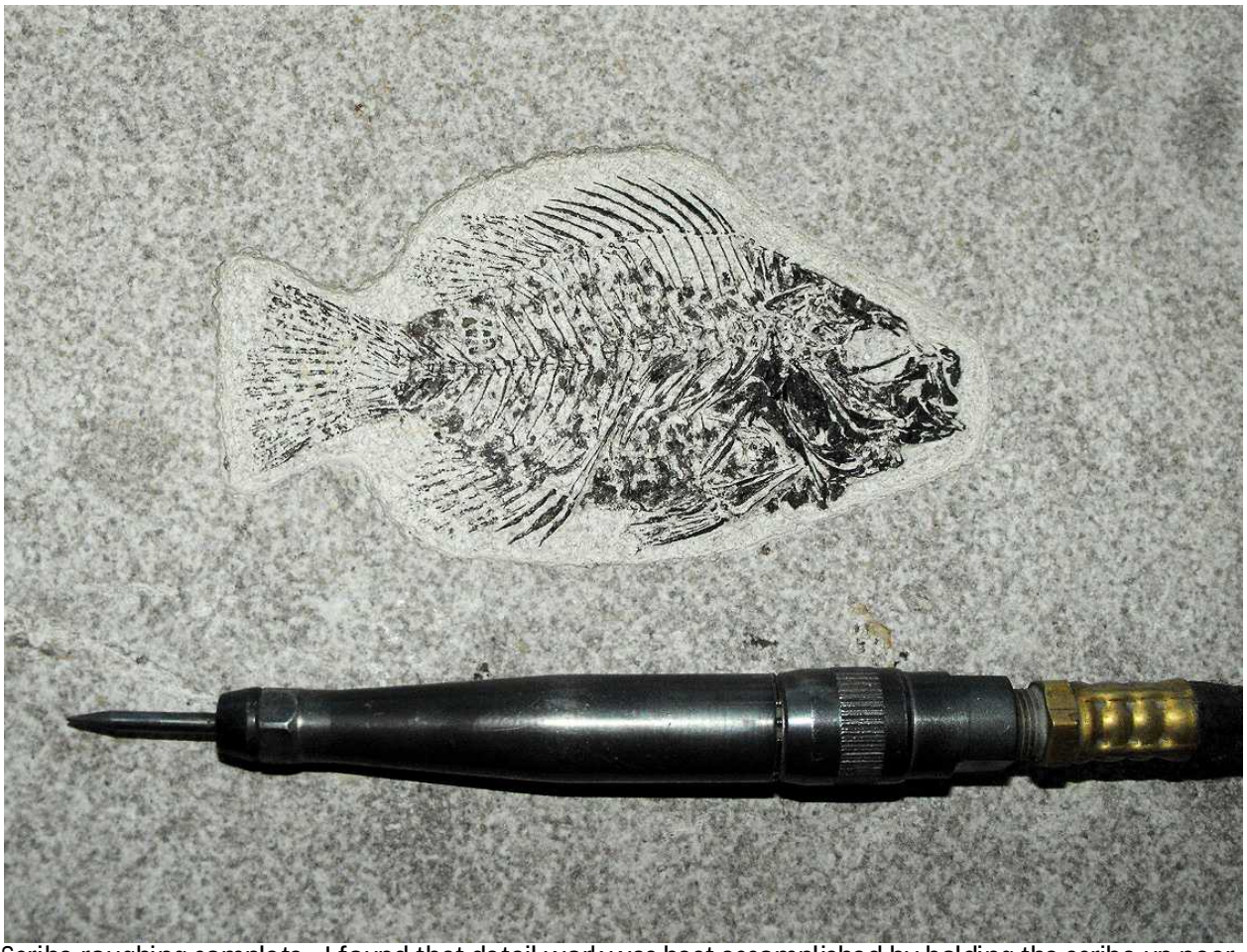
FIGS 397-404: Sequential prep photos of an 18 inch layer perch, *Priscacara liops* , this and next 7 pages (Site 377)

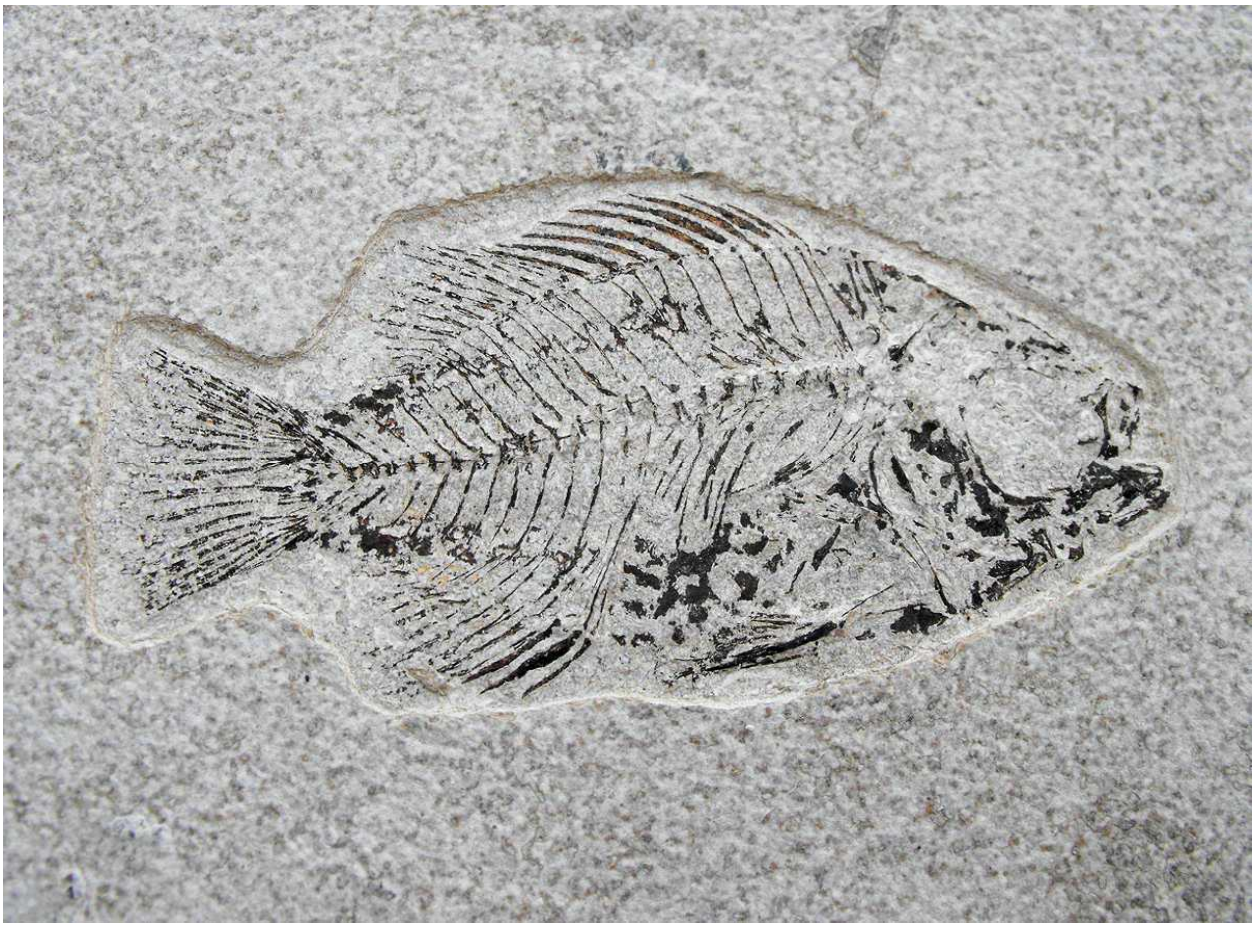


Scribe roughing complete. I found that detail work was best accomplished by holding the scribe up near its fitting, allowing the tool's weight to dictate downward pressure on the stylus, which essentially lies parallel to the plane of the fossil

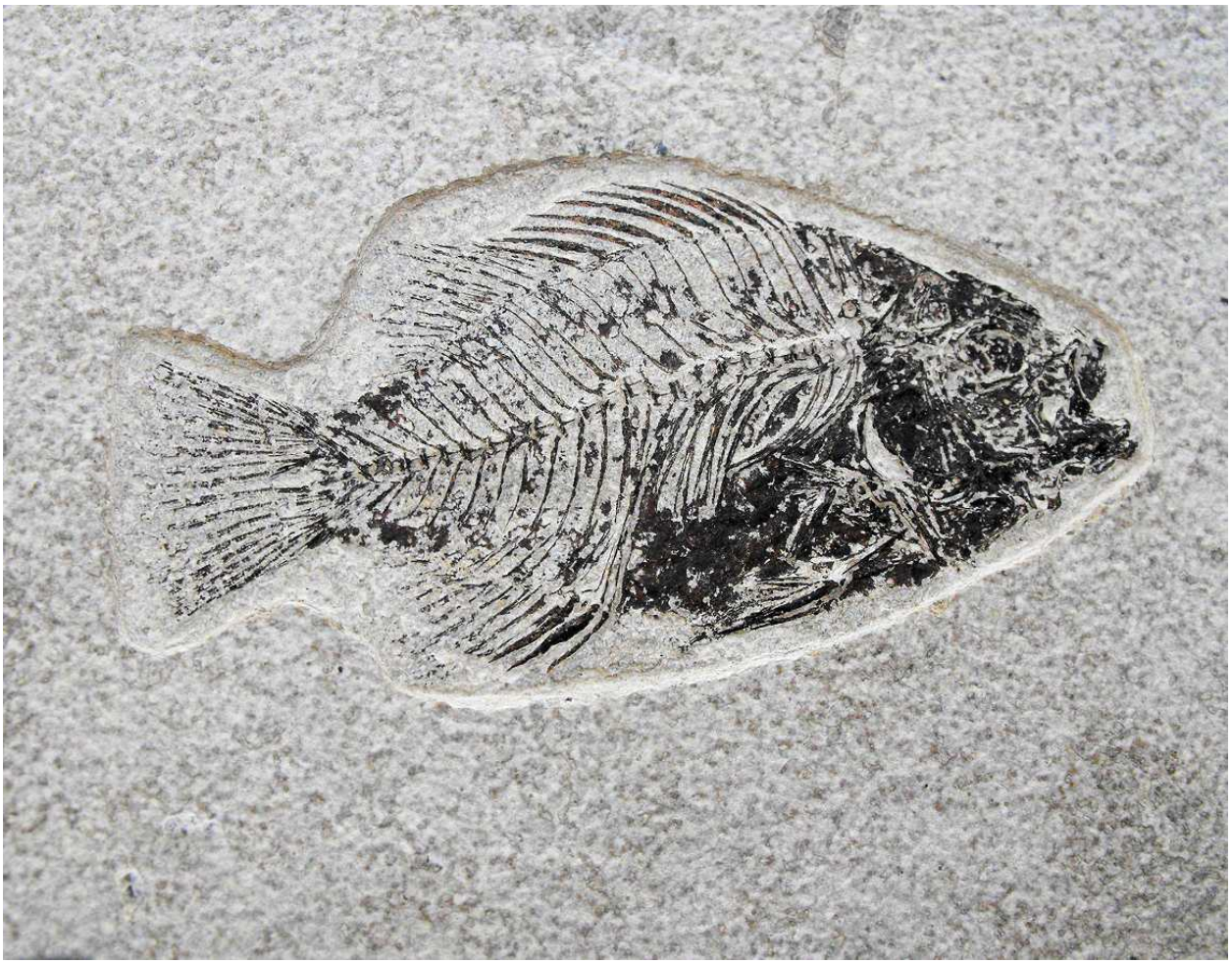
Dolomite blasting complete

Touch up painting complete - finished product

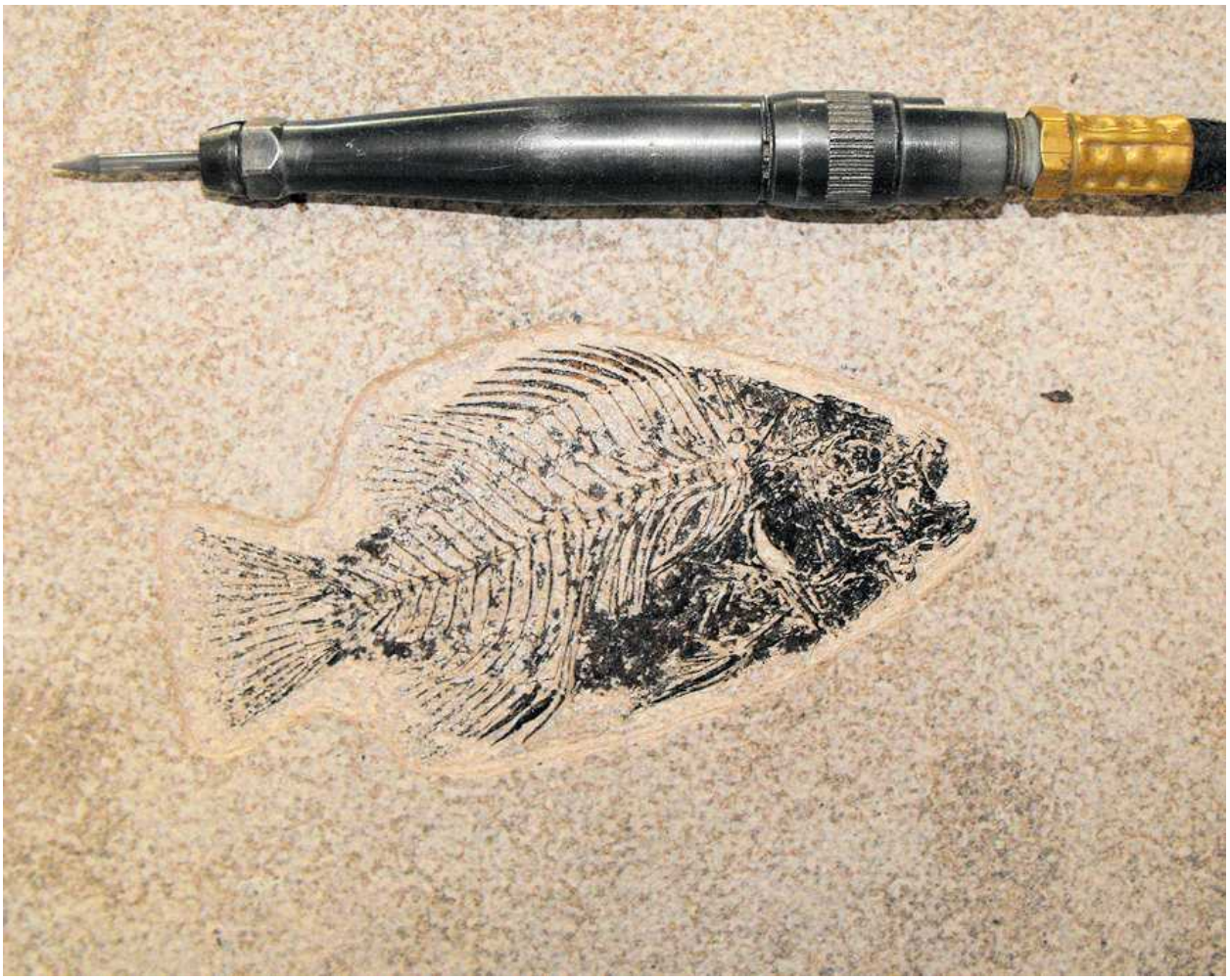
FIGS 405-413: Sequential prep photos of our second *Priscacara liops* from the 18 inch layer, this and next 8 pages (Site 677)



Course scribe work complete



Fine scribe work complete



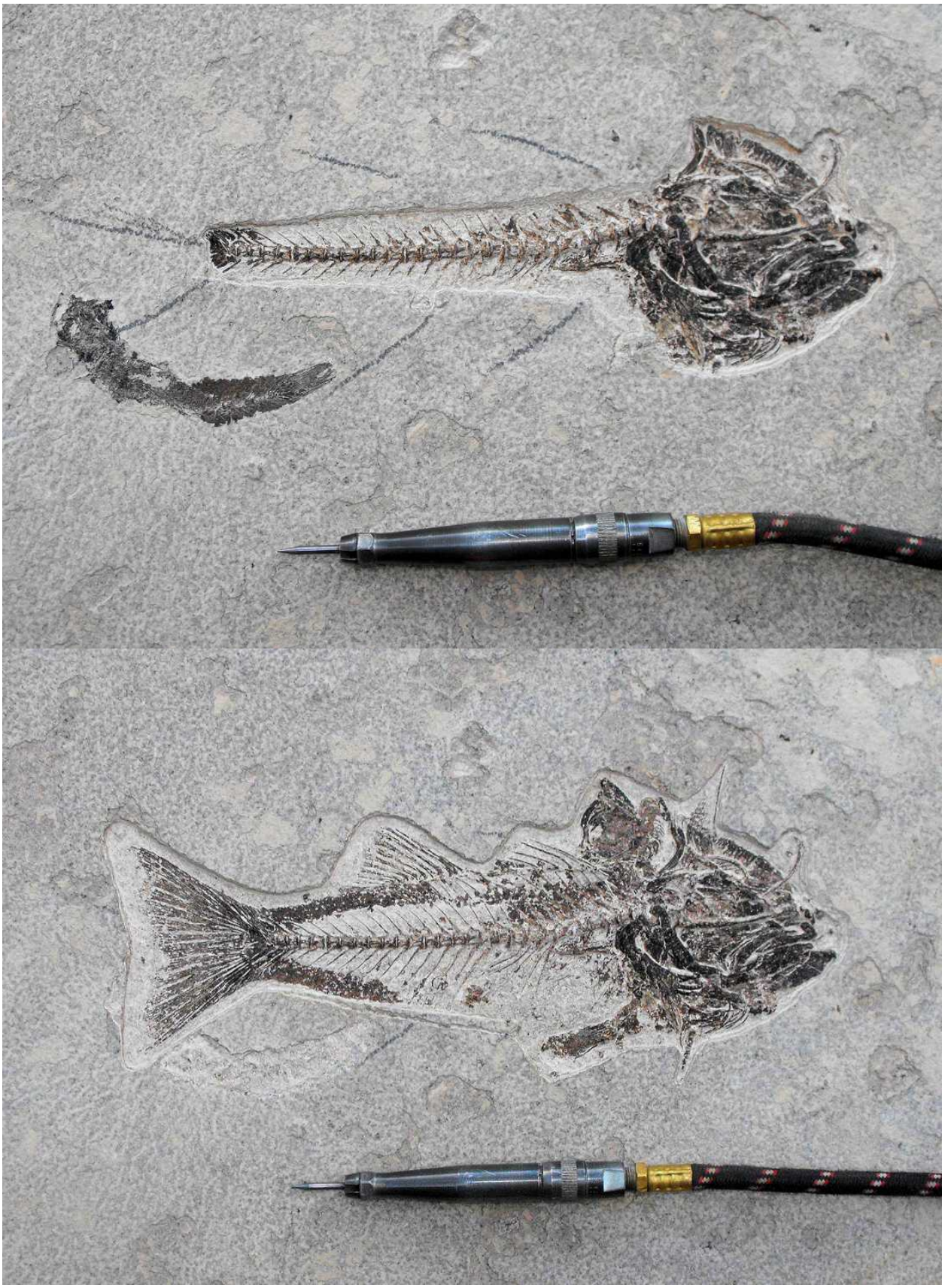
Ready to move to the blast cabinet

Post blasting – note the minor “blow throughs”

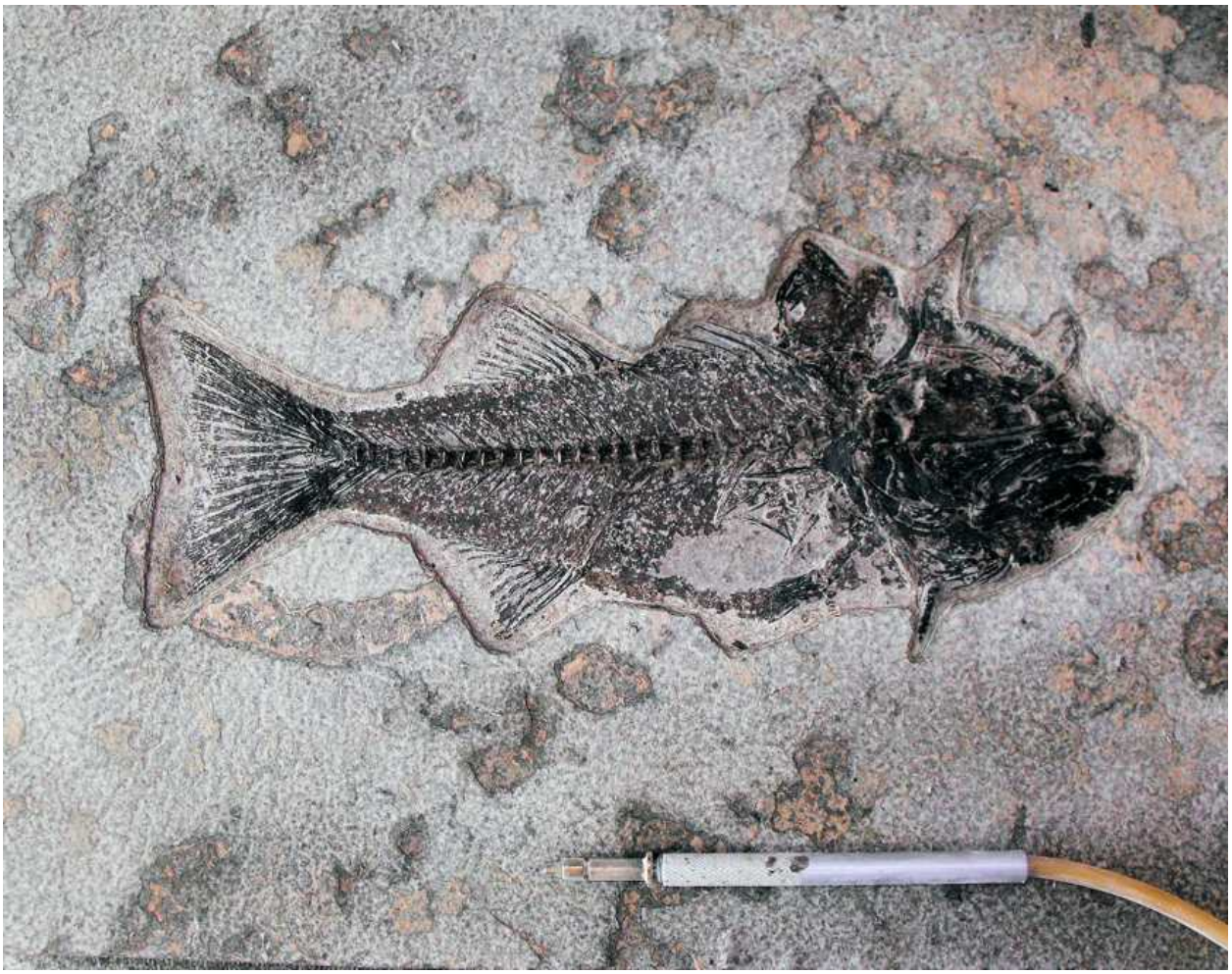
Finished product after touch up painting

FIGS 414-422: Sequential prep photos of our 12 inch long *Mioplosus labracoides,* a relative of the perch or pike from the 18 inch layer, this and next 7 pages (Site 677)

Head first with the scribe

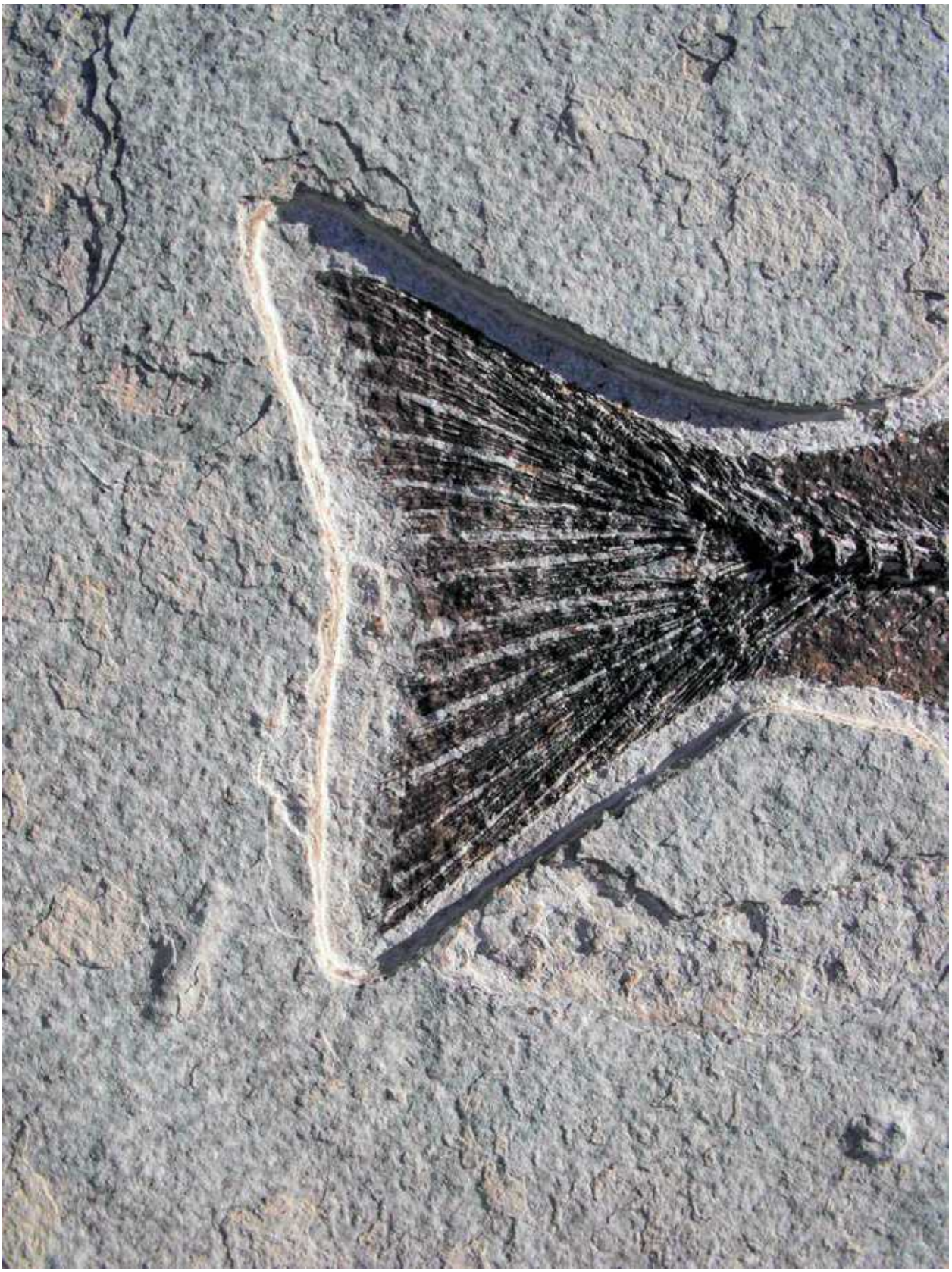


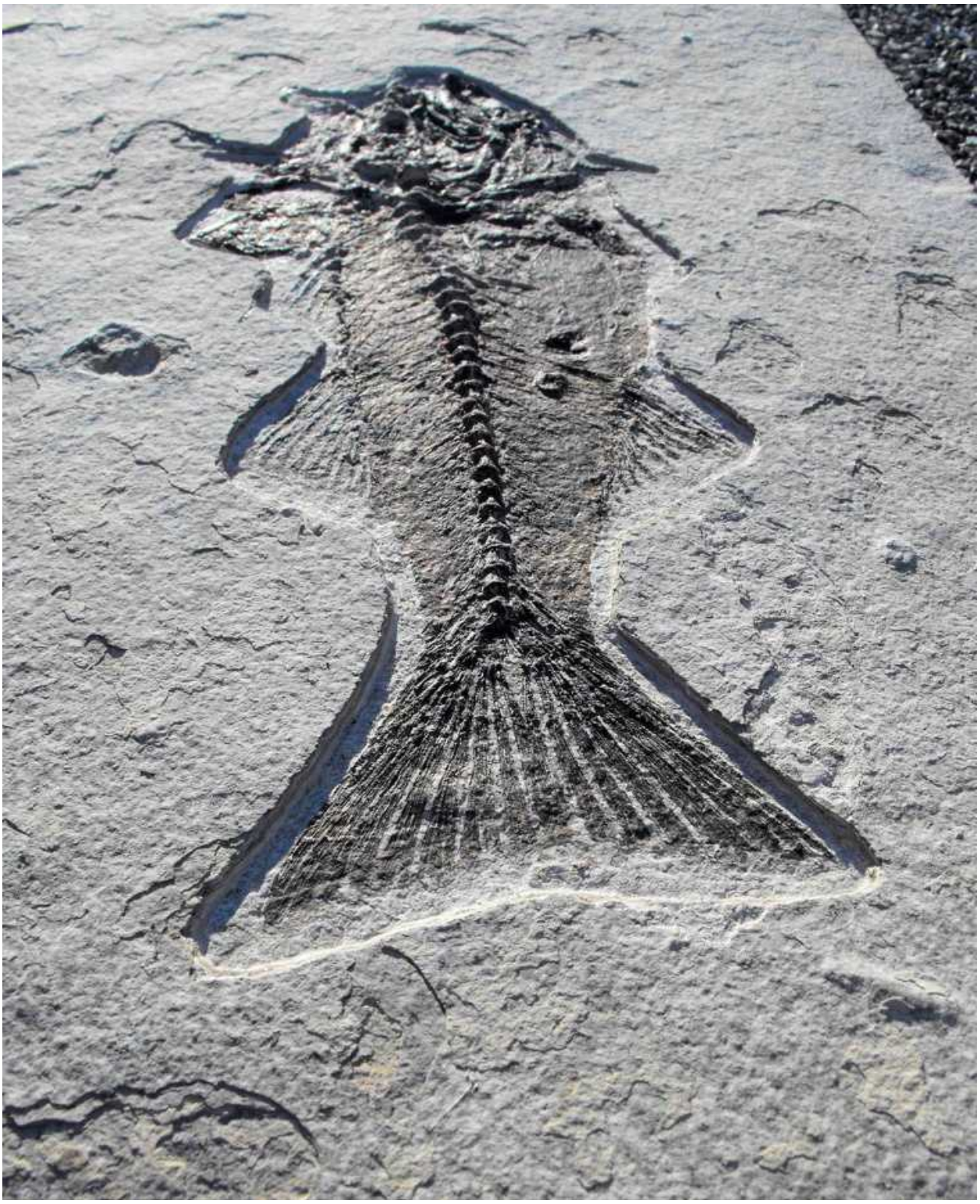
Wiping away a superfluous *Knightia* near the tail, revealing a *Knightia* head above and behind the head of the *Mioplosus* – finished scribe work



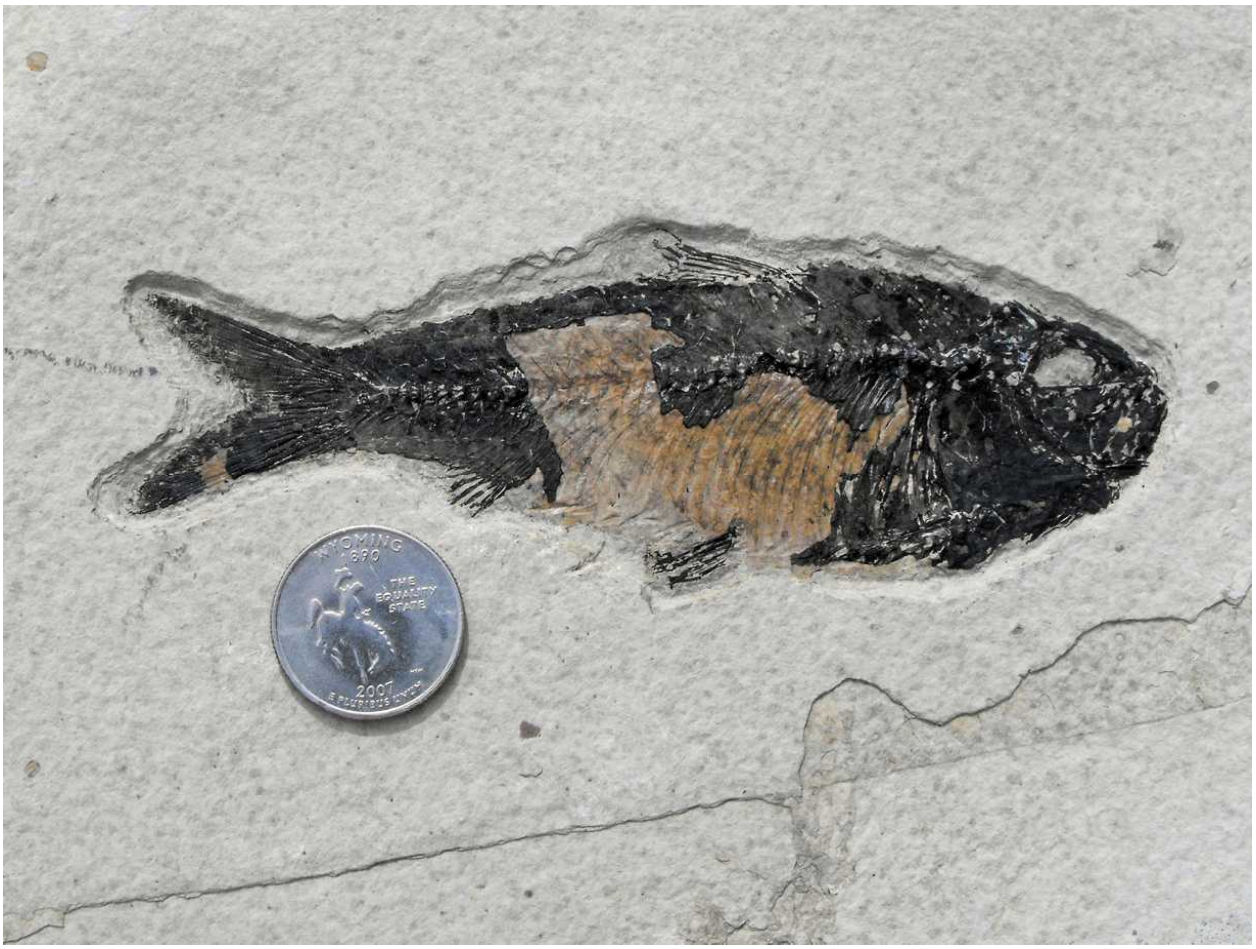
Dolomite blasting complete

Touch up painting complete – finished product





FIGS 423-424: A small *Mioplosus labracoides* from the bottom of the 18 inch layer, this page, with a *Knightia eocaena* on the reverse side, next page (Site 677)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FIGS 425-429: An attractive plate from the bottom of the 18 inch layer containing a high grade *Knightia eocaena* and 3 nice march flies *Plecia pealei*, this and next 4 pages (Site 677)

FIGS 430-435: Our 18 inch layer *Knightia eocaena*, some high grade, this and next 5 pages (Site 677)


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FIG 436: Weston Woehr showing our Eocene wall aquarium (Sites 676 and 677)

July 24, 2013: Pecan Gap Replay

After work on Wednesday I made an investigatory stop at an old, largely reclaimed site in the Pecan Gap Chalk that I used to visit 5-10 years ago, and wrote off since. Same as I remember from last visit, the better fossil zones are now gone. But I got lucky and found a decent *Pachydiscus travisi* ammonite in a block of chalk that rolled off the bluff within 10 yards of my parking spot. No complaints!

FIGS 437-439: Pecan Gap Formation ammonite *Pachydiscus travisi* this and next page (Site 20)

FIG 440: Roughly preserved Pecan Gap Formation ammonites *Pachydiscus travisi* (Site 20)

FIGS 441-443: Pecan Gap Formation *Eutrephoceras* nautiloid with a surprise, this and next 2 pages (Site 20)

A hitchhiking shark tooth blade, probably *Squalicorax kaupi* based on serrations

FIG 444: Phosphatic *Baculites* straight ammonite sections from the Pecan Gap/Austin contact (Site 20) nice

FIG 445: A nice Pecan Gap Formation *Inoceramus* clam (Site 20)

July 25, 2013: Pleistocene Purchase

I don't buy many fossils, but it was time to make some upgrades to my Texas Pleistocene vertebrate collection, and I had sniffed out a deal I couldn't refuse on one side of a mammoth mandible with one tooth intact. We negotiated our deal to include a loose mammoth tooth, but from images I couldn't discern the quality of the tooth.

During my drive to pick up the specimens, I got a call from the owner saying there was a third tooth in the garage collecting dust that the family wanted to get rid of, and they were curious if I was interested. HMMMM....its a matter of size, condition, and cost, I told them.

Finally we arrived at our meeting point, and I found all 3 specimens to exceed expectations. The jaw was beautiful! But the loose tooth was spectacular, much better in condition than any of my personal finds. The third tooth was a mammoth upper tooth from a smaller animal, about 75% complete, probably having lost a spit tooth from the front edge, and a few plates broken off the back side. All

were unprepped and still covered in sand and gravel as found, just like I like ‘em! We negotiated a price on the third tooth, shook hands, and parted company pleased all the way around with the transaction.

FIGS 446-455: A mouthful of Pleistocene mammoth fossils from South Texas followed by detail shots o the jaw next 9 pages

Sand and gravel encrusted jaw

Jaw possibly *Mammuthus hayi*, the first mammoth in North America, early Pleistocene


After scribing jaw clean

Tooth almost 10 inches long

The enamel pattern of the tooth in jaw looked different from that of the other two teeth, so I began emailing experts. As it turned out, the two loose teeth were *Mammuthus columbi*, the Columbian mammoth, the most common elephant in the Texas fossil record, hailing from Rancholabrean times, perhaps 10,000-300,000 years old.

The tooth in jaw, however, had a straighter, simpler, more widely spaced enamel pattern. This specimen was later tentatively identified as *Mammuthus hayi*, the first mammoth to inhabit North America beginning in early Irvingtonian times, making the specimen 300,000 to 1.8 million years old, probably toward the older end of the scale. This purchase just got more interesting! This was the opinion of 2 out of 3 experts I contacted, and the third thought this was a worn *M. columbi*, with excessive wear changing the appearance of the enamel. Either way, I'm pleased.

FIGS 456-460: Pleistocene upper mammoth tooth, this and next 4 pages, given to my friend Robert Bowen when he hand delivered my Green River fish fossils on his Texas road trip which conveniently fell a week after our flight home

FIGS 461-467: The other Pleistocene upper mammoth tooth – I think I'll keep this one

Love those colors!

July 28, 2013: Stream Stomping in San Antonio 678 169 KPG Eut Big Kau Ammo

After taking my beloved wife out for a weekend of boating and wineries at Marble Falls and vicinity, she needed to do a little work once we got home, so I continued my field study of the Austin to Pecan Gap sequence within an easy drive of home.

This session took me to a new-to-me stream, starting my 3.5 mile round trip hike in the Austin Chalk. Finds were scant. I found one 15 inch ammonite that someone else had broken in half while attempting to free it from the bedded limestone. I made quick work of the rest of it with my 3 pound hand sledge and chisel with the intention of reconstructing it. Once back together, it began to take on some of the design cues of *Peroniceras*.

FIGS 468-470: Austin Chalk Site 678 and the c.f. *Peroniceras* ammonite found there

FIGS 471-472: Hints of Austin Chalk ammonites (Site 678)

The rest of this long hike was a dud, so I pulled up stakes and moved on to a site I had not hit in a while, but opted to investigate the site's Pecan Gap Chalk after late May's flooding. Paydirt was varied and scant but welcome. I took 2 *Hemiaster texanus* echinoids followed by a *Eutrephoceras* nautiloid. I took a few *Baculites* straight ammonites, but passed on a great many more.

FIG 473: Unidentified Pecan Gap Formation irregular echinoid – posterior ambulacra look a bit long to me to be a *Hemiaster* (Site 169)

FIG 474: Pecan Gap Formation *Hemiaster texanus* echinoid (Site 169)

FIG 475: Pecan Gap Formation *Hemiaster texanus* echinoids and *Baculites* sp. straight ammonite

(Site 169)

FIGS 476-478: Rare Pecan Gap Formation *Placenticeras* ammonite unfortunately wrecked by prep (Site 169)

An odd displacement in the whorl marked this as an imperfect specimen

The curse of the Pecan Gap is its friable nature. Catastrophe occurred despite relief cuts made with a cordless Skil saw

The hands down best find was a rare 10 inch *Placenticeras* ammonite, my first complete one from the Pecan Gap Formation of South Texas. It had a strange crushed and shifted section, but appeared complete. Rather than shatter it with hand sledge and chisel alone, I opted to come back with a cordless saw at my earliest convenience to make some relief cuts and hopefully bring home this rare specimen in one piece.

Well....things didn't exactly go as planned, and that ammonite began to crumble even after I pedestalled it, so I cut and ran. With that experience behind me, I was quite pleased with the banner collecting month that July proved to be, and look forward to better success on my next Pecan Gap *Placenticeras*.