

FOSSIL COLLECTING REPORT

September, 2011

Daniel A. Woehr and Friends and Family

The Makings of a Cosmopolitan Paleo Campaign

With divorce 3 years behind me and my son at an age where he doesn't yet need braces or a car, finances finally allowed me to realize a tri fold dream....visiting Europe for the first time, fossil collecting outside of the U.S., and collecting Jurassic age exposures. Several things came together to make the trip a reality. First of all, my girlfriend Ms. Brett is keenly interested in fossils and time spent in the great outdoors, and she is well traveled in Europe as well, making her a shoe-in as my lovely travel companion.

Secondly, TheFossilForum.com and Steinkern.de provided us with wonderful contacts. Online forum connections with other serious collector-friends abroad provided us with "boots on the ground" local knowledge indispensable in planning a 15 day fossil trip to countries where we speak very little of the native languages, despite my 30 day self guided crash course in German. So after checking into fossil export laws and collecting potential, we settled on southeastern France and Bavaria for our paleo itinerary. With so many offers for field guidance and places to stay in various parts of Europe, it was an agonizing decision to exclude certain parts of the continent in order to keep things logistically feasible.

Brett and I are forever indebted to Jean-Louis Latil (our "French Connection") and family in Lazer, France for their hospitality, great cooking, and field guidance, making our visit to France truly unforgettable. But Jean-Louis did not act alone in rolling out the proverbial red carpet. The kingpins in overall trip planning were the well known and universally admired Italian team, Nando Musmarra a.k.a. "Fossil Veraci" and his wife, Diana Fattori. They provided suggestions and feedback on sites and even lodging across France and Germany, saving me countless hours of planning, and even put us in contact with other knowledgeable collectors and museum staff. In addition, Roger Furze, a skilled collector and preparator transplanted from Canada to southern Germany, was very generous and helpful with information. A couple of seasoned German collectors who formed the German fossil forum Steinkern.de, namely Wolfgang Dietz and Sönke Simonsen, provided a great mix of site information and field guidance, as well as advice on restaurants and other points of interest.

Without their collective assistance, this saga would not have taken the same course nor evolved into such a world class adventure. Allow me to expound in detail as to how our paleo odyssey unraveled...



FIG 1: Geologic time scale, courtesy of Burgermeister-Müller Museum



FIG 2: More detailed Jurassic geologic time scale, courtesy of Burgermeister-Müller Museum

September 6-7, 2011: Texikaners Descend on Europe

And so we embarked on my first ever transatlantic flight, leaving San Antonio around noon with a layover in D.C., the long leg of our flight taking us through the night. The sleeping pills didn't work so I enjoyed seeing the small towns over England lit up at night. Running only a half hour late we landed in München (Munich) around 9:30 a.m. and picked up our Mietwagen (rental car) right away...I cringed when I saw the huge red dot AVIS logo on each door....to me this seemed like we were begging to be robbed.....however thieves generally aren't interested in hauling off rocks (more on that later) so I figured we would be safe, but perhaps lampooned, as we traversed the countryside.



FIG 3: Our cut rate Opel Corsa...and nothing screams "please rob and kill us" in all languages better than the big red dot!

Jetlagged, I slammed a 5 Hour Energy and floored it 600 miles across southern Bavaria, the panhandle of Austria, and the entire length of Switzerland and ultimately into the French Alps, stopping occasionally for some really good espresso to keep me awake. On a side note, I was really impressed with some of the Esso gas stations along the German Autobahn – great food and coffee by American standards – nothing like an American truck stop.

Once we entered France we stopped by a quaint little town somewhere between Genève and Chambéry. This was our first close look at historic buildings much older than what we see in the U.S. Of particular interest were some Roman aqueducts and other ruins still in place in the center of town. This framed our trip to Europe for me with a historical

perspective that I could certainly appreciate, and I was prepared to imbibe the history of all the towns and points of interest along the way. Lots of time to kill on this leg of the drive....so let's talk about our first hosts on this trip.



FIGS 4-7: Brett and Danny stretching our legs halfway through our long drive from Munich to Lazer, stopping somewhere in eastern France near the Swiss border







A couple years ago I was contacted by Jean-Louis Latil, a lower Cretaceous ammonite researcher residing in Lazer, France. He publishes his research through the University of Grenoble and in his internet searches found my fossil reports on the Brazosport Museum website where he saw ammonites of the age he studies, thus establishing our first contact. A stay with his family in their 300 year old farm house nestled in the picturesque southern foothills of the French Alps soon became a vital part of our itinerary and in the end cemented wonderful friendships and memories that will last a lifetime.

And so we rolled into Lazer very late around 11 p.m. local time, having wasted no time along the way. Jean-Louis' wife Joëlle had prepared for us a wonderful dinner of guinea fowl cannelloni with a salad of 4 colors of home grown tomatoes, which we were very agreeable to after essentially 2 days of travel with no sleep nor shower...what a way to meet in person for the first time!

We had a valuable lesson reconfirmed on the final leg of our drive...don't put blind faith in any road GPS! Although I had pre programmed all planned destinations into Brett's Garmin well before our trip, the GPS will often choose a different route than planned, often a non direct one, in this case sending us through an extra half hour or so of switchbacks through the Rhône-Alpes region, with possibility of our vehicle being dumped hundreds of feet into the abyss in absence of guardrails. Not a cool thing when you are two days fried from constant travel. We joked our way through it and were quite happy to finally make sleep a priority. I felt bad that our whacked out sleep schedule affected our hosts on a work/school night...but they are invited to do the same to me when they come to stay at my house for two weeks this coming spring!

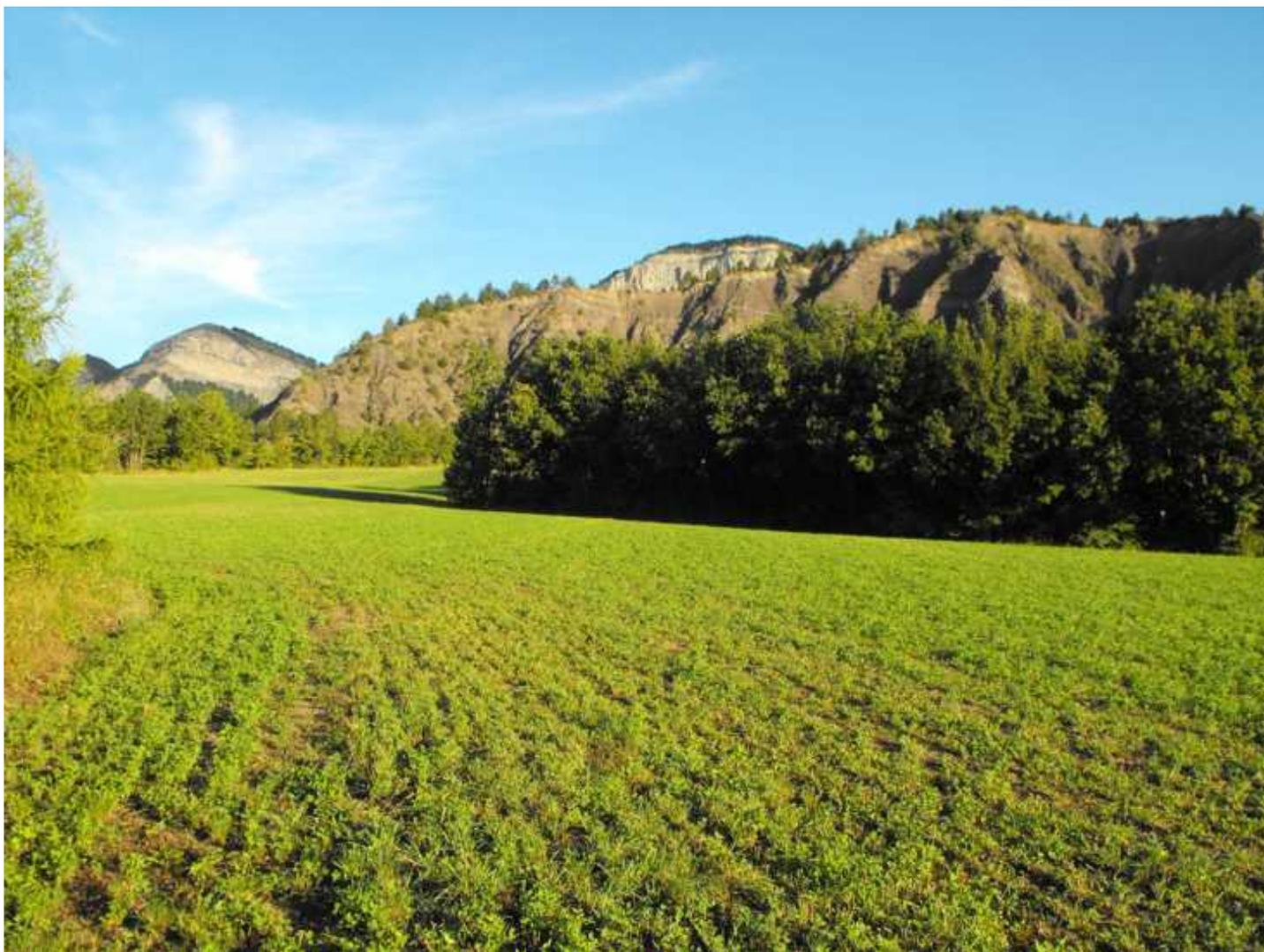
September 8, 2011: Parlez-Vous Fossiles???

Ms. Brett had been working 14+ hour days lately, so she opted to sleep in on Thursday, our first real day of vacation. When she awoke she instantly felt the much needed refreshment of vacation...comfortable early fall temps allowing the windows to be open all night (with no bugs, mind you!); panoramic views of the foothills of the Alps right outside the window.



FIGS 8-10: Finally arrived at the Latil's home Lazer, seated in the foothills of the French Alps. Pastoral morning views out the bedroom window and from the side yard next 2 pages





If she peered hard enough, she just might have seen Jean-Louis and me climbing around an area slope of brown and gray Jurassic marine marl, more specifically a gradational contact of gray Callovian sediments overlying more brown Oxfordian marls and nodular concretions. This contact zone is Upper Middle (Malm-Dogger) Jurassic, roughly 161 million years of age (MYA). I had awoken on time without the aid of an alarm, my inner cravings for paleo adventure winning the arm wrestling match with my need for rest.

It was quite a change a pace for me – no 100°F, no Texas sun burning the back of my neck like a red hot ingot, no fire ants, black widows, scorpions, or rattlesnakes to contend with. For once I could just concentrate on looking for fossils, but it was hard not to gaze across the valley before me, the church steeple and rooftops of a cluster of buildings in the valley below, and the ruins of a medieval castle destroyed during the French Revolution perched on a knob above, with a Jurassic rock slide on the mountainside just beyond.....history was all around us.



FIGS 11-16: Jean-Louis Latil and the author stomping around Callovian-Oxfordian (Jurassic) contact zone at Site 558 this and next 5 pages





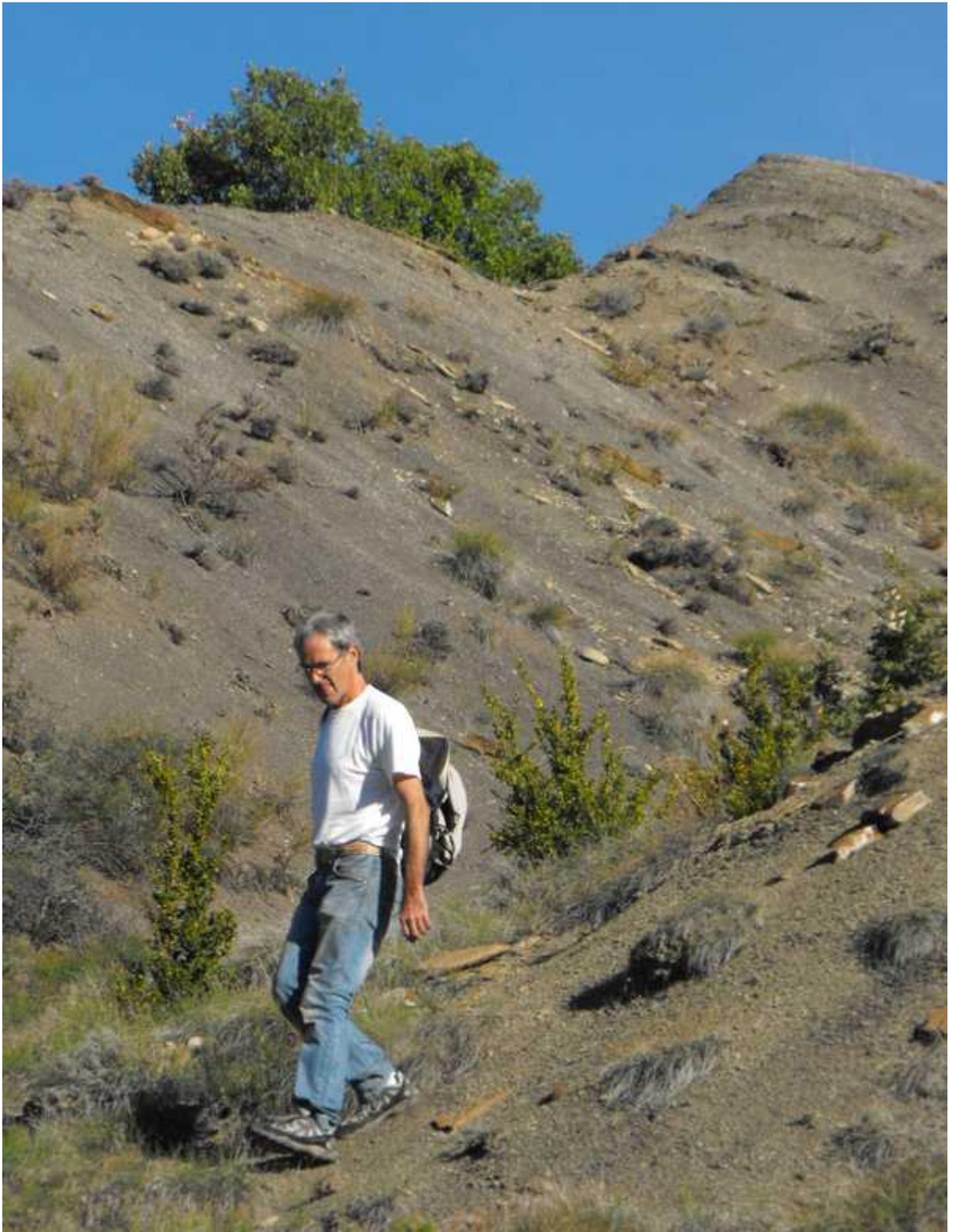








FIG 17: Interesting Jurassic mountainside exposure with ruins of a medieval castle in the foreground destroyed during the French Revolution...this place is "steeped" in history....

With eyes on the ground, we spent a couple hours of hard searching to produce a half dozen ammonites between us. I scored first, finding an ammonite exposed in a weather split brown nodule, but Jean-Louis scored best, quite magnanimously laying a 75-100 mm perfect ammonite in my hand for keeps. Now that's hospitality! Tentative ammonite ID's include *Allagaticeras* f. *alligatum* and *Sowerbyiceras* sp.



FIGS 18-19: Unidentified ammonite , the author's first ever Jurassic find, this and next page (Site 558)





FIGS 20-21: Unidentified ammonite impressions left in the field, this and next page (Site 558)





FIGS 22-25: *Allagaticeras* cf. *alligatum* ammonite found by Jean-Louis, this and next 3 pages (Site 558)









FIGS 26-27: *Sowerbyceras tortisculatum* ammonite this and next page (Site 558)



Our second site nearby exposed the same sediments and produced one nice little 25 mm ammonite for me at the base of the gray slope. Off the subject, Jean-Louis is a car enthusiast, and I much enjoyed his assertive driving technique through the switchbacks headed back to Lazer.



FIGS 28-30: *Sowerbyceras tortisculatum* ammonite this and next page (Site 559)

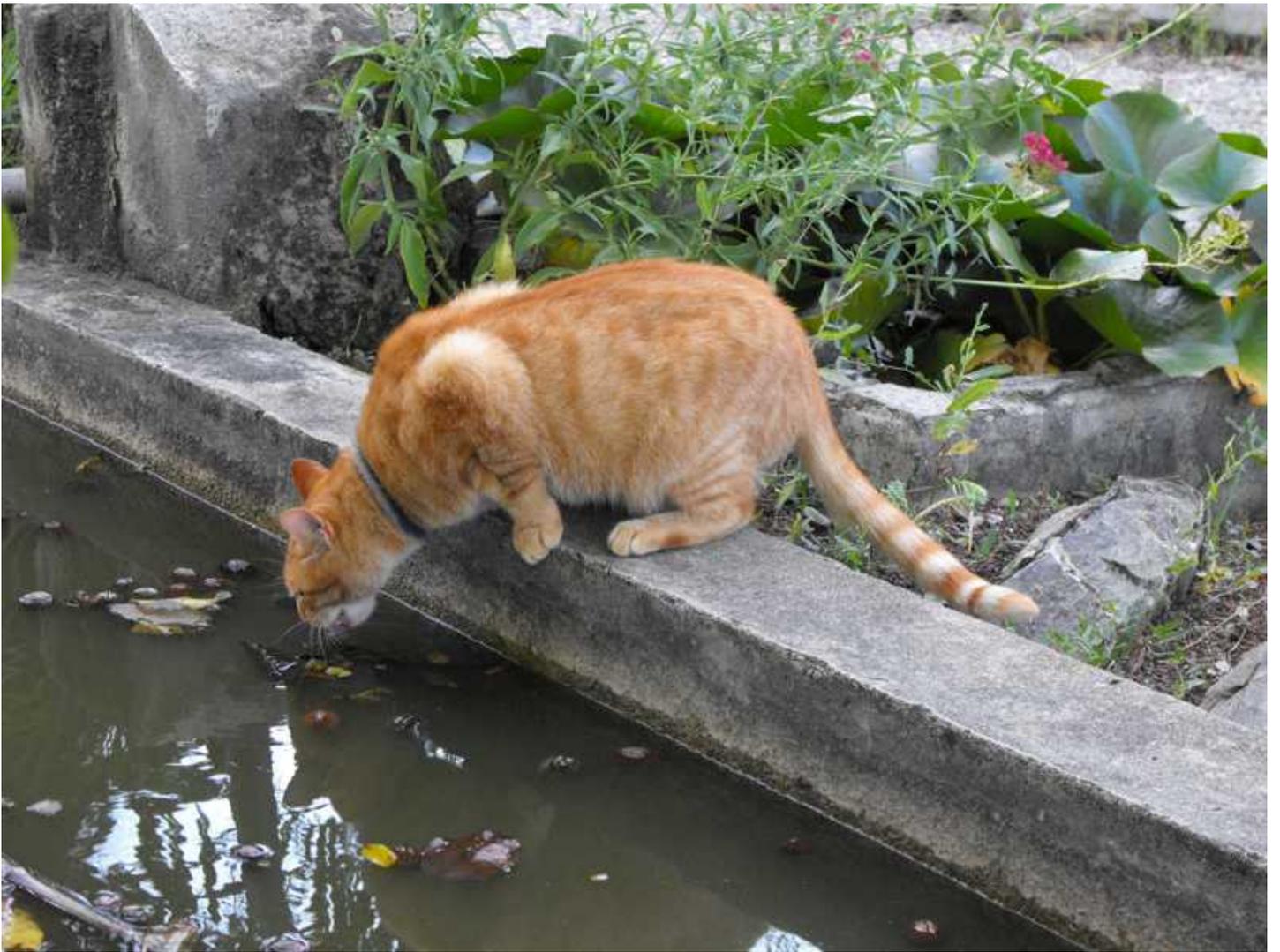


Circling back to the farm house for lunch, we joined forces with a perky and well rested Ms. Brett. It was good that we saved this next site for her as it was ludicrously productive, a spectacular exposure of Valanginian (near basal Cretaceous, 136.4–140.2 MYA), quite regularly alternating light gray limestones and marls providing a backdrop of much more order and regular bedding than I often see in stratigraphic units of any age.

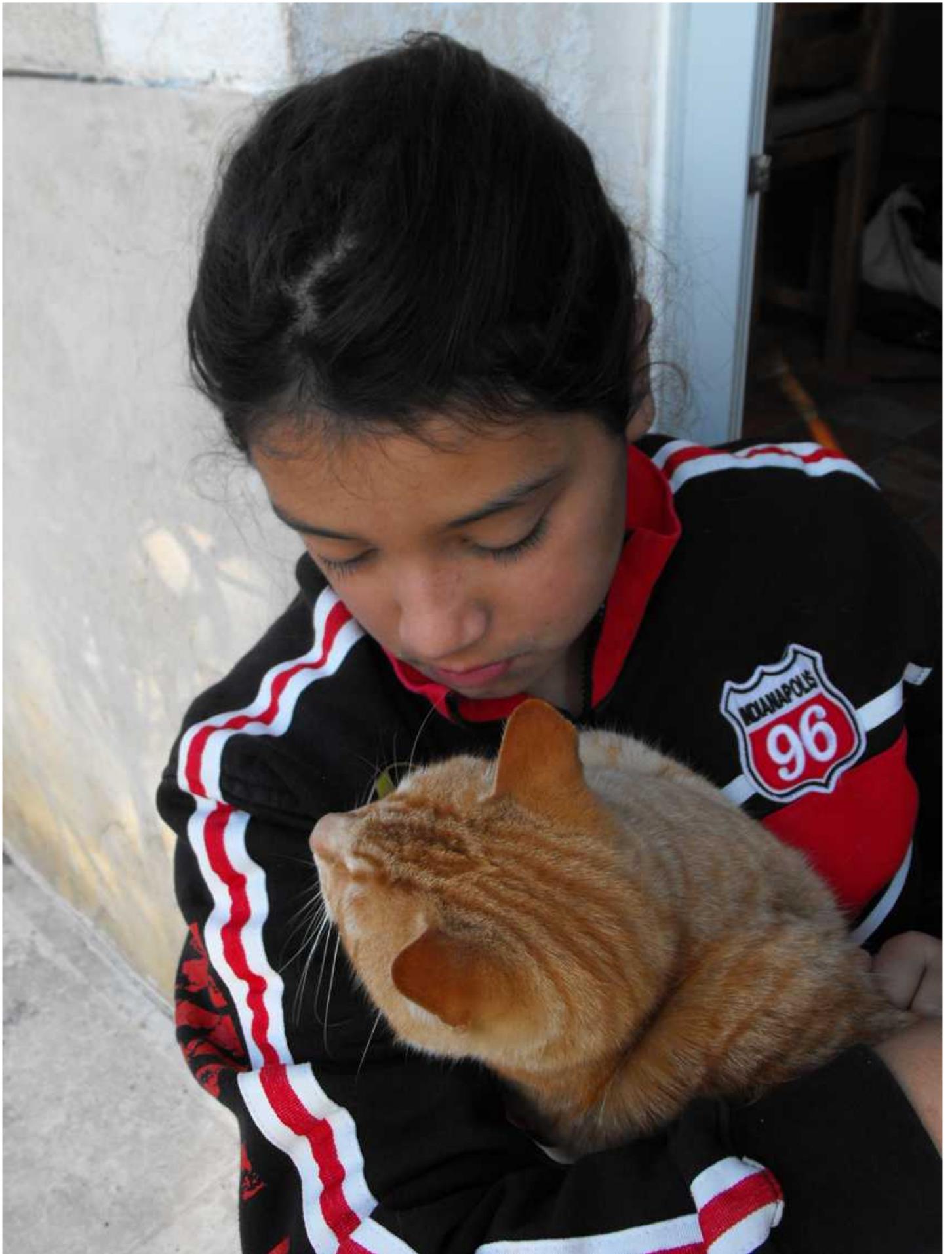


FIGS 31-32: Jean-Louis and the author this page, Jean-Louis and daughter Colline next page





FIGS 33-34: Family kitty Carmel this page, Carmel and Colline next page





FIGS 35-36: A healthful lunch for the fossil hunters this page, lunch for Carmel the Cat next page (!?!) 41 years old and I'm still catching critters like when I was 9...



We were able to drive directly on top of the exposure and just as Jean-Louis had promised, we were finding small pyritized ammonites within the first 15 seconds after piling out of the van. In fact, he could have driven onto the exposure and let me hang out the door and grab them, the hunting was so easy!

We were led to a marl flat where the ammonites were so concentrated that you could literally walk 75 meters, stepping on 2 or more at a time. They were scattered around us in the thousands, and we spent the next couple hours gathering hundreds each, and there may have been more than 10 genera present, plus at least two genera of belemnites (elongated, calcitic squid hard body parts, genus unidentified in this report), with the distinctly flattened belemnite *Duvallia* present if you kept your eyes open for them.



FIG 37: Just something miscellaneous and French looking in nearby Lagagne for my American friends and family

Brett and I crawled around the marl flat and surrounding low slopes while Jean-Louis billy goated up the mountain, later coming down and giving each of us a very rare and well preserved ammonite specimen to supplement our take of *Saynoceras*, *Neolissoceras*, *Olcostephanus*, *Neocomites*, *Phylloceras*, *Lytoceras*, and others which remain unidentified in this report.



FIGS 38-39: Panoramic views of Valanginian (Lower Cretaceous) Site 560 this and next page





FIGS 40-42: Ms. Brett "Fossil-eyed" at Site 560 this and next 2 pages







FIGS 43-44: The author taking in the topography this page, thinking his girlfriend wasn't watching, next page (Site 560)



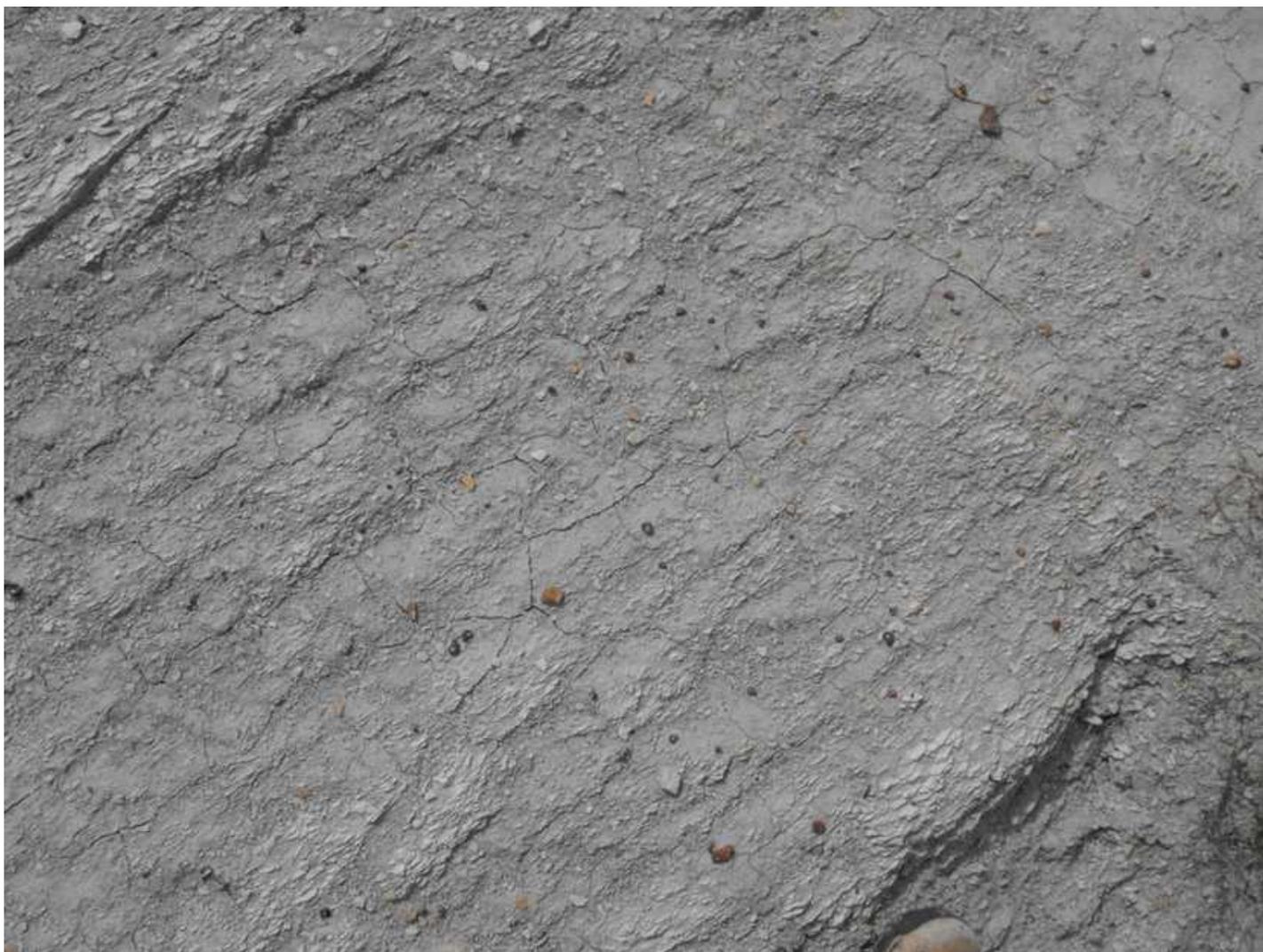


FIGS 45-46: French pastries delivered to the field courtesy of Jean-Louis and Colline!!! this page, on site tutorial next page (Site 560)





FIG 47: Billy goat? Chupacabra? No its Jean-Louis sniffing out elusive pyritized ammonites from the upper reaches of Site 560



FIGS 48-53: Basically every black, brown, or limonite colored speck on the ground is an ammonite at this place...and there were thousands scattered around Site 560. See for yourself this and next 5 pages













FIGS 54-56: Unidentified belemnites (squid guards) from Site 560 this and next 2 pages







FIGS 57-60: Interesting flattened *Duvalia* sp. belemnites this page, unidentified rhyncholite (nautiloid jaw) next 3 pages (Site 560)









FIG 61: Unidentified pyritized gastropod (Site 560)



FIG 62: Straight ammonites *Bochianites neocomiensis* along with a couple French Revolution era nails (Site 560)



FIGS 63-64: Ms. Brett's ammonite finds prior to sorting this and next page (Site 560)





FIG 65: *Lytoceras* sp. and *Protetragonites quadrisulcatum* (Site 560)



FIGS 66-74: *Neocomites neocomiensis* this and next 8 pages (Site 560)





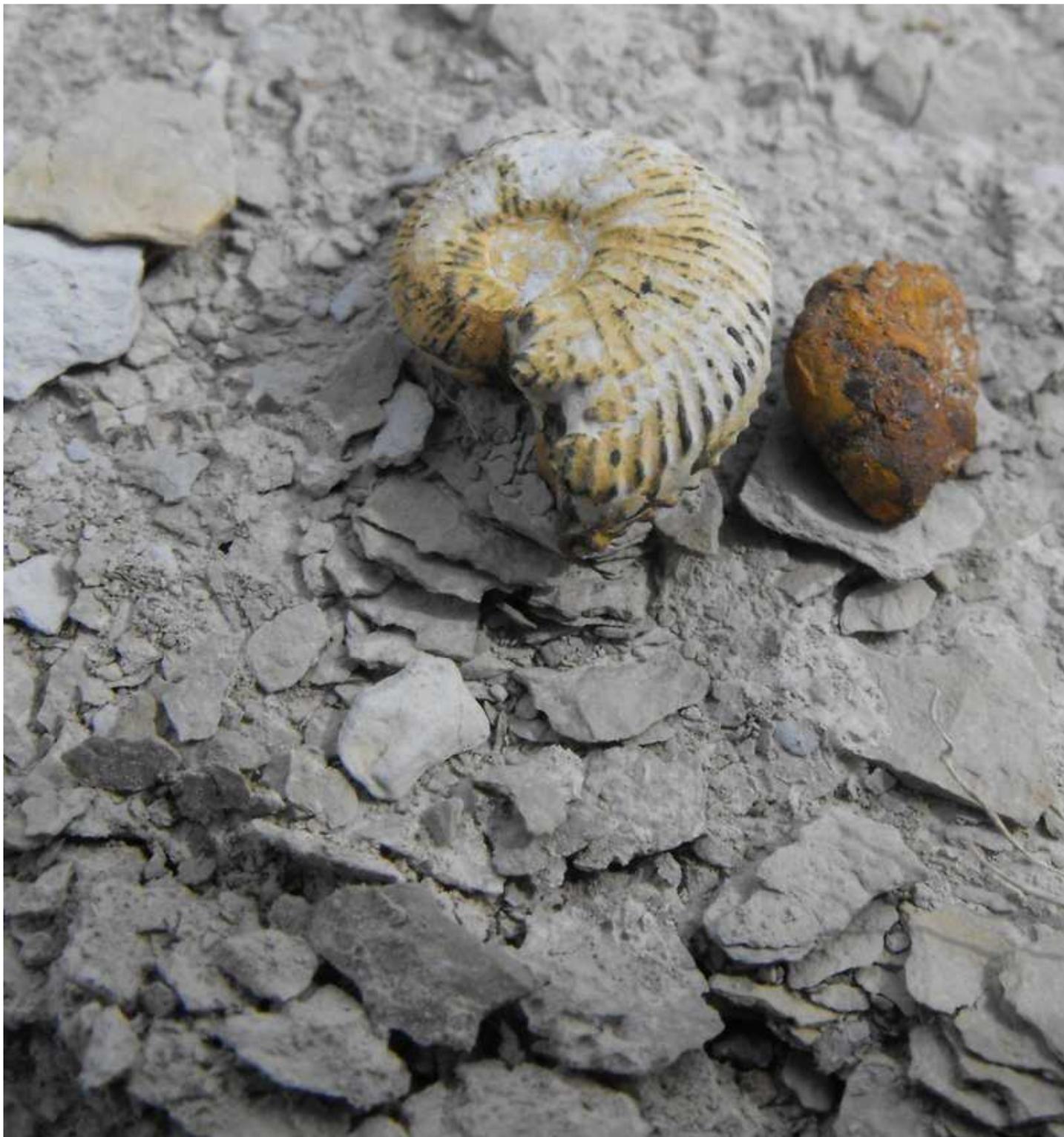














FIG 75: *Neohoplaceras* sp. (with tubercles) and *Neocomites neocomiensis* (no tubercles) from Site 560



FIGS 76-79: *Neolissoceras grasianum* this and next 3 pages (Site 560)

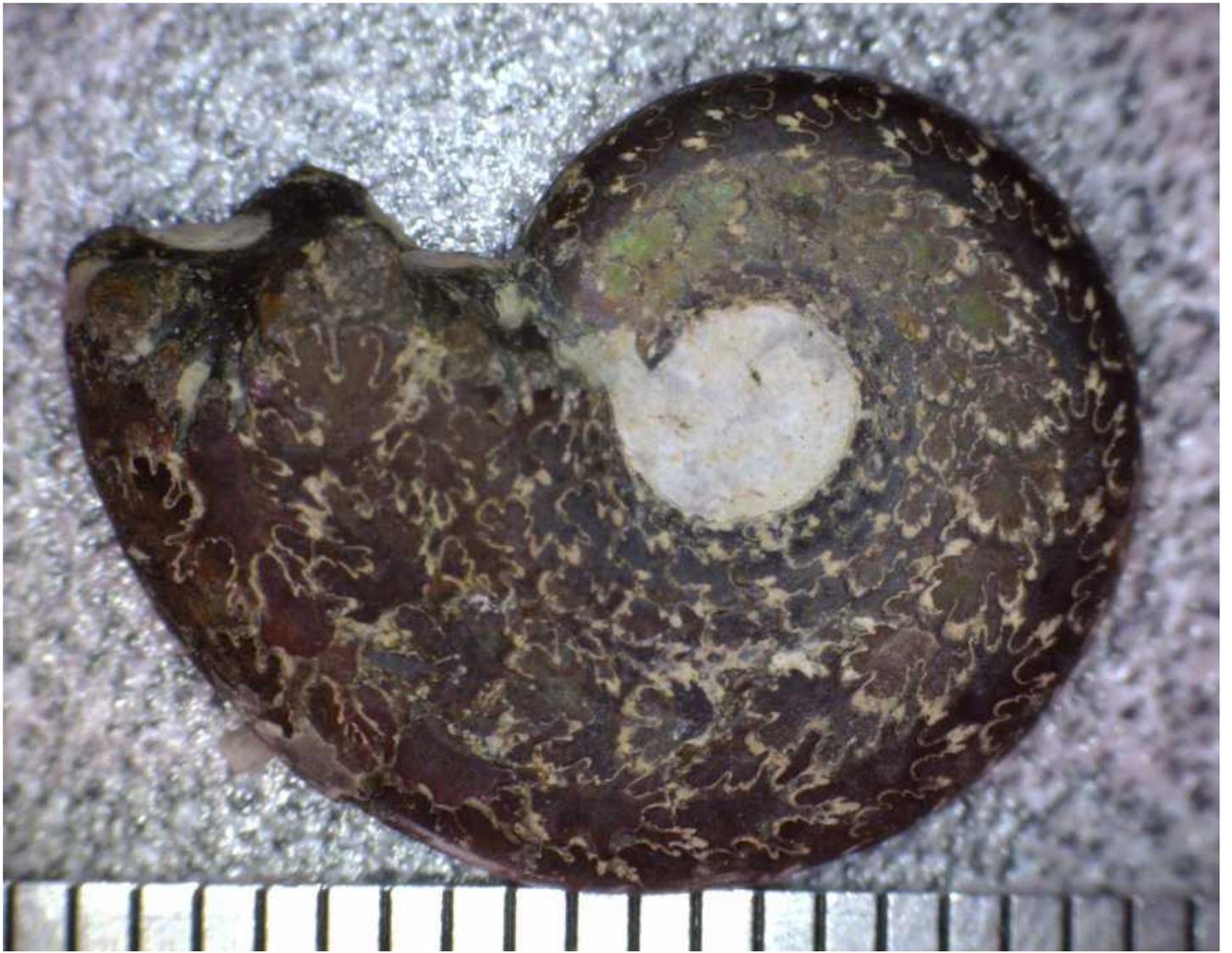








FIG 80: *Paquiericeras (Julianites) undulatum*, quite rare, thought by French ammonite experts Latil and Bulot to be the only specimen of this species currently outside of France. Bulot has found 3 in 20 years. This specimen found by Latil (Site 560)



FIGS 81-83: *Phylloceras* sp. this and next 2 pages (Site 560)



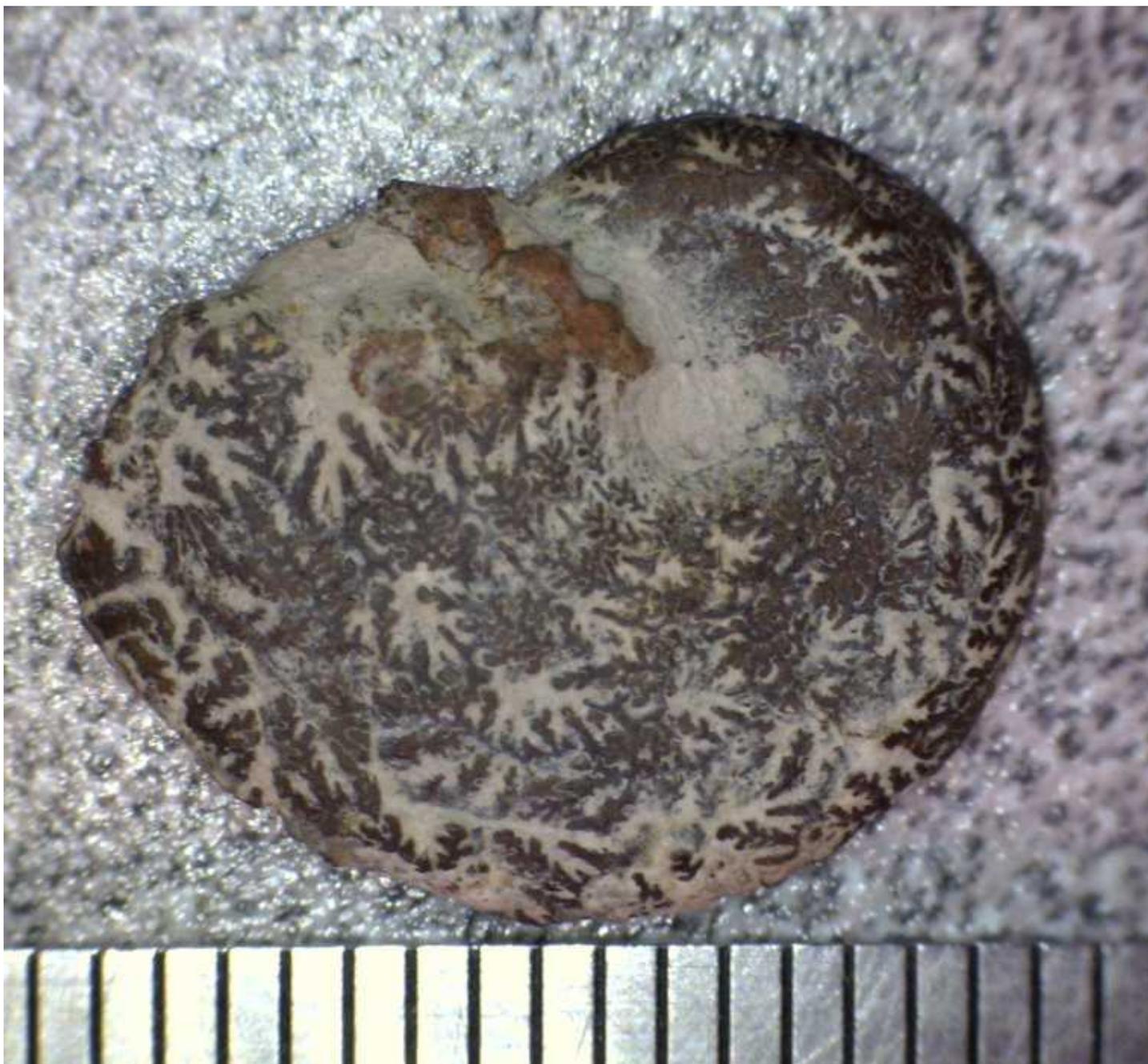




FIG 84: *Phylloceras* sp. and *Neolissoceras grasianum* (Site 560)



FIGS 85-86: *Protetragonites quadrasulcatum* this and next page (Site 560)





FIGS 87-91: *Sarasinella biformisthis* and next 4 pages (Site 560)











FIGS 92-95: *Saynoceras verrucosum* this and next 3 pages (Site 560)









FIGS 96-97: *Valanginites* cf. *nucleusthis* and next page (Site 560)

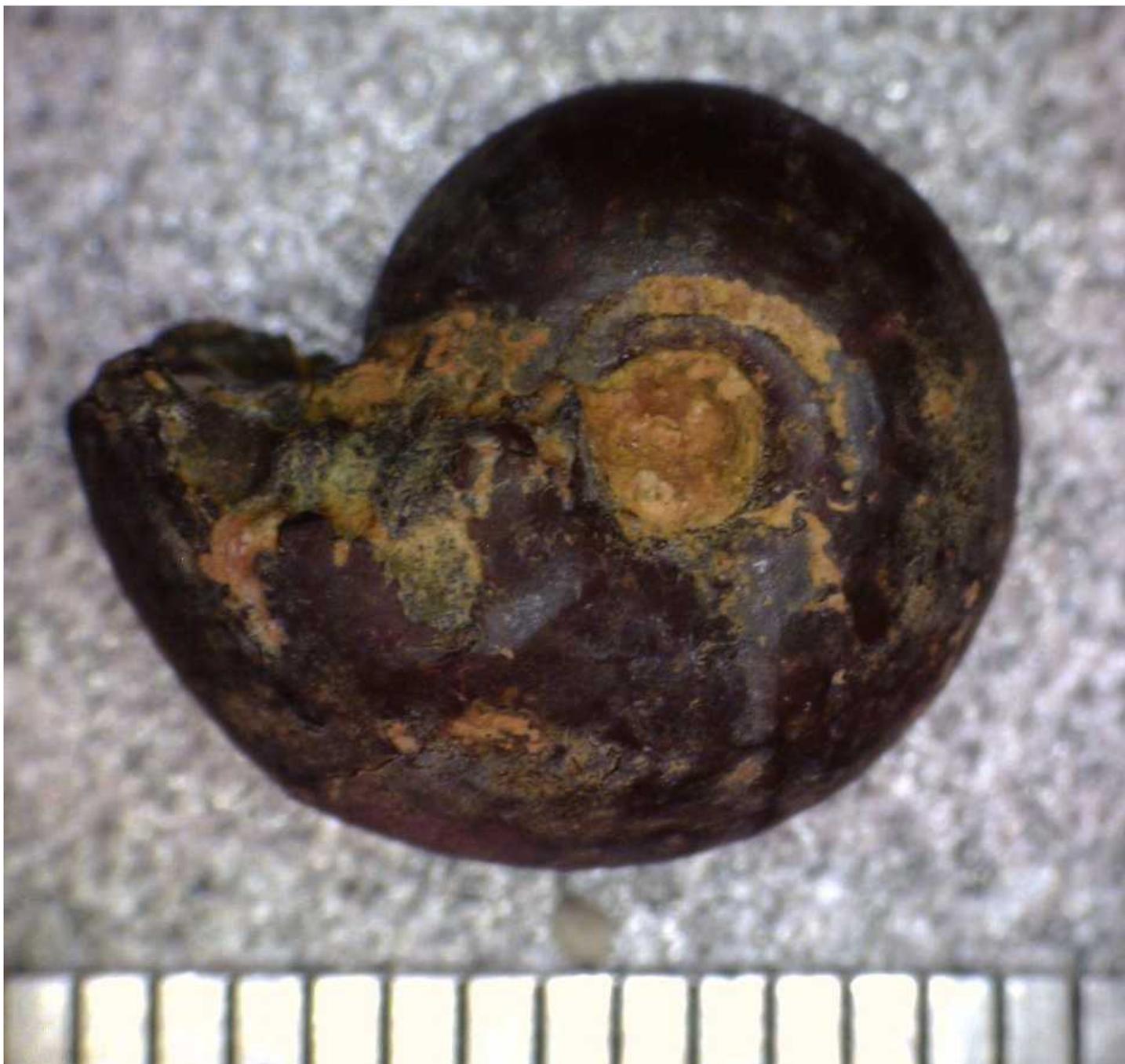




FIG 98: Unidentified compressed ammonite (Site 560)

Jean-Louis left and returned with his daughter Colline, and some much welcomed French pastries delivered to us in the field, then took us to a medieval watchtower overlooking the Alps and surrounding valleys, explaining glacial events to us and how the valleys were carved thousands of years ago.



FIGS 99-100: Medieval watch tower near Lazer this page, breathtaking view from there of the southern foothills of the Alps next page





FIG 101: Our gracious hosts, the Latil family, Joëlle, Colline and Jean-Louis

Dinner at their house was once again spectacular...Roe deer, potatoes, red wine, salad, a big aged cheese wheel, wild white peaches, Venezuelan dark chocolate, and double espresso....now that was some fine dining, better than any of the restaurants we visited in France!



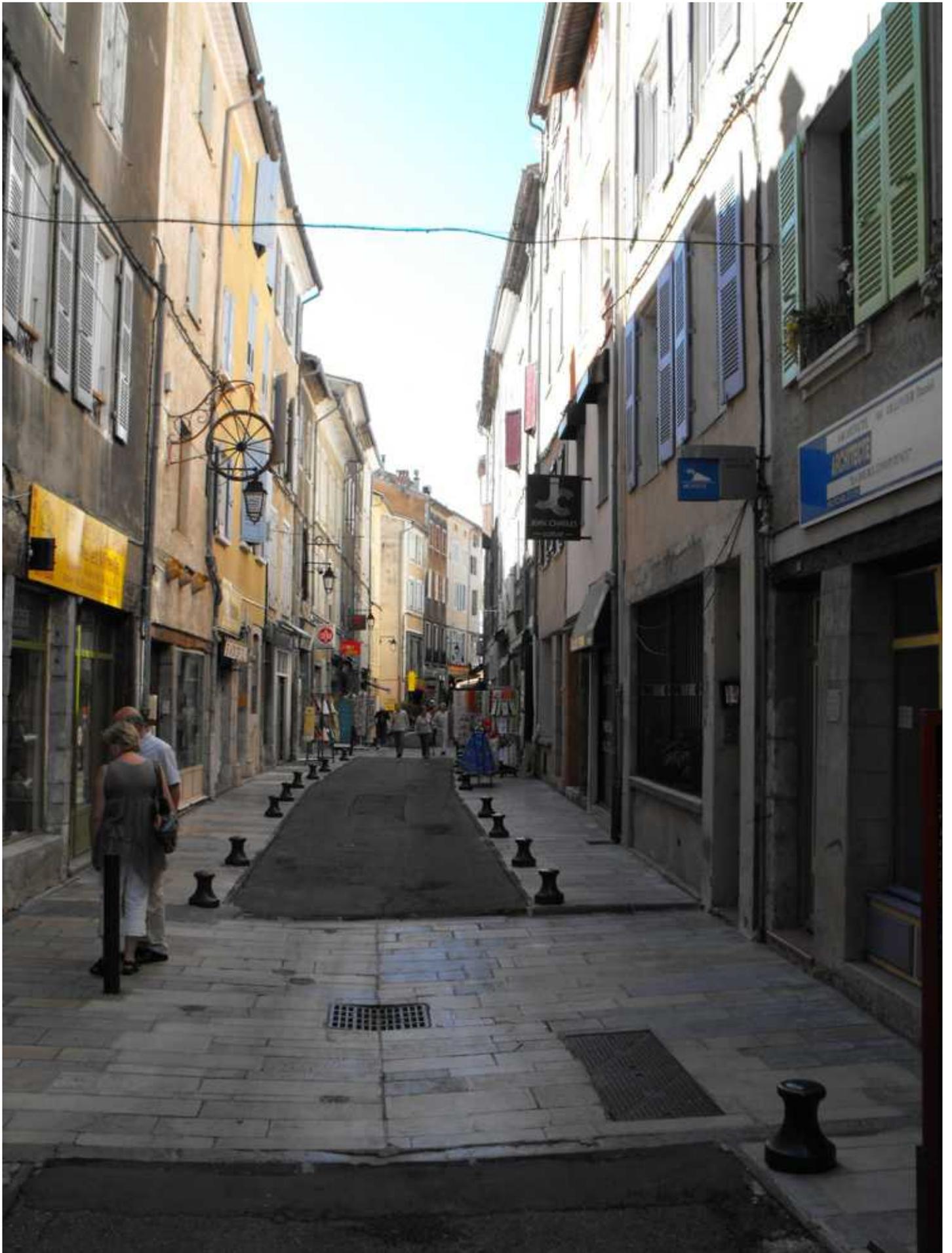
FIG 102: Another iconically French image for my friends and family...cheese, sausage, good bread, grapes, and wine

September 9, 2011: City Slickin' in Sisteron

On Friday we opted to sleep in, then casually explore the nearby town of Sisteron on Jean-Louis and a Joëlle's suggestion. We enjoyed walking this scenic town nestled amongst some Jurassic limestone cliffs turned vertical by faulting; the La Durance River coursing through the center of town. Curiously the town mascot seemed to be a man chasing a sheep, as we saw this in topiary form....that's about all I'll say about that!



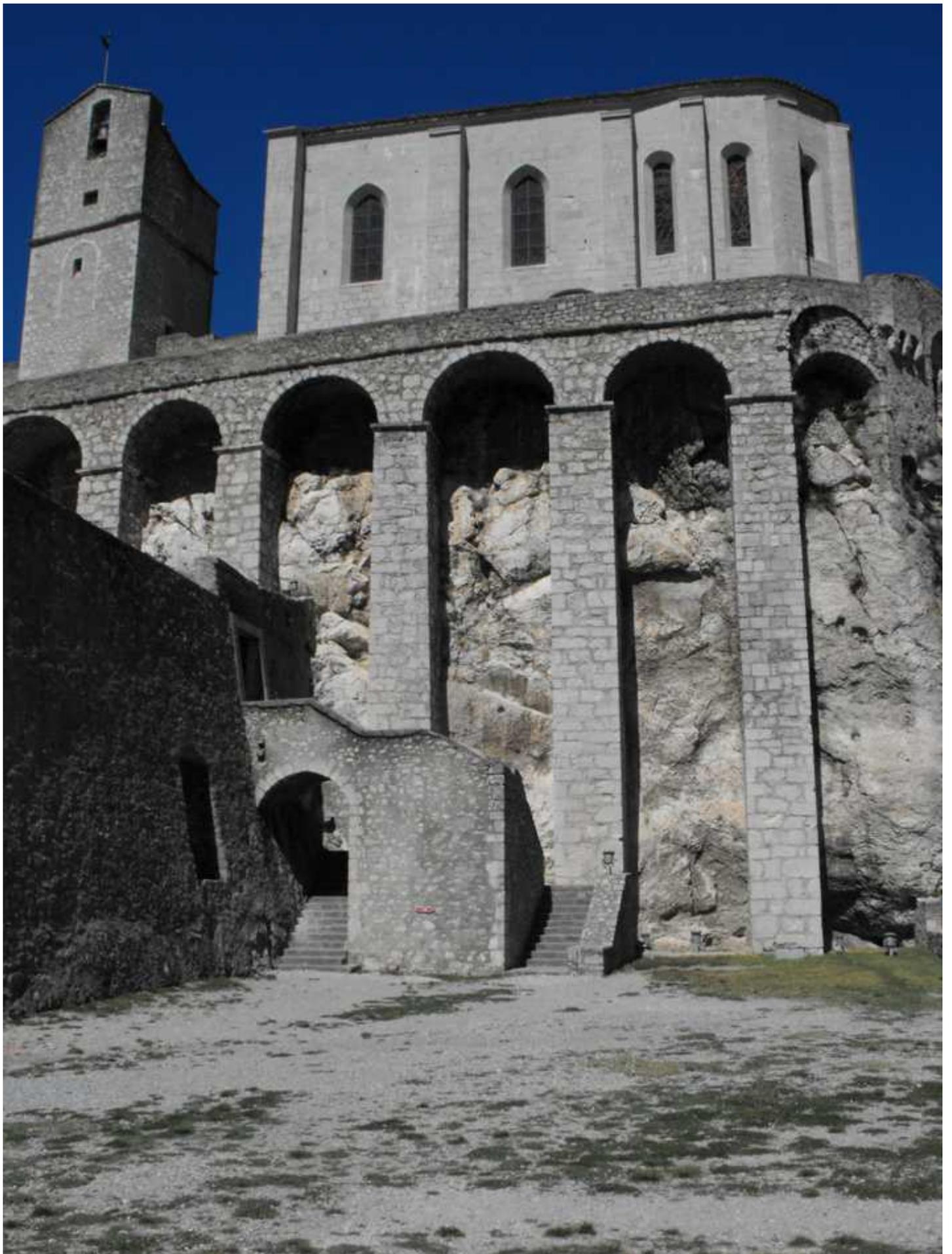
FIGS 103-104: Downtown Sisteron this and next page

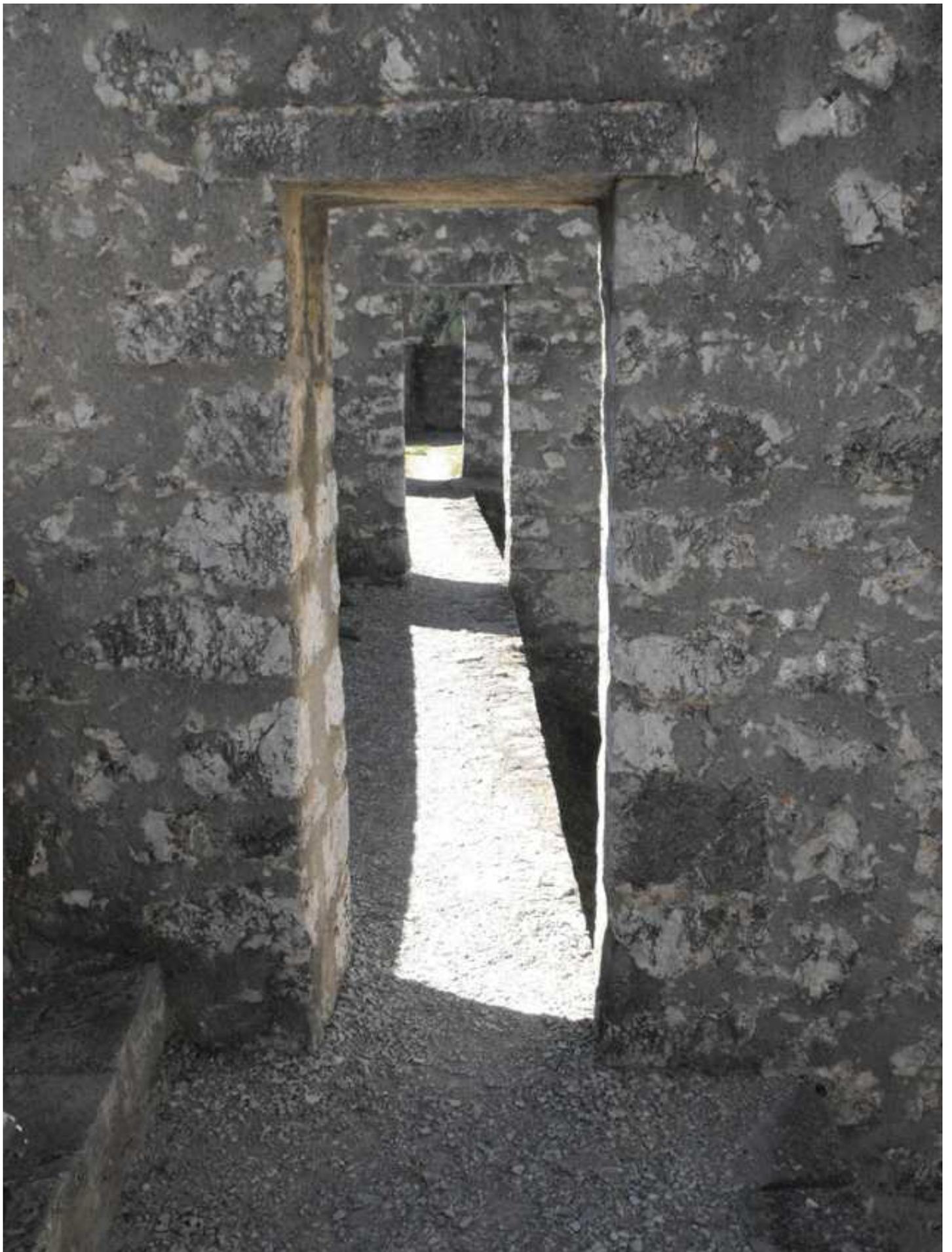


We toured a medieval castle named The Citadel, and took note of the archer's slits around every corner. The place looked to be impenetrable in its day.



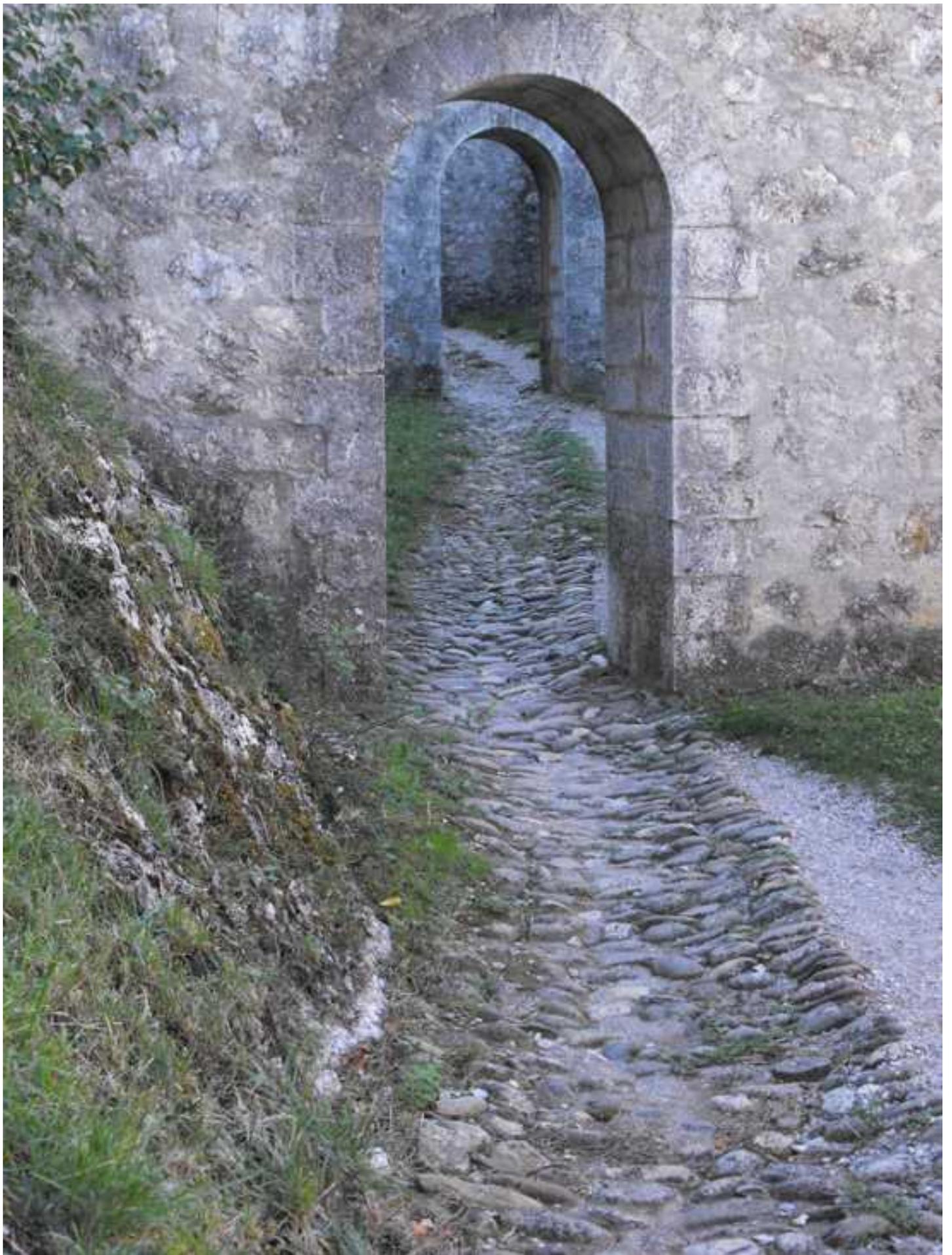
FIGS 105-115: Views of and from the Citadel in Sisteron overlooking the La Durance River, this and next 10 pages. Note archer's slits



















CASIMIRUS PRINCEPS POLONIÆ, &c.

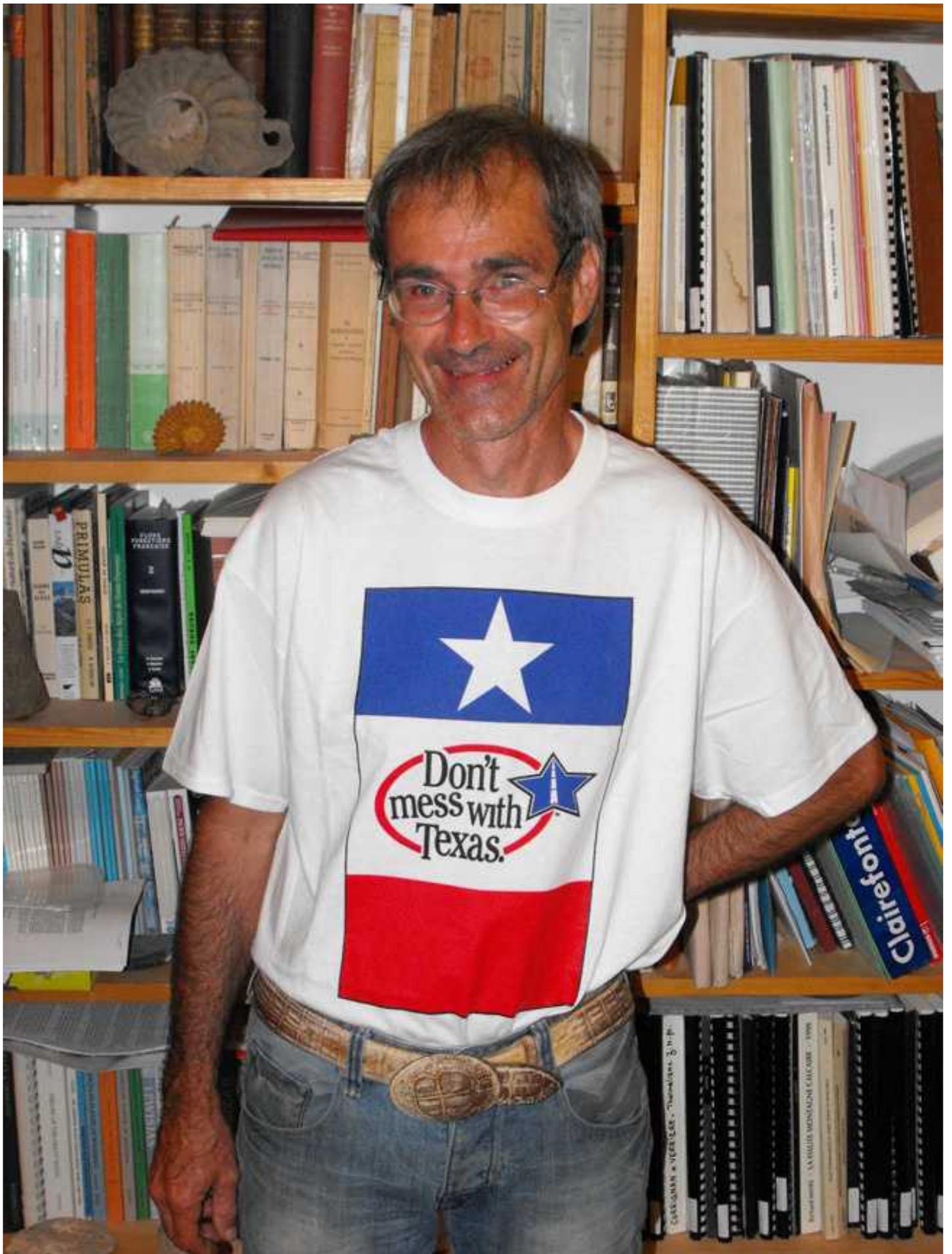


As is the case in many European towns, it was difficult to get a sit down meal in the mid afternoon, and we settled for some sub-par steaks, but the ice cream we later found on a side street made the dining experience all the better.

Back on the home front we got a good look at Jean-Louis' prize 1967 Cadillac Coupe de Ville, a rare ride even in the states. Very impressive. Jean-Louis is a member of the American Car Club of France and will soon be interviewing the management team of my company, Vintage Air, Inc., for an upcoming article for his French car club magazine...we have a cool, multifaceted connection with Jean-Louis.



FIGS 116-117: Honorary Texan Jean-Louis Latil this and next page with his prized 1967 Cadillac Coupe de Ville



And once again this connection showed itself through mutual appreciation of fine food at his dinner table. This night brought us a montage of French fineries....foie gras (French for "fat liver"), roast duck, green beans with mushrooms and garlic, potatoes pan fried in duck fat, and a dessert of dry sausage, bakery bread, cow, sheep and goat cheese, grapes and coffee. These people are in surprisingly good physical shape for as many courses as seemed customary at their table!



FIG 118: From the Latil's kitchen one of our favorite meals of the entire trip – roast duck with potatoes skillet fried in duck fat, small town bakery French bread.....WOW!

September 10, 2011: L'Amonites de Belmont

The cornerstone of our collecting experience in France came Saturday, and Brett, Jean-Louis, and I all rose at 3:30 a.m. gulping espresso, then we hit the road by 3:45 so as to be on site at 7:30 at the Lafarge Quarry in Belmont, just northwest of Lyon. It was somewhat of a high speed night chase at 140 KMH through winding alpine roads behind Jean-Louis in his Citroen wagon, not an easy task for our underpowered little Opel Corsa. But images of ammonites dancing in my head helped me keep my foot sufficiently heavy for the task at hand.

Tales of ludicrously productive Jurassic ammonite collecting at the Lower Middle Jurassic Aalenian/Toardian contact (Dogger/Lias transition, 176 MYA) had caught my attention months before. Jean-Louis was able to secure us invitations from a local fossil club through seasoned ammonite collectors Cyril Beaudoin and father/son team Patrick and Marc Boselli. This was no casual collecting venue...Brett and I had to forward copies of our passports and proof of liability insurance well in advance of our trip. And while collecting hours were restricted to the hours of 8-12 that morning, we were told that we'd exact a substantial finder's fee for our efforts.

And so we converged in the parking area in front of the quarry with roughly 40 other collectors. It was interesting that such a high percentage of collectors were women. Brett found this to be quite pleasing. For me it was interesting to be surrounded for the first time in my life by people speaking a language completely foreign to me. However there were aspects of their company that transcended all linguistic lines, namely hospitality and helpfulness. We felt quite welcomed by not only our hosts, but the entire crowd.



FIGS 119-120: Eager Jurassic ammonite hunters Jean-Louis Latil, Ms. Brett, and the author this and next page (Site 561)





FIGS 121-122: Our hosts who secured us permission to collect through their fossil club Geo Paleo, left to right, Cyril, Patrick, and his son Marc (Site 561)





FIG 123: Safety talk in French at the Lafarge Quarry in Belmont (Site 561)

Soon we all piled our tools into a pickup truck after a safety talk in French, and we hiked $\frac{1}{4}$ mile into the pit, Marc leading the pack with youthful exuberance as the overlying orange, gritty Aalenian layers were revealed before us at the contact with the underlying lavender Toarcian layers of limestone and marl. The veterans had heavy hand tools including two handed 6-8 KG sledgehammers and big splitting chisels in addition to big plastic crates for their expected bumper crop of finds. They dived straight into the contact zone and began blind mining, splitting layers of limestone and piling up large ammonites.



FIGS 124-128: Youthful exuberance demonstrated by Marc Boselli above, the whole club and guests getting down and dirty next 4 pages. The explosion of colors makes this hands down the most beautiful quarry I have ever collected (Site 561)









Brett and I had shipping weight considerations in mind, so we began by surface collecting some of the smaller ammonites free of matrix in the weathered purple slopes of the Toarcian. Splendidly preserved *Hildoceras*, *Mucrodactylites*, *Pseudogrammoceras* and other ammonites came to hand quickly, and I picked up a small, perfect white *Cenoceras* nautiloid and a gastropod as well as a number of belemnite guards, as did Brett. There were so many belemnite pieces around that I picked up only the ones with the tip preserved, and we saw at least two varieties, one with a sharp tip, the other with a blunt tip, some of the larger ones as big around as my thumb.



FIG 129: Unidentified Toarcian ammonite in situ (Site 561)



FIGS 130-131: Toarcian ammonite *Dactylocerasor Catacoelocerasas* found and after a water soak took out the center (Site 561)





FIG 132: Toarcian ammonites *Hildoceras* in situ (Site 561)



FIG 133: Toarcian ammonite *Microdactylites* in situ (Site 561)



FIG 134: Toarcian ammonite *Pleydellia* in situ (Site 561)

Patrick called Brett and me up into the orange Aalenian layers, and the change in lithology presented a completely different collecting experience...except for the fact the here too the ammonites littered the ground, some loose, some in boulders, others in situ at ground level. The lightly calcified white to mustard colored *Leioceras* ammonites were easy to spot in these rocks, as were the belemnites, and Brett and I continued to load up on both. Patrick gave us a fossiling discourse in French, and I picked up on just a bit of it, his description of shell preservation tipped off to me by the only

two words I knew, "ammonit" and "coquille" (shell). His body language made it clear that we'd find ammonites everywhere, and we did, as well as occasional bivalves and brachiopods.



FIG 135: Patrick's Aalenian gastropod *Pleurotomaria* (Site 561)



FIGS 136-137: Ms. Brett exploiting the paleo potential of Aalenian sediments this and next page (Site 561)





FIG 138: A pretty little Aalenian ammonite of the genus *Pleydellia* (Site 561)

Fossil density was high enough in these rocks that I was able to extract a few multi specimen blocks, some with both ammonites and belemnites, and this orange, gritty matrix later proved to yield easily to my air scribe. As I pondered my take, yet another nice Frenchman called me over as he pulled a huge 400 mm diameter ammonite, possibly a *Lytoceras*, from the contact zone and gave it to me. This was a wonderful gift but it was not feasible for me to haul it home since it probably a 20 KG specimen. Thinking fast, I accepted it graciously, then later traded it to Jean-Louis for a smaller, high grade specimen of the same species. Portability was a key factor for us as the weight was adding up fast!

Time was running short so we dropped back down into the Toarcian and worked some other weathering lavender spoil piles. Despite 40 people crawling all over the quarry, the collecting seemed to be as good or better as we approached the 12:00 quitting time. On these piles we pulled several multi specimen ammonite blocks, mostly representing ammonites in the *Grammoceras/Pseudogrammoceras* spectrum along with scattered belemnites and bivalves. These blocks were spectacular, and I took several, but I knew I was over the weight limit for the plane ride home, or at least would be if the remaining sites of the trip were even sparsely productive.

It was fun to watch the shocks of the pickup bottom out as we all piled our crates of ammonites into the bed. I also enjoyed seeing what others had found. Cyril for instance had focused on blind mining the contact zone and had 8 or 10 nice large *Lytoceras* ammonites to his credit. Someone else had split open a big *Cenoceras* nautiloid which had geodized chambers. On the walk back to the vehicles, Jean-Louis found a very nice *Popoceras* ammonite and handed it to

Brett...a kind gesture as this is perhaps one of the most ornate and delicately ribbed ammonites available from the quarry.



FIG 139: A calcite filled Toarcian nautiloid *Cenoceras* split in section (Site 561)



FIGS 140-141: Jean-Louis and the author admiring a honkin' big unidentified ammonite that changed hands a couple times before leaving the quarry (Site 561)





FIG 142: Tired ammonite excavators slap happy from success (Site 561)



FIG 143: Our ad hoc crew of paleo enthusiasts, left to right, Patrick, Ms. Brett, the author, Jean-Louis, Marc, and Cyril – what a great bunch of hosts! (Site 561)



FIGS 144-145: Our personal pile of spoils this page; collective, suspension bottoming take of ammonites following page (Site 561)





FIG 146: Always cognizant of shipping weight for the ride home, we took the time to reduce matrix whenever possible (Site 561)

Satisfied with our take, Brett, Jean-Louis and I were joined by Cyril, Patrick, and Marc at a local Doner Kebab restaurant in Belmont.....sort of a Mediterranean menu specializing in chipped turkey and veal. Here I asked Patrick questions about preparing our finds, with Jean-Louis serving as interpreter. After bidding a heartfelt thank you and farewell to our new friends, Jean-Louis took us to a rest stop where we spent an hour sitting on the ground, hammers and chisels in action reducing the size and weight of each specimen as much as possible without risk of breakage.

From there we shook hands with Jean-Louis and headed north while he headed south. Our time with him and his family had been a superlative kickoff to our European collecting expedition, and left us with lifelong memories with great people, scenic mountains, wonderful table fare, and of course the tug of success from our shoulder straps.

Despite driving 250 miles before dawn and collecting 4 hours, we still had enough steam left to press another 250- 300 miles north that day, retiring for the night in a small eastern French town where we could only find an Italian eatery with V-E-R-Y S-L-O-W service, however the gnocchi and pizza were OK. Wiped out, it took some open mindedness to endure a room with no air conditioning, a barking dog in the room next door, and somebody pulling the fire alarm at 6 a.m.but we made it work and racked it up as part of the adventure.

Now, the finds.....



FIGS 147-151: Step by step expert preparation of a Toarcian *Pseudogrammoceras* block gifted to and prepared by Roger Furze, this and next 3 pages (Site 561)









FIGS 152-157: The author's best Toarcian ammonite and belemnite block, this and next 5 pages (Site 561)



Pseudogrammoceras



Podragosites



Pseudolillia



Same *Pseudolillia*



Mesoteuthis



FIGS 158-169: *Pseudogrammoceras* ammonites this and next 11 pages, spectacular colors in some cases (Site 561)

























FIGS 170-172: *Podagrosites* ammonites this and next 2 pages (Site 561)







FIGS 173-174: Toarcian ammonite *Porpoceras this* and next page (Site 561)





FIG 175: Toarcian ammonites *Calliphylloceras* above, *Catacoeloceras orpoceras* below (Site 561)



FIGS 176-177: Toarcian ammonites *Catacoeloceras orpoceras* and possibly others this and next page (Site 561)





FIGS 178-179: Toarcian nautiloid *Cenoceras* sp. this and next page (Site 561)





FIG 180: Toarcian ammonite *Esericeras* sp. this and next page (Site 561)



FIG 181: Toarcian ammonites *Gruneria* sp. (Site 561)



FIGS 182-185: Toarcian ammonites *Hammatoceras* sp. this and next 3 pages (Site 561)









FIG 186: Unidentified Toarcian ammonites (Site 561)



FIG 187: Toarcian *Haugia* sp. ammonite (Site 561)



FIGS 188-195: Perhaps my favorite of the Toarcian ammonites of this site, *Hildoceras bifrons* this and next 7 pages...the colors! (Site 561)

















FIG 196: Toarcian ammonites *Hildoceras bifrons* left, *Pleydellia* sp. right (Site 561)