

CHAPTER ONE

Tom Borrenson saw his first AO specimen at a rock shop in Powell, Utah. Of course he didn't know that at the time, but it caught his eye.

He'd come in to see what Russell Lowe might have in the way of dinosaur bone, but also out of curiosity, having known from an early age that any rock shop will probably have something interesting. Also, it was his job. Tom was a paleontologist and had spent a decade of summers looking for big game in the Morrison Formation. Very big game indeed: up to fifty tons or more when alive. Skeletal remains are scarce, so Tom used the eyes, feet and vehicles of local rockhounds to help him find remains that he could never have found if he'd had to do all the looking on his own.

A buzzer sounded as he entered the store. This was one of those old rock shops, not an air-conditioned art gallery like the other one in Powell and not at all like the fancy ones he'd seen in Santa Fe and Sedona. This one had an air of unkept informality, dust and time, its paint peeling in places, linoleum on the floor faded and worn. He could hear a slab saw hard at work in a back room. The door to the workroom opened, the sound of the saw brightened, then diminished as it closed. A young man came over to the cash register and asked, "Can I help you?"

"Is Mr. Lowe in?"

"No, he'll be out all day. Is there something I can help you with?"

"Thanks, no. What's a good time to catch him?"

"Hard to say. He's in and out. We open at eight. Sometimes he's in then, but it's hard to say. Did you want to leave a message?"

"Oh that's all right. I'll stop by another time. He probably won't remember me anyhow. It's been a few years. Thanks again."

"Okay. Feel free to look around." The man stood by the cash register with his arms folded. No one else was in the store.

Well, I won't take his time, Tom thought. But let's see what we've got here. Anything special, anything to amuse my jaded palate?

Every rock shop is different. Some have little to offer but junk, the dregs and leftovers from decades of bad and self-indulgent management, shops run by aging moms-and-pops perhaps, friendly folk, but don't count on them to know very much about what they sell. And who'd purchased all those chipped fluorite crystals and banged-up desert rose that had seen better days, ugly gray dinosaur bone chunks, amorphous, anomalous local jasper, obscure chunks of vein-filling showing druzy-quartz clusters stained ugly with a wash of hematite, or those pyrites decorated with a dab of copper green?

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Someone had, once upon a time. Maybe they'd only kept the business because it was them and theirs, forever and ever until the end, slabbing and slabbing because decades ago hobbyists had cut cabochons from slabs, though those days are now long gone.

Sure left a lot of ugly slabs though! He thumbed through a stack of bone slab lurking in a pan of water that barely brightened them. Well, this being near the heart of dinosaur country, I'll bet Lowe's got a lot more of these in the back. Probably wonders why he ever cut them or bought them, and what in the world he'll ever do with them. But someday some tourist kid'll be tickled pink to have one. Real dinosaur bone! 145 million years old! Doesn't matter much what it looks like, does it, when you look at it that way.

Some of the uglies were slabbed "spiderweb" bone. If he held one of these up to a light, the light would shine through the agate that had filled in around the interior bone struts, leaving opaque bone in a kind-of "spiderweb" silhouette. But all these slabs were pretty dull; the best had been sold off years ago and this stuff was the dross, leftovers, sad and sorry odds and ends. And he knew the good stuff wasn't being replaced, because bone chunks are mostly found as surface accumulation, and most of that had been picked up years ago.

He turned to the specimen pieces nearby, small broken chunks and knobs of bone, some sliced apart with a diamond saw and then polished where they'd been cut. These were more expensive and a bit more colorful, and were more in line with current taste, which now asked for a display fragment of the ancient past that had at least a bit of pretty color and, hopefully, some sense of having once been part of a living creature. The slabs looked more like very thin slices of Wonder Bread and were a bit harder to relate to as fossils.

He moved on, looking for what he'd come to see, probably the stuff over there on dusty shelving near a window, where he found a small display of badly collected trash. Lowe had a reputation. The pity was that these bones had been *in situ* when they were dug up, which put them in a very different category than the broken chunks and joints that accumulate higgledy-piggledy on the ground as softer earth erodes away from around them. Which is why these were controversial bones: for him, for the BLM, and for anyone who studies the Mesozoic past and wants an accurate and well-preserved record of the story it tells.

The door buzzer sounded and a man with two children came in. The boy, about seven or eight, asked the clerk a question and the clerk pointed in Tom's direction. The kid ran across the store and, stopping next to Tom, looked down at the bones with awe. A moment later he looked up and asked, "Can I touch them?"

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“Sure,” Tom said.

The boy reached down and gently stroked a large, drum-shaped stone, the centrum of a dorsal vertebra. “Wow!” he said.

“Look,” the boy said to his sister. “A dinosaur!”

“Not a dinosaur,” she said. “Dinosaur bones.”

“Same thing,” he replied.

I guess they are, at our distance, Tom thought. We flesh them out in our imaginations and art and think we know them, and try to guess what their living colors and habits were, but it was all an awfully long time ago. Cute kids. The boy's not much older than Michael.

Turning his thoughts back to the bones on the shelf, Tom now looked at them with a critical eye. In one corner was a badly patched sauropod femur, a diplodocid judging by its gracile lines, the missing pieces and breaks filled in with who-knows-what by someone, and the whole thing then painted dead black. Definitely a big bone and with a big price, but like overprocessed food, of no real interest, or beauty either. The boy was now holding the vertebral drum, but with only cotyle and condyle and the material between remaining, the zygapophyses missing and the diapops and parapophyses gone, it was hard to guess what genus it might belong to. There were also several large fragments of pelvic material with some of the associated fused sacral vertebra still attached. These all appeared to have come from the same skeleton, perhaps a camerasaurid, and they were mineralized similarly, again arguing for a common source.

Other material on the shelf had signs of weathering and the small, hard, black lichens that indicate surface material, bone that had broken up and moved downslope long ago. He had no problem with these, nice chunks for kids to play with and to display on coffee tables and as lawyers' desk ornaments. But the camerasaurid bones and some of the others had almost certainly been dug from their original repository in the earth, and though admittedly of no particular interest to Tom Borrenson, he'd like to have been there. Never know what you might find, maybe even a skin imprint, so rare he never expected to have the privilege of finding one himself.

What's this? he asked himself, laughing. Two hundred dollars for a perfectly preserved 11 inch dinosaur rib bone, all the pieces glued together so you could pick it up whole. Great specimen, low price. Only trouble was, it wasn't dinosaur bone and it certainly wasn't from Utah. Although not painted black like some of the others, its natural, smooth black exterior looked like no other bone in the room. Probably Pleistocene fauna, he thought, from Florida maybe, though he was no expert. Mammalian definitely, maybe one of the larger oreodonts from Nebraska. I wonder if Lowe knows what he's selling or just doesn't care. Probably the latter, from what I hear.

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Ah, now here's an interesting item: a stegosaur throat plate. Possibly a bit of ankylosaur armor, but by the looks of this piece, I'd say not. Could be a titanosaur scute, though that one's rare enough I'd buy it if it were. That's the problem: all this stuff is out of context and has no record of where it was found. He thought maybe he'd buy it, picked it up, looked at both sides, put it back. He had enough stray bones in his life and didn't need more. This was nothing, really.

The buzzer sounded as the kids and their dad left. Tom wondered what, if anything, they'd bought. A small chunk of bone at least, he hoped. Lots else to choose from though, he thought as he wandered back across the store. Not a bad store really. Some nice quartz clusters and a beautiful slab of acid-etched crinoids from Ohio. Some pretty decent polished petrified wood from Utah and Arizona, bookends and slabs and one log cross-section three feet in diameter. Also lots of little odds and ends for purchase: brachiopod shells, pyrite cubes from Spain, agatized internal casts of tree twigs, Petroskey coral from Michigan, and a couple of baskets of dinosaur gizzard stones. Hard to prove they're gizzard stones though. Polished to a high gloss by the grinding and acids in a dinosaur's gizzard, he'd read that Pueblo potters down in New Mexico had treasured them in the old days as tools for smoothing the surface of leather-hard, still-drying, unfired pottery. Of course these days if you want a polished stone for this sort of work you'd buy a tumbled agate.

There were other stones of all sorts: the usual dyed agate slabs and bookends from Brazil in improbable shades of blue and green or orange, and quartz crystals with colorful metallic coatings supplied by vacuum deposition. And then there were items that even dealers probably considered natural but really weren't: zincite from zinc smelters in Poland, peacock ore chemically treated to bring out bright surface colors from the brassy chalcopyrite beneath, magnetic lodestones created from natural ore with the help of powerful electromagnets. Oh well, most customers here probably neither knew nor cared what was natural and what wasn't.

Here's an odd one, Tom thought, spotting a couple of rough specimens lying between dyed alabaster bookends from Mexico. Look artificial, whatever they are. The pieces, each the size of two fists, were angular and amorphous and had no obvious crystal structure, but they exhibited a chatoyancy that in its prismatic iridescence reminded Tom a little of rainbow hematite. There was an odd depth to the stone's shimmer that was quite unfamiliar. He picked up one of the specimens for a closer look and saw a fine but irregular grid of dark, opaque material running through rough, semi-transparent rock. Sort of a spiderweb effect, but somewhat more geometric and considerably finer in scale than you'd find in any dinosaur bone. Must be man-made, some industrial byproduct, he decided. The dark network certainly didn't look

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crystalline. He pulled a 10X loupe from his pocket and took the specimen over to a window.

The rock's chatoyant play of colored light was dazzling even in winter sunlight. Has to be artificial. The clear material looks like agate though. Odd. Well, enough—I've got to get going. This is just playing around.

He returned the stone to its place between the bookends and, without really thinking about it, picked up its companion piece and turned it over. What he saw was matrix, material that had once surrounded this specimen much as rock matrix surrounds a fossil, and a piece of matrix remained attached. Well, let's have a look. This will probably solve the mystery.

He walked back to the window, took out his loupe again, and holding it to his eye brought the matrix up close. He was surprised by what he saw. He'd expected, oh, a ceramic perhaps, vitreous chunks from a high-fire crucible maybe, but no, what he saw was an ordinary, everyday chunk of upper Morrison Formation streambed rock: green and gray clays and fine sands with an admixture of small, stream-polished micro-pebbles in the usual color mix of black and white and clear and brick red and yellow and off-green. Very distinctive, very Morrison, and he'd seen it again and again in many of his digs for a decade. What on earth was it doing on this odd specimen? Could this be re-cemented alluvium that had washed around some industrial relic? Maybe a calcite cement, like caliche hardpan. He louped it again. No, doubtful. He rubbed the piece of matrix and it didn't crumble under the pressure of his thumb. Looks like the real thing. He checked the sticker. \$30. I'll take it.

Standing behind a customer at the cash register, Tom took the opportunity to examine a few of the curios at the counter. Alongside the register was a rack of carded silver earrings, each inlaid with several different colors of dinosaur bone. Also, from some ancient magazine, a laminated page featuring Russell Lowe. Beneath the register were two display cabinets, lit from within, each with glass shelves and glass window fronting. One had a small collection of faceted gemstones and a selection of silver jewelry, mostly rings, inlaid with colorful stones of no great value, and a few inlaid with nicely colored pieces of dinosaur bone. There were a couple of gold rings and pendants, and next of these was a collection of dinosaur bone cabochons, the big oval sort, cut years ago for use in Western belt buckles. Pretty poor, he thought. These are definitely the leftovers.

He moved over to the right-hand cabinet. Now here's a treat, he thought, a collection of really fine, beautifully colored dinosaur bone cabochons, large and small, with interesting patterns, good definition, and, by the looks of it, pretty well silicified, which is to say silica-hard and free of calcite or soft, largely unaltered bone. Very nice bright reds, a few yellows, some spiderweb

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with areas of red and yellow, a few bluish and at least one that he suspected had been dyed. Green bone exists, but never, to his knowledge, in a shade quite that intense. But you never know, even when you think you've seen it all.

The lower case contained a number of exquisite specimen pieces and a few slabs, all of the best and most prized agatized bone. The polished cross-sections and cut-off ends revealed secret worlds within, honeycombed bone in white and black embedded in agates of astonishing color and form. What had once been marrow and blood vessels within the bone's interior became empty cavities after burial, and in time, with the help of silica and mineral-laden ground waters, these had become exciting, flowing, brightly colored stones, rocks that had once walked the earth, chemical shadows of ancient beasts. Here was bright, abstract design that had, embedded in the idea of its structure, a whole imaginative world, and not just the world of most pretty rocks, slow percolation and crystal growth deep underground in cold waters or hot geothermal springs. Oh sure, some of that, but first of all a living creature, breathing and eating, running and mating, part of a continuous chain of being that stretched back hundreds of millions, no, billions of years even then, 145 million years ago. Well, some pretty interesting rock all right, and beautiful too.

"May I help you?"

"Please." He handed the rock in his hand to the cashier. "Any idea what this is?"

"Got me," said the kid. "I only work here Holidays. You'll have to ask Mr. Lowe."

"I'll take it anyhow," Tom said.

"That's \$32.55 with tax."

"Thanks," Tom said, accepting his change. "By the way, I'd like to look at a couple of pieces in this case, please," he said, indicating the right-hand case.

"I'm sorry. Mr. Lowe keeps the key for that one. That's his own collection."

And now Tom saw the small, hand-lettered notice silhouetted by bright lights: "Not for Sale."

"Well, thanks anyhow."

He went out into the pale sunlight and walked over to where, on his way in, he'd seen piles of rough stone on a graveled yard, but a chain-link gate now closed the area off from the parking lot.

He stuck his head back in the shop door. "I'd like to see some of your rough," he requested.

"We're closing soon. Just ask Barto to let you in."

"Okay."

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Tom walked back over to the gate. Looking in he saw a man in a shed loading a vibrolap.

“Are you Barto?” he shouted. The man came over to the gate. “The fellow inside said you could let me in.”

“Sure. Just a minute, I go get the key,” the man said in heavily accented English. Returning, he unlocked the gate.

Inside there were heaps of rough stone dumped onto the graveled yard, each pile a different kind of rock or mineral, fossil or crystal. There were piles of Moki marbles from the Navajo Sandstone and concretions from Mexico that might—or might not—contain quartz crystals. A small pile of rusty cubes had once been pyrite, but over time had morphed into hematite. Colorful chunks of petrified wood furnished another pile, then rose quartz chunks, various agates, calcites, and on and on. He went over to take a look at the pile of dinosaur bone.

Surface material all, weathered, worn, broken. The sort of stuff you could have found easily 30 or 40 years ago if you knew where to look, and maybe most of this had been found back then. People high-grade what they find, cut and polish the best material, then leave the lesser pieces to grow grass and gather leaves until that old rockhound passes on, and then his heirs sell the lot to someone like Lowe. Or maybe this stuff had been picked up within the past year by some scavenger rockhound, and if so it probably came from BLM land or maybe even from the Navajo Reservation. In any case Lowe would have bought old collections along the way, everything would get mixed together, and if there were any questions, Lowe, or anyone else in the trade, could always claim that old so-and-so had found it way back when, back when the rules about what you could and couldn't pick up on public land weren't so strict. Well, nothing here of interest anyway.

Tom walked to his van, opened the back doors, wrapped his purchase in old newspaper, and stuck it in a plastic milk crate alongside the box of tire chains.

He didn't know it, but he'd just made the most important purchase in his life.