A FRAC SPECIAL REPORT

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The Wetumpka Impact Crater: A Fond Look Back

by Bill Warren

A Dream Becomes a Reality

On Sunday, October 19, 2008, seventeen FRAC members – **Carlos & Olga Flores, Jerry & Beverly Williams, Alan & Sally Bolton, Steve Knight, Angela Smith, Tom Danei, Charles Turner, Patsy Lwowski, Dwight Harness, Joe Auriemma, Larry Higgins, Dr. Richard Schmude, John Wallace** and **Bill Warren –** visited the Wetumpka, AL meteor crater impact site, thereby fulfilling a dream of many FRACsters that began more than a decade earlier.

Shortly after FRAC's founding in February, 1997, **Larry Higgins** mentioned a meteor crater in central Alabama near a town called Wetumpka. The site was not widely known at the time – in fact, it wasn't proven to be a meteor crater until 1998. From the beginning, though, interest was high among FRAC members regarding a possible FRAC visit to the site.

Two early attempts to arrange such a visit, first by **Bill Warren** and **Larry Higgins** in 1999 and later by **Dawn Knight,** yielded little information beyond a single article about a visit to the site in 1997. Two facts stood out from that article: the crater was *huge* – 4.5 mi. in diameter – and the property owners in and around the crater would not permit trespassers on their land. Our dream of visiting Wetumpka was not forgotten, but merely put on a back burner as we attended to other matters.

Fast forward to 2007.

During the preceding decade, unbeknownst to us in FRAC two things happened. First, in 1998, a team led by Auburn geology professor **David T. King** proved conclusively that the Wetumpka crater was indeed an *astrobleme* (literally, a "star scar"). And later – Dr. King says it was in 1999, but that couldn't be so or else Larry, Dawn or I would have discovered it in our separate earlier searches – the Wetumpka Chamber of Commerce began conducting annual crater tours.

Problem was, neither of those events was highly publicized. The impact itself was a geologic event, not astronomical, and Dr. King's published findings appeared in geology magazines, not *Astronomy* or *Sky & Telescope.* It was only after another passing mention of Wetumpka by Larry Higgins in 2007 that I again Googled Wetumpka, found an additional Wetumpka Chamber of Commerce (hereafter referred to as CofC) site and learned that annual tours were conducted for a $20-per-person fee.

The rest, as they say, is history.

Two Preliminary Visits to Wetumpka

Unwilling to wait another four months to attend the tour, Larry and I drove over to Wetumpka one Sunday in late October, 2007, and spent several hours driving around the rim and inside the crater. Using the 1997 article as our reference point, we found two of the five sites that are included in the CofC tour (although we didn't know it at the time): the outcropping of rocky turmoil that the article said was visible from U. S. Hwy. 231, and the central peak.

We first began to comprehend the immensity of the site when, at lunch in a restaurant on Hwy. 231, Larry asked the waitress taking our order, "Where is the meteor crater?" Her reply: "You're sitting on it."

Since we only found out about the CofC tour in Nov., 2007, there wasn't time to adequately prepare our members for a Feb. '08 tour. So Larry, **Dr. Richard Schmude** and I signed up for the tour. Our thinking at the time was, *We can take the tour, find out where they go, and then come back, have Richard give a talk on Wetumpka and arrange a tour of our own, thereby saving our members $20 per person.* (The $20 CofC fee included a copy of Dr. King's 66-pp. book, *WETUMPKA IMPACT CRATER, 3rd Ed.*, co-authored by Lucille W. Petruny. That book was not part of the separate deal we eventually struck with Dr. King.)

Our admittedly hazy and irresponsible thinking wasn't corrected until we toured Wetumpka and found that (a) four of the sites involved venturing onto private property (as opposed to, say, merely parking on the side of the road); and (b) I read in Dr. King's book that the landowners were zealously protective of their privacy, willing and ready to prosecute unwanted trespassers. We decided that it would *not* be good for FRAC's reputation or Richard's professorial status for a group of FRAC members to be arrested for trespassing.

In reading Dr. King's book, I learned that he sometimes conducts his own tours for his Auburn geology students and other groups interested in the Wetumpka site. Preferring not to wait yet another year for our members to visit

Wetumpka, I contacted Dr. King in August, '08, and we began making plans for an October '08 visit to the crater.

Anyway, not surprisingly to us during the CofC tour Richard was far more knowledgeable regarding what happened at Wetumpka than the Auburn geology gradstudent who served as our guide was. By the second of five stops on the tour, the tour guests were huddling around Richard to hear what he had to say, and even our guide was asking him questions.

After the tour, the three of us retraced our route by car. Whe we reached the central peak, while parked on the roadside and looking up at the hill across the road Richard said, "I've gotta go up there! Get a photo of me while I'm climbing to the top!" (And I was thinking, *Yeah, that'll help the judge when your trespassing case gets to court!)* And away he went, scurrying up the hillside while Larry snapped photos.

Richard's Wetumpka talk at our Sept. 2008 club meeting was the final piece of the puzzle to be fitted into place prior to our visit. It raised our enthusiasm for the visit to an all-time high.

Finally, early on the morning of October 19th, fourteen of us gathered at a Griffin Waffle House to carpool to Wetumpka. (The other three participants joined us in Wetumpka.) After a three-hour trip in which everyone agreed that I was the slowest driver in the universe, we met Dr. King and four of his students at the prearranged embarkation point, the Hardee's parking lot on Hwy 231 in Wetumpka.

Touring the Wetumpka Impact Crater Site

The CofC's 2-hour tour consists of five stops at sites intended to show various aspects of the effects of the earth's upheaval 83 million years ago when a massive meteor slammed into Wetumpka. Our tour with Dr. King was considerably longer, and involved six stops -- four before lunch and two after lunch – but for the life of me I can't recall what the other one was.

CVS Pharmacy. Both tours began with a stop across the highway from Hardee's, behind the CVS pharmacy. There, we saw outcroppings where the earth along the NNW rim folded back on itself at impact to reveal a bedrock of metamorphic rocks called *mica schist.* Some of our more athletically inclined members scaled the outcropping to take photos of us studying the terrain, after which Dr. King showed us charts of the crater and where we would be going.

Bald Knob Scenic Overlook. Then we visited the Bald Knob Scenic Overlook, an area along the top of the NW rim that provides a panoramic view across the crater to the eastern rim. That rim, now an eroded ridge of hills, was created in less than 30 seconds yet is still clearly visible, more than 80 million years later. The view was spectacular. (This was, I think, where **Joe Auriemma** fell in love with Wetumpka. It was, fortunately, his only fall.)

On Dr. King's tour (but not the CofC tour), we also hiked about ¼ mi. downhill from Bald Knob to another scenic vista afforded by someone's deck. We got a more southerly view from there, including a partial view of what we thought was the central peak. **Jerry Williams** found a rock to use as a hammer, and showed his carpentry skills with loose nails in the deck.

The Cliffs. Two factors created The Cliffs, an outcropping about 50-75 ft. deep and maybe 50 yds. wide, just inside the NW rim. *Erosion and groundwater flow* created the gully at the bottom – but the west wall of the gully consists of huge deformed blocks comprised of sedimentary layers that collapsed and fell from the crater rim to their present site within a few hours of impact.

Naturally, **Alan Bolton** had to go around the gully to the western side, where a misstep on his part would have left **Sally** a widow, to get photos. We were glad there were no overhanging vines nearby for Alan to Tarzan his way back to us across the chasm.

Just before breaking for lunch, we stopped by the highway to pose for group photos at the Alabama Historical Society's Wetumpka historical marker along Highway 231. A more intrepid crew of adventurers you never saw.

The Buck Ridge Area. This nondescript area along the side of a dirt road proved very interesting. Dr. King showed us where earth had been scraped away to create the road. He said, "It cost a great deal for us to have the core samples dug to a depth of 200-300 feet." Then he showed us the exposed outcrop of soil. "See that?," he said, pointing at it. "There's shocked quartz all through that. If we'd known it was there at the time, we wouldn't have had to drill for soil samples."

Dwight Harness and **Dr. Schmude** scraped away samples of their own – with Dr. King's blessings, I hasten to add.

(Incidentally, it was here by the side of the road where Dr. King casually mentioned that "You know, of course, that there's a meteor impact crater in Georgia. It's near the town of Woodbury, a place they call 'The Cove.'")

The Buck Ridge area also encircles Ground Zero, the precise spot where impact occurred. That impact was equal to roughly 15% of the world's nuclear weapons detonating at one time in one place, yet Dr. King and other geologists insist that this was a "minor impact" in terms of its overall effects on the planet.

Yeah, tell that to the dinosaurs at Wetumpka who, 83 million years ago, looked up to see what that incredibly bright light in the sky might be!

Meteor Impacts

Meteor impacts are not at all uncommon throughout the solar system. With little or no atmosphere to burn away incoming space rocks, the surfaces of Mercury and the Moon resemble a teenager's worst nightmare, their faces pocked with scars of countless encounters with space debris. Even mighty Jupiter, largest of the planets and 500 million miles from the Sun, is not immune: in 1993, a close pass by Jupiter tore **Comet Shoemaker-Levy 9** into more than 20 fragments, all of which plowed into Jupiter's soupy atmosphere in succession, like Antarctic penguins lined up to dive into the ocean, when the comet returned in 1994.

Scratch one comet. The score: Jupiter 1, Comet Shoemaker-Levy 9, 0.

Earth is hardly immune to meteor impacts. An estimated 2,000 tons of space rocks are added to Earth's weight every year. Most – but not all – of them are rather small, ranging in size from grains of sand to rocks and small boulders.

About 1.85 billion years ago an asteroid crashed into what is now Sudbury, Ontario, Canada, creating a crater that measured about 160 mi. in diameter. One might say that the impact destroyed nearly all life on Earth – but since at the time the only living organisms were microscopic, it's a moot point.

1.79 billion years later – about 60 million years ago -- another catastrophic extraterrestrial impact, the 10-mi.-dia. Chicxulub meteor that smashed into what is now the SW corner of the Gulf of Mexico, resulted in the death of the dinosaurs and the end of the Cretaceous Era.

Between those events, about 83 million years ago, another meteorite plowed into the shallow sea where the present-day town of Wetumpka, Ala. (pop.: 7000) is located in Elmore County. That meteorite, measuring about 1,100 ft. in dia., was relatively small compared to the two examples previously cited. But that's like saying that the damage done by an atomic bomb is relatively minor

compared to that of a hydrogen bomb blast: if you're in harm's way, you're just as dead, either way.

At Wetumpka, where a 100-300-ft. deep shallow sea covered much of the area, all plant and animal life, both terrestrial and aquatic, died instantly within about 48 miles of the point of impact.

It was generally thought that, since the open end of the 270^{o}, **U**-shaped Wetumpka crater lay at the SW corner, the meteor must have approached the impact point from the NE at an angle of 10-12 degrees. However, Dr. King said that a very different scenario might have occurred.

Wetumpka At the Moment of Impact

When the meteor struck, the result in the first milliseconds after impact was that the sea was literally vaporized (think: Moses, under God's direction, parting the Red Sea, with the meteor being "Moses"). The meteor's further advance in ensuing milliseconds blasted a 4-1/2-mi.-wide hole in the sea and the earth beneath it, with untold millimegatons of ejecta blasted into the air and previously subterranean layers of earth folding outwards in all directions away from the epicenter. According to Dr. King, the ensuing earthquake and tsunami of water rushing back into the void created by the blast might have collapsed the SW portion of the wall regardless of which direction the meteor came from. Material ejected in the blast and falling back into the crater, and sediment carried by the roughly 78-ft.-high tsunami, served to partially refill the crater.

Shock waves created by the blast traveled away from the point of impact in all directions, including downward. On the surface, the winds created by the shock waves would have equaled those of a Category 5 hurricane; the subterranean shock waves generated an earthquake that would have measured magnitude 9 on the Richter scale; and the heat produced by the blast would have burned trees and forests along the coastal plain as far away as 36 miles from the shoreline. (The impact took place 12 miles offshore.)

The name "Wetumpka" means *rumbling waters* in the Creek Indian language; although unaware of the events that transpired at that site 83 million years ago, the Indians could not possibly have come up with a more appropriate name for the marine impact that re-shaped the land countless eons before they inhabited the area. If a similar blast – which was more than 175,000 times more powerful than the atomic bombs that leveled the Japanese cities of Hiroshima and Nagasaki in August, 1945 – were to occur today, Alabama's capital,

Montgomery (pop. 200,000), 12 miles away to the north, would be wiped off the face of the earth.

Proof of Impact: A Long Time Coming

As early as 1881, the Wetumpka region was noted for its "disturbed geology" – hardly a surprising conclusion, since it's difficult to overlook a small mountain rising out of an otherwise flat plain that stretches to the horizon in all directions, especially when the "mountain" contains a crater-like central depression.

In 1969-70, Alabama state geologists undertook a re-mapping of the state's topography, including the Wetumpka region. (The first mapping took place in 1926.) That project produced data suggesting that Wetumpka's unusual topography might be the result of a meteorite impact.

In 1998, Dr. King and others finally were able to raise the necessary funds to undertake drilling for core samples at two sites in Wetumpka. Those samples contained, among other things, both shocked quartz and iridium.

Shocked quartz is quartz that has been deformed by shock waves and intense pressure. It is produced in only two ways, by nuclear explosions or meteor impacts. Iridium is very rare in terrestrial rocks, but is commonly found in chondritic meteorites. The presence of those two features in core samples proved conclusively that Wetumpka was in fact the site of a meteorite impact.

Dr. King wrote, "Not all impact craters contain shocked quartz, but all shocked quartz has been found in impact craters, except for small amounts noted in rocks in craters produced by detonation of nuclear weapons. Whereas there are many criteria for recognition of impact craters, shocked quartz stands out (as) the best and most widely accepted of all." (King and Petruny, *Wetumpka Impact Crater Guidebook, 3rd ed.,* p. 13).

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