

# A lightning strike preserved in the sand

by Malcolm McElvaney

Lightning can strike twice in the same place, in this case on some unknown date to create two sets of fulgurites and on a future date as a fragment sticking out of the sand to ignite my curiosity. On April 17th of 2011 during a moonlight walk at the Monahans Sandhills State Park I stumbled upon a fragment of a fulgurite sticking out of the sand. In the back of my mind I knew what I had found but I wasn't sure and I got my confirmation from the park staff before I left for home. In my quest to relax and just walk the dunes in the full moonlight I had discovered a site lightning had struck and a new adventure awaited me.

The very nature of the shifting sands is fluid and dynamic and the treasures and lost junk appear and disappear as the wind blows. Seeing those fulgurite fragments still attached to the main mass under the sand was a chance discovery on that April 17<sup>th</sup> morning and a pure adrenaline rush. The area was a lower blow out between dunes but not hard packed, as I was heading North the smaller fulgurite was on the left and around two feet to the right was the larger fragment that caught my eye initial. When I touched it it broke off but I was able to dig down and keep track of the fulgurite as it disappeared under the sand. I then focused on the smaller one on the left and dug out a few more fragments. With the location marked on the gps and few samples to show for the efforts I headed back to the car.

The opportunity and value of studying a known lightning strike site was impossible to pass up so I went back on the 24<sup>th</sup> of April to excavate the site with a good shovel and make shift brush for finer detail work and set about the task. I found the site again but the sand had already begun to reclaim the valuable discovery and if I had just found the site I would have missed it, because I knew where it was and had dug a hole earlier on the previous visit I relocated it easy enough. I focused on the larger fulgurite and found the beginning of the last fragment and tried to carefully dig out fragments in the longest lengths possible but just when I thought I was succeeding it would crack and I would pull it out and try again. In the end I got to around two and half feet deep and gathered enough samples to create a nice display and provide some individual examples to donate to the state park. I already had a hole on the right side of the smaller fulgurite so I tried to excavate that one as well but it was too fragile for my clumsy attempts. As I dug I couldn't see any other artifacts caused by the lightning except the small fragments breaking away from the main fulgurite occasionally.

I never answered the question as to how deep the strike penetrated but I had a reason to learn about lightning and could hold in my hands the results of it. Lightning in Latin is "fulgur" or thunderbolt according to another Internet site and can strike many earth based objects to create artifacts. In the sand these artifacts are called sand fulgurites and on rocks they are rock fulgurites. Rocks hit by lightning form glass coatings and crust along the natural veins and structure of the rock usually found on higher mountain peaks only. Sand fulgurites are hollow due to the rapid cooling of the newly formed glass tube following the path of the electrical current through the ground. Partially fused sand sticks to the surfaces of the unusual structures as the current dances unpredictably. The quartz in the sand and rock melts at around 1800 degrees Celsius into glass and a lightning strike averages around 2500 degrees Celsius.

Lightning world wide strikes the ground at least eight millions times a day and I have read somewhere that it plays a role in keeping an active electrical charge going from the atmosphere to ground and in the process creates ozone needed to protect against ultraviolet rays from the sun. The most common

type of lightning is created by a build up of a positive charge on the ground and a negative charge in the atmosphere creating a stepped leader coming down creating a channel in the air for a discharge to follow. On the ground a streamer finds the highest most conductive point and meets the stepped leader to complete a circuit. More than one strike can follow the newly formed channel with the return stroke creating the most visually striking light show; however, the electrical potential decreases on each strike until the conductive channel breaks down.

When I found the site lightning had struck I didn't understand how it had happened but only saw the effect. Now I know I saw the cause of one main strike at full strength and as the channel broke down possibly a separate second strike of lesser power two feet in the same vicinity. Once before I had ventured into the dunes on a full moon walk and walked right into a thunderstorm cell and saw many causes to the effect I recently found. On that June 26<sup>th</sup> day of 2010 I walked into a thunderstorm cell amazed at how quickly the temperature dropped as if a curtain existed separating the cell from the normal air. I either outlasted the storm or it traveled past me and I ended up experiencing another aspect of life in the sand dunes and now have come full circle experiencing the wonders of watching the lightning on that night of 2010 and maybe witnessing the strike I found petrified on April 16<sup>th</sup> of 2011. I will never know.

## June 26<sup>th</sup> of 2010

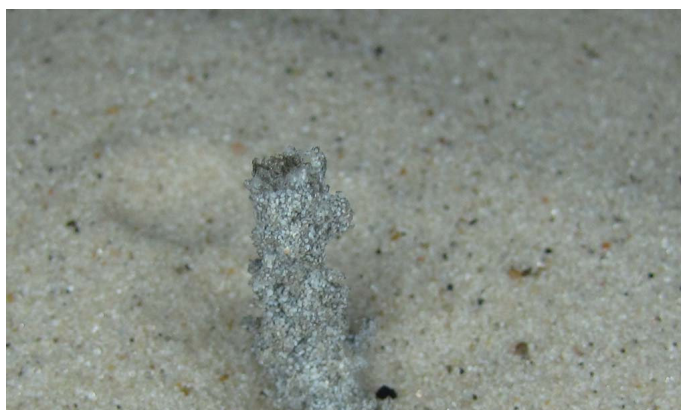


*Distant lightning during a thunderstorm*

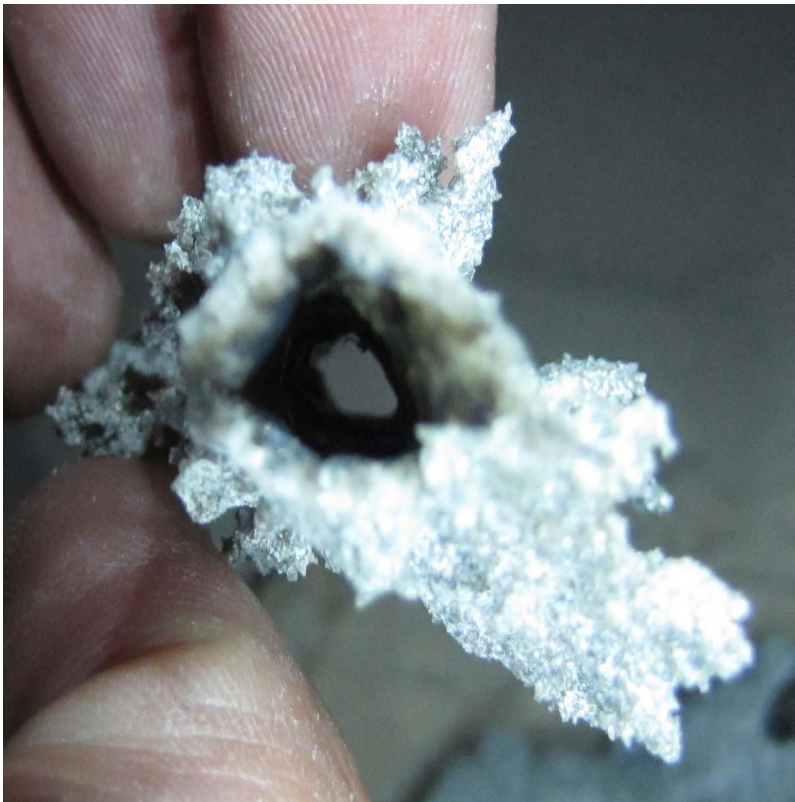
April 16<sup>th</sup> of 2011



*The piece of the fulgurite originally sticking out of the sand that caught my eye.*



*A good view of the glass tube that is formed.*



*One of the fragments with no sand in the tube.*



*Results of digging up the fragments of the smaller fulgurite.*



*Once I started hitting wet sand the dig went much easier, this a fragment still surrounded by sand before I could extract it.*



*This is how it looked after I cleaned off the area around the next fragment buried in the sand.*



*At arms length and fighting the sand trying to reclaim the hole you can see the next fragment I could have dug up.*



*The day was almost over and this is how the excavation site appeared.*

April 29<sup>th</sup> of 2011 – As I pick the photos for this essay the pictures transport me back in time to that June thunderstorm and the discovery made on a moonlight walk one April morning a year later, and I wouldn't trade it for anything. Till my next adventure I'll leave you with my friends favorite movie quote from Galaxy Quest: "Never Surrender, Never Give up".