

1967, August 13.

Dr. Harold C. Urey,  
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Dear Sir:

I am sorry I omitted the time from the abstract on the Bells, Texas, meteorite of 1961, Sept 9. It was 10.08 p.m., C. S. T., which I feel sure is correct to within a minute, probably less.

I never did work out the path as well as it perhaps might have been. Once we began to locate meteorites we felt we had enough for our purpose and that trying to retrieve the stones was more important than gathering dubious visual observations.

Sketches on some preliminary maps I used indicate that I first thought the fireball was moving towards a direction about 7 or 8 degrees west of north. However, when the positions of find of the seven meteorites ultimately located were plotted on a Geological Survey quadrangle map a line could be drawn that passed less than 0.2 of a mile from all points and this indicates the fireball was going North  $10^{\circ}$  West, which I have adopted as the path azimuth of flight.

I regret we can be much less positive about the slope. I can say only that I have the general feeling from all the observations that it was low. I believe the fireball was coming in at an angle to the horizontal of not over  $20^{\circ}$  or  $30^{\circ}$  and I would prefer the former. I have a number of unreduced observations from which this might be determined with somewhat more certainty, but it would take a lot of labor and still be subject to the usual astronomical criticism of being quite approximate and based soely on visual reports.

I should add that the azimuths given above are referred to true north, not magnetic.

Donald Elston, of the U. S. Geological Survey at one time, came thru here last January and looked over some of my notes and maps on Bells, as well as the actual specimens. He was then studying at Tucson, and he and Shoemaker were trying to work out something of significance as to classifications of meteorites; they had some rather special ideas about carbonaceous chondrites and were therefore interested in such data as I had. He took down information on the apparent path of the fireball similar to what you are requesting and you might wish to check with him as to the figures he used.

The co-ordinates of the first Bells stone found were  $33^{\circ} 36.2'$  N.,  $96^{\circ} 28.0'$  W.

It may also interest you to know that the first meteorite our group ever tracked down was also a carbonaceous chondrite, the Crescent, Oklahoma, fall of 1936, August 17. My offhand recollection is that it fell at 7.17 p.m. C.S.T. There is a brief note about it in "Popular Astronomy" of that year.

I have long been an admirer of your work and publications and am glad to help with any information I can.

Sincerely,