ASTRONOMY FORUM

Sperling's Eight-Second Law*

Everyone who sees a total solar eclipse remembers it forever. It overwhelms the senses, and the soul as well — the curdling doom of the onrushing umbra, the otherworldly pink prominences, the ethereal pearly corona. And incredibly soon, totality terminates.

Then it hits you: "It was supposed to last a few minutes — but that couldn't have been true. It only seemed to last eight seconds!"

This effect frustrated my first four eclipses, and most fellow eclipse fanatics assure me they've been bothered by it, too. Yet tape recordings, movies, and the whole edifice of astronomy and celestial mechanics all claim that it *did* last the full, advertised, two to seven minutes — to within a few seconds, that's what *really* happened.

Where did all that precious time get lost?

Eclipse Watching

True eclipse freaks recognize only two modes of life: eclipse expeditions, and preparing for them. They'll devote a year or two to perfecting equipment: telescope, camera, weird filters, and film — sandproofed, soundproofed, rainproofed (heaven forbid!), and bug resistant. No matter what their expedition sees — or does — along the way, they'll fret about totality. Will * the * clouds * part? * Will * the * equipment * work? * WILL * WE * SEE * IT?

The partial eclipse is a tantalizing, exasperating hour and a half. Then the diamond ring forms, gleams, and vanishes, and at last they have totality. They gape in awe for just a second, then dive desperately into the sequence, many times rehearsed, of exposures, adjustments, notations so hurried they can only be unraveled from the tape recordings afterwards.

Inevitably, totality terminates too soon, often even before the planned sequence does, and they never make it to their own hard-won free-looking phase. "But I got it on film!" they proclaim, "and I can frame that and glow at it forever — even though I only saw it through the camera's finder."

The novice and the non-astrophotographer take the "hang-loose" approach. Restless in the partial phase, they get impatient and even quarrelsome around the one-hour mark. But in the last ten minutes they can feel it: totality's a-comin'. The world is darker, oranger; shadows look queerly sharp-edged. There's a nip in the air, the birds are atwitter, and shadow bands go skittering around. The ominous umbra sweeps in, the corona unfolds, the diamond glitters and is extinguished, and "OH * MY * GOD * THAT'S * THE * MOST * BEAUTIFUL * THING * I'VE * EVER * SEEN!" They stare transfixed, all their senses open, trying to take in as much as they can. Unwilling to concede that totality can't linger past third contact, they keep staring at the emerging solar sliver long after it gets painfully bright. Finally, they must be ordered to look away. Then, limp, with shit-eating grins, they applaud, or yelp, or shuffle aimlessly and ask where the next one's gonna be and how t' get there.

Both styles of eclipse-watching yield the viewer a solid eight seconds of memory.

Go ahead: replay your own.

See — it's about eight seconds long! I replayed all my images of my first four totalities in about half a

*"All Total Solar Eclipses Last Eight Seconds"

minute. And that was after seeing twelve-and-a-half minutes of totalities. The other twelve minutes just weren't there! Poof!

Transfixed —

The culprit is attention span. If you stare transfixed, your mind, knowing the scene isn't changing, says "I already know that," and neglects to store away the same image yet again. So the solution is not to stare.

What? Not look at that most marvelous miracle you've traveled umpteen thousand kilometers to see?

No, I didn't say not to *look*, I said not to *stare*.

Pre-record a tape cassette, timed to start at the first diamond ring. On it, tell yourself what to notice during different parts of your precious few minutes in the Moon's shadow. Notice how the umbra envelops you, enjoy the diamond ring, then examine the prominences (they're bright so you don't have to be fully dark-adapted). Next, survey the corona — its general shape, and any outstanding features.

Switch away for a few seconds, to check the colors all 360° around the horizon. Since totality is just starting, it'll be darkest in the west, lighter in the east. Now, back to the Sun. Your eyes, now partly dark-adapted, are ready for the corona. Which is the very longest streamer, and how far out can you trace it? Where is the innermost dark wedge? Pick out an interesting pattern of filaments and make a mental engraving of it.

OK, back to the horizon. Sweep around again, and notice how much difference a minute or two makes. The west is lightening, foretelling totality's end, and the east is dark, where folks down-path are just now getting theirs.

Finally, back to the Sun. Review the most noteworthy coronal details. Look again at prominences, since there's a whole new crop of them on the 3rd-contact side. Watch for the pink fringe of chromosphere that anticipates — yes, here it comes — the second diamond ring.

How quickly the corona fades — and now even the last of it is going — and it's incredible how bright even that tiny wedge of Sun's surface can be!

And now this eclipse, too, is over — but this time you've won. From *each* separate span of attention during totality you can savor your eight seconds of mental replay. If you moved your attention enough times, you'll recall many times that eight-second limit. Yes, Sperling's Eight-Second Law can be beaten!

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