

## A WONDERFUL NIGHT FOR COMETS

By Rachel Metcalf Stoneham

courtesy of Greg Stone

Illustrated by Thomas Armstrong

Mrs. Stoneham's reminiscences about her father first appeared in Popular Astronomy, VOL. XLVII, No.1, January, 1939.

Below is the September, 1979 YANKEE magazine reprint of that article.

Joel Metcalf was a minister dedicated to heavenly pursuits in his hobby as well. He is the only amateur astronomer to have six comets named after him. Moonless summer nights, his daughter recalls, were his favorite times. Seated at his telescope, he "fished" the sky for comets....

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The Reverend Joel Hastings Metcalf was a man whose sights were set on heaven in more ways than one. When he wasn't reaching for his spirit from one of his New England pulpits, he was reaching for its substance through one of his painstakingly hand-built telescopes.

A man of faith who occasionally wrote religious poetry, he was also a man of proven physical courage and significant scientific technological achievement. His skill as an observer led to the discovery of at least five comets, as well as 41 asteroids, those tiny chunks of rock which orbit between the planets Mars and Jupiter.

His gift for shaping the delicate and precise curves that go into the making of a fine telescope lens led to the creation of instruments of such quality that half a century later they are still being used by major observatories.

Born in Meadville, Pennsylvania, on January 4, 1866, he served parishes first in Burlington, Vermont, then in Taunton and Winchester, Massachusetts, and in Portland, Maine.

He was a frequent and welcome visitor at the Harvard College Observatory, where he had a strong friendship with the late Edward C. Pickering, director. One of his hand-shaped lenses was in recent use at Smithsonian Astrophysical Observatory's Boyden Station, Bloemfontein, South Africa. A second lens was refurbished in 1974 and put in use at the George R. Agassiz Station, Harvard Massachusetts, by Harvard College Observatory.

But these facts convey only the barest framework of a man whose spirit and drive are best captured in the words of his daughter, Mrs. Rachel Metcalf Stoneham:

My father bundled me up one night when I was two years old and took me out-of-doors at midnight to see an eclipse of the moon. From then on, stargazing became a common occurrence of my girlhood. For my father's devotion to his job, the ministry, hardly surpassed his consuming passion for his hobby, astronomy. Years before the Scopes evolution trial or any of the events that led up to it, my father, Joel H. Metcalf, had reconciled his two chief interests, believing with the poet, Edward Young, that "the undevout astronomer is mad."

Religion came in large doses to us youngsters on Sundays and often during the week, but astronomy came with almost every meal, and we took it with the same mater-of-factness that we took our bread and butter. It wasn't that father exactly wanted an audience, but rather that he thought better out loud. So, at mealtimes, we listened, not

always impatiently, to the latest discoveries or the most recent theories of space, and we gradually and painlessly learned to understand advanced astronomy without ever having learned the elementary part. As sugar was sprinkled on our oatmeal, so astronomy was sprinkled over our family life.

Occasionally we could tease father into astronomical reminiscences. Then we were delighted and, of course, we soon knew the stories by heart, along with Cinderella and the Three Bears. Oddly enough, it was through the Sunday School that father first caught a glimpse of the possibilities of the heavens. When he was 14 years old, he took from the Sunday School library a book called *Other Worlds Than Ours*, by Richard Proctor. This book became an open door through which he had visions of the universe beyond. At about that time, [Mars and Jupiter came into conjunction](#), and, spurred on by the book, young Joel sat under the stars in his backyard, watching the phenomenon. After this first sip, nothing could quench his thirst for knowledge about the heavens.

Father's first telescope came into the family just before I did. He saw an advertisement of a fine seven inch telescope (that means the lens was seven inches in diameter) to be sold to close an estate in New York. He wrote and made an offer of \$500. As soon as his bid had gone, He was in the agony of doubt whether he had offered enough. He had. Then, of course, he wondered if he had offered too much.

He lived in Burlington, Vermont at the time, and winter had frozen Lake Champlain for many inches. He decided to bring the telescope and its dome across on the ice with sleds and horses. All went well, until quite suddenly, the ice cracked. The horses and men jumped, but the instrument fell with a heavy thud, lying across the opening, neither in or out. They dared not move it lest the parson's recent extravagance sink to the bottom. It was many long years before wrecking-cars, so several men worked with a derrick almost a week to get this ungainly, heavy, and expensive gadget safely onto dry land.

All this belongs to the years before my time. But during my father's next pastorate, I became well initiated into his astronomical mores. Out in our pastorate yard stood a square framed observatory not unlike a modern garage, except that the peaked roof slid back, divided into two parts which pulled out on runners like large shelf brackets. With its roof slid back, the telescope could stick out like a snail from its shell, and point in any direction. The ropes from the roof dangled sufficiently low so that by jumping we children could just catch hold, and, hanging on like monkeys, have a leisurely ride to the ground. If the observatory was unlocked, as usual, my friends and I would tiptoe inside and repeat the process to close the roof again. The fact that we were playing around a costly and carefully adjusted instrument did not impress us.

Summers, during my father's long vacations, if he were not traveling in Europe, he was sure to be making telescope lenses at our camp. This highly specialized art was more of a gift than a science, for there was no authoritative book at the time on grinding, polishing, and computing the curves of the lenses. The 16-inch lens for the photographic telescope at Harvard University was made under the pine trees within view of Lake Champlain, and I felt personally responsible for its ultimate success.

Everything was grist to my father's mill, and expensive apparatus was unthinkable. So with a barrel for a table and a packing box for a chair, he would sit for hours swishing the 16-inch lozenge of glass, one inch or so thick, around and around on a curved surface of

carefully prepared beeswax and rouge-around and around and around, with the patience he did not often evince on other projects. Hours and days and weeks, with the care of a surgeon during a critical operation, he smoothed the curves to a fraction of a millimeter. Hour after hour, mother and I took turns reading to him on every conceivable subject, for while his hands were busy, his brain

Could be gathering material for another year of the inevitable sermons.

When the curves had to be checked, we hung raincoats over the windows in a little side room of the cottage, and even stuffed up the knotholes. Then I proudly held a lighted candle just so, behind a piece of thick paper with a pin prick in it, in a miniature imitation of Venus.

Father looked through the lens at this prick of light from a certain distance and vouchsafed the one word, "hmmm." What he saw I never knew, but whatever it was, it told him whether to grind or polish more on this side or that, and the resulting telescope from these makeshift operations served Harvard long and well.

Winter astronomy was prosaic and, one might say, impersonal. How my brother hated those long, black, lonesome nights, when, bundled to the teeth, he had to keep the telescope camera trained upon a certain heavenly object. The photographic plates when developed looked like a diagram of a bad case of chickenpox. But each pockmark had a meaning for father. By careful examination, and by superimposing one plate upon another of the same region taken a different night, he could spot hitherto undiscovered heavenly objects. In all, he found about 60 asteroids, or minor planets, or an average of one for every year of his life—a truly enviable record.

But summer astronomy was thrilling and personal. How my father loved those long, black, friendly nights, when he could sweep the heavens, oh, so slowly, and carefully, hour after hour, with his comet-seeker.

A lovely evening with a full moon was not a lovely evening to father. He wanted only a moonless, star spangled, black velvet night. Comets are shy creatures and disguise themselves often as nebulae. Even through father's powerful comet-seeker, they looked like fuzzy dots in a field of bright pinpricks. Not every summer could yield a comet, but, like fishing, the fun seemed to be in the fishing as well as in the catch.

Days he spent grinding and polishing his lenses, or fishing for bass in Lake Champlain, but on dark cloudless nights, he fished for comets on the hill. With a little oil lantern he would wend his eager way over the stile and in and out the hammocks to set up his comet-seeker.

This looked like nothing half so much as six feet of aluminum stove pipe, but it was really an expensive and balanced instrument, easily set on a sort of tripod. His seat was a low semi-circle bench just the right height so he could get the maximum horizon with the maximum of adjustment. Footsteps of friendly cows or galloping of frisky horses allowed to roam at night

kept father company in the dark, and once, as he lit his lantern, he gazed with horror into the placid eyes of a skunk, which looked and walked away.

Mother and I were used to father's late hours and would hardly more than stir when he quietly close the screen door and tiptoe on every squeaky board on his way out to bed. Once and a while we would be instantly roused by father's thunderous whisper to mother, "Elizabeth! I think I've got one." Daytimes "one" would indicate a bass or pickerel, but nights meant a comet. And at once we bounded out of bed, lit lamps, brought out maps-

everyone talking at the same time.

If the map indicated no black dot at the precise spot which father had seen something "fuzzy", then we knew that what he "had" seen was either a comet or a nebula, and only an hour or more of waiting would tell us which. Nebula were like rock bass to be tossed back into the void as worthless. But comets were a priceless catch. Comets move but nebulae are stationary.

So when, after an hour of impatient waiting, father trudged back to the hill, we three could hardly contain ourselves for excitement, hoping that the dot had moved.

Once in a while, of course, there were false alarms, but father's trained eye seldom betrayed him. One dark night in August when I was eleven years old, father really "got" one. The next step was to send word to the Observatory at Harvard. Our camp was a half mile from the nearest telephone, which had 16 people on the line. At 2:30 A.M. a jangle on the phone would have brought 16 sleepy families to listen in. That method was unthinkable, not only out of kindness to them, but also father could not have heard well with 16 receivers off-he had tried it before. Neither could he have stood the suspense of a three-mile walk to the village. So we instantly knew that our only means of communication with civilization was by way of a two mile trip by water and a half-mile walk to the village store and post office.

We had a rowboat with an engine of sorts in it and luckily I knew how to run it. Father was in no condition to be mechanical. So while mother stayed home (the boat held only two) and imagined us wrecked on every reef., we started out. The boat was rickety, the batteries weak, the gasoline low, and oil lantern our only light, with the stars for our guide. Not a single light twinkled on shore. We gave the first reef a wide berth and took the deepest water down the bay. Finally, slowing down to the merest put-put, we closed in on shore and found the dock by bumping into it gently, head-on.

Father was striding off with the lantern while I was still tying up the boat, and I dashed after him panting. We banged and called until a terrified postmaster let us in, much relieved to know that the whole village was not afire and that we only wanted to use his telephone. I heard him mutter something under his breath about these danged city-folks. Then, while I sat on a counter surrounded by candy, dress-goods, fish hooks, seeds, kitchen and farm implements, as well as the politely interested but scantily dressed postmaster and his wife, father put in a long distance call to Cambridge. His calm, controlled voice belied his smoldering excitement, and one would have thought he discovered a comet every night. His message delivered, giving the exact position of the fuzzy spot, we could take our weary way homeward with a jug of gasoline for the almost empty tank. Our own dock could not stand being bumped, so we shut off the engine and rowed quietly up to poor mother who no doubt had been wondering whether comets were really worth the trouble.

Uneasy rests the head which has just discovered a comet, for nights are dark and astronomers avid in more than one place, and many eyes were straining to find little fuzzy spots that same night. So not until he received corroboration next day was father quite sure that the comet was indisputably his. One, comet years late, was discovered simultaneously by farther and a European astronomer, so they had to share the honors. Much more important but not half as much fun was when father startled the world by the discovery of two comets in three nights. As a matter of fact, he discovered three comets in three consecutive nights, but, unfortunately for him, one of them was an independent

discovery of one already known, but which had unexpectedly changed its timetable. This record, I believe, has not been equaled by professional astronomers.

Now there are six Metcalf comets (one hyphenated with the European) which run their computed orbits around through the years, a perpetual memorial to their discoverer. It has been many years since I have been telescope-making or comet-seeking with my father, but every black velvet night, I still think, "What a wonderful night for comets."