

Comets From ASTRONOMY FOR AMATEURS

BY
CAMILLE FLAMMARION
AUTHOR OF POPULAR ASTRONOMY
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Glittering, swift-footed heralds of Immensity, these comets with golden wings glide lightly through Space, shedding a momentary illumination by their presence. Whence come they? Whither are they bound?

What problems they propound to us, when, as in some beautiful display of pyrotechnics, the arch of Heaven is illuminated with their fantastic light!

But first of all—what is a Comet?

If instead of living in these days of the telescope, of spectrum analysis, and of astral photography, we were anterior to Galileo, and to the liberation of the human spirit by Astronomy, we should reply that the comet is an object of terror, a dangerous menace that appears to mortals in the purity of the immaculate Heavens, to announce the most fatal misfortunes to the inhabitants of our planet. Is a comet visible in the Heavens? The reigning prince may make his testament and prepare to die. Another apparition in the firmament bodes war, famine, the advent of grievous pestilence. The astrologers had an open field, and their fertile imagination might hazard every possible conjecture, seeing that misfortunes, great or small, are not altogether rare in this sublunar world.

How many intellects, and those not the most vulgar, from antiquity to the middle of the last century cursed the apparition of these hirsute stars, which brought desolation to the heart of man, and poured their fatal effluvia upon the head of poor Humanity. The history of the superstitions and fears that they inspired of old would furnish matter for the most thrilling of romances. But, on the other hand, the volume would be little flattering to the common-sense of our ancestors. Despite the respect we owe our forefathers, let us recall for a moment the prejudices attaching to the most famous comets whose passage, as observed from the Earth, has been preserved to us in history.



Great Comet of 1858

Without going back to the Deluge, we note that the Romans established a relation between the Great Comet of 43 B.C. and the death of Cæsar, who had been assassinated a few months previously. It was, they asserted, the soul of their great Captain, transported to Heaven to reign in the empyrean after ruling here below. Were not the Emperors Lords of both Earth and Heaven?

We must in justice recognize that certain more independent spirits emancipated themselves from these superstitions, and we may cite the reply of

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Vespasian to his friends, who were alarmed at the evil presage of a flaming comet: "Fear nothing," he said, "this bearded star concerns me not; rather should it threaten my neighbor the King of the Parthians, since he is hairy and I am bald."

In the year 837 one of these mysterious visitants appeared in the Heavens. It was in the reign of Lewis the Debonair. Directly the King perceived the comet, he sent for an astrologer, and asked what he was to conclude from the apparition. As the answers were unsatisfactory he tried to avert the augury by prayers to Heaven, by ordaining a general fast to all his Court, and by building churches. Notwithstanding, he died three years later, and the historians profited by this slender coincidence to set up a correlation between the fatal star and the death of the Sovereign. This comet, famous in history, is no other than that of Halley, in one of its appearances.

This comet returned to explore the realms near the Sun in 1066, at the moment when William of Normandy was undertaking the Conquest of England, and was misguided enough to go across and reign in London, instead of staying at home and annexing England, thus by his action founding the everlasting rivalry between France and this island. A beneficial influence was attributed to the comet in the Battle of Hastings.

A few centuries later it again came into sight from the Earth, in 1456, three years after the capture of Constantinople by the Turks. Feeling ran high in Europe, and this celestial omen was taken for a proof of the anger of the Almighty. The moment was decisive; the Christians had to be rescued from a struggle in which they were being worsted. At this juncture, Pope Calixtus resuscitated a prayer that had fallen into disuse, the *Angelus*; and ordered that the bells of the churches should be rung each day at noon, that the Faithful might join at the same hour in prayer against the Turks and the Comet. This custom has lasted down to our own day.

Again, to the comet of 1500 was attributed the tempest that caused the death of Bartholomew Diaz, a celebrated Portuguese navigator, who discovered the Cape of Good Hope.

In 1528 a bearded star of terrific aspect alarmed the world, and the more serious spirits were influenced by this menacing comet, which burned in the Heavens like "a great and gory sword." In a chapter on Celestial Monsters the celebrated surgeon Ambroise Paré describes this awful phenomenon in terms anything but seductive, or reassuring, showing us the menacing sword surrounded by the heads it had cut off.

Our fathers saw many other prodigies in the skies; their descendants, less credulous, can study the facsimile reproduced in Fig. 51, of the drawings published in the year 1557 by Conrad Lycosthenes in his curious Book of Prodigies.

So, too, it is asserted that Charles V renounced the jurisdiction of his Estates, which were so vast that "the Sun never slept upon them," because he was terrified by the comet of 1556 which burned in the skies with an alarming brilliancy, into passing the rest of his days in prayer and devotion.

It is certain that comets often exhibit very strange characteristics, but the imagination that sees in them such dramatic figures must indeed be lively. In the Middle Ages and the Renaissance these were swords of fire, bloody

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crosses, flaming daggers, etc., all horrible objects ready to destroy our poor human race!

At the time of the Romans, Pliny made some curious distinctions between them: "The Bearded Ones let loose their hair like a majestic beard; the Javelin darts forth like an arrow; if the tail is shorter and ends in a point, it is called the Sword; this is the palest of all the Comets; it shines like a sword, without rays; the Plate or Disk is named in conformity with its figure; its color is amber, the Barrel is actually shaped like a barrel, as it might be in smoke, with light streaming through it; the Horn imitates the figure of a horn erected in the sky, and the Lamp that of a burning flame; the Equine represents a horse's mane, shaken violently with a circular motion. There are bristled comets; these resemble the skins of beasts with the fur on them, and are surrounded by a nebulosity. Lastly, the tails of certain comets have been seen to menace the sky in the form of a lance."

These hairy orbs that appear in all directions, and whose trajectories are sometimes actually perpendicular to the plane of the ecliptic, appear to obey no regular law. Even in the seventeenth century the perspicacious Kepler had not divined their true character, seeing in them, like most of his contemporaries, emanations from the earth, a sort of vapor, losing itself in space. These erratic orbs could not be assimilated with the other members of our grand solar family where, generally speaking, everything goes on in regular order.

And even in our own times, have we not seen the people terrified at the sight of a flaming comet? Has not the end of the world by the agency of comets been often enough predicted? These predictions are so to speak periodic; they crop up each time that the return of these cosmical formations is announced by the astronomers, and always meet with a certain number of timid souls who are troubled as to our destinies.

Red Light Cap

Rogers George

Last weekend I visited the Annapolis Boat Show to take some photos of a boat for a sailing friend. Since I had shelled out seventeen bucks to get in, I thought I'd look around. Among the hundreds of vendors I saw lots of optics--expensive sunglasses, of course, plus binoculars and spotting scopes galore, but no telescopes.

However, I did spy an item I'd never seen before that should be of interest to astronomers: A baseball cap with red LEDs built into the brim. They seemed to be reasonably bright, and they certainly pointed exactly where you looked. The cap has six LEDs, two whites pointing straight out from the edge of the brim, and four pointing down, under the brim, two red and two white. You can control which LEDs light up. He bragged that the two coin batteries power the lights for quite a while. The guy was selling them for about \$42 each, but he told me you could buy two dozen of them for half price, and get your club logo embroidered on the caps as part of the deal. I don't know if we have access to 24 heads with \$21, but they look like good quality headgear. You can get easy-dry nylon or cotton twill in white or black. The company is out of Connecticut. Their site is sailorsnightvisioncap.com. Phone 203-324-4171.

I'm pretty sure you can grab a photo of the cap off their web site, if you want one.

Of UFO's, Comets, the Sun and Geese

Don Surles

Google says there are 1,139 people named "Jose Bonilla" in the United States. But way back in the 1880's there was one Jose Bonilla in Zacatecas, Mexico (see map) who was a fortunate astronomer...he had access to a telescope to view and photograph the Sun.

Apparently the "observatory" had some new photographic equipment, which used wet glass plates, not film, to photograph sunspot activity on the Sun. BTW...real film, the stuff we used before digital, was not invented until the late 1880's and it was not very useful. It would be after WWI that real film became a useable and affordable product for negative and positive (slide) photography.

It seems there was some mysterious activity captured on those plates on August 12 and 13, 1883. Our man Jose reported that he saw more than 450 dark, unidentified objects crossing before the sun while observing sunspot activity at Zacatecas Observatory in Mexico. He was able to take several photographs, exposing the wet plates at 1/100 second (the F-ratio apparently was not recorded).

Until recently the objects were actually thought to be high-flying geese. However, the UFOlogy world insists they were UFO's and Bonilla is usually given the distinction of having taken the earliest photo of an unidentified flying object. Some ufological literature interprets the objects as either alien spacecraft or an unsolved mystery.

Recently some modern day astronomers from the Universidad Nacional Autónoma de México have pieced together a different possibility for what our man Jose actually saw and photographed. Here is the headline:

Billion Tonne Comet May Have Missed Earth By A Few Hundred Kilometers in 1883

Recently, Hector Javier Durand Manterola and his colleagues at Universidad Nacional Autónoma de México reviewed the observations of Jose Bonilla at an observatory in Zacatecas (see map for location). During the course of two days, October 12th and 13th, 1883, Bonilla counted almost 450 objects, surrounded in what he described as a mist, passing across the face of the sun.

"Our working hypothesis is that what Bonilla observed in 1883 was a highly fragmented comet, in an approach almost flush to the Earth's surface," writes Manterola, the lead author of the report.

The only piece of evidence the authors use to suggest that this was a comet in the process of breaking up, was Bonilla's descriptions of the objects as being "fuzzy" in nature and leaving dark trails behind them. At 1/100 of a second there should not have been any actual movement of the spot recorded...so the dark trails were apparently just that...dark trails.

Bonilla's report of the observations was eventually published in the French magazine, L'Astronomie, in 1886. The editor of the magazine explained the moving spots as flocks of birds or dust passing in front of the Mexican astronomer's telescope.

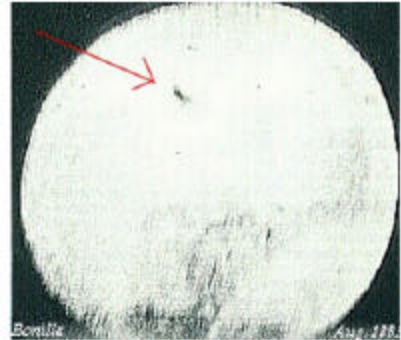
However, there are no other reports by astronomers from nearby observatories of anything unusual about the sun during the same period.

This lack of supporting observations could be explained by parallax: If the fragments were close to Earth, parallax would have ensured that they would not have been in line with the Sun even for observers in the nearby observatories...if they were looking at the sun. And since Zacatecas, Mexico is at the same latitude as the Sahara, northern India and south-east Asia, it's not hard to imagine that no one else was looking... astronomical observations were kinda sparse from those latitudes in 1883.

Here are some calculations from Manterola and his colleagues:

1. the cometary fragments must have been between 600 km and 8000 km of Earth.
2. they estimate the size of the fragments at 50 to 800 km across, suggesting the original comet was close to a billion tons.
3. they list this as a "near miss"... this is a term apparently borrowed from the airline industry.

(Continued on page 6)



Mexican astronomer Jose Bonilla snapped this one-of-a-kind photograph on Aug. 12, 1883. Scientists now believe it was a comet fragment that came dangerously close to hitting the Earth. Photo: Wikimedia Commons/Public Domain

IRISH ASTRONOMY

O'Ryan was a man of might
Whin Ireland was a nation,
But poachin' was his heart's delight
And constant occupation.
He had an ould militia gun,
And sartin sure his aim was;
He gave the keepers many a run,
And wouldn't mind the game laws

St. Pathrick wanst was passin' by
O'Ryan's little houldin',
And, as the saint felt wake and dhry
He thought he'd enther bould in.
"O'Ryan," says the saint, "avick!
To praich at Thurles I'm goin';
So let me have a rasher quick,
And a dhrop of Innishowen."

"No rasher will I cook for you
While betther is to spare, sir,
But here's a jug of mountain dew,
And there's a rattlin' hare, sir."

St. Pathrick he looked mighty sweet,
And says he, "Good luck attind you,
And whin you're in your windin' sheet,
It's up to heaven I'll sind you."

O'Ryan gave his pipe a whiff-
"Them tidin's is thransportin',
But may I ax your saintship if
There's any kind of sportin'?"
St. Pathrick said, "A Lion's there,
Two Bears, a Bull, and Cancer"-
"Bedad," says Mick, "the huntin's rare;
St. Pathrick, I'm your man, sir."

So, to conclude my song aright,
For fear I'd tire your patience
You'll see O'Ryan any night,
Amid the constellations.
And Venus follows in his track
Till Mars grows jealous raally,
But, faith, he fears the Irish knack
Of handling the shillaly.

Charles Graham Halpine (1829-1868).

(Continued from page 5)

I prefer "NEAR COLLISION" This near-collision scenario has "Extinction Event" written all over it.

4. Manterola and his team have suggested the fragments could have been from a comet called Pons-Brooks that was seen that same year by American astronomers.

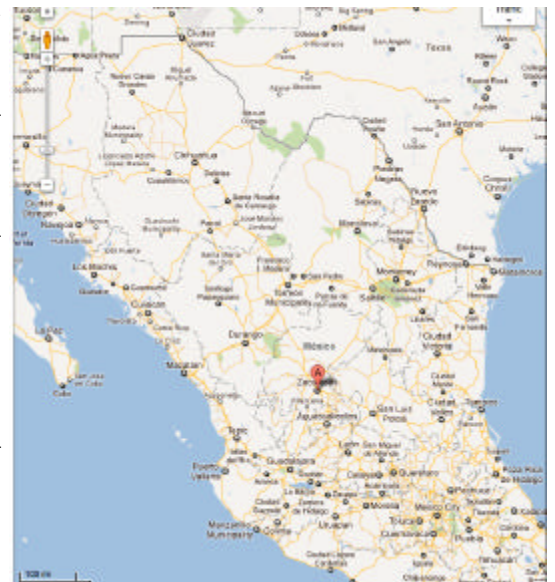
"Using the results reported by Bonilla, we could estimate the distance at which the objects approach to the Earth's surface. According to our calculations, the distance at which the objects passed over was between 538 km and 8,062 km, - and the width of the objects was between 46 m and 795 m"... say Manterola and his colleagues.

The team believes that the fragments would have passed Earth as close as 600 to 8,000 km from the planet's surface. Fragments of the comet would have been 50 to 800 km wide, while the intact comet would have weighed a billion tons.

The massive comet, if it had hit Earth, would have the same impact as the object that killed off all the dinosaurs. In fact, if an individual fragment had hit Earth it would have the same effect as the Tunguska impact in Siberia in 1908. Given that Bonilla saw 447 objects, if all of them had collided with Earth, it would have been an extinction event.

How about meteors produced by such a close encounter with so many cometary fragments? These observations happened just before the annual Perseid meteor shower, but reports for that year do not depict it as being exceptional or having a different radiant than should be expected. Instead, the report notes that 157 of the 186 meteors observed on the 11th were definitively Perseids, and that 1883's display was not exceptional by any means. However, the 1883 Leonid meteor shower, peaking in November, was exceptional, generating an estimated 1,000 meteors an hour. But there are no records of a different radiant for the Leonids of 1883.

So...was it an invasion of aliens? Was it a decaying comet that came perilously close to destroying life on Earth? Or was it geese? And were the geese of the Canada clan? Or did the emulsion on those glass plates have impurities? Have you ever taken pictures with dust in your camera? Doesn't matter if the camera uses glass plates, film or is digital...dust is dust and it will create spots. But dust in a camera will not cause an extinction event on Earth.



POP Quiz— Back agin by popular demand. This month you have to match the items below to their correct answers (Duh!). Use of the internet is forbidden. Check you books (e-books are OK!). Good Luck !

1. _____He discovered that Jupiter has moons like Earth.
2. _____Invents radio astronomy and discovers a strange radio-emitting object at the center of the Milky Way.
3. _____In the 1840s, using Newtonian mechanics, he predicted the position of the then-undiscovered planet Neptune after analysing perturbations in the orbit of Uranus.
4. _____Formerly known as Lucifer and Vesper.
5. _____Formerly known as Apollo and Hermes.
6. _____First planet noted for retrograde orbit in 1534 BC.
7. _____Abd al-Rahman al-Sufi wrote about it around 964, describing it as a "small cloud".
8. _____486,000 miles per hour.
9. _____Discovered by Edmond Halley in 1714.
10. _____When first discovered, it was labeled LGM-1 for "Little Green Men No.1".
11. _____Named so because of their composition.
12. _____Still operational after 34 years and from 119 AU away.
13. _____Discovered by Antoine Darquier de Pellepoix in January, 1779.
14. _____Discovered in March of 1767 by Pierre Méchain.

Pick from these if you must: Andromeda Galaxy, Galileo Galilei, Karl Jansky, M13, M57, Mars, Mercury, Neutron star, Pulsar, Pluto, Ring Nebula, Speed of the Sun in the Milky Way, The Sombrero Galaxy, Uranus, Urbain Le Verrier, Venus, Voyager1 (So So Sorry, I ended up with more answers than questions, so pick carefully!).

ANSWERS: (1) Galileo Galilei; (2) Karl Jansky; (3) Urbain Le Verrier; (4) Venus; (5) Mercury; (6) Mars; (7) Andromeda Galaxy; (8) Speed of the Sun in the Milky Way; (9) M13; (10) Pulsar; (11) Neutron star; (12) Voyager1; (13) Ring Nebula; (14) The Sombrero Galaxy

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