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Comet 2006 P1 (McNaught), as photographed by its discoverer, Rob McNaught, January 20, 2007. © 2007 Robert H. McNaught.

David Seargent

The Greatest Comets in History

Broom Stars and Celestial Scimitars

 Springer

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For my wife Meg, and David Austen

Preface

Naked-eye comets are far from uncommon. As a rough average, one appears every 18 months or thereabouts, and it is not *very* unusual to see more than two in a single year. The record so far seems to have been 2004, with a total of five comets visible without optical aid. But 2006, 1970, and 1911 were not far behind with a total of four apiece.

Yet, the majority of these pass unnoticed by the general public. Most simply look like fuzzy stars with tails that are either faint or below the naked-eye threshold. The ‘classical’ comet – a bright star-like object with a long flowing tail – is a sight that graces our skies about once per decade, on average. These ‘great comets’ are surely among the most beautiful objects that we can see in the heavens, and it is no wonder that they created such fear in earlier times.

Just what makes a comet “great” is not easy to define. It is neither just about brightness nor only a matter of size. Some comets can sport prodigiously long tails and yet not be regarded as great. Others can become very bright, but hardly anyone other than a handful of enthusiastic astronomers will ever see them. Much depends on their separation from the Sun, the intensity of the tail, and so forth.

Probably the best definition of a great comet is simply one that would draw the attention of non-astronomers if viewed from somewhere well away from city lights and industrial haze. Typically, they are at least as bright as a reasonably bright star and sport easily visible tails, at least 5–10 degrees long. Most of the traditionally great comets of history were as bright as or brighter than a star of first- or second-magnitude with tails that could be traced to 10–20 degrees or more in a dark sky.

But these comets are not the subject of this book! What we are searching for are not simply “great” comets but the greatest of the great, the cream of the comet world. We are looking for nothing less than cometary royalty!

Picking out the best of the best is not as easy as it may sound. Ancient peoples were frequently awed by the sight of a comet in their skies, and this reaction tended to color the way they recorded it. In fact, comets were objects of such fear and dread that anything seen in the sky looking vaguely like a star with a tail was enough to trigger rumors of a comet! This can make it very difficult for

a modern reader of these centuries-old records to sort out what was a real comet and what was something else.

A prime example of this is the famous (infamous?) description of a “comet” in 1528 by the French surgeon Ambroise Pare. In Pare’s own words

So horrible was it, so terrible, so great a fright did it engender in the populace, that some died of fear, others fell sick. . . . This comet was the color of blood; at the summit of it was seen the shape of a bent arm holding a great sword as if about to strike. At the end of the blade there were three stars. On both sides of the rays of this comet were seen a great number of axes, knives, bloody swords, among which were a great number of hideous human faces, with beards and bristling hair.

Very picturesque and graphic indeed! The trouble is that there are no other records of a bright comet in 1528. Whatever Pare saw in the sky, it was not a comet. Most likely, he witnessed a spectacular display of the aurora borealis. The faces, swords, and axes are probably not hard to imagine in the moving lights and curtains of a great aurora. (By the way, lest we be tempted to scoff at the naivety of our “superstitious” ancestors seeing these sorts of images in an aurora, we might recall the number of times Venus is reported today as an alien spaceship complete with landing gear and windows!).

But it is not always the original observer who causes confusion about the object recorded. A case in point is the occasional reference in modern works to a “comet” recorded by St. Augustine, probably for the year 396, that is said to have given off “a smell of sulfur.” At least one book of elementary astronomy saw evidence here of the old belief in comets having an effect on the air and dismissed the reported odor accordingly.

However, what St. Augustine actually wrote was “a fiery cloud was seen in the east, small at first, then gradually as it came over the city it grew until the fire hung over the city in a terrible manner; a horrendous flame seemed to hang down, and there was a smell of sulfur.” Whatever this was, it was not a comet. Augustine did not even *claim* that it was a comet. It *may* have been a meteorite fall, but an even better guess might be a lightning filled tornado funnel. The luminous effects associated with these can be very spectacular, and they are often accompanied by “a smell of sulfur”!

Incidentally, Chinese chronicles *do* record an astronomical object that year, although the description matches a nova or supernova rather than a comet. In any case, the Chinese object is almost certainly unrelated to the phenomenon noted by Augustine.

We should also be aware that, as well as dubious cases like these, some comet records are completely fictitious. A chronicler will sometimes invent a portentous comet to mark the birth and/or death of some great political personality. For example, an alleged comet appearing at the death of Charlemagne in A.D. 814 seems to have been pure embellishment.

For the most part, comets that were only mentioned on one or two nights or which appeared in a single record were eliminated straightaway as contenders for the greatest comets on record, even if their description implied something

unusually spectacular. Although a minor comet might be seen on a single occasion only (and there are bona fide instances of this), anything truly spectacular is likely to have been widely observed over a considerable period of time and to have been immortalized in abundant records.

However, even after minor and dubious objects had been pruned from the list, a daunting number of entries remained. Many of these had clearly been spectacular objects that left great impressions on those who saw them. But how many could truly be listed among the *greatest* of the great comets?

For the next step in the selection, I referred to a “scale of importance” devised by D. Justin Schove in his 1984 book *Chronology of Eclipses and Comets AD 1~1000*. Although this work covered only part of the period of interest, it could be extended to earlier and later comets without too much difficulty.

Schove’s scale is as follows:

1. Minor comet, noted only by experienced sky-watchers.
2. Not noted by the general public.
3. Noted by at least one contemporary chronicler.
4. Noted by some chroniclers.
5. Noted by most chroniclers.
6. Noted as remarkable in most chronicles.
7. Noted as remarkable even in short annals.
8. Created consternation. Long remembered.
9. Created terror. Remembered for generations.

After reading through Schove’s list of comets and comparing them with the descriptions given in Kronk’s *Cometography*, I decided as a rough rule of thumb that a scale reading of 7 or higher would qualify a comet as one of history’s greatest. My aim, therefore, was to use Kronk’s descriptions of Schove’s 7+ comets as the standard by which to measure comets of earlier and later centuries.

In essence, this remained the method followed, although I did not always stick rigidly to Schove’s evaluations and found myself disagreeing with a couple of the values he assigned.

In those cases where an orbit for the comet had been computed, and even the absolute brightness known at least approximately, it was also a helpful check to compare the comet’s performance with a recent object of similar true brightness and observed under comparable circumstances. This counted as something of a reality check, especially when we are dealing with records of “frightening, prodigious signs in the sky” and so forth. Expressions like this occur mostly in early European chronicles, and they tend to conjure up images of some utterly fantastic object unlike anything seen in recent times. Yet, where an orbit allows us to form some idea of the comet’s true appearance in the sky, we more often than not find it to have been something that would have fitted in very well with the brighter comets of the past few decades. Where European and Chinese records of the same object exist, the latter tend to be more sober in their descriptions and can act as another good reality check.

The end product of this pruning and sifting forms the subject of this book. What emerges is a list of over 30 individual comets, which (as far as I could ascertain from their often varied descriptions) met the criterion for being history's greatest. In addition to these comets, I have also included, separately, the historical appearances of Halley's Comet and the members of the Kreutz group of sungrazers. Among these latter are found the brightest and some of the most spectacular of all comets as well as, paradoxically, most of the smallest and faintest ever recorded.

Essentially, the comets included here were ones of exceptional brightness and/or those having long and intense tails. Yet, brightness alone or tail length alone did not automatically mean inclusion in the list. A comet might have been recorded as having a tail (say) 70 degrees long, but if there were reasons for thinking that this tail was so faint as to be missed by most casual observers, it would have been left off this list. Likewise, even comets bright enough to be seen in broad daylight were omitted if they did not also become spectacular nocturnal objects (a list of daylight comets and possible daylight comets has been added as a final chapter to compensate for what some may feel to be an unfair omission).

There will probably be objections to some of my specific omissions.

For instance, I did not include the comet of 147 B.C. The very impressive-sounding account sometimes given of this comet is, in reality, most probably a combination of three separate objects. The Chinese comet of August (for which an orbit has been computed) is not consistent with the Chinese comet of May, or with that of October and November, the latter suspected by H. H. Kritzinger as being the previous appearance of C/1858 L1 Donati. None of these objects can clearly be identified with the one recorded by Seneca sometime between the years 151 and 147 B.C. This was said to have been as large as the Sun and "so bright that it dispelled the night" – a description reading more like that of a great meteor than a great comet.

I have also omitted the comet observed by Peter Apian in 1532, despite its inclusion in most catalogs of great and remarkable comets and Apian's historically important observations showing the tail as pointing away from the Sun. This seems to have been the first European recognition of this fact, although the Chinese had already noticed it as early as the ninth century.

The comet was unquestionably bright, but the tail seems to have been no longer than around 10 degrees, more in the nature of a 'typical' great comet than one of the greatest of the greats. Moreover, judging by Apian's drawings and the general descriptions of this object, its tail appears to have been predominantly a plasma type. These are not as intense as the strong dust tails of very large and active comets. If Apian's Comet was rather low on dust, it is unlikely to have rated as one of history's finest, despite its obvious brightness and historical importance.

Of course, it is quite possible that I have missed some comets that should have been included, and I may have included one or two that should not be here. Moreover, there must surely have been splendid comets in ancient times that

were only at their best from far southern latitudes. These would either have passed unseen and unrecorded by the chroniclers of the time or else entered into the records as relatively minor objects unworthy of being included in the present list. To these comets I offer my apologies. If recent times are any indication, some of them may even have been the greatest of them all!

In the course of the following pages, we look first and foremost at the historical returns of Halley's Comet. This is *not* because it is the biggest, brightest, and the best (it is not!) but simply because it is the most famous and the only comet that has achieved 'great' status at more than one known return. On several appearances, it has entered the ranks of the other objects in this book, having been rated variously as 7, 8 and even 9 by Schöve during the first millennium of our era. Because this is a book about the greatest of the greats, the more spectacular apparitions of Halley will be the ones of chief interest to us.

Succeeding chapters will take us initially from ancient times until the end of the tenth century, then from the beginning of the eleventh until the end of the eighteenth, before moving into the more detailed modern period from the beginning of the nineteenth century to the present day.

The sixth chapter deals with that fascinating family of comets known as the Kreutz sungrazers, some of which became the most brilliant ever recorded by humankind, and the seventh with those relatively rare objects seen in daylight.

Before launching into history, however, let us take a closer look at the characters of our story – the comets themselves, what they are and from where they come.

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