

Father Eusebio Francisco Kino

And

The Comet of 1680 - 1681

By Ellen Shaffer



WHEN THE NAME OF Father Eusebio Francisco Kino is mentioned, most Americans think of the explorations and the missionary activities of this pioneer of the Southwest. However, he excelled in more than one field, and, among other things, he had an interest in astronomy.

During November and December of 1680 and the first two months of 1681, a great comet, which was visible in all parts of the world, made its appearance for a period of seven weeks. It was observed in Mexico with great interest by one of that country's leading savants, Don Carlos de Sigüenza y Góngora, who held the Chair of Astrology and Mathematics at the Royal and Pontifical University of Mexico, and it was likewise noted in Spain by that learned member of the Society of Jesus, Father Eusebio Francisco Kino, native of the Italian Tyrol and former professor of mathematics at the University of Ingolstadt, who, instead of following the brilliant university career for which he seemed so admirably fitted, had chosen the life of a missionary as his vocation and was, at that time, at Cadiz awaiting a ship to Mexico, where he hoped he would be given an assignment to the mission field in China.

Comets had for centuries been considered harbingers of ill omen, and this one was viewed with apprehension in both the Old World and the New. Father Kino, in a letter dated Cadiz, December 28, 1680, wrote to his patroness, the Duchess of Aveiro, and,

mentioning the appearance of this huge comet, spoke of the evil repute in which comets were held, and expressed the hope that this one protended no evil to the Duchess and her family. In the Mexican capital, Don Carlos de Sigüenza y Góngora, who took an exceedingly modern view of comets, which he felt exerted no force whatever on human destinies, sought to reassure the uneasy by publishing a short work entitled: *Manifiesto Filosófico contra los cometas despojados del imperio que tenían sobre los tímidos*, which was issued early in the year of 1681 and dedicated to Don Carlos's patroness, the Virreina, whose fears he particularly wished to calm.

His effort, while it must have soothed the anxiety of many, was not received with enthusiasm among certain exponents of astrology. Although he was himself a professor of that subject, he had, as Bolton¹ points out, dealt "a hard whack at some brands of astrology." A doctor of medicine, Don José Escobar Salmerón, tried to refute the arguments of Sigüenza and offered the slightly nauseating suggestion that the comet in question was composed of the exhalations of dead bodies and human sweat. Don Carlos's succinct reply to this was: "Avoid sweating!"

Another person to enter the fray as a defender of the malignant qualities of comets was Don Martín de la Torre, a native of the Netherlands, then living in Campeche. He issued a work entitled: *Manifiesto Cristiano en favor de los Cometas mantenidos en su natural significación*, in which he repeated the century-old beliefs in regard to comets. Sigüenza's rebuttal to this was: *Belerofonte Matemático contro la Quimera Astrológica de Don Martín de la Torre*, which, according to Rojas Garcidueñas,² was not published but circulated in copies. It so effectively tore the arguments of Martín de la Torre to pieces that that gentleman never attempted a reply.

In May of 1681 Father Kino reached Mexico, and he soon formed a friendship with Don Carlos de Sigüenza y Góngora. The two men, both in interests and education, had much in common. Both were mathematicians, both shared an enthusiasm for the study of geography, and both had received their education from the Jes-

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uits. Don Carlos had left the Jesuit Order, but later in life he returned to it and died in it. The two savants also were of the same age; Rojas Garcidueñas states that they both were born in August of 1645, although Bolton³ believes that the date of Kino's birth was August, 1644.

Not long after his arrival, Kino was approached by friends and urged to write his views on the comet of 1680-1681, and this he proceeded to do. His manuscript gained the approval of the church authorities on September 24, 1681, was immediately printed, and, apparently, published the following month.

A copy of this work is in the Biblioteca Nacional of Mexico, and the Henry E. Huntington Library of San Marino, California, likewise, has one in its possession. It is a modest, attractive volume of *quarto* size, and, considering that it was printed in a century when the art of printing was at low ebb, it is a competent typographical job, printed on better than average paper. The title page reads:

EXPOSICION ASTRONOMICA *de el cometa que el año de 1680 por los meses de noviembre y diziembre y este año de 1681 por los meses de enero y febrero, se ha visto en todo el mundo y le ha observado en la Ciudad de Cadiz.*

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At the bottom of the title page is a woodcut of *Our Lady of Guadalupe*, whom Kino had chosen as his patroness — the apparition of Our Lady to whom the Duchess of Aveiro was also devoted. A large folding copperplate engraving of a celestial map is inserted at the beginning of the text, which pictures the parts of the sky through which the comet passed and traces its course with what, to the casual observer, would seem to be scientific accuracy. This, likewise, bears the image of *Our Lady of Guadalupe*.

The book consists of twenty-eight folios, or fifty-six pages, and is divided into ten chapters, each one of which discusses some phase of the comet's appearance. It opens with a dedication to the Virrey in which Kino speaks of comets:

“. . . *se presagien y teman (no ay que espantar que*

*tienen mucho de divino rompimiento con los humanos)
improsperos sucesos y tragediales infortunios . . .”*

And after this mention of the tragic and unfortunate happenings which they might presage, he then cites the opinion of Bodino that they are the souls of great men who after centuries on earth rush through the skies in fiery splendor to become immortals. This pleasingly poetical concept, while unscientific, is definitely more agreeable to contemplate than the theory of exhalations of dead bodies and human sweat.

The dedication is followed by a poem relating to comets, which abounds with classical allusions, and which would seem to indicate that, while Kino habitually used a simple and direct style, he could, when the occasion demanded, readily turn his pen to the florid phraseology which was deemed “fine writing” at that period.

The first chapter begins appropriately enough with: “*Que linage de Creatura sea el Cometa*” and in this discussion of the nature of comets he quotes Cicero, who termed them “*stella cincinata*” — curly-headed stars — another charmingly romantic and descriptive concept. He then refers to Thomas Fieno, who defined a comet as “*un milagro del a naturaleza, para nada más apto, que torcedor del humano entendimiento, o perpetuo Eculeo de la estu- diosa curiosidad, a quien si debemos admirar siempre, podremos cono- cer nunca.*” Although Fieno felt that one should always admire them but could never know them Kino felt sufficiently emboldened to state that they are exhalations of clouds, rivers, and seas of the terrestrial globe and that they come from evaporations of the planets — a belief which, he says, is held by his fellow Jesuit, the learned Father Athanasius Kircher. The next authority whom he quotes is the noted astronomer, Tico Brache, who held that comets are much higher than the moon and are formed and exist in an altitude above the solar atmosphere.

In the second chapter, Kino discusses at length the time the comet was visible — a period of seven weeks. The comet of 1664-1665 had appeared for seventy days, he mentions one in 1337 that lasted one hundred twenty days, there are several recorded cases of

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comets of fifty days duration, and he finally refers to that dreadful comet, the "Precursor of the Vengeance of God," which in 70 B.C. flashed through the skies for a space of 365 days and heralded the fall of Jerusalem.

The third chapter is devoted to the violent, rapid movement of the comet through the skies. The author mentions how it was first seen in the early morning hours before the dawn, but, in the course of the seven weeks during which it appeared, the time changed and it was finally observed a little after sunset.

The fourth and fifth chapters give us a glimpse of Kino, the mathematician, for he discusses the two positions of the comet — the apparent and the actual — with reference to the principles of perspective and geometry —and also shows the method by which he proposes to determine the distance of the comet from the earth. In the following chapter he enlarges on this, and computes the distance at 1,153,000 Spanish leagues, and cites various mathematical authorities who are in accord with these ideas.

Chapter Seven is a comparison of this comet with the comet of 1664-1665, with specific mention of the basic differences. He also touches on other comets which had preceded this one, and quotes Father Juan Bautista Ricciolo who had stated that one hundred fifty-five comets had appeared from 480 B.C. to A.D 1618.

In Chapter Eight, the author considers the matter of the size of the celestial apparition, which he determines partly from the length of time it was visible nightly. In Cadiz he had at first observed it for two minutes at a time, and this later increased to nearly three minutes — an amazing length of time for such a rapidly moving body to be visible. From this fact he deduces that the comet was of huge size.

The ninth chapter is a discussion of the atmosphere of the body of the comet, and the theory is considered that the sun and the planets are formed by earthly exhalations.

The tenth and final chapter is the longest in the book, and in it Kino launches into the aspect of the comet which he really considers of the most importance, what the comet of 1680-1681 por-

tends, whether it augurs future good fortune or impending disaster. All the preceding chapters, with their more or less scientific approach, were designed to lead up to this one which comes to the crux of the matter. He says that comets have been said to presage the death of great personages, such as kings, or foretell calamities, such as the ruin and desolation of kingdoms.

He then inquires into the possibilities that comets may not be evil. They are not mentioned as malignant forces in the Holy Scriptures. There is a belief that burning comets, as they sweep through the skies, purify the air — a celestial cleansing by fire. Furthermore, there are not a sufficient number of comets to account for the deaths of all the illustrious; there are more deaths than comets. Added to that, we are told in the *Book of Jeremiah* not to fear the signs the Gentiles fear.

Having thus set up these arguments in favor of the harmless quality of comets, Kino then refutes them, for it was his sincere conviction that these heavenly bodies were warnings of coming misfortune. To begin with, he says, there has always been a universal acceptance of the idea that comets exert a baleful influence on human affairs. Numerous aphorisms and maxims bear this out. He cites many instances of the deaths of notable personages in classical times whose end had been foreshadowed by comets shooting through the heavens. Everyone, he adds, "high and low, nobles and plebians, learned men and idiots have always felt that comets merited the evil reputation that they bear." They are, he thinks, sent to inspire us with the fear of God, although exactly why they appear is something known only to Him. It is not necessary that individuals die according to the number of comets seen, but their appearance is always an omen of tragedy. Moreover, observers in one part of the world frequently see comets not visible elsewhere. The number of comets and the number of deaths of notables do not have to equal, but it may be that they are, since many comets may appear without our knowledge. As to the signs the Gentiles fear, that, says Kino, probably refers to divination from the entrails of animals. Such signs, of course, should be ignored. On the other hand, we ought to

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fear the signs sent to us by God to put us in mind of the world's end. Aristotle and Seneca knew that comets boded no good to mankind, and Kino sees in them warnings of the Last Judgment. From *Apocalypse* he quotes: "*There will be signs in the sun, moon and stars . . .*" and such a sign he sees written in the comet's track of fire.

Finally, he takes up the matter of what this particular comet, which he had personally viewed in Cadiz, might indicate. It foretells ill, he believes, for three of four European kingdoms, although he makes no specific mention as to which ones he thinks might be affected. Such a huge comet of such lengthy duration would, in addition, seem to usher in general misfortune: floods, earthquakes, winds, excessive heat and cold, alteration in human bodies, contagions and illnesses. The dire effects of the comet would probably last as many years as the comet did months or days. Once again he quotes Father Athanasius Kircher's theory that comets are the exhalations of the planets — an opinion also held by Father Christopher de Escheiner and Father Juan Bautista Ricciolo, he adds. The book closes with a simple and moving dedication to the Mother of God, *Our Lady of Guadalupe*, and the watchword of the Jesuit Order: *Omnia ad maiorem Dei gloriam.*"

In stating his case, Father Kino relied on tradition rather than independent thinking. To his mind the strongest argument in favor of the malignancy of comets is the fact that everyone has always felt they were indications of disaster, and, since everyone thought so, it must be so. Such reasoning today seems decidedly naive. His complete acceptance of a traditional attitude in regard to comets seems somewhat incompatible with his unquestioned ability as a scientist and mathematician. In the field of geography he was a few years later to demonstrate that he was quite capable of going against tradition and proving his premise in a modern, scientific manner. However, the most competent human beings are inconsistent at times, and his opinion on comets seems at variance with most of his thinking.

The book, while imbued with beliefs which the world in general has since discarded, has sincerity. In reading it one feels that

Father Kino stated his position simply, directly, and honestly. Furthermore, it is wholly lacking in a controversial tone.

The "*Exposición*" was well received in ecclesiastical circles; Padre Eusebio was the recipient of thanks from Rome, and Sor Juana Inez de la Cruz composed a poem in praise of the author.

Sigüenza said that during the time Kino was writing his "*Exposición*" he never mentioned the matter to him. Friends of the Mexican scholar, however, told him that Kino was busy with a volume which was a direct attack on his "*Manifiesto*" and urged Don Carlos to be ready with a reply. In November, before he left for California, for Kino had already received orders to proceed thither to begin his work of evangelization, Father Kino called on Sigüenza to say goodbye, and, so Bolton⁴ says, casually inquired what his friend was then writing. On being told "nothing," he handed Don Carlos a copy of the "*Exposición*" with words to the effect that he should read it and he would have something to write about.

After reading it, Don Carlos, it seemed, did indeed have something to write about, for he considered Kino's volume an attack on his "*Manifiesto*" — just as his friends had told him. He resented the fact that Kino had dedicated the book to Virrey, when Don Carlos had dedicated his own volume to the Virreina, his patroness. When the priest stated that everyone, from those of the highest intelligence to the lowest, believed in the malign power of comets, the Mexican savant believed that Kino meant to imply that he, Don Carlos de Sigüenza y Góngora, who did not believe thusly, was a fool. The ideas Kino expressed in the "*Exposición*" were the very ones Don Carlos had considered outworn superstitions and had taken pains to refute in his two previous treatises on comets. As a Mexican who possessed inherent pride in his country and his people, Don Carlos felt that he had been patronized and belittled by a European scholar who was slightly contemptuous of New World culture.

He promptly prepared a reply which would vindicate his position, and, since he considered Kino's book a personal attack, he made

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his retort highly personal also. The title page of his book (there are copies in the Biblioteca Nacional of Mexico City and the Henry E. Huntington Library of San Marino, California) reads:

LIBRA ASTRONOMICA y Filosófica en que D. Carlos de Sigüenza y Góngora, Cosmógrafo, y Matemático Regio en la Academia Mexicana, examina no solo lo que a su Manifiesto Filosófico contra los Cometas opuso el R. P. Eusebio Francisco Kino de la Compañía de Jesus, sino lo que el mismo R. P. opinó y pretendió haver demostrado en su Exposición Astronómica del Cometa del año de 1681.

Because of lack of funds, the book was not published until 1690, but it is almost certain that Sigüenza sent a manuscript copy to Father Kino immediately after he wrote it. Whether it ever reached the missionary priest or not is problematical, as Kino was moving about from one place to another, and Don Carlos received no acknowledgment of it.

The volume, when finally published, was dedicated to Don Gaspar de Sandoval, then Virrey of New Spain, and the text commences with the words: “*Nunca con más repugnancia, que en la ocasion presente tomé la pluma en la mano . . .*” (Never have I taken pen in hand with more repugnance than on the present occasion). This would put a slight strain on the reader’s credulity, for Don Carlos hardly impresses one as a reluctant antagonist.

He had mentioned Kino on the title page, and he mentioned him again on the opening page of the text. His book extended to 188 pages and in it he delivered every smashing argument he could against Kino. It has been called “quite as much a rhetorical performance as a scientific treatise”⁵ and recalls the statement of Rojas Garcidueñas that, when Don Carlos was making efforts to secure the Chair of Astrology and Mathematics in the Royal and Pontifical University of Mexico, he displayed “gifts more of the lawyer than of the mathematician.”⁶ His refutations were marshalled with legal precision, nor were the mathematical aspects of the situation overlooked, for the latter half of the book was devoted to mathematical proofs of Sigüenza’s position and included numerous diagrams

and geometrical reckonings. He examined the calamities cited by Father Kino and pointed out that they had actually occurred before the appearance of the comets which were supposed to foretell them. He argued that, instead of blindly taking the word of other writers, one should examine the facts for oneself in the light of one's own reason and knowledge — a highly refreshing and modern point of view. He quoted eighty authorities on comets, among them twenty classical writers, nor did he neglect to include Kino's own authority, Father Athanasius Kircher, in the number. He covered the situation from every possible angle, including the personal. He related how he had loaned Father Kino maps, which were later returned through a third person torn and in bad condition. He indicated that he felt his "*Manifiesto*" had been attacked because Kino, as a European, could find no good in a volume produced in the New World. He even questioned that Kino had ever witnessed the appearance of the comet in Cadiz, which was, of course, ridiculous.

He refuted every argument advanced by Kino, and, for good measure, quoted two poems, one showing that comets foreshadow evil and the other asserting that they are good omens. Then, remarkably enough, he closed the work with: "*y quedan los cometas libres de las infamas, que sin razon les imputan: y quedamos todos amigos, supuesto que.*

*Dissentire duo animis de rebus ijsdem
Incolunia licuit semper amicitia."*

Perhaps it really was his wish that "comets remain free of the infamy imputed to them and that we all remain friends," but such a book would seem a rather severe test of friendship. Kino, during the nine years that had elapsed between the time that his own book was published and that of Don Carlos finally came from the press, was busily traveling about his far flung territory, building churches, feeding his Indians, placing his assistants, and preaching the Gospel. In all probability he never knew of Sigüenza's book until it was printed, and only once, as far as is known, did he ever refer to it. In his "*Inocente, Apostolica y Gloriosa Muerte del V. Pe. Francisco Xavier Saeta*," published in 1695, he expresses the hope that this

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volume will have a happier fate than his "*Exposición*" which had so offended Don Carlos de Sigüenza y Góngora. He protests that it never entered his mind to attack Sigüenza's "*Manifiesto*," which he does not know that he ever read. He mentions briefly that he wrote the "*Exposition*" at the request, speaks of the approval he had received from Rome and from various friends, and he refers to Sor Juana's poem in its praise.

The men who knew Father Kino well and worked with him in the mission field for years, pictured him as a gentle and humble person, "cruel to himself — merciful to others." If his "*Exposición*" was written as an attack, it would seem to be out of keeping with what is generally known of his character.

The average person of the present day is inclined to be much in sympathy with the views of Sigüenza and surprised at their modernity. Father Kino gave expression to the generally held beliefs of his own time; Don Carlos anticipated the ideas of the future. In the matter of the presentation of these beliefs, however, one cannot but respect the frank sincerity and apparent lack of contentiousness on the part of the Jesuit, while one regrets that the brilliant Mexican scholar, whose arguments today ring so much truer than those of his opponent, felt it necessary to be so caustic an antagonist. It is a sad episode in the lives of two great men; one wishes it could have been erased and that theirs could have been a warm, life-long friendship.

It is not to Kino's discredit that he considered the stars a factor in world affairs. It was a generally accepted belief in his day and had the weight of centuries behind it. In the *Nuremberg Chronicle*, written by the learned Dr. Hartmann Schedel of that city and published there in 1493, appear numerous woodcut delineations of comets, and the text relates the disasters which they heralded. Popes, monarchs, and scientists of the 15th century held the belief, and in the 16th century Miguel Servet, to whom the discovery of the circulation of the blood is attributed, had been a believer in astrology. Universities still had chairs of astrology in Kino's time, one

of which was held at the University of Mexico by Sigüenza y Góngora himself, as has already been noted.

Even today, the fact that astrology has been discarded as a science, does not mean that it is lacking in believers. The great American humorist, Samuel L. Clemens (Mark Twain) believed that Halley's Comet was a controlling force in his life. He was born when this comet was in the skies, and his biographer, Albert Bigelow Paine, tells us he was certain his life would end when it returned again. In April of 1910, when the comet again appeared, he lay dying, although he did know that it was once more visible, and his life ended as he believed it would, with the reappearance of Halley's Comet. Today charlatans in every large city are able to extract substantial sums from people who have credulous faith in the stars. They may be ashamed of this faith and deny it, but the fact remains that they do believe.

Kino's gifts as a mathematician and geographer should not be discounted because, in one field, he followed the current ideas of his day. He made a notable contribution to the knowledge of his period when he was able to explode the century-old belief that California was an island, which he did in a thoroughly scientific manner — "I have discovered with all minute certainty and evidence, with mariner's compass and astrolabe in my hands, that California is not an island but a peninsula, or isthmus, and that in thirty-two degrees of latitude there is a passage by land to California, and that only to about that point comes the head of the Sea of California."⁷

In the two hundred seventy years that have elapsed since Father Kino wrote his book, the science of astronomy has made tremendous strides, and his explanations as to the composition and movements of comets have been outmoded. But the purpose behind their fiery appearance in the skies still waits an answer. Kino felt they were sent to inspire us with the fear of God. Most people regard these flaming bodies, hurling through space, governed by certain definite, mysterious laws, with a feeling of awe. Those who believe in a God of supreme, infinite intelligence, the workings of

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whose Mind the finite human mind cannot grasp, may feel that in one respect, at least, Father Kino was right.

*Aplauda La Ciencia Astronomica Del Padre Eusebio Kino
De La Compañia De Jesus Que Escribio Del Cometa Que
El Año De Ochenta Aparecio, Absolviendole De Ominoso.*

*Aunque es clara del cielo la luz pura,
clara la luna y claras las estrellas,
y claras las efímeras centellas
que el aire eleva y el incendio apura;*

*aunque es el rayo claro, cuya dura
producción cuesta al viento mil querellas,
y el relámpago que hizo de sus huellas
medrosa luz en la tiniebla oscura;*

*todo el conocimiento torpe humano
se estuvo oscuro sin que las mortales
plumas pudiesen ser, con vuelo ufano,*

*Icaros de discursos racionales,
hasta que el tuyo, Eusebio soberano,
les dió luz a las luces celestiales.*

Sor Juana Inez de la Cruz

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*EXPOSICIÓN ASTRONOMICA DE EL COMETA que el
año de 1680 por los meses de Noviembre y Diciembre
y esta año de 1681 por los meses de Enero y Febrero, se ha
visto en todo el mundo y le ha observado en la Ciudad de
Cadiz El P. Eusebio Francisco Kino. Mexico, Lupercio,
1681.*

THE HISTORICAL SOCIETY OF SOUTHERN CALIFORNIA

- Capítulo I. Que linage de Creatura sea el Cometa.*
Capítulo II. Que el Cometa no fué más que uno, y de el tiempo que duró.
Capítulo III. Del movimiento, y lugar del Cometa.
Capítulo IV. Del lugar verdadero y aparente del Cometa, y de su Paralaxi.
Capítulo V. Que tanto disto el Cometa del tierra, según se saca y deduce de los principios paralacticos.
Capítulo VI. Que el Cometa no fué elementar, sino celeste donde se comprueba con nuevos argumetos, la exorbitante distancia que a via de nosotros a el, numerados sus leguas según el computo Español.
Capítulo VII. De la similtud cotexo y comparacion del Cometa de 1680 y 1681 con el del ano de 1665 y 665.
Capítulo VIII. De la magnitud y corpulencia del Cometa, y de la longitud de su cauda, reducida su candidad a legus Españolas.
Capítulo IX. De la atmosphera del cuerpo del Cometa, y de que fuerte se forma su cauda, per se varie y fenezca.
Capítulo X. De lo que pronostica Cometa de 1680 y 1681 o que anuncio prospero o infeliz amague.

NOTES :

1. Bolton, *The Rim of Christendom*.
2. Rojas Garcidueñas, *Don Carlos de Sigüenza y Góngora*, p. 50.
3. Bolton, *Pimería Alta*, p. 28.
4. Bolton, *The Rim of Christendom*.
5. *Ibid*.
6. Rojas Garcidueñas, *Don Carlos Sigüenza*, p. 29.
7. Bolton, *Pimería Alta*, p. 334.