

IS THE SUPERNOVA OF A.D. 185 RECORDED IN ANCIENT ROMAN LITERATURE?

*By Richard Stothers**

Records of possible supernova explosions have not been found so far in the ancient Greek and Latin literature.¹ This is partly a fault of the ancients, in apparently failing to monitor the sky on a regular and systematic basis and to record clearly the details of unusual celestial "portents" that were observed,² and partly a fault of the moderns, in relying perhaps too heavily on the results of previous scholarly searches through the Western literature.³

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¹F. R. Stephenson, "Historical Searches for Supernovae," in *Origin of Cosmic Rays*, ed. J. L. Osborne and A. W. Wolfendale (Dordrecht: Reidel, 1975), pp. 399–424; F. R. Stephenson and D. H. Clark, "Historical Supernovas," *Scientific American*, 1976, 234:100–107; F. R. Stephenson, "A Revised Catalogue of Pre-Telescopic Galactic Novae and Supernovae," *Quarterly Journal of the Royal Astronomical Society*, 1976, 17:121–138. Ancient temporary stars of the type now known as ordinary novae are listed from Western sources by Alexandre G. Pingré, *Cométographie* (Paris: Royal Printing Office, 1783), Vol. I; Alexander von Humboldt, *Kosmos* (Stuttgart: J. G. Cotta, 1850), Vol. III; Yu. P. Pskovskii, "Survey of Stellar Outbursts of the Pretelescopic Era," *Soviet Astronomy—AJ*, 1972, 16:23–31. The famous "star" of 134 B.C. is probably not a nova or supernova; see J. K. Fotheringham, "The New Star of Hipparchus and the Dates of Birth and Accession of Mithridates," *Monthly Notices of the Royal Astronomical Society*, 1919, 79:162–167; E. Zinner, "Die neuen Sterne," *Sirius*, 1919, 52:25–35. Nor, apparently, is the object of A.D. 389; see W. T. Lynn, "The So-Called New Star of A.D. 389," *Observatory*, 1884, 7:17–18 (addendum on pp. 75–76). Pingré had earlier expressed similar opinions about the cometary nature of these two well-known "stars." Analogy with the star of Bethlehem (c. 5 B.C., Matthew 2) may have been the stimulus behind the recording of a daytime star that appeared shortly after the birth of the future pseudo-Christian emperor Severus Alexander (c. A.D. 208, *Historia Augusta, Vita Severi Alexandri* 13.5). The new star that Hadrian claimed to have seen (A.D. 130) after the death of his favorite Antinous may have been only a figment of the emperor's wishful imagination (Dio-Xiphilius, *History*, 69.11). The Roman poet Claudian (*Panegyricus de quarto con-*

The ancient Chinese astronomers, unlike their Western counterparts, were court-appointed, full-time civil servants, who maintained a regular watch over the sky and made detailed records of their observations. Excerpts from these state records were later incorporated in official dynastic histories. For these reasons, most searches for historical supernovae have been confined to the more reward-

sulatu Honorii Augusti, 11. 184–188) witnessed a temporary, tailless star that was plainly visible in the daytime. The panegyric was written for the year A.D. 398, but I think that it is quite clear from ll. 169–172 and 203–204 that Claudian regards the star as a portent of Honorius' being made a co-emperor (late in 393). Claudian's brief description of the star suggests to me a fireball or a supernova, although Tycho Brahe, Pingré, and Lynn favored the planet Venus. The Chinese *Chin shu* (A.D. 635) mentions a "guest star" that appeared during March of 393 in the constellation Scorpius and was visible for eight months; according to Stephenson and Clark either of two young supernova remnants in Scorpius is a possible relic of this event. The "large yellow star" of 396 in Taurus, reported in the Chinese *Wei shu* (A.D. 572), may be the subject of Count Marcellinus' (sixth century, *Chronicon*) remark that in that year "the heavens seemed to be ablaze"; various modern authors have considered this star to be some kind of nova. The present paper is devoted to a critical discussion of the one truly probable supernova recorded in ancient times, that of A.D. 185.

²A few surviving compilations of explicitly dated (or datable) celestial phenomena were made during antiquity: Aristotle, *Meteorologica*, 342–345; Seneca, *Quaestiones naturales*, 1 and 7; Pliny, *Naturalis historia*, 2; Obsequens, *Prodigiorum liber*. The detailed description given for various categories of objects by the first three authors indicates that more specific data must have been available to them than are provided to us.

³Most authors have apparently depended directly or indirectly on Pingré. This industrious compiler examined a large number of ancient sources and also, among other sources, the well-known collection by Conradus Lycosthenes, *Prodigiorum ac ostentorum chronicon* (Basel: Oporinus, 1552), which contains a supplement to Obsequens' collection of prodigies. However, even Pingré's search of the literature is incomplete. His work needs a modern reevaluation.

ing Far Eastern literature.⁴ Criteria used to differentiate supernovae from novae, comets, and other objects have included: (1) a very bright appearance in the sky, (2) a lack of anything resembling a tail, (3) a fixed position with respect to the background stars, (4) a duration greater than about six months, (5) a color of white, changing to yellow and, later, red, (6) a position well away from the predicted positions of planets and bright stars for the epoch in question, (7) a low galactic latitude, (8) a significant separation in time from other known supernovae, and (9) the presence (today) of a supernova remnant with a suitable position and age. With rare exceptions, the ancient Western reports of unusual celestial phenomena can be examined only under criterion (1), sometimes also under criteria (2), (4) and (5); positional data are nearly always lacking.

If the Far Eastern reports are necessarily used as a guide to interpreting the ancient Western literature, then only one supernova event (but see n. 1) is likely to have been recorded in the West, namely, the brilliant "guest star" of A.D. 185 that occurred in the southern constellation Centaurus. According to the *Hou han shu*, written by the Chinese historian Fan Yeh (c. 450):

On the day *kuei-hai* in the tenth month of the second year of the Chung-p'ing reign period a guest star appeared within *Nan-mên*; it was as big as half a mat; it was multicolored and it fluctuated. It gradually became smaller and disappeared in the sixth month of the year following the next year. According to the standard prognostication this means insurrection.⁵

The object was visible for either eight or twenty months, depending on the rendering of the Chinese text. Stephenson and

⁴A complete set of references to catalogues is provided by Pskovskii and by Stephenson.

⁵The translation is given by Stephenson and Clark, "Historical Supernovas," pp. 106–107. Most of the other translations that I have seen state that the star disappeared in the sixth month of the immediately following year.

Clark estimate that it may have been as bright as apparent magnitude -8 (to be compared with -4 for Venus and -13 for the full moon). As viewed from Loyang, its maximum altitude above the horizon was probably only 1.5 to 3° . This may explain the peculiar physical attributes of the object, since atmospheric refraction is strong at large zenith angles. Today, a supernova remnant, G315.4-2.3, is found near the site of the ancient starburst.

In Western civilization, the event occurred during the reign of the Roman emperor Commodus (180–192). It must have been readily visible from the latitude of Alexandria (which is 3.5° farther south than Loyang) but only marginally visible from Antioch or Carthage; it would have been invisible from all points in Italy and Gaul. A search of Western literature has turned up two possible references to it, the first from the *History* of Herodian (c. 250):

There were certain portents which coincided with these events; some stars shone continuously by day, others became elongated and seemed to hang in the middle of the sky.⁶

The second possible reference is from the *Vita Commodi* in the *Historia Augusta* (fourth century):

The prodigies that occurred in his reign, both those which concerned the state and those which affected Commodus personally, were as follows. A comet appeared. Footprints of the gods were seen in the Forum departing from it. Before the war of the deserters the heavens were ablaze.⁷

⁶Herodian, *History*, 1.14.1; text selection, translation, and commentary by C. R. Whittaker, *Herodian* (Cambridge, Mass.: Harvard University Press, 1969). I record here my indebtedness to Mrs. Lynn Bowdery for assistance in the acquisition of some of the source materials used in the present study.

⁷*Historia Augusta, Vita Commodi* (traditionally ascribed to Aelius Lampridius), 16. 1–2; text selection, translation, and commentary by David Magie, *The Scriptores Historiae Augustae* (Cambridge, Mass.: Harvard University Press, 1921).

Before attempting to date or analyze these celestial portents, a few words about our two main sources are necessary. Herodian was probably a youth in 185 and may have witnessed the supernova from Alexandria or Antioch, since his place of origin seems to have been somewhere in the East. He expresses skepticism about portents, but possibly used the history of Cassius Dio (a slightly older contemporary) as a partial basis for his own account of the events in Commodus' reign. Certainly Dio is very fond of reporting portents. Nevertheless, he does not mention any celestial portents like those of Herodian for the period in question. But it should be pointed out that Dio was probably in Rome at the time of the supernova; moreover, the pertinent part of his history has only come down to us in the abridgement of Xiphilinus (eleventh century). As for the late *Historia Augusta*, the author of the *Vita Commodi* probably relied on Dio or Marius Maximus (whose work is no longer extant) for the portents in question, but no more about the original reportage of the portents is known.

The chronology of the events in Commodus' reign, to which these portents of disaster are referred, is not entirely certain. Best estimates of the dates will be adopted here chiefly from the critical discussions by Whittaker and Alföldy.⁸ For those portents mentioned by Herodian, both internal and external evidence can be used to affix rough dates. From internal evidence alone, Pingré⁹ and Whittaker have assigned a date of 190/191, since the short passage mentioning the portents is found between the accounts of the fall of the praetorian prefect Cleander (189/190) and the burning of the Temple of Peace (191/192). Wagner has referred the portents to the emperor's death (192).¹⁰ But Alföldy rightly points out that all of the portents

that occurred during Commodus' reign were collected by Herodian in one passage,¹¹ and he further reminds us that Herodian's chronology is often faulty. Certainly, Commodus' ominous neglect of the imperial business began at least as early as the death of the deserter Maternus (187/188) and perhaps as early as the plot of the emperor's sister Lucilla (182). Hence internal evidence alone does not argue against the possibility that the celestial portents may refer to the years 182–188.

As for the external evidence, Ho lists seven new celestial objects that appeared during the reign of Commodus, according to Far Eastern sources.¹² The objects of 180, 182, 188 (spring), and 191 are definitely comets, as is probably the object of 186; the "guest star" of 188 (summer) may be a fireball; and that of 185 is the supernova. Herodian's "elongated" stars are probably comets rather than auroral streamers. The plural form suggests two or more of them; therefore the earliest must have been seen no later than the year 188, unless at least one of the following situations is true: (1) Herodian or his source mistook the pre-perihelion and post-perihelion apparitions of the comet of 191 for two different comets,¹³ (2) the comet of 191 split into two or more visible parts,¹⁴ or (3) the Chinese observers missed some prominent celestial pyrotechnics. None of these alternatives seems very likely.

Caesaribus facta traduntur (Jena: Neuenhahn, 1888), pp. 48–49.

¹¹The portents related in the *Historia Augusta* and in the *History* of Dio-Xiphilinus are similarly grouped together.

¹²Ho Peng Yoke, "Ancient and Mediaeval Observations of Comets and Novae in Chinese Sources," *Vistas in Astronomy*, 1962, 5:127–225.

¹³This mistake has sometimes been made even in relatively recent times, according to D. J. Schove, "Comet Chronology in Numbers, AD 200–1882," *Journal of the British Astronomical Association*, 1975, 85:401–407.

¹⁴The comet of c. 373 B.C. was reported by the Greek historian Ephorus to have split into two parts (Seneca 7.16). Multiple fragmentation seems to have occurred in the case of the comet of 11 B.C. (Dio 54.29). In modern times, Biela's comet (1846) divided into two parts, as have several other comets.

⁸Whittaker, *Herodian*; Géza Alföldy, "Bellum desertorum," *Bonner Jahrbücher des Rheinischen Landesmuseums in Bonn*, 1971, 171: 367–376.

⁹Pingré, *Cométographie*, Vol. I, pp. 294–295.

¹⁰Fridericus Wagner, *De omnibus quae ab Augusti temporibus usque ad Diocletiani aetatem*

Our conclusion that some of the celestial portents occurred before 188 is strengthened by the statement in the *Historia Augusta* that “before the war of the deserters the heavens were ablaze.” Undoubtedly this war refers to the rebellion of Maternus,¹⁵ which took place between 185/186 and 187/188. Although the war was fought in Gaul, the portent need not have been observed there. Furthermore, the date of the portent is not likely to have been earlier than 184/185, when the praetorian prefect Perennis was executed; otherwise, this crucial change of power would probably have been made the stated object of the portent. Since the portent is mentioned distinctly from the preceding portent of the “comet,” it may well refer to the supernova of 185.¹⁶ Admittedly such a vague omen could also refer to a strong lightning storm, auroral display, or meteor shower.¹⁷ But Herodian’s less vague statement that “some stars shone continuously by day” now makes sense if he too is reporting the supernova.¹⁸ The plural form “stars”

may either reflect the variability of the supernova (mentioned by the Chinese) or its seasonal reappearance above the horizon the following year, or else the form may simply constitute a rhetorical device to balance the companion clause about “elongated” stars. It is very unlikely that the first mentioned stars were daytime comets: such comets ought to show “elongated” tails at night if they are near enough to the sun to be so exceedingly bright; furthermore, two or more daytime comets in close succession would have been most unlikely; and, finally, the Far Eastern sources do not mention that any of the comets of that period was visible by day, although silence on this question does not, of course, constitute proof.

It may be concluded from this analysis that the two passages drawn from Roman history, if taken together, imply that a star suddenly flared up to a brilliance greater than that of Venus for a duration of at least several days somewhere during the period 184–186. This unique stellar “Roman candle” agrees satisfactorily with the Chinese report of the “guest star” of A.D. 185, which has been interpreted in modern times as a nearby supernova explosion. Curiously, the Roman and Han Chinese empires reached their greatest territorial extent in A.D.

¹⁵A very doubtful devil’s advocate position has been suggested recently by Bohumila Mouchová, “Omina mortis in der *Historia Augusta*,” in *Bonner Historia-Augusta-Colloquium 1968/1969*, ed. J. Straub (Bonn: Rudolf Habelt, 1970), p. 117.

¹⁶Which comet of Commodus’ reign is meant here? If the prodigies are considered to be arranged in approximate chronological order (cf. Joseph M. Heer, “Der historische Wert der *Vita Commodi* in der Sammlung der *Scriptores Historiae Augustae*,” *Philologus Supplementband*, 1904, 9: 1–208), then the comet is probably the one of 182.

¹⁷This portent (*caelum arsit*) is not an uncommon one in Roman literature. No ancient author gives a general explanation of it.

¹⁸The portent (ἀστέρης γὰρ ἡμέριοι συνεχῶς ἐβλέποντο) apparently does not refer to halos around the sun, described as “stars” by Pliny (2.98). Dio (74.14), however, personally witnessed at Rome “three stars [halos?] that suddenly came to view surrounding the sun” in the reign of the emperor Didius Julianus in A.D. 193. Moreover, the author of the *Vita Pertinacis* (14.3) in the *Historia Augusta* probably drew on Dio’s account when he mentioned this phenomenon in connection (incorrectly) with the omens of Pertinax’s death, a little earlier the same year. Now it is interesting that Dio interpreted the “three stars” as portending the imminent wars of desertion of the three legates Severus, Niger, and Albinus from their loyalty to the empire (A.D. 193–197). If Herodian and the author of the *Vita Commodi* (who conceivably might have conflated Dio’s and Herodian’s ac-

counts of the portents or simply used the latter’s account very loosely) were combining (and misplacing in time) the various reports of daytime “stars” (Dio 74.14), “blazing heavens” (Dio 75.4), and a “comet” (Dio 75.16), which occurred in the years A.D. 193, 196, and 200, respectively, then we might the more readily adopt Mouchová’s suggestion (see n. 15) that a post-Commodian “war of the deserters” is meant in the *Vita Commodi*. It is certainly rather suspicious that both Herodian and the author(s) of the *Historia Augusta* assigned all of these celestial portents to the period 180–193 (March) but none to the period 193 (April)–200, whereas the converse is true in the case of Dio, who has mentioned (78.30) one or two other comets as occurring in the year 218. On the other hand, the collections of portents in Herodian and in the *Historia Augusta* for Commodus’ reign are also similar to a collection in Dio (65.8) for the much earlier year A.D. 69, likewise notable for its civil wars. When portents falling in a given period are summarized together in a brief fashion, they unavoidably tend to resemble other collections of portents of the same types occurring in entirely

116 and 97, respectively; soon thereafter they began their simultaneous decline in power (in the ninth decade of the second century according to many historians).¹⁹

different periods. Therefore, I prefer the straightforward identification of the celestial portents as given in the main text.

It is only poetic justice that a supernova should have heralded the beginning of the end for these two greatest of ancient empires.

¹⁹It is rather a pity that Roman-Chinese cultural contact, which became direct beginning in A.D. 166, did not lead to a more careful recording of celestial phenomena by Roman observers.

REMARKS ON MILLER'S REVIEW OF *PHILOSOPHICAL PROBLEMS OF SPACE AND TIME*

By Adolf Grunbaum*

In his review of the second edition of my book *Philosophical Problems of Space and Time*, Arthur I. Miller depicts my treatment of the special theory of relativity (STR) as egregiously biased and historically untutored.¹ Hence I wish to give interested readers of *Isis* some indication of why I believe that they should look at my book themselves rather than rely on Miller's review.

1. Those of us whom Gerald Holton has dubbed "experimenticists" have maintained that the STR owes its origin not only to Einstein's reconceptualization of various old facts but *also* to his quest for theoretically encompassing experimental findings which were anomalous for the aether theory, notably the null outcome of the Michelson-Morley (M-M) experiment. Miller predicates some of his main historical objections on the correctness of Holton's (and Polanyi's) contrary thesis that the M-M result played no such genetic role. When I discussed Holton's and Polanyi's contentions (Ch. 12; Appendix §§34 and 35, pp. 834-839), I deemed it appropriate to call attention to Shankland's 1973 firsthand report of his personal interviews with Einstein, which had just become available in print. And since the latter report runs counter to Holton's thesis in regard

to the genetic role of the M-M experiment, I concluded (p. 836) that the question as to that genetic role is moot. My unwillingness to accept Holton's account as definitive instead of Shankland's prompts Miller to say: "He [Grunbaum] does not even correct the blunder [concerning the genetic role of the M-M result] in this second edition." And despite my attention to the views of both Polanyi and Holton, Miller chides me (p. 590) for having "carefully selected" my secondary sources so as to support only my own point of view and for having cited Shankland "to rescue matters" while avoiding sources not useful to my philosophic purposes (p. 593).

2. I take it to be a commonplace that a logically correct understanding of the assertive content of a given physical theory as first propounded is essential to an adequate understanding of its historical genesis. In regard to the history of the STR, my avowed aim was to show specifically how an historian could be led astray by insufficient command of the logical relations between various cardinal statements made by the STR or of the logical differences between the STR on the one hand and its aether-theoretic predecessors on the other. A few key points from Miller's review will now serve to illustrate that the danger against which I cautioned is indeed quite real.

On page 590, Miller notes that I label as "assumption (ii)" the assumption that light is nature's fastest signal (*in vacuo*).

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¹*Isis*, 1975, 66:590-594, review of Adolf Grunbaum, *Philosophical Problems of Space and Time* (2nd ed., Dordrecht/Boston: Reidel, 1973).