

Between Copernicus, Kepler and Galileo. A Memory of Owen Jay Gingerich (1930-2023)

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Abstract: Owen Gingerich, passed away on May 28, 2023, has been one of the most important historians of astronomy between the twentieth and the twenty-first centuries. Teacher of history of astronomy at the Harvard University (1967-2000) contributed with fundamental studies from the astronomy of ancient Greece to the birth of astrophysics. His most important work was the search and study of the copies of the first (1543) and second (1566) editions of the *De revolutionibus* of Copernicus. A job that led him to personally visit hundreds of libraries and collections of rare books around the world. I will describe his main contributions and teachings through his texts and personal memories mainly about his relationship with Italy, on the copies of the *De revolutionibus* described in his works, and on the copies he was not able to include in an update of the “Census” never published but which deserve new studies.

Keywords: Astronomy, Biography

1. Introduction

Owen Gingerich, as one of the obituaries dedicated to him remarks, was a “walking astronomy encyclopedia” and a prolific writer of books, invited conference papers, and articles for professional journals. His many contributions to the history of astronomy and more in general to the history of science have been very important. His skill and competencies as an astronomer and an expert of rare books, his knowledge of the global history, his curiosity, and his generosity to support new entrants in the field have been recognized all over the globe. Like other scholars, I had experienced the generosity with which Gingerich shared his private notes and his expertise. Both in his publications and private network, Gingerich actively stimulated new approaches to the history of early modern astronomy. Through his biography, his publications and mainly his researches on Copernicus and the *De Revolutionibus*, we will see his importance in the progress of the history of astronomy.

2. Biography¹

Gingerich was born on the 24th of March 1930 in Washington, Iowa, to a Mennonite family. The Mennonites are a group of Anabaptist Christian church communities tracing their roots to the Radical Reformation in the Europe of XVI century. The Mennonites are a pacifist group. They believed in adult baptism, which means they were despised both by the Catholics and the Protestants.

His father was a schoolteacher, and his mother was too, for a short while. During his youth, the father was teacher in high school while he was working on his PhD in social American history writing about the Mennonites in Iowa. When Gingerich was 9, his father made the first telescope which Gingerich used in his life, a telescope good enough to see Saturn’s rings. Between 1941 and 1947, the family moved to Kansas, where the father got another job and Gingerich attended the schools.

¹ The main source of this summary of Gingerich’s life is the interview of Owen Gingerich by Alan Macfarlane, dated August 31, 2008, the transcription of which has been published in Turin & Macfarlane (2022, pp. 25-61). Video recording of the interview is available: <https://www.sms.cam.ac.uk/media/1117240> (Accessed: 7 December 2023).

In 1946 the father was appointed supervisor for the United Nations Relief and Rehabilitation Administration (UNRRA) which was going to be sending shiploads full of horses to Poland, and Gingerich participated as a cowboy. The following year, the father moved to teach at Goshen College in Indiana and Gingerich was enrolled there even if he had not completed the high school.

During a visit to Yerkes Observatory as a member of the Astronomical League (American amateurs' association), Gingerich discovered that an amateur astronomer had been hired as a summer employee just to look after the public. Since he was already a member of the American Association of Variable Star Observers (AAVSO), which had its headquarters at Harvard College Observatory, he had the connection with Harvard, and he wrote a letter to them saying: "Is there a possibility of a summer job?" I got a reply from Harlow Shapley, who was probably the most famous astronomer in America at that time."

So Gingerich spent the summer as an assistant to Harlow Shapley at the Harvard College Observatory (HCO). The following year, instead, Gingerich spent the summer as a collaborator with *Sky and Telescope* also based at the HCO. This collaboration will be continued for more than fifty years.

In 1950, Gingerich received a Degree in Chemistry from Goshen College but then, following a suggestion of his teacher to decide based on his feeling, he applied to Harvard University for graduate school in astronomy with the idea to become a science writer.

At Harvard sometimes he was teaching assistant to prof. I. Bernard Cohen, the professor of history of science and famous expert of Newton. In 1953 Gingerich completed his master at Harvard University and in the following year he married Miriam Sensenig, his partner for all the life.

The Korean War had been ongoing since 1950 and Gingerich was called to arms. As a Mennonite, he was a pacifist and refused to participate in the War. He risked being arrested but he was able to find an alternative, and he moved with his family to Beirut (Lebanon) to teach physics and astronomy at the American University between 1954 and 1957. In 1958 Gingerich returned to Harvard to work on his PhD in astrophysics entitled "The Study of Non-Gray Stellar Atmospheres", under the supervision of Chuck Whitney and Cecilia Payne-Gaposchkin, which he completed in 1961. From that period on, he always lived in Cambridge, Massachusetts.

From 1967 to 2000 Gingerich has been professor of astronomy and, from 1970, of history of science at Harvard University. In the same 1970, he began to collaborate with the new founded *Journal for the History of Astronomy*² and he was reviews editor for more than thirty years. After his retirement in 2000, he was nominated emeritus at Harvard University and senior astronomer emeritus at the Smithsonian Astrophysical Observatory.

Along his academic career, he has been active in several institutions: he has been chairman of the US National Committee of the International Astronomical Union, a councilor of the American Astronomical Society (AAS) and he helped organize its Historical Astronomy Division (HAD).

He has also received many awards: the Polish government's Order of Merit in 1981, the HAD's Doggett Prize for his contributions to the history of astronomy in 2000, the AAS awarded him their 2004 Education Prize, the Prix Jules Janssen 2006 of the French Astronomical Society, the 2009 Trotter Price of the Dept. of Engineering, A&M University, Texas.

The asteroid 2658 Gingerich was named in his honour in 1985.

In 2006 he has been Head of the IAU commission in charge to debate whether Pluto was a planet or not, and even though the conclusion of the commission was favourable to maintain Pluto as a planet, the IAU General Assembly voted to consider it a minor planet.

Gingerich has also been known as an expert and collector of rare astronomical books but less known is that he was a collector of sea snail shells of the genus *Fusinus*.

In the last few years, he suffered of a progressive worsening of health conditions and, after a period in a hospice, he died on May 28, 2023, in a hospital in Belmont, Massachusetts.

² It was the first journal dedicated to the history of astronomy. It still remains a reference in the field and by 2023, it had reached its LIV volume.

3. Gingerich's publications³

Gingerich began very early to write on astronomy. His first publications were in the journals of the high school he frequented and the Goshen College. The first “official” paper was published in a Mennonite journal for young people: “Building a Telescope”, *The Youth's Christian Companion*, in 1949, followed by two other papers in another Mennonite Journal: “Telescopes and stars”, *Mennonite*, 1949, 63(34), pp. 15-16 and “How to build a telescope”, *Mennonite*, 1950, 65, pp. 486-87.

In 1951 he published his first contribution on *Sky and Telescope*: “Eclipse experiences”, 1951, 10(12), pp. 287-288 and already in 1953, he published the first paper on an historical topic: “Messier and his catalogue”. *Sky and Telescope*, 12(8) pp. 255-258; 12(9) pp. 288-291. On *Sky and Telescope*, Gingerich will publish around two hundred contributions in fifty years including articles, reviews and short notices on astrophysics, observations, and history of astronomy. Several papers have been reprinted in the anthology *The Great Copernicus Chase and other adventures in astronomical history*, Sky Publishing and Cambridge University Press, Cambridge 1992.

Gingerich's first academic publications were on the topic of his PhD thesis: “A Computer Program for Nongray Stellar Atmospheres”, *The Astronomical Journal*, 1961, 66, p. 285. Abstract; “Studies in non-grey stellar atmospheres. I. A basic computer program”, *Astrophysical Journal*, 1963, 138, pp. 576-586; “Model atmospheres for late-type stars” (with D. Latham, J. Linsky, and S. Kumar), in Hack, M. (ed.) *Colloquium on Late-Type Stars*, Osservatorio Astronomico di Trieste, Trieste, 1967, pp. 291-312; “The Harvard-Smithsonian Reference Atmosphere” (with R. Noyes, W. Kalkofen, and Y. Cuny), *Solar Physics*, 1971, 18, pp. 347-365.

Gingerich has been one of the first scholars to use computers for simulations of physical phenomena but his interest in the history of astronomy took him to extend the usage of computers to the computation of planetary positions in the past⁴ and verification of ancient astronomical tables.⁵ He was initially interested in the works of Kepler, but later he covered the history of astronomy from ancient times to contemporary astrophysics.

His most important contributions were on the great astronomers of the scientific revolution: Copernicus, Tycho Brahe, Galileo Galilei and Johannes Kepler. Many of his studies up to 1993 have been included in an anthology published in that year: *The Eye of Heaven: Ptolemy, Copernicus, Kepler*. American Institute of Physics, New York.

Other topics he covered were Egyptian astronomy, astrolabes, paper instruments, ephemerides, the history of observatories and of observational practices, and the contributions of less known astronomers like Erasmus Reinhold, Paul Wittich, and Giovanni Antonio Magini.

He was also involved in controversies on historical questions, one about the validity of the observations and the star catalogue in Ptolemy's *Almagest* and another on the copy of Galilei's *Sidereus Nuncius* that appeared on the antiquarian market and was later demonstrated to be a fake.

Gingerich considered himself also an “amateur theologian”. The role of theologian derives by his Christian faith of Mennonite confession. The motto of the Mennonite college he attended was “Culture for Service” and he was heavily involved in discussions of the interplay between science and Christianity, believing that one did not contradict the other. Gingerich considered himself an anti-Creationism Christian, believing in “intelligent design” by a Creator rather than “Intelligent Design”

³ Gingerich personally compiled a bibliography of his publications updated to 2011. It can be downloaded from the website of the *Journal for the History of Astronomy*: https://journals.sagepub.com/doi/suppl/10.1177/00218286231195409/suppl_file/sj-pdf-1-jha-10.117700218286231195409.pdf (Accessed: 7 december 2023), but searching Gingerich's publications in the *SAO/NASA Astrophysics Data System* <https://ui.adsabs.harvard.edu/> the result is a list of c.600 publications!

⁴ (1963) *Solar and Planetary Longitudes from -2500 to +2000* (with W. Stahlman), 1963; (1965), “Lunar visibilities in ancient Babylon”, *Isis*, 56, p. 69.

⁵ (1964) “The computer versus Kepler”, *American Scientist*, 52, pp. 218-226; (1968) “Les positions des planetes au moyen age: Application du calcul electronique aux tables alphonisines” (with E. Poulle), *Comptes Rendus de l'Academie des Inscriptions et Belles Lettres*, 111(4), pp. 531-48.

(capitalized), which he saw as more of an undesirable political anti-evolution movement. He wrote: “There is a God as a designer, who happens to be using the evolutionary process to achieve larger goals – which are, as far as we human beings can see, [the development of] self-consciousness and conscience” (Gingerich 2006).

His last publication was again dedicated to his preferred subject, Nicolaus Copernicus. It was a contribution included in the catalogue of an exhibition at the National Gallery in London dedicated to the famous portrait of Copernicus made by the Polish artist Jan Matejko in the nineteenth century.⁶

4. The Census of Copernicus’ *De Revolutionibus*

His most important contribution, which kept him busy for more than thirty years, was the research of the existing copies of *De revolutionibus orbium coelestium libri sex* of Nicholaus Copernicus, the capital book for the history of science. He thus remembered the reasons that made him begin this research:

I went on a sabbatical leave in 1970 to Cambridge, England, and on a holiday, we took the children up to Edinburgh. On the way, I stopped in Leeds with another professor, Jerry Ravets, who was also on the international committee to plan the Copernican celebrations [for 1973]. We talked about Arthur Koestler’s book *The Sleepwalkers* which was a bit of a put down for Copernicus saying that it was the book that nobody read ... Two days later we were up in Edinburgh and I went to the Royal Observatory to look at their fabulous book collection. And I took a look at their first edition of Copernicus. I was amazed to realize that it was annotated thoroughly, from beginning to end, in the margins of the book. Now if this book had so few readers, it seemed preposterous that the very next copy I happened to look at would be so thoroughly well read. [...] This gave me an idea, I thought, maybe I should look at some more copies (Turin & Macfarlane 2022, p. 49).

One thing led to another, and it became, not just a simple research project, but it became an obsession to try to see as many as possible. It took me 30 years before I was able finally to publish the census of some 600 copies of the first and second edition of this book, giving the provenances and ownerships of each of the copies to the extent that one can figure it out, plus information about what if any annotations were in it. And the annotations proved to be pretty interesting. The most interesting thing was this intense connectivity between copies, that if you got a book that seemed to be heavily annotated, you were almost certain to find another one with almost identical annotations in it because students copy their teachers’ notes (Turin & Macfarlane 2022, p. 50).

The copy of *De revolutionibus* that Gingerich saw in Edinburgh, which he later discovered was annotated by Erasmus Reinhold, became the catalyst that inaugurated his obsession to survey every surviving copy of the first edition, printed by Johannes Petreius in Nuremberg in 1543, and the second edition, printed by Heinrich Petri in Basel in 1566 of Copernicus’ book. That quest led him to travel hundreds of thousands of miles, from Aarhus to Beijing, from Coimbra to Dublin, from Melbourne to Moscow, from St. Gallen to San Diego. Finally, in 2002, after thirty years and around 600 copies seen, he published his inventory with the main results of his scrutiny: *An annotated census of Copernicus’ De Revolutionibus (Nuremberg, 1543 and Basel, 1566)*⁷ (hereafter *Census*; Gingerich 2002).

The inventory includes for each copy:

- a. Type of bookbinding and dating (approximated).
- b. Size of the pages in millimeters.

⁶ Gingerich, O., “Nicolaus Copernicus: the man who invented the solar system”, in Riopelle, Szczerki & Gingerich (2021), pp. 10-19.

⁷ The hardback edition is out of print, but an e-book can be purchased: <https://doi.org/10.1163/9789004502611>.

- c. Any indication of provenance: inscriptions, labels, stamps with their position on the book.
- d. If any annotation is present.
- e. If the book has been censured following the instructions of the Catholic Church, dated 1620. The text has been deleted at the end of the introduction and in folios 6, 7, 9, 10 and 122 (Gingerich 2002, app. III, pp. 367-368).

Gingerich was able to describe 277 copies of the first edition and 324 copies of the second edition, of which he possibly inspected 95% directly.

He summarized the major findings of his project in these terms:

the pattern of multiple copies of the most important annotations, demonstrating the existence of a silent network that connected sixteenth-century astronomers; the fact that most astronomers in that century indeed owned and generally annotated the book, while rejecting as real the heliocentric cosmology itself (Gingerich 2002, Preface, p. VII).

Two years later, in 2004, Gingerich published *The book nobody read: chasing the revolutions of Nicolaus Copernicus* (Gingerich 2004), a companion book to the *Census* in which, with his highly entertaining and anecdotal style, he summarized the most important results obtained in the history of early modern astronomy, but he also discussed his approach to the research and told many anecdotes happened along these thirty years. This book is a masterpiece that had great success, with translations into 14 languages.

But the research was not finished. Already in *The book nobody read* and in the short note Gingerich published in 2006 – “Supplement to the Copernicus Census”, *Journal for the History of Astronomy*, 37, p. 232 – he announced his intention to publish an update or a second edition of the *Census*. But due to other projects and then to the age he reached, he never did it.

The need for a supplement to the *Census* was and is clear. Already in 2006, Gingerich mentioned knowing of 4 new copies of the first edition and 18 of the second edition of *De revolutionibus*. Personally, I verified and sent him the pictures of a first edition preserved in Mondovì (CN), heavily annotated in the first three books.

Limiting the analysis to the copies of *De revolutionibus* existing in Italy, 21 copies of the first edition and 47 copies of the second edition were described in the *Census*. In *The book nobody read* one more copy of the second edition was mentioned. In 2006, Neil Harris, full professor of archival and bibliography in the University of Udine, added 3 copies of the first edition and 2 copies of the second edition in the review of both Gingerich’s books for the journal *The Library* (Harris 2006). My personal research in catalogues of libraries available online, direct contacts, reports of auctions and journalistic news resulted in 1 copy stolen of the first edition, 11 new copies and 4 “disappeared” of the second edition but other copies could be preserved in unexplored libraries, could have been sold and changed the owner or have been stolen.

Speaking with other colleagues in the recent meetings dedicated to the anniversary of Copernicus, I verified the will to organize an international cooperation to proceed with the *Census* of the *De Revolutionibus*, to continue and not interrupt the work begun and masterfully accomplished by Owen Gingerich.



Fig. 1. Owen Gingerich in his office at Harvard University. On the left and in front: the cases where he preserved his rare books

Conclusions

I think the best conclusion is to leave the word to Gingerich himself. In the interview by Alan Macfarlane at the question:

You would like to be considered primarily as a historian of science or as an astronomer;

he answered:

I suppose as a historian of science, but, basically, I was interested in knowing how science works. And by doing science, you get some insights, but the history of science gives you a broader perspective and sometimes it's easier to tease out the meanings of what happened a hundred, two, three, four hundred years ago. I have devoted a lot of time to thinking particularly about Renaissance astronomy and exactly what the relation between observations and theory and scientific proof versus scientific persuasion and that gives me also a foundation for thinking about the broader questions of where truth lies in religion versus where truth lies in science and so on. I suppose as a historian of science, my contribution would lie in the work, particularly what I've done in making the census of Copernicus's book. But I hope I've got further insights into how Kepler was thinking, how Galileo was mapping the moon and so on (Turin & Macfarlane 2022, p. 54).

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