

# **Evanescence and Permanence: A trip to the Ahmanson Reading Room, Huntington Library and thoughts about “original sources” in astronomy**

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September 21, 2018

## **Source Material in Astronomy**

In my field of astronomy and astrophysics, our typical “source material” for any research would be the cosmic photons – particles and waves of light and energy – that bombard our tiny planet from all corners of the universe. Our Earth is a crossroads of cosmic photons that arrive from all directions – some of them from our nearby star, the sun, and others from the first atoms to condense from the Big Bang that began the expansion of the universe. Some of the photons have just been released – and are fresh from their 8 light minute journey from the sun – while others have been traveling for billions of years and only now are reaching earth – to end their billions of years of travel crashing onto a sidewalk, or if they are fortunate, bouncing through a telescope and being detected by patient astronomers who have waited for their arrival.

For this talk I am honored to share a place on a panel with historians, which may at first seem to be an odd pairing, but all of us astronomers are historians. Our history is of the universe, which we can view directly through our telescopes as they are able to focus on objects millions billions of light years away, and literally can see the past. The stories that we construct from our sources involve cataclysmic events such as the Big Bang, exploding stars, collapsing and crashing clouds and planets and emergence of mysterious objects such as black holes, white dwarfs and neutron stars.

The tale we astronomers have learned tells us of our “Cosmic Context” – suspended as we are between two infinities of time and space, and inextricably linked to the cosmos that formed us and destined to return with all of our elements back into those same cosmos. Our elements themselves are records of the early universe – and have once traveled inside a star, been released into the dark black of space, and re-collapsed into a cloud, which itself became the planet Earth from which we arose.

This context is one that gives us a message of our ephemeral nature. Our existence of 100 years or so is such a tiny fraction of the universe that it is hard to visualize. If the vast expanse of the 13.7 billion years since the Big Bang were compressed into a length of time of a classical symphony (about an hour), then our existence would comprise only 23 microseconds of the symphony, and all of human history about 1/1000 of a second. This is not enough time for a single note of the orchestra, and is instead only enough time for dimly detecting the presence of vibrations in the room. Despite this tiny baseline of time, however, our species has decoded the entire history of the universe and the details of star and planet formation, and the tale of the origins of our planet Earth.

And yet despite our ephemeral nature, and the transience of our own selves, and even the Earth in the cosmic timeline, we have been able to create a sense of permanence and transcend our own tiny lifespan. One of the main pieces of this involves the book – which allows us to speak across generations and centuries and to recreate the thoughts of those who may long have passed away. And this process of transmitting our thoughts to distant long-awaited descendants is what I want to focus on in my discussion about “source materials” in astronomy. Because the development of astronomy and our awareness of our place in the universe comes not from photons or telescopes or fancy gadgets but from human beings, and from their ability to communicate ideas and meanings to each other and to form culture. And for this the book is the essential technology – no less important today than it was centuries ago.

### **The Ahmanson Reading Room at the Huntington Library**

This fact was made clear to me the first time I visited the Huntington Library in San Marino as a scholar. We astronomers do not often have the privilege of visiting these wonderful rare books, but one of my research areas involves archaeoastronomy, the study of how people in previous centuries and from cultures around the world interpret the universe and the skies. I was working on my book, *The Power of Stars*, and had been teaching about the subject for 15 years, but I realized that my project would be much better if I could access the original sources from early European astronomers to interpret directly their thoughts and visions for how the universe is structured.

I therefore visited the Ahmanson Reading Room at the Huntington Library – and as I sat down in the plush velvet chair and wrote out my request to view some books from over 400 years ago, thoughts about rare books, cosmology and other matters swirling about!

What is the nature of the universe? Of earth? As I began looking through the volumes, Voices from across time began to speak to me through these old and rare books. Some books were developed to speak for the Church and the local nobility as a testament to the prevailing wisdom and sources of power in civilization at the time. In many cases the works of Plato and other Greek philosophers were bound, illustrated and presented for the edification or moral rectitude of a long past generation.

Some books challenge our modern perceptions – and call out to us from a distance, a lone voice in the dark, an original composition amidst the droning march of civilization. Ideas about the starry skies, sea creatures, and other wonders of the skies were presented in maps filled with ancient mythological characters that were the common knowledge of all of those from past centuries. Compendiums of ancient philosophy, works of poetry and art bound are bound together, sometimes forming a duet across the centuries, such as the volume that presented 19<sup>th</sup> century poems from Poe illustrated by the Japanese artist Arakawa in the late 20<sup>th</sup> century.

Some works in the catalog were mysterious and obscure – by authors unknown, written in Latin, or “damaged by silverfish and worms” according to the catalog. Such is the fate of some books, and indeed some ideas. As a modern person typing on my laptop, and

frequently zapping information from my cell phone, I am humbled and energized in the presence of such books. I realized that all of us are animate and in our living, breathing bodies as we command waves of electrons, drive fast Japanese cars, and listen to music on a “cloud.” We are the masters of electrons and electronics in the post-modern, post-post-industrial age in Los Angeles, which is maximized for speed, and which creates volumes of ephemeral, flashy and shiny things that may not survive the decade, let alone the century.

And yet inside the library, in air-conditioned, silent and dark quarters are the books which speak to us of ideas and of thoughts that are as close to what humans can know of as permanent. Lined up in ranks they await the tender fingers of a scholar to open them and explore their lines. Some are “impressed on pigskin” and others “vellum”. The inks on those sheets dried 500 years ago and were kindly mixed by people from local berries and other objects from their natural worlds. The voices in Medieval French sang out in that long-past Spring day – harvesting the berries, and awaiting their mixing and boiling, the tradespeople talking excitedly about the news of the village – upcoming marriages, deaths, plans for the summer. The ink was put into its bottle and awaited its use. Then the ink made its way into a dark dimly lit cell enclosed in stone walls. The scholar had his sheets ready, and assembled quills and ink to begin the project for the day. The ink has arrived and has met its page – placed there with care in that spring of 1541, the words assembled to speak to us as if they were written yesterday to us – who live in a time and in a way that the author and the scribe and the many owners of that same volume could not imagine. And yet their voices speak to us.

Some Latin in the beginning of a work by Cicero:

*“Et Quoniam Eadem Natura Cupidatem Ingenuit hominibus veri inveniendi quod facillime apparet, cum vaui curis, etiam quid in ceolo fiat, scire avemus, his initiis inducti, omnia vera diligimus; id est, fidelia, simplicitia, Constantia, tum vana, falsa, fallendia odimus.” Cicero, De Fin Bot et Mal ii. 14.*

*“ And more as much as nature itself has implanted in man a craving after the discovery of truth, (which appears most clearly from this, that, when unoppressed by cares, we delight to know even what is going on in the heavens,) – led by this instinct, we learn to love all truth for its own sake; that is to say, whatever is faithful, simple, and consistent, while we hold in abhorrence whatever is empty, deceptive, or untrue”.*

What joy this brings to me to imagine. A symphony is a work brought about by the collective music of dozens of souls, who breath the same air, speak the same language, and hear their results at the moment the bow hits the string. And yet what greater symphony is this – this music of the mind that travels through time, through generations, and achieves its culmination only within minds separated by death, yet resonating with the same life, the same energy, as if they were in the same room. Truly books defy time, and this collection of ancient books defies time, space, and the distance provided by civilizations long-fallen, disbanded, re-assembled, and reconstituted by political masters. The scholar is the ultimate

subversive – lying in the shadows, and casting out his words for another scholar to discover centuries later.

### **A date with a book**

After dining luxuriously on Tony's Pizza in San Marino (it an institution of considerable sentimental value for me) and spending some time gazing on the faded 1970's posters of Italy on its walls (Trieste, Napoli! They announce) I am back. The entire drive through the city I await my appointment with excitement. Three books have been summoned for me – Herschel, Manilus, and Northrup. The oldest is from 1797. They await me inside the library, like a set of performers rehearsing before the concert, and I approach them with the same anticipation. What will I learn? Will I be worthy to be in the presence of these minds? I truly feel humbled – for an academic secular humanist, this is the closest place to a cathedral I can imagine, and I feel truly reverent in this place.

And the results:

A small box; green cardboard, holds my first treasure. The binding is shot, and the pages a bit faded. The box protects it, as does the soft velvet cradle I am issued in which to view the text.

**“Manilus in English”** – my first volume. I am greeted with an inside cover in which a crowd of people are drawn gathered at the shore of an ocean in which many boats are floating densely like bath toys. The engraved pen and ink art shows a distant cloud in which strange angular lightning bolts protrude like bent wires, contained within a peculiar central aperture of the cloud, the cloud itself appearing something like a fuzzy hat that the Russians would wear. To the left the sky is filled with dark and sharply drawn objects; a small bag of some kind, a hat with ribbons dangling, a sword, a bugle, and three crowns fall, on the flag are the words “Naftentes morimur”. A few stars are visible. Among the items are money, and tools – a hammer, a clock, a musical instrument. The people look content, grateful, and busy gathering the things fallen to the ground.

The full title is “The five books of Manilius – containing a system of the ancient astronomy and astrology, together with the philosophy of the stoicks. Done into English verse. With notes.” Of course being a good modern scholar, I did the only reasonable thing to find out more. I checked Wikipedia:

## Marcus Manilius

From Wikipedia, the free encyclopedia

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**Marcus Manilius** (fl. [1st century AD](#)) was a Roman [poet](#), [astrologer](#), and author of a poem in five books called *Astronomica*.

The author is neither quoted nor mentioned by any ancient writer. Even his name is uncertain, but it was probably Marcus Manilius; in the earlier books the author is anonymous, the later give Manilius, Manlius, Mallius. The poem itself implies that the writer lived under [Augustus](#) or [Tiberius](#), and that he was a citizen of and resident in [Rome](#). According to [Richard Bentley](#) he was an Asiatic Greek; according to F. Jacob an African. His work is one of great learning; he had studied his subject in the best writers, and generally represents the most advanced views of the ancients on [astronomy](#) (or rather [astrology](#)).

Manilius frequently imitates [Lucretius](#), whom he resembles in earnestness and originality and in the power of enlivening the dry bones of his subject. Although his diction presents some peculiarities, the style is metrically correct.

[Firmicus](#), who wrote in the time of [Constantine](#), exhibits so many points of resemblance with the work of Manilius that he must either have used him or have followed some work that Manilius also followed. As Firmicus says that hardly any Roman except [Caesar](#), [Cicero](#) and [Fronto](#) had treated the subject, it is probable that he did not know the work of Manilius. The latest event referred to in the poem is the great defeat of [Varus](#) by [Arminius](#) in the [Battle of the Teutoburg Forest](#) (AD 9). The fifth book was not written until the reign of Tiberius; the work appears to be incomplete, and was probably never published, for it was never quoted by any subsequent writer.

The astological systems of Houses, linking human affairs with the circuit of the [Zodiac](#), have evolved over the centuries, but they make their first appearance in *Astronomicon*. The earliest datable surviving horoscope that uses houses in its interpretation is slightly earlier, c. [20 BC](#). [Claudius Ptolemy](#) (c. AD [130](#) - [170](#)), the father of classical astrology, almost completely ignored houses (*Templa* as Manlius calls them) in his astrological text, *Tetrabiblos*.

Two manuscripts of *Astronomicon* made in the [10th](#) and [11th](#) centuries lay hidden in monasteries, one at Gembloux in Brabant (now in Brussels) and another that has come to rest in the library at Leipzig.

The unknown text was rediscovered by the humanist [Poggio Bracciolini](#) somewhere not very far from Constance, during a break in the sessions of the [Council of Constance](#) that he was attending, in [1416](#) or [1417](#). The *editio princeps* of *Astronomicon* was prepared by the astronomer [Regiomontanus](#), using very corrupted manuscripts, and published in [Nuremberg](#) about [1473](#). The text was critically edited by [Joseph Justus Scaliger](#), whose edition appeared at Paris in [1579](#) and a second edition, collated with much better manuscripts, at Leiden in [1600](#). A greatly improved edition was published by Richard Bentley in [1739](#). The edition of [A.E. Housman](#), published in five volumes from [1903](#) to [1930](#), is considered the authoritative edition, although some may find G.P. Gould's edition for the [Loeb Classical Library](#) (Harvard, 1977) less intimidating.

## External links

[The \*Astronomica\* of Manilius at The Latin Library](#)

[Dr. Shepherd, "Astrological Houses"](#)

[A.E. Housman's introduction](#)

[\[edit\]](#)

## References

*This article incorporates text from the [Encyclopædia Britannica Eleventh Edition](#), a publication now in the [public domain](#).*

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"[http://en.wikipedia.org/wiki/Marcus\\_Manilius](http://en.wikipedia.org/wiki/Marcus_Manilius)"

And from the Manilus text comes a few wonderful quotes:

*“Open the skies, and teach how stars obey, and run their races as Nature marks the way, their power and influence, what directs their course, what whirls them round, and what confines their force”*

A very nice passage in Book I, page 13, describes the succession of constellations as they move across the sky. I read the entirety of book I, and enjoy the opening scenes of Augustus' Rome and the starry nights, filled with omens and promises about the future. Some interesting passages describe the power of stars to bring down nations, and to cause wars and plagues to occur. Strongly implies the existence of meteors and comets is a sign

of the sky's displeasure and that these correlate with recent (!) events in his time – the fall of 3 divisions in Gaul under Vero, and the civil war at Phillipi.

My next book was “**Astronomy**” by Sir John F.W. Herschel, 1833. John Herschel is William Herschel's son. He was the main British astronomer from about 1822-1833. Magnificent plates at the end show hand-sketches of Mars, Jupiter and Saturn, with remarkable detail on the planet surfaces. Tables provide information on the satellites of these planets, including 7 moons of Saturn, possible 6 moons of Uranus. With their sidereal periods indicated. Further plates show beautiful drawings of a star cluster, a comet, galaxies, and a wonderfully precise inverse rendering of the Orion nebula. This at the end of the book. Fantastic.

The print is crisp, well defined, and the text similarly sharply written. Incredible precision is shown in the tables – 12 decimal points in the periods of the moon and other objects; precise distance estimates, and even an illustration of the scale of the solar system which can be assembled on a “bowling field” which gives planets as pinheads, cherries, and mustard seeds for scale. Metonic cycle, Very detailed descriptions of open clusters, globular clusters, telescopic observations of planet disks.

My third book was: “**Earth Sea and Sky**” or the “**Marvels of the Universe**” – “a full and graphic description of all that is wonderful in every continent of the globe, in the world of waters and the starry heavens” by Henry Davenport Northrop, DD. It dates from about 1870. It is filled with lovely ink drawings of creatures, and descriptions of 19<sup>th</sup> century safaris.

It was a wonderful day in the Rare Book room. As I summed up the day, I was struck by a translation from one of the texts of another quote from Cicero (which I happened to translate using Google Translate, and then find in an online Loeb classics volume):

*quamquam tum quidem vel aliae quaedam rationes honestas nobis et curas et actiones darent; nunc autem quid est sine his cur vivere velimus?*

*“although in that case indeed perhaps certain other interests would afford us honourable subjects of thought and honourable fields of action; **whereas now without our present studies what reason have we to wish to be alive?**”*

It is this experience of communication with the past through books that to me speaks of a no less marvelous grandeur than the vastness of space - which comes from our human capacity to share ideas across centuries, across continents and across cultures to spark ideas and inspiration in minds that come after us, and that allows us to share in the thoughts and musing of those from past centuries. Thank you for your attention!

declararem. Fecl igitur sermonem inter nos habitum in Cumano, eum esset una Pomponius. <sup>1</sup> tibi dedi partes Antiochinas: quas à te probari intellexisse mihi videbar: mihi sumsi Philonis. Puto fore, ut, cum legeris, mirere, nos id locutos esse inter nos, quod numquam locuti sumus. sed nostri morem dialogorum. Posthac autem, mi Varro, quam plurima, si videtur, & de nobis inter nos: serò fortasse: sed superiorum temporum fortuna reip. causam sustineat. Hæc ipsi præstare debemus. Atque utinam quietis temporibus, atque aliquo, si non bono, at saltem certo statu civitatis, hæc inter nos studia exerecere possimus. Quamquam tum quidem vel alia quæpiam rationes, honestas nobis & curas & actiones darent: **nunc autem quid est, sine his cur vivere velimus?** Mihi verò cum his ipsis vix: his autem detractis, ne vix quidem. Sed hæc coram, & sapius. Migrationem, & emtionem feliciter evenire volo, numque in ea re consilium probo. Cura ut valeas.

9 DOLABELLA CICERONI S. D.

S. V. G. V. & Tullia nostra rectè V. Terentia minus bellè habuit: sed certum scio jam convaluisse eam. Præterea rectissime sunt apud te omnia. Etsi nullo tempore in susceptionem tibi debui venire, partium causa potius, quam tua, tibi suadere, ut te aut cum Cæsare, nobiscumque conjungeres, aut certe in otium referres, præcipue nunc jam, inclinata victoria, ne possum quidem in ullam aliam incidere opinionem, <sup>2</sup> nisi in eam, in qua scilicet tibi suadere videar, quod piè tacere non possum. Tu autem, mi Cicero, sic hæc accipies, ut, si ve probabuntur tibi, si ve non probabuntur, ab optimo certè animo, ac delectissimo tibi, & cogitata, & scripta esse iudices. Animadvertis, C. Pompejum nec nominis sui, nec rerum gestarum gloria, neque etiam regum, ac nationum clientelis, quas ostentare crebriò solebat, esse tutum: & hoc etiam, quod infimo cuique contigit, illi non posse contingere, ut honestè effugere possit, pulso Italia, amissis Hispaniis, capto exercitu veterano, circumvallato **nunc** denique: quod nescio, an ulli umquam nostro acciderit imperatori. Quamobrem, **quid** aut ille sperare possit, aut tu, animum adverte pro tua prudentia. Sic enim facillimè, quod tibi utilissimum erit, consilia capies. <sup>3</sup> Illud autem te peto, ut, si jam ille evitaverit hoc periculum, & se abdidit in classem, tu tuis rebus consulas: & aliquando tibi potius, quam cuivis, sis amicus. Satisfactum est jam à te vel officio, vel familiaritati, satis factum etiam partibus, & ei reip. quam tu probabas. reliquum est, ubi **nunc est** resp. tibi finis potius, quam dum illam veterem sequamur, si mus in nulla. Quare velim, mi jucundissime Cicero, si fortè Pompejus pulsus his quoque locis rursus alias regiones petere cogatur, ut tu te vel Athenas, vel in quamvis quietam recipias civitatem. Quod si eris facturus, velim mihi scribas, ut ego,

M. CICERO P. DOLABELLÆ, S. D.

10 **N**ON sum ausus Salvio nostro nihil ad te litterarum dare. nec mehercule habebam, **quid** scriberem, nisi te à me mirabiliter amari: de quo etiam nihil scribente me, te non dubitare, certò scio. Omnino mihi magis litteræ sunt expectandæ à te, quam à me tibi. Nihil enim Romæ geritur, quod te putem scire curare: nisi fortè scire vis, me inter Niciam nostrum, & Vidium, iudicem esse. Profer alter (ut opinor) duobus versiculis expensum Nicias: alter Aristarchus hos *ὁμοίους*. Ego, tanquam criticus antiquus, iudicaturus sum, utrum sint *κατὰ τοὺς νόμους*, an *κατὰ τὸν ἔθνη*. Puto **nunc** dicere: Oblitusne es igitur fungorum illorum, quos apud Niciam? & *ἰνγεντιῶν* culinarum cum Sophia Septimia? **Quid** ergo? tu adeo mihi excullam, severitatem veterem putas, ut ne in foro quidem reliquæ pristinae frontis appareant? sed tamen suavissimum *ὁμοίους* nostrum, præstabo integellum: nec committam, ut, si ego eum condemnaro, tu restituas, ne habeat Burfa Plancus, apud quem litteras discat. Sed **quid** ago? cum mihi sit incertum, tranquillone sis animo, an, ut in bello, in aliqua majuscula cura, negotiove versere, labor longius. Cum igitur mihi erit exploratum, te libenter esse risurum, scribam ad te pluribus. Te tamen hoc scire volo, vehementer populum sollicitum fuisse de P. Sullæ morte, antè quam certum scierit. **Nunc** quærere desierunt, quomodo perierit. satis putant, se scire, quod sciunt. Ego ceteroqui animo aequo fero, unum vereor, ne hasta Cæsaris retraxerit.

CICERO DOLABELLÆ

11 **V**EL meo ipsius interitu mallem litteras meas desiderares, quam eo casu, quo sum gravissimè affectus: quem ferrem certè moderatius, si te haberem. Nam & oratio tua prudens, & amor erga me singularis, multum levaret. Sed quum brevi tempore, ut opinio nostra est, te sum visurus, ita me affectum offendes, ut multum à te possim javari: non quòd ita sim fractus, ut aut hominem me esse oblitus sim, aut fortunæ succumbendum putem: sed tamen hilaritas illa nostra, & suavitas, quæ te præter ceteros delectabat, & erepta mihi omnis est. Firmitatem tamen & constantiam, si modò fuit aliquando in nobis, eandem cognosces, quam reliquisti. Quòd scribis, pietatis te mea causa sustinere: non tam id laboro, ut, si qui mihi obtrectent, à te refutentur: quàm intelligi copio, quod certè intelligitur, me à te amari. quod ut facias, te etiam, atque etiam rogo. Ignoscaisque brevitati litterarum mearum. nam & celeriter unà futuros nos arbitror, & nondum satis confirmatus ad scribendum.

CICERO DOLABELLÆ

12 **C**RATULOR Bais nostris: liquidem, ut scribis,

Figure caption: Page from work by Cicero, including the quote *quamquam tum quidem vel alia quæpiam rationes honestas nobis et curas et actiones darent; nunc autem quid est sine his cur vivere velimus?* Which translates to “although in that case indeed perhaps certain other interests would afford us honourable subjects of thought and honourable fields of action; whereas now without our present studies what reason have we to wish to be alive?”