Per Aspera Ad Astra

On The Motivation Of Human To Do Astronomy Or An Apology Of Magic.

Artur J. Dobija

August 27, 2023

Letter to the Reader

> *Οἶδ' ὅτι θνατὸς ἐγὼ καὶ ἐφάμερος· ἀλλ' ὅταν ἄστρων*
> *ἰχνεύω πυκινὰς ἀμφιδρόμους ἕλικας,*
> *οὐκέτ' ἐπιψαύω γαίης ποσίν, ἀλλὰ παρ' αὐτῷ*
> *Ζηνὶ διοτρεφέος πίμπλαμαι ἀμβροσίης.*[1]
>
> Attributed to Ptolemeus as found in his, *Harmonika*

> I know that I am by nature mortal and ephemeral.
> But surrounded by celestial bodies,
> When I track their ever-rushing spirals,
> My feet no longer touch earth, I stand before Zeus himself
> and take my fill of ambrosia, divine fare[2].

What other idea parallels the human interest in the skies above? We had them for a home of those whom we admired the most. Today, roused by their silences, we dare to dream its acclaim.

A dedication, whose enormity is out of grasp for anybody experiencing its fathoms, empowers all the people involved in the utmostly dangerous ventures into the space itself. It is something worth thinking about. What results in landing at the bosom of the Moon and – as we still confide in – a future conquest of Mars, requires meticulous planning and vast resources intended only for the highest humanity's priorities.

We expect such a priority to constitute naturaly only when an existential threat is seriously lurking right at the gates. Yet those kinds of doomsdays, that our current and future space mission prospects to alleviate, still seem distant and unlikely even for children of our children. It is a dedication to a planning far beyond strategic – whoever ascribes utilitaristic intentions for conducting any advanced space research, even today, still may risk cynicysm.

[1] Cristian Tolsa. "The 'Ptolemy' Epigram: A Scholion on the Preface of the Syntaxis". In: *Greek, Roman, and Byzantine Studies* 54 (2014), pp. 687–697, p. 687.

[2] J. Solomon. *Ptolemy Harmonics: Translation and Commentary*. Mnemosyne, Supplements. Brill, 2018, p. xxxvii.

This outline hopes to validate the author's idea, that our interests in the outer space is still worth more than an aim of merciless exploitation it could at one point degrade to. It is unlikely to lift your body into the skies without previously lifting there your mind. Our greedy dream of becoming an interstellar species is already well grounded on an much older inkling, that we have already been begotten as cosmic beings, children at the bosom of this Universe, willing to regain what we once denied.

Let us just for once be surprised before rejecting such an idea (for such a temptation lingers in the contemporary mind) and let us follow an example. Regarding ecology, we already took a similar direction right at our home. What else keeps us motivated to sustain the Earth as habitable as possible for all of its native species if not a well-accepted restituted belief in Mother Nature, Greek Gaia in disguise? Many serious international efforts proves it not to be a mere metaphore or a slogan, proving that something philosophically much more serious must be here at stake.

All the words to come aim at one thing. They are going to propose an idea that parallels the human interest in the skies above indeed. It is the very *interest* itself. How come the modern secular science and utilitarian technology can originate from a speculative fascination of celestial bodies, unreachable by this speculative science's very definition?

There is a lesson to learn from this paradox. Few of us will ever contribute anything substantial to the philosophical or scientific knowledge. Yet the very precious and vital source of it – an interest of who am I in the world – every human carries right above their beating heart.

1

Space research could do very little without devices that are remotely controlled from the Earth. But, before the era of radio, very little could be done to achieve a controlled movement of other object without direct attachments. Yet it was not impossible to give such example, of which our ancestors were very much aware.

Imagine having two musical string instruments – lutes, guitars, violins etc. – whose corresponding strings are perfectly tuned to the same pitch. When a musician plugs one of those strings, the corresponding string of the other instrument starts to *resonate* as well. For us, it is easy to deduce that some kind of energy transmission happens through the waves of the air. However it is much more difficult to explain, why the corresponding string will resonate much stronger compared to the others[3] and why we cannot physically feel this energy, if it results in a force strong enought to move a relatively object (a metal or gut string).

This phenomenon is known to a pre-modern scientific mind as *sympathy* (from ancient Greek συμπάθεια – fellow feeling). Some bodies tend to influence others if they posses similar qualities. This doesn't necessarily relates only to change within the movement (or momentum) but may apply to other qualities as well like state, substance etc.. A famous alchemical operation of turning a common substance into gold was meant to happen only at the right and nontrivial circumstances. Astrology may serve as another example – the independent movement of celestial bodies influences our fate by adressing undisclosed attributes common both to humans and stars.

[3] Let us notice here that other present strings may resonate as well, but more quiet. A string sound is always *complex*, i. e. consisting of more than one frequency. At the same time, a resonating string may pick up any of the frequencies that belong to it's base frequency's overtone series.

In this sense, at the kernel of a sympathetic influence there is a *mystery*, placing itself outside the scope of physics, but still within the context of matter. This domain in between is the domain of the *occult* (from Latin occultus – concealed) and – more strictly speaking – of the *natural magic*[4]. In this strict context, both terms never refer to some kind of "spirituality", but rather to the realm of matter that interactions cannot be explained by any known (and mainly Aristotelian) accepted views on the physics[5].

2

Many mysterious cases of the sympathy have been already "debunked" by the modern science by finding its precise natural cause (gold being a chemical element) or discrediting such a link altogether (astrology). Still, a discovery of another "action at distance"[6] excites professionals and layman – quantum entanglement is a very blunt example of such a well-attested phenomenon.

One of the key differences between an experiment supporting quantum entanglement (for example one measuring spins of electrons distaned by 1.3 kilometers[7]) and the demonstration of the resonance with the lute strings lie in the fact, that the former was done in order to challenge contemporarly upheld theory about certain specific behaviours, while the latter simply exemplified a well-accepted ancient universal principle. It would be too much to claim that the theory of sympathy paved the intellectual way to modern physics, as the traditions of natural magic and modern quantum mechanics have very different backgrounds. However, there are at least two consequences of the older speculative approach that make contemporary findings worth considering.

First, a dare to admire closer the beauty of speculation at one point of the history pushes many philosophers practicians alike, into performing spectacular empirical demonstrations of the theory, expanding the limits of their field.

> Based on the harmonies operating at all levels of existence, the occult philosophy provided a theoretical underpinning for a wide range of experimental activities that not only embraced the production of spectacular mechanical, chemical, and physical effects by engineers and alchemists, for example, but also included the manipulation of human emotions[8].

This commotion results in an empirical experiment, that soon will challenge the supreme validity of the thought experiment and rhetorical argument, laying first foundations for what will result in the industrial revolution, allowing XIX century secular positivism.

Second, only an elaborated and widely acclaimed theory (as natural magic used to be) could prepare at least the phenomenon's common fantasy space,

---

[4] Penelope Gouk. "The role of harmonics in the scientific revolution". In: *The Cambridge History of Western Music Theory*. Ed. by ThomasEditor Christensen. The Cambridge History of Music. Cambridge University Press, 2002, pp. 223–245, p. 224.

[5] Ibid., p. 224.

[6] Ibid., p. 231.

[7] B. Hensen et al. "Loophole-free Bell inequality violation using electron spins separated by 1.3 kilometres". In: *Nature* 526.7575 (Oct. 2015), pp. 682–686.

[8] Gouk, "The role of harmonics in the scientific revolution", p. 227. The "manipulation of human emotions" does not end on advices how to act out a touching performance:

> Masques and weddings [...] commisioned for dynastic weddings and other royal occasions [...] deployed complex machinery for in the creation of visual and aural effects that astonished and moved their audiences even while affirming prinely power (ibid. p.227).

enabling enought motivation for a contemporary thinker to even consider a peculiar phenomenon worth taking account of. The authors of the electron entanglement experiment support John Bell's argument

> that no theory of nature that obeys locality and realism can reproduce all the predictions of quantum theory[9].

Using this argument to support the historical validation of the natural magic and sympathy would be absurd. What counts here is that this argument's *structure* is able to appear at all, partly because a distant, but similar concept already used to vividly function. A similar statement, if raised in XIX century, would be regarded as utterly pseudo-scientific, because another theory structure roughly alike – sympathy – had been by then just freshly rejected.

3

Because a serendipity surprises so much, we tend to forget how much of a preparation it takes to foster people's will to devote to them. We shall now strengthen this point by asking a completely diffent, but still related question.

On Wikipedia, we can check that *each month* since the year 1830, there is page devoted to ships that sunk that particular month[10]. Each of those pages list numerous shipwracks at once. How come that we mostly remember only the disaster of a very particular one – *Titanic*?

If the answer focuses on the dismay of this unfortunate event, this dismay must already carry along a large impedimenta of expectations. Those must have stuck much before the disaster.

> The sinking of the *Titanic* had a traumatic effect, it was a shock, 'the impossible happened', the unsinkable ship had sunk; but the point is that precisely as a shock, this sinking arrived at its proper time – 'the time was waiting for it': even before it actually happened, there was already a place opened, reserved for it in fantasy-space. It had such a terrific impact on the 'social imaginary' by virtue of the fact that it was expected. It was foretold in amazing detail: "In 1898, author named Morgan Robertson concocted a novel about a fabulous Atlantic liner, far larger than any that had ever been built. Robertson loaded his ship with rich and complacent people and then wrecked it one cold April night on an iceberg. [...] the book was called *Futility* [...] Fourteen years later a British shipping company named the White Star Line built a steamer remarkably like the one in Robertson's novel. [...] Robertson called his ship the *Titan*; the White Star Line called its ship the *Titanic*'[11].

Within the realm of the history of science, a similar (and possibly less devastating) phenomenon is described: a multiple discovery[12]. The traumatic example of *Titanic* expands the instant of a discovery into a sort of continuous experience of participating right within the transmission of ideas. In this light, trauma or eureka moments are more like a clear realization of this transmission, allowing those ideas to outlive us and be – finally – articulated and passed over.

---

[9] Hensen et al., "Loophole-free Bell inequality violation using electron spins separated by 1.3 kilometres", p. 682.

[10] `https://en.wikipedia.org/wiki/Lists_of_shipwrecks`

[11] S. Žižek. *The Sublime Object of Ideology*. Phronesis (London). Verso, 1989, p. 75-76. Quote from Walter Lord's *A Night to Remember* after ibid. p. 75-76

[12] `https://en.wikipedia.org/wiki/List_of_multiple_discoveries`

The last example shall make this point even clearer. A paradox of Thomas S. Kuhn idea of the "Copernican Revolution", is that his own description of Copernicus grounds him as conservative mediator between the Neo-platonic solar revelation[13], Christian monoteistic appraisal of the Heighest Godmand and a *mathematicus*, at the same time mastering the art of astronomy and astrology – a pinnacle of his studies. Hence, Copernicus crosses intellectual traditions, that could rarely be called "Revolutionary'. In the center of the Universe reigns the Sun[14] – by extension Neo-platonic Apollo, by extension Apollonian Christ, at last throned on his rightfull solar throne.

Here we end our journey. We sketched here some amusing features of the human motivations to study the sky. We tried to emphasise similarities and differences between the science right before its Revolution. Many things we skipped: a Ptolemaic division of knowledge into practical and theoretical (and why astronomy is the latter); Metochites' cosmic kythara and advice for astronomers to study music first; Harmony (or Canonincs) that – understood by Boethius as music – let us, meek people, share the same attributes as stars and rotatons of the spheres; Copernicus (alleged) poem to the Seven Stars and Christ as their king, Kepler's universe singing sacred polyphony. I aimed at paying respect to the dormant ideas that allowed the Scientific Revolution to happen. Let's awake them when time will come.

[13] T.S. Kuhn. *The Copernican Revolution: Planetary Astronomy in the Development of Western Thought*. A Harvard Paperback. Harvard University Press, 1957, p. 131.

[14] Ibid., p. 131.

“

O stelliferi conditor orbis,
qui perpetuo nixus solio
rapido caelum turbine uersas
legemque pati sidera cogis,
ut nunc pleno lucida cornu
totis fratris obuia flammis
condat stellas luna minores,
nunc obscuro pallida cornu
Phoebo propior lumina perdat
et qui primae tempore noctis
agit algentes Hesperos ortus
solitas iterum mutet habenas
Phoebi pallens Lucifer ortu.
Tu frondifluae frigore brumae
stringis lucem breuiore mora,
tu cum feruida uenerit aestas
agiles nocti diuidis horas.
Tua uis uarium temperat annum,
ut quas Boreae spiritus aufert
reuehat mites Zephyrus frondes,
quaeque Arcturus semina uidit
Sirius altas urat segetes:
nihil antiqua lege solutum
linquit propriae stationis opus.
Omnia certo fine gubernans
hominum solos respuis actus
merito rector cohibere modo.
Nam cur tantas lubrica uersat
Fortuna uices? Premit insontes
debita sceleri noxia poena,
at peruersi resident celso
mores solio sanctaque calcant
iniusta uice colla nocentes.
Latet obscuris condita uirtus
clara tenebris iustusque tulit
crimen iniqui.
Nil periuria, nil nocet ipsis
fraus mendaci compta colore.
Sed cum libuit uiribus uti,
quos innumeri metuunt populi
summos gaudet subdere reges.
O iam miseras respice terras,
quisquis rerum foedera nectis!
Operis tanti pars non uilis
homines quatimur fortunae salo.
Rapidos, rector, comprime fluctus
et quo caelum regis immemsum
firma stabiles foedere terras[15].

”

Boethius, *De Consolatione Philosophiae V*

[15] https://faculty.georgetown.edu/jod/boethius/jkok/1m5_t.htm

> Founder of the star-studded universe, resting on Thine eternal throne whence Thou turnest the swiftly rolling sky, and bindest the stars to keep Thy law; at Thy word the moon now shines brightly with ful l face, ever turned to her brother's light, and so she dims the lesser lights; or now she is herself obscured, for nearer to the sun her beams shew her pale horns alone. Cool rises the evening star at night's first drawing nigh: the same is the morn ing star who casts off the harness that she bore before, and paling meets the rising sun. When winter's cold doth strip the trees, Thou settest a shorter span to day. And Thou, when summer comes to warm, dost ch ange the short divisions of the night. Thy power doth order the seasons of the year, so that the western breeze of spring brings back the leaves which winter's north wind tore away; so that the dog-star's heat makes ripe the ears of corn whose seed Arcturus watched. Naught breaks that ancient law: naught leaves undone the work appointed to its place. Thus all things Thou dost rule with limits fixed: the lives of men alone dost Thou scorn to restrain, as a guardian, within bounds. For why does Fortune with her fickle hand deal out such changing lots? The hurtful penalty is due to crime, but falls upon the sinless head: depraved men rest at ease on thrones aloft, and by their unjust lot can spurn beneath their hurtful heel the necks of vir tuous men. Beneath obscuring shadows lies bright virtue hid: the just man bears the unjust's infamy. They suffer not for forsworn oaths, they suffer not for crimes glozed over with their lies. But when their will is to put forth their strength, with triumph they subdue the mightiest kings whom peoples in their thousands fear. O Thou who dost weave the bonds of Nature's self, look down upon this pitiable earth! Mankind is no base part of this great work, and we are tossed on Fortune's wave. Rest rain, our Guardian, the engulfing surge, and as heaven rule, with a like bond make true and firm these lands[16].

References

Gouk, Penelope. "The role of harmonics in the scientific revolution". In: *The Cambridge History of Western Music Theory*. Ed. by ThomasEditor Christensen. The Cambridge History of Music. Cambridge University Press, 2002, pp. 223–245.

Hensen, B. et al. "Loophole-free Bell inequality violation using electron spins separated by 1.3 kilometres". In: *Nature* 526.7575 (Oct. 2015), pp. 682–686.

Kuhn, T.S. *The Copernican Revolution: Planetary Astronomy in the Development of Western Thought*. A Harvard Paperback. Harvard University Press, 1957.

Solomon, J. *Ptolemy Harmonics: Translation and Commentary*. Mnemosyne, Supplements. Brill, 2018.

Tolsa, Cristian. "The 'Ptolemy' Epigram: A Scholion on the Preface of the Syntaxis". In: *Greek, Roman, and Byzantine Studies* 54 (2014), pp. 687–697.

Žižek, S. *The Sublime Object of Ideology*. Phronesis (London). Verso, 1989.

[16] https://mylatinnotebook.wordpress.com/2012/04/06/de-consolatione-philosophiae-o-stelliferi-condit