

SCIENCE EDUCATION: DWELLING IN KEPLER'S 'TEMPLE OF URANIA'

Dr Maurizio Toscano
The University of Melbourne, Australia

Abstract

How can we begin to imagine a post-modern rendering of science education when the disciples of science continue to cling so firmly to a creation myth in which Science, like Botticelli's Venus stepping forth from a clam shell, breaks away from the pre-modern metaphysical commitments of religion, magic and the superstition in a singular event called the Copernican Revolution? Like Heidegger returning to pre-Socratic philosophy in order to re-examine the question of being, I want to argue in this paper for the possibility of finding in a re-telling of this 'birth of Science' some trace of the how science might have differently addressed the question of its relationship with metaphysics, especially the metaphysical commitments we now associate with Modernity. To this end, I explore the legacy of the Johannes Kepler, whom I argue exemplified an orientation towards 'science' that more fruitfully captures the post-metaphysical conceptualization of science called for in the later works of Martin Heidegger. By drawing links between the works of Kepler (as exemplary of the 'beginning' of Science) and Heidegger's (as an articulation of the culmination of science), I want to demonstrate how science education in particular can usefully serve as the means of re-discovering in science, as students so often do, the process of what Heidegger refers to as 'dwelling'.

Cosmology and the problem of metaphysics

This paper has its origins in an educational experience. More precisely, a workshop I have run with pre-service science teachers on a regular basis for more than a decade now. The workshop centers on an activity that takes as one of its premises the claim that pre-service science teachers, by virtue of their extensive formal education, along with their professional and general life experiences, and their unprecedented access to knowledge, are amongst the most learned individuals in contemporary Western society. The second premise upon which the activity is based is the claim that one could, in principle if not practice, seek out the most learned person from any civilization, in any geographical location – past or present – and ask them to put forward a view of the cosmology that holds sway for his or her people. The crux of the activity is to have science teachers, in their capacity as learned individuals, to articulate what constitutes the cosmology of the present age; and furthermore to find a way of representing that cosmology using text and or imagery.

In addition to making explicit to students the two aforementioned claims justifying their qualification for the task at hand, I also present them – in a necessarily abbreviated way – an example of such a singular cosmological view. The example I present them with is a visual representation of the cosmology expressed in Dante Alighieri's epic, three-volume poem: *The Divine Comedy*. By way of visual representation, I take A. Mathai's depiction of the architecture of the 'Comedy'. In this picture we have the conical, subterranean circles of hell leading to the devil at the geographic center of the earth; the path from hell through the earth to the mountain of purgatory at the nadir of Jerusalem; the path of ascent through the crystalline spheres that carry to the planets across the sky; and finally the realm of the Empyrean – the seat of God in heaven beyond the sphere that carries the fixed stars. I make the point that this 'architecture' is itself a fusion of the Aristotelian and Ptolemaic cosmological models with Judeo-Christian theology, but that is only half the story I wish to convey with this example.

What is missing from this visual representation of *The Divine Comedy*, but which is central to the poetic work itself is the presence of human beings. One would need a microscope to interrogate the

'postcard' view of *The Divine Comedy* to begin to see very *human* souls that cover every surface of this architectural space. The *Divine Comedy*, having been written at a time when late medieval thinking and early renaissance thinking were blended like watercolors on wet paper, represents an attempt to conflate earthly matters with the divine order. What the architecture of the 'postcard' view captures is a sense of physical and metaphysical hierarchy: a place for everything and everything in its place. What it fails to depict is that it is not just entities that have some location proper to their nature, but also people. We must recall that Dante's poem is, crudely speaking, an exercise in locating the very real, flesh-and-blood, Florentines of his time into this divine architecture: each soul was a real person, whose condition in the metaphysical space brought us in communion with the lesson to be gained from that person's narrative in the mundane and political life of northern Italy in the early 1300's.

The introduction of Dante's cosmological epic poem at the outset of this exercise is meant to make explicit what I take as the distinction between two different readings of 'cosmology'. For pre-service science teachers, cosmology is read primarily as a sub-discipline of the sciences; one that deals ostensibly with accounts of the spatial-temporal realms far beyond the earth – and often associated with describing the full extent of physical reality and the full extent of our temporal understanding of the historical, the present and the future narrative of the evolution of the universe as a whole. With such a view in mind it is for them 'the scientist' that must take up the mantle of the learned person, albeit one confined by the limits imposed by the practices and assumptions of science, as they understand them. The second reading of cosmology, which is captured by Dante's epic poem, seeks instead to locate humans within the architecture of the universe insofar as this spatial-temporal architecture serves both as an account of what is (that is, the ontological dimension of the universe) and the source of all existential significance – the highest being (that is, the theological dimension of the universe). The distinction might properly be cited as the distinction between physics and metaphysics. Indeed, for Heidegger, that which serves both an understanding of the ontological and theological aspects of being – the ontotheological – is precisely metaphysics:

If we recollect the history of Western-European thinking once more, then we will encounter the following: The question of being, as the question of the being of entities, is double in form. On the one hand, it asks: What is an entity in general as an entity? In the history of philosophy, reflections which fall within the domain of this question acquire the title ontology. The question "What is an entity" simultaneously asks: Which entity is the highest entity, and in what sense is it? This is the question of God and the divine. We call the domain of this question theology. This duality in the question of the being of entities can be united under the title ontotheology. (Heidegger, 1976, p. 499; quoted in Thomson 2005)

It would be tempting to think that the pedagogical merit or purpose of this task is to bring into sharper relief the distinction between physics and metaphysics, as if physics itself were somehow immune to any metaphysical commitments. Quiet the contrary. This exercise aims to make more explicit for science teachers the role that metaphysics plays in the very construction of physics as a way of knowing, doing and being that has, supposedly, overcome the influence of metaphysics. More precisely, this view of physics aspires to an encounter with the ontological that has simply done away with its theological baggage. Such a view of physics, while claiming to provide the now infamous "view from nowhere" – and therefore abolishing the need for the privileged perspective and authority of theological being, nonetheless cannot completely claim to provide a "view by nobody" (or more philosophically a "view from a non-being"). An oversimplified gloss of Heidegger's *Being and Time* that takes him as giving an accounting of *Dasein* (as the being for whom the question of being is an issue for it) is useful in this respect; for one does not need to replace the "view from God" with "the view from humans" (or a "view from nothing") in order to overcome the theological (or ontological) burden of metaphysics – it may be possible for a "view from *Dasein*" to help constitute a post-metaphysical condition.

This temptation to bifurcate metaphysics-as-ontotheology and deal only with the apparently God-free ontology of the cosmology (physics) plays out in pre-service science teachers' most typical attempts at the exercise so described. Drawing upon their general knowledge of science, pre-service science teachers present cosmological models that amount to a taxonomy or zoo of astronomical and

cosmological entities. Typically there is at the center of the page a representation of our Solar System, with concentric circular orbits about a central Sun. Just a little beyond this central motif there is typically a 'gap' followed a region filled in equal measure, and dispersed at random, both with stars and galaxies. Reserved for the edges of the page are various ways of representing the 'edge' or 'limits' of the universe. For most, this region is occupied with question marks – these too distributed at random like the stars and galaxies in the middle-distance. This is an attempt perhaps to show the limits of their (or our) understanding of the extent of the universe beyond that which is immediately accessible either to the sense or to the senses extended considerably by the technological instruments of science. Others are more confident in making the limit explicit, choosing instead to draw a closed (and usually dotted) line around the outer section of the page and label it with question marks. It is interesting to note that representations of this kind appear to break the cosmos up into two regions: the 'near' and the 'far'. The boundary between these two regions is marked by the ubiquitous 'gap' between the Solar System and the rest of the universe: as if in a post-Copernican age, it is no longer the lunar sphere that demarcates the mundane from the divine, but rather the edge of our secular Solar System – the Solar System is the new 'earth' in an every expanding re-writing of the Copernican revolution. However, since we know this boundary to be arbitrary from scientific perspective, we are left with the feeling that even the most remote parts of the cosmos (including the region full of question marks) are immediately available to us as a scientific resource.

The distinction between near and far is crucial here for understanding how this seemingly secular and overtly physical picture of the cosmos comes to betray the metaphysical commitments at play. For Heidegger, what still holds sway for us in the present epoch, and perhaps most especially for those like pre-service science teachers that are inducted into the sciences, is the metaphysics of modernity (with its penchant for calculation) and the metaphysics of technology (with its reduction of all entities to mere resources). Heidegger saw the influence of metaphysics in the confusion between what might be called "existential" proximity and "technological/modern" proximity, respectively. Heidegger illustrates with examples, in his essay on *The Thing*, the way in which our modern/technological metaphysical conditioning has afflicted us with such confusion:

All distances in time and space are shrinking. Man now reaches overnight, by plane, places which formerly took weeks and months of travel. He now receives instant information, by radio, of events which he formerly only learned about only years later, if at all. The germination and growth of plants, which remained hidden throughout the seasons, is now exhibited publicly in a minute, on film. Distant sites of the most ancient cultures are shown on film as if they stood this very moment amidst today's street traffic. Moreover, the film attests to what it shows by presenting also the camera and its operators at work. The peak of this abolition of every possibility of remoteness is reached by television, which will soon pervade and dominate the whole machinery of communication. (Heidegger, 1977, p. 163)

Heidegger refines the issue a little later in the essay, like this:

Yet this frantic abolition of all distances brings no nearness; for nearness does not consist in shortness of distance... What is nearness if it fails to come about despite the reduction of the longer distances to the shortest intervals? What is nearness if it is even repelled by the restless abolition of distances? What is nearness if, along with its failure to appear, remoteness also remains absent? (Heidegger, 1977, pp. 163-4)

The ease with which pre-service science teachers are able, in the current epoch, to access immediately the remoteness of cosmological entities (bringing the very remote entities 'near'), while simultaneously divesting them of any personal and existential significance (keeping them 'remote'; distant from any authentic concern), underscores Heidegger's view that technology creates a kind of leveling of what is 'technologically' near and far, respectively. Technology actively undermines the existential significance that we should properly ascribe to entities when we use the word 'near' (as in the phrase, "near and dear"). The pre-service science teachers have not used their experiences and knowledge to secure a 'world picture' free from metaphysics but instead ensured that: "Everything gets lumped into uniform distancelessness" (Heidegger, 1977, p. 164). Their metaphysical commitment – we should say, *our* metaphysical commitment – shows up in this way.

Metaphysics and the learned individual

Such an interpretation of pre-service science teachers' typical responses to the task of representing a learned contemporary's cosmology goes some way to showing how metaphysical commitments hold sway even over that which we unthinkingly take to be scientific, secular, objective and non-metaphysical representations of the universe. What this view suggests is a strong relationship between the forces of metaphysics and scientists' accounts of (and accounting for) the knowledge claims and practices of science. This philosophical perspective raises a number of questions concerning education, if for no other reason that the premises for the activity described above refer specifically to a learned person. Moreover the learned person in question is not only defined in terms of the expectation that they can know what is the cosmology that best captures the entirety of human experience and existence, but also that they are in a position to convey it, teach it, or better said live it out. Admittedly, this seems to give such a learned individual a status above what we might call the mere educator and the merely educated.

Here there are immediate parallels that can be drawn between the role and status of the learned person and Heidegger's rendition of the work of philosophers in his essay dealing with Nietzsche's attempts to overcome metaphysics. Heidegger relates metaphysics to the work of philosophers thus:

...metaphysics is thought as the truth of what *is* as such in its entirety, and not as the doctrine of any particular thinker. Each thinker has at any given time his fundamental philosophical position within metaphysics. Therefore a particular metaphysics can be called by his name. However, according to what is here thought as the essence of metaphysics, that does not mean in any way that metaphysics at any given time is the accomplishment and possession of the thinker as a personality within the public framework of creative cultural activity. In every phase of metaphysics there has been visible at any particular time a portion of a way that the destining of Being prepares a path for itself over and beyond what is, in sudden epochs of truth. [Original emphasis] (Heidegger, 1977, p. 54)

I read this passage as putting forward three theses, which I want to use to explore further the nature of education (becoming a learned person) and its relationship to both metaphysics and the possibility of overcoming metaphysics.

Firstly, according to Heidegger no doctrine by any individual thinker can fully capture the metaphysical conditioning that holds sway at any particular time. Every philosopher's thinking captures only a part of the conditioning metaphysics. Hence philosophers give us access to only "a portion of a way that the destining of Being prepares a path for itself". I shall call this the philosophical *incompleteness thesis*.

Secondly, I take Heidegger's reference to "the thinker as a personality within the public framework of creative cultural activity" as opening the door to the possibility that "the public framework of creative cultural activity" affords more than just philosophers the opportunity to reveal aspects of the metaphysics of a particular epoch. I refer to this as the *pluralist thesis*. Permitting this kind of pluralism in the expression of metaphysics works against the exceptionalism implied by the distinction between the learned person and the merely educated person cited earlier. So if we were to uphold the view that certain people were better attuned to, more strongly influenced by, or are better capable of articulating the dominant metaphysics, then we would need to locate it in a place other than "the public framework of creative cultural activity".

Thirdly, and quite explicitly in Heidegger's view, the dominance of a particular metaphysics holds sway across a particular historical period or epoch. Moreover, we can move quite suddenly from one epoch to another (in a way that is perhaps analogous to Kuhn's paradigm shifts in the sciences). I shall

refer to this as the *epochal thesis*.

These three theses point to the difficulty, if not the apparent impossibility, of any individual overcoming metaphysics. If no single philosopher can lay claim to knowing which precise metaphysics holds us in its grip (*the incompleteness thesis*), then we must abandon hope that an individual philosopher can show us the metaphysical landscape in which we wander and take us instead towards a place free from metaphysics altogether – a place that Nietzsche's madman in declaring the death of God saw but never reached. If this task is beyond the individual philosopher, then we might also exclude any 'philosopher' that chooses to call herself by another name: 'artist', 'Natural Philosopher', 'scientist', 'teacher', 'prophet', etc. Finally we also seem doomed by the relativism (in the context of "the public framework of creative cultural activity") introduced by the *pluralist thesis*. If there is any hope for conceiving of education in terms of becoming a learned individual that overcomes metaphysics, then we may have to find this is an individual's capacity to reject the confinement and historicity of the epochal nature of metaphysics.

In the next sections, I want to show, with reference to the work of Johannes Kepler, that not only is such an individual, existential condition free from (epochal) metaphysics possible, but also amounts to what Heidegger calls *dwelling*.

Johannes Kepler and the Scientific Revolution

Earlier I described how my motivation for examining the relationship between metaphysics and the scientifically learned person came from an workshop activity that asked pre-service science teachers to give an account of contemporary cosmology with the view to making explicit their (our) ontotheological – that is metaphysical – commitments. While typically pre-service science teachers do not find the means to fully and explicitly articulate the metaphysics that holds sway for them as contemporary scientists, nonetheless I have tried to argue that the 'leveling' of the 'near' and 'far' evident in their representations of the cosmos gives us some grounds for claiming that their attempts at representing a cosmology betray their commitment to the modern and technological metaphysical epochs described by Heidegger. The *philosophical incompleteness* and *pluralist theses* would suggest that we take a charitable view on any educated person's capacity to give expression to the metaphysics in its entirety. If we accept that this principle of charity should apply to our understanding of the influence of current metaphysical epoch, then it may be reasonable to assume that there are limitations on the extent to which individuals can identify historical epochs as well, not to mention the "sudden" transitions between epochs.

If we accept the *pluralist thesis* and allow for metaphysical epochs and their transitions to show up for us through the thoughts of individuals beside philosophers, then the history of metaphysics is perhaps juts as likely to show up in the epochs and changes associated with other ways of thinking. While there is any number of candidates for such an historical inquiry into metaphysics – for instance, we might examine our changing ideas regarding medicine – for the purpose of this current paper, I wish to focus on the *Scientific Revolution* that took place during the 16th and 17th Centuries in Western Europe. While the title *Scientific Revolution* rolls easily enough off the tongue and glosses over an exceptionally complex period of Western human history, I beg the reader to allow such as gloss in order to bring to the fore the exceptional life of a person from this period.

Part of what constituted the *Scientific Revolution* was a shift in Western thinking about the cosmos – what is popularly called the *Copernican Revolution*. The popular summary of this revolution has it that Copernicus, in developing a cosmological model with the Sun at its center rather than the earth, made a fundamental break with the cosmology of antiquity. Additionally, this view has it that Galileo, armed with Copernicus' heliocentric model, was able to (much to his detriment) challenge the divine authority invested in the Church; and thereby usher in the completely secular thinking we call science today: a secular way of thinking about the cosmos that culminated in Newton's clockwork universe governed by physical laws that found expression in mathematics. While this brief account of the

Scientific Revolution might suffice for a popular reading of the history of science – and incidentally, is often what passes as the most complete account of the *Scientific Revolution* that science teachers can offer – the details show that the transition from classical science to modern science was not so clear-cut. Nowhere is this most evident than in the life work of Johannes Kepler.

The thinking with respect to cosmology at the beginning of the 16th Century was markedly different from that towards the close of the 17th Century. The classical interpretation of cosmology at the beginning of the *Scientific Revolution* was largely dominated by mathematical and geometric accounts of celestial phenomena (the positions of the planets across time against the backdrop of fixed stars). Essential to this mathematical work was the Platonic metaphysics that introduced the distinction between the imperfect affairs available to the senses and the perfect forms, which were accessible *a priori* through mathematics. The result was that cosmology became the discipline of finding a perfect mathematical cosmology. Out of this mathematical neo-Platonism emerged the cult of the perfect circle from which the entire mathematical cosmos was to be fashioned. That Copernicus largely held firmly (along with Galileo and Tycho Brahe) to this classical mathematical-metaphysical cosmology suggests that someone else in the Pantheon of scientific revolutionaries led the 'true' *Copernican Revolution*. Certainly by the end of the 'revolution', the Newtonian clockwork universe had done away with any explicit metaphysical baggage from antiquity by foregrounding a physical, or mechanistic account of cosmology that was accessed through mathematics. Newton secured the universality of mechanistic and physical accounts; such that there were no longer any distinction to be drawn between the physical laws that govern the Moon's orbit say, and those that govern the trajectory of a falling apple.

Yet, it was Johannes Kepler who "...first look[ed] for a universal physical law based on terrestrial mechanical to comprehend the whole universe in its quantitative detail" (Holton, 1954, p. 341) and so it was he who set the stage for the shift from a metaphysical-mathematical rendition of classical cosmology to the physical-mechanistic-mathematical model of modern cosmology. So, unlike Copernicus, Galileo and others, it was Kepler's search for the universal that contributed most to the move towards modern science; or as Bryk puts it:

...The central and permanent contribution lies in this, that for the first time the whole world structure was subjected to a single law of construction, – though not a force law such as revealed by Newton, and only a non-causative relationship between spaces, but nevertheless a single law. (Bryk, 1918, cited in Holton, 1954, p. 342)

One could read this summary as suggesting that Kepler's attempt at developing a universal mechanistic model of the cosmos was original but ultimately fell short of the unification that Newton would later provide. What such a reading misses, though, is the degree to which Kepler achieved a kind of universality that was not possible in either the classical or the modern Newtonian world picture. For Kepler managed to preserve in *his* universal cosmology the presence – in equal measure and status – the mathematical, physical-mechanistic and metaphysical dimensions of reality.

Space here does not permit me to give a full account of how Kepler's cosmological thinking culminated in the tri-unity of mathematical, physical, and metaphysical accounts of the cosmos. Nonetheless, I can offer a sense of this by pointing out how these aspects influenced the development of his famous three laws of planetary motion. Firstly, Kepler's commitment to a mechanistic account led him to model the solar system after the theory of Magnetism introduced by William Gilbert in 1600. Kepler sought a mechanical explanation of planetary motion in terms of the extension of the Sun's magnetic lines of force out to each planet. As the Sun rotates, the magnetic lines of force carry the planets around their respective orbits. The structure of the Sun's magnetic field (to use the modern terminology) would also push the planets closer and further radially, accounting for their elliptical orbits. Kepler's mechanical coupling of the Sun's magnetic influence to the planets had its inspiration in the Christian theological construct of the Holy Trinity in so far as the Sun stood for God the Father; each planet as God the Son; and the volume in between, God the Holy Ghost. Moreover, Kepler's elliptical orbits allowed Kepler to place the Sun (God) firmly in a mathematically 'central' position (at the ellipse focus); and this worked well with his Christian metaphysics. Finally, the mathematical

harmony introduced through Kepler's discovery that the vector to each planet sweeps out equal areas per unit time, more than compensated for the mathematical harmony lost by abandoning the classical commitment to circular orbit.

Metaphysics and time

There are many examples from Kepler's work that seem to capture this interweaving of the mathematical, the physical and the metaphysical. Many scholars take this as an intellectual liability in Kepler's work; asking as it were: How much further could Kepler have gone, how much sooner could we have begun modern science had he not been sidetracked by all this confusion? Or they ask: Where should we place Kepler; was he a classical cosmologist or a modern one? These questions stem from a progressivist conception of time in which each subsequent intellectual epoch represents a significant improvement on the last: after all, one might say, if no improvement occurs how would we know we have shifted from one epoch to another. Reconstructing history using a conception of time whose direction of flow is given by the arrow of progress is arguably a metaphysical commitment in itself. If this is so, then living a life outside of time might readily inoculate us against metaphysics, once and for all. Given this possibility, we could read Kepler's intellectual activity as somehow overcoming metaphysics by remaining timeless – that is, by thinking in such a way that the metaphysical commitments of every age are brought to life simultaneously. Kepler, as the thinker of the *Scientific Revolution*, who seems least like he ought to belong there, might just provide the kind of timeless, post-metaphysical approach to reality that we want to ascribe to the learned individual. So, while never completely free of metaphysics, since the learned person always comes to manifest some part of the metaphysical "path" of the history of Being, by embracing all metaphysical epochs allochronically the learned individual has open to them possibilities of being that can not be exhausted.

In a sense this is perhaps how Nietzsche's "eternal return of the same" is expected to give us a post-modern way of being. Or as Sloterdijk puts it with reference to locating Nietzsche's thought in 'antiquity':

His [Nietzsche's] true date is therefore antiquity – and, because antiquity can only exist in modern times as repetition, neo-antiquity. The neo-ancient antiquity in which Nietzsche locates himself is not meant as a mere programme, something that could be placed on an agenda to meet the needs of today...Agendas provide the forms of work that modernity uses to arrange its steps on the timeline to the future, whether one interprets them as meaningful or empty forward motion...His concept of allochrony...is based on the idea...that antiquity has no need of repetitions enacted in subsequent period, because it 'essentially' returns constantly on its own strength...It [antiquity] is rather a kind of constant present – a depth time, a nature time, a time of being – that continues underneath the theatre of memory and innovation that occupies cultural time. (Sloterdijk, 2013, pp. 30-31)

What we see in Kepler's work is precisely the kind of timelessness that Sloterdijk identifies with Nietzsche's allochrony. And for our present case, it provides the possibility of an individual being simultaneously conditioned enough by metaphysics to allow it to manifest through them – incompletely, pluralistically – and yet allow the possibility of living a perpetually ancient life that affords the embracing of all possible metaphysical epochs. That is, the learned person may be implicated into metaphysics according to the *incompleteness* and *pluralist* theses, but may overcome metaphysics by rejecting the *epochal* thesis.

Kepler's Temple of Urania

In the previous section I argued for the possibility of interpreting Kepler's intellectual contribution to the development of science as an example of the learned person orienting themselves with respect to reality in such a way as to overcome metaphysics while still giving expression to the metaphysics that holds sway in any particular epoch. Moreover, this possibility of being beyond metaphysics shows up in Kepler's intellectual projects: firstly in his comportment towards the many ways of disclosing the world; and secondly by being open to a timeless way of being in the sense carried by Nietzsche's

identification with antiquity.

There is another place in Kepler's work where he makes manifest his openness to multiple ways of being. We see it in the frontispiece to his 1627 publication of *Tabula Rudolphinae* (*The Rudolphine Tables*) (Figure 1). The image, designed by Kepler himself, is dense with allegorical significance and references to the human and political affairs of his day. Although I shall only want to point out some general features of this image to conclude this paper, a detailed description of the image is provided by Ragstedt (2013).

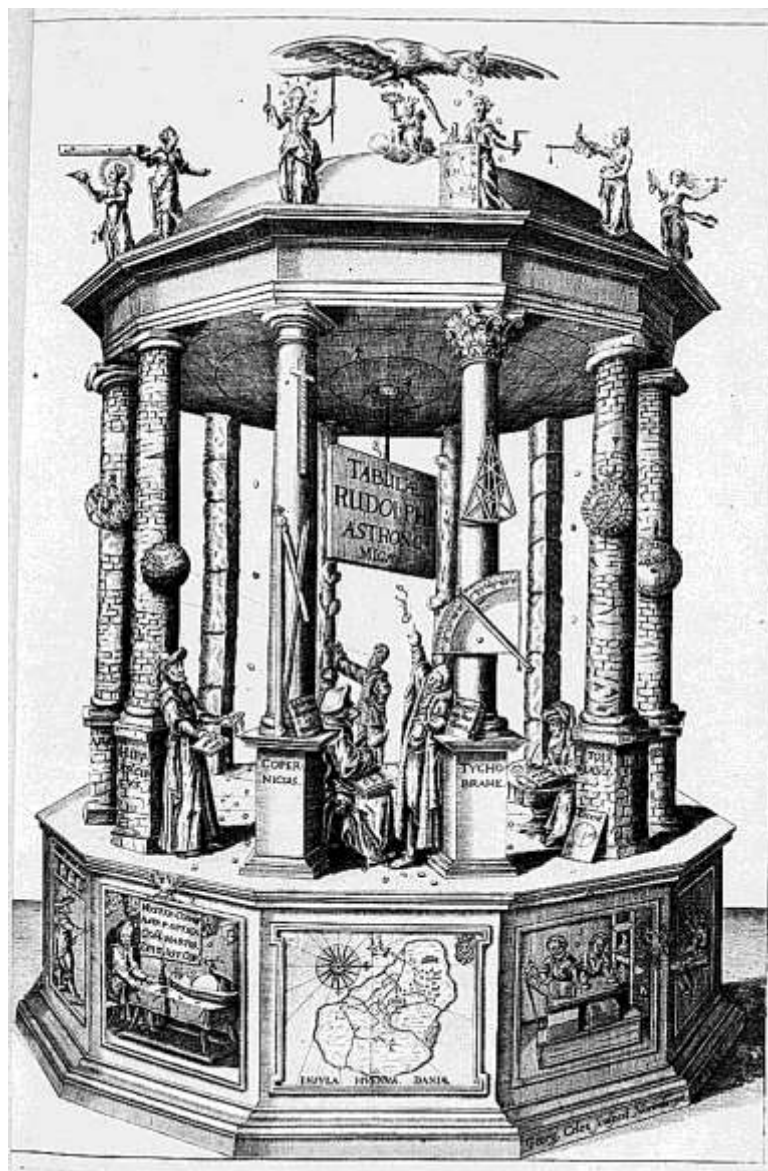


Figure 1. Frontispiece to the *Rudolphine Tables* (1627) designed by Johannes Kepler.

The frontispiece to the Rudolphine Tables is said to depict the *Temple to Urania*, for the image of Urania (the muse of astronomy) takes the most significant position in the temple proper – crowning its dome – and yet playing second fiddle to the imperial eagle that represents the eponymous Holy Roman Emperor Rudolph II. I read the temple as consisting of four main parts: (i) the base; (ii) the figures and columns; (iii) the temple ceiling; and (iv) the gods.

The *Temple of Urania* is a synthesis of the very earthy affairs of human beings along with the heavens and the gods. The base depicts: the 'worldly' island of Hven from which Tycho Brahe's famously accurate astronomical observations were made; Kepler working late into the night; depictions of the publishers and patronage that made the publication of Kepler's work possible – in short a grounded reality. Above this we have a representation of the history of cosmology and the mortals that contributed to each significant period: including, Hipparchus, Copernicus, Brahe and Ptolemy. While the refinement in these cosmological perspectives is depicted in the progression in ornamentation of each column, each column is an equivalent weight bearer – pointing as it were to the allochrony discussed earlier. The columns connect (as much as support) the 'sky'; which appears as the Tychonian model on the ceiling of the temple. And finally we have crowning the temple along with Urania, the muses of mechanics and mathematics. This single image, designed by Kepler himself, does well to capture the timeless synthesis of thought that expresses the metaphysics of the *Scientific Revolution* while not being imprisoned by it.

At the risk of reading too much into Kepler's *Temple of Urania*, I cannot help but point to the parallels between the four parts of the temple described above and Heidegger's four-fold. Heidegger chose 'dwelling' as the word that best captures a non-metaphysical orientation to the world that is opened up by the presencing of the earth, the sky, the mortals and the god-like ones. If Heidegger is correct, then we could surely look to Kepler as an example of the learned individual who overcame metaphysics by learning to dwell in the four-fold *Temple of Urania*.

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