

# Wit[h]nesses of Time, a Note-Book of Hours on an Astrolabe

A partial story halfway through

usturlap  
saat  
mimari çizimde bedensellik  
izdüşümsel oluş  
**astrolabe**  
**timepiece**  
**embodiment in architectural drawing**  
**projective cast**

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Zamanda nasıl seyreder, nasıl dümen tutarız? Usturlaplar, genel tanımıyla, gizli kozmolojik bilgiyi mekansal ve zamansal açılımlarıyla 'okumak' ve yorumlamak konusunda bize rehberlik eden, gök bilimle ilgili araçların en eski ve etkin örneklerinden biri olarak dikkat çekerler. Usturlapların yorumlamaya dayalı, şiirsel ve felsefi düşünsemelere doğru açılan oldukça çeşitli kullanımları olsa da, günümüzde navigasyon ve zaman hesaplamasına dair, nispeten nesnel uygulamalarına karşı daha popüler bir tarihsel ilgi duyulduğu söylenebilir. Bu durumla bağlantılı olarak, usturlapların sıklıkla matematiksel kesinlik ile ilişkilendirildiğini ve "geometrik esaslara dayalı, tutarlı ve geometrik bir alan" (Aiken, 1994, s.341) kurduğu şekilde genel bir kanı olduğunu söyleyebiliriz. Ancak usturlapları öncelikle birer 'çizim' olarak ele almak, usturlaplarla kurduğumuz (ve tarih içerisinde bastırıldığını öne sürebileceğimiz) bedensel ilişkimize dikkat çekebilir; ve böylelikle dünya, gözlemci ve usturlap arasında kurulan çetrefilli mekansal ve zamansal ilişkileri ve bununla birlikte ortaya çıkan mekansal ve zamansal tutarsızlıkları gözler önüne serebilir diye düşünüyoruz. Bu düşüncelerle, bu makalede, çizimi bir dizi "kayıt altına alınmış" mekansal veri bankası olarak ele almak yerine, bedensel olarak içselleştirilmiş bir eylem olarak irdelemek ve bir çizim olarak usturlapla kurduğumuz (bastırılmış) bedensel ilişkimizi açmak istiyoruz. Usturlaplarla kurduğumuz bedensel ilişkimizi, Aby Warburg'a ait *Bilderatlas Mnemosyne*'deki (1924-1929) 'tarihsel olmayan' imge okumasına benzer şekilde, esas olarak iki saat yapısı arasında, analogik ve anakronik bir okuma kurgusu içerisinde tartışmaya açmayı planlıyorum: usturlaplar (8. - 16. yüzyıl) ve John Hejduk'un *Zamanın Çöküşü* (1984). Böylesine bir tarihsel tahayyülün *denklage*'si olarak Warburg'un kullandığı imge panoları yerine, defterlerimi kullanmayı ve "gerçekle kurgu arasında bir yerde devinen" (Rendell, 2007, s.187) tarihsel bir tahayyülü harekete geçirmeyi umuyorum.

How do we navigate in time? Astrolabes, described in general terms, are astronomical instruments that guide us to 'read', 'extract', 'interpret' and 'reflect' on the hidden spatio-temporal cosmological and celestial knowledge. Though they have been known to be adorned with celestial knowledge with manifold uses from practical applications to intellectual, poetic, theoretical reflections, today, there is a wider historical interest in their precision in navigation and in calculating time. Relatedly, these instruments have often been associated with mathematical certainty and with "a uniform, measurable, geometrically structured space" (Aiken, 1994, p.341). Yet, our embodied engagement with astrolabes as drawings seems to have been repressed in time; and the entangled spatio-temporal relations that are set between the universe, the observer, and the astrolabe seem to fly under the radar, as well as the spatio-temporal inconsistencies that come along with it. In this article, rather than taking drawing as a set of "reported" spatial databanks but as an embodied act that is bodily internalized, I would like to focus on our (repressed) embodied engagement with the astrolabe as a drawing. Akin to Aby Warburg's 'not-historical' reading of images in his *Bilderatlas Mnemosyne* (1924-1929), I intend to track this historically repressed survival of embodiment of astrolabes in the form of an analogical and anachronic reading mainly between two time-pieces: astrolabes (8th - 16th century) and John Hejduk's *The Collapse of Time* (1984). Instead of panels of images, I will use my note-books as a *denklage* for such a historical imagination with the hope to set a historical imagination in motion, "located somewhere between fact and fiction." (Rendell, 2007, p.187).

## PROLOGUE

"[...] "Well, you navigate. Like at sea, you search out the constellations and set your course." Putting my head right up close to the carburetor I realized how intricate it actually was. It was hard to imagine that any machine required such subtle curves, or that anyone could cut such a precise course as its construction. "This is a two-barrel carburetor" Bear pointed to one of the holes. "Look at the constellations; see it's geometry; [...] you can't separate those three things anymore, the geometry, structure and story are inside of each other; they are the constellation." Bear [the machinist] had just given me a gift, if I could just remember the sense of those fields, that constellation articulating matter allowing a story to be written in space. I asked, "But how do you navigate? How do you move through those fields and actually locate the bit?" "That takes a long time to answer: What you find depends on what you are looking for and what you need. Let's take a look at your package; what did you bring today?" (Gersten, 1998).

Listening to *Bear*, the machinist, I look into my bundle with the hope of hunting the hours of a particular timepiece: the astrolabe. Shortly, my package will reveal itself hour by hour; meanwhile, the hours on an astrolabe will unfold, compiling perhaps a notebook of hours of its own kind. This short book of hours will slowly unfold with the hope that this journey will not be a narrative that appraises the time of history.

### PROLOGUE 01: Questioning the Historical Genealogy of Astrolabes on the basis of a Uniform Spatio-Temporality

Astrolabes, described in general terms, are astronomical instruments, often referred to as "the instrument of all instruments" that guide us to "read," "extract," "interpret," and

"reflect" on the hidden spatio-temporal cosmological and celestial knowledge. Although these astronomical instruments have been known to be adorned with celestial knowledge, with manifold uses from practical applications to intellectual, poetic, and theoretical reflections (such as site surveys, time-telling practices, catoptric sundials, horoscopic divinations, cosmological omens), today, there is a wider historical interest in their precision in navigation and in calculating time. Among their manifold uses, the interest in the instrumentality of astrolabes as a time-calculator map seems to have stepped forth and paved the way for them to be called the "first computers."

Yet, astrolabes should perhaps be considered primarily as 'drawings' in their own right: they are projections of both the celestial realms and the situated sky, incised on plates, which ultimately work as cosmological instruments. Paul Emmons, author of *Drawing, Imagining, Building* (2019), critically traces various historical trajectories of embodiment in architectural drawing and opens a potential space for the possible reflections of embodied imagination in the future. Emmons, thus, draws our attention to the dangerous but quite common tendency rising with the current computerizations in the field of architectural drawing, as well as Alberto Pérez-Gómez, Louise Pelletier (1997), and many others:

The danger lies within the reduction of practice to production and the ignorance of the vitality of the embodied imagination when the power of the tools is concerned (Emmons, 2019, p.217). The concern felt over the ignorance, exclusion or denial of the embodied imagination demonstrates a pressing urgency against sustaining this imposed classic separation, the immediate historical and philosophical roots of which, as Emmons also mentions, could be traced back to the Enlightenment. Emmons argues that the actuality of architectural drawing demonstrates indeed a more entangled situation compared to what the radically rationalized

theory of architectural drawing claims to construe: Drawing is more than a set of "reported" spatial information (2019, p.13).

Architectural drawing is related with tacit knowledge, "internalized bodily", which "can be difficult to articulate even upon reflection" (Emmons, 2019, p.13). As Brigid McLeer writes on Penelope Haralambidou's drawings, "[...] taking place [...] despite not fully understanding" (as cited in Haralambidou, 2013, p.16). The act of drawing is something that escapes our immediate understanding, that is however bodily experienced, "built up from childhood on top of which we add a modicum of rational knowledge" (Emmons, 2019, p.11). This tacit and enigmatic knowledge is significantly a matter of memory and the "imaginal". As coined by Henry Corbin, "the imaginal" diverges from the imaginary and the fantasy by referring intrinsically to the cognitive power of the faculty of imagination (Frascardi, 1998, p.253).<sup>1</sup>

With projection as an embodied act, it becomes impossible to speak of projection without bodies that engage with(in) it, nor not to hear the voices lurking around it. Emmons mentions a certain "double act of embodiment" in architectural drawing: "Architectural drawing [...] includes both the drafter's physical engagement with a drawing under construction as well as the imaginal body projected into the drawing of a future building" (Emmons, 2019, p.12-13). Emmons, emphasizing embodiment in architectural drawing, traces the origins of projection back to early traditions of on-site drawing and to manifold embodied connections between construction sites and drawing practices. In relation to this, he argues that "drawing was an index of construction" (Emmons, 2019, p.13). It stages a rather entangled situation whereby embodied practices engage with the rational, mathematical and geometrical operations.

With a reference to the etymological roots of projection, derived from *projectum* in Latin,

meaning something that is to "stretch out, thrust out, throw forth" (*proicere, pro- (forward), iacere* (throw, impel)), Emmons argues that 'projective', rather than referring to a specific technique, implies a future open to interpretation and anticipation akin to divination. In his framework, 'projective' drawing is not a descriptive depiction of something that already exists. In relation to this, he argues that 'projective' is an inherent characteristic of architectural drawings and points out that 'projective' oscillates between presence and absence and is related to imaginative acts rather than deterministic ones (Emmons, 2019, p.3-5).

In a similar vein, but approaching from a different perspective, Robin Evans envisions projection not as a single canon of geometry in the discipline of architecture but as a broader issue, inter-situated within an 'expanded field'<sup>2</sup> that concerns design: In this expanded field, projective is that which relates thinking with imagining, imagining with drawing, drawing with building, building with our eyes and hands, our body. It is a slippery, translational field. In Evans's words, "projection operates in the intervals between things, it is always in transitive" (Evans, 1995, p.366). Evans's reading of projection invites us to think of 'projective' as a set of dynamic relations concerning design, not as a mere technical issue of architectural representation. A restricted understanding of projection freezes and assigns 'projection' to be a 'proper' name of a drawing technique, transforming it into 'a proprietorial instrument'.<sup>3</sup>

While astrolabes are canonized as miraculously wondrous instruments, and while their instrumentality has been a major topic for research and reflection, I believe that the embodiedness of astrolabes as drawings seems to have been repressed in time – buried silently underground throughout history. Instead, these instruments have mainly been associated with mathematical certainty and with "a uniform, measurable, geometrically structured space" (Aiken, 1994,

p.341), providing a reliable and almost 'precise' spatio-temporal map of the celestial sphere. As their historical trajectories have been drawn forward to digitalization in architecture, transforming them into very early remnants of computerization in architecture by contemporary researchers, I argue that the entangled spatio-temporal relations that are set between the universe, the observer, and the astrolabe seem to fly under the radar, as well as the spatio-temporal inconsistencies that come along with it.

I believe that rather than viewing astrolabes as mere descriptive technical drawings, they could be discussed in terms of embodiment in architectural drawing. A close reading of our (historically repressed) embodied engagement with astrolabes as a projective and imaginal drawing could help us to speculate on the role of embodied inconsistencies in manifesting time itself. Departing from these questions, in this article, I would like to unfold a discussion that does not rehearse the astrolabe as a 'consistent' spatio-temporal celestial map and does not necessarily locate it historically within the origins of computerization.

### PROLOGUE 02: A Partial Story Halfway Through, a Note-Book of Hours

Aby Warburg, with his unfinished work *Bilderatlas Mnemosyne* (1924-1929),<sup>4</sup> offers an alternative way to read history of art that is not strictly based on formal styles, chronological genealogies and historical significations. Consisting of plates (*Tafeln*) – wooden panels on which images of various kinds, in different size and formats, are pinned to form constellations around certain themes or questions that goes beyond the historical categorizations – the *Atlas* demonstrates the qualities of an "open work", as well as of a work-in-progress (as it actually was). It is the unusual arrangement of images that becomes challenging, rather

than the comprehensive number of images the *Atlas* includes. Through the way the images are put together (not only through the images themselves), the *Atlas* intends to move the reader mentally and calls for a historical imagination.

Warburg's library, built over the years, shows a similar characteristic to his *Atlas*, although it is not visual like the *Atlas*. As described by Warburg's library assistant Gertrud Bing, his library is "a curious combination of museum and laboratory" (Wimmer, 2017, p.249). The constant arranging and re-arranging of the books in the library take into consideration what Warburg calls "*Denkraum*" (a space or place of thinking) or what Bing refers to as "*Denklage*", which could be described as "the situation, the site and constellation of thinking", or "the lay or the layers of thought" (Wimmer, 2017, p.249). The arrangement itself invites the visitor or reader to engage with the embodied, symbolic configuration of knowledge or images in "historical motion".

The process of a never-ending arrangement of images creates anachronic configurations, representing a complex historical time in motion. Since this anachronic configuration of images is open for engagement with the reader, I believe that this anachronism comes with a 'not-yet' condition and transforms into an even more complex model of a non-historical time. While the *Atlas* works beyond institutional and chronological authorial boundaries to make connections beyond the disciplinary borders, the constellation becomes "alive," rather than freezing historical time into a new definite configuration.

Warburg's *Atlas*, although it is not open to be shuffled physically, encourages its reader to engage with it mentally in the manner of playing with cards – yet, perhaps without falling into "a structurally paranoid approach that [...] everything could relate to everything else" (Wimmer, 2017, p.255). Warburg's *Atlas* is primarily concerned with the



repetitive occurrence of certain forms in various images throughout history, and it tries to trace these occurrences by making analogical relations that put these images and forms in historical motion. Thus, it plays with the historical time in an inventive way.

According to Wimmer, the re-definition of history as an intellectual act of imagination "takes us beyond the imperative distinction between *historia* and *history*." (Wimmer, 2017, p.266-267). In relation to this, we may suggest that we may speak of the possibility of a history and an archive that is not conventional, hence not institutive and conservative, but "always a partial story halfway through" (Cheatle, 2013, p.133).

In a similar vein, my speculative reading on astrolabes intends to "explore historical knowledge as an ongoing reconstruction in the present, located somewhere between fact and fiction" (Rendell, 2007, p.187). Akin to Warburg's not-historical reading of images making use of analogical relations, I intend to track the historically repressed survival of embodiment of astrolabes, specifically focusing on the embodied relations between the astrolabe(s), the observer(s), and the universe(s).

My non-historical reading will be in the form of an analogical reading mainly between two time-pieces: astrolabes (8th – 16th century) and John Hejduk's *The Collapse of Time* (1984). Yet, instead of panels of images, I will use my note-books as a *denklage* for such a historical imagination that includes found images, as well as my own drawings and notes (Figs. 1 and 2).<sup>5</sup>

With the hope to set a historical imagination in motion, now, I will proceed with my note-books of hours, and slowly wander in and out.

## 1. HOUR | ... but, how do we navigate? 'But' rises like a monolith

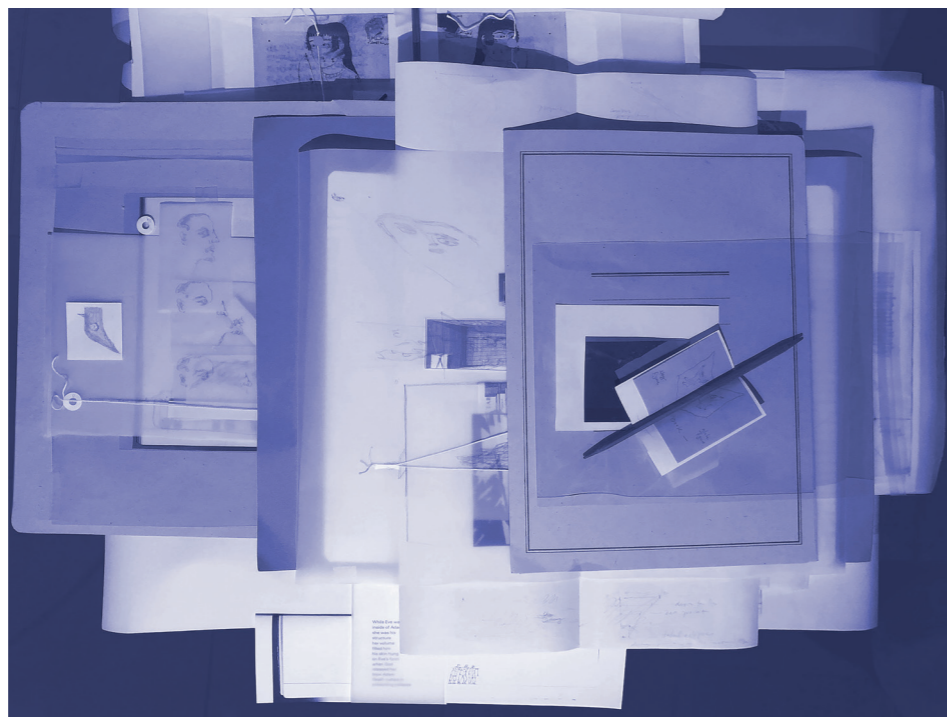


Fig. 1 - Note-Book of Hours by Bahar Avanoğlu (2022).



Fig. 2 - Note-Book of Hours by Bahar Avanoğlu (2022) structured akin to Warburg's *Bilderatlas Mnemosyne* (Panel 39, Final Version of *Bilderatlas Mnemosyne*, the Warburg Institute, School of Advanced Study, University of London, available at <<https://warburg.sas.ac.uk/archive/bilderatlas-mnemosyne/final-version>>).

... But, how do we navigate? Subsequent to a particular period of time of being enraptured by the intricacy of the rotational discs, projected lines, obscure ornaments, numerical inscriptions, intimidatingly detailed tables, and in some cases poetic verses and symbolic inscriptions, this might be one of the questions we ask ourselves the first time we encounter an astrolabe (Fig.3) -

*aşurlāb* in Arabic, derived from Greek, meaning 'taker of the stars' (Morrison, 2007, p.1). And perhaps this might have been the question that haunted the fifteenth century Cairo astronomer al-Wafā'ī and urged him to complain that the Aleppo astronomer Ibn al-Sarrāj did not write any texts on how to use one of his creations, "the most sophisticated astrolabe ever made" (King, 2007, ch.1), and then

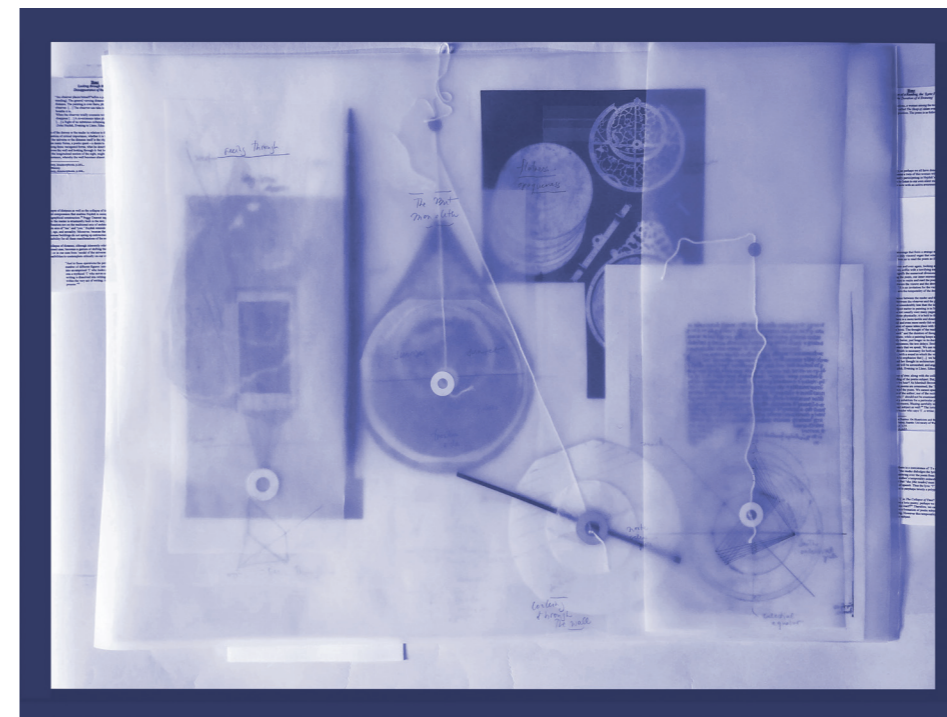


Fig. 3 - Note-Book of Hours by Bahar Avanoğlu (2022) on our embodied engagement with an astrolabe. On the left side, I have a screenshot of my phone, taken as I was examining the constellations via the *SkyView App*. The screen acts as a see-through dome showing the constellations. The rest of the visual notes is about astrolabes: I have fragmentary notes such as "the 'but' monolith", "sunrise" (on the left side of the plate), "sunset" (on the right side of the plate), "flatness, opaqueness", "looking through the wall"...

prepared one on his own. Diving into the pleasing abundance of treatises, manuals and articles, old and new, we might happily take curious and variegated paths of exploration. 'Instruments of all instruments' or even 'the very first computers' would be some of the frequently attributed definitions we would certainly encounter, used for these astronomical instruments, with regard to their manifold uses, precisely more than thousand uses according to the tenth century astronomer 'Abd al-Rahman al-Sufi (King, 2007, ch.1).

Indeed, now perhaps a historical artefact, once 'the instrument of instruments' that every philosopher or philosopher candidate should be educated on.<sup>6</sup> While we are exposed to minute details how each part, each dot, each degree, each line works, this flat instrument seems to get *transparent* and *transparent*; almost freeing itself from its materiality and consisting purely of overlapped *projected* drawings; in other words, of lines and dots representing the celestial realm. The transparency of drawing is also related with the transparency of meaning, or the greed to *see reality*

*behind the drawing*, or the meaning behind all the dots and the lines. Rosalind Krauss mentions the criticality of the distinction between transparency and opaqueness of a painting with a reference to Clement Greenberg: Transparency falls to illusionist and realistic art, where you can see reality through the painting, while opacity falls to modernism "establishing painting as a cognitive rather than merely a mimetic object" (Krauss, 1980, p.191).

So, as we are exposed to the meaning of each dot and of inscribed lines on the astrolabes, and as the instrument gets *transparent* and *transparent*, we now realize, that we in fact got hold of its entire intestines directly in our hands: The skin of ornaments, in fact hieroglyphs of the fixed stars; the elegantly curving lines, in fact projections of both the celestial realms and the situated sky; circular rotations in fact a celestial gesture; overall, a time-teller, a navigator, a pedagogical tool, a highest form of a gift,... but foundationally, a drawing on its own terms – confirming, in Deanna Petherbridge words, "the primacy of drawing" (2010) or the

importance of drawing in the visual thinking.

Indeed, these instruments of instruments could be considered primarily as drawings in their own rights, which work as cosmological instruments, perhaps as "reading machine"s or the first lesson of the three lessons in architecture in Daniel Libeskind's terms (1985). The philosopher shall read, extract, interpret and reflect the hidden spatio-temporal cosmological and celestial knowledge through these incised hieroglyphs of constellations. As we read in a poem accompanying an astrolabe by the tenth century astronomer-mathematician-poet Abū Ishāq, the astrolabe works as a model of not only the earth but 'the highest sphere':

*The petitioners / those hoping (for your intercession) gave you presents whilst they celebrated / gathered together on the day of the great / new autumnal festival / birthday, over which you presided (with your greatness).*

*But your servant Ibrāhīm, when he saw the grandeur of your status over all that might compete with it, / when he saw that there was nothing that could compete with the grandeur of your status, was not satisfied with giving you the Earth, and so he presented you with (a model of) the highest sphere together with all that is within it. (as translated and cited in Abuzayed, King and Schmidl, 2011, p.93)*

Now, we, the assigned hermetic readers of this wheel of fortune, slowly shift between being a timekeeper (or perhaps more correctly a time-reader) and a diviner, and an astrologer, and a surveyor, and a sailor, and a prayer, and a poet, and a teacher, and a student, and perhaps an architect also responsible to make timepieces as assigned by Vitruvius. However, as the instrument gets *transparent* and *transparent* with each piece of information, obscurity surprisingly not only prevails, but falls even stronger upon us while this reading-machine becomes opaquer and opaquer... *But, how do we navigate?* This question now haunts a modern



spirit in us. "The "but" which rises like a monolith at the threshold of the sentence" (Sartre, 1988, p.32-33) defeats the transparency of information on how this astrolabe works.

This modern spirit does haunt us inherently, not merely because we are already exposed to much more competent digital tools that now replace this instrument. And not because we thus suspect the actual instrumentality of this astrological device, even though the intricate matrix of projected lines on the instrument is still working almost eternally except for some expected degree conflicts. Also, not because the nature of the practice of symbolic reflection and the hermetic reading has gone through many tests and altered severely in the past hundred years, transforming this instrument perhaps into an object of historical contemplation or aesthetic curiosity.

The 'but' rises as a monolith with a reference to poetic opaqueness and sensuality, urging us critically to object to the transparency of meaning: "It is no longer a meaning, but a substance. It is seen from the outside and Rimbaud invites us to see it from the outside with him" (Sartre, 1988, p. 33). As Rosalind Krauss draws our attention to this aspect in the context of architectural drawing, the 'but' monolith investigates the literary construct through the "barring of the device": "That is, forcing the reader's attention to the actual procedures of writing, or narrating, directly exhibiting the technical substructure of the story. [...] To force the viewer to encounter the picture as first of all a flat object, is for the painter what Shklosky's "barring of the device" is for the writer" (Krauss, 1980, p.189-191). Relatedly, the 'but' in our question urges us inherently to the opaqueness and flatness of the astrolabe, as opposed to seeing through the device, that is through the inscribed lines and through the dots. In other words: as opposed to the greed of seeing reality through the drawing. After all, is it not so that planispheric astrolabes are additionally referred with the adjectives *saḥi* or *musattah*

(meaning flat),<sup>7</sup> and thus are characterized primarily by their flatness?

Now, I look back into my bundle and pick out an Ottoman miniature.

## 2. HOUR | The Book-holder and the Astrolabe-holder

This particular Ottoman miniature, illustrated in *Şehinşahnâme* [Book of the King of Kings],<sup>8</sup> depicts a regular scene in an Ottoman observatory built in Istanbul in 1577 (Fig. 4). Among many illustrated instruments, we see some astrologers engaging deeply with an astrolabe, a couple of quadrants, a dioptra, compasses, dividers, a clock, sandglasses, books, a pen box, a celestial globe, a terrestrial globe... Surely, we might get a bit confused by the peculiar visual narrative of the miniature, as it perhaps cannot provide us with a 'measurable' data on how the

astrologers should characteristically use these instruments. We perhaps feel more lost than ever, when we see the terrestrial globe depicted in an elevational view, flattened almost perfectly into a circle, in contrast to its base (along with all other bases in the room), which is depicted three dimensionally in reverse perspective. The *observer* holding the globe with one hand (perhaps as a gesture for its rotation), seems to be distanced to the model except for his manual gesture; and he seems to be situated *outside* the model. As is the man working on his drawing with a compass on the table. Looking and hovering over the model or the drawing of the globe while being situated directly on the Earth seems, however, to pose no conflict after all.

Almost all other instruments are placed on top of the table, which dramatically cuts the miniature painting on the central horizontal axis. The observers sitting around the table, seem to demonstrate



Fig. 4 - Note-Book of Hours by Bahar Avanoğlu (2022) compiling a miniature from *Şehinşahnâme*<sup>10</sup> (above) and from *Les Maqâmât d'Aboû Mohammad al-Qâsim ibn 'Alî al-Harîrî* (below).<sup>11</sup>

other ways to engage with a variety of instruments: One case, however, seems particularly poignant: The observer's eye is compelled to be located on the instrument. While this most particular situatedness is quite obviously illustrated for the quadrant, we see that this position is also required for the planispheric astrolabes, as it is illustrated in other depictions such as a miniature from a thirteenth century Maqamat manuscript<sup>9</sup> (Fig. 4).

Indeed, in order to find the exact temporal position of the celestial realm, the reader/philosopher needs to be an observer first and is required to place the astrolabe – or the model of the celestial sphere – between herself/himself and the celestial sphere. More specifically, especially at night, the reader/philosopher should hold the astrolabe plate vertically aligned to her/his sight of vision (as a longitudinal section of her/his own sight) so that the eye can look through the holes pierced at both ends of the alidade – an observational sighting tool located at the backside of the instrument –, and align the *alidade* to a specific celestial object. The eye is then compelled to be located momentarily and coincidentally on the celestial planispheric drawing plane (instead of across the plane). While the *alidade* invites the reader/philosopher to participate within, reminding her/him of her/his own situatedness within the universe, the stereographic projection incised on the frontal face of the astrolabe presupposes the reader/philosopher to hover over the model from outside.

Oscillation between these two situatedness (outside and within) is illustrated as mirrored images in the *Book of the Constellations of the Stars* (*Kitab suwar al-kawakib*) by 'Abd al-Rahman al-Sufi. This book contains mirrored images of the constellations: one as perceived from the ground looking up into the sky, the other as seen looking at a celestial globe from outside. Accordingly, the latter view becomes literally equivalent to a mirrored image of our view from inside or vice versa. According to art historian



Fig. 5A - Note-Book of Hours by Bahar Avanoğlu (2022), compiling *The Blood of a Poet*, *The Book of the Constellations*<sup>12</sup> and *Şehinşahnâme*<sup>13</sup>. The 'book-holder' of the *Book of the Constellations* and the 'astrolabe-holder' share a certain sisterhood in terms of their inconsistent situatedness: *Where am I? In or/and out? Am 'I' situated on the earth looking up into the sky (inside) or looking down to the celestial globe (outside)?* The reader of the *Book of the Constellations* is invited to have twinned personas (depicted as mirrored images), one situated inside, one outside. The astrolabe-holder is invited to shift her/his position from inside (looking 'through' the alidade) to outside (looking 'at' the astrolabe).

Emilie Savage-Smith (2013, p.134), the *Book of the Constellations* was written with the intention to be useful also for owners of the celestial globes, not only for the observers situated on the globe looking into the sky (Fig. 5A and 5B).

When we look further into the

*Book of Constellations*, especially in terms of how the illustrations become a navigator for the reader, we confront yet another obscurity: in some of the early copies of the book, all the figural depictions of the constellations, are depicted standing in upright position, in other words not oriented on the sheet by



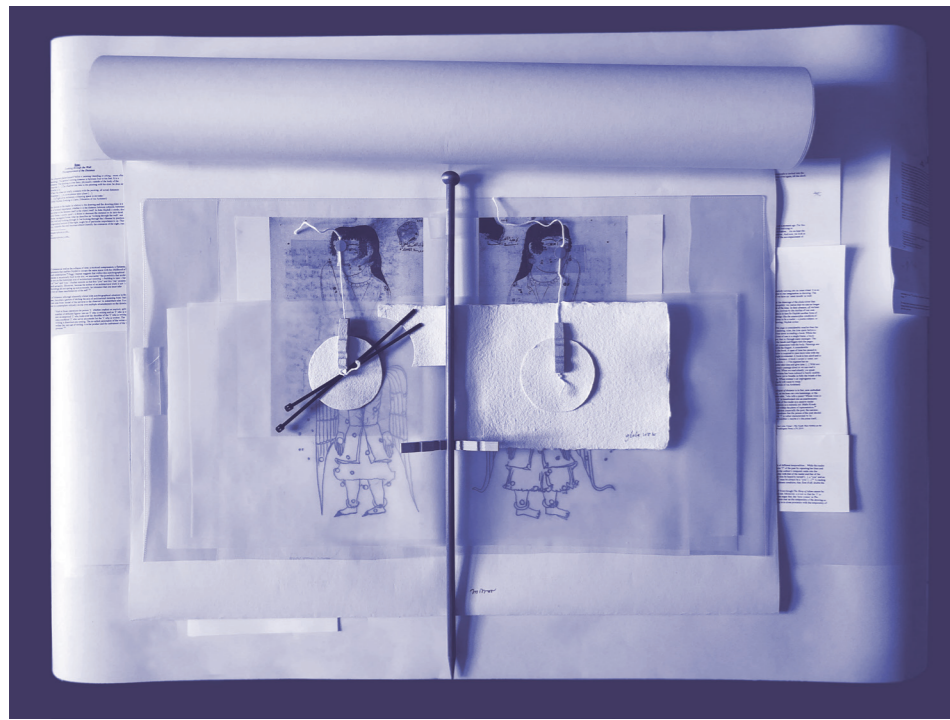


Fig. 5B - Note-Book of Hours by Bahar Avanoğlu (2022), on the *Book of the Constellations* and astrolabes. The 'book-holder' of the *Book of the Constellations* and the 'astrolabe-holder' share a certain sisterhood in terms of their inconsistent situatedness.

the point of a compass. While the orientation of the constellations on the page does not necessarily correspond to the orientation of the constellations as seen in sky view nor in globe view, the navigation through these images transforms into a challenging task, which is surely, quite different from what we experience through various kinds of *Sky View App's* today, which enable us to instantly *see through the screen*, the actual orientation of the constellations. Relatedly, Savage-Smith argues that these early illustrations in the *Book of Constellations* "are not "scientific" diagrams in any measured or quantitative sense" (2013, p.132). These figural depictions of constellations possess rather a poetic opaqueness peculiar to images and the art of memory, rather than the transparency of clouds of points.

As opposed to the (early) depictions of the constellations in the *Book of Constellations*, the astrolabe seems however, to rely on projected and mathematical grounds. These instruments have been often associated with mathematical certainty and with "a uniform, measurable, geometrically structured space"

(Aiken, 1994, p.341), providing a reliable and almost 'precise' spatio-temporal map of the celestial sphere, whereby the stereographic projection becomes the major testimonial for this argument. The stereographic projection of the globe, specifically calculated for local latitudes, contains the horizon, the latitudes [*almucantars*] above the horizon and the lines of unequal hours below the horizon. On top of this plate [*safihah* in Arabic or *tympanum* in Latin], the celestial part is placed as a separate rotational circular layer.

The major fixed stars indicated through delicate pointers and the sun's path indicated as the ecliptic (as an eccentric circle), are inscribed on this circular perforated frame, called *ankabut* [in Arabic meaning spider, *rete* in Latin meaning net]. This stereographically projected matrix is supported by an atlas of a wide range of information incised on the 'mother' component, the *umm* (in Arabic, *mater* in Latin, meaning literally the mother). Working almost like a vessel, holding all the plates, bits and pieces together, the *umm* also works as a structural 'mother' component. Inscribed generally at the rim of the frontal part and on the rear face of

the *umm*, we read the zodiac signs, various calendric, astronomical and astrological information and tables, as well as information and graphics useful for surveying and observation such as shadow squares.

So, where are we – the readers – situated within this "uniform, measurable, geometrically structured space"? Within this network of projected lines, we locate ourselves represented as a point on the frontal and rear plane of the astrolabe, in the middle, centered to the horizon, on the celestial center. Meanwhile, all the celestial objects rotate around us clockwise.

Accordingly, the projection of the celestial sky is mirrored; whereby the west is located on the right; and the east is located on the left. Distinguished from a heavenly vault with a twist, whereby the vault acts as a *see-through* screen, the astrolabe rather resembles the enigmatic mirror scene in Jean Cocteau's movie, *The Blood of Poet* (1930). As a mirror-image of what we perceive under the celestial sphere, the celestial map on the astrolabe would correspond closer to the globe-view depictions in the *Book of the Constellations*. Although detecting the rise of the sun on the left side of the device starts to evoke a slight uncanniness, the coherency of the projectedness seems for a moment to protect the secured grounds of the instrument (Figs. 5A and 5B).

However, this uncanny feeling rises, when we start to set the instrument into motion and commence to read the spatio-temporal relations of the celestial objects. Holding the astrolabe by its ring on top, perfectly aligning the plane of the instrument vertically to the gravitational direction, we align and try to look through the *alidade*. For this special moment, we are situated *within* the celestial sphere, placing the model between our bodies and the celestial bodies. And then, the next moment, we are situated outside the model, looking at the celestial sphere *from outside*...

In the strangest way, we seem to ascend reaching outside the border

of celestial sphere and descend down to earth. At this moment, the *alidade* transforms into a killjoy for the secure projectedness and cheats the secluded firmness of the drawing plane, transforming it into a fleetly relative, doubtful and uncertain site. While the secluded secureness of the drawing plane is violated by this oscillation between outside (ascent up to the outer space) and inside (descent down to the earth), we are perhaps also puzzled to confront our own inconsistent situatedness depicted as mirrored personas as in the *Book of the Constellations*. As Jennifer Bloomer draws our attention to a similar ambiguity in the context of the tectonics of section drawings: A mirror of a clock? Reversing time and canceling each other out...

<Rachel was looking into the mirror at an angle of 45°, and so had a view of the face [of a clock] turned toward the room and the face on the other side, reflected in the mirror; here were time and reverse-time, co-existing, cancelling one another exactly out.>  
<Skeletons, carapaces, no matter: her inside too was her outside.> (Pynchon as cited by Bloomer, 1987, p.51).

### 3. HOUR | A Mirror of a Clock? Her Inside too was Her Outside

I think that the shift of the observer between inside and outside advocates against the widely-accepted recognition of astrolabes as a time-telling instrument with a consistent, uniform spatio-temporality that is generally related with computerization in architectural drawing. Hence, this obscure shift speculatively enables astrolabes to be discussed in terms of spatio-temporal ambiguity of projection in architectural drawings.

This spatio-temporal ambiguity of drawing that emerges through our inconsistent situatedness in relation to the picture plane could be further detected in projective drawings. In relation to the violation of the secured projectedness of the astrolabes, further potentials of spatial hermetic ambiguities

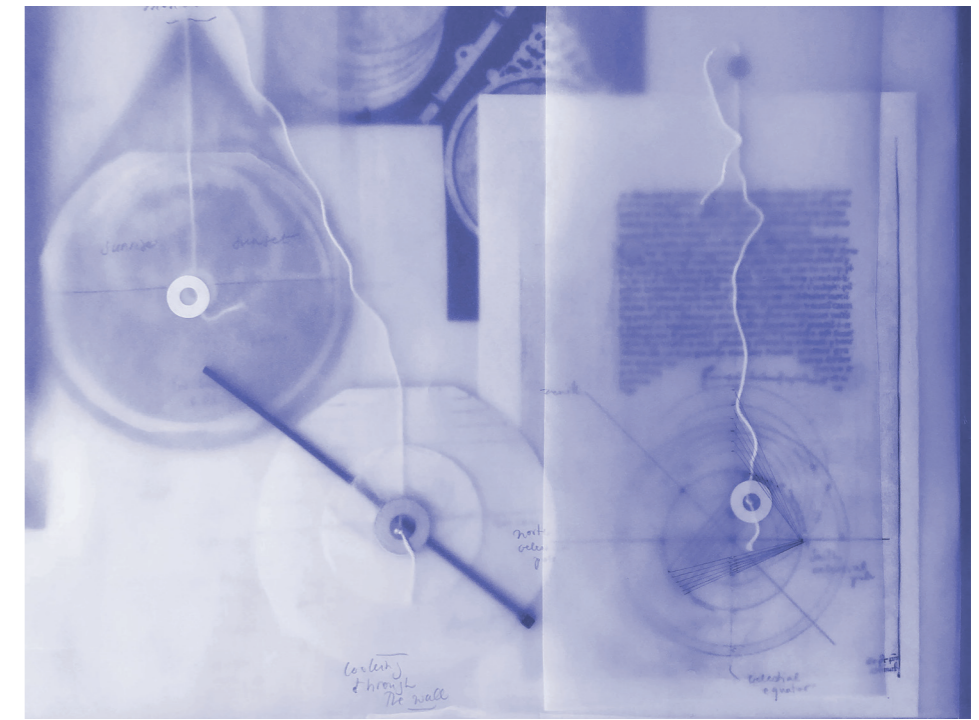


Fig. 6 - Note-Book of Hours by Bahar Avanoğlu (2022) on astrolabes. On the right side, I have a few tracings on the print-out of the 14th century copy of 8th century astronomer Messahalla's projection of almucantars.<sup>16</sup> I draw on the intricate labyrinth of superposed projective and constructive lines in play.

could be also discussed within the construction of the stereographic projection.

Looking at the intricate labyrinth of superposed projective and constructive lines in play (as in the 14th century copy of 8th century astronomer Messahalla's projection of almucantars<sup>15</sup>), we sense the potential of a poetic monstrosity that urges us to focus on the act of writing (*projection*), on the baring of the device; not only on what is written (*projected*). This is the same poetic mechanism that stems from words that have more than one meaning, creating a multiplicity of possibilities, ludic and secret plays of meanings. Thus, it is through this poetic mechanism that writing becomes the act of writing itself, not the act of pointing at what is written, enabling the *within* to be an *outside* at the same time.

Jane Andrews Aiken, from the point of a historian, argues that the medieval astronomic projections could be thought as the precursor of some particular distance point diagrams applied in the construction of the perspectival drawings (Fig. 6), especially because "both assume the existence of a uniform, measurable,

geometrically structured space" (1994, p.341) "where one may precisely locate objects" (1994, p.342). Although relying on a direct contiguity between the distance point diagrams and the astrolabic projections is quite risky, as the essence of the gaze in perspective does not have a direct correspondence in astrolabic projections, an investigation of embodiment and the use of superposition and transferal of distinct projective lines in distance point diagrams could be a clue to further discuss the spatial construct of astrolabes as a spatial ambiguity rather than uniformity.

As Lyle Massey thoroughly discusses in the context of distance point diagrams, the 'eye' is bound to be split into two on the paper plane in order to construct the perspectival drawing: one to be embodied and one to be represented (2007, p.37-54). While the vanishing point is expected to be embodied by the viewer in order to create a *trompe-l'oeil* effect, the distance point is on the drawing plane merely for constructive purposes and is a representation of the same eye. While the vanishing point is projected on the plane of



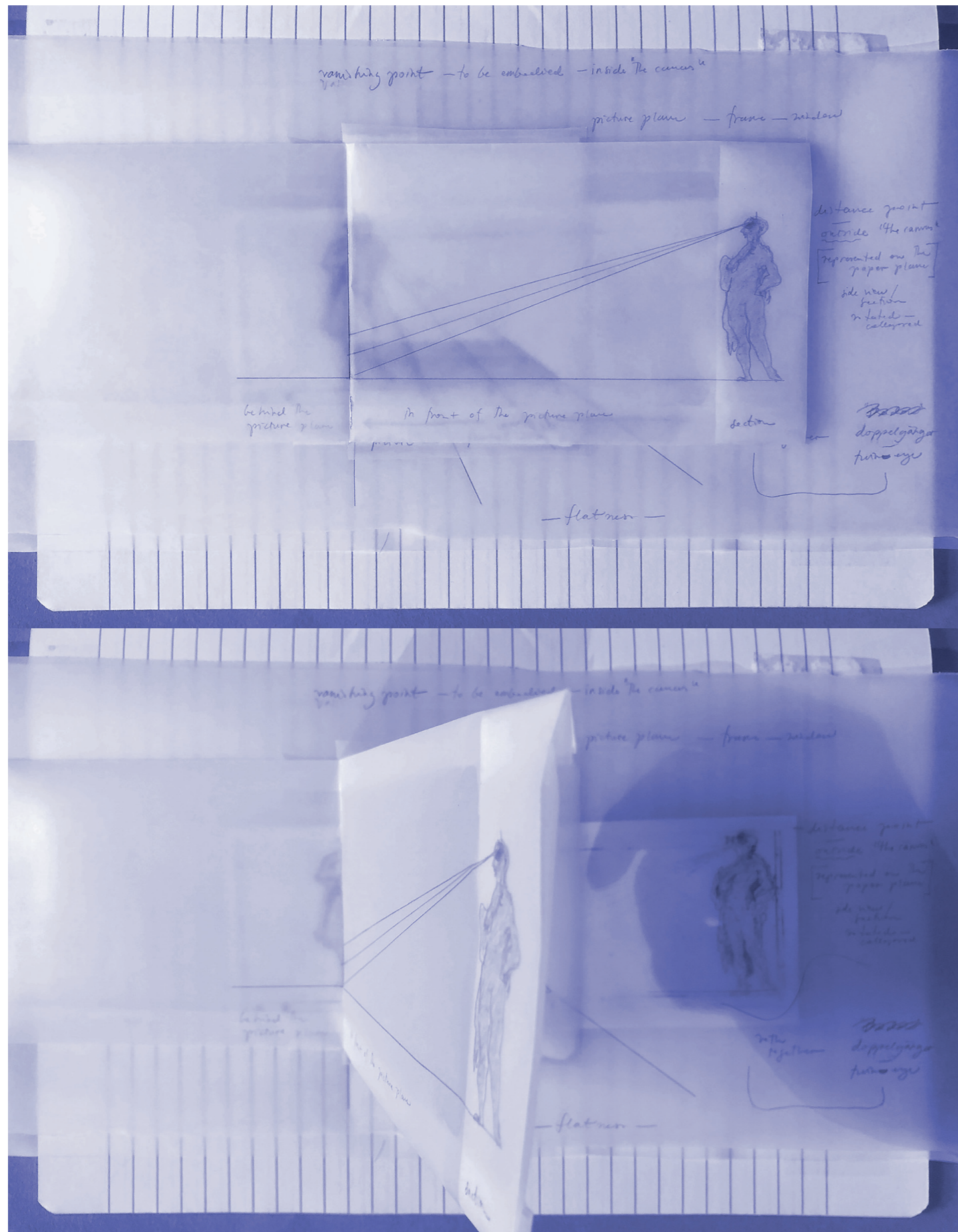


Fig. 7 - Note-Book of Hours by Bahar Avanoğlu (2022) on distance point diagrams and twinned personas. I have a few visual and textual notes specifically on what Massey calls "a disjunction between thinking about the mathematics of perspective on a flat, two-dimensional surface and inhabiting perspective as a three-dimensional projection" (2003, p.161): "behind the picture plane", "in front of the picture plane", "flatness", "picture plane - frame - window", "flatness", "vanishing point to be embodied inside the canvas", "outside the canvas", "represented on the paper plane", "rotated - collapsed", "doppelgänger".

representation and refers to the stable eye, from which vanishing lines radiate into eternity, the distance point is located outside of the frame of the representational canvas, and refers to the eye seen from the side view; and is responsible for determining the rate of declining distance in depth. "Pictures of the distance point produce a disjunction between thinking about the mathematics of perspective on a flat, two-dimensional surface and inhabiting perspective as a three-dimensional projection" (Massey, 2003, p.161).

Within these superposed frontal and side views in distance point drawings that share the plane of projection as a shared component, we have to imagine that not only the lines are shifting roles; but also us as well (Fig. 7): While we try to situate ourselves across the perspectival drawing by distancing ourselves according to the vanishing point in order to experience the *trompe-l'oeil* effect at its most; simultaneously we see another persona of ourselves, on the paper, looking in the section of the paper. Correspondingly, in distance point drawings, we do not only see what we see but how we see (Massey, 2003, p.165).

Although not a device in particular, we can think of the distance point diagrams in terms of the 'baring of the device', alienating us from the *trompe-l'oeil* effect and opening the realm of projective possibilities. Massey interprets this as a split between the embodied and the represented, and argues that the "split between an epistemological viewpoint and an ontological resolution reveals an ambiguity at the heart of perspective geometry itself" (Massey, 2003, p.166).

We can propose to discuss this ambiguity not necessarily as a split of the eye, but also as a process of doubling - a conception of a *doppelgänger* of the vanishing point or the singular persona assigned to the drawer, the viewer or the reader. Thus, relatedly the distance point as a *doppelgänger* could be interpreted as a testimonial for the fear of the death of the singularity

of the stationary point. While ensuring the construction of the drawing, the distance point as the uncanny twin-eye, transforms now into a morbid sign,<sup>17</sup> an omen for the death of the vanishing point; and thus, acts as a *memento mori* of the eternal, immune uniformity of the *projected* drawing (Fig. 7).

This doubling of the stand point of the drafter, the observer or the reader in relation to the drawing plane, reminds me analogically of the doubling of the observer in astrolabes: One (ephemeral) embodied persona (on the earth, looking up) doubled with another (sempiternal) persona (outside the celestial sphere, looking down). I think that this twinned personas and its shift between inside and outside advocate against the widely-accepted recognition of astrolabes as a time-telling instrument with a consistent, uniform spatio-temporality. Hence, it speculatively enables astrolabes to be discussed in terms of spatio-temporal ambiguity of projection in architectural drawings and instruments.

This condition perhaps extends its possibilities to contemplate critically on our own multiple situatedness in relation with the drawing plane, not only between the universe and the observer - just as Calvino writes about the manifold positions of 'I's one can take on in relation to the text.

*And in these operations the person 'I,' whether explicit or implicit, splits into a number of different figures: into an 'I' who is writing and an 'I' who is written, into an empirical 'I' who looks over the shoulder of the 'I' who is writing and into a mythical 'I' who serves as a model for the 'I' who is written. The 'I' of the writing is dissolved into writing. The so-called personality of the writer exists within the very act of writing: it is the product and the instrument of the writing process.* (Calvino, 1986, p.15)

Unsettling the fixed stationary point of the observer through unusual ludic and poetic mechanisms, John Hejduk's work *The Collapse of Time* (1984), seems to be drifting through the shores

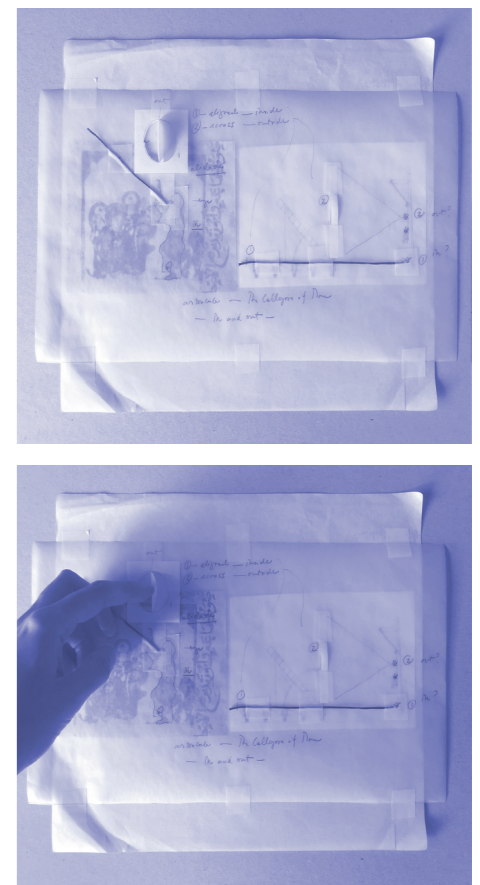


Fig. 8 - Note-Book of Hours by Bahar Avanoğlu (2022), compiling a thirteenth century Maqamat manuscript showing an astrolabe<sup>18</sup> and John Hejduk's *The Collapse of Time* (as published by AA Publications in 1987). I have visual and textual notes on the unfixed situatedness of both the reader of the astrolabe and the observer in *The Collapse of Time*: With regard to the reader of the astrolabe: "aligned - inside", "across - outside". With regard to the observer in *The Collapse of Time*: "looking across the clock tower - outside" "looking aligned to the collapsed clock tower - inside?".

of such questions as well (Fig. 8). Yet, his work, which performs as an obscure timepiece, seems more openly to negate the right time, instead of properly aiming to keep it.

In *The Collapse of Time*, similar to astrolabes, the spatio-temporal inconsistency of projective drawing is manifested in a quite hermetic way, structurally embedded within the set, rather than merely represented. As Hejduk's collapsing clock tower openly plays with the secret affair between clock towers and coffins (Shapiro, 1987, para.1), it also invites us to imagine alternative temporalities of a drawing.



## 4. HOUR | The Collapse of Time

Constructed in the September of 1986 in Bedford Square in London by AA, as a clock tower that collapses into its own sarcophagus, *The Collapse of Time* is actually a poetic constellation that consists of many structures. Looking into Hejduk's drawings and reading his "Diary Constructions", we immediately understand that this clock tower rising on its wheels, envisioned to be dragged from place to place, from time to time by the inhabitants of the city, is not a singular structure, but it is also in company with the nomadic structures in *Victims* (1984), in particular with *Security*. Yet, like al-Jazari's (1136-1206) ingenious *Elephant Clock*, *The Collapse of Time* in itself can be read as a poetic mechanism between three constructions (Fig. 9): The first is the nomadic clock tower that slowly collapses into its own sarcophagus (the numbers from 1 to 13 are inscribed on its frontal face, forming a vertical axis. A square instead of

12 appears attached to the surface. These numbers inscribed on the surface seem now rather allegorical components - ruins that have lost their instrumental functions of dividing and measuring time).

The second is a vertical pole that can be read as the orthographic twin of this clock tower. It is the only part that is fixed to the ground and with the help of a pulley system, this pole suspends a chair occupied by, in Shapiro's words, a "seer" (1987) - a male observer witnessing the collapse of the clock tower. Lastly, the third is a booth occupied by a "sayer" (Shapiro, 1987) - a reciting woman, again moving on wheels.

Although this discussion would benefit a comprehensive investigation of the entire poetic mechanism, in this article, I will restrict my discussion to the poetic mechanism set in motion between the seer sliding along the vertical pole and the collapsing clock tower.

## 5. HOUR | Who are the Witnesses?

In his "Diary Constructions", Hejduk mentions three thresholds that mark the collapse of time: 90 degrees, that is, "spatial, elevational, flat time", 45 degrees, that is, "angular, isometric time", and 0 degrees, that is "horizontal, perspective time" (Hejduk, 1987). Although the angular descriptions could literally be read as an allusion to the angular positions of the clock tower alone, Hejduk's writings along with his drawings draw our attention to the changing projective relation between the seer and the collapsing clock tower (Fig. 10).

As we look at Hejduk's drawings and writings, we see that a man among the townspeople is chosen to sit on a chair, suspended along the vertical pole that is positioned directly across the clock tower. The man, as he occupies the chair descending along with the collapsing tower, is asked to silently witness "the collapse of the time". This condition - that the work is structurally inclusive of the viewer - reminds me of Marcel Duchamp's *Étant donnés* (1946-1966), which includes the audience as a witness

in the work by inviting them to look through the peep holes. Looking at Duchamp's work, Octavio Paz rightly asks "who are the witnesses?" A question that is inherently interested in a particular situation whereby "our testimony is part of the work" (Paz, 1978, p.49-50).

Why does our testimony become an openly structural part of the art work or a timepiece in particular? Peggy Deamer, writing on Hejduk's work and asserting that the reader is structurally embedded in his works, suggests that by this condition we encounter "the possibility that architecture might function not on the traditional axis of architectural meaning - building to user - but on an alternate axis of 'me' and 'you'. Hejduk reminds us that this 'you' and this 'me' possess gender, age, and sexuality" (1996, p.72-73).

In *The Collapse of Time*, we may argue that it becomes clear that it is not only a matter of the observer witnessing the work, but the observer is also witnessing its own changing relative position. We may further set forth that it is not only the gaze of the witness but the unsettlement of the gaze that makes it even more poignant for the work. If we go back to the drawings, we may see that while the tower collapses slowly, and while the eye of the witness descends along with it, the positions between the witness and the tower changes slowly but dramatically from directly across the surface, to a slightly tilted position, to a full alignment of the eye and the surface (Fig. 10). The final horizontal state renders a condition where the eye and the frontal face align on the same plane as in a linear anamorphic construction, marking the moment of death or of the total collapse of time.

This fully horizontally aligned state could be considered as what Krauss refers "as the condition of the world disappearing from view" (1999, p.100), a state in which it is impossible to witness anything by the gaze alone.

The total alignment of the clock tower and the witness is quite similar to what Hejduk describes

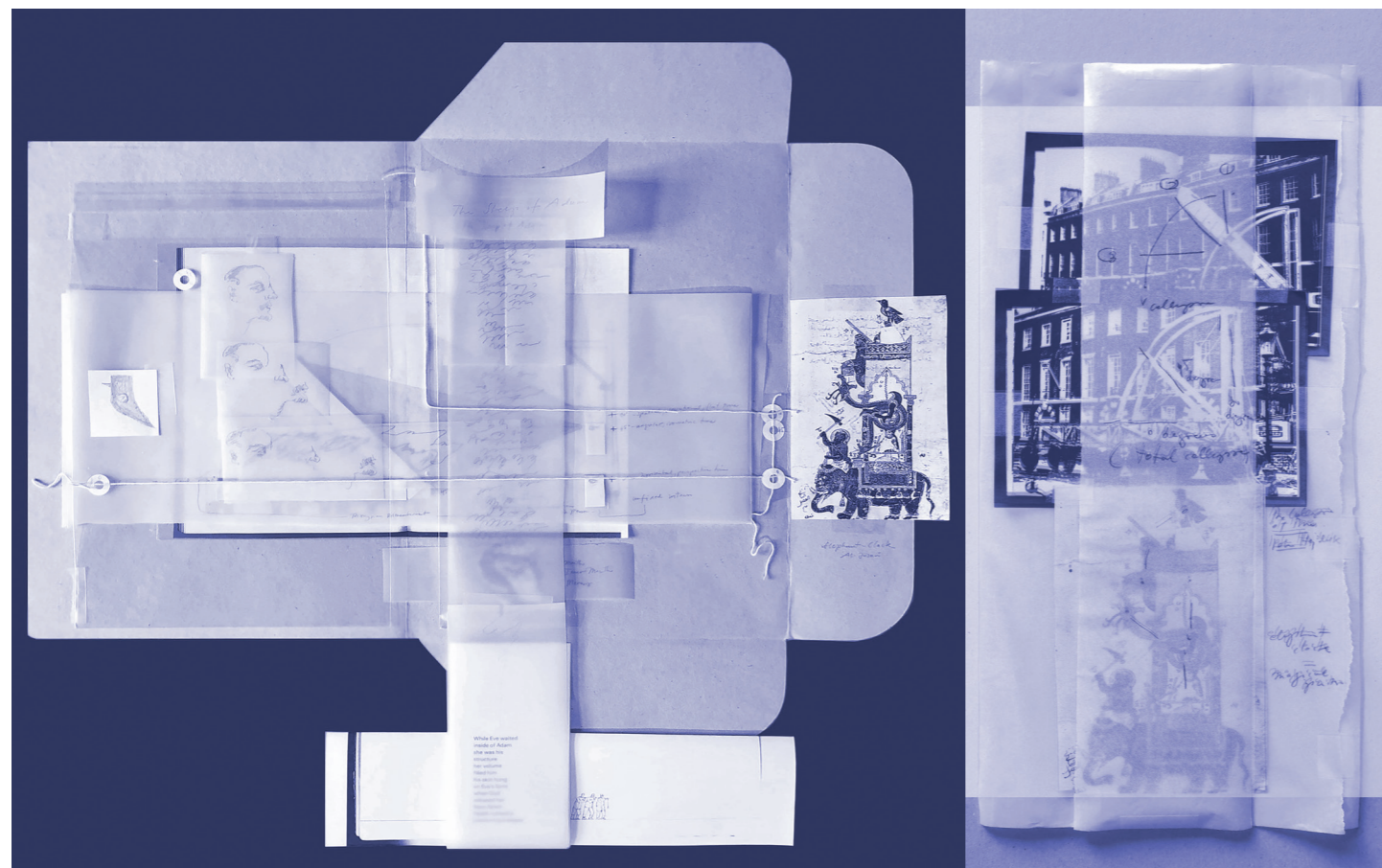


Fig. 9 - Note-Books of Hours by Bahar Avanoğlu (2022). I have visual and textual notes on the poetic mechanism of John Hejduk's *The Collapse of Time*<sup>19</sup> analogical to the 'magical' mechanism of al-Jazari's *Elephant Clock*.<sup>20</sup>

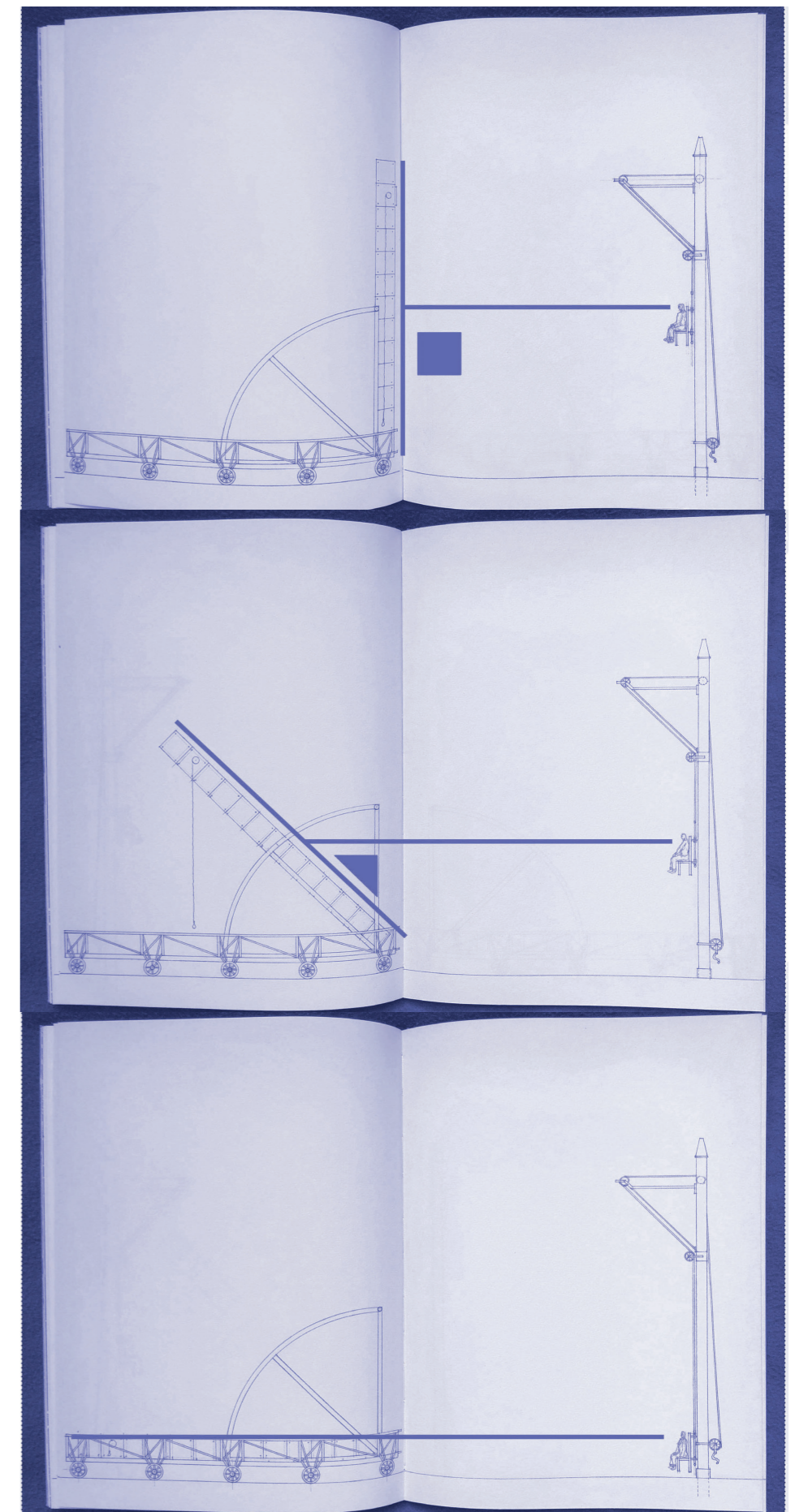


Fig. 10 - Visual notes by Bahar Avanoğlu (2022) on Hejduk's drawings of *The Collapse of Time* (as published by AA Publications in 1987). My notes investigate the speculative time-telling practice according to the changing position of the observer in relation to the picture plane. We see the time of "90 degrees", "45 degrees", and "0 degrees" in sequence as the clock tower collapses.



as “looking through the wall” – not standing across the wall and looking through it by positioning the wall as the longitudinal section of the sight (Fig. 11).

This particular instance, whereby the wall becomes almost literally the extension of the sight, equals to the collapse of distance as well as the collapse of time; a mystical compression, a flattening.

## THE WIT[H]NESSES OF TIME

Now, as the hours slowly unfold and compile this notebook of hours eclipsing astrolabes and Hejduk's ritualistic timepiece *The Collapse of Time*, we may wonder: *What / who tells the time? Who are the witnesses*

or more likely the with-nesses?

Focusing on the suppressed embodied engagement with the astrolabe as a projective drawing reveals an inherent embodiment in double act, that according to Emmons is peculiar to architectural drawings (2019, p.12-13). Translating the drafter, reader or the observer between inside and outside, wit(h)nessing the doubling of oneself as different figures of 'I's, and wit(h)nessing the different states of the work relative to her/his changing positions, seem to be the very mechanisms to manifests the time itself, and create a rather inconsistent spatio-temporality that perhaps even requires us to get lost for an instant.

Rather than confirming the

uniformity of the projection and time, this speculative reading urges us to consider the critical urgency of being inclusive of our own unfixed situatedness in relation to the drawing and of our intimate testimonies as a part of time-telling practices. On a wider spectrum, we think that it reminds us of the criticality of the embodied act of drawing.

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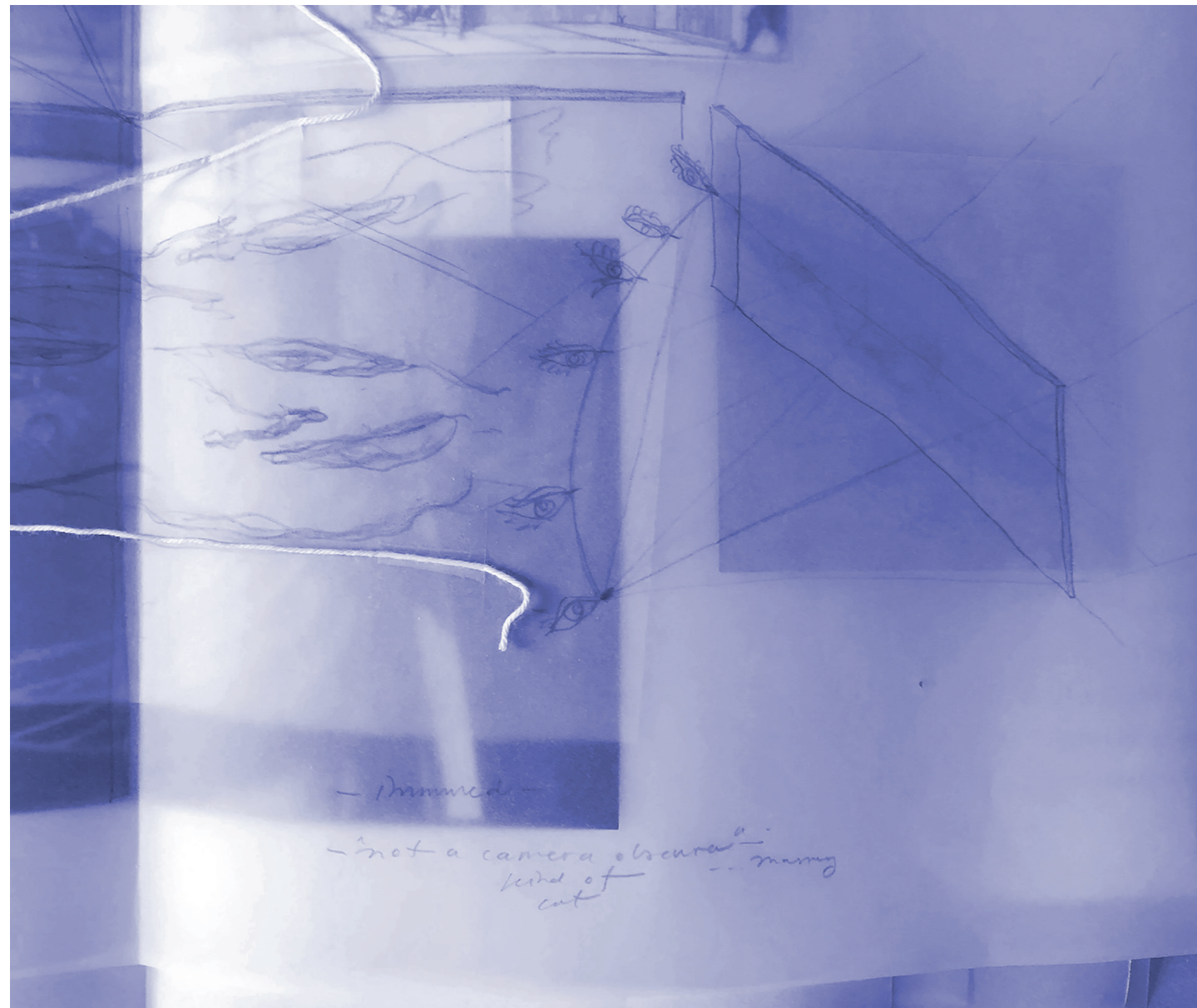


Fig. 11 - Note-Book of Hours by Bahar Avanoğlu (2022), on the mystical compression, “looking through the wall” and “extension of sight”.

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## NOTES

1. With reference to Corbin's *Mundus Imaginalis*, or, *the Imaginary and the Imaginal*, Ipswich: Golgothooza Press, 1976.

2. As described by Krauss in 1979, “Expanded Field” cherishes plurality, variety and transitive relations, as opposed to singular terms and dualistic foundations. Historical narratives based on disciplinary autonomies are critically rejected (Krauss, 1986).

3. For a critical reading on the ‘proper’ see Ingraham (1998, p.114).

4. Available through [Url-1].

5. Pigrum asserts that the panels of Warburg's *Atlas* show a resemblance to the studio walls of artists (2021, p.53), the site where the artist compiles a set of charged images. This site of charged images could be a note-book as well.

6. G. Chaucer wrote *A Treatise on the Astrolabe* (c. 1391) primarily for his son Lewis.

7. In Arabic texts (Savage-Smith, 1992, p.18).

8. Istanbul University Library (FY. 1404, fol. 57a).

9. *Les Maqâmât d'Aboû Mohammad al-Qâsim ibn 'Alî al-Harîrî* (fol.178v). Public Domain [Url-2].

10. See note 8.

11. See note 9.

12. Virgo as seen on a globe and in the sky from a copy of al-Sufi's *Book of Constellations* dated 400 H (1009-10) and signed al-Husayn ibn 'Abd al-Rahman ibn 'Umar ibn Muhammad. Bodleian Library, Oxford (MS Marsh 144, p.223, 224) and from a copy of al-Sufi's *Book of Constellations* made at Baghdad in 1125. MIA, Doha (MS.2.1998, folio 93a and 93b), as published in Savage-Smith (2013, p.148-151).

13. See note 8.

14. See note 12.

15. Cambridge University Library, MS I, i.III.32, fol.67v. as published in Aiken, 1995, p.181.

16. See note 15.

17. On ‘double’ as a harbinger of death, see Freud, 2003, p.142.

18. See note 9.

19. The photographs of *The Collapse of Time* are taken by H. Binet, P. Barnett and R. Bunschoten (1986), as published by AA Publications (1987).

20. Folio from a *Book of the Knowledge of Ingenious Mechanical Devices* by al-Jazari. Public Domain. available through [Url-3].