



WHAT IF? WHAT NEXT?

# **SPECULATIONS ON HISTORY'S FUTURES**

## **SESSION 1A**

### **MODES OF ARCHITECTURAL HISTORY**

#### **Ecologies of History: Histories of Ecology**

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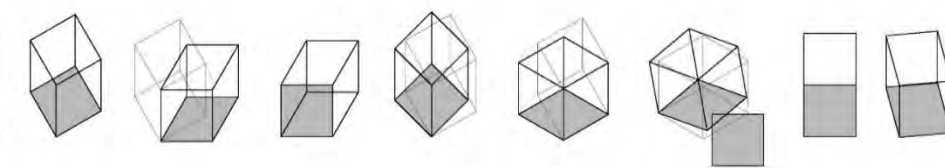
# **THEORETICAL ITERATIONS OF PARALINE PROJECTION FROM IVAN LEONIDOV, O. M. UNGERS, AND OMA**

**Beth George** | University of Newcastle  
**Sally Farrah** | University of Western Australia

*Building on a theoretical framework established previously, this paper examines key drawings and projects from the infamous Manhattan series, produced by the Office of Metropolitan Architecture (OMA), which went on to form the Appendix of Rem Koolhaas' Delirious New York (1978). We situate their work in relation to that of two key proponents of the paraline medium: Ivan Leonidov; and Oswald M. Ungers. While the theoretical inheritances from both of these figures to OMA are well-documented, we are interested in examining the drawn lineage. To examine the Manhattan drawings is to walk through a set of drawing techniques that become increasingly estranged from these forefathers. From "The City of the Captive Globe" (1972) – an Ungers-homage in plan-oblique – to "New Welfare Island" (1975-76), a trimetric which employs Leonidovian destabilisation, the practice make forays into novel drawing construction. The "Welfare Palace Hotel" (1976-77) combines techniques resonant with Leonidov, but utterly distinct, and becomes irreverent and celebratory in a way that serves as joyful complement to the text of Delirious New York itself. While many authors have noted Leonidov's formal and theoretical influence on Koolhaas and OMA - including Robert Maxwell (1981); Robert Gargiani (2006); Francesco Marullo (2013); and Pier Vittorio Aureli (2015) - there is a paucity of critique regarding both Leonidov's and OMA's unique archaic and modern methods. If the plan-oblique can be understood as an elementary form of paraline drawing, then the laborious reconstruction of the plan in trimetry and obliques, introduce both a conventional and conceptual complexity. Koolhaas' Delirious New York, and the lesser-known writings of Elia Zenghelis, will be used as lenses in our reading of OMA drawings. Architectural and urban positions emerge from the hierarchical relationships exposed in the trimetric and elevation-oblique techniques themselves, such as the privileging of surface over tectonics; the rejection of abstraction; analogies of post-mortem and anthropomorphism; the cropping of the frame; and the role of cuteness. This paper contributes to a growing body of recent scholarship regarding the architectural drawing as mental space.*

## Introduction: Stretching Convention

This paper is paired with another, “Trajectories of axonometry through distances and disciplines”,<sup>1</sup> and collects its threads. In “Trajectories”, we plotted a course from medieval *mappa mundi*, through the military perspective, to the plan-oblique under Le Corbusier, who in taking to the sky bestowed attention on the roof plane that became a tenet of his ‘Five Points.’ We studied the drawing’s espousal and hybridisation by Ivan Leonidov, who recollected its primitive heritage and layered into it political and perceptual depth. The individuals studied were linked not geographically or theoretically, but through developments within their drawings, demonstrating an operative and rhetorical capacity in a shift from figural to cognitive space, from the bird’s eye to the mind’s eye. We offered up in “Trajectories” a chronological pursuit, observing a notional volume of architectural space mutating from the upright, to the oblique, to the axonometric and planometric: casting, extruding, and rotating with each transition.



**Figure 1.** Illustration of paraline techniques discussed across both papers (L-R): plan-oblique (Le Corbusier), rotation, elevation-oblique or plan-oblique with angled vertices, symmetrical plan-oblique, isometric, tilted isometric (Leonidov), planometric (Leonidov), trimetric (OMA).<sup>2</sup> Source: Authors, 2020.

In this paper, we now begin to stretch and distort that volume, as within the hands of key postmodern exponents, it takes on greater complexity. We trace a connection from Leonidov to the members of the Office of Metropolitan Architecture (OMA), threading in influences from O. M. Ungers, both of whom were connected to OMA in various ways. The writings and drawings of each cement these figures as influential in their employment of the paraline medium. Under OMA, this trajectory of experimentation with paraline projection continues. Greater levels of distortion and promiscuity suggest a stretching of the drawing convention that parallels the expansive urban thinking the practice were engaged in. The particular focus of this paper is given to OMA’s drawings of Manhattan, which formed the Appendix to *Delirious New York*.<sup>3</sup> Of primary interest to us is the manner in which OMA’s drawn texts can be understood through their particular language, in relation to their written discourse. The technical peculiarities of this drawing set, and the manner in which standard paraline conventions are employed and tweaked, can be read against their own theory and their inheritances from a paraline legacy established by Ungers and Leonidov.

## OMA, O.M. Ungers, and The City of the Captive Globe

In 1975, OMA was formed, consisting of Rem Koolhaas, Elia and Zoe Zenghelis, and Madelon Vriesendorp. In an article for *AD* in 1977, OMA wrote that the firm consisted of these four figures “in association with O. M. Ungers”.<sup>4</sup> In fact, the name of the practice is both a homage to Ungers (OMU), and Roberto Gargiani suggests possibly to the IAUS.<sup>5</sup>

Created prior to the formation of OMA, “The City of the Captive Globe” (1972) by Koolhaas and Zoe Zenghelis is a conventional plan-oblique cast (Fig. 2). A processual drawing of the project reveals it first existed as a hard-lined plan-oblique – in the style of Ungers – then filled with colour. Koolhaas wrote this drawing might be “a subconscious portrait of O. M. Ungers’ architecture”.<sup>6</sup>

Though Ungers’ method might be adopted in structure, his personal ideologies – a tectonic relationship between form and content; and the aim for rationalism and abstraction – are countered. While Ungers criticised “the ideology of the perfect plan”,<sup>7</sup> the plan-oblique maintains its primacy. OMA would come to employ axonometry, distorting the plan and sometimes also

elevation, emphasising surface over volume. This suggests a break from Ungers' tectonic aims, whereby he considered architectural form as "the perfect expression of content".<sup>8</sup> Rather, for Koolhaas, the link between form and content, or "between form and meaning... were irrevocably severed".<sup>9</sup> Elia Zenghelis also wrote on "the redundant baggage of 'content'".<sup>10</sup> What results in OMA's paraline drawings is "a new condition that is strong enough to encompass the complexity of everyday reality".<sup>11</sup>



**Figure 2.** Rem Koolhaas and Zoe Zenghelis. "The City of the Captive Globe". Plan-oblique. 1972. Source: Gift of the Howard Gilman Foundation. The Museum of Modern Art, New York/Scala, Florence © 2021.

Ungers was interested in "the possibility of architecture achieving abstraction... through a complete elimination of any narrative".<sup>12</sup> If Zenghelis wrote on the "terrifying *Rationalism* of the total",<sup>13</sup> and claimed abstraction was one of many crimes committed by modernism,<sup>14</sup> it is telling that Ungers' plan-oblique method would evolve within OMA's oeuvre. While Ungers cited three levels of reality in architecture – "the factual; the perceptual; and the conceptual"<sup>15</sup> – his projection methods suppress the perceptual in their inherent rationalism. Lara Schrijver has observed this distinction between Koolhaas and Ungers regarding the perceptual, where "Koolhaas more readily accepts the beauty of reality 'as is', while Ungers still tries to unveil the potential he sees in it".<sup>16</sup> Fritz Neumeyer terms this as "Ungers's objective idealism" versus OMA's "subjective idealism".<sup>17</sup> In order for OMA to approach a representation that came closer to reality, they had to bend Ungers' paraline technique, remaining technical but inviting the irrational. OMA explored ways in which hybrid paraline projection could narrate their perceptual concepts and "the psychological terrain of the metropolis and its 'delirium'".<sup>18</sup> Enter the influence of Leonidov.

### **Inheritances and Deviations from Leonidov in OMA**

From 1971, Koolhaas began researching the work of Leonidov,<sup>19</sup> which continued during his tenure at the IAUS.<sup>20</sup> In 1973, Koolhaas proposed the idea to MoMA of hosting a Leonidov exhibition,<sup>21</sup> and although unsuccessful, the IAUS held a Leonidov exhibition in 1977 and published the first English catalogue on his work.<sup>22</sup>

The notion that one completes an image in their mind was significant to Leonidov's body of work – he embraced ambiguity and multivalence in order to amplify the cognitive and perceptual: to engage in not just the construction of a drawing but its reconstruction in one's mind. Similarly, OMA's drawings resonate with "human experience"<sup>23</sup> and reconstruct their "own *reality*".<sup>24</sup> Elia Zenghelis refers to the "elaborate drawing as technique"<sup>25</sup> of OMA as "critical re-presentation".<sup>26</sup>

The concepts of perception<sup>27</sup> and experience<sup>28</sup> are central to Zenghelis' writing and thus OMA's work. Zenghelis claimed that for OMA, the aim is to "represent that which is in the mind's eye".<sup>29</sup> This emphasis on 'the mind's eye' comes to the fore in OMA's hybrid drawings via the primitive, as learnt from Leonidov's projections, and explored in the writing of Robin Evans and Massimo Scolari. It was Scolari who wrote how primitive forms of paraline drawing "strike the mind more than the eye".<sup>30</sup> Yet OMA's drawings commingle aspects of Leonidovian primitivism with far greater scope for intricacy and narrative, lending them a sense of hybridity – edging between the archaic and modern.

Where Leonidov explored axonometric methods, OMA's Manhattan projects employ various angles of trimetric projection. Both have a tendency to destabilise the depictive world: to slump or tilt projection axes. The choice of a projection type is consequential in architectural theory, as it gives the rules to translate "a mental image to drawing, and of the building back to the viewer through perception",<sup>31</sup> where "*all are zones of instability*."<sup>32</sup> Scolari has noted "the discomfort we experience before a tilted picture or wall out of plumb tells us that the force of gravity is also an aspect of form... Architecture too... is oriented and orders itself within those invisible lines of force that project it onto the earth and toward the centre of the world".<sup>33</sup> We believe this is why several authors refer to OMA's early projections as "surreal",<sup>34</sup> or as precursors to "dirty realism".<sup>35</sup> OMA's drawings also adhere to Francesco Marullo's recent exploration of 'estrangement' within axonometric projection as "making the ordinary unfamiliar and finding wonders in the consuetudinary",<sup>36</sup> acts by "increasing its perceptive consciousness".<sup>37</sup>

OMA innovate from Leonidov's methods through shedding the post-modern taste for the abstract,<sup>38</sup> aiming for "*amplification* rather than abstraction".<sup>39</sup> Leonidov's projections abstracted to communicate "the subordination of form to organisation",<sup>40</sup> and "the radically new relationships...among form, space and media".<sup>41</sup> OMA's language is instead "inclusivist"<sup>42</sup> and realistic. They reject mystification, but are still distinctly architectural: they employ a rigorous language of paraline projection to narrate their theories.<sup>43</sup>

### **New Welfare Island (1975-76)**

The New Welfare Island Project (Fig. 3) introduces the trimetric to OMA's oeuvre.

#### *Splaying and Post-mortem*

The projection angles of this drawing are intriguingly slight – the x axes tilted minimally from horizontal, the y axes not far from vertical: it is unusual to look at in the extremity of its tilt toward the viewer. It is distorted in relation to the familiar 60-30 plan-obliques of Le Corbusier: if his convention derived from aviation, this might be seen to emulate the view out, and down, from the uppermost 'aerial plots' of Manhattan's skyscrapers. With the plan elements inclined so far toward the picture plane – so that it almost reads as a planometric drawing – the elevational elements become strangely flattened against it. The visual effect is of splaying the body of the city: opening out the field of the drawing. The parallels between this prone cast and the notions of post-mortem referred to in the text are overt: the city is laid bare, with the grid as unfolded ribcage.

#### *False Hybridity*

At first, it may seem to be a hybrid construction, involving a trimetric cast on the left, interpreted clearly through the grid, and as an elevation-oblique at the centre, where the majority of the design attention is focused. And it is a hybrid, but not because it is a collision of two types of drawing. The grids of island and mainland are not aligned, so in this instance we simply catch the mainland in trimetric and the island in oblique. What is enabled by this construction is the interplay of resonances with both the Leonidovian 'primitive' – the archaic cast of medieval *mappa mundi* or town cartography where elevations are cast onto plans in-situ – and the tectonics of modern axonometry. In its estrangement from the plan-oblique method of Figure 2, the trimetric introduces an "otherness" compared to "all previous Urbanisms."<sup>44</sup> The crank that



occurs in the actual grid (which is sharpened here by a fictive straightening of the shoreline) is amplified in this construction: we bend from one drawing type into another.



**Figure 3.** Rem Koolhaas and Zoe Zenghelis, New Welfare Island Project. 1975-76. Source: Gift of the Howard Gilman Foundation. The Museum of Modern Art, New York/Scala, Florence © 2021.

### *Instability*

This morphological bending gives the effect of slippage to the composition: if you focus your eyes on the gridded left, the island components seem to want to slide downward off the page to the right. There is a sense of instability and gravity at play. An analysis using guides, however, reveals that if anything the horizontals of the island tilt slightly up toward the right: they are compensating ever so slightly for the extremity of the drawing's left. The overall effect is a sort of visual leaning back, not dissimilar to that achieved in Leonidov's House of Industry isometric, which is slightly rotated off the vertical axis and seems to orbit. While this Leonidovian slump might be seen as a sort of 'nod' to his call for linear cities, for OMA the vertical axis had to remain plumb to support Koolhaas' Manhattanism.

### *Voided Grid*

The communication of the remainder of Manhattan as unoccupied grid does not imply vacancy. It could be related to the latency of voids referred to by Leonidov, who saw them as charged.<sup>45</sup> The other effect of uncluttering the grid is to more keenly read its morphology. The "conditions

for... inscription, that is, for an architectural articulation with the city and the particular pleasure produced by it, are found neither in the extreme order of the grid, nor in the complete disorder of its loss, but in the meeting of the borders that separate order and disorder.”<sup>46</sup> This drawing plots moments of friction, intensity, collision, and perversion within a territory drawn to be absent, but understood to be not just present, but as containing and producing the very urban condition being here celebrated.<sup>47</sup> Attention is given to points of anomaly within the grid – to ‘implied monuments’ and intersections, and with flourishes like the Hotel Sphinx and its neighbouring mass seemingly ‘riding’ on tectonic wedges.

### Welfare Palace Hotel (1976-77)

In OMA’s “Welfare Palace Hotel” (Fig. 4), we encounter a shift from axonometry to elevation-oblique projection.<sup>48</sup>



**Figure 4.** Rem Koolhaas and Madelon Vriesendorp. “Welfare Palace Hotel”, cut-away elevation-oblique. 1976-77. Source: Gift of the Howard Gilman Foundation. The Museum of Modern Art, New York/Scala, Florence © 2021

### Confrontation

Unlike the axonometry of Leonidov and Ungers, Figure 4 distorts the plan, eschewing a tectonic reading, and preserves the elevation to privilege surface. Scolari reveals how the elevation-oblique behaves like Egyptian hieroglyphs,<sup>49</sup> it becomes figural. Resonances exist here with Leonidov’s embrace of the archaic, but the drawing is not reductive. When it comes to the

architecture it is detailed and explicit. The drawing type is as combinatory as the city – both primitive in its resemblance and modern in its accuracy – presenting us with the possibility “to live *inside* fantasy”.<sup>50</sup> This simultaneously strange yet familiar projection, through its combination of archaic and modern, reflects OMA’s design philosophy, whereby “the ‘new’ can only be registered if grafted onto the base of the familiar, as a modification which incorporates the rudimentary original.”<sup>51</sup>

### *Inversion*

Welfare Palace is striking because it floats in a sea of black. This extends a lineage of figure-ground reversal canonised by Leonidov. It is a technique that draws attention to the void in the urban process.<sup>52</sup> By isolating one urban block in the projection, the figure-ground technique aids in a palpable isolation found in Koolhaas’ narration of Manhattan. Yet Figure 4 also presents us with deviations from Leonidov, by including colour. There is an absence of shadow casting in Leonidov’s drawings: rather, the role of the black *absorbs* shadow and gradations of tone, assisting the drawings to approach the abstract. OMA’s Welfare Island combines elements of *both* Euclidian “geometry of touch” and projective “geometry of vision”<sup>53</sup>. Out of the black field springs an urbanism with detail and delight. The commingling of abstraction and attention serves to highlight the city as one that hovers between the cognitive and the visual, as a series of “mental constructions”.<sup>54</sup> This is evident in Peter Cook’s reading, who observed the drawing as “held by an ‘unreal’ that nonetheless has a reference back to the ‘real’ but refuses to ape it.”<sup>55</sup>

### *Anthropomorphism and Lobotomy*

Where Figure 3 laid out Manhattan through act of an urban, post-mortem dissection, Figure 4 utilises the metaphor of lobotomy at the formal scale. In facing the viewer, the towers are upstanding: they meet us. Like IAUS-affiliate John Hejduk’s paraline experiments, is “an architecture that looks at you – it is upright and facing you... it returns the gaze”.<sup>56</sup> The effect is one of anthropomorphism, where the towers not only face us but take on a sense of possessing character. Zenghelis reflects that “Madelon’s obsession with seeing buildings as individuals did influence me. I think it also influenced Rem.”<sup>57</sup> On Figure 3, OMA write that “the RCA has turned its back to Hotel Sphinx,”<sup>58</sup> and that the tops of the skyscrapers in Figure 4 “are so designed that they ‘stare’ at Manhattan.”<sup>59</sup> Facades become bodies that transmit “an explicit figurative message”.<sup>60</sup> Through the elevation-oblique, facades are granted the ability to speak, yet OMA decide they are to be deceitful: they act as masks that “hide everyday life”.<sup>61</sup>

This personhood is only exaggerated by the holding in each tower a mind’s eye of its own. As inspired by “Leonidov’s glass prisms in Magnitogorsk”,<sup>62</sup> these penthouses are thus their *brains*: as *seeing minds*, they literally represent the archaic relationship between cognition and vision.<sup>63</sup> Zenghelis notes this corollary between mental and architectural space, stating that “architecture exists in the mind as a preconception”.<sup>64</sup> These anthropomorphic metaphors, and OMA’s penchant for the medieval, are evident in Koolhaas’ two contributions to *Oppositions* published prior to this project. The ability for us to see into the brain of each character must surely approximate a lobotomy, each holds the mechanisms of city, but perhaps not a conscious gaze.

And we ‘operate’ on the body of the city one more time: in the cutaways at the base of the two foregrounded towers. There is a flippant convenience in this gesture: the towers exist, but they are obstructing our view of the pool. The curvilinear code given to reducing distance between details – say a window head and sill – in documentation drawing is used to imply the towers’ continuum. It is clear to see where the foremost tower meets the ground, but far less so the second. Whatever spatial relationship they have at their tops is lost at their bottoms. Is this the kind of crude ‘fudging’ familiar to us all in drawing construction? A refusal to resolve or explain? Perhaps it reflects a convenience that is not foreign to the predilection of *Delirious New York* to indulge. It is also one of a few foibles in the drawing – the bridge at top left is a technical conundrum, and the section cut through the ground beneath the front tower would suggest the inability for pool and raft to float before it. These seem happy and apt obscurities in the context of the novel. Have it all: your elevation-oblique and your cutaway section, too.



## Across the Manhattan Series

Reading between OMA's Manhattan projects, the following qualities emerge: projecting beyond the frame; cuteness; and axonometry as the simulacrum of skyscraper construction.

### *Projecting Beyond the Frame*

The cropping of all these projections to evoke a horizon-less urbanity is a device utilised for OMA's Manhattan projects.<sup>65</sup> While this is common practice among students and practitioners using digital drawing methods, when drawn by hand, this cropping becomes an ideological choice. It suggests the interminable nature of city and drawing alike. Even the cover photograph of *Delirious New York* resists diminishing – it utilises a tilt-shift lens, eliminating a third vanishing point and bringing the scene closer toward a paraline cast.

### *The Role of the Cute*

OMA's shift towards "portraiture of the metropolis"<sup>66</sup> in the 1970s, compared to Ungers' hard-lined methods, also reflects Leonidov's interests as a painter.<sup>67</sup> Cook has suggested that colour detracts from a drawing's ability to capture "the sublime".<sup>68</sup> This holds true if one compares Hugh Ferriss' perspectival renderings of Manhattan,<sup>69</sup> which in "the avoidance of minutiae served the strength of his charcoal atmospherics".<sup>70</sup> OMA certainly do not avoid the minutiae, and their highly detailed and technical drawings reflect Rem's observation that "the Metropolis is an additive machine".<sup>71</sup> Like trimetry, colour is utilised as a perceptual device to highlight the importance of surface over tectonics. Both Evans and Scolari note colour is a "haptic" property that can "jeopardize perceptions of metric uniformity",<sup>72</sup> whereby "gradations of tone... suggest the corporeality of the third dimension."<sup>73</sup> OMA utilise colour in order "to fuse the popular with the metaphysical, the commercial with the sublime, the refined with the primitive."<sup>74</sup>

The limited palette utilised across the projects allows them to avoid becoming "too picturesque",<sup>75</sup> and maintains a certain "artificiality"<sup>76</sup> that Koolhaas observes in Manhattan. The palette is a sweeter and more sherbet version of Constructivist colour schemes, and holds the projection in the realm of the cute. We note a prevalence today of "cute aesthetics of pastel colours", a revival intended to better "communicate with the public."<sup>77</sup> It resembles reality rather than representing it verbatim, to avoid "the danger of being appropriated by fashion."<sup>78</sup> The playful colour scheme, alongside the strange projection cast, are dual mechanisms that prevent the scene from immediate and complete consumability, in "an act of resistance against the rote commodification of architecture."<sup>79</sup>

### *Axonometry as the Simulacrum of Skyscraper Construction*

Cook has noted the similitude of the plan-oblique drawing with a building site.<sup>80</sup> With construction lines as stringline and spirit level, vertices as scaffold, and the deposition of materials as incremental labour, the drawn field becomes simulacrum.<sup>81</sup> Is there not a particular confluence between skyscraper and paraline drawing? Consider the process of making an axonometric: setting out the base, erecting columns, multiplying the floors vertically, and travelling between them as by elevator to plot out rooms and forms. This might be seen as a precisely enactive drawing system for a practice ensconced with conceiving towers as responsive arrangements of mass and symbolic form.

## Conclusion

Drawing from the writings of Evans and Scolari on the relationships between optical, mental, and projective space, this paper contributes to a growing field of scholarship focusing on the architectural drawing as a mental space.<sup>82</sup> We demonstrated, through an examination of three different projection types found in OMA's Manhattan series, how the group manipulate paraline conventions toward theoretical ends. It is remarkable the extent to which the drawn language and the written discourse become inseparable in the reader's memory: there is no un-pairing of the prose and the image once read together.

What also makes these drawings significant is that they were created *before* a body of literature emerged in architectural journals that commenced critical examinations of parallel projection in the 1980s.<sup>83</sup> As Sonit Bafna and Hoyoung Kim have noted, OMA's production "invert the expected logical relationship between drawings and theory – practical experiments in drawings come first",<sup>84</sup> and demonstrates the reciprocity that occurs in the act of drawing construction in the mind's-eye, and the construction of architectural theory in the mind.

While our explorations of architectural projection have so far focused on pedagogy, they are also critical to practice. Several of the tools we find in OMA's representational artillery, particularly cuteness and frontality, are prevalent in current architectural praxis. The analogue drawings of OMA – some of the most infamous of the post-modern period, perhaps infamous as a result of their successfully inclusive techniques – are unique in their intentionality and ideologies. Yet there are ancestors to be located in contemporary digital projections that may form yet another thread in an ongoing trajectory.

## Endnotes

<sup>1</sup> Beth George and Sally Farrah, 'Trajectories of Axonometry through Distances and Disciplines'. In Victoria J. Wyatt, Andrew Leach, and Lee Stickells (eds.), *Proceedings of the Society of Architectural Historians, Australia and New Zealand 36, Distance Looks Back* (Sydney: SAHANZ, 2020), 172-83.

<sup>2</sup> Nomenclature around projection types is surprisingly tangled. Much use of *axonometry* will point to drawings that preserve the orthography of the plan, and *isometry* to those in which the plan representation is first distorted into obtuse and acute corners. But as Hilary Bryon and others have clarified, the more accurate classification places isometrics, dimetrics, and trimetrics within a broader category of axonometric projections (all of which entail plan-reconstruction with varying angles). Isometric is often applied as a catch-all for isometrics, dimetrics, and trimetrics, rather than axonometric, which should be their collective. That which is commonly held to be axonometric drawing – direct casting from plan – Bryon terms plan-oblique drawing. Oblique drawings always maintain a component, either plan or elevation, as un-distorted and parallel to the picture plane, hence plan-obliques or elevation-obliques. To avoid ambiguity, we will discuss plan-obliques herein, as well as explicit use of iso- and trimetric axonometric casts. It is worth noting that our last paper, "Trajectories", applied the term axonometric in terms of its common parlance for plan-obliques, rather than in the manner since clarified and adopted here. See Hilary Bryon, 'Revolutions in space: parallel projections in the early modern era', *ARQ* 12, 3/4 (2008), 337-346.

<sup>3</sup> Rem Koolhaas, 'Acknowledgements', *Delirious New York*. 2<sup>nd</sup> ed. (New York: Monacelli Press, 1994), 317.

<sup>4</sup> OMA, 'The Discovery of Manhattanism', *AD* 47, 5 'AD Profiles 5: OMA' (May 1977): 330.

<sup>5</sup> Roberto Gargiani, *Rem Koolhaas/OMA: The Construction of Merveilles* (London: Routledge, 2006), 25.

<sup>6</sup> Koolhaas, 'The City of the Captive Globe, 1972', *AD* 47, 5 'AD Profiles 5: OMA' (May 1977): 332.

<sup>7</sup> Kenneth Frampton, 'O. M. Ungers and the Architecture of Coincidence', in Frampton and Kolbowski (eds.), *O. M. Ungers: Works In Progress, 1976-1980* (New York, Rizzoli: 1981), 3.

<sup>8</sup> Reinhard Giesemann and Oswald Mathias Ungers, 'Towards a new architecture (1960)', in Ulrich Conrads (ed.), *Programmes and manifestoes on 20<sup>th</sup> century architecture* (London: Lund Humphries, 1970), 166. He also wrote later that 'form and content made up a unity', in Oswald M. Ungers, 'The theme of transformation or the morphology of Gestalt'. *Lotus Documents* 1 'Architecture as Theme' (1982): 23.

<sup>9</sup> Lara Schrijver, 'OMA as tribute to OMU: exploring resonances in the work of Koolhaas and Ungers'. *The Journal of Architecture* 13, 3 (2008): 240.

<sup>10</sup> Elia Zenghelis, 'Text and Architecture: Architecture as Text'. In Martin van Schaik and Otakar Máčel (eds.), *Exit Utopia: Architectural Provocations 1956-76* (Munich: Prestel Verlag, 2005), 261.

<sup>11</sup> Schrijver, 'OMA as tribute to OMA', 251.

<sup>12</sup> Rem Koolhaas and Hans Ulrich Obrist, 'Interview with O. M. Ungers', *Log* 16 (2009): 93.

<sup>13</sup> Zenghelis, 'Apropos of style and ideology', 34.

<sup>14</sup> Elia Zenghelis, 'Apropos of style and ideology', *Lotus International* 25 (1979): 34.

<sup>15</sup> Oswald M. Ungers, 'Designing and Thinking in Images, Metaphors and Analogies', in *Morphologie: City Metaphors*. 3<sup>rd</sup> ed. (Köln: Verlag der Buchhandlung Walther König, 2012), 14.

<sup>16</sup> Schrijver, 'OMA as tribute to OMA', 257.

<sup>17</sup> Fritz Neumeyer, 'OMA's Berlin: The Polemic Island in the City', *Assemblage* 11 (1990): 48.

- <sup>18</sup> Neumeyer, 'OMA's Berlin', 38.
- <sup>19</sup> Gargiani, *Rem Koolhaas/OMA*, 4.
- <sup>20</sup> Koolhaas' first contribution to the IAUS's journal was on Leonidov. See Rem Koolhaas and Gerrit Oorthuys, 'Ivan Leonidov's Dom Narkomtjajzprom, Moscow', *Oppositions 2* (1974): 95-103.
- <sup>21</sup> Gargiani, *Rem Koolhaas/OMA*, 21.
- <sup>22</sup> Kenneth Frampton and Silvia Kolbowski (eds.), *Ivan Leonidov* (New York: IAUS, 1981).
- <sup>23</sup> Elia Zenghelis, 'Drawing as technique and architecture', in *OMA Projects 1978-1981* (London: AA, 1981), 12.
- <sup>24</sup> Zenghelis, 'Drawing as technique and architecture', 12.
- <sup>25</sup> Zenghelis, 'Drawing as technique and architecture', 13.
- <sup>26</sup> Zenghelis, 'Text and Architecture', 256.
- <sup>27</sup> His first year at the AA 'began with an exploration of the urban environment through perception'. Cynthia Davidson and Elia Zenghelis, 'A conversation with Elia Zenghelis', *Log 30* (Winter 2014): 75.
- <sup>28</sup> '... the synthetic re-presentation of real experience is capable of *procuring the experience* with an intelligibility and clarity of representation, the intensity and absoluteness of which lived-in reality can never hope to approximate.' Zenghelis, 'Text and Architecture', 255.
- <sup>29</sup> Zenghelis, 'Text and Architecture', 255.
- <sup>30</sup> Massimo Scolari, *Oblique Drawing: a History of Anti-Perspective* (Cambridge, MA: MIT Press, 2012), 54. Demetri Porphyrios observed OMA's drawings operate by 'triggering the consciousness to the psychological'. Demetrios Porphyrios, 'Pandora's Box: An Essay on Metropolitan Portraits'. *AD 47*, 5 'AD Profiles 5: OMA' (May 1977): 357.
- <sup>31</sup> Sonit Bafna and Hoyoung Kim, 'Beyond instrumental use: a study of writing on architectural drawings in the late twentieth century', *ARQ 22*, 1 (2018): 49.
- <sup>32</sup> Our emphases. Robin Evans, *The Projective Cast: Architecture and its Three Geometries* (Cambridge, MA: MIT Press, 1995), xxxi.
- <sup>33</sup> Massimo Scolari, *Considerations and Aphorisms on Drawing*. Translated by James S. Ackerman (Rovereto: Edizioni Stella, 2007), 15.
- <sup>34</sup> To Koolhaas, the Manhattan skyscraper 'makes feasible, to a maximum degree, the fantastic dimension foreseen by Surrealism.' Gargiani, *Rem Koolhaas / OMA*, 69.
- <sup>35</sup> The term 'dirty realism' has been adopted in relation to architecture by Jesús Vassallo, as architects who in their critique of modernist representation, utilise visual praxis that 'mess with the real', by adopting 'intentionally *archaic techniques*' of representation. Vassallo cites the work of Koolhaas in the 1970s as a predecessor of these contemporary tendencies of digital drawing and collage. Jesús Vassallo, *Seamless: Digital Collage and Dirty Realism in Contemporary Architecture* (Architecture at Rice: Park Books, 2016), 178-180.
- <sup>36</sup> Francesco Marullo, 'Drawing Estrangement', *OASE 105 'Practices of Drawing'* (2020): 59.
- <sup>37</sup> Marullo, 'Drawing Estrangement', 71.
- <sup>38</sup> An example of this is Daniel Libeskind. See Werner Oechslin, 'From Piranesi to Libeskind: Explaining by Drawing', *Daidalos 1* (1981): 15-9; and Alberto Pérez-Gómez, 'Architecture as Drawing', *JAE 36*, 2 (Winter 1982): 6.
- <sup>39</sup> Zenghelis, 'Drawing as technique and architecture', 11.
- <sup>40</sup> Anderson, 'A Screen that receives images by radio', *AA Files 67* (2013): 4
- <sup>41</sup> Anderson, 'A Screen that receives images by radio', 4.
- <sup>42</sup> Porphyrios, 'Pandora's Box', 357.
- <sup>43</sup> 'In all these schemes we are contained in a drawn world. It is superbly controlled, aligned, coloured, gathered, dispersed, allowed to rest, reanimated, brought to a point.' Robert Maxwell, 'Introduction to new work of OMA', in *OMA Projects 1978-1981* (London: AA, 1981): 7.
- <sup>44</sup> Rem Koolhaas, 'Life in the Metropolis' or 'The Culture of Congestion'. *AD 47*, 5 'AD Profiles 5: OMA' (May 1977): 321.
- <sup>45</sup> Leonidov's drawings present us with 'tense and meaningful voids'. Vieri Quilici, 'Introduction (1975)', in Frampton and Kolbowski (eds.), *Ivan Leonidov* (New York: IAUS, 1981), 10.
- <sup>46</sup> Mario Gandelsonas, *X Urbanism: Architecture and the American City* (New York: Princeton Architectural Press, 1999), 76
- <sup>47</sup> Such overlaps with Gandelsonas' urban lexicon present opportunities for reading across the works of the various members of the IAUS: fertile ground for future dissemination.
- <sup>48</sup> Upon close inspection, the drawing is about 0.5 degrees off being an elevation-oblique. Whether this is aided by the painterly infill, or intentional, only OMA know. This lack of perfect symmetry also somewhat aids in its anthropomorphic metaphor. However, the drawing still reads as an elevation-oblique.

- <sup>49</sup> '... wavering between representation and life, between reality and magic... with its orthogonal distinctness of outline, its rare frontal views, and its absence of points of view and foreshortening'. Scolari, *Oblique Drawing*, 50.
- <sup>50</sup> Koolhaas, "Life in the Metropolis' or 'The Culture of Congestion'", 325.
- <sup>51</sup> Koolhaas, 'The Architects' Ball - A Vignette, 1931', *Oppositions* 3 (1974): 584.
- <sup>52</sup> Pier V. Aureli's study of the urban strategies of both Ungers and OMA reveal how the 'archipelago' infra space is as important as the formal 'islands'. See Aureli, *The Possibility of an Absolute Architecture*, Cambridge, MA: MIT Press, 2011.
- <sup>53</sup> Evans, *The Projective Cast*, 351.
- <sup>54</sup> Koolhaas, "Life in the Metropolis' or 'The Culture of Congestion'", 321.
- <sup>55</sup> Cook, *Drawing*, 183.
- <sup>56</sup> Ray Lucas, 'Occlusion and deliberately hidden lines: Hejduk's Wall House', in *Drawing Parallels: Knowledge Production in Axonometric, Isometric and Oblique Drawings* (Routledge: London, 2019), 79.
- <sup>57</sup> Zenghelis, 'A conversation with Elia Zenghelis', 86.
- <sup>58</sup> OMA, 'Welfare Palace Hotel', 344.
- <sup>59</sup> OMA, 'Welfare Palace Hotel', 345. The design borrows from Koolhaas' reading of Leonidov's Dom Narkomtjazzprom project in its equivalence of facades as faces. See Koolhaas, 'A Foundation of Amnesia', 7.
- <sup>60</sup> OMA, 'Welfare Palace Hotel', 345.
- <sup>61</sup> Koolhaas, *Delirious New York*, 101.
- <sup>62</sup> Koolhaas and Oorthuys, 'Ivan Leonidov's Dom Narkomtjazzprom', 102.
- <sup>63</sup> See Scolari, *Oblique Drawing*, 54; 57; and 297.
- <sup>64</sup> Davidson and Zenghelis, 'A conversation with Elia Zenghelis', 97.
- <sup>65</sup> See also OMA's Egg of Columbus Circle (1975).
- <sup>66</sup> Porphyrios, 'Pandora's Box', 361.
- <sup>67</sup> 'Thanks to paintings by Leonidov... he can observe the effect of the presentation of a project in the form of a painting.' Gargiani, *Rem Koolhaas/OMA*, 42.
- <sup>68</sup> Cook, *Drawing*, 86.
- <sup>69</sup> 'Ferriss's expressive chiaroscuro drawings mixed poetry and power in a twentieth-century Sublime.' Carol Willis. 'Drawing towards Metropolis', in Hugh Ferriss, *The Metropolis of Tomorrow*. 2<sup>nd</sup> ed. (New York: Princeton Architectural Press, 1986), 148.
- <sup>70</sup> Cook, *Drawing*, 131.
- <sup>71</sup> Koolhaas, *Delirious New York*, 293.
- <sup>72</sup> Evans, *The Projective Cast*, 353.
- <sup>73</sup> Scolari, *Oblique Drawing*, 70.
- <sup>74</sup> OMA, 'New Welfare Island, 1975-76'. *AD* 47, 5 'AD Profiles 5: OMA' (May 1977): 341. Porphyrios notes that 'Colour and above all secondary non-architectural information was needed.' Porphyrios, 'Pandora's Box', 358.
- <sup>75</sup> Cook, *Drawing*, 169.
- <sup>76</sup> Rem Koolhaas, 'Bigness, or the problem of Large (1994)', In Koolhaas and Bruce Mau (eds.), *S, M, L, XL: Office for Metropolitan Architecture* (New York: Monacelli Press, 1995), 512.
- <sup>77</sup> Alejandro Zaera-Polo, 'Well into the 21<sup>st</sup> century: The architectures of post-capitalism?' *El Croquis* 187 (2016): 261.
- <sup>78</sup> Zenghelis, 'Drawing as technique and architecture', 13.
- <sup>79</sup> Zaera-Polo, 'Well into the 21<sup>st</sup> century', 257.
- <sup>80</sup> Cook, *Drawing*, 21.
- <sup>81</sup> Evans, 'Translations from Drawing to Building', 8.
- <sup>82</sup> A recent issue of *OASE* journal entitled 'The Drawing as a Practice' stated the contents 'are situated within a tension between, on the one hand, the drawing as a mental space, in which the ideas of the architect are translated and developed through specific modes of drawing, and, on the other, the drawing as technique, in which the materiality of the drawing seems to shape the design process itself.' Decroos et al, 'The Drawing as a Practice', *OASE* 105 'Practices of Drawing' (2020): 17.
- <sup>83</sup> The first of these is *Daidalos* 1 (1981) 'Drawing as a Medium of Abstraction'. See also Scolari, 'Elements for a History of Axonometry'. *AD* 5, 5-6 (1985), 73-78.
- <sup>84</sup> Bafna and Kim, 'Beyond Instrumental Use', 50.