

## **Super Models**

### **or: Some (Scale) Models That I'd Like to Know**

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#### **I. The Scale Model as Spiritual Redemption**

*Why look for two-dimensional forms to fit orbits in space? One has to look for three-dimensional forms—and, behold, dear reader, now you have my discovery in your hands!*<sup>1</sup>

What is the role of the scale modeler? And what are the intentions of the maker?

Conventionally, the scale model is created for an architectural proposal — as a stand-in or approximation used to gain approval for the building itself. However, viewed as a critical design artifact within a cultural context, the scale model can pose questions about the implications of making by hand, the manipulation of scale with which the miniature engages, and the spacial and personal interrelationships that models can represent. The seventeenth century astronomer, Johannes Kepler, for example, wanted to be reassured that there was some logical, intentioned reason for the number of planets and for their movement around the sun, and his scale model of the solar system afforded Kepler the capacity to engage in a pioneering endeavor of the scientific revolution without having to disentangle his pursuits from his religious beliefs, as well as those of the prevailing

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<sup>1</sup> Kepler, Johannes. *Mysterium Cosmographicum*. Johannes Kepler, *Gesammelte Werke*, Vol. I. Walther von Dyck and Max Caspar, eds. 1938. Preface to the reader.

culture in which he worked.

Kepler was teaching mathematics in Gratz in July of 1595 when he was struck by the realization that a circle drawn inside a triangle drawn inside a circle described what he believed to be the relationship of the orbit of Jupiter to the orbit of Saturn.<sup>2</sup> He would spend years following this realization attempting to model the solar system in such a way that the orbits of the six discovered planets could be described within a set of the five Platonic perfect solids, nested to fit the eccentricities of each planetary orbit.<sup>3</sup> As Arthur Koestler writes in his biography of Kepler:

So there existed only five perfect solids—and five intervals between the planets! It was impossible to believe that this should be by chance, and not by *divine arrangement*. It provided the complete answer to the question why there were just six planets ‘and not twenty or a hundred.’ And it also answered the question why the distances between the orbits were as they were. They had to be spaced in such a manner that the five solids could be exactly fitted into the intervals, *as an invisible skeleton or frame*. And, lo, they fitted! Or at least they seemed to fit, more or less.<sup>4</sup>

Kepler wanted to know God’s plan for the universe, and he believed that if he could only describe these rational relationships, he could reassert God’s hand into what, given his unique embrace of the heliocentric Copernican model, must have seemed like an

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<sup>2</sup> Koestler, Arthur. *The Watershed: A Biography of Johannes Kepler*. Garden City: Doubleday & Company, Inc., 1960. 43. Print.

<sup>3</sup> Kepler, Johannes. *Mysterium Cosmographicum*. Tübingen: 1596. e-rara.ch. Web. 03 Nov. 2013.

<sup>4</sup> Koestler, Arthur. *The Watershed: A Biography of Johannes Kepler*. Garden City: Doubleday & Company, Inc., 1960. 47. Print. [Emphasis added].

otherwise chaotic universe.<sup>5</sup> Kepler was initially drawn to astronomy and the Copernican model purely as a spiritual pursuit, albeit one that he struggled to disambiguate from, but often conflated with, a distinctly scientific practice; Koestler explains his reasoning in that “... the sun must be in center of the world because ‘he’ is the symbol of God the Father, the source of light and heat, the generator of the force which drives planets in their orbits, and because a sun-centered universe is geometrically simpler and more satisfactory.”<sup>6</sup>

Using Kepler as a case study provides questions concerning the potentially productive role that misreading can play in how we regard the scale model as a tool for understanding and describing relationships and motives in the world. Kepler was driven by the perceived elegance and rationality of his model as evidence of a divine logic that governed the solar system. The issue of materiality in the process of making presents itself as a factor here in that Kepler only made paper versions of his nested model, since much of his efforts lay in mathematical calculations, the remote observations of the movement of the planets across the night sky, and the unknowability Kepler sustained in the relative accuracies or inaccuracies of his planetary observations.<sup>7</sup> He planned to have his model professionally fabricated in more permanent material.<sup>8</sup> Indeed, Kepler only set out to fabricate a series of paper models of his nested Platonic solid solar system in February of 1596 as a means of demonstrating its aesthetic qualities as an object worthy

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<sup>5</sup> *Ibid.* 50.

<sup>6</sup> *Ibid.* 59.

<sup>7</sup> Hart, George W. “Johannes Kepler’s Polyhedra.” 1998. Web. 18 Nov. 2013.

<sup>8</sup> *Ibid.*

of casting in precious metals; he proposed using it as a means to dispense beverages in the court of Frederick, Duke of Wuerttemberg.<sup>9</sup> As Koestler writes: “... Kepler had no money to make a copper model, as he resentfully conveyed to the Duke in his next letter; instead, he settled down to the Herculean task of making a paper model of all the planetary orbits and the five perfect solids in between. He labored day and night for a week; years later he nostalgically remarked that it had been quite a pretty model, made out in paper of different colors, with all the orbits in blue.”<sup>10</sup>

Kepler may have been among the first scientists to fabricate a scale model depicting a relationship that he had no capacity to ever know in a complete physical sense. Whereas today the dissemination of imagery and digital and physical models of atomic structures and DNA helices is relatively common, this tool of physical abstraction based on relatively exact scientific accuracies would have been, presumably, a much rarer object of inquiry and mediation in the sixteenth and seventeenth centuries. But arguably, in our reading of them today, these objects perform similar functions as Kepler’s planetary model did for him — they provide a rational, structured basis for the ongoing existence and accord of the natural world.

The scale model here takes on greater significance, not only in that Kepler saw it as a determinant of his aspired-for redemption in the mind of God, but that in eventually retreating from the nested Platonic model (though never explicitly rejecting it) and the

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<sup>9</sup> Koestler, Arthur. *The Watershed: A Biography of Johannes Kepler*. Garden City: Doubleday & Company, Inc., 1960. 68. Print.

<sup>10</sup> *Ibid.* 69.

false hope that it provided for a divine rationale to the universe, Kepler unknowingly asserted what would become the break between mysticism and science, astrology and astronomy. Kepler provided a hypothesis and used the scale model as a tool for interrogating that hypothesis against his astronomical observations. When, after a great deal of frustration and deliberation, he finally concluded that his hypothesis and his observations could not be reconciled, he withdrew from his original hypothesis, and in doing so, established a cornerstone of contemporary scientific inquiry. In this example, the scale model has been granted the capacity to *communicate back*. It becomes not just an object upon which logics and rationales are to be projected, but one which can communicate with its maker. Even when, as in Kepler's case for so many years, the maker may not have the capacity to understand or internalize the message that the scale model is conveying.

## II. The Scale Model as Cinematic Prop

*It's not models — it couldn't be a model — because there are people in them.*<sup>11</sup>

What are the situated adjacencies of the scale model? And how will the relationship to scale impact the reading of the scale model? In the 2001 comedy film *Zoolander*, Ben Stiller's character dramatically destroys a scale model that has been presented to him as a philanthropic tribute to his legacy as a fashion icon and supermodel.<sup>12</sup> The character

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<sup>11</sup> Howard, Ron, dir. *Apollo 13*. Director's commentary. Universal Home Video, Inc., 1998. DVD. (01:53:26–01:53:28).

<sup>12</sup> Stiller, Ben, dir. *Zoolander*. Paramount Pictures, 2001. Film.

here has misread the scale model as the full-scale structure that it was intended to denote. This scene underscores the significance of the relationship between the scale model and the person reading, or more importantly, misreading, it. In its framing and pacing, the scene starts to address how this moment of encounter with the scale model is a moment of interpretation, projection, and performance, for both the character and viewer, in how we understand the narratives and motives that are embedded in the tools of rhetoric and discourse. Though Stiller's intention is toward absurdist humor, the scene speaks to the amplification of the object's significance within the filmic tropes of how scale models are often used.

When the scale model is depicted in cinema as a scale model (as distinct from being depicted as a cinematic special effect) it is used as a narrative tool made physical, around which a set of knowing, assertive characters can mediate and enact a discussion about a broader, more significant action, which will often become the setting for the climax of the story. The scene usually opens on a cut or dissolve of the scale model, in which, momentarily, the frame may be intentionally composed to obscure any adjacent figures or objects that might situate the viewer as to the actual physical dimensions of the scene being portrayed. The viewer is knowingly or unknowingly at the mercy of the frame, compelled to accept or reject this representation, as was Ben Stiller's character in *Zoolander*, as the full-scale, life-size structure.<sup>13</sup>

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<sup>13</sup> Heindl, Gabu, and Drehli Robnik. *Mock-Ups in Close-Up: Architectural Models in Film 1919 - 2012*. 2007-2013. Film.

The camera will often linger, taking in the wealth of detail and extending this moment of misreading, often accompanied by the disembodied voice of the character leading the discussion. The camera will then truck or zoom back, pan or tilt off of the scale model, and reveal the action that is unfolding around, but rarely within, the object. The viewer has suddenly been resituated, forced to readdress scale and the reported accuracy of the events being portrayed on screen.<sup>14</sup> As Susan Stewart writes: “The miniature has the capacity to make its context remarkable; its fantastic qualities are related to what lies outside it in such a way as to transform the total context. [...] Amid such transformations of scale, the exaggeration of the miniature must continually assert a principle of balance and equivalence, or the narrative will become grotesque.”<sup>15</sup>

The object, and the discussion itself, serve often as harbingers to events that will precede in the narrative. As with Kepler, the physicality of the object often points to the nature of the relationship between the group mediating the plan and how the viewer is meant to interpret this group’s status or the legitimacy of their stated intentions. And what emerges after viewing hundreds of scenes of scale models in cinema, as in Gabu Heindl and Drehli Robnik’s supercut *Mock-Ups in Close-Up: Architectural Models in Film 1919-2012*, is the shift across decades in the role of the scale model in cinema: the 1940s and ‘50s present mostly painted wood models of battlefields and war plans, the ‘60s and ‘70s often depict paper and cardboard models for bank heists and jailbreaks, and the ‘80s and ‘90s mostly consist of foam core and acrylic proposals for postmodern malls and

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<sup>14</sup> *Ibid.*

<sup>15</sup> Stewart, Susan. *On Longing: Narratives of the Miniature, the Gigantic, the Souvenir, the Collection*. Durham: Duke University Press, 1993. 46. Print.

theme parks, which often occupy the offices of smarmy real estate developers.

Significantly, the fabrication of the scale model is rarely depicted or discussed in these scenes. It is as if the scale model appears through some divine intervention (a possibility that Kepler might have enthusiastically endorsed). In those cases where the scale model is evaluated as an actual physical object with material qualities, as opposed to a perfect rendering of the event under discussion, it is almost exclusively to humorous effect as an inversion within the set of tropes and clichés in how scale models are often used in cinema.<sup>16</sup>

### III. The Scale Model as Conceptual Art

*If you understand model as being, like, your life insurance plan is a model. Or, the weather forecast is a model. That's the model I'm doing. I'm doing a model, which is kind of simplifying what we know about the world on to one focused point.*<sup>17</sup>

Who or what does the scale model claim to represent? And who or what details is the scale model neglecting, either intentionally or unintentionally? In cinematic imagery the scale model becomes an embodiment of a larger set of cultural contexts, and, as such, the scale model becomes an ideology in and of itself. For Thomas Demand, a contemporary

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<sup>16</sup> See, for example, *Back to the Future* (dir. Robert Zemeckis, 1985), *Austin Powers: International Man of Mystery* (dir. Jay Roach, 1997), or *Con Air* (dir. Simon West, 1997).

<sup>17</sup> Demand, Thomas and Sylvia Lavin. "Thomas Demand In Conversation With Sylvia Lavin." SCI-Arc Media Archive. Southern California Institute of Architecture. 01 Apr. 2013. Web. 01 Oct. 2013. (00:16:21 – 00:16:36).

German photographer and sculptor, the model points to something both compelling and unsettling about the relationships that the scaled object exposes.

Demand constructs paper and cardboard models of famous and infamous sites and objects to-scale, then destroys the model after carefully lighting and photographing it. The photographic prints in exhibition are often between six and eight feet in either dimension and are displayed without frames. In erasing people and flattening surface details, Demand's work comes right up to the edge of facsimile, interrogating those very embodied ideologies that media imagery and models effectively obscure.<sup>18</sup> This example returns the discussion to the issue of framing and misreading the relationships that the scale model claims to depict. The scale model is a narrative, but one that obstinately insists on a very particular set of formal accuracies, while leaving everything else uncomfortably ambiguous for the reader — which is what, potentially, opens the space for misreading. The settings and circumstances that Demand models are always accountable to reality as it existed at some fixed point in time, usually derived from photographs that he selects from newspaper stories or historical archives. The work can be thought of as accurate to the extent that Demand's models remain faithful to certain selected spacial relationships and apparent material qualities depicted in the source imagery, while the selected erasure of details, such as people and text, in conjunction with the objective, concise titles he applies to the work (*Badezimmer/Bathroom*, *Büro/Office*, *Copyshop*, etc.) complicates the relationship to objectivity and accuracy

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<sup>18</sup> Marcoci, Roxana. "Paper Moon." *Thomas Demand*. New York: The Museum of Modern Art, 2005. 26. Print.

that the technical processes of modeling and photographing often exploit.

Demand shares with the Kepler the preoccupation with scientific method and technology as a way of reaching a greater, perhaps frustratingly unattainable truth concerning the capacity to understand the world through the process of making physical abstractions (i.e. scale models). Whereas Kepler longed to “... [read] the mind of the Creator...”<sup>19</sup> through the process of developing his nested Platonic model of the solar system, we could infer that Demand longs to *read the mind of the media* through the process of creating models from existing photographic documentation. As Demand has said about making and interacting with his models: “When I walk around them I feel a strange sense of destabilisation. You transpose yourself to a time and place in which you could never be.”<sup>20</sup>

## **In Conclusion**

### **or: There’s No Such Thing as a Cute Dollhouse in CAD<sup>21</sup>**

Because the concept of scale specifically delineates a relationship between a fixed viewer and a fixed physical object, the way that scale is commonly understood in digital tools and interfaces diminishes this relationship between object and maker to nothing more

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<sup>19</sup> Koestler, Arthur. *The Watershed: A Biography of Johannes Kepler*. Garden City: Doubleday & Company, Inc., 1960. 60–61. Print.

<sup>20</sup> Thomas Demand quoted in: Godfrey, Mark. *Thomas Demand: Nationalgalerie*. Göttingen: Steidl Mack, 2009. 4–5. Print.

<sup>21</sup> I am indebted to my thesis co–advisor Tim Durfee as the source of the quote from which the title of this section is derived.

than a dimensional factor of accuracy. But, as the examples above demonstrate, there is much more at stake in the making, understanding, reading, and misreading of scale models than simply an obstinate insistence on some subjective notion of “accurate” verisimilitude between that which is model and that which is being modeled. To think of the scale model as nothing more than a tool for gaining approval for some proposed architectural endeavor, or simply as a means to depict some historical site or tourist attraction, is to diminish the broader set of meanings that the miniature can embody as a critical design object in a cultural context.

The advent of large scale computational technologies lends legitimacy to a new set of faithful reproductions and accuracies within the practice of modeling — those models that attempt to abstract a depiction (via high resolution photography and algorithmic digital image interpolation<sup>22</sup>) of the entire planet, such as the “Photorealistic 3D Buildings” layer mesh in the Google Earth desktop and mobile applications and the Google Maps website. However, so long as such models remain confined to a set of vectors, rendered across digital platforms, they will never rise to an engagement through making and reading than anything more than set of narrow accuracies; as fastidious fabrications, but never as scale models. And in an era of ubiquitous digital fabrication tools — with consumer-oriented modeling applications and 3D printers rapidly inserting themselves into greater facets of everyday life — questions of the role, loyalties, and obligations of the maker take greater significance across a broad spectrum of society.

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<sup>22</sup> Birch, Peter. Google. “The Next Dimension of Google Maps.” *YouTube*. 06 Jun. 2012. Web. 22 Jan. 2014.

These questions will emerge in private and professional contexts, domestic and industrial spaces, and are unlikely to be easily resolved for years to come.

Models both restrain and compel our understanding of the world around us. But it is through the practice of scale modeling that the maker is often, though not always, forced to engage with a set of issues that are rarely, if ever foregrounded in the digital fabrication process. Scale models are uniquely imbued with the capacity to communicate *back* to their maker, especially as it concerns the implications of depiction through abstraction, accuracy, and scale. Scale models engage and exploit our capacity to productively misread their implications and intentions. Scale models are able to critically pose the questions above, and others, in a manner that engages uniquely with the physical world.