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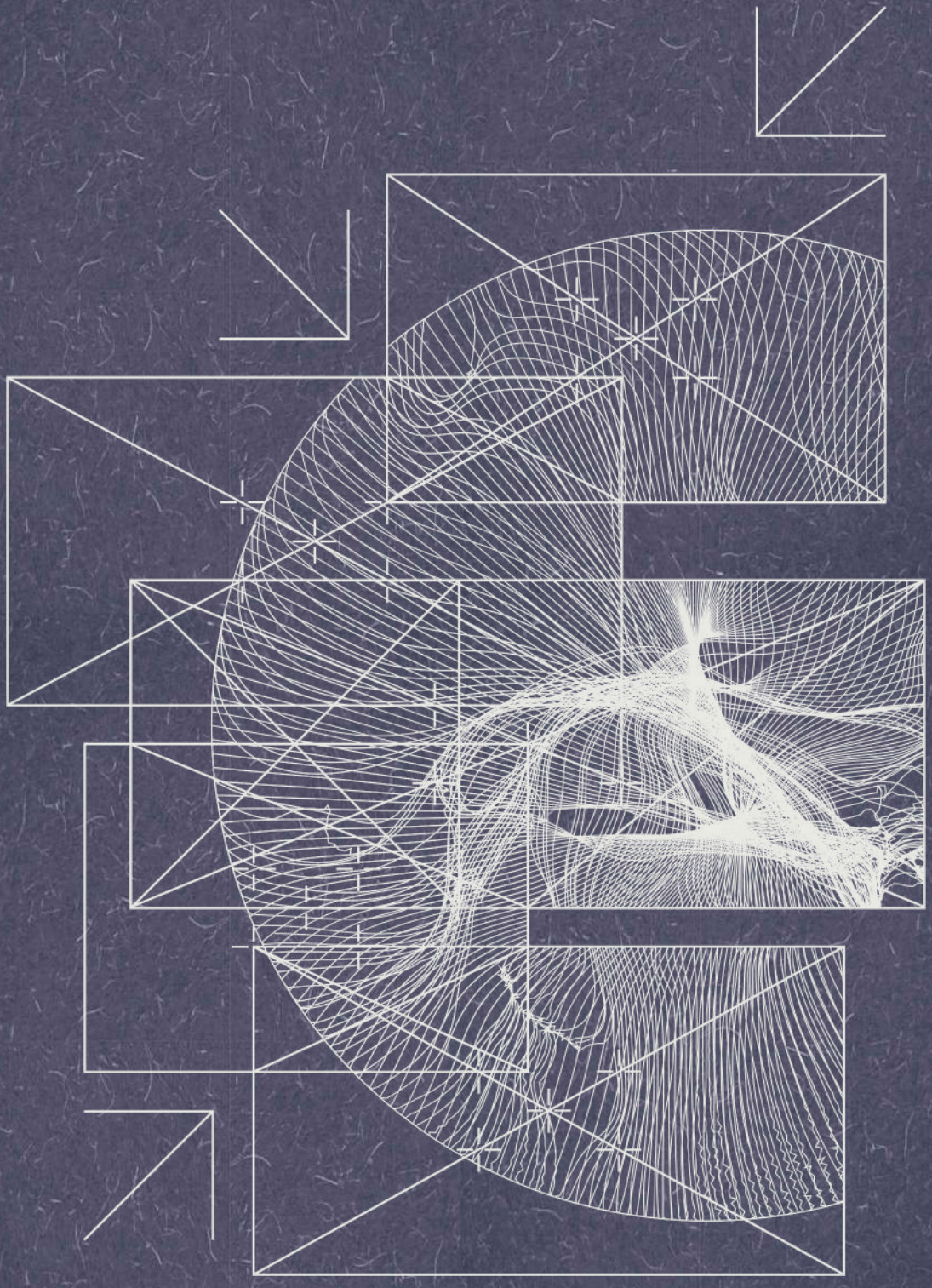

Disegno

Journal of Design Culture
Double-blind peer-reviewed, open access scholarly journal.

Aims and Scope

Disegno publishes original research papers, essays, and reviews on all aspects of design cultures. We understand the notion of design culture as resolutely broad: our aim is to freely discuss the designed environment as mutually intertwined strands of sociocultural products, practices, and discourses. This attitude traverses the disciplinary boundaries between art, design, and visual culture and is therefore open to all themes related to sociocultural creativity and innovation. Our post-disciplinary endeavour welcomes intellectual contributions from all members of different design cultures. Besides providing a lively platform for debating issues of design culture, our specific aim is to consolidate and enhance the emerging field of design culture studies in the Central European academia by providing criticism of fundamental biases and misleading cultural imprinting with respect to the field of design.

All research articles published in Disegno undergo a rigorous double-blind peer review process.
This journal does not charge APCs or submission charges.

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A NEW ACCOUNT OF THE RELATION BETWEEN ART, SCIENCE, AND DESIGN

NOAM ANDREWS: THE POLYHEDRISTS

Alexandra Karakas

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Noam Andrews: The Polyhedrists: Art and Geometry in the Long Sixteenth Century. *Cambridge: MIT Press, 2022. 304 pages. ISBN-13: 978-0-26204-664-0*

In general, the intertwining of drawing, perspective, instruments, design, and science is still far from being fully understood. In particular, the way mathematical knowledge of solids relates to art is a multidisciplinary endeavour that is hard to grasp without simplifying matters in some way. In his new book titled *The Polyhedrists: Art and Geometry in the Long Sixteenth Century*, Noam Andrews aims to detail the history of Platonic solids in different domains. Andrews claims that "the visual history of polyhedra is littered with false starts, poignant failures, and allegories unable to convey the weight of their subject matter" (59). This is true, and there are many different reasons why. On the one hand, the categorisation of different disciplines in the sixteenth century was far from the disciplinarity of today. Art, science, and design were much less separated, and consequently, an investigation in any of these fields typically considered phenomena in their complexity. On the other hand, the scientific revolution transformed the way science operated as a social institution, and within these processes, other fields in the humanities also shifted perspective. Lastly, it is hard to grasp the complexity of the epistemic role and relatedness of artefacts.

Fortunately, *The Polyhedrists* does not separate art from design and science, and it therefore reflects the interrelatedness of the three and represents the intertwined relationship of these disciplines and human-made objects (see for instance, the closing chapter titled "Epilogue: Corpora Irregulata et Regulata" and the sections in it on Kepler). Central is the problem of distilling philosophical concepts into tangible things, i.e., drawings and solids. For instance, in the chapter titled "Instruction and Measurement," Andrews starts to discuss Nurem-

berg's, the great Renaissance city's history, including its material culture, the natural philosophers, scientists, and artists who lived there, in order to portray the rich cultural history of the city. Particular emphasis is placed on Albrecht Dürer, one of the most notable Nurembergers, who was not only a remarkable artist, but also participated in the circulation of philosophical and scientific knowledge as a humanist. Dürer used scientific instruments for measurements, such as compasses and solids, to balance the proportions of the human body, and later, he adapted a Vitruvian system of ratios as well. Dürer became familiar with Euclidian geometry during his trip to Italy, where he also learnt about Piero della Francesca's method of foreshortening. Readers familiar with Erwin Panofsky's work on Dürer may find Andrews descriptions of these an exciting addition to our understanding of the evolution of perspective in Dürer's work.

Indeed, perspective is central to the connection between art and science for both philosophical and instrumental reasons. Being a book about solids and visuality, *The Polyhedrists* showcases many different illustrations, drawings, and other visual elements to support the book's argument. Accordingly, Polyhedra had a unique role since they served as a basis for exploring three-dimensional abstraction. Thanks to this and a massive amount of technical investment, these solids slowly became the single most recognisable emblems of perspectival measurement tools. Polyhedra were divided into two major groups in Western culture: the regular or Platonic solids and the semiregular or Archimedean solids. The five regular solids—the tetrahedron, the hexahedron, the octahedron, the dodecahedron, and the icosahedron—owe their name to Plato, who in the *Timaeus* associated four of them with the basic elements, that is, fire, air, water, and earth. In contrast, the dodecahedron is associated with the heavens. Archimedean solids consist of thirteen convex polyhedrons with high symmetry. The difference between Platonic and Archimedean solids is that while the former are a single regular polygon, the latter are comprised of two or more regular polygons. Knowledge of these solids became more and more important in the sixteenth century. Martin Kemp emphasises the role of sensory effects and the particular properties of the eye, and states that "geometrical procedures provided an appropriate means for the representation of three-dimensional objects on a flat surface in such a way that the projection presented essentially the same visual arrangement to the eye as that presented by the original objects" (Kemp 1990, 165).

However, Andrews emphasises that geometrical knowledge was only part of the skill set of Renaissance man. The diverse knowledge about instrument design, mechanics, astronomy, mathematics, arts, architecture, optics, and cartography, to name but a few, was only loosely united by geometrical principles (102). On page 140 of *The Polyhedrists*, Andrews shows a painting of one of the most distinguished goldsmiths of the sixteenth century, *Portrait of the Goldsmith Wenzel*

Jamnitzer by Nicolas de Neufchatel. There are seven artefacts in the painting next to Jamnitzer: a silver measuring scale, a compass, a prayer book, spectacles, an hourglass, a figure of Neptune, and a drawing of Neptune. Andrews examines these artefacts and claims that "each of the seven items chosen represent the epistemic aspirations of the art and science of goldsmithing at its mid-sixteenth century zenith" (141). These objects are epistemic in that they contribute to the production of both scientific and artistic knowledge, and they also serve as components of learning. They mediate, establish, and affect how artists and scientists measure, purify, observe, and represent the world. Thus, the epistemic role of artefacts cannot be separated from scientific discoveries or the development of particular artistic progress.

The most well-known example of this issue is the book titled *Secret Knowledge: Rediscovering the Lost Techniques of the Old Masters* by David Hockney ([2001] 2006). Building on his collaboration with physicist Charles M. Falco, Hockney claimed that artists like Caravaggio and Jan van Eyck used concave mirrors, lenses, and other optical devices when making pictures, be it painting or drawing, to project parts of the images illuminated mainly by sunlight onto a canvas or board. Moreover, he claimed that artists started using optical devices as early as the beginning of the Renaissance, thus three hundred years before art historians had suspected it. Even though many have criticised their claims (Stork et al. 2011), their essential claims seem trivial to other historians and philosophers of science and art. Don Ihde claimed that "Hockney did not rediscover the secrets of the Renaissance, he simply republicised them. What may have been forgotten by some critics and historians is how fully technologised the Renaissance and Early Modernity [were]. Might Galileo without his telescope be analogous to Caravaggio without his camera?" (Ihde 2008, 385).[1] Thus, the way artists used technological devices for art is similar to how science is deeply rooted in using artefacts. If we accept this claim, the study of the artefacts and critical texts of the scientific revolution can reveal a lot about the art and design of the same period, since they are analogous in many ways.

One of the advantages of the book is not ignoring historiographical issues alongside philosophical and historical accounts. For instance, in the chapter titled "Instruction and Measurement," the author discusses how Dürer might have struggled reading ancient texts and how Pirckheimer, a translator and Dürer's friend, could have influenced Dürer's understanding of ancient texts. This connection is especially relevant since Pirckheimer did not just translate some essential works but also lent his personal library to Dürer and recommended specific works to him. In this way, Pirckheimer nudged Dürer in certain intellectual directions and influenced Dürer's artistic and intellectual praxis.

Through various examples, Andrews emphasises the social aspect of art and design. One of the most important social aspects of art was the existence of many studios and workshops, in which different phases of object production took place. Since drawing was the primary

[1] *Another critic of Hockney with comparable praxis is the Hungarian graphic artist, animator, and essayist István Orosz, who frequently reflects—by way of art, model reconstructions, and historical analyses—on the intertwinements of technology and symbolic meaning in the era, including Brunelleschi's demonstration of perspective, Dürer's polyhedron in* Melancholia, *the instruments and the anamorphosis in Holbein's* The Ambassadors. *See, for example, his 2011* A követ és a fáraó *and 2013* Válogatott sejtések *(both Budapest: Typotex).—Eds.*

form of communication, goldsmiths such as Jamnitzer had to rely on graphic skills to be able to facilitate the production of certain items. Design sequences display thinking processes that were later handed to goldsmiths, manufacturers, or the commissioner. These examples show that an artist, designer, or scientist rarely worked alone; rather, teamwork is essential in most cases and for many reasons.

In contemporary art, solids still interest artists whose work is connected to science in some way. Attila Csörgő's work titled *Platonic Love* (1997), for instance, plays with time, solids, and movement to slowly transform geometrical forms into new pieces. His makeshift lever and pulley transforms three Platonic solids, a tetrahedron, a cube, and an octahedron, into another Platonic solid, a dodecahedron. Similar problems appear in the Danish-Icelandic artist's Olafur Eliasson's practice, who uses solids and different scientific concept in his work. For instance, in *Your Sound Galaxy* (2012), *Firefly Double-Polyhedron Sphere Experiment* (2020), and in *The Tetrahedral Night* (2017).

The Polyhedrists offers a rich historical, sociological, and theoretical account of geometry in the sixteenth century. The book showcases many images alongside the text: artworks, illustrations, and drawings of devices, solids, and other instruments that support the author's argument. Because of the tremendous amount of information, it can sometimes be heavy going for readers who do not have enough background information or previously did not know anything about the topic, so I would not consider this an easy book for beginners. However, it is an essential read for anyone interested in the intertwined relationship between art, design, and science since it provides an incredible amount of knowledge and interpretation in a beautifully made book.

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