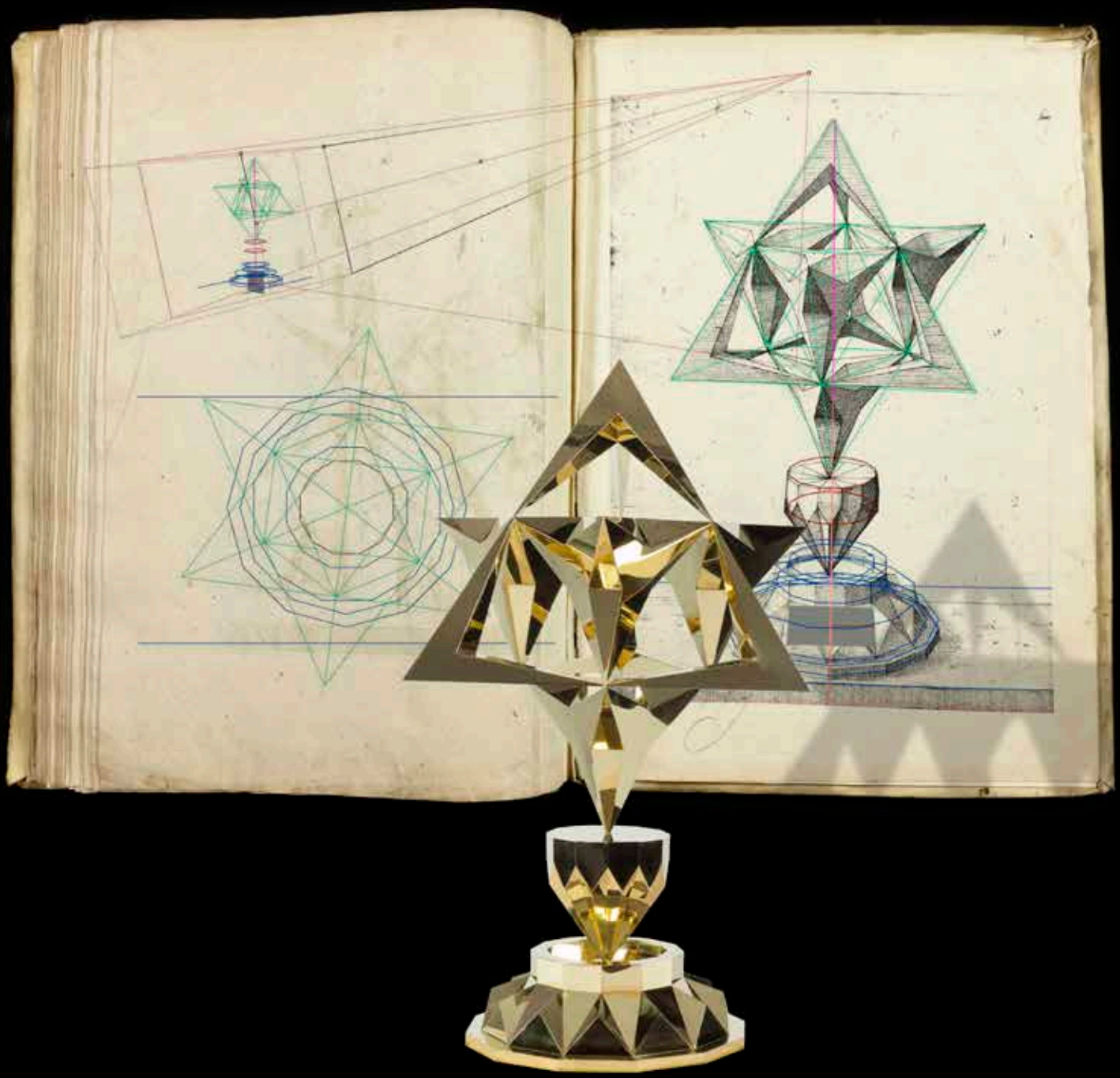


EXHIBITION PROSPECTUS

POLYHEDRAL MONUMENTS

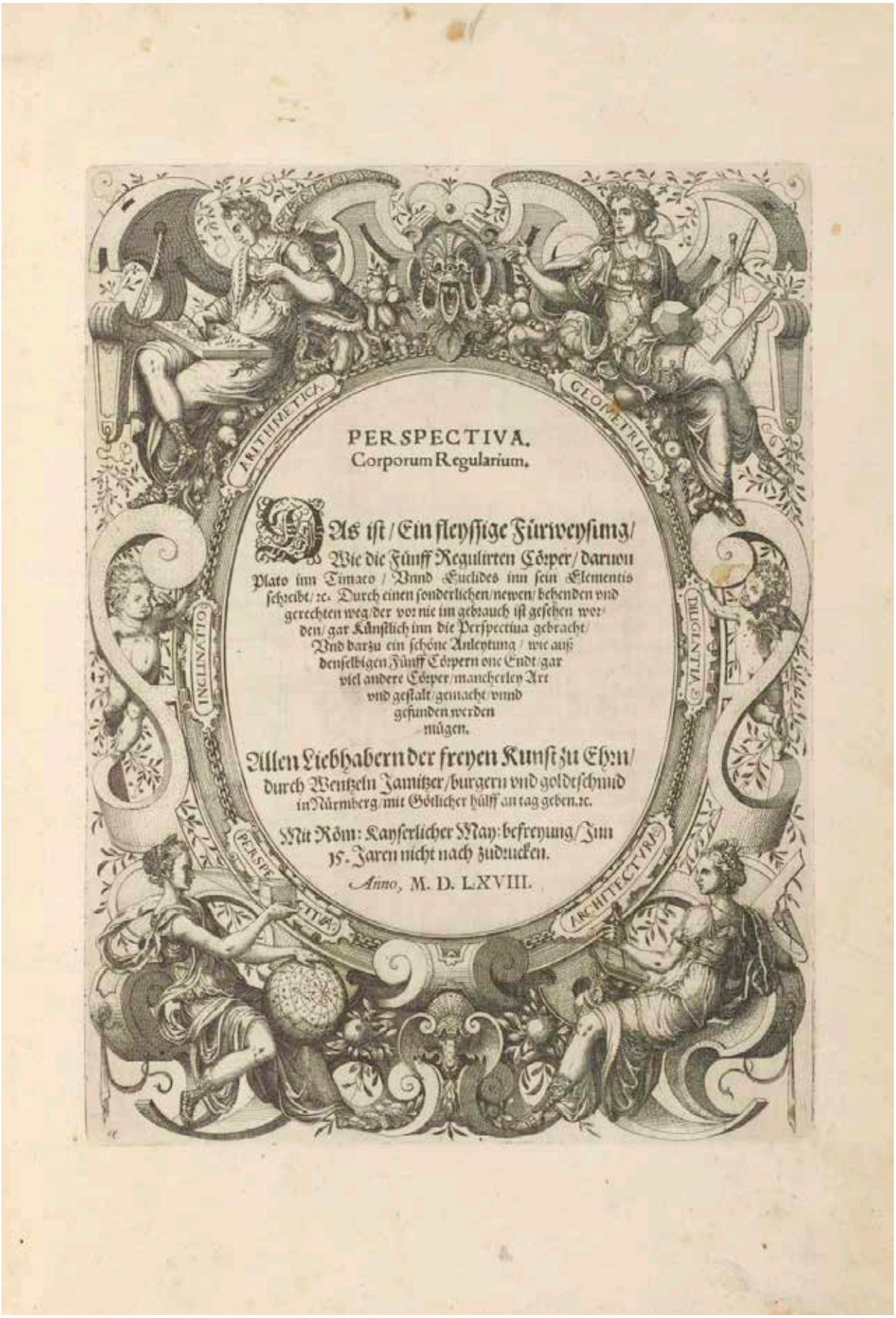
New Perspectives on Wenzel Jamnitzer

FACTUM arte

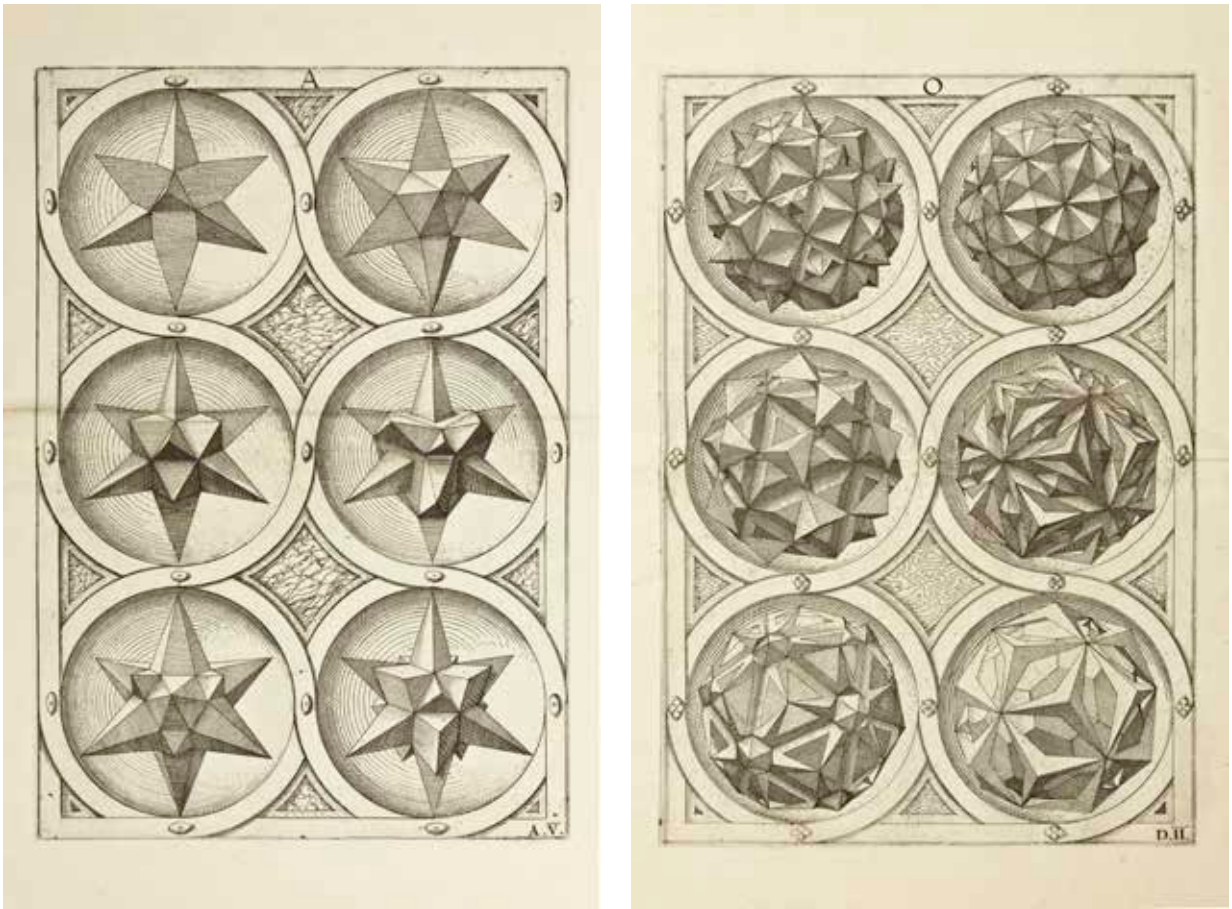
'For Jamnitzer, a mirror, a painting, and a mathematical representation are all ways of representing and knowing nature. Nature, and its processes, could come to be known both through imitation and through mathematical representation.'

Pamela H. Smith[1]

1. Pamela H. Smith, *The Body of the Artisan: Art and Experience in the Scientific Revolution* (Chicago, 2004), p. 80.



Title page of Jamnitzer's *Perspectiva Corporum Regularium*, Nuremberg, 1568. Here, Jamnitzer is drawing on the traditional *Quadrivium* curriculum which underscored the Liberal Arts. However, he has replaced Astronomy and Music with Perspective and Architecture, both fields more relevant for his endeavors. The addition of *putti* representing Inclination and Diligence adds to the charm and wit of his presentation.

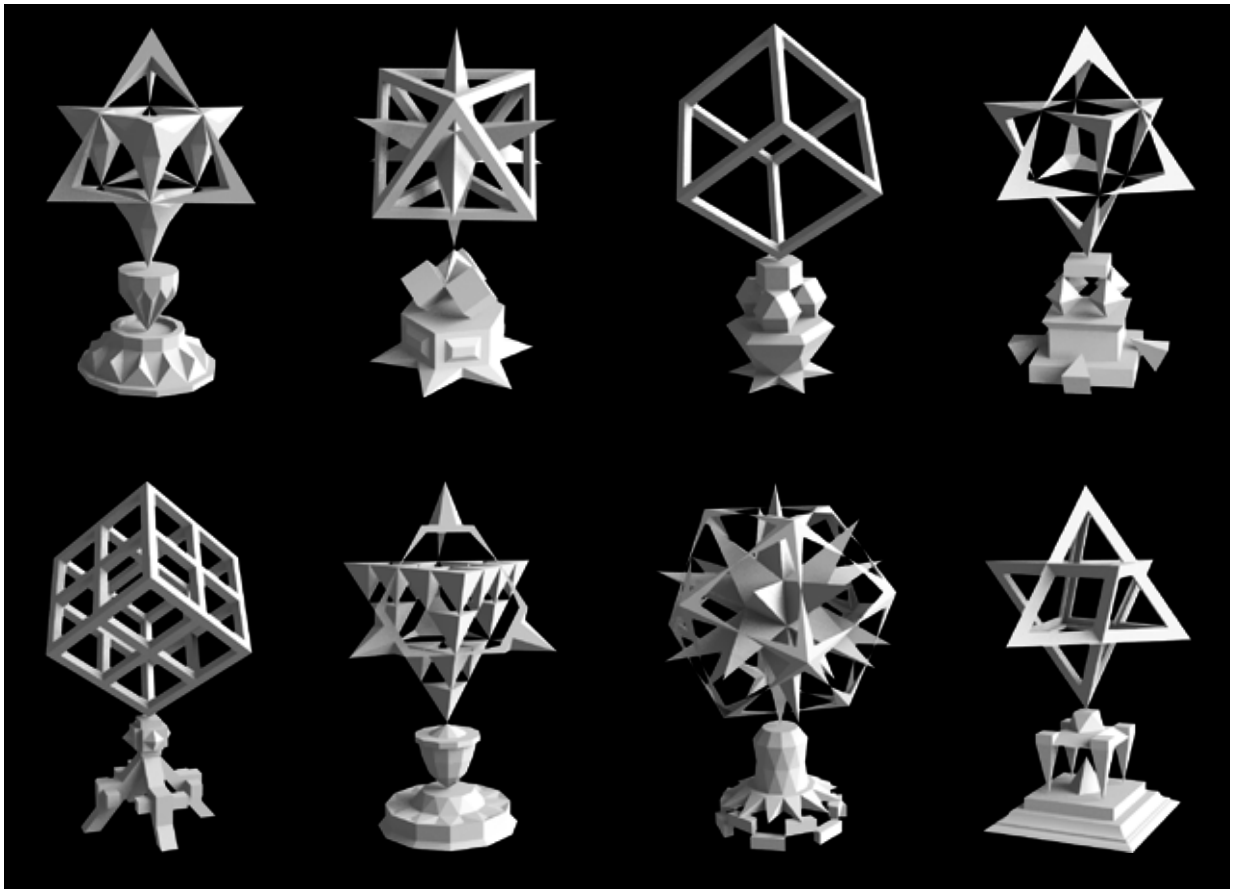


Wenzel Jamnitzer, *Perspectiva Corporum Regularium,* Nuremberg, 1568, plates A V and D II.

THE EXHIBITION

Factum Arte, Madrid, is organizing an exhibition entitled *Polyhedral Monuments. New Perspectives on Wenzel Jamnitzer*, a contemporary response to the fascinating innovations in the fields of geometry, perspective and life-casting of the sixteenth-century Nuremberg goldsmith and inventor, Wenzel Jamnitzer (1508-85).

In his 1568 publication, *Perspectiva Corporum Regularium*, a collaboration with the Swiss master engraver, Jost Amman, Jamnitzer proposed a staggering number of forms drawn in startling perspective of objects that did not exist in the then-known, natural world. Rejecting both the mathematical obfuscations of Piero della Francesca and his followers, as well as the window-planar approach to perspectival drawing championed by Leon Battista Alberti and his followers (including Leonardo and Dürer), Jamnitzer devised, after forty years of experimentation, a new means of drawing. His technique, while inspired by the "string" method proposed by Dürer—where the ray of vision, spanning from infinity to the physical object, is charted in a pointillist fashion—eschews the presence of an object. Instead, a plan and an elevation of an imaginary object are drawn in sharp perspective and then linked together to create an image in three dimensions. Using this technique, Jamnizter could range freely in his imagination to devise new polyhedra, which while following geometric rules, were forms that had never been seen. He called his work on Perspective "a subtle and beautiful Art."



3D renderings of polyhedral monuments from the *Perspectiva Corporum Regularium*.

Jamnitzer was by no means the first artist to attempt to draw polyhedral forms in perspective, nor was he the first to develop variants—Leonardo drew some of the regular variations for Luca Pacioli at the end of the fifteenth century, and there were other geometricians and print makers in Jamnitzer's German milieu who also engaged with these ideas, including Albrecht Dürer. However, Jamnitzer was the first to create what might be considered a vocabulary of forms based upon the Platonic solids that responded to both geometric rules and his own aesthetic sensibilities. There is an originality in this work and an elegance of execution, which is unmatched by even those who came after him.

In essence, what Jamnitzer achieved without the intervening step of photography—a technology that captures a two-dimensional image in a window—was the theoretical basis for computer generated three-dimensional forms. In keeping with his discoveries, Factum Arte has reverse-engineered Jamnitzer's figures with software used for architectural design. The resulting three-dimensional forms range from the 120 small polyhedra that correspond to Jamnitzer's variations on the Platonic solids—some of these forms can be handled and contemplated by visitors—to a selection of eight polyhedral monuments, composite assemblages that Jamnitzer derived out of his vocabulary of forms. These forms will also be accompanied by virtual re-creations of a selection of Jamnitzer's spherical and conical forms. While the spheres possibly represent the celestial and terrestrial globes, the cones are purely speculative. Two of the conical monuments will be made at a scale of two meters tall, emphasizing Jamnitzer's ability to conceive of objects of great complexity. The centrepiece of the exhibition will be a 5 x 3 meter re-creation one of Jamnitzer's esoteric compositions from the end of the *Perspectiva*, populated by a Florentine *mazzocchio*, possibly a funerary monument.

PART 1 Polyhedral Variations

plate A.II

Tetrahedron and derived bodies

plate A.III

Tetrahedron and derived bodies

plate A.IIII

Twin tetrahedron and derived bodies

plate A.V

Tetrahedral star-shaped bodies

plate B.I

Octahedron and derived bodies

plate B.II

Octahedron derived bodies

plate B.III

Octahedron and derived bodies

plate B.IIII

Octahedron derived bodies

plate B.VI

Hexahedron and derived bodies

plate C.I

Hexahedron derived bodies

plate C.II

Hexahedron and derived bodies

plate C.III

Hexahedron derived bodies

plate C.V

Icosahedron and derived bodies

plate C.VI

Icosahedron derived bodies

plate D.I

Icosahedron and derived bodies

plate D.II

Icosahedron derived bodies

plate D.IIII

Dodecahedron and derived bodies

plate D.V

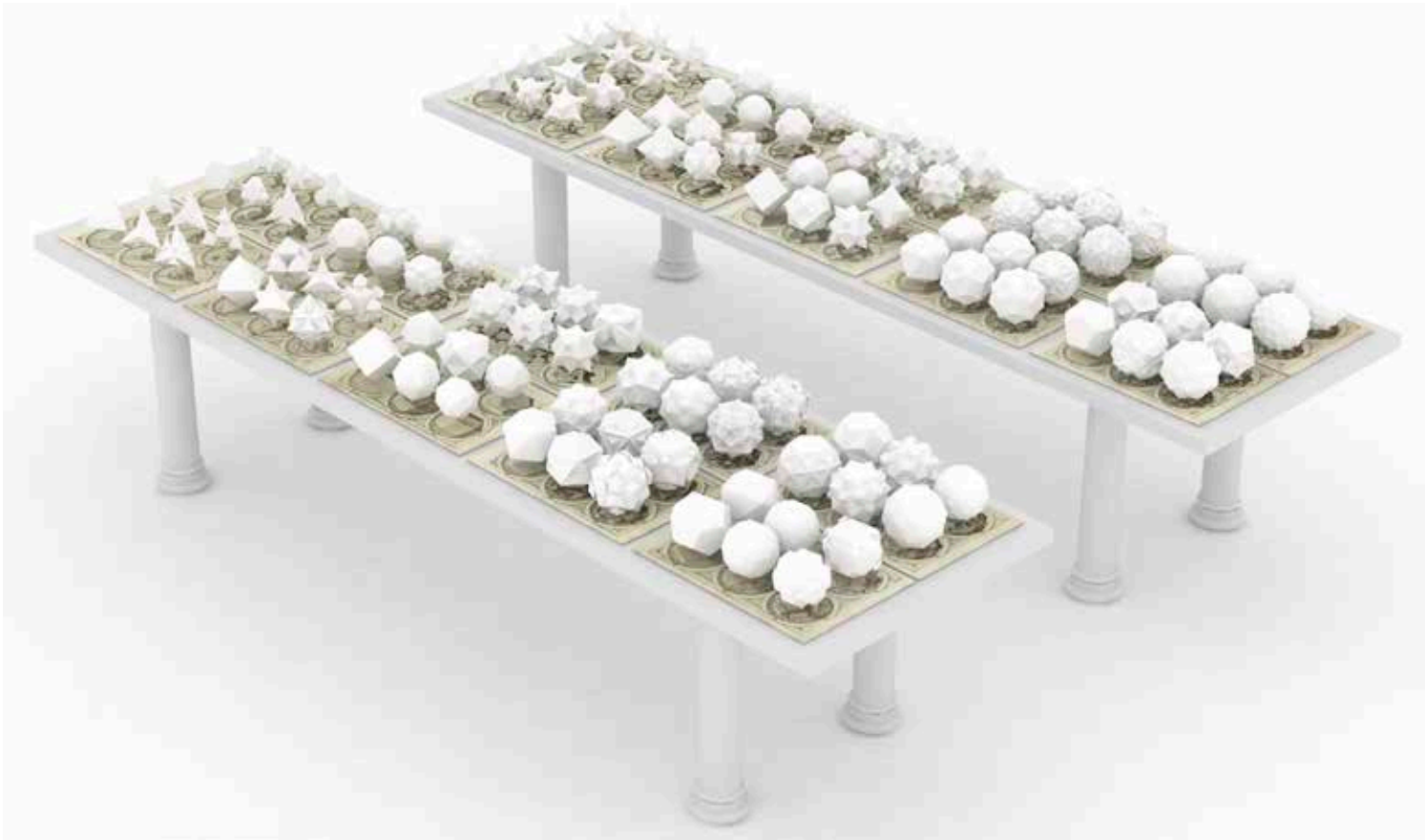
Dodecahedron derived bodies

plate D.VI

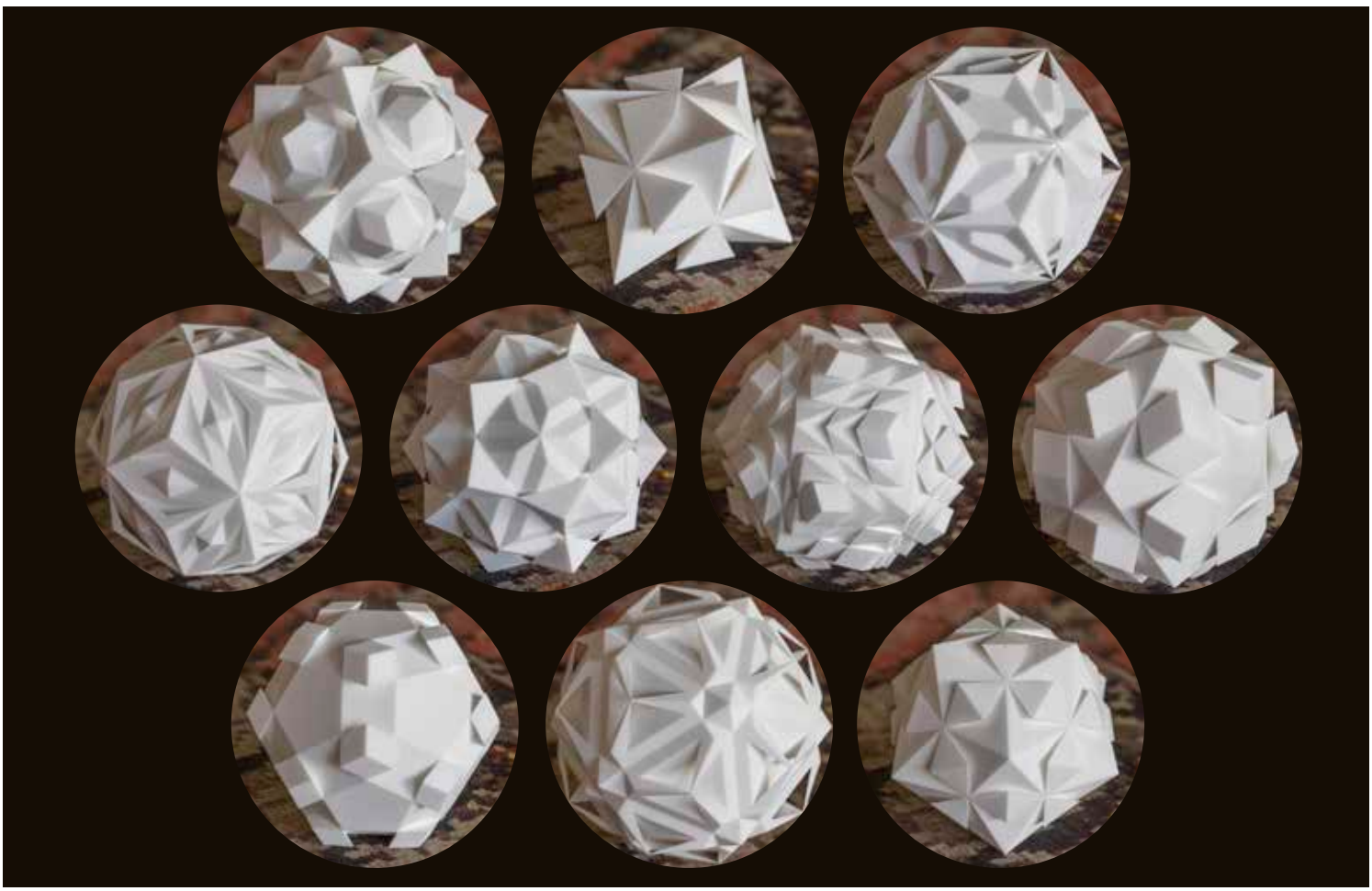
Dodecahedron and derived bodies

plate E.I

Dodecahedron derived bodies



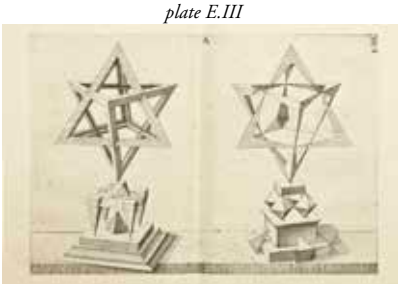
Proposed display of solid polyhedra according to Jamnitzer's scheme.



A selection of 3D printed solid polyhedra.

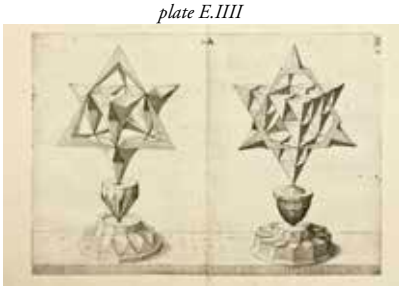
PART 2 Polyhedral Monuments

plate E.III



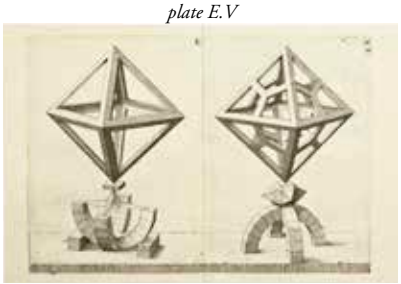
Two tetrahedral bodies

plate E.IIII



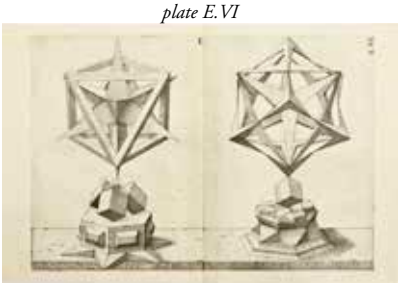
Two tetrahedral bodies

plate E.V



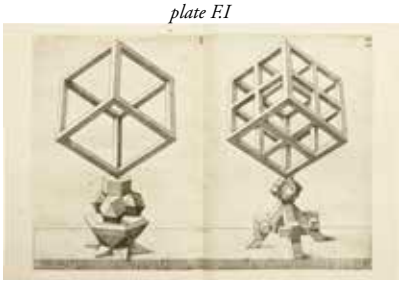
Two octahedral bodies

plate E.VI



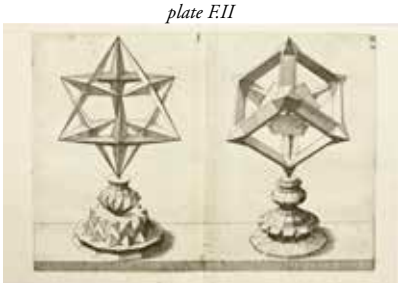
Two octahedral bodies

plate F.I



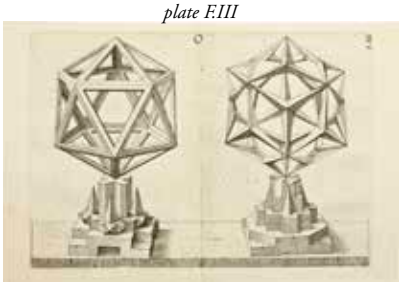
Two hexahedral bodies

plate F.II



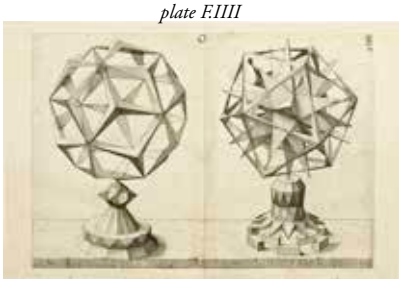
Twin tetrahedron and hexahedron bodies

plate F.III



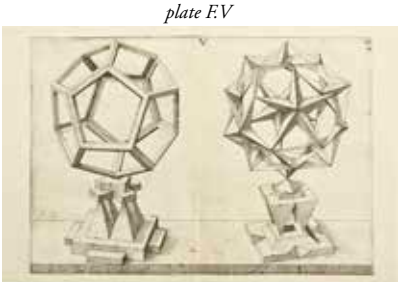
Icosahedral and rhombictriacontahedral bodies

plate F.IIII



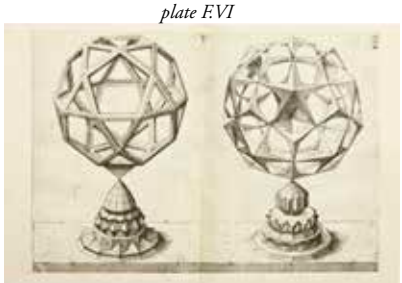
Rhombictriacontahedral and stellated icosahedral bodies

plate F.V



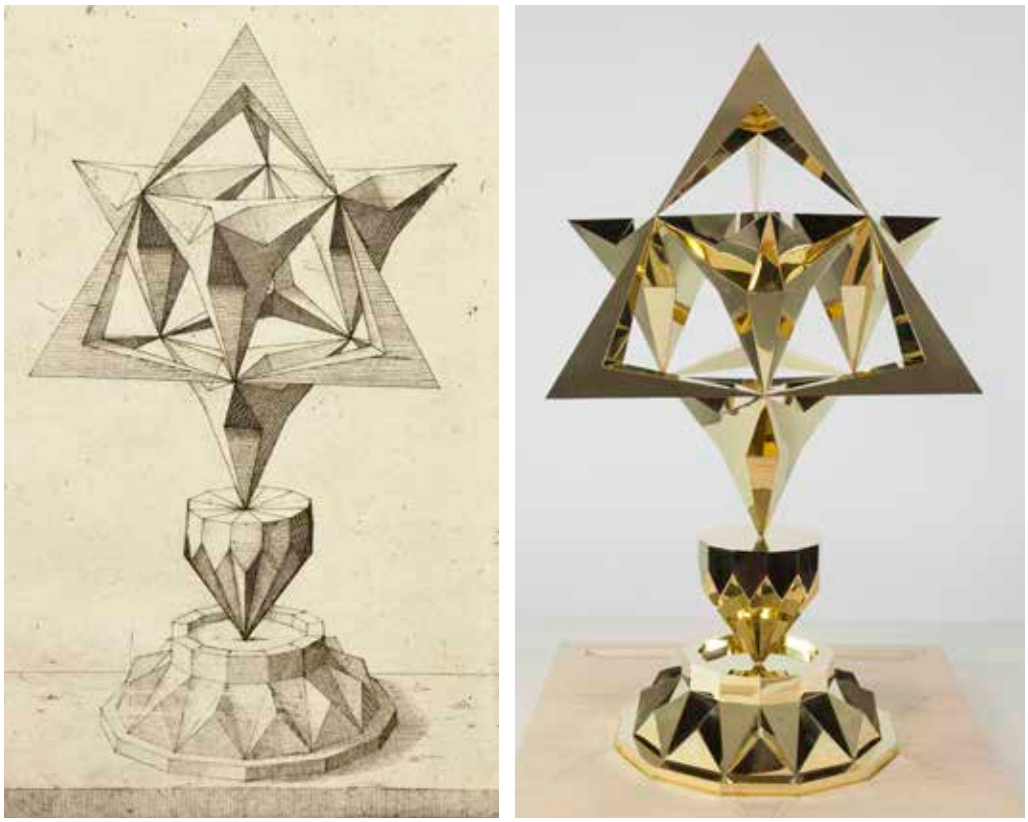
Two dodecahedral bodies

plate F.VI

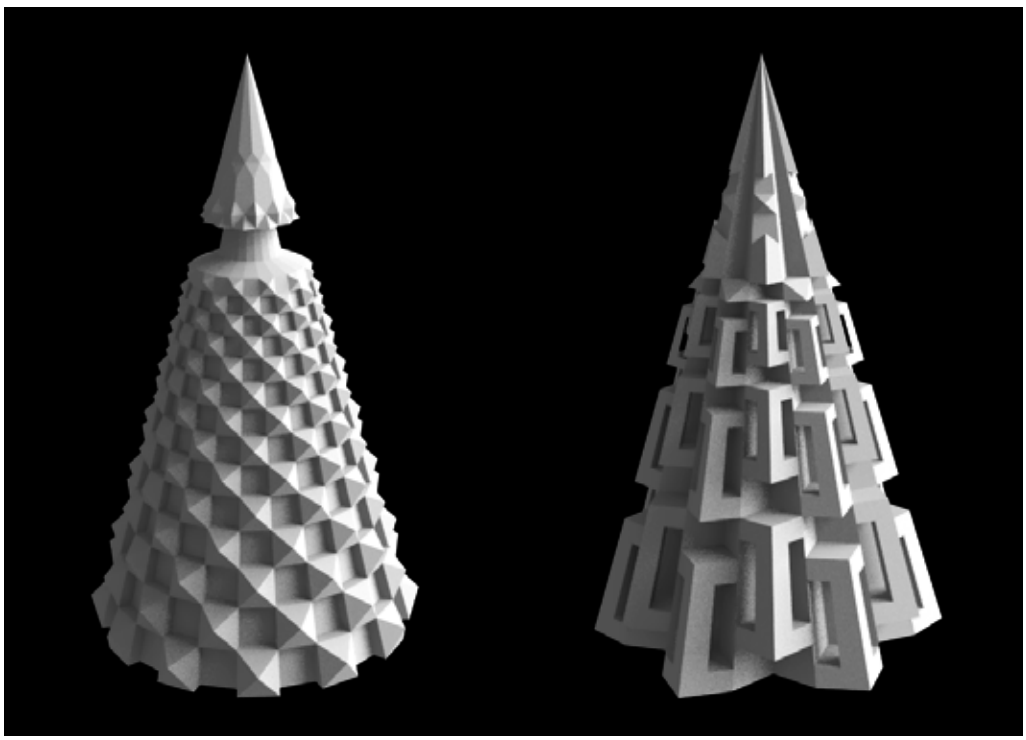


Two icosidodecahedral bodies

The three-dimensional forms created for this show will be made using a variety of media and techniques including printed resins, folded brass, routed plaster and cast stainless steel. The aim is to demonstrate the sophistication of Jamnitzer's vision through the application of cutting edge 3D printing and prototyping technologies.



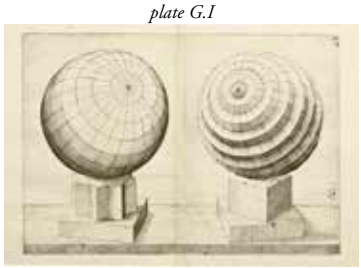
A monumental polyhedral figure designed by Wenzel Jamnitzer and realised in folded, soldered and polished brass. Factum Arte, 2015.



3D renderings of conical figures from the *Perspectiva Corporum Regularium*.

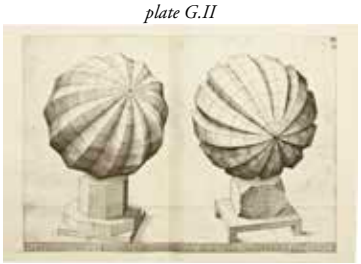
PART 3 Conceptual Monuments

plate G.I



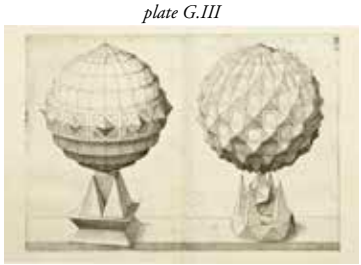
Two spheres

plate G.II



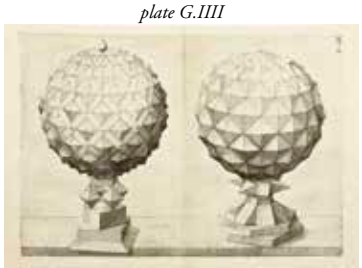
Two spheres

plate G.III



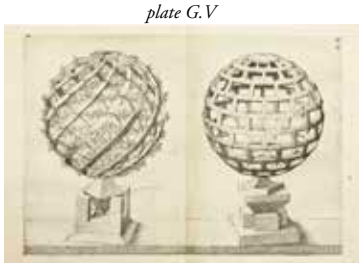
Two spheres

plate G.IIII



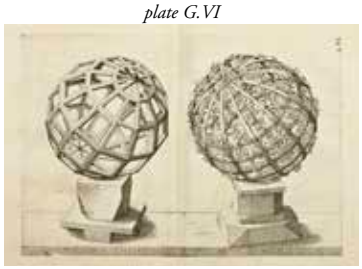
Two spheres

plate G.V



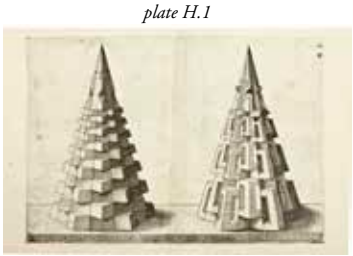
Two spheres

plate G.VI



Two spheres

plate H.I

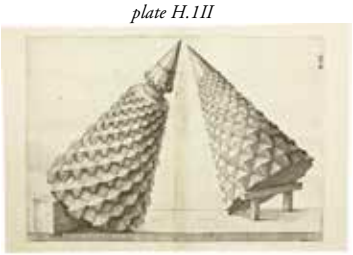


Two cones

plate H.II

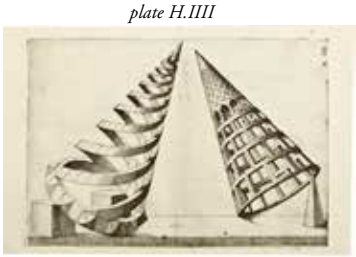
Two cones

plate H.III



Two cones

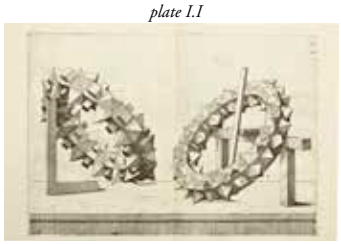
plate H.IIII



Two cones

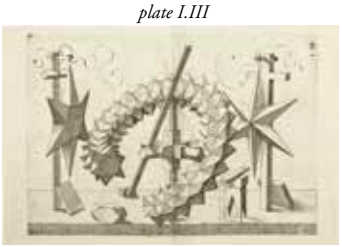
PART 4 Esoteric Constructions

plate I.I



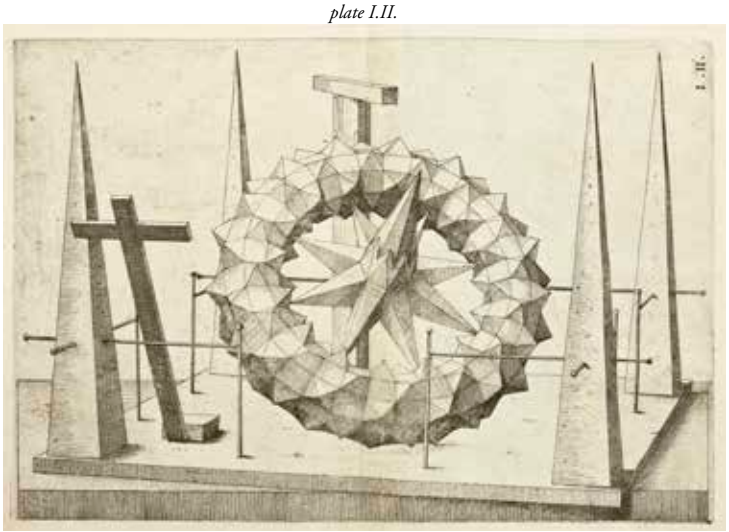
Two toruses

plate I.III

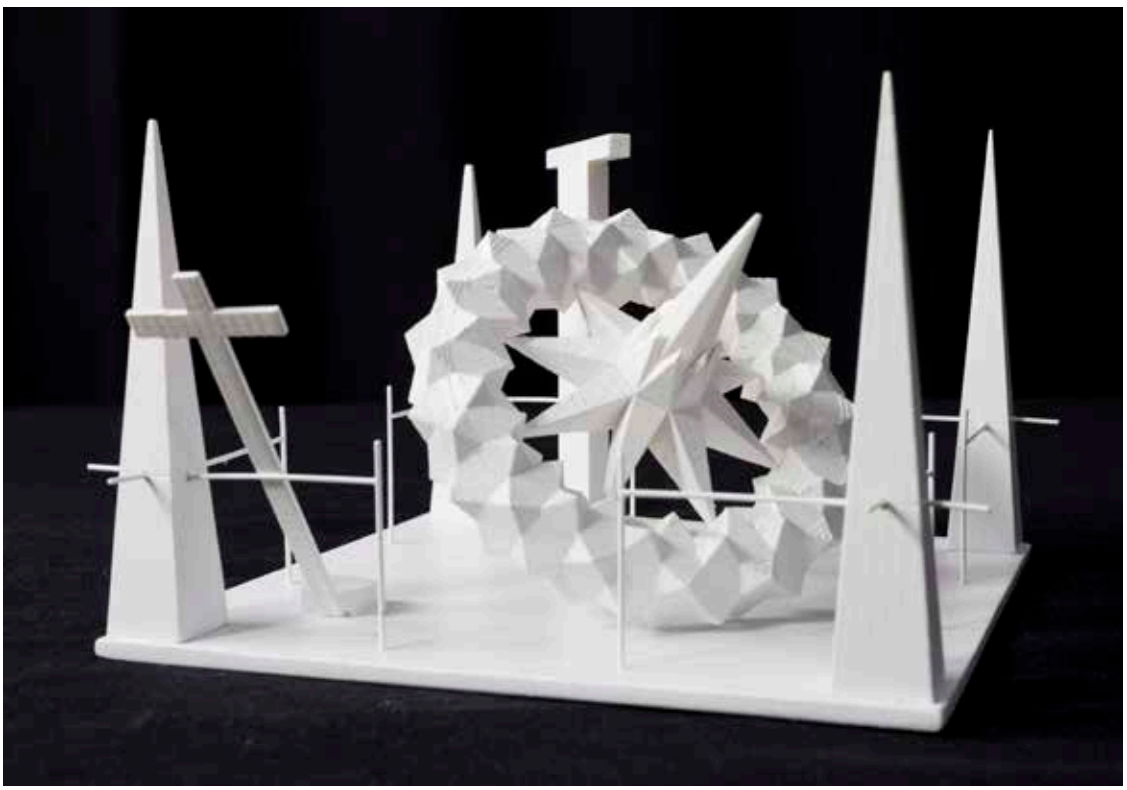


Two stars and an incomplete torus

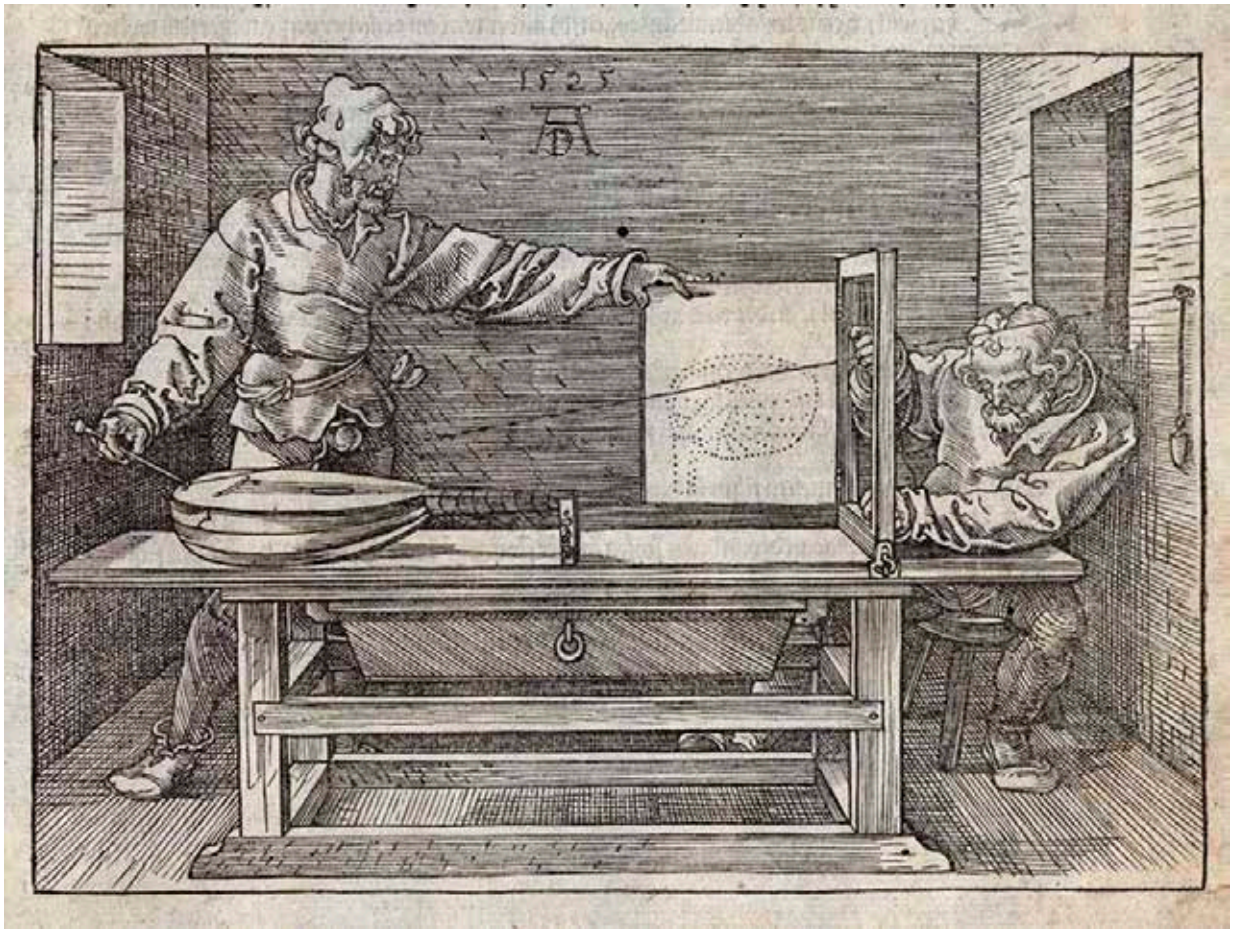
plate I.II.



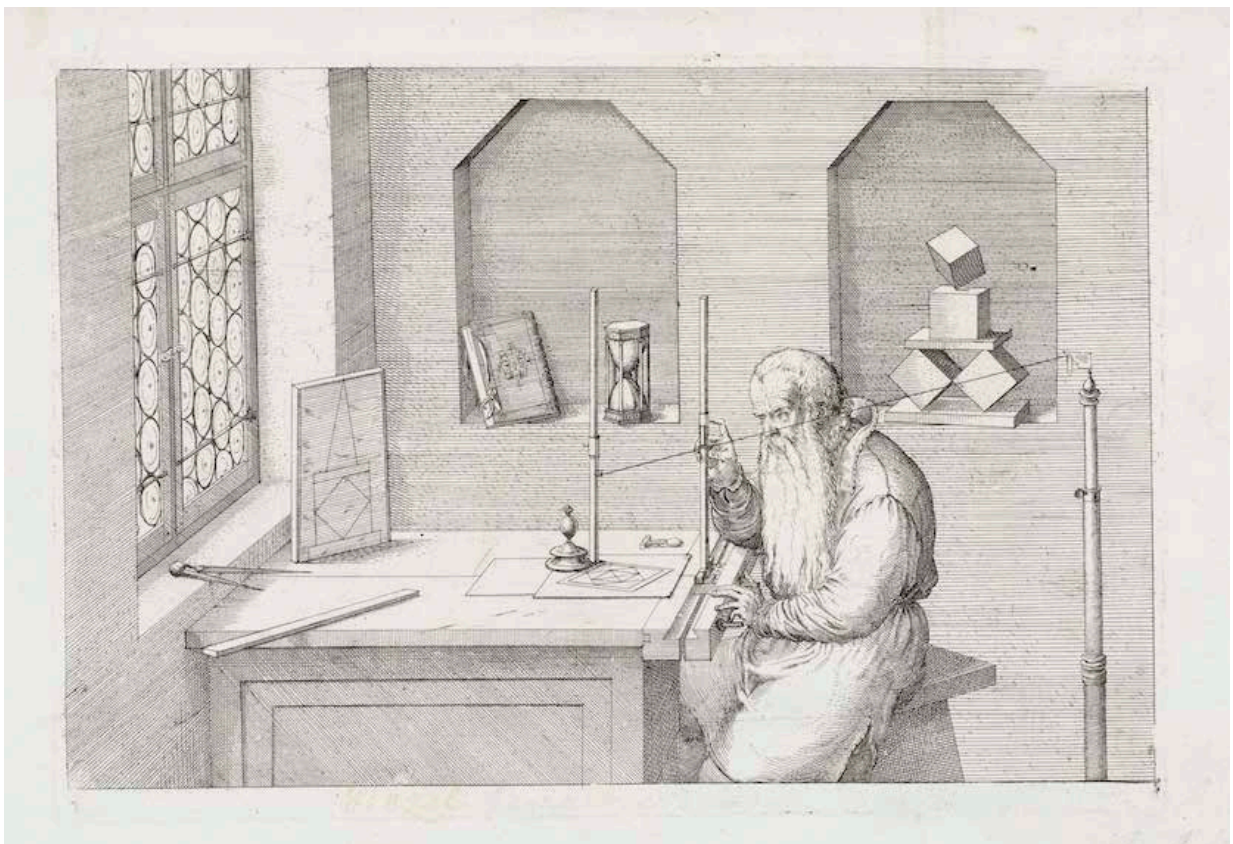
Pyramids and a torus



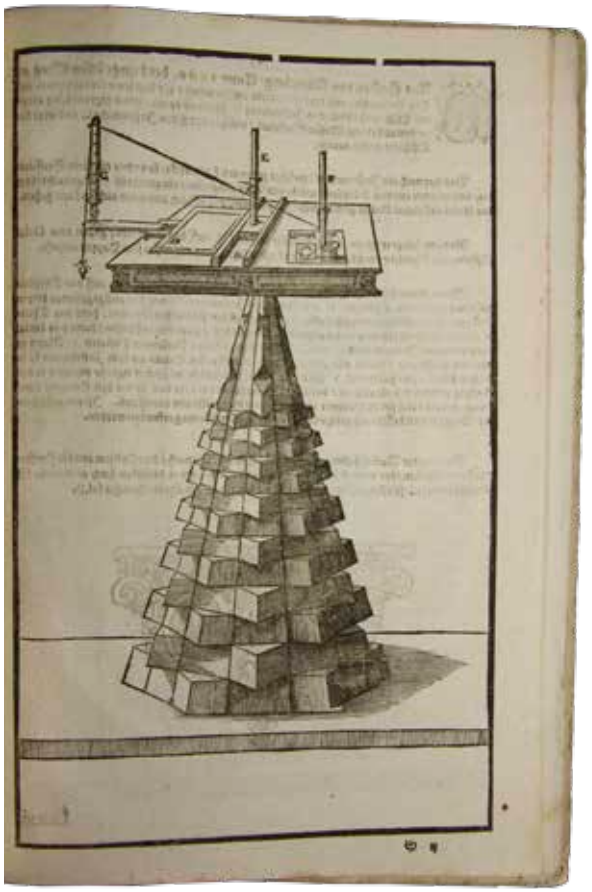
3D printed construction modelled from Jamnitzer and Amman's engraved design, Factum Arte, 2015.



Perspective using the string method, Albrecht Dürer, *Manual of Measurement*, 1525.

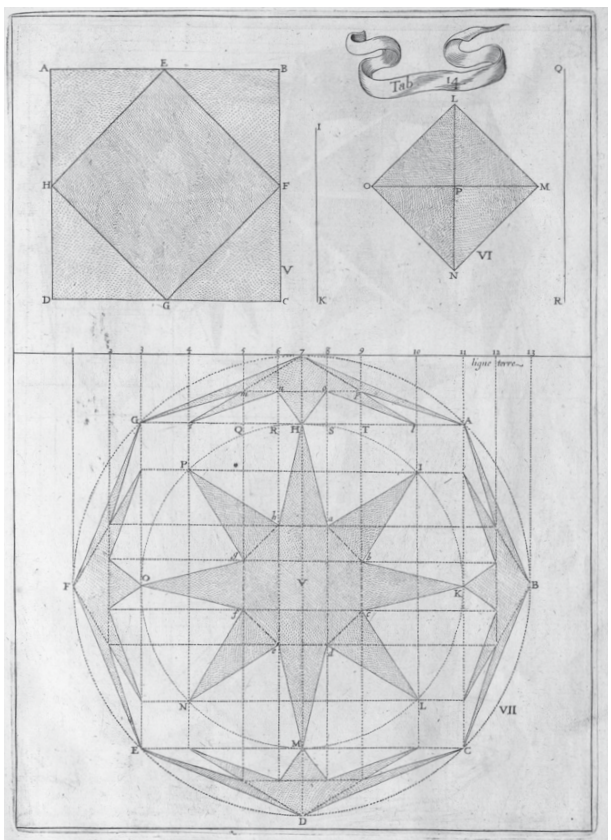


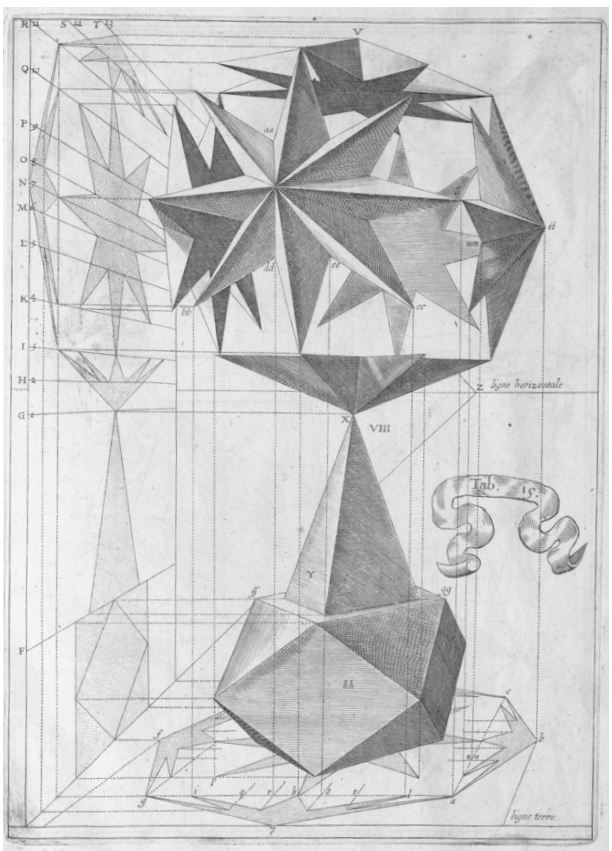
A portrait of Jamnitzer with his perspective device, Jost Amman, ca 1560-70.



Paul Pfinzing, *Optica*, Augsburg, 1616.

Jean François Niceron, *La perspective curieuse*, Paris, 1638.





From Jean François Niceron, *La perspective curieuse*, Paris, 1638.

From its Prologue, it is clear that *Perspectiva* was meant as a didactic work although Jamnitzer did not explain his drawing techniques, leaving it for a second volume that was never published. However, a drawing and its engraving, both by Jost Amman, have survived, which may have been preparatory to that volume. It shows Jamnitzer in his studio setting up a "perspective machine" of his own invention. The machine comprises three adjustable vertical elements that intersect with a ray of vision, borrowed from Dürer's apparatus. The device is used to record the spatial presence in three dimensions of imagined objects. This device intrigued many of Jamnitzer's contemporaries including the Nuremberg patrician Paul Pfinzing (1554-99) and the French monk-mathematician Jean-François Niceron (1613-46), who both offered explanations for its use. For this exhibition, Factum Arte will also offer an interactive, rediscovery of Jamnitzer's perspective machine to the public in a virtual form.

Finally, the exhibition will offer an artistic and technical response to Jamnitzer's fascination with the ancient art of casting from life, a technique cultivated by Renaissance artists in Florence and Padua but also practiced by Jamnitzer's contemporaries such as Bernard Palissy (1510-1590) in France. The Viennese art historian Ernst Kris famously called this aesthetic development *Der stil "rustique"* (The Rustic Style) relating it to prevailing interests in naturalism, alchemy and a mastery of natural materials by the post-Renaissance artists who presaged the Scientific Revolution of the early seventeenth century. A contemporary approach to casting from life, including a tree, grasses, and plants, will illustrate the possibilities of combining digital technology with traditional artistic practices inherited from the Renaissance.

Casting from life, Factum Arte, 2015.

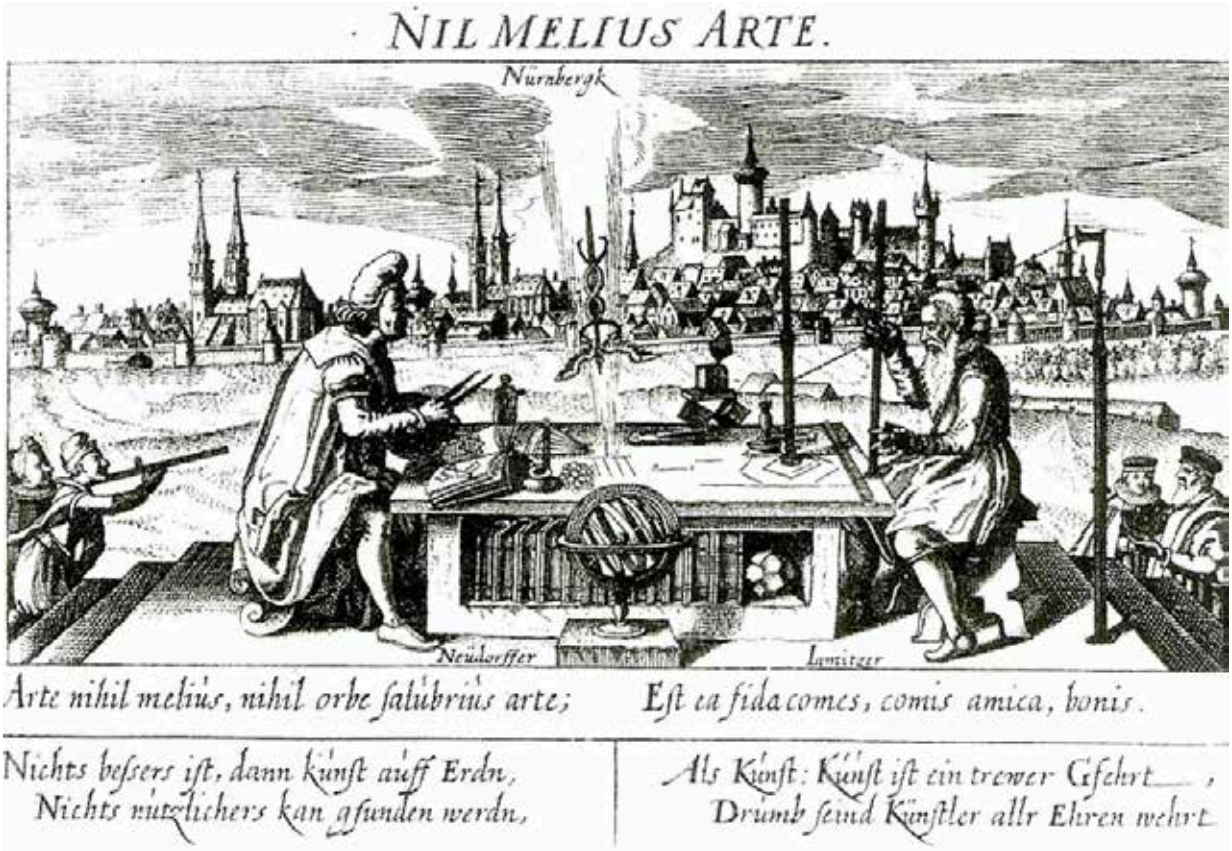
As a point of comparison with the forms realised by Factum Arte, the exhibition will include copies of the original printed works on perspective by Jamnitzer, Pfinzing and Niceron. Through this exhibition, Factum Foundation intends to shed new light on Jamnitzer's achievements. Using 3D modelling programs, new printing technologies and traditional craft practices in a variety of media (including precious materials), some of Jamnitzer most imaginative designs will be created as physical objects. The work will be contextualised by an exhibition catalogue. The exhibition has been conceived to tour various international venues, whether principally focused on art, science or other related fields of study.

EXHIBITION CATALOGUE

The accompanying exhibition catalogue will document the objects created for the show, and the means of their manufacture through analyses of Jamnitzer's work: drawings, engravings and examples of his life-castings. It will include thought-provoking essays by contemporary thinkers on Jamnitzer's significance, both historical and current.

The catalogue will also aim to deliver Jamnitzer's primary texts to contemporary audiences. Reproductions of both the printed *Perspectiva Corporum Regularium* (Nuremberg, 1568, and its Amsterdam, 1626 additions) and an unpublished illustrated work that Jamnitzer prepared in 1585 to accompany a desk set of scientific instruments, will be included. The texts of both works will be edited and translated to English, with accompanying studies.

Factum Foundation will collaborate with various specialists in the preparation of the catalogue including Pamela H. Smith, Heather Ecker and Adam Lowe.



Vignette of Nuremberg from Eberhart Kieser, *Thesaurus Philopoliticus,* Frankfurt am Main, 1623. "There is nothing better than art, nothing more wholesome in this world than Art. It is a faithful companion, a courteous and good friend. That is why artists are worth all honour." Text by Daniel Meisner (1585-1625).

WENZEL JAMNITZER AND HIS CONTEXT

In an image engraved by Eberhart Kieser in 1623 for the *Thesaurus Philopoliticus* (1623), the fraternal and inventive spirit of the city of Nuremburg, renowned in the sixteenth century for its artists, printers and makers of scientific instruments, is conveyed by a portrait of two artists. Johann Neudörffer, on the left, gestures to his companion with a variable compass, an invention of the figure on the right, Wenzel Jamnitzer, who works with a machine that produces drawings of complex objects in perspective. Between them, the caduceus, a winged staff, dually entwined with snakes, swooshes down from the heavens.

The animated appearance of this arcane object suggests not only the quick wit of Hermes, Messenger to the Greek Gods, and by inference the astuteness of artists, but also Hermes Trismegistus, an antique figure to whom a series of mystical texts, the *Hermetica*, are ascribed. The *Hermetica* were foundational works for the field of Alchemy.

The Alchemy of the Natural Philosphers of the fifteenth and sixteenth centuries was principally a search to understand the materiality and structure of the world, to discover the hidden secrets of nature, a noble proto-science that engaged equally with theory and practice. Like their Alexandrian predecessors, the Natural Philosophers relied on the theoretical framework of classical texts, such as Plato's *Timeus* and Aristotle's *Physics*. They engaged with Plato's ideas about the symbolic transmutation and recombination of elemental materials—earth, water, air and fire—in addition to sulphur, mercury and salt. With Plato, they believed that both inanimate and organic matter was dynamic and living.

Nicolas de Neufchâtel, Portrait of Wenzel Jamnitzer, ca. 1562-63. Musée d'Art et d'Histoire, Geneva.

The re-reading of Classical poetry by these post-Renaissance thinkers may have also helped to shape such ideas. In Book XV of Ovid's *Metamorphoses*, Pythagoras articulates this perspective clearly:

> Nothing perishes, for substance merely assumes new shapes in perpetual succession. Birth is but an alteration in the mode of existence: death is only the cessation of a single period of being. We have passed from an age of gold to an age of iron; and we shall again and again pass through a similar series. Many are the revolutions even of the great globe itself, which I have witnessed. I have beheld the earth inundated by the ocean: I have seen land emerge from the sea and occupy its place. I have gathered marine shells in the centre of solid continents: I have contemplated an anchor on the summit of the loftiest mountain. Plains I have seen rise into hills, and hills sink into plains. In fine, heaven, and earth, and whatsoever they contain, are subject to perpetually successive revolutions. To destroy is only to reproduce in another form: matter itself, as it knew no beginning, knows no end.

The idea that art is embedded in nature lay behind the rise of the cabinets of curiosity, or "wonder chambers", amongst fifteenth and sixteenth century nobles and rulers. Their collections were filled with rare, natural things, nautilus shells with metal settings, composite antiquarian objects, virtuoso gestures of artistic techniques, scientific tools and natural mutations that excited the curious. These assemblages may have been born of a demonstration of humanistic capability, mercantile reach and technological marvel, but they were also closely related to the study and classification of species. Maximilian II,

father of Rudolf II, for example, acquired the most complete copy of Dioscorides herbal surviving from Antiquity in 1569, now called the Vienna Dioscorides, making the Viennese court a centre for the study of botany.

As Pamela Smith has argued, replicas from nature also held an important place in the collections because they would remain and not putrefy, but also because of a fascination with vermin— lizards, snakes, frogs, turtles and insects—which were though to spontaneously generate out of decaying matter and came to symbolize cycles of decay and regeneration of the human soul. Detailed life-casts, in a real sense, provided permanent evidence of the processes of nature, and what may have inspired revulsion in the flesh, inspired fascination as a replica. These objects that embodied a transmutation from living creature to quickened metals, flowing into moulds made by artists, was nothing if not alchemical. Smith quotes the printer Walter Hermann Ryff, who wrote in 1547, "This part of sculpture, casting, has its origin in the true natural alchemy (not the deceptive art of seeking the philosophers' stone, which these days is called alchemy)." This was the context in which Jamnitzer worked.

Wenzel Jamnitzer was considered by his contemporaries as the preeminent Nuremberg goldsmith of his generation. Born in Vienna in 1508, the son of a goldsmith, and brought by his parents to Nuremberg, Wenzel became a master goldsmith and citizen by the age of 26. He established a workshop with his brother Albrecht, with whom he collaborated on all of his major projects until Albrecht's death in 1556. In 1544, Wenzel became a master juror in the local system governing crafts that was patronized by patrician families and existed without guilds and he set the examination for master goldsmiths. In 1552, Jamnitzer was made master of the city's mint, reflecting his esteem amongst the citizens of Nuremberg, and in particular, the goldsmiths. Alongside his professional success, Jamnitzer also became politically influential. In 1556 Jamnitzer represented the goldsmiths on the greater Nuremburg Council and in 1573, he was elected a city alderman. His rise from Viennese outsider to executive of the inner cabinet ruling the city of Nuremberg

Details, Wenzel Jamnitzer, Merkel Table-Center, 1549, Rijksmuseum, Amsterdam.

Wenzel Jamnitzer, Merkel Table-Center, 1549, Rijksmuseum, Amsterdam.

Wenzel Jamnitzer, Hand-bell, Nuremberg,1555-60, silver gilt. The lizards insects and flowers were cast from life in silver. The Rothschild Collection, on loan to the British Museum.

was due to his outstanding skills as a craftsman and admiration for his pious character and professional successes. However history did not treat him so well. Despite the fact that he ran a large and thriving workshop, Jamnitzer's reputation has been obscured by the fact that few of his original works remain—many were melted down for their precious metals during the Thirty Years War.

Jamnitzer's surviving oeuvre comprises works of surprising contrast. Alongside his commercial work and commissions for the ruling Hapsburgs and other princely and noble families, some of which incorporates his experiments with life-casting, Jamnitzer became fascinated with mathematical and practical developments in the fields of optics and perspective, which had been advanced significantly by artists in fifteenth-century Florence. He alludes to have read classical and modern works on optics and perspective, which, in addition to Euclid, must have included Ptolemy's *Optics* and its successors such as Ibn al-Haytham's *Kitab al-Manazir* (in Latin: *Opticae thesaurus*), summarized and subsumed by thinkers nearer to his own generation. This research culminated in 1568, with the publication of the *Perspectiva Corporum Regularium*.

Jamnitzer was a man of his time, but also an innovator: his understanding of the structure of the world was influenced by the Classical sources he read, Neo-Platonist and possibly Neo-Pythagorian ideas, and whatever esoteric schools circulated at the courts of his Habsburg patrons. His own restless creativity brought him into the forefront of an art form that drew upon the work of previous generations, but also innovated in order to create images of conceptual elemental particles of the natural world that were invisible to sixteenth-century levels of magnification. Beyond this, the fascination his work provokes lies in his still enigmatic means of production, which pre-figures the language of computer modelling and captivates with its bold imagination and nearly perfect execution.

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Nuremburgers in the sixteenth century were coming to terms with the consequences of the printing press and its transformation and mediation of information. At the same time, Nuremberg was a place where metalworking, and in particular goldsmithing, flourished; a place where goldsmiths worked daily with the most precious materials. Paralleling this binary of information and materiality in our own times, the digital is no longer purely associated with the virtual. While photography once mapped the world onto a flat plane, composite photogrammetry is now used to record surfaces and volumes at increasing resolutions. Additive printing technologies fuse, sinter, electro-form and laminate while subtractive technologies carve every material from polyurethane to metal and stone. In this dynamic environment of creation, curious polymaths with a deep understanding of materials like Wenzel Jamnitzer attract renewed interest. That he invented an early form of virtual 3D modelling places Jamnitzer alongside the figures of Joseph Maris Jacquard (the inventor of a loom driven by punchcards), Charles Babbage (the inventor of the difference Engine) and Ada Lovelace (the first computer programmer). This exhibition of objects made recently from Jamnitzer's highly original ideas about the nature of reality of forms brings together two creative moments that have much in common.

SCHEDULE, REQUIREMENTS AND FEES

The exhibition will be available for three-month engagements starting in Spring 2016. It will require between 250 to 400 square meters of gallery space, with a minimum of four meters of ceiling height. The show will be designed modularly so as to provide maximum flexibility for different venues—it will be able to be reconfigured to fit various spaces. An exhibition design will be provided for each venue.

Factum Arte will work with in-house curators at each venue to insure the reception of the show by local audiences. Factum Arte's curators will be available for both the preparatory stages of the show and for lectures and public events if expenses are covered.

The loan fee: terms and conditions on application. It will include the loan of plinths and exhibition furniture, installation, de-installation, and one-way transport. It will also include the designs for signage and posters, video monitors and projectors. The fee will not include advertising, exhibition brochures, insurance, security or any other costs associated with the running of the exhibition.

The catalogue will be available for an agreed-upon fee, dependent upon the number of copies purchased in advance.

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