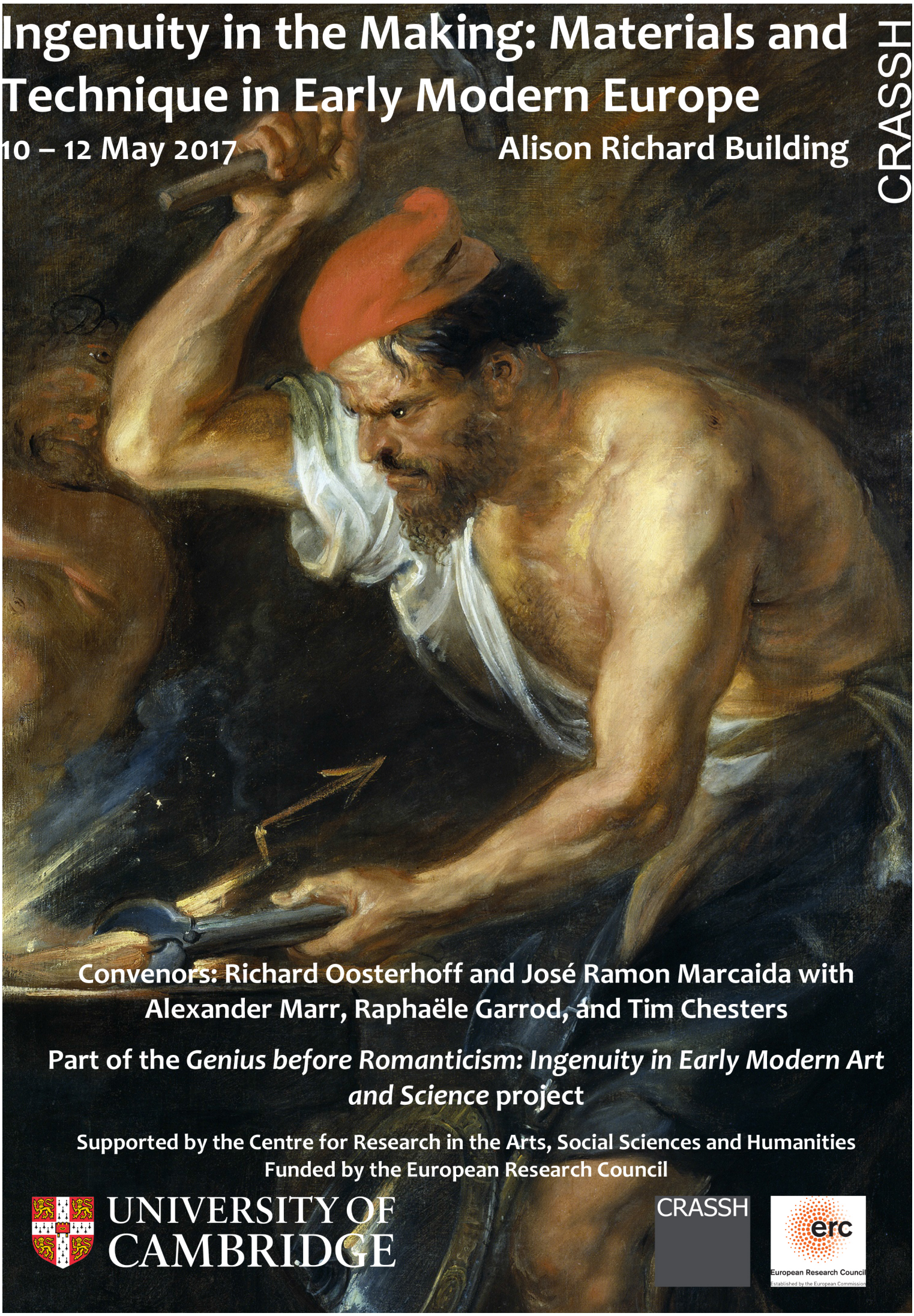
Ingenuity in the Making: Materials and Technique in Early Modern Europe

10 – 12 May 2017

Alison Richard Building

CRASSH



Convenors: Richard Oosterhoff and José Ramon Marcaida with Alexander Marr, Raphaële Garrod, and Tim Chesters

Part of the *Genius before Romanticism: Ingenuity in Early Modern Art and Science* project

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Front cover image:
'Vulcan forging the Thunderbolts of Jupiter' Peter Paul Rubens (1636-1638)
Museo del Prado, via Wikimedia Commons

Back cover image
'Trouble Comes to the Alchemist' Dutch School (17th-century)
Chemical Heritage Foundation (CHF), via Wikimedia Commons

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Programme

Wednesday 10 May — Little Hall, Sidgwick Site

17:00 **Ingenious Failure: Artisanal Languages of Error**
Public lecture by Sven Dupré, Utrecht University and University of Amsterdam

18:00 *Wine reception in Atrium, Alison Richard Building*

Thursday 11 May — Room SG1/2, Alison Richard Building

9:00 *Registration and Coffee*

9:15 Opening Remarks by Richard Oosterhoff

9:30 **Session I** — Chair: Alexander Marr

Io's Hoof and the Origins of Letters: Ingenuity and Invention in Geofroy Tory's *Champ Fleury* of 1529
Andrew Morrall, Bard Graduate Center

These require the industry of the most ingenious Artificer […]": The Making of the Ingenious Artifex and Artificers in Early Modern 'Manuals' (1540 -1662)
Jenny Boulboullé, Utrecht University

Redefining Ingenuity and Technique in Art Theory and Critique, ca. 1800
Marieke Hendriksen, Utrecht University

11:00 *Break*

11:30 **Session II** — Chair: Tim Chesters

Ingenuity, Labour, Diligence: Miners and the Resilience of Mineral matter
Tina Asmussen, Max Planck Institute for the History of Science, Berlin

Tangible, Pneumatic, and their Intermediates: Francis Bacon on the Transformation of Matter
Doina-Cristina Rusu, University of Groningen

Ingenuity in the Testing: The Detection of Counterfeit Gems in Early Modern Europe
Michael Bycroft, University of Warwick

13:00 *Lunch*

14:00 **Session III** Chair: José Ramon Marcaida

New World Feathers and the Matter of Ingenuity
Stefan Hanß, University of Cambridge

"Artful" Objects and "Indian" Provenance in German Records around 1600
Anna Grasskamp, Hong Kong Baptist University/University of Leiden

15:00 *Break*

15:30 **Session IV** Chair: Sietske Fransen

Ingenious Hands? Touch and Technique in Renaissance Practices of Anatomy
Viktoria von Hoffman, Villa I Tatti

The Artisanal Mastery of Natural Matter and the Human Body in Early German Print
Tillmann Taape, University of Cambridge

The Contested Ingenuities of Brains, Nature, and Hard Work in Seventeenth-Century Dutch Anatomy and Chymistry
Evan Ragland, University of Notre Dame

Friday 12 May

Room SG1/2, Alison Richard Building

10:00 **Session V** Chair: Katherine Reinhart

For Piranesi the Roman Empire Lasted until 1770: Creating Roman Artefacts in the Eighteenth Century
Caroline van Eck, University of Cambridge

Making, Writing and Thinking in Early Modern Nuremberg
Hannah Murphy, King's College London

Ingenious Sundials in Italian Renaissance Gardens
Denis Ribouillault, University of Montreal

11:30 *Early lunch*

13:00 **Session VI** Chair: Raphaële Garrod

Spirited Matter and Ingenious Nature: Accounting for Chemical Change in Early Modern England
Jennifer M. Rampling, Princeton University

Crafting the Miraculous, Animating Automata
Christina Neilson, Oberlin College

A Vitalist Counterblast: Renaissance Biotechnology and the Charlatan's Ingenuity in J. E. Burggrav's *Lamp of Life* (1611)
Vera Keller, Clark Honors College, University of Oregon

14:30 *Break*

15:00 **Ingenuity in the Making:**
A Conversation with Sven Dupré and Tim Ingold (University of Aberdeen)
Chair: Alexander Marr

16:00 Concluding remarks

Abstracts

Ingenuity, labour, diligence: miners and the resilience of mineral matter

Tina Asmussen, Max Planck Institute for the History of Science, Berlin

Silver, copper, and lead mining experienced a veritable boom in the Ore Mountains, the Harz Mountains, and the Tyrolean Alps from the second half of the fifteenth century. Mining ranged among the most important driving forces behind economic and technological dynamics in early modern Europe. But in the early modern period – and still today – mining was regarded with particular ambivalence. On the one hand it was seen as an evil force: the mines were perceived as sites of death, devastation and pollution. On the other hand mining became an emblem of progress and innovation: technical innovation and mechanization were fundamental hallmarks of early modern mining and ore processing. Mining manuscripts and printed manuals are filled with manifold inventions of human industry and ingenuity. Practices of prospecting, extracting and proceeding ores are described and illustrated in great detail, just as the use of various tools and the construction of complex mechanical devices, assay furnaces and crucibles. But these inventions and innovations did not change the nature of mining from being dependent on "sweat and bloodsour work" (*schweiß und blutsawre arbeit*). Our modern understanding sees labour as solitary, repetitive and alienating. In contrast, my paper historicises bodily labour at these mining sites and analyses the practices of making and the ingenious techniques of assayers, engineers and miners as dependent on bodily and mental dispositions, such as industry, fatigue, perseverance and diligence.

These require the industry of the most ingenious Artificer […]": The Making of the Ingenious Artifex and Artificers in Early Modern 'Manuals' (1540 -1662)

Jenny Boulboullé, Utrecht University

This paper explores the construction of the ingenious *artifex* and artificer in how-to books that circulated widely in early modern Europe. I will focus on print books, first published between 1540-1662, that were concerned with manual arts and sciences (art and craft technologies, mold- and metal making, practical history and philosophy of nature). Several case studies will be discussed. "Ingenious" is, for example, a much used concept in the English translation of Della Porta's *Magia Naturalis* (Lat. 1558, ext. edition 1589, English *Natural Magick* 1658) where it is closely linked to manual expertise, practical know-how, and cunning operations for the exploration and creation of natural marvels. Della Porta's 'handbook' for the early modern "artifex", became a true bestseller in early modern Europe where it was printed in many editions and translations. How do other authors and makers of practical and artisanal 'manuals' frame and value "ingenuity"? Can we trace semantic shifts - e.g. between somatic and intellectual connotations - in comparing how "ingenuity" is used in diverse artisanal fields, and across different editions and translations? Finally, my paper also aims at stimulating discussions by addressing methodological questions: Can we make sense of this concept in early modern artisanal and practical writings by textual analysis alone? What kind of performative methods can we use to gain a better understanding of concepts that appear to be deeply embedded in skilled expertise, technical mastery, and material literacies?

Ingenuity in the testing: the detection of counterfeit gems in early modern Europe

Michael Bycroft, University of Warwick

The history of precious stones shows that ingenuity was not just a matter of making but also a matter of testing -- not just a matter of cutting, polishing and fabricating gems but also a matter of

distinguishing, authenticating and evaluating them. Quite apart from its ubiquity in the early modern crafts, testing deserves our attention for three further reasons. It connects the ingenuity of craftsmen to the regulation of the crafts, since craft regulations often involved testing the quality of materials. It reveals new connections between the crafts, natural history, and natural philosophy. Finally, it suggests one way in which the premodern concept of ingenuity may have differed from its modern counterpart, namely that it drew no distinction between testers and makers--or, to put it differently, no distinction between craftsmen and connoisseurs, between modes of production and modes of evaluation, or between the quantity of goods and their quality.

For Piranesi the Roman Empire lasted until 1770: creating Roman artefacts in the eighteenth century

Caroline van Eck, University of Cambridge

In 1769 Piranesi took part in an excavation of the swamp of Pantanello, near Hadrian's Villa. From the fragments of Roman and Egyptian statues, cult objects and other artefacts he found there he created three magnificent colossal candelabra, two of which ended up in the Ashmolean Museum, the other in the Louvre. He sold these objects, for staggering prices, as genuine Roman artefacts, but even a brief comparison with their Roman ancestors shows that they are actually very much his own creation. But to reject them simply as fakes, as was done in the nineteenth century, would be too simple, and to project present-day notions of authenticity, restoration and imitation unto Piranesi's very different working methods. In my paper I will argue for a less anachronistic or normative approach, that starts from Piranesi's own ideas about composition and creation, which are informed by his unequalled, first-hand knowledge of Roman material culture, but also by his fascination with the Second and Third Pompeian Styles. These have suffered from a bad press since Vitruvius' condemnation of them as unreal and irrational. In fact they exemplify Graeco-Roman ideas about ingenuity in pictorial and artefactual composition.

New World Feathers and the Matter of Ingenuity
Stefan Hanß, University of Cambridge

This paper reconsiders the emotional and aesthetic significance of New World feathers in early sixteenth-century Europe. The arrival of Central and South American feathers and feather-work prompted sheer amazement amongst Europeans. In several accounts, Europeans expressed their emotional responses to such objects in a language whose grammar centered upon the concept of 'ingenuity'. I explore the meanings of such affective responses and the general emotional appeal that feathers and feather-work from the Americas caused, by re-approaching the material and visual aesthetics of such objects. Sixteenth-century Europeans were highly trained in observing, knowing, experiencing and appreciating how things were made. Early European visual aesthetics of the ingenuity of indigenous feather-work thus gained their meanings within a culture of making that highly appreciated materials and crafts knowledge. In order to reconstruct the matter of New World feathers in the 'period eye' (Baxandall, Rublack) of sixteenth-century Europe, I use the microscope as a heuristic tool of historical research. Digital microscoping, I argue, helps to recalibrate our understanding of viewing conventions and hence to understand the matter of feathers in sixteenth-century Europe.

Redefining ingenuity and technique in art theory and critique, ca. 1800
Marieke Hendriksen, Utrecht University
The term 'ingenuity' has a long history of being used in relation to art and craft, and the contriving or making of both material and immaterial things more generally, whereas the use of 'technique' and its inflections to discuss the skills involved in art and craft appear to be of a more recent date. After exploring earlier dichotomies in art theory such as *discorso* versus *ingegno* (Da Vinci), this paper examines the rise of the use of 'technique' in German philosophy, art theory and criticism around 1800, and why it was used in that context as a contraposition of (amongst others) ingenuity and genius. I argue that these developments can be explained from a desire in the fields of philosophy of perception and the judgement of taste to give art and its appreciation a special

phenomenological status, thus redefining the old mind-hand dichotomy in terms of ingenuity and technique.

Ingenious Hands? Touch and Technique in Renaissance Practices of Anatomy

Viktoria von Hoffman, Villa I Tatti

This paper examines the uses and meanings of the word *ingenium* in Renaissance anatomical writings. The technical skills of the surgeon displayed in beautiful demonstrations of dissections or in delicate surgical procedures were readily described as *ingenious*. These skills relied on a refined sense of touch and were therefore embodied in the dissecting hand, heavily represented in the visual culture of anatomy. Was the surgeon's *ingenio*, like his manual expertise, epitomized by his hand and located in his sense of touch? Did the matter of the medical craft – human flesh – determine the nature and identity of these ingenious 'artisans of the body'? Did*ingenio* encapsulate the ways in which anatomy crafted the human body? By examining the cultures of ingenuity that suffused the realm of medical *technè*, this paper will chart the languages of experience (*peritia*) shaped by the sensible bodies of medical practitioners, drawn from repeated – tacit – experiences of touching other bodies.

A Vitalist Counterblast: Renaissance Biotechnology and the Charlatan's Ingenuity in J. E. Burggrav's *Lamp of Life* (1611)

Vera Keller, Clark Honors College, University of Oregon

Observing surviving *Kunstkammer* objects, it is easy to imagine the aesthetics of ingenuity as that of cold, dead matter: the hard-edged geometry of turned ivory polyhedra, the eerily jerky movement of automata and ethereal arrangements of hair, feathers, and even fetal skeletons. Far more difficult to recover is the ingenuity of the living, both in former lived experiences and in the evanescent spirits, fine structures, and internal movements that vanish with the passing of life. J.E. Burggrav's *Lamp of Life*, about a purported sympathetic lamp fueled by human blood, sets out an alternative vision of ingenuity: hot, viscous

and alive. Burggrav championed the fusion of mechanical inventions and the living body, not only as a means of developing powerful new devices, but also in order to reform the medical curriculum and develop the human capacity for ingenuity more generally. He embraced the charge of chymical charlatanry he expected to receive (and did). Nature herself operated as a charlatan, and it was up to the student of nature to train himself to follow her tricks.

Io's Hoof and the Origins of Letters: Ingenuity and Invention in Geofroy Tory's *Champ Fleury* of 1529

Andrew Morrall, Bard Graduate Center

Champ Fleury, published in 1529 by the French humanist, Geofroy Tory, is in part a typographic manual that at its heart lays out the author's unique method of mathematically constructing "antique" capital letters. Yet it is also a moral and allegorical treatise in the tradition of medieval commentaries, remarkable for the correspondences it draws between properly proportioned letters, the moral virtues, the ideal human body and the cosmos. Finally, it is also a humanist tract, striking as a meditation upon the origin of letters and of their significance in the world, as in its concern for the purity and improvement of the French language. At a period when many artists and craftsmen were seeking to ally their work with the liberal arts cursus, Tory, who was both printer and designer of letter types and teacher and editor of humanist texts, provides a useful paradigm for the ways craft practice and book learning came together. This talk will examine Geofroy Tory's self-proclaimed ingenuity in combining mathematical construction and allegorical invention as a means, as he saw it, of discovering previously undiscovered truths.

Crafting the Miraculous, Animating Automata

Christina Neilson, Oberlin College

Sculptures with movable body parts appeared during the late Middle Ages and their appeal continued for centuries. With arms that could fold, legs that could bend, heads that could nod, eyes that could roll,

and tongues that could move, these figures closely approximated that which they represented—living things. The ability of these sculptures to move suggested they had come to life, but this capacity was dependent on makers, who applied leather, parchment or polychromed gesso like skin over a corpus of wood with joints rendered to enable movement. This paper will address what it meant for an artist to make these images and explore how the maker's skill intersected with their object's ability to become animated.

The Contested Ingenuities of Brains, Nature, and Hard Work in Seventeenth-Century Dutch Anatomy and Chymistry

Evan Raglan, University of Notre Dame

From the late 1630s, innovative Dutch physicians took sides with Harvey in the heated controversy with Cartesians over the action of the heart, grafted in chymical medicine from Van Helmont, Glauber, and their own laboratory work, and then rose to prominence as medical professors and clinical practitioners in the 1660s. Their complex and competitive experimentalist culture displays a range of uses of *ingenium*, from Classical *topoi* to straightforward praise and mocking irony. In this paper, I sketch the range of meanings of *ingenium* and related terms in this context and argue that they assembled around three main types: ingenuity of the brain or mind alone, of nature, and of long experience in anatomical and chymical work. I show that they consistently rejected and ridiculed the Cartesian insistence on *a priori* speculations. Instead, physicians such as Johannes Walaeus, Franciscus Dele Boë Sylvius, and their students such as Regnier de Graaf relied on long experience and bodily, sensory engagement with anatomical structures and chymical activity. Only through such hard work could investigators develop their own *ingenium* to match the acuity of nature. This stance appears widely among early modern anatomists, as examples from William Harvey to Thomas Bartholin show. Even later critics who rejected the Leiden acid-alkali system celebrated their anatomical and experimental ingenuity. Finally, I suggest that an unfinished sketch of De Graaf at work dissecting points to parallels between the ingenuity of artists and anatomists.

Spirited Matter and Ingenious Nature: Accounting for Chemical Change in Early Modern England

Jennifer M. Rampling, Princeton University

In alchemical treatises and recipes, chemical change is often explained with reference to a "mineral virtue" or "vegetable" property present in natural substances, which, through the "ingenious operations" of nature, brings about material transformation. These material virtues might in turn be harnessed by human ingenuity. This paper explores how alchemists in early Tudor England engaged with the ingenuity of nature in order to solve pressing practical problems. How might the "virtue" be isolated from substances with very different physical properties – from vitriol and mercury to vinegar and distilled wine? How could mineral substances be induced to "grow" like plants? And how might patrons be persuaded to invest in such techniques? To these we might add our own, modern questions, asking to what extent our recognition of practitioners' creativity and expertise has been masked by their emphasis on nature's powers. As I shall argue, alchemists in fact demonstrated remarkable ingenuity in manipulating both matter and their own textual sources.

Ingenious Sundials in Italian Renaissance Gardens

Denis Ribouillault, University of Montreal

During the Renaissance, gardens were considered the ideal place for the display of *ingegno*. The display of ingenuity in a garden was expected and appreciated by its visitors, who were eager to demonstrate their ability to understand and discuss the learned conceits presented to them in the garden. Such display of *ingegno*, fundamentally linked with sociability and *conversazione*, even became a marker of nobility and a fierce competition took place between garden owners. At a more general level, *ingegno* primarily referred to the competition between man and nature. It was the artist, craftsman or engineer's capacity to play, equal or even surpass the work of nature that was deemed most delightful. In this paper, I try to summarize contemporary attitudes towards the display of *ingegno* in Italian Renaissance gardens by paying

specific attention to the use, materiality and display of garden sundials, a category of objects that has been largely forgotten but that epitomizes the quest for ingenuity in the early modern period.

Tangible, pneumatic, and their intermediates: Francis Bacon on the transformation of matter

Doina-Cristina Rusu, University of Groningen

Francis Bacon's natural philosophy is grounded upon a distinction between tangible and pneumatic matter. While the former is dense, inactive, and inert, the latter, also called 'spirits', is rare, active and the cause of all visible phenomena. This means of course that spirits are what has to be 'manipulated' in order to perform changes upon natural and artificial bodies. While the connection and communication between these two types of matter can seem problematic, this paper claims that the difficulty can be solved by the fact that for Bacon tangible and pneumatic change into each other. Moreover, an important role is played by the intermediate states, such as vapours and exhalations. These different states of matter represent the key to understand Bacon's experimental method, which aims at discovering them and accumulating knowledge about matter. Further, this knowledge should be used for the benefit of humankind.

The artisanal mastery of natural matter and the human body in early German print

Tillmann Taape, University of Cambridge

Hieronymus Brunschwig's manuals on surgery and distillation are among the earliest printed works on practical medicine. Written by a craftsman rather than a scholar, they articulate a material world of fragile human bodies, obstinate matter resisting the efforts of human art, and elusive healing 'spirits' trapped therein. This paper explores how Brunschwig engages with bodies, materials and processes through hands-on manipulation and sensory experience, to uncover an artisanal mentality of making and healing between the embodied expertise of endless repetition and quick responsive action in medical emergencies. It also

shows how the innovative use of available printing technology aids the communication of technical knowledge and artisanal expertise.

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Notes

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Ingenious Failure: Artisanal Languages of Error

Sven Dupré

(Utrecht University)

10 May 2017, 17:00 – 18:00

Little Hall, Sidgwick Site

Free public lecture

Part of the *Genius before Romanticism: Ingenuity in Early Modern Art and Science* project

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