Craft is a problem. Tied to culturally specific, temporally localized, manual modes of material production, craft is a condition to be overcome by modern design. At the same time, most design disciplines harbor romantic notions regarding the hand-crafted. The tactile manipulations of the craftsman’s hand, the contact with the natural material, the removal of technological mediation, are seen to foster a more authentic aesthetic sensibility. The modernism I refer to here could be that proposed by Loos, Muthesius, Le Corbusier, or Behrens in the early decades of the twentieth century, or one of many other modernization movements that have occurred in architecture. (The Italian Renaissance and contemporary digital design culture are two prime examples). Each was driven by a desire to articulate an aesthetic for the space of daily life tied to a real or perceived change in the means of producing material objects. Design’s role in regulating material production, implicit in this discussion, is enabled by the ever-changing technologies of mediation. Craft is often seen as something distant from mediation, as something that happens only in direct contact with the material. But, given the outcry that many architects have voiced over the discipline’s move into digital design, the question arises whether the problem with craft is located in material manufacture at all, or rather directly in the mode of mediation itself.

In what follows, I will argue that craft techniques have always involved technologies of mediation. A knife in the hand of a craftsman can be understood as part of a mediated system that links materials, tools, techniques, and participants into a practice that can be classified as “traditional” only after its active development has passed. That there have been changes in design techniques is obvious, but to see these changes as a distancing from the natural is to mistake the “nature” of what it means to manipulate material in the first place. The mastery of the artisan is the mastery of mediation, whatever the technology may be that interfaces between designer and artifact. All craft practices develop specific tricks and subterfuges in order to

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1 Alina Payne, From Ornament to Object (Yale University Press: New Haven, CT 2012) p.244
cajole material into becoming other than what it is. To be able to
disguise the effort of this artifice is often what defines mastery.
Access to the natural has nothing to do with it.

There are key insights into this condition made by the
French anthropologist of modernity Bruno Latour in his book
We Have Never Been Modern. Latour argues that one of the
main conditions of modernity is the institution of a division be-
tween the natural world and the social world with an asymme-
trical emphasis on the human, thus suppressing the non-human.
“Modernity is often defined in terms of humanism, either as a
way of saluting the birth of ‘man’ or as a way of announcing his
death. But this habit is itself modern, because it remains asym-
metrical. It overlooks the simultaneous birth of ‘nonhumanity’
things, or objects, or beasts ...”2 Traditional craft practices
exist in a pre-modern condition that does not yet radically dis-
tinguish between the human and non-human, between cultural
and natural, between fact and fetish. This inability to make the
distinction is exemplified in the habits, myths, and rituals that
are part of the activities of pre-modern ornament and design.3
It is the modern critique that seeks to divide out aspects be-
longing to the fetishes of craft from those that are the facts of
design. We cannot go back to a pre-modern practice, as most
contemporary examples of a return to traditional techniques
result in pure kitsch. What Latour offers instead is an alternate
possibility: we have never been modern.

To avoid the movement back to a nostalgic, pre-modern
state, Latour introduces the idea of the “non-modern”. This
non-modern stance focuses its critique on what he claims to be
the two levels of modernity: a level of purification where nature/society are split and a level of mediation where hybrid assem-
blages proliferate.4 Furthermore, Latour finds modernity to have
two dominant positions regarding the status of mediation in its
relation to reality.5 He finds both positions to be problematic.

The first position treats nature as the sole locus of truth
and reality. In this belief we can see both the roots of aesthetic
themes under discussion here, this position sees mediation as a
window continually reflecting assumptions built into the system
by human cultural conventions. Mediation is not understood to
exist in a pre-modern condition that does not yet radically dis-
tinguish between the human and non-human, between cultural
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The first position treats nature as the sole locus of truth
and reality. In this belief we can see both the roots of aesthetic
theories of natural beauty as well as the foundations for the
empirical sciences. Both art and science here posit a reality out-
side of us that is knowable through representation, yet both also
deny this representation any generative aspect. Representation
is a transparent mapping of the world for human understanding
and does not in any way effect the objective conditions that it
attempts to represent. In relation to our discussion regarding
craft, this position sees mediation as a window framing views of
objective reality. To remove layers of mediation is to get closer
to nature. The problems with this position arise when it is un-
derstood that it is impossible to remove all mediation, and that
ultimately it is a privileging of a distinctly biased human per-
spective that is being held as objective and neutral.

The second position sees nature as explained and fabri-
cated by society. Truth and falsehood are relative cultural con-
structs. It is only in the study of culture that knowledge is ac-
quired. Here, the study of representation is the study of reality,
whether this is graphic, linguistic or numeric. Again, the human
is the privileged subject. The problem for this social construc-
tivist position arises when it is faced with the question of a
reality that exists outside of human knowledge. The response
is that we only know the external world through representation,
and since we cannot get outside of ourselves we have no way
of knowing if our representations are a true map of nature; thus,
“nature” is a product of our representations.6 In relation to the
themes under discussion here, this position sees mediation as a
mirror continually reflecting assumptions built into the system
by human cultural conventions. Mediation is not understood to
have any connection outside of itself to nature or the non-hu-
man. It is a self-reflecting cultural construct that under study
only reveals its artifice.

Latour is looking for an alternate position, one that es-
capes the trap of claiming that reality falls solely to nature or
solely to society. The non-modern position he proposes sees
both nature and society as resultant concepts explainable from
the proliferation of clusters of quasi-objects that exist in hybrid
alliances. It is through the mediations and translations of these
human/non-human networks that larger entities are articulated.
According to Latour, modernity does not allow this middle posi-

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4 Bruno Latour, We Have Never Been Modern (Harvard University Press: Cambridge, MA 1993) p.11
5 Ibid. pp.11
tion. Truth is either “out there” in nature, or “in here” as a social construction. The non-modern position focuses us directly on the role of mediation in-between “things” (variously called by Latour hybrids, quasi-objects, actants, or actors) that cannot be reduced to either side of a purified dichotomy.

“...the number of obvious hybrids is overwhelming: ‘frozen embryos, expert systems, digital machines, sensor-equipped robots, hybrid corn, data banks, psychotropic drugs, whales outfitted with radar sounding devices, gene synthesizers, audience analyzers[...]’ (NM, pp.49-50). These hybrids are a nightmare for any attempt to slice the world cleanly into purified districts. For this reason, the modern position will deliberately misread them ‘as a mixture of two pure forms” (NM, p.78) But such a mixture is impossible if the two pure forms do not exist in the first place. Latour’s hybrids are not just another set of fuzzy gray areas suitable as campsites for those who are fond of the transgressive borderlands. For our world contains nothing but hybrids, and even the word ‘hybrid’ misleads us with its false overtones of a mixture of two pristine ingredients. If we call them quasi-objects, the work done by the ‘quasi-’ is to remove any lingering hint of solid natural objects approached through a colourful diversity of equally valid cultural standpoints. There are only actants: all actants are constructed through numerous trials of strength with others, and all have an intimate integrity that partially resists any effort to disassemble them.”

With the arguments of Bruno Latour in mind, I would now like to turn to the relationship between material craft and design sensibility. These concepts have a problematic relationship with modernity precisely because of their hybrid status. Craft always hints toward a manual tradition, passed between masters and apprentices through a guild like training. It suggests a mundane connection between material and the hand. Craft resists the abstractions which drive the use of mathematics and geometry; it resists the theorization of philosophical discourse. It is too “out there” in nature, to use Latour’s distinction. Sensibility suffers under the opposite weight through associations with subjective feeling; an emotive element tied to sensory stimulation which tends to exclude it from the procedures of rational argument or objective science. It is too “in here,” too personal, too expressive. When craft reared too large in a design, it was either dismissed as provincial vernacular nostalgia or seen as an added value to the physical building but minor in relation to the essential questions of architecture. When sensibility reared too large in an architectural design, it was treated as either un-imitable individual genius (Michelangelo), demented undisciplined decadence (Borromini), or marginal idiosyncratic jest (Gaudi).

Numerically measurable drawings began to replace the trade techniques of the medieval guilds during the 15th and 16th Centuries in Western Europe. These drawing techniques were used to regulate, predict, and provide proof regarding objective beauty through rational proportions of geometry. These drawings allowed the architectural design to be controlled at a distance, through mediation. But, despite the desire to see these techniques as a dismantling of manual traditions, a species of craft and sensibility persisted through the new drawing technology. This new mediated assemblage was not the oral-, material-, tool-based hybrid of the medieval guild but an assemblage binding together a different set of actors, with a different set of skills, articulating a different set of sensibilities. The basis of the proportional proof was threefold; the existing buildings of antiquity, the writings of Vitruvius, and the proportions of nature filtered through the human body. These aspects could all be mediated through drawing as it allowed the collusion of plane geometry, visual mimesis, and notational script. The drawings of the Italian Renaissance assembled a relation between painting, poetry, music, geometry and mathematics. These mediations were hybrid, their practice constituted a craft; their masters articulated their sensibilities in contact with specific media, on specific mediums, aided by specific instruments and tools.

7 Bruno Latour, We Have Never Been Modern (Harvard University Press: Cambridge, MA 1993) p.96
Triangle Diagram: From Structure to Pattern to Plan
What mattered most was that this shift aided by a change in the
technology of mediation allowed architecture to enter into the
humanist discourse of the liberal arts.\(^\text{10}\)

To view another historical juncture, the Arts & Crafts
movement in England in the middle of the nineteenth century
struggled with the loss of traditional material techniques and
ornamentation to modern industrial manufacture. The fears of
William Morris, John Ruskin, and Owen Jones are an interest-
ing parallel to contemporary worries regarding digital technol-
ogy. But, interestingly, it was not through a return to a material
practice that salvation would be found. It was in the aesthetic
training through drawings published in books that the contin-
uity of craft values would be extended into modern conditions.
*The Grammar of Ornament* by Owen Jones was not published to
train people in vanishing material practices, but to train them
in the visual patterns that ornament was composed of. To read
the “general principles” that Jones prefaces this book with is
to see how deep the theories of drawn images had penetrated
aesthetic discourse by the nineteenth century.\(^\text{11}\) These images
acted as training both for the sensibility of the designer and
the sensibilities of the burgeoning consumer public entering
the market for industrially produced goods. The assemblages
created through these mediations linked together architect,
archeologist, art historian, industrial manufacturer, financer,
social reformer, and the consumer market.

This shift toward drawn mediations that began in the
Italian Renaissance finally reaches its technological fulfillment
in the start of the nineteenth century with the hybrid con-
struction of Descriptive Geometry. Mathematically, Gaspard
Monge’s method resolved the planar co-ordinate geometry
of Descartes for three dimensions.\(^\text{12}\) Graphically, Descrip-
tive Geometry produced a strange weightless visualization of
interrelated projections, complex intersections, and tumbled
auxiliary views. These mediations became the backbone of
modern engineering drawing, and by the second decade of the
twentieth Century, became melded into the drawings of archi-
tects as well. The axonometric drawing, which has its roots in
the various oblique projections of military and machine design,
becomes fully rationalized through the auxiliary projections of
Descriptive Geometry. There is no privileged relation to gravity

10 Ibid, p.113
11 Owen Jones, *The Grammar of
Ornament* (Bernard Quaritch: London,
UK 1856) p. 9
12 Peter Jeffery Booker, *A
History of Engineering Drawing*
(Chatto and Windus Ltd: London,
UK: 1963) p.95
in this system, no culturally defined convention of iconographic elevation or symbolic plan. The easiest things to draw in this space were objects; specifically geometric objects; more specifically, un-adorned abstract geometric objects. Furthermore, the objects of architectural design are now in the exact same space of mediation as the objects of industrial design, be they planes, ships, and automobiles or furniture, vases, and cigarette lighters. The technologies of Descriptive Geometry and Axonometric projection allowed a whole new set of alliances to be formed between industrial design and architectural design. This development in mediation parallels many of the shifts that Alina Payne finds in the discourses of art history and design theory surrounding the turn of the twentieth century in her book *From Ornament to Object*.  

Although one could trace the influence of digital technology on architectural mediation through a myriad of routes, (following Mario Carpo the thread leads straight to the Italian Renaissance and Leon Battista Alberti), there is a significant change in both the quantity of users and the manner in which digital media begins to operate during the 1990s. It has been suggested in recent architectural research that the hybrid of digital modeling/digital fabrication is offering a return to craft traditions that existed prior to the industrial revolution, or in an extended suggestion, prior to the modernization of architectural representation during the Renaissance. These interpretations are interesting for they bring attention to how a shift in mediation alters the alliances between the parties that are mediated.

The questions that we should ask today are not how digital technology is destroying architectural craft, but how it is changing it. The digital model regulated through parametric computation is a very different mediation. It is not just a new tool. Even at the level of mundane pragmatics, “the computer”
must be understood as an assemblage of the computational interface (software), the physical interface (hardware), the simulation resolution (display devices), and output machining (CAD/CAM fabrication in all possible modes). Frederich Kittler proposes the computer as the first technology of mediation that fuses storage, manipulation, and transmission into a single assemblage.\(^\text{17}\) This proposal could lead to the observation that digital mediation brings the designer closer to the objects of fabrication than ever before, thus provoking new opportunities for a craft sensibility. “Opportunities” is actually the wrong word, for this colluded combination of image, model, mathematics, and manufacture, demands a greater attention to craft by the architect. In many contemporary cases, the architect’s digital model serves as the shop drawing for manufacture, there is no intermediate fabricator as a separate actor correcting and altering design drawings with fabrication expertise (i.e. craft). This shift requires the architect be able to craft a digital model to a degree of detail, precision, and commitment that was rarely the case when a drawing was interpreted primarily as “design intent.”

The software that architects are now using owes a significant amount of its operational vocabulary to the industrial design practices of automobile, airplane, and ship design. Many contemporary software platforms were developed specifically to navigate the complexities of a precision manufacture particular to the surfaces desired by these design practices, surfaces best described through a differential geometry of spatial vectors rather than a positional geometry of planar shapes. This movement to differential geometry has the peculiar effect of increasing the “object-like” qualities of the design while also increasing the potential variability of the design’s final shape. This combination sounds strange to architects, yet is fairly common in traditional crafts that work in surface deformation (i.e. Ceramics, Metalurgy, etc.). The surfaces are malleable within the parameters of an exchange between material, tool and energy; they also often form distinct “objects” in relation to social use; and lastly, the finished surfaces are often best described as blurred between ornamental articulations and functional performance. (Examples are: vessels, weapons, armor, coins, utensils, jewelry, etc.). Car body design fits into this tradition as it was by and large one of clay sculpting and sheet metal stamping prior to the introduction of Bezier spline computations and CAD/CAM manufacturing in the 1960s.\(^\text{18}\) The automobile, plane, and ship industries have adapted their design mediations by finding a computational mode in which their key craft conditions could transfer over. In the process, new surface possibilities developed into new aesthetic desires for the object of the automobile.

Digital mediation also opens a hybrid assemblage between architecture, cinema, and animation. The potentials for architecture are fascinating given the restructuring of the human sensornium that cinema spearheaded throughout the twentieth century. There have already been several forays into animation software (Greg Lynn - FORM) and motion capture (Mark Goulthorpe - dECOI) pulled from the entertainment industry and applied...
to architecture. But the question of craft in this context of the digitally altered image offers other possibilities for architectural design as well. To give one example, every frame in modern cinema passes through the hands of a “digital composite artist.” These artists are a key part in crafting a convincing version of a reality, even though the situations presented are often far from real outside of the frame of the film. In order to achieve these effects it is not enough to try to recreate the real; in order for the effect to be “special,” there must be an extension of the conditions of reality. The historical lineage of the composite artist is collage, which has a rich discourse of crafting fragments from found reality into new hybrids of alternate realities. Specifically, the questions of the surrealist collage are tied to tricks and subterfuges that condition a simulation of familiarity setting the stage for an aesthetic of de-familiarization, or the estrangement of reality. Digital compositing in cinema owes a great deal to these subtle techniques that set up moments for estrangement, and is at the same time shifting the techniques of collage through new means. This is an intense investigation of craft and mediation with specific questions regarding how images become real to human perception and at the same time poke, prod, and extend this accepted reality. They have become aesthetically hybrid, speculatively real.

In Latour’s argument, modernity suppresses these hybrid mediations in favor of pure divisions. For instance, since the Renaissance, the drawn representation has held the architect’s design idea to be produced later as a direct copy through the hand of the builder. This devalues craft, for it is seen as inconsequential to the real work, the design, which exists essentially as drawing on paper. But, if we follow the Latourian reading of this condition, craft is not destroyed, just shifted into a different meditation. This shift is what matters, as it alters the mode through which the aesthetic and conceptual arguments will be articulated. Architecture and other design disciplines have recently undergone a shift towards the computational. It is now up to the various disciplines to push their experimentation to the limits of reality, to identify the moments of difference, and to critically craft the potential hybrids offered by these changes in the technologies of mediation.