Past with Present: A Design Process

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Past with Present
A Design Process

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Abstract

The design process detailed in this thesis addresses how a designer brings a design that is both relevant but dated into the present. Four stages make up the design process: investigation, scattered design, design réseau, and focused design, and the process covers the choice of artifact, historical and cultural research, and the conclusions derived from research. The chandelier acts as artifact in this design process iteration. The goal of the thesis project is a process that stresses both innovation as well as the cultural and symbolic importance of older designs; the outcome of this design iteration is honed chandelier concepts with prototypes.
Introduction

How does a designer bring a design that is both relevant but dated into the present? The response to a question using “how” must take the form of an explanation, offer direction, or outline a process. A designer brings a design that is both relevant but dated into the present through a process—a design process. Henceforth the process under discussion will be known as “the design process.”

Only select artifacts are eligible for the design process explored in this thesis. The appropriateness of the selection depends on the artifact fulfilling the stipulations of “relevant” and “dated.”

How does a designer bring a design that is both relevant but dated into the present?

Along with “present,” these terms warrant further attention. “Relevant,” in this case, conveys that the design still possesses positive qualities. The relevant qualities are probably the reason for the selection of the design.

“Dated” communicates that the design in question has skeuomorphs and vestigial elements, rendering the design unsatisfying, inappropriate, or limiting new designs.

“Present” could, in some contexts, be defined as any design being created or produced at current, but in this instance “present” will be the constraints derived from the perceived needs of the present-day imposed upon the design process.

A good candidate for the design process has elements that are to be retained, other elements that will be eliminated, and a set of constraints that address contemporary life.

The inspiration for creating a design process that both innovates and incorporates elements from the past derives from observing a duality when it comes to designing certain kinds of artifacts. Either the designer copies or nearly copies artifacts that have existed for centuries, or the designer redesigns with little regard for the history of the artifact. Between the two extremes of mimicry and a process stressing just innovation exists unexplored design space.
Underpinning the stated thesis topic are a number of assumptions: namely, that the past is important, innovation is important, and topical constraints are important. The goal of the process outlined in this document is to both focus on history and on innovation.

The Past and Design

Objects do not exist in a cultural or a historical vacuum. Even when completely alien, artifacts will be approached and assimilated using cultural mores and group and individual past experiences. For objects that are not alien, the artifact means something and communicates to the culture. The use of an artifact connects consciously and subconsciously to all other contact with that artifact, creating a complex tapestry of meaning as we the users interact with the world.

The extent and depth of meaning attributed to objects is debated, and some argue meaning can vary from object to object and artifact to artifact. Ellen Dissanayake, in *Homo Aestheticus*, calls art the act of “making special,” and human life as well as human objects fall into categories of either special or normal, or can be placed along a continuum between these two ideas. How exactly specialness translates into meaning is complicated. Adrian Frutiger proposes that symbolic content has its limits; everyday objects lack symbolic content. “Tools, crockery, clothing, and housing are too close to humans’ daily life to be charged with any mythological content.” It is only through association with certain objects or organisms that they obtain symbolic force. Other theorists argue the opposite point, that familiarity with an object can augment its “specialness” or its symbolic force.

How objects acquire and shed meaning is beyond the scope of this thesis. The design process assumes that artifacts have roles and that objects communicate in the context of a culture. Appendix B focuses on office design and office culture to illustrate the broader links between culture, meaning, and design. Discovering what an artifact means is a key component to the design process, allowing the object to retain its relevant features.

Innovation

Design is a discipline of creation, change, and by extension, destruction. The purpose of design can be described as finding good solutions to design problems; designing can be loosely equated with innovating. Depending on the prescribed school of thought, “good” in industrial design can mean a certain style, increased sales, satisfying economic constraints, usability, acceptable quantity of resources used, reusability of the product, satisfying a set of other design goals, specialness, availability to a class of people, or being true to a material, among many other ideas.
The design process presented in this thesis attempts to counter the fact that innovation, at times, fails to consider the symbolic power or the history of an artifact, ignoring cultural context in the quest for change. Innovation rests at the heart of design, but change should not ignore the history or cultural meaning of artifacts.

The following four sections correspond to the four steps of the design process explored in this thesis. A division into four sections is the simplest breakdown of the process without diluting or compromising the stages. The stages move from initial investigations through producing a series of designs, then combining and evaluating the designs, and finally focusing on a select number of the designs. The process inherently produces standards with which to judge the final set of designs. The aim of the entire process is to move from an array of varying design concepts to an output with refined and focused design concepts.
Investigations

Investigation begins with a choice of artifact. The word “artifact” refers to a class of objects. Examples of artifacts include sofas, cell phones, and trash cans. Three-dimensional work in this first stage focuses on building a quick version of the artifact and disassembling and subverting older designs of the artifact.

Choice of Artifact

It is important to chose an artifact that fits certain criteria. Ideally the choice of artifact has a long history and possesses a number of elements that will continue in the new design. The artifact remains important in some capacity to the current culture, but instances of the artifact should be outdated. What constitutes outdated can be debated, but a case must be made that the artifact is outdated in some capacity.

The chandelier is a good candidate for the design process and is used in this thesis to demonstrate the process. The chandelier has a long and tortuous history, and, in the last century and a half, the artifact has been subject to the transition from candle to gas and then to electric lighting technologies. The candle was originally a central determining element in chandelier design, but the new lighting technologies render most chandelier designs technologically obsolete. Culturally, though, chandeliers continue to be produced, bought, used, valued; chandeliers exude meaning and possess a role in many cultures. Designs that focus on new lighting technologies overwhelmingly overlook the cultural role of the chandelier. Chandeliers pose interesting design challenges, presenting the designer structural, luminescent, electrical, and reflective challenges in addition to the concerns of the individual designs. The chandelier has an added benefit of falling squarely within the realm of industrial design.
The 3D Sketch

The aim of this step is to familiarize the designer with the artifact. The model produced should be quickly assembled, possibly out of scrap parts, and preferably at a full scale. It should ideally be a working model to be a fully effective learning tool.

The 3D sketch for the chandelier is constructed out of coat-hanger wire, Christmas lights, and pull ties. A number of issues came to the forefront during the creation of this model, including a need to consider light quality, lamp intensity, overall produced lumens, light reflectivity, the type and location of wires, size and orientation of the chandelier, arm spacing, symmetry, and bulb and light direction. Because the chandelier hangs, balance comes into play; if the designer has neglected balance the form might tremble or list. With a chandelier, the designer is typically trying to power multiple, separate points of light, which can be challenging.

The 3D sketch for the chandelier was successful for its quickness and ease of construction, and because of the unveiled considerations to be revisited in later designs.
Disassembly and Subversion

After the 3D Sketch is completed, two design strategies, disassembly and subversion, allow the designer to break down the artifact into manageable pieces and then play with the segments.

Three chandeliers from Habitat for Humanity Restore translated into a ready supply of arm, body, bobèche, and candle pieces. Key at this juncture in the process is familiarization with the materials traditionally used in the manufacture of the artifact. The three chandeliers conform to typical chandelier assembly conventions and rely on a specific type of screw thread. Typically, pieces that combine to form the chandelier are stacked on a single axis, parts being either screwed together or held from slipping off the main pipe by nuts, loops, or final screws.

Almost all electric lamp parts, which include chandeliers, use “lamp pipe,” which typically is rated at 1/8 IPS with a diameter of 3/8”. The IP stands for “iron pipe size,” a sizing convention that is a holdover from when fixtures were being converted to gas power. Sizes 1/4 and 3/8 IP are less common, and lamp pipe frequently has a pitch of 27 per inch, so the most common size is technically 1/8-27 IPS.¹

Within the lighting industry the term “lamp” often refers just to the light bulb and not to the entire lighting structure. A light bulb socket would then be called a “lamp holder.”
Arms

In two of the acquired chandeliers the arm shape is a common chandelier “S,” and the arm investigation kept the essential form of these arms and focused on a manipulation of materials. Chartreuse yarn was the first material chosen because of its vibrant and, for a chandelier, atypical hue. The texture of the yarn arm had a “cottage” feel; application was quick and easy.

The use of copper segments for the second arm suggests the types of metal normally found in chandeliers, though copper rarely makes an appearance in its pure form like the copper in this model, but as a part of the alloy brass. The similar reflectivity of the different metals might lead the copper to signify some amount of opulence; the arrangement of the copper segments had the unexpected consequence of appearing armored, conveying the ideas of “military” and “strength.”

The materials applied to the third and fourth arms are infrequently associated with chandeliers. In an attempt to signal concepts of “clean” and “synthetic,” polystyrene was molded by being vacuum formed over the arm. The yellow tape used to fasten the two polystyrene pieces altered the impact of the white

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Left, yarn arm. Right, copper arm.
PS tremendously. For the other arm red Plasti Dip gave the arm a rubbery, “grippy” appearance. Both of these investigations were pleasing in their marriages of older form and infrequently utilized materials.

The arm investigation was fairly successful in its main objectives: connecting the designer to the wide range of material choices available for application to future designs and familiarizing the designer with a portion of the main artifact.
Bobèche

Because the drip pans on the Habitat for Humanity chandeliers were so similar in shape, the bobèche investigation sought to subvert the typical bobèche vocabulary. The choice of polystyrene seemed appropriate because of its neutral texture and color.

Ceramics and bowls from thrift stores made excellent molds and the polystyrene successfully vacuumed. The resulting forms do not differ in any drastic way from a drip pan in most chandeliers, but the curve of their bowls seem unusual for a chandelier, signaling that chandeliers typically adhere to a fairly strict shape vocabulary for the bobèche. Subtle alteration is enough to shift the drip pans from a common form.
Chandelier Form

The size of a typical chandelier can present challenges when investigating the overall form. Scaled models are an appropriate response, but CAD (computer aided design) software has an equally generous set of benefits. Though CAD can distance and blind a designer to physical constraints and construction considerations, software is ideal for large, abstract investigations into form.

By using NURBS as a mathematical model, AliasStudio lends itself to the sculpted shapes chandeliers often take more so than programs such as SolidWorks, which is a parasolid-based solid modeler. The variation and subversion of the overall form came about through manipulation of the “S” shaped arm, the base unit in this investigation. Different iterations displayed changes in arm quantity, arm orientation, and overall orientation. In cases such as this one, momentary disregard to certain constraints, in this case materials and scale, can free the investigation, allowing for profitable experimentation.
Scattered Design

In the second stage, scattered design, the designer expands on different concepts to produce a range of designs and design concepts; a concept is the underlying idea behind a design or a group of designs.

The designer undertakes most of the historical research during the scattered design stage. Historical research provides the designer a deeper and more robust understanding of the artifact at hand. Research should commence the moment the artifact is chosen, culminate during the scattered design phase, and taper off as the designer focuses on specific designs. Learning the technical, economic, and cultural forces that shaped the artifact’s history allows the designer to more fully understand the obsolescence and the cultural space the artifact occupies, both of which help the designer understand the artifact elements to retain.

In keeping with the spirit of the transformation that the chandelier is undergoing during the design process, the term “chandy” is assigned to the more advanced designs, a modernized form of the word chandelier.

A History of the Chandelier

The chandelier typically traces its origins to abbeys and religious buildings of medieval Europe. Histories of the chandelier exclude Asian and other non-European lighting. Structures similar to the chandelier exist, including certain Chinese and Japanese lamps, but these designs follow a different lineage. For a deeper discussion into the general nature of the evolution of artifacts, see Appendix A. While lighting systems of other cultures would
no doubt be illuminating and inspirational, the design process at hand is concerned with the chandelier in particular and the cultural role of the chandelier, both of which are decidedly Western. Adding other cultural elements into the history would generate confusion. For the sake of clarity what follows is a Western history of artificial illumination with special attention given to the chandelier.

Until the appearance of coal gas lights in the nineteenth century, lighting technology had changed little in thousands of years. Apart from wood, the fuel used for interior artificial illumination was typically animal fats or plant oils, both of which were prone to being consumed as food instead of fuel in times of want, especially in the case of the plant oils.

Open flames had a tendency to be messy, expensive, and a bit dangerous. Beeswax was a luxurious alternative, as tallow could go rancid, melt in the summer, and oil could congeal in the winter months. Rushlights, lamps using rushes as wicks, dripped and were enormously messy, and the quantity of smoke produced was a concern. Fire was a constant danger. Wicks of tallow candles had to be trimmed every quarter hour, meaning that a single person could tend to only ten candles at any given time, so those who could afford servants could afford lights, and those that could not were limited in the number of candles they could and did light.¹

Candles gradually became more common, over a several hundred year period, beginning in the seventeenth century. Prior to this time, ample evidence supports claims that candles were used rarely. Candlemaking was not considered a necessary skill in a wife nor a need for a village, and the choice to burn candles was also a moral choice, as artificial illumination could imply neglecting responsibilities or unscrupulous opulence.²

For most individuals, contact with candles took place in a church. Because candles were used so rarely, they became staple features for religious or ceremonial buildings, used symbolically for ceremonies, for sinners, and for the dead. The candle represented “stark differences in everyday life—light from darkness, wakefulness from sleep, the solemn from the everyday.”³ The first chandeliers illuminated the large, dark spaces of certain medieval buildings, which were typically religious in nature. A drip pan had a spike in the center onto which a candle could be thrust. A simple, early chandelier design consists of two planks of wood arranged into a cross, upon which the drip pans sit. Another early design consisted of a circular structure with candles atop on the parameter. For any candle-burning chandelier replacing the candles is obviously important, and the rope that held the chandelier aloft could be slackened, lowering the chandelier to the floor to allow for candle replacement.
The upper classes began to use artificial light much more frequently in the eighteenth century, but for lower classes and, originally for all people, light was almost wholly solar. The schedule of the sun, in turn, determined meal and bedtimes, and it is little wonder that the sun was treated with reverence by so many cultures. Solar light shaped both daily and monthly routines and was a free and, for the most part, readily available light source. Country dwellers planned night activities to coincide with the brightest phases of the moon. Originally, using any technology for light implied a degree of additional effort and economic costs. The attractiveness of artificial illumination stemmed from the perceived benefits versus the costs and availability of artificial light for that particular culture. Cultural attitudes towards light impacted adoption of new technologies and the use of old ones; candles were originally associated with sleeping rather than nighttime endeavors, an association that was aristocratic in nature, as a candle at night implied beeswax as well as a servant to tend to the flame throughout the night.

The chandelier addressed the problem of lighting a larger spacial area than could be lit by a single candle, a task also taken up by girandoles and sconces, the defining differences being that girandoles are supported from the floor, sconces attach to a wall. The ways of amplifying the light include increasing the number of candles, positioning the candles in a central area, increasing the amount of flame, or using reflectors or refractors to direct the light. Increasing the flame consumes more fuel, and the fireplace, and later stove, was primarily used to generate heat. Compared with a chandelier, a broad open flame used vastly larger amounts of fuel, had to be ventilated, produced a great deal of heat compared to candles, and, for all of these reasons, was often placed in walls in the form of a fireplace. The chandelier became a useful response to the limitations inherent in large, open flames as a light source.

As artificial light became more accepted in the seventeenth century, more distinct connections emerged between social status and type of illumination. Technological advances combined with shifts in cultural or social mores to augment the use of artificial illumination, as French theater provided the prototype for new, fantastic lighting effects. “Elaborate lighting carried connotations of excess and extravagance, although an absence or inadequacy of candle lighting could signify poverty and depravity as well.” Darkness was equated with danger; the wealthy would travel with their own light sources.

The messages of artificial illumination remained strong indicators of class, taste, and status. Around 1800, public gas lighting began to be installed in cities—beginning with the most luxurious commercial districts or symbolic city elements. Arc lights, the first electric lights, were developed in the late nineteenth century, but produced such a blinding glare that their use was unsuitable for interiors.
The transitions from solid and liquid to gas fuels and then to electricity affected chandeliers, as gas burners and electric wiring made appearances in the new designs and were physically installed in older chandeliers. Gas lighting typically protected the flame with a glass chimney, which controlled the flow of air. Incandescent lamps (see definition of “lamp” on p 9) might be covered with shades or colored glass to try and temper the brightness of the lamp.

Electricity made the multiplicity of arms and lamps a technological skeuomorph. No longer was illumination limited by the unit of brightness brought by candles or by gas. In fact, many of the design challenges for electrical lamps would center around the dampening and shading of the too-bright lamp, for a single lamp could easily provide greater brightness than a score of candles. The bobèche was not needed to catch drips of wax, and the light didn’t necessarily need to be held aloft by plastic duplicates of candles.
The Curly Chandy is the first design that moves away from simple subversion to a more complex creation. Like the form investigation, the designs for the Curly Chandy continue to use AliasStudio. The design is still a subversion, as the arm spacing, consistent arm shape, and drip pan placement all run counter to traditional chandelier logic. The models and sketches for the Curly Chandy do begin to feel more like a finished design than the form investigations, but the concepts behind the Curly Chandy are fairly simple. Without designated materials, lamp type, and construction method, the design remains an abstraction.
The Bio Chandy began as an observation about the link between Art Nouveau and nature as inspiration, and grew out of an attempt to draw inspiration from nature in a contemporary manner—resulting in a scientific understanding of the natural world.

The first underlying logical constraint calls for equal spacing of the light producing entities on a single plane. Many chandelier designs follow such a logic, though sometimes more tiers, or planes, are situated above or below the main plane. In the majority of existing chandeliers, the structural response to such a logic uses arms to hold one or two of the light points. The arms conjoin at a central point and branch in a radial fashion.

Diagrams depicting branching divided into sections of two, three, and four initial branches. The black circles are the lamp units.
The Bio Chandy branches in a non-radial fashion following examples set by floral and arboreal structures, and becomes almost more mathematical than biological. The curves on the Bio Chandy are obviously different than archetypal chandeliers. The material could be recycled plastic, such as recycled PVC, or a thermoplastic. There were questions as to whether this kind of concept, with scientific inspiration, satisfies the constraint of being “in the present,” an issue that was not fully resolved as attention shifted to other designs.
Sketchwork

At this stage in the design process, the designer should have ideas and be recording them in the form of two and three dimensional sketches. Many of the sketches are not and will not be as developed as the Curly Chandy or the Bio Chandy. The following sketches represent a range of underlying concepts.

Both pages demonstrate working through LED characteristics, limitations, and application—including LED arms as plug-in parts.

Left page, sketches precede the Deco Chandy and are focused on the concept of “structure.” Right page, full and partial LED plug-in concepts.

Left page, ideas on how to hang a single candle or candle/pan unit. Right page, detail of backbone arm and individual segments.
A 3D sketch of “wiggle chandy,” a design which subverts arm shape. Pipe cleaners, rubber washers, and electrical wire (candles)
The Ring Chandy model was produced later in this particular design process, but the design fits much better with the scattered design. The fact the design calls for such a small chandelier runs counter to later conclusions about the role of the chandelier in contemporary culture.

The impulse behind designing the Ring Chandy took the form of a question: “what kind of chandelier and what scale object do LEDs naturally want to light? “Naturally” is a tricky word, but the thinking was that an LED is physically a tiny object, and as such wants to light a similarly scaled object. The shape and arrangement of LEDs was an homage to early medieval chandelier varieties that were found in monasteries. The base is a cross section of thick pipe, roughly cut, which hints at an industrial style.

The light might be a candidate for portability, or the fixture is fitting in a setting with more confining space. The power cord remains a dilemma. The model represents an interesting beginning for a light fixture but does not qualify, according to research conclusions, as a chandelier, mainly because of its size.
Réseau

In the third stage all the scattered designs are arranged in a single space, the “design réseau,” where the designs are grouped according to common traits. As historical research begins to wane, the designer should begin forming conclusions about the significance of the artifact. The investigations, designs, and research should now indicate what is worth preserving from past artifacts and what elements should be altered or deleted, and why.

Conclusions on the Artifact

When considering the role of the chandelier, two ideas stand out: the link between chandeliers and wealth or status, and the chandelier as a ceremonial and domestic artifact. These ideas are what the chandelier mean. Certain elements support what the chandelier means, and the meaning of the chandelier dictates the manifestations of the elements. As such, the meaning and the elements re-affirm and perpetuate each other.

Some important elements for a chandelier include the cost and type of materials, the size of the chandelier and the space the artifact occupies, the setting, the kind of light the artifact emits, and the chandelier form. Many of these elements listed have a dual nature; size can be big or small, for instance. The chandelier typically prefers that which enhances the idea of wealth, domesticity, or ceremony, which is the trait big, in this case.

Great size communicates wealth in a number of ways. Typically, a voluminous artifact has an inherently high cost stemming from the price of materials, assembly, and transportation. Often as important is the volume of space itself; interior space, especially domestic space, can be costly. Providing the chandelier sufficient room is an economic consideration. The cost of the typical raw materials used, the number of parts, and the degree of assembly required also plays a role in elevating the cost of the chandelier.

The setting of the chandelier is critical when focusing on the ideas of ceremonial and domestic. Large interior spaces are typically given important ceremonial functions, a bond central to what makes the chandelier a culturally strong artifact. Crucial social practices are linked to the chandelier: dining as a group, banquets,
dances, ballrooms. Theaters, churches, and certain government buildings all contain chandeliers, and they can be found in entryways and over stairs, which are often ceremonial in nature. Not only does a new artifact have to replace the chandelier technologically, but the artifact must take on the role of the chandelier.

Many settings are decidedly non-domestic and are not ceremonial in the same manner, and considering these settings provides an interesting contrast to the home. Stadiums, offices, and factories all fall under this another type of setting. Design for factories and for office interiors has a different vocabulary than domestic design. Executive offices, which are set apart from normal office design and communicate status, can be, at times, domestic or ceremonial. Usually, though, what might suggest comfort at home can be seen as informal or inappropriate for an office; what signals efficient in a cubicle sometimes comes off as cold or impersonal in one’s apartment. Chandeliers, being so strongly associated with non-work activities, would have to shed a lot of their signifiers to become appropriate for work, that is unless the piece in question could be construed as historical or artistic, as is the case when a chandelier happens to be in an older building or the chandelier is installed as art. In this last case, the business or organization in question might be communicating a certain cultured status, which is demonstrated by their knowledge and preference for history, art, or design.

Certain buildings are neither work-related nor domestic. Public artifacts can be more austere, making them seem hygienic or appropriate for a population with divergent tastes. Some civic and government artifacts must take into account constant use, theft, vandalism, and general disrespect. Chandeliers are exempt from some public considerations because they can be placed out of reach of the user, but the danger of misuse remains, especially for what is often a fragile construction. The message of a chandelier often fails to coincide with municipal aims, which include demonstrations of frugality and neutral opinions. Of course the opposite is also true—civic artifacts are group objects, and as such demonstrate the status or wealth of the group. The United States Capitol building illustrates this point well. Local and regional wealth is demonstrated by the ability of the government to support aesthetic, artistic, recreational, and other life-enhancing endeavors.

Apart from its function, if a building falls under certain stylistic categories, such as historic or not-Modern, a chandelier becomes more likely. Building styles that repel chandeliers include factories, most sports venues, industrial, military, and strip-mall. Public and larger buildings often have big, ceremonial spaces that create opportunity for chandeliers, such as lobbies, stairs, ballrooms, or restaurants, and these organizations have the means to purchase big chandeliers. If the building or the organization inside is aspiring to display wealth, such as buildings used for entertainment,
dining, residence, and, at times, governmental and athletic structures, the chandelier is more welcome.

Placing chandeliers outdoors lacks serious precedent and rarely happens. Candles did a relatively poor job lighting anything but the interior, and construction and design of chandeliers made them particularly vulnerable to the elements. Various varieties of streetlamp were much more common, and when electricity became widespread there was less resistance to electric use outside, as incandescents and then fluorescents could illuminate where candles, and to an extent even gas, had failed.

Light quality is another supporting element. According to Richard Kelly, artificial illumination falls into either an ambient, a focal, or a sparkle category. A chandelier sparkles, a "microscopic bombardment of points of light-the most exciting kind of light there is ... it stimulates and arouses appetites of all kinds." Though a chandelier does not have to sparkle, perhaps it is this effect that makes the chandelier such a good candidate for eating, socializing, and other special activities. In regards to lighting, the sparkle category is rarely used; most light is solar, either direct or indirect, or it is focal or ambient, and usually a combination of these types. Work atmospheres typically want sufficient illumination so that employees or customers can see clearly, using a mix of ambient and focal lighting. Other types of interior lighting strives for a contrast between shadows and the light. Sparkle enters the retina with dozens of points of light, temporarily overwhelming the eye with its unique variety of light. The tendency to use this particular type of light helps cement the chandelier’s use in special social circumstances.

Because of the brightness of lamps, the designer is often faced with the technical problem of how to soften or dampen the glow from the lamp, a problem common to incandescent, fluorescent, and halogen lamp types. Many lamp types can become hot; halogen lamps can become quite hot. Fluorescent lamps traditionally buzzed, required ballasts, emitted an off-color light, and contained mercury. The last few years have brought many changes to fluorescents: they now fit into Edison screw sockets, come in more pleasing colors, do not buzz as much, and as a result have received a great deal of media attention on their energy and cost savings. Fluorescents do still contain mercury and require ballasts.

Governments are considering banning the sale of incandescents in coming years. This shift to fluorescents means that the chandelier is under additional technical strain; fluorescents are even less suited for the multiplicity sought after in chandeliers: they require ballasts, which can cost more and take up space, and the possible unappealing light color is a consideration. Some plug-in, compact fluorescents are candle shaped, as if the entire candle were to glow, making them attractive, theoretically, for use in certain chandeliers.
From an economic standpoint, most chandeliers are designed to last long periods of time and to have a sluggish birth-death cycle. Classically, the materials in play signify opulence: polished metal alloys, crystal, glass, and at times precious metals, iron, or even wood. The artifact has a fairly weak upper-economic limit, that is, because the chandelier conveys wealth and status, the barrier limiting materials, scale, and implementation is proportional, loosely, to the artifact’s luxury status. Few want a luxury file cabinet or a luxury coffee mug, but demand for fairly to very luxurious chandeliers is much greater.

Radical design changes to the chandelier in the form of materials, form, color, and textures could very well push the class connotations of the design even higher. Both consumers and designers are familiar with sudden design transformation being linked to high-design, with high-design being expensive or elite. What might be termed cutting edge design often strives to reach those highest and lowest on the economic scale, or in certain cases the design targets specific sub-cultures that have their own unique design ideals. Low-cost materials might counter this effect.

Whole families of materials are technologically underrepresented in chandelier design: plastic and aluminum, the two Modern favorites, as well as fabric, rubber, particle board, and paper products. In terms of illumination, designers have been using LEDs, which continue to develop as technology reduces the production costs and continues to address the LED’s limitations: angle of light dispersal, cost, and light color. Their small size, efficient energy usage, and inclination towards sparkle make LEDs a wonderful chandelier light source. Exciting technological advances are in store for illumination, the coming of bioluminescence not least amongst these changes.

Should the chandelier be designed for an aristocratic audience? Would a chandelier for a mobile home be appropriate, for instance? The designer might choose to continue to design for large, interior spaces, a perfectly understandable decision given the chandelier’s history, a decision that limits designs for a mobile home. A large design can be carried out even while the design itself would result in a lower-cost artifact. The space consideration is one of the more important economic restraints. Any large chandelier will almost certainly have an upscale status, but a chandelier that falls within a certain size and begins to use alternate materials begins to shed its class associations, but also to undermine its archetypal image and to strain the ability of the chandelier to carry out its role as symbolic, cultural artifact. As such, the chandeliers produced in this design process must be appropriate for traditional settings while addressing the technological and other weaknesses on an individual basis. The relationship between the chandelier and its setting contributes to its continued popularity.
For the purposes of this design process iteration, the traditional, formal elements of the chandelier, such as the candle, bobèche, and radial arm, will be considered skeuomorphs. Thus, the other important supporting elements must be maintained and enhanced for the chandelier to keep its societal role. Maintaining a large size is essential, as is designing for traditional chandelier settings. The light quality will need to communicate specialness, but need not necessarily sparkle. The materials and chandelier style will each convey their own meanings. This list of considerations, coupled with constraints from contemporary culture, will guide decision making during the rest of the design process.
Design Réseau

The design réseau brings together the best of the scattered design into a single location so as to highlight the similarities, differences, relationships, and over-arching concepts that exist between the different designs. The word itself is French for the mesh used in lacemaking or the grid on a telescope that connects networks of stars. The closest synonym is “network,” but all other words, including “web” or “map,” whose arrangements are either too regular or too irregular, fail to fully describe an asymmetrical structure based on groupings and relationships.
The subversion families are marked red, with arm alterations that tweak typical arrangement, spacing, shape, and orientation.

Light source focal point concepts with the candle/bobèche unit as principle entity. These designs are non-structural solutions to hanging light sources in space.

A primary emphasis on overall chandelier form over singular arms or light sources.
Additional subversion with single arm as manipulable piece

LED arm concepts

Whole chandelier designs applying LED arm concepts
A focus on structural arrangements of parts

An emphasis on light reflection and a secondary emphasis on stackability

Underlying concepts of tension and release
Ideas of hanging as a main focus

Experimental, including movement, bioluminescent, and biological technologies
The circles represent the four designs chosen for the final stage: the focused design. The chosen concepts avoid strict subversion, tending towards tension, structure, collapsibility, alternate illumination and LEDs, multiplicity, temporary installation, alternate materials, and a sufficiently large scale.
Focused Design

Focused design is simply the execution of a small number of designs that have been plucked from the réseau. The designer fixates on what makes the artifact relevant and works to shed obsolescence. In this way, the designer moves the different concepts to an acceptable completion.
The stylistic similarities to Art Deco led to the namesake of the Deco Chandy. The use of aluminum as a material and the triangular frame that makes up the arm is reminiscent of industrial structures and bridges of early and mid century America. The configuration of the lampholder and exposed electrical cords further support the industrial aesthetic, as does the choice of lamp, an intermediate E-17 screw base lamp normally seen in exit signs that strongly displays its numerous filament coils.
Collapsibility and portability were the driving concepts behind the Deco Chandy. Lightweight and easily installed, the chandy was intended for use at outdoor events. Unfortunately, the strong stylistic associations, aluminum and electrical materials, and lamp type all undermined the design requisite of “present,” and ultimately the design was deemed unsuccessful.

*First lampholder segment prototype*

*Full single lampholder prototype with short arm connectors*

*Left, materials for Deco Chandy: aluminum tubing, lampholders, wire. Right, detail of mounted prototype arm*

*Finished single arm from the side*
Thatched Chandy

A fascination with multiplicity was the genitive force behind the Thatched Chandy. The perception of abundance creates a sense of heightened opulence. The craftsmanship necessary for the execution of the design coupled with the visual qualities of so many pieces leads to visual richness.

Centuries-old thatching techniques helped the initial concept. Thatching in and of itself is an old technology, but thatching a chandelier is an uncharacteristic application of the technique. The thatched material was also atypical, so the fact the design uses thatching does not date the design.

The model uses red polystyrene straws glued to bent galvanized conduit. For the model, hot glue melted the straw tips into place before the pipe quickly dissipated the heat, contributing to a significant production time difference between a conductive and non-conductive base. A plastic base, for example, did not dissipate heat and tripled the time a straw needed to be supported before it was independently secure.
The original goal was to have the chandy glow internally and at different intensities, the light diminishing in brightness as it traveled to the tips of the straw. Numerous obstacle prevented this in the scale model, including the danger of melting the PS, the difficulty in making pipe porous to light, challenges inherent in a transparent base, including attaching straws to a material other than metal, and wiring and installing illumination that was small enough and still bright enough, such as LEDs. A single, bright source of illumination is another option, as is the use of fiber optics, though this solution seemed fraught with familiar light intensity and technical problems. The model, as shown, is lit by exterior sources—an acceptable but not ideal option.

Production of this design could be accomplished in a number of manners. A jig that encircled the curved base with thousands of holes could hold the thatch pieces in place until a glue dried. Another scenario involves a jig that would move along the length of the base. Still a third method is to cast single sections that hold many pieces. The section of thatch might be a single ring or multiple rings, perhaps out of silicone, to form the “straw,” which
could be slipped onto the base. It should be noted that in production the straw cannot be made from Polystyrene as in the model; the plastic degrades and is sensitive to heat.

The public response to this particular chandy was very positive. Visually, at least, the design was successful. The major challenge, as well as what makes this design contemporary, will be the manufacturing and lighting challenges. The chandy communicates chandelier-ness through its size, arm curvature, and ornate visual texture, and is successful at bringing a dated object into the present.
Tent Chandy

The idea behind the Tent Chandy was a structure that would use flexible poles to establish tension in fabric and then drape or hang slack pieces of fabric around the light source. In the final model tent poles provide the tension and structure, and three pieces of fabric create most of the volume.

Many small and half-sized models preceded the final model. Achieving the correct amount of tension in the fabric was difficult, and the early work on the Tent Chandy focused on this aspect. The tautness in the fabric had to counter the tension from the poles; the slack fabric was designed to envelop the light source. A plywood board with eyehooks provided a perfect testing ground for achieving correct tension and experimenting with how slack fabric behaves.

With a contemporary constraint of collapsibility, the Tent Chandy satisfies the conditions set forth in the premise of the design process. Through its size and presence, the chandelier retains its cultural role, and many of the skeuomorphs are phased out. The fabric is heat-proof, and is specifically designed for high heat situations and theatrical environments. Even so, incandescents should not be used with this fabric, which represents a major change from the final model. Like the other collapsible chandeliers, the Tent Chandy is meant for temporary, ceremonial events and outdoor settings.
Model of single fabric segment with center slack and a taut edge. The model is on a half-scale board that simulates tension.

All 360 degrees of fabric, half-scale model with edge slack and center tautness.

Unpinned patterns intended to have both edge and center slack. The patterns here dropped awkwardly and failed to hang as expected.

Three-fabric model similar in nature to the final prototype. Long, hanging fabric has not yet been tacked back up into the center of the model. The full base board is visible here.
One single, full-sized segment with single pole out of the three final segments

Finished, lit prototype from below

Detail of folds and intersections of the fabric

Possible application for the collapsible, portable Tent Chandy: a reception
Like the Tent Chandy, the Chandy-40 comes from the collapsibility section of the design réseau. For the Chandy-40, part of the portability is achieved through stackability. The design consists of identical, thin pieces radially anchored when assembled. One-third of the arms have LEDs on the top surface; the light reflects from the underside of higher arms. The DC current passes through circuits embedded in the base of the arm.

The design calls for the circuits to be printed on the surface of the arm. Circuit boards are typically printed through different forms of etching, that is, material is removed from a solid piece of copper till circuits remain. In the last decade, much work has been done on alternative methods for printing circuits, and these arms would not be printed like circuit boards, but should be printed with the addition of the exact amount of copper to the arm surface. The copper will be sealed by a transparent film, the copper
ink visible on the surface of the arm for aesthetic purposes. In the base of the arm, vias will connect the surface circuits to the arms underneath. The strips of LEDs used in the final model might be a manufacturing option in production, but printing with desktop printers, printing LEDs, flexible printing, and printing on various surfaces are all emerging technologies that could be utilized.

A working model displays how the chandelier would look lighted and a demonstration model shows the printed circuits and the packaging. For the working model, LEDs pre-arranged into a strip were soldered onto leads and secured to arms. A nexus of wires ran upwards and eventually through an AC-DC converter.

For both models, 14-ply illustration board, white on one side, yellow or olive on the other side, became the arms. The grain of the ply affected the bend of the arm; going with the grain down the length of the arm provided stability and sagged less than going against the grain. Because the arm in the model was a paper-based product, and possibly because the paper was not protected against the air, the arms sagged after hanging aloft for a few months.

The Chandy-40 is technologically and culturally current, addresses portability and tries to harness a relatively new manufacturing process. Through the artifact’s size and light quality, the chandy fits into the cultural niche occupied by the chandelier. Furthermore, the compact packaging is economical and could also be considered environmental due to saved fuel and range of possible paper materials; the shipping arrangement of the chandelier

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*Left*, first working arm prototype. *Right*, test of LED reflectivity on the underside of another arm

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*Electrical schematic of the Chandy-40*
takes up a fraction of the space of similarly sized chandeliers. The single concern relates to the artifact’s chandelier-ness due to the lack of conventional arm, bobèche, candle shapes, or typical lamp types, a fear that is addressed through by the overall size, the use of arms and materials, and the avoidance of an industrial or an overwhelmingly Modern vocabulary, such as the use of metal, aluminum in particular, or plastic. The Chandy-40 in particular seems to fulfill the design process criteria.

*Left and Right:* the cutting and painting of the display prototype

Display prototype next to packaging. Arms, spacers, electrical chord, pipe, washers, and a converter are all included in the package

*Left,* display model in packaging. *Right,* display model next to outer packaging
Illustration of a single arm and spacers. The printed circuits are clearly visible. In the upper right of the illustration the underside of a piece shows the connection points to the vias.

The working model of the Chandy-40 from below.
**Conclusions**

Through text and pictures the final design section conveyed the successes, failures, and work yet to be accomplished for each design. Generally, the final designs were portable, used a variety of materials unconventional for the artifact, dabbled in alternate and various light sources, and, for the most part, retained the correct traits and jettisoned other elements deemed vestigial from the traditional artifact. In many of the designs, the chandeliers continued to fill their prescribed role, and this iteration of the design process was a good one.

But was the process itself successful? The process has an inherent, initial set of constraints and a second set of constraints produced during the process prior to the design réseau. The process does allow a designer to move from a single artifact to a set of completed designs, and fulfills the thesis question of how to bring a strong but dated object into the present. Other types of responses to the thesis question are certainly possible, but the response presented in this document is successful.

The chandelier has been the sole artifact used to demonstrate a single cycle of the design process. A hypothetical run-through of the process using other artifacts will hopefully further explain the design process and expand on techniques and possible application.

**Possible Application: Door**

The archetypal domestic door in America consists of a hinged swing door on a vertical axis with panels and a metal knob or a metal lever. If a key is present it too is metal. The ritualistic and
ceremonial role of doors are critical to their design, and doors often serve as metaphors for change, protection, home, and forbidden space. For all these reasons doors are a strong artifact.

The interest in door design is heightened when comparing the archetypal domestic door with business or retail doors. A typical convenience store might have steel framed doors whose surface area is primarily glass. These doors slide open mechanically when activated by a motion sensor, and are usually larger than domestic doors. Because different door designs are fairly segregated, stark differences exist between kinds of doors, signaling possible dated artifacts and a large area of untapped design space with which to work, offering the possibility of a profitable cross-breading of door types.

Using the design process outlined in this thesis document, the designer might begin quickly assembling a full-scale or half-scale door. Once completed, investigations and subversions could begin. Hinge function and material, locks, door form, and door material are all good candidates for the investigations. The hypothetical begins to become hazy in the next step without conclusions from the investigations. The designer should begin sketching and building models that address any number of overriding concepts. The réseau brings these designs together, where the designer decides on the candidates that best fulfill the conclusions. If, for instance, the designer wanted to focus on the concept of “security,” certain designs would be plucked from the réseau. The final step is the actualization of the designer’s selections.

Possible Application: Luggage

Though perhaps merely the opinion of this author, suitcases before 1900 represented something far grander than today’s scuffed bags. Perhaps due to the fact that travel typically took much longer than today’s trips, many old suitcases and trunks emanated self-importance and were a metaphor for a journey or for change. One can almost envision the trunks stacked on deck of a ship steaming into Ellis Island. The luggage was leather, metal, wicker—and perhaps the sum of the materials, size, care, and story made suitcases seem more treasured than the bags used today.
The system luggage functions in today has changed dramatically from a hundred years ago. For the chandelier, the system of energy consumption in the West shifted. For luggage, personal modes of transport have shifted from boats and trains to cars and planes. The latter has tighter restraints on size than the former, and planes have restricted size to an even greater extent recently, causing a stark decline in large suitcase sales. Additionally, the way luggage is handled by automatic luggage systems, the need for light materials in the case of planes, and increased security concerns have all helped dictate the way the materials and design for luggage have morphed in recent decades.

The investigations might focus on size, structure, form, handles, wheels, opening, and travel history. The challenge that would be confronted by the design process would be to co-opt the grandeur of old luggage while addressing constraints like three-dimensional space, weight, security, and portability.
A final note

Many other design processes exist, and there are other possible processes that possess similar aims as the goal of this thesis. The process presented in this document focuses on the dual importance of innovation and the historical, cultural context of a base artifact. The process responds to how a designer can incorporate both innovation and context.

In the future it would be exciting to witness the process presented here applied to another artifact. At the very least, this document will hopefully be inspirational and provocative for designers that chance upon this thesis. The best of luck to future R.I.T. design students.

Spencer Biegler
February 2009
Appendices

Two of the following sections outline some of the research which led to conclusions concerning the importance of environment and cultural context in the design process. Originally the goal of the thesis research was to understand how designs change over time, and researched subject matter included semiotics, time, technology, and economics. Only the two most applicable and useful subjects of research are present here: design evolution and design and culture.

Because the following research was not directly applicable or part of the design process, but did influence the development of the process, the research is included here. Additionally, the topics are interesting and beneficial in their own right.

The third appendix contains predictions about the future as applicable to design, providing personal background information on what it means to bring a design “into the present.”
In writings on design history it is not uncommon to find descriptions of how a particular artifact “evolved.” The temptation to attribute design change to a kind of evolution is easy to understand—biological evolution is a ready-made system of change. Unfortunately, evolution as a metaphor can also be downright misleading, yet the differences between biology and anthropology are as enlightening as the similarities, and, with a foreknowledge of the limits of the metaphor, considering the link between design and evolution can be quite rewarding.

Because the thesis statement mentions bringing a dated object in the present, grasping how an artifact correctly evolves is a relevant area of study. One benefit to the research was viewing artifacts as organisms, a mental step that led to seeing that artifacts must coexist and fit into their environments and their surrounding systems. A critically important step in the design process became understanding what about the chosen artifact was still relevant, and to sculpt the final designs accordingly. Realizing the relevance of the artifact came about when considering the fitness of organisms.

What follows is a brief history of biological analogies and survey of evolution and design. The artifact is the focus because, as George Bassala notes in *The Evolution of Technology*, the artifact is the primary unit of study in evolutionary change. He defends using evolution as a metaphor for design change, arguing that:

> Metaphors are not ornaments arbitrarily superimposed on discourse for poetic purposes. Metaphors or analogies are at the heart of all extended analytical and critical thought. Without metaphors literature would be barren, science and philosophy would scarcely exist, and history would be reduced to a chronicle of events.

The relationship between the concepts of designing and evolving is a complex one. Evolution, if one were to try and capture the basic tenets, calls for a system that designs the best solutions based on the ability of different designs to survive and reproduce. In classic Darwinian evolution, organisms do inherit traits from their parents, but changes in the diversity available to the species are randomly generated. Lamarkian evolution differs in that...
changes in the environment elicit changes in the organism, and organisms can pass these changes that were made during life to their children. The change in the Lamarkian system is not random, but deterministic or willed on the part of the organism. Though refuted by gene theory, Lamarkian is better suited in explaining design change.

In a number of ways, the metaphor of evolution can be useful when thinking about design change, as different designs often share traits in a way similar to organisms, and traits are shared between parents and offspring or between siblings or other familial relations. As often commented, designs are also produced in an environment of amazing diversity. The transformation from design to artifact or organism depends on a set of strict criteria and the availability of and ability to attain certain resources called for in the design, and in both, “selection must be made from among competing novel artifacts.” Artifacts, like organisms, have a birth/death cycle, and each has species or types. Organisms and artifacts both have a continuity in form and appearance between successive generations, and there is often a gradual transformation with small alterations. There is a geographical diffusion of designs for both.

The differences between design morphology and evolution are equally essential. The central tenet of Darwinian evolution is that the designs themselves are hardwired to compete against other designs directly. The competition can include their own species, other species that use the same resources, and the resources themselves, when disinclined to be used as food. Human designs and artifacts do not normally compete in the same manner, but instead rely on human intellect, culture, or consumerism to determine the fitness of the design, depending on the prescribed school of thought. In the 250 plus pages of The Evolution of Design Steadman utterly fails to bring the reproductive struggle into the argument.

Designs do not directly give their genetic code to offspring and do not typically reproduce. Thus, even if the outcome is the same (a halt in the use of a certain design or the extinction of a species), the determining factors in human design are human decisions and the ability and resources to produce a design. Designs become extinct through production cessation of a design and the destruction of existing instances of the design, though artifacts sometimes deteriorate to the point of destruction without help from people.

The metaphor of evolution exists within a larger, related series of biological metaphors. The parallels between the human world and biology have been recognized for probably as long as there has been a conception of a separate human sphere, and the topic was examined by the Greeks. Aristotelian philosophy looked to organisms as an example of perfect harmony and balanced proportion
synonymous with the classical ideal of beauty. The qualities of wholeness, of integrity, of a unity in structure such that the parts all contribute to the effect or purpose of the whole, and no part may be removed without some damage to the whole.  

Biological applications to design expanded in the eighteenth century, when paleontologists were busy collecting and cataloging plant and animal specimens, archaeologists and anthropologists began gathering man-made artifacts from past and present human cultures, and architects started documenting structures from around the world on a larger scale. There was plenty of cross-breeding between the output of scientists, naturalists, and architects, and an especially common topic of interest was method of classification. Buildings and tools began to be recorded and ordered like living specimens.

More recently, evolutionary thinking and the application of evolutionary metaphors as relevant to industrial design is colorfully displayed in a Harper’s article from 2005. In “A Romance of Rust: Nostalgia, Progress, and the Meaning of Tools,” Donovan Hohn trails his uncle-in-law Tom as Tom visits auctions and flea markets, accumulating tools for his already vast collection. Most of the 25,000 tools in Tom’s collection are his preferred tool, the wrench. Previously a biology teacher, Tom belongs to a larger culture of galoots, or tool lovers, and Hohn suggests that Tom did not just collect tools, “he was a taxonomist of tools, a naturalist of tools. He’d progressed from Gray Dogwoods to Succulents to wrenches, as if the age-old distinction between nature and culture were the folly of philosophers.”

Biology and design were, and still are, linked by comparisons using anatomical metaphors; skeletons were the load bearing structural elements, exteriors the skin or scales, and so forth. The zoological techniques used by Tom to order the collection prompts Hohn to explain that “divorced from usefulness and subjected to morphological classification, [the tools] looked like fossils of Cenozoic mollusks or the wristbones of tyrannosaurs,” and, concluding, Hohn states “everything evolves … Even Hammers. Even Keys.”

Another method of metaphor-production was juxtaposing the organism’s environments to the design or the object’s environments. The environmental understanding of design has strong implications when considering the Modern movement, which gave rise to two related, sweeping claims: all design morphology is a result in changes in the environment, or all design morphology should be a result of its environment. The second claim can also be worded so that “context” is used instead of environment.”Alan Colquhoun thought that Modernism was the result of two contradictory ideas, “biological determinism on one hand, and free expression on the other … what appears on the surface as a hard, rational discipline of design, turns out rather
paradoxically to be a mystical belief in the intuitive process.” Modernism’s claims become easier to ingest when ‘environment’ is equated with technology, culture, fashion, economy, or any of a range of influences, meaning that Modernism proclaims that design is the result of everything that influences design.

Differing opinions aside, it was generally agreed that changes made to successive generations of artifacts by “primitive” peoples were part of a gradual process. It was more apt, then, to say that the designs of the artifacts “evolved,” as one could trace the small changes made to similar artifacts from the archaeological specimens. Balfour traces production changes in primitive people, where humans began to adapt available forms, imitated and stylized these forms over time, and then through successive copying and unconscious variation, established a stable system of replication that incorporated change.” In Notes on the Synthesis of Form, Christopher Alexander calls this kind of production unselfconscious, versus our selfconscious manner of design and production. The unselfconscious method is characterized by being homeostatic, by consistently producing “well-fitting” forms, by the coupling of myths with building habits, by a belief in rightness without question, and most simply by a simultaneous rigid adherence to tradition and a proclivity for immediate action or change in the face of misfits. Alexander blames modern design failures on the individual; “architecture did actually fail from the very moment of its inception” because all that’s really needed, according to Alexander, is correction of misfits and object replication.

Hohn visits industrial designer Bary van Deursen of Stanley tools, who Hohn labels “goofy for Progress” and “gonzo for Change.” To Hohn, the primary feature of today’s tools is to “outperform the competition not in the workshop but at Home Depot and Wal-Mart. Functional refinements, like BladeArmor, are minor compared with the cosmetic changes the tools neverendingly undergo.” The commercial or consumerist element, both in the design process and in industrial design’s history, should not be undervalued. Equally as important is the danger inherent to the concept of “progress.”

Design process in less industrialized societies does differ in comparison to those societies that are more industrialized, but I suspect the differences are more complex than, for instance, Christopher Alexander’s division of selfconscious and unselfconscious. The type and method of production play an important role, as more modern production allows for single designs to be reproduced in greater quantities, with more conformity and with less chance for alteration by the maker. The cultural tendency to adhere to tradition is another consideration. Compared with many other cultures, the western world, and America in particular, has a long history of valuing progress and change, though only if these changes mesh with societal values. Alexander creates a strict duality, a schism in production types, that can be dangerous. There
are elements of labor division in many societies, and plenty of craft-based or alternate production methods in our own society; sweeping rules can lead to weak generalizations.

Apart from understanding design morphology, the evolutionary process is also the basis for a design process. To David Pye, “innovation often hinders improvement” and the best designs emerge from minute alterations within a long span of time. One wonders if Pye would have been pleased with the Rams-inspired Apple products, with each generation a part of a design lineage.

Throughout his article, Hohn muses about those ancient tools, American culture, design morphology, current industrial design practice, and about the role of a tool apart from its function. For the antique-tool market, “value is largely aesthetic and symbolic. Hammers do not only pound, saws do not only cut. They also mean.” Tools become a romanticized symbol of the American past, or, at times, what American masculinity has lost in recent years. At times, it is useful to think of artifacts as organisms, to consider the environment of artifacts as biological, to remember that both artifacts and their meanings evolve.
Appendix B

Culture and Design

While studying evolution resulted in the conclusion that context and environment are crucial to the design process, exploring the relationship between culture and design led to the idea that the cultural role of an artifact is often the most important contextual consideration. The following is an introduction to design and culture over time.

Design was essential to the industrial revolution. It might be better stated that design made mass manufacturing possible, and manufacturing made design as we know it. With the advent of the industrial revolution came a shift in consumerism, a culture of (conspicuous) consumption, and a reordering of national, personal, class, gender, and many more identities. As with manufacturing, and as a pattern repeated throughout the history of design, culture influenced design, and then design appropriated these ideals, reflecting, representing, and recasting them into palpable permanence.

Critics, including Adrian Forty and Penny Sparke, note that consumption in the last few centuries trends toward identities created by consumerism as purchasing and possessing continue to define us, but they downplay the identity-causing effects of all production-consumption. In past societies, identity emerged out of (re)production of the past and the physical ritual of making, though the identity forged was often a more group based identity. For many groups, status was attached to the accumulation of certain artifacts. In Western societies, the ideology of change, driven in part by consumerism and a reflection of status, can and does override older forms, and the ritual of buying somewhat displaces the ritual of making. Certain critics are not wrong to call attention to the linkage between identity, objects, and consumption during the last century of Western culture, but over-stress the difference between current and past societies.

Forty outlines a broad theory which diminishes and almost negates the input from individual designers, placing the generative force behind design in the realm of society itself. The subject of desks is illustrative of Forty's philosophies, as changes in values at the workplace directly contributed to the changes in office
furniture throughout the nineteenth and twentieth centuries. The following briefly summarizes the link between desk design and culture to illustrate the broader relationship between the two; for a deeper look at desks see Objects of Desire, chapter 6.

**Design in the Office: The Desk**

The standard nineteenth century American or English desk had a back with pigeon-holes and drawers from desktop to floor. Such a design gave the clerk a personal space of his own and "encapsulates the responsibility, trust and status given to some clerks." The surge of 'scientific management' principles around 1900 slowly transformed the design of the desk. Space was added between the desk and floor to allow for easier cleaning, and the bottom drawers became legs. The pigeon holes went next, as well as any roll tops, which might allow the clerk to lose or harbor needed paper. No longer did the clerk need to file, nor was he allowed, as that activity had become a separate occupation. Gradually, too, did many of the other drawers disappear, some desks leaving mere slivers of space for personal objects.

The design shifts represented a declining status of the office clerk, as well as added pressure on management to increase efficiency. The clerk no longer worked in a private space, but with supervision. In this regard, the office of the early twentieth centuries mimicked factories in the way they viewed their work force, division of labor, and processes. Forty points out that management was paying for both the clerk’s time as well as the right of constant supervision.

Executives’ desks were held to a different standard, and as the scientific principles struggled to explain why executives needed larger desks with more drawers, the social implications were clear: the larger desk was a symbol of status and power, and drawers gave executives the privilege of personal space and clearly indicated that the executive was subject to different, higher office standards.

After World War II, change in designs was in many ways economic at heart: demand for white collar workers increased, and full employment left offices competing against factories for workers. Factories paid similar if not higher wages than office jobs, but offices chose to promote the status of office work and its middle-class implications, and to cultivate images of a clean, modern workplace. Additionally, the current thinking began to shift from individual efficiency to performance as a group. From a design standpoint, the interiors of offices, unlike the earliest part of the century, began to reference upper class domesticity and suggest an environment of friendliness and teamwork. Employees could decorate their own space and the management made attempts
to consider employees’ varied personalities and needs, a message aimed at both employees as well as business connections.³

Designs for the office were both a result of the changing office climates as well as a purposeful statement by the designs about the status and values the office culture aspired to. Culture is the primary design consideration, though its effects are often subtle and subconscious. Design has a greater degree of permanence and power when compared to other mediums, and:

little attention has been given to design’s influence on how we think. Those who complain about the effects of television, journalism, advertising and fiction on our minds remain oblivious to the similar influence of design. Far from being a neutral, inoffensive artistic activity, design, by its very nature, has much more enduring effects than the ephemeral products of the media because it can cast ideas about who we are and how we should behave into permanent and tangible forms ⁴

Design in the office is a projection of office culture, and office values vary from decade to decade. Office design also reinforces office culture, perpetuates a certain ideology. Part of “design’s influence on how we think” takes the form of how design conveys meaning to us, created through countless interactions with the world and things in the world. Through culture and memory, artifacts become infused with a symbolic dimension.
Endnotes

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