Towards an Understanding of Technology Through Theories of Art

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I. Introduction

It is commonplace even today for the question "What is art?" to prompt the public to engage in a spirited debate.[1] Interestingly, however, there is no similar tradition for the public to engage with the question of "What is technology?" The question of what technology is seems to be too obvious or inconsequential to devote much intellectual energy to it. The closest question to it which does generate public enthusiasm is "Is this discipline a science?" In spite of this, in this paper I want to show that our understanding of what technology is can be refined by contrasting our many existing theories of art with various possible theories of technology.

For the English speaking public, linking the question of art with technology seems absurd, since the prerogatives of art and technology appear to be diametrically opposed. Looked at etymologically, however, this reaction is surprising, since the word "art" comes from the Latin *ars*, which was used as a translation of the Greek *technē*, which give birth to the English "technology." Of course, it is not so unusual in the history of languages for words with a common origin to come apart in meaning or even to become opposed to one another. What is surprising in the case of "art" and "technology" is that this separation has happened in spite of the difficulty we find when tasked with clearly

[1] For a recent example, see the firestorm of online criticism sparked by film critic Roger Ebert's declaration that "Video games can never be art" (`http://blogs.suntimes.com/ebert/2010/04/video_games_can_never_be_art.html`, available as of Spring 2010).

differentiating the sphere of technology from the sphere of art. Both are human inventions done partly for human benefit and partly for their own sakes. Both separate us from non-human animals and from nature. Both have been considered the crowning achievement of civilizations. As a result, it is valuable to ask whether this separation of meanings has come about through a refinement of our understanding and discriminative abilities or through the imposition of a false dichotomy.

To better understand the question of what technology is I will look at broad categories of theories of art and ask whether we might understand technology under parallel concepts. To bring order to what might be a nearly endless task, I will begin by classifying theories of art according to which cause from Aristotle's theory of four causes the theory takes to be primary in creating art: efficient, formal, material, or final. Efficient theories are those that focus their explanations on the processes that give rise to art rather than art objects themselves; formal theories try to characterize what different art objects have in common; material theories look at the art object itself; and final theories are those that focus on the purpose of art or lack thereof. Once I have looked at art theories according to these classifications, I will utilize the additional category of the "place" of art to better characterize remaining possible theories. Within each of these categories, I will also consider what a parallel theory of technology would look like. Finally, I will conclude by noting the inadequacy of any theory with just a single focus to capture all of our intuitions about art or technology and recommend that instead we create a robust theory that incorporates elements of each potential causal foci into a larger normative vision for the world as a whole.

II. Efficient Cause

It has often been noticed that out of Aristotle's four causes, efficient causation is all that is meant today when we speak of "causation" in general. David Hume is notorious in this regard for introducing the image of the colliding billiard ball as the paradigm of a

causal interaction. Within theories of art, the theories that we may classify as focusing on efficient causation are those that focus on explaining *how* art is made rather than focusing on describing art objects. For these theories what is determinative of an object's status as a work of art is the process by which it has come to be.

For example, an efficient theory of art may emphasize that works of art are created as matter of painstaking attention by the artist. On this basis, purported artworks which are created in a slapdash manner may be eliminated from consideration as possible art objects. This leads to the common objection to certain purported artworks that "my child could have done that." In other words, the degree to which an object is artistic is related in certain ways to the level of skill necessary to create the object.

On the other hand, some theories of art focus on the importance of "spontaneity" over mere skill. Such theories describe skill as a quality of the craftsman rather than the artist proper. Related theories of art hold that it is the process of "expression" that makes an act an artistic act. On this set of theories, an artwork is the result of a process by which an artist expresses him- or herself through the art. This set of theories eliminates banal but meticulously crafted objects from consideration as art objects on the grounds that such purported artworks fail to express any aspect of the inner life of the artist. Similarly, overtly commercial objects are viewed with suspicion.

A focus on how an artwork comes to be leads naturally to a consideration of who it is that creates the artwork (the subjective turn). One seemingly tautologous way of speaking about art is to say that "Art is what artists make." From that logical starting point, one might suppose that the qualities of the artist are what make some objects works of art and others not. Although logically speaking one might just as easily suppose the reverse—that is the properties of the art that makes the artist—nevertheless, this is a way of thinking about art with broad popular reception that is reinforced through the stereotype of the starving artist as a tortured genius. Hence another set of art theories focus on the artist as the locus of art. These theories combine well with the earlier two

theories by supposing that an artist is a person with great skill who desires to express him- or herself spontaneously in art and avoids commercial entanglements.

The apotheosis of the efficient cause theory of art must be the famous urinal of Marcel Duchamp (or "R. Mutt"). The object itself, like his other readymades, has no claim to being art except that it was produced by Duchamp who, as an artist, is qualified to turn ordinary objects into artworks merely by deeming them artworks. For Duchamp, the primordial artistic act is submitting an object to a gallery for inclusion. (The role of the gallery will be explored in greater depth in the section on "place.") The theory underlying Duchamp's practice has been the subject of much discussion but whatever it is, we can say that in general it holds that there are very few properties that an individual is required to possess in order to qualify as an artist. In fact, it might be that to be an artist one needs only to declare oneself to be an artist. Or perhaps the artist is an individual recognized as such by other artists. (The "Artworld" theory will also be explored in greater depth later.)

Applying this set of overlapping and conflicting theories to the question of what technology is, we see a vision of technology as that which is produced by the thorough and skillful application of the scientific method. On this view, defining technology means defining the scientific method that produces it.

Alternatively, technology might be a mode of expressing our understanding of physical laws in a practical medium. In this case, theories of technology ought to focus on describing flashes of insight or the "eureka" moment.

Or perhaps technology is that which created by the engineer or the inventor. As with art, here also we have stereotypes of the "mad scientist" or otherwise tortured (scientific) genius.[2] Theories of technology of this type will list the character traits needed

[2.] We may note that even the stereotypes of the "nerd" or "geek" rely on a sense of alienation from society. This betrays the hidden fact that both the artist and the inventor are creators, and the introduction of novelty and difference is something of which society is naturally intolerant, since it relies on uniformity for its propagation through time.

to produce technology, perhaps focusing on meticulousness and persistence along with vision and intellect.

One common flaw for theories of both art and technology that focus on the efficient cause as a defining aspect is that the processes involved in the creation of art and technology have many side-effects which do not count as artworks or technological inventions. It may be that the artist creates an artwork through sweat and tears, but the sweat and tears are not themselves artworks. Neither is a great artist creating art when in the restroom. By the same token, the application of scientific study of the world may create pollution, which, while a technological by-product or artifact, is not a technological work in itself. In order to distinguish things that the artist makes which are art from those that are not, we must look at the artwork. So too, to tell technology from side-effects, we must look at the object manufactured. When we look at the object, what we will see first are its formal qualities.

III. Formal Cause

Theories of art that look at the formal characteristics of the work have a long and venerable tradition. They tend to be at their height when there is a strong tradition of criticism within a culture. Around the world, whenever a field of art becomes sufficiently mature, artists and critics will begin creating elaborate theories to explain just what qualities a superior work has to separate it from an inferior work. For this reason, there are innumerable different and frequently conflicting formal theories of art.

For example, many of the mid-twentieth century art movements in America were centered around the theory that a good painting is a painting in which certain formal qualities were balanced in a particular way. For this reason, the critic Clement Greenberg praised the work of Jackson Pollock, since it invited the viewer to just look at the canvas without interpolating any interpretations of the meaning of the work. The formal qual-

ities of the work were felt to stand or fall on their own merits apart from the life of the painter or the meaning of the work.

In spite of the narrow meaning of "formalism" within art theory, we might also classify theories of art that focus on shared properties and patterns common to superior works of art as formal cause theories. Thus, theories about the proper contents for artworks are "formal" theories in this broader sense of "formal." For example, it was a widely held opinion in French salons early in the nineteenth century that paintings or sculptures which deal with mythological or historical events are more artistically valuable than those that deal with still life or landscapes, but over the course of the century, this opinion was reversed. By the mid-twentieth century, it was widely felt by elite critics that the best content for a painting was no content; abstract painting was considered superior to representational painting. This shifting of opinions can be seen as a process in which new formal theories replace old ones. Whatever particular kind of content it is that critics favor at a given time, the fact they are classifying things as more or less artistic according to the similarity of the works to some ideal means that all of these theories are focused on the formal causation of the work.

Looking at technology, there are many potential ideals from which to take a description of its form, but perhaps the most important is the "machine." Something technological ought to be distinctly inorganic, metallic, angular, hard, and powerful like a factory machine. A technology theorist might emphasize that a technological artifact is something made within certain engineering tolerances with certain pieces fixed and certain pieces allowed to move in specified channels.

On the other hand, a broader view of technology would allow for the existence of "social technology." Such a view might emphasize not only the inorganic but also the ways that human beings are able to shape whole ecosystems. One example is the Native Americans of the Pacific coast, who skillfully used forest fires to control their environment. A more contemporary example might be the factory farm, in which the vicissitudes

of nature are regularized by human ingenuity (although not without creating new problems). What these examples show is an imposition of regularity on the irregular rather than any superficial aspect. Nevertheless, they constitute a formal explanation of technology.

Whichever specific formal theory one favors for art or technology, it is clear that existence of such a vast range of theories casts doubt on the viability any particular one. Such theories are transparently subject to the passing whims of history and clearly enshrine the tastes of their creators. When painters paint colorful canvases, the critics praise vividness; when painters paint subdued canvases, the critics praise restraint. In one age the paradigmatic technological artifact is the spear; in the next, the compass; in the next, the clock; in the next, the engine; in the next, the computer. Each theory has too specific of a vision of what a proper form is to be very lasting. At the same time, as we shall see, these theories fall short by neglecting the particularity of the object. To make a more particular theory, we must focus on the material cause, and to make a more general theory, we must focus on the final cause.

IV. Material Cause

Perhaps the simplest theory of art is to hold that what makes a thing art is the material from which the work is made. Paint on canvas is a painting, and therefore art. Marble when hewn makes sculptures. Paper when marked is a drawing.

Though such theories of art are too naïve to have many adherents, it is not so unusual to run across particular technologists from the twentieth century proclaiming that some certain material, possible steel or glass, is the technological material par excellence. Traditionally archeologists have divided up the earliest phases of humankind's existence according to the dominant material used for tools: the Bronze Age, the Iron Age, etc.

Unfortunately, well recognized forms of art have no particular material associated with them. For example, theater can be reasonably well accommodated by an efficient

theory or a formal theory, but there is no clear material by which it can be incorporated into a "material" theory of art for this sense of the word material.

Furthermore, although these theories focus on the kinds of materials needed for art or technology, these "material" theories are actually "formal" theories in disguise, in that they focus on the form that the materials ought to take rather than the material itself. Unless a theory is focused on what the materials are in themselves, it cannot be called a truly material theory.

Once all outward aspects of the object are taken away, what is left for a truly material theory of art to focus on? One answer might be the way that art objects are often invested with a kind of "aura" or historicity that cannot be captured formally or efficiently. For example, a perfect copy of a Van Gogh painting that is formally identical to the original would not have the same economic value as an original Van Gogh. Furthermore, many art theorists will insist that it also properly lacks the same artistic value as the original. There is something about the material of the original art object that gets invested with a value that no copy can ever possess, no matter how exactly it duplicates the outer form of the original.

One might try to explain this value in terms of the efficient cause of the work. It might be suggested that the difference between the two lies in the fact that the original was created in an act of expression, whereas the copy was created for merely base commercial reasons. However, such a theory will be unable to explain why another person who happened to have the same character and experiences as Van Gogh would not be able to spontaneously create paintings of identical artistic value.[3] Even an identical process of efficient causation cannot give a new art object the same underlying materiality as a prior work.

[3.] For a humorous example of an author attempting to replicate the form of a work without replicating its efficient cause, see J. L. Borges' short story "Pierre Menard, Author of the *Quixote*" (available at `http://www.coldbacon.com/writing/borges-quixote.html` as of Spring 2010).

A purely material theory of art is impossible, because it would not be a theory at all, just an assertion that some things are art. It would be an ontology that asserts the existence of art beings without giving an epistemology of art images. However a hybrid theory with a strong emphasis on the material aspect of art could be made that would focus on the haecceity of a work or event. Each work has a particularity all its own, which no other work possesses. Certain objects have a kind of artistic sacredness because of their historicity. Even non-material arts can claim such haecceity, as seen in the Japanese tea master Sen no Rikyū's concept of *ichi-go ichi-e* 一期一会 or "one time, one meeting." According to Sen no Rikyū, each particular performance of the tea ceremony has a specificity that will never arise again and must be appreciated in and for itself alone. Material cause focused theories of art would hold that art has an attentiveness to the suchness of experience.

A corresponding theory of technology would hold that technology is a means of grasping things as they truly are—scientifically. Technology makes us aware of the table as a collection of fundamental particles. Technology tells us in greater and greater detail what a thing is and smashes our comfortable preconception of an anthropocentric world. Through technological understanding we see things in their utter foreignness to human concern.

Alternatively, technology can be seen as erasing the "aura" of the individual material that art embraces. As Martin Heidegger explains in "The Question Concerning Technology,"[4] technology is a mode of revealing, and what modern technology is most concerned to reveal in its challenging of things is the "standing-reserve." In this way, a lump of coal or the water of the Rhine River are not presenced to us as things in their unique individuality but as purely instrumental reserves of energy. In this way, technology helps to destroy the individuality of any one thing as we classify it by its

[4.] Heidegger, Martin. "The Question Concerning Technology" in *Basic Writings*. Ed. David Krell. Harper-Collins, 1993. Pp. 311–341.

instrumental value. One lump of coal is as good as any other. One kilowatt of electricity is of the same value as another, no matter what its source. Each electron is the same as any other electron with its only difference quantifiable in a handful of "quantum numbers." Unlike art, modern technology embraces instrumentality to such a degree that anything that can achieve the same end is the same thing. We can skip over the individual objects and grasp all objects by the formal properties that bear on their instrumental value.

This way of thinking begins to give us one way of marking a distinction between art and technology, namely art's unique attention to the particularity of things. On the other hand, when the art world embraces economic value as the sole measure of worth, it too overlooks things themselves as material entities and sees them as instrumentally useful only as "standing-reserves." The work of post-modernist artists who embrace capitalistic commodification (such as Takashi Murkami and Damien Hirst) would then show that the difference noted here is not a difference between art and technology but between pre-capitalist sentimentality and post-capitalist economic realism. Such theorists might concede that to a certain extent, artists have been slower than technologists to embrace this change, but it is a difference of timing, not essence, so once again the line between art and technology becomes blurred.

Theories relating art and technology to the material underlying objects are interesting, but as mentioned, there cannot be complete theories of art and technology which focus solely on the material. Such theories inevitably gain their generality by speaking about the purpose of art or technology as being awareness of materiality, but of course "purpose" is another name for Aristotle's final causation. Accordingly, we are drawn into a consideration of alternative theories of the purposes of art and technology aside from merely bringing our attention to material itself.

V. Final Cause

The purpose of art is a topic that has been debated as extensively as the topic of what art is. Indeed, there is widespread disagreement about whether art can or should have a purpose or not. Nevertheless, I will take as final theories of art any theory of art which defines in art in relation to its purpose or lack thereof.

One common theory of the purpose of art is that art is for moral instruction. In the strong form of this theory, all art is didactic; it is only that sometimes the artists do not know how their art is instructing others. In a weaker form, good art is art that allows for the proper instruction of others, neutral art is that which has no effect, and bad art is that which leads to corruption. Although this family of theories may seem quite vulgar to aesthetes, it finds backing from such well-respected sources as Leo Tolstoy and Plato. Tolstoy in *What is Art?* explains that the activity of art is based on the "capacity of man to receive another man's expression of feeling and experience those feelings himself" (5.5) and that as a result "The stronger the infection [of feeling and experience in the audience], the better is the art as art" (15.29).[5] Plato in the early books of the *Republic* has Socrates discuss music and poetry solely as it relates to the education of the auxiliaries and guardians and seems to take this as their purpose.

One possible alternative purpose for art can be seen in the tenth book of the *Republic* when poetry is banned for its overly broad mimesis of things the poet does not know. Many in the public seem to take mimesis of visual experience to be the defining quality of visual art, and they seem positively offended by the nineteenth and twentieth century trends away from mimesis and towards expression and abstraction. Although mimesis is somewhat mystifying as a purpose for art (why should I want a perfect visual copy of a table rather than a real table that I can use?), it cannot be denied that art is often utilized for its mimetic abilities and ranked according to its fidelity of mimesis.

[5.] Tolstoy, Leo. *What is Art?*. Tr. Alymer Maude. Available online at `http://www.csulb.edu/~jvancamp/361r14.html` as Spring 2010.

Similar to theories of simple mimesis are theories of refined mimesis and theories of catharsis. In these theories, the purpose of art is not simply to double the world like a mirror but to bring out its most salient aspects for their contemplation by an audience. The audience is, as in didactic art, brought to greater understanding of life and their place in the world by engaging with art that takes the chaos of raw experience and transforms it into something aesthetically appreciable. Or if this is not the effect on the audience, then at the very least art can serve as a kind of therapy for the artist and help the artist to express something that otherwise could not be expressed in words and so would trouble him or her deeply.

Related theories that focus on the artist's relationship to his or her audience concentrate on the purported difference between a mere craftsman and a true artist or genius. A craftsman is able to realize objects that fulfill a certain formal vision for what beautiful objects ought to be, but a true genius is able to create new formal visions for what beauty is through their production of new objects. The purpose of real art, on this view, is to bring new concepts into our consideration, so that we may have a richer experience of and appreciation for the world around us.

Other theories about the purpose of art place less emphasis on the fact that art allows for the aesthetic re-appreciation of the world than the aesthetic experience itself. These theories are closely connected to theories of "art for art's sake." Aesthetic experience is taken to be different from a mere pleasure but nevertheless good for its own sake without any need for further instrumental value. (A distinction between aesthetic experience and mere pleasure must be made so that one can have an aesthetic experience "disinterestedly," that is, without concern for how the objects of such experience may be utilized instrumentally for obtaining pleasure.) The appreciation for the world gained by aesthetic experience may or may not lead to any difference in one's behavior or activity in the world, but the experience itself is nevertheless of value. Art objects, for these theories, are any objects which assist in the inducing of aesthetic experiences.

One difficulty for theories of aesthetic experience is that two observers may have different experiences when faced with the same object or situation. Theories about the "ideal observer" attempt to circumvent this shortcoming by describing what sort of observer is best positioned to have the right kind of aesthetic experience. Such theories can be further combined with earlier theories of didactic art by postulating that the enculturation of the individual so as to be able to have a certain kind of aesthetic experience is best spurred on by prior exposure to other art objects in a certain progression in a manner similar to moral education. Theories of the ideal observer can be further combined with larger moral, political, or religious ideals in order to describe the sort of individual who, it is hoped, will be the product of a proper aesthetic education. Thus, even though both theories of the ideal observer and theories of art for art's sake emphasize the importance of aesthetic experience, these two categories of theories may be strongly opposed to one another, since ideal observer theories describe the creation of ideal observers as the purpose for which art exists.

Religious theories of art can be quite similar to ideal observer theories in that both emphasize the importance of creating a certain kind of individual, but religious theories differ in that they see this activity as not just normatively preferable but a means of communing with the gods themselves. Worth noting is that these religious theories of art may be more ancient than any of the other aforementioned theories, in that we see a close connection between religion and the various arts in many non-modern cultures around the world. Even canonical examples of art such as the Venus de Milo or the ceiling of the Sistine Chapel were original created in a religious context as objects not only of beauty but also of religious veneration. Religious theories of art sometimes claim that it is an act of piety to create religious art on behalf of the gods, and as such artistic creation can earn one various forms of merit or favor. Religions also have a tendency to strictly regulate the kinds of religious art that are appropriate. In their strictest forms, religions may have a literally iconoclastic attitude towards any representational art whatsoever. Even in less

strict forms, religions may precisely regulate the formal qualities that they feel are appropriate for art.

As shown above, a wide variety of purposes have been proposed as the key aspect of art, including no purpose. Many of these same purposes have also be seen as the key to distinguishing good technological advances from bad ones. For example, just as art is commonly blamed for being insufficiently didactically effective, technology is frequently blamed for "softening" or "emasculating" society and so leading to "decadence." On this view, just as bad art is blameworthy for indulging the vulgar passions, bad technology is blameworthy for enabling us to act on those same passions without suffering their natural (normatively deserved) consequences. Good technologies will be those which develop the character of their creators and employers. For example, various martial technologies such as marksmanship or horseback riding have been praised for their ability to instill concentration and self-control in those who master them. The Boy Scouts are notorious as a organization for their devotion to some technologies (such as fire starting, knot tying, and orienteering) and their rejection of others, mainly on the basis of their usefulness in training potential soldiers.

A purely mimetic view of technology is hard to find, but technological innovators do often point to nature as their source of inspiration, and we do find occasional cases in which technologists aim to create artificial life or artificial intelligence, and so replicate something that nature has already provided directly. As a parallel to the refined mimetic view of art, the refined mimetic theory of technology holds that the purpose of this technological replication is to enable the individual to bring order to a chaotic world. Rather than simply bringing internal order to the psychological state of the artist or the observer, this theory emphasizes the imposition of an external order onto the world itself. On this theory, technology's role is to translate its user's intention into a change in the material world. As such, technology itself is anything so structured as to have an effect on the material world in such a way that it can be predicted or controlled by an agent. This

is perhaps the dominant view of technology today: an instrumental means of allowing human beings to achieve their goals in an otherwise indifferent or even hostile world. This view has a surprising parallel to the cathartic view of art in that on this pair of theories, both art and technology are aimed ultimately at realizing human happiness. The difference between the two would then be merely a vaguely defined difference in means (art tends to involve paintings, sculptures, literature, and drama; technology tends to involve engineering and agriculture) rather than any sharply determined difference of end. Or perhaps if there is a difference of ends, it is that art's partisans believe human happiness is best realized through contemplation of the human, and technology's partisans believe that human happiness is best realized through contemplation of the non-human.

If the genius view of art holds that the artistic genius discovers new ways of conceptualizing and arranging the formal properties of art, it hardly needs to be pointed out that the genius view of technology holds that the technical genius discovers new ways of conceptualizing and arranging the physical world. As noted before, our Romantic stereotypes of both kinds of genius are similarly dark, isolated, tortured, foreboding, etc., although perhaps the artist takes more pleasure in his or her displeasures.

The non-instrumentalist view of "art for art's sake" seems distinctively artistic until one remembers the existence of "pure" as well as "applied" sciences. Those who believe in the value of the pure sciences hold that knowledge of the physical world is a good in and of itself and needs no justification in any practical advantage so conferred. Investigations into the origin of the universe and its possible eventual dissolution serve no end except the end of knowledge itself. For those who favor development of this kind of technology, it is the state of knowing rather than transitory (aesthetic) experience which is to be valued. Nevertheless, the ongoing process of curiosity-driven learning has a status which is equivalent in its way to the epiphany of the aesthete.

Perhaps differently from aesthetic experience, scientific understanding is non-problematically transmissible from one generation to the next, whereas artistic traditions are sometimes considered to be a barrier to aesthetic experience, since they may lead to an intellectual evaluation of a work rather than a true experience of the work. Of course, just as not everyone will have the proper aesthetic experience when encountering an art object, not everyone will gain a scientific understanding by mere exposure to technological artifacts. A proper path of education is vital in both systems if a certain class of persons is to emerge in succeeding generations. Especially since the Cold War, the American education system has been geared towards the production of scientists and engineers. These technologists are "ideal observers" of a somewhat different character from artists. Whereas artists strive to be unrestrained in their creativity, scientists and engineers must work within the physical constraints of nature. On the other hand, even artists must understand the compromises forced on them by the media in which they do their work, and no amount of creativity or innovation in media will ever completely eliminate these restrictions. So, once again, we have found that the difference between art and technology seems at first distinctive but with greater investigation turns out to be one of degree and details.

If there is one difference that appears on the surface to be definitive, it must be the religious origin of art and the scientific origin of technology. Yet even this difference becomes fuzzier on investigation. While it is true that scientists have a methodological commitment to materialism that they pass on to their implementation of technology, this does not mean that they are entirely without a sense of awe or reverence for the larger forces of the universe. We can see evidence of this in the physicist Richard Feynman's statement in *The Feynman Lectures on Physics*, that

> far more marvelous is the truth than any artists of the past imagined it. Why do the poets of the present not speak of it? What men are poets who can speak of Jupiter if he were a man, but if he is an immense spinning sphere of methane and ammonia must be silent?[6]

For humanists of a certain bent, technology is, while not quite religion per se, certainly part of a larger spiritual vision of the norms of inquiry, our goals for human development, and our place in the cosmos as a whole. Even just the title of futurist Ray Kurzweil's book *The Age of Spiritual Machines* is proof of this.

Returning to the earlier topic of the place of art and technology in human betterment, it is generally supposed that technology is instrumental and art is non-instrumental, but this supposition falls apart upon serious scrutiny. We have found that whatever the purpose of art is, a parallel purpose can be found which technology aims to fulfill. It is therefore untenable to hold that art is either uniquely non-instrumental or that technology is uniquely instrumental. Both art and technology are intimately bound up in the realization of a vision of human progress. Artistic progress tends to be measured in the production of aesthetic innovation and creative leaps of genius, whereas technological progress tends to be measured in the production of knowledge and scientific leaps of genius. Therefore, to differentiate them, we must look more closely at the context in which this progress takes place. Going beyond Aristotle's four causes, we will examine the role of "place" in causation.

VI. Place as Cause

Aristotle's four causes were created to classify the various factors which must converge in order for a substance to come into being and remain in existence. Speaking in terms of journalism's Five Ws and One H, they cover Who creates the thing and How they do so (efficient causation), What kinds of things are created (formal causation), What they are created out of (material causation), and Why they are created (final causation). What the four causes leave out are Where spatially and When historically things come into being. The place of a thing is as much of a requirement as any other cause, since an object or process which lacks a place in space and time cannot be said exist in the conventional

[6.] Quoted in Wikiquote, available at `http://en.wikiquote.org/wiki/Richard_Feynman` as of Spring 2010.

sense. Having a place imparts a relational dimension to an object that lets us ask about its surroundings as well as its direct causes. In understanding the place of a thing, we come to understand the sort of context that gives rise to it.

Returning to the topic of the religious origin of art, one can say that the original "place" of the Venus de Milo was a temple, but through the twists of history, the statue lost that original place and ended up in the gallery of the Louvre. On the other hand, the original place of Duchamp's urinal was, of course, the restroom. Nevertheless, having been selected by the artist, its new place is also the gallery. The gallery is a place that inherits the social role of the temple in the same way that secular theater inherits the role of the religious rite. In these cases, what was originally a divine ecstasy is secularized into a communal aesthetic experience. As mentioned in the section on material causation, art objects have a kind of "aura" of originality. A theory of art as the inheritor of the place of civil religion will point out that cult objects are also thought to have a literal aura in virtue of their position in a sacred place.[7] Artists on this theory are kind of literal priesthood who have the ability to transubstantiate things from being vulgar objects to being art objects merely by introducing them to the gallery space in the proper way. Once so installed, ordinary people will make pilgrimages from great distances in order to have their lives improved by contact (usually only visual contact) with the set-apart objects.

The theory that the gallery historically inherits the place of the temple accounts for many of the more romantic or grandiose sentiments that are attached to art, but it fails to account for who the artists and art critics are and what activity unites them. If they are a priesthood of some sort, they must have set of dogmas and rituals that give them common purpose and make them one priesthood and not another. One widely received theory of art in the twentieth century is Arthur Danto's "Artworld" theory. On this

[7.] Cf. Matthew 23:17, in which Jesus rhetorically asks, "for which is greater, the gold, or the temple that hath sanctified the gold?" It is clear that Jesus sees the sacredness of the temple as a place lending sacredness to the contents of the temple.

theory, artists select works (some commenters use the term "baptize") and submit them to relevant individuals in the Artworld for consideration. If they approve of an object, then it becomes art. If they do not, it remains what it is. The topic of conversation that sets the Artworld apart from other groups of human beings is "aesthetic predicates." The Artworld considers the aesthetic experience of the object that is possible when certain formal properties (in the broad sense of formal) are taken into account and progresses by developing new and more interesting predicates as time goes on. Understanding an art object means understanding the aesthetic experience the object would provoke in its intended Artworld and in the Artworld as it stands today. When the object's place in the Artworld is grasped, the object is known.[8]

What is the place of technology? If the art gallery continues the temple, then the technological laboratory inherits the craftsman's shop. Introducing an object to the laboratory brings it within the ambit of technology. (Most concerningly, this seems to be the case even with the human being.) Contextually speaking, the difference between art and technology is not a difference of method, form, material, or aim; it is a difference of cultural positioning. Both the temple and the craftsman's shop are parts of the town and attempt to contribute to its well-being and continuation, but each finds the mode of contribution of the other suspect. As C. P. Snow noted in his famous "The Two Cultures" lecture, the world of "literary intellectuals" has come apart from the world of scientists. Literary intellectuals and others in the Artworld put up with the scientific culture for the practical reason that they need the goods and services they provide, but nevertheless they disdain them as excessively materialistic and cut off from what is truly valuable.

[8.] The process of properly understanding an art object for Danto is similar to the process of objectively understanding a physical object for Kant with the Artworld taking the place of transcendental Reason. For Kant, an understanding is objective if it accords with the understanding that would be produced by a being that possesses Reason. For Danto, an understanding of art is proper if it accords with the understanding that would be produced by a member of the Artworld. Also like Kant, Danto sees the true artist as a kind of genius who increases our store of concepts ("predicates") by which we can recognize beauty ("aesthetic experiences").

The broader coalition of scientists and craftsmen for their part consider their work to be the only work of value and the work of the others to be intellectually meaningless and a waste of resources. According to this theory, the split between art and technology is primarily a historically perpetuated split in culture. Nothing larger can be said about the split because the split itself is meaningless and perpetuated for its own sake.

This theory of the place of art and technology has much to recommend to it, but it seems to be going too far if it claims that there are no essential differences whatsoever in the meaning of art and technology. To go beyond it, we must bring together all of the perspectives explored so far.

VII. Conclusion

Aristotle's four causes have been used a mere heuristic to bring order to this investigation, but if we return briefly to their original conception, we see that Aristotle claims it is only with the confluence of all the causes that a substance can come to be. In the same way, a robust theory of art or technology will need to be multifaceted in order to take into account the role of all five causal factors. No one perspective is enough to capture everything we think about art and technology.

It is a philosopher's delusion to think that behind our jumbled ordinary intuitions there must stand a single unified and determinative definition for the concept in question. As such, so long as we are exploring the space of possible concepts permitted by our intuitions, we will never find the unifying factor that lies behind the concept. Rather than "finding" this unifying factor, the philosopher must *create* it by looking at what exactly it is what use the concept to do and what we ought to be using the concept to do.

Looking at how various theories of art are used, it is clear that the definition of art is at its most contested when the matter of prestige is on the line. Sometimes a discipline will claim the mantle of "art" in order to raise its prestige, and other times prestige is increased by rejecting the title of art and claiming the title of "science."[9] The public

fascination surrounding the question of "what is art?" turns on precisely this issue. Besides a basic confusion of "art" and "good art," the debate reflects the fact that there is a public norm which holds that art is an unconditioned good. As such, for anyone to claim the title of art is necessarily for that individual to demand a certain level of public approbation. By contrast, the question "What is technology?" has no public acclaim built into it and so receives little attention. On the other hand, "science" is a term of respect, and so the question "What is science?" has a similar level of purchase with the public.

Frequently, certain activities which might otherwise be taken to be arts (for example, quilting, weaving, or glass blowing) are rejected as mere crafts or skilled traded. On the other side of the coin, those who find modern art distasteful express their distaste not by saying that abstract painting is an inferior art but by claiming that it is not an art at all. Such debates are not dissimilar to the debate among school children about whether cheerleading or gymnastics count as "sports" because they are scored by judges. The arguments given, however worthwhile on their own, are of secondary importance to the deeper cause of the debate, which is an attempt to order the values of society in a certain way. To call cheerleading a sport is to place a stereotypically female activity on a plane with masculine activities. So too, to call Jackson Pollock an artist is to put him in a category of secular veneration alongside Michelangelo and da Vinci. The stakes for calling something a technology appear to be much lower, but ultimately, it pivots around the same center: where will we place it in our society?

As we have seen, there is no simple way to distinguish art from technology. For every proposed definition of art, a parallel definition can be given for technology which tweaks only at the edges and not at the core meaning. Therefore, in order to either make a strong separation between the two or dissolve the distinction all together we would need to present a normative vision of how the world ought to be arranged. It is out of

[9.] For an example of positioning a discipline relative to art in order to calibrate its prestige see: Knuth, Donald. "Computer Programming as Art" in *Communications of the ACM*. Vol. 17 (1974), pp. 667–673.

the scope of this paper to attempt to defend such a vision here, but I will briefly remark that for my purposes, I see further entrenchment of the division of the two cultures as harmful. My vision of the future is one in which artists become more sensitive to the mechanical factors of the physical world and technologists become more sensitive to the aesthetic experience of the human subject. The difference between the two cultures is helpful insofar as it allows for a plurality of perspectives within society but pernicious insofar as it causes members of the one culture to ignore developments in the other or dismiss them out of hand. A better way of thinking about art and technology is to see them as a continuum of ways of approaching the world with numerous pockets of sub-divisions (painters vs. poets vs. industrial engineers, say) but no sharp break between two larger categories. Whichever pole of the continuum one is closest to, what is to be praised are processes in which the individual cultivates his or her own skills at expression in a medium in a manner that is at once beautiful and functional. The product of this expression ought to allow us to focus on the haecceity of things without losing a sense of their contextual relationships. Such an activity is valuable both for its own sake as a way of creating positive experiences for individuals and as a means of storing up valuable cultural know-how and insight. If art and technology are able to enrich one another, then we can bring the joy of the festival to everyday life without thereby ruining the harvest. If they are not able to do so, we may inadvertently ruin our ability to either celebrate life or maintain it.