# “The Art and Craft of the Machine”:

3D Printing, the Arts and Crafts Movement and the Democratization of Art

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1800-luvun lopulla Englannissa syntynyt Arts and Crafts -liike halusi tehdä taiteesta ja tuotannosta demokraattisempaa. Liikkeen merkittävin edustaja oli runoilija, käsityöläinen ja sosialisti William Morris. Nykypäivänä avoimen lähdekoodin filosofia ja vertaistuotantotavat yhdistettynä 3D-tulostusteknologiaan edustavat samankaltaista filosofiaa tuotannon demokratisoinnista kuin Arts and Crafts -liike 1800-luvulla. 3D-tulostus on uusi teknologia, jolla tietokonemalleista voidaan helposti luoda fyysisiä kappaleita. Arts and Crafts -liike vastusti konetyötä, joten kysymys koneen roolista taiteen tuhoajana ja taiteen pelastajana 1800-luvun lopulta nykypäivään on tutkimuksessani keskeinen.

Tutkin Arts and Crafts -liikettä erityisesti sen isähahmon William Morrisin luentojen pohjalta mutta pohdin myös muiden ajattelijoiden tekstejä. 3D-tulostuksen ollessa vielä hyvin uusi teknologia pohjaan tutkimukseni siitä akateemisten artikkelien ohella myös uutisartikkeleihin, populäärikirjallisuuteen, videoituihin luentoihin sekä itse tekemiini haastatteluihin. Vertaistuotantoa sekä avointa lähdekoodia käsittelevät jaksot perustuvat akateemiseen kirjallisuuteen. Tutkimukseni on kulttuurikritiikkiä ja sovellan siinä vertailevaa analyysiä.

Arts and Crafts -liikettä, 3D-tulostusta ja siihen liittyviä filosofioita yhdistävät halu tuoda tavaratuotanto lähemmäksi tavallista ihmistä. Niitä yhdistävät myös ajatukset vapaasta yhteistoiminnasta, laadun tavoittelusta voittojen sijaan sekä eräänlainen sosialismi. Uuden teknologian myötä tulevaisuudessa saattaa ilmetä kehitystä Arts and Crafts -liikkeen toivomaan suuntaan. Taiteen, käsityön ja konetyön käsitteet ovat jatkuvassa muutoksessa. Lewis Mumfordin käsitteiden pohjalta voidaan väittää, että koneen rooli taiteen tuhoajana tai pelastajana on riippuvainen koneen käyttäjän ideologiasta tai filosofiasta.

avainsanat: William Morris, Arts and Crafts -liike, 3D-tulostus, taiteen demokratisaatio, vertaistuotanto

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## 1. Introduction

In 1901, the American architect Frank Lloyd Wright delivered an address called "The Art and Craft of the Machine" to the Chicago Arts and Crafts Society. In his address Wright talks about William Morris and his opposition to the machine in the creation of art and how it played a crucial role in the destruction of the arts. But instead of taking Morris's side, Wright proposes that the machine, instead of destroying the arts, could in fact democratize them: "Nor was it so grown as to become apparent to William Morris, the grand democrat, that the machine was the great forerunner of democracy" (Wright 2000 [1901], 202). On the one hand, the machine is seen as the destroyer of art, and on the other hand, as the saviour of art. The above-mentioned duality, whether real or perceived, of the machine is central to my discussion of the matter, and so I have decided to pay homage to Wright's polemic address in the title of this MA thesis.

Nearly three decades later, the American philosopher Lewis Mumford describes the ambivalent role of machines in the creation of art as follows:

> Was the displacement of art that marked the introduction of machinery a permanent or a temporary process? It was impossible to answer this question in John Ruskin's time; but by now I think we may say confidently that the process was only a temporary one. While those who value the traditional arts are chiefly conscious of the loss, we are now also conscious of the fact that industrialism has produced new arts, associated with the application of precise methods and machine tools. Will these new industrial arts altogether replace the traditional ones? Will the traditional arts recover some of their lost ground? Has the machine age developed a new esthetic, or is its bias essentially anti-esthetic? Will the expression of the human personality through the arts regain its ancient place and will art once more accompany all human activity? These are some of the questions we must ask. (Mumford 1928, 102)

The above passage is from a newspaper article titled "Art in the Machine Age" written by Mumford for *The Saturday Review of Literature*. Toward the end of the passage Mumford puts forward a number of compelling questions that feel uncannily relevant in 2014. Of

special interest is the sentence in which he questions whether the human personality will, with the emergence of the machine age, find anew its expression in art and whether art will "once more accompany all human activity" (Mumford 1928, 102).

The industrial era revolutionized society, manufacture and art. The days of old, when people lived in intimate communities in the countryside, when carpentry was a thriving trade and people would make a large part of their own things were over. Are those days now coming back? The Arts and Crafts Movement of the late 1800s, inspired by William Morris and John Ruskin, strove to make art popular, as it had been in the Middle Ages, and create a new, more beautiful world. Its ideas were aesthetic, democratic and socialist. The Movement had a great influence, which was most distinctly visible in Germany in the 1920s, but in spite of its influence all of the attempts to create a new popular art that would be widely shared by the people failed. It is my claim that today in the 21st century, new technologies such as 3D printing and revolutionary ideas like Open Source have created a new set of circumstances that might finally bring us closer to achieving the dreams of William Morris and the Movement he inspired.

In this thesis I am going to study the ideas of the Arts and Crafts Movement. More specifically I will study its ideas of the democratization of art, and attempt to point out similarities and differences that are apparent in the newly emerging 3D printing scene. I will ultimately attempt to uncover a possible philosophical or ideological kinship between the ideas behind these two historically distant and superficially very dissimilar phenomena. The second half of the thesis will be an analysis of the ambivalent role of the machine and how it relates to handcraft. The Arts and Crafts Movement had an adversarial view of the machine and yet the machine is the prerequisite for 3D printing.

## 2. Methodology

This study falls within cultural criticism, applying comparative analysis based on a wide range of materials. I will study the Arts and Crafts Movement through the texts of a number of its affiliates, but the main emphasis will be laid on the lectures of William Morris. I am aware that William Morris is generally not viewed as being integrally part of the Arts and Crafts Movement but rather as a progenitor of the Movement along with John Ruskin. For the purposes of this thesis, however, a convincing argument in favour of including William Morris and John Ruskin into the Arts and Crafts Movement can be made. In spite of the fact that the historical movement was headed by a younger generation than Morris and Ruskin themselves and that they were not essential constituents of the Movement, the philosophy or ideology that the Movement expressed was to a very large extent formulated by Morris and Ruskin. This, in my opinion, justifies their incorporation into the Arts and Crafts Movement.

The second part of my analysis will focus on 3D printing, open source and peer production. It will comprise very varied materials. Owing to the novelty of these phenomena I will also be using a considerable amount of non-academic texts, such as newspaper articles, Internet videos and some unpublished materials, including interviews conducted by myself. The thesis at hand is among the first academic attempts at tackling the cultural and historical significance of 3D printing.

I also have personal experience with peer production and 3D art. Between 2004 and 2009, I was creating computer graphics for different computer games such as *Half-Life* and *Counter-Strike* which had a very active "modding" (that is, modification) community behind them. I was active in peer production communities such as the Clan of the Dead Goat which produced open source content for computer games such as *Counter-Strike*.

## 3. Historical Background

William Morris and John Ruskin were the two chief influences behind the subsequent generations of artists and architects in England. Therefore, in subsection 3.1, it is important to shine a light on the 19th-century context they were writing in. In subsection 3.2 I will explain the Arts and Crafts Movement of the 1880s that sets the stage for later developments in this field of human endeavour.

### 3.1. William Morris

William Morris (1834–1896) was a powerful figure in the realm of art and politics in the late Victorian era. His work and teachings had an enormous impact on contemporary artists who felt that decorative art had fallen asunder in the industrialized Victorian England. Morris's thinking was deeply grounded in Romantic ideas. Nostalgia, nature and democracy are clearly visible in his lectures, widely disseminated to a larger audience. Morris's thinking is also deeply indebted to the renowned art critic of the time, John Ruskin, whom Morris admired greatly. Morris was a typical Renaissance man, who did not limit himself to poetry and painting but also practiced numerous different craft skills. Consequently, one of Morris's most passionate aims was the restoration of the crafts, "the lesser arts," back into their rightful place alongside the higher arts which he believed had been separated from each other due to a change in social structure. In essence it means that painters and sculptors had become members of the upper class whereas the fletcher and the mason had become members of the lower class (1882C).

Morris was unsatisfied with the decorative art of his time which had been transformed with the advent of the industrialization (2000 [1888], 171). Before the Industrial Revolution the production of everyday items was in the hands of craftsmen who did most if not all of the work by hand. These craftsmen were often incorporated in workshops or guilds, thus building on a long line of tradition that spanned from the Middle Ages to the present day. After the

Industrial Revolution the manufacturing of wares had been relegated to factories, where a new industrial tradition of design had not yet been established. According to Pevsner (1991, 45–46), industrial production was at this early stage mostly in the hands of manufacturers who were uneducated in the arts. The industrial revolution was a subversive change that affected the entire Western civilization. The most prominent discontent was voiced in the most industrially developed countries like England where new inventions such as the steam engine, the railway system and different labour saving machines were first put to use. An established example of this discontent is Ned Ludd, the weaver who in the early 19th century shattered two knitting machines, and consequently gave the name to so-called Luddism, which in today's usage refers to opposition to new technologies.

English Romanticism, which can be seen as a reaction toward these changes in society, was one of the most visible movements that spoke out against the disruption created by the new world order. Advancements in rational thought and scientific practices, as embodied in the Enlightenment Movement, demystified natural phenomena and professed to substantiate human mastery over nature. Romanticism rebelled by drawing attention to the *sublime,* an inexplicable feeling often experienced in nature that is beyond rational thought, and *the picturesque* which was posited somewhere between beautiful and the sublime. Romanticism declared that sensibility was paramount to rationality. Romanticism held fast to the belief that there were things that were not subject to scientific scrutiny and were unattainable by rational thought. As noted above, William Morris's own thinking was deeply grounded in Romantic thought. The yearning nostalgia that marked so many of the Romantic poets' works, was also present in Morris's reverence for the Middle Ages that served him as a source of inspiration for his ideas of workmanship and artistic freedom (1882C). Morris was also trained as a painter in the Pre-Raphaelite Brotherhood which is noted for being inspired by the art of the Middle Ages, the art before Raphael, as the name suggests.

The commercial atmosphere of the time also sparked vehement opposition. Capitalism, antagonized by Karl Marx and Friedrich Engels, had formed a symbiotic bond with industrialization, leading to many maladies in Victorian England. Critics like Carlyle (1843), Ruskin (2004) and Morris (1883) all spoke of the adverse effects of capitalism and industrialization. The commercial products that the industry created were of substandard quality to Morris and Ruskin, but they also criticized the factories and the machines inside them for degrading men into mere flesh-and-bone machines – the repetitive and arduous toil that men were subjected to in factories was not humane (Morris 1882D; Ruskin 2004, 24). The mechanization of work was not only destructive to decorative art but also to the human mind and the human body.

These circumstances of the Victorian society sparked in Morris the flame for revolution. As Morris grew older he got more and more involved in politics, culminating in his joining the Socialist League when he was 50 years old (Thompson 1959). Morris's aim in politics was not only the amelioration of the conditions of the working classes, but also the reformation of art by reforming society (Stansky 1996, 123). Morris believed that the only way to reform society was by a socialist revolution that he hoped to be imminent (Boos 1986, 491). In his novel, *News from Nowhere, An Epoch of Rest* (2004 [1890]), Morris envisages his utopian dream of a socialist society where men and women have redefined the concept of work; no one is forced to work, but most choose to. In Morris's utopian England money is not used, people craft their own things and love is free. Furthermore, Morris's *News from Nowhere* depicts a society where art is part of society.

### 3.2. The Arts and Crafts Movement

The Arts and Crafts Movement emerged in the 1880s when students of decorative art, consisting mainly of designers, architects and craftsmen began convening for the purpose of exchanging ideas (Greenstead 2005, 1). These creative individuals sought unity in the field of

art which they felt was mistreated by the Royal Academy and the Royal Institute of British Architects. The Arts and Crafts Movement felt these institutions were too exclusive because their main concern was the professionalization of the fields of art and architecture, respectively. The Arts and Crafts Movement was inspired to a large extent by Morris, whose aim to re-elevate the status of the lesser arts was also taken up by the Movement. The concept of "The Unity of Art" (that does not separate lesser and higher art) necessitated that the professionalization of art, architecture and design was to be opposed (Stansky 1996, 120). In line with Morris's and Ruskin's teaching that defined art as a product of each period's social situation, the Arts and Crafts Movement felt that at the time the arts did not have a role in society that it deserved. This was the case with the Art Workers Guild (Stansky 1996, 123). I will discuss this topic in greater length in section 5.

The Arts and Crafts Movement was composed of many different groups that were united (at the very least) by their drawing inspiration from Morris's thinking. The different groups sometimes expressed contrasting views on certain subjects, in politics for example, but they are generally considered to be very much alike in many other respects. The main groups comprising the Movement are usually thought to be The Century Guild, The Art Workers Guild and the Arts and Crafts Exhibition Society, with the two first mentioned being perhaps the most important.

In general terms the Movement was less radical in its ideology when compared to Morris and his thirst for revolution, and its members were also somewhat more accepting towards machines than the other progenitor of their movement, John Ruskin. The Century Guild, and its most prominent character, Arthur H. Mackmurdo, recognized that the propagation of good design was only possible with the help of machines (Stansky 1996, 70). The Arts and Crafts Movement, like the similarly motivated Pre-Raphaelite Brotherhood (Prettejohn 2012, 37), emerged partly as a reaction to the bourgeois taste of the time (Crawford 1997, 23). Unlike the recycling of past styles that had been favoured in Victorian

England, especially in architecture where revivalist schools such as Neo-Gothicism reigned, the Arts and Crafts Movement wanted to create a style that would find its inspiration in the past but still be unique and look historical in the future (Stansky 1996, 122). This implies that the style was to look new and particular in its own time – rendering it historical in the future. In essence the movement wanted the style to reflect the contemporary zeitgeist, not that of another time, like revivalist schools.

## 4. Contemporary Developments

It may at first blush seem that the practical concerns and ideas within the Arts and Crafts Movement have little to do with 3D printing and the digital technologies of today's world. However, I argue that a good understanding of the events and ideas surrounding the clash between industrial forces and the Arts and Crafts in the late 19th and early 20th century may help us grasp the latest developments in technology and art.

### 4.1. 3D Printing and Additive Manufacturing

In the mid-1980s, new technologies emerged that could create three-dimensional objects from computer models. These machines were called *selective laser sintering printers*. Today these technologies have evolved to a point where, much like in the case of so many other technologies, they have become smaller in size and more affordable, inviting the first groups of consumers to adopt the technology. Now this technology is commonly called by the name 3D printing, which makes the technology sound somewhat understandable, but can be misleading, as we will soon see. 3D printing involves a design on a computer (that is, 3D design) and a device (printer) that brings the design to the real world so that unlike a "2D" printer, such as an inkjet or laser printer in your home or at your workplace, the end product of the printing is a three-dimensional object. 3D printing, in the end, does not exactly explain to us how it achieves its goal, and it is in fact only one of the technologies used. A more technical name that better describes how these technologies function is *additive manufacturing*.

Additive manufacturing technologies include at least seven different processes (Huang, et al. 2012, 1192–1193), including the aforementioned selective laser sintering (SLA) and, perhaps a little misleadingly, three-dimensional printing (3DP). Because 3DP is also the name of a particular additive manufacturing process, the term 3D printing is not preferred as an umbrella term for these technologies, despite popular usage. In this thesis,

however, I am going to be using 3D printing to refer to additive manufacturing technologies because of its widespread usage outside the technical sphere.

But what exactly is additive manufacturing? Huang and others describe it well:

> Additive manufacturing (AM) is the "process of joining materials to make objects from 3D model data, usually layer upon layer" [1]. It is also known as rapid manufacturing [2] or rapid prototyping [3]. Unlike conventional manufacturing techniques such as machining and stamping that fabricate products by removing materials from a larger stock or sheet metal, *additive manufacturing creates the final shape by adding materials*. It has the ability to make efficient use of raw materials and produce minimal waste while reaching satisfactory geometric accuracy [1–3]. Using additive manufacturing, a design in the form of a computerized 3D solid model can be directly transformed to a finished product without the use of additional fixtures and cutting tools. This opens up the possibility of producing parts with complex geometry that are difficult to obtain using material removal processes. (Huang, et al. 2012, 1191, reference numbers in the original text, emphasis mine)

The term additive manufacturing thus becomes clear. Seven different processes of achieving the addition of material exist. In the case of SLA, a laser is used to incorporate the layers into each other, while some, like laminated object manufacturing (LOM), use "adhesive-coated sheet materials" (Huang, et al. 2012, 1191). Additive manufacturing devices can use a range of different materials, such as metals, ceramic, wax and paper, but at the moment the majority of the printing is done in different types of plastics.

I claim that in 3D printing, or additive manufacturing technologies in general, hides a revolutionary potential. It promises not only a new way of manufacturing items, but also a new way of organizing an economy. Widespread access to 3D printing technology could create a world where manufacturing moves from big factories and corporations into home desktops and into the hands of consumers, totally subverting the very definition of the consumer. Once the technology develops beyond its embryonic stage of clunky, difficult to use, expensive machinery and software, and becomes easy and affordable technology, 3D

printing could offer everyone the possibility of becoming *a maker*. Much like the development of personal computers from room-sized Pentagon mainframes to handheld tablet computers, this new technology is paving the way to becoming a common sight in homes, making possible for consumers things that were previously only possible for large corporations and professionals. Virtually anyone can now print their own books, broadcast their own comedy shows or publish their own music album. It is very likely that soon virtually anyone can manufacture his or her own cutlery, door handles, or shoes. Essentially 3D printing could democratize production. In his book *Makers* (2012) Chris Anderson describes the following chain of events:

> Transformative change happens when industries democratize, when they're ripped from the sole domain of companies, governments, and other institutions and handed over to regular folks.
>
> We've seen this picture before: it's what happens just before monolithic industries fragment in the face of countless small entrants, from the music industry to newspapers. Lower the barriers to entry and the crowd pours in.
>
> That's the power of democratization: it puts tools in the hands of those who know best how to use them. We all have our own needs, our own expertise, our own ideas. If we are all empowered to use tools to meet those needs, or modify them with our own ideas, we will collectively find the full range of what a tool can do.
>
> The Internet democratized publishing, broadcasting, and communications, and the consequence was a massive increase in the range of both participation and participants in everything digital [...]
>
> Now the same is happening to manufacturing [...] (Anderson 2012, 63)

But 3D printing by itself is not enough to revolutionize manufacturing. It is only a technology. However, along with the first adopters of personal computing various movements calling for sharing, openness and co-operation emerged. These movements and their ideas are concomitant with the evolution of 3D printing technology and the democratization of production.

### 4.2. Open Source and Peer Production

Open source has become with ever-rising popularity a prominent development model in the world of software design. Currently its ideas are being applied into the sphere of physical production. The term *open source* originally referred to the source code of a computer program that is made free and available to the community at large. The open source development model has proved effective because it employs the community of the software users themselves to further develop the software. The open source method entails like-minded hobbyists working together in co-operation without being motivated by financial gains but rather by the betterment of the software itself. This leads to a level of quality and detail that is not attainable by a small team working with proprietary software. De Bruijn (2010) quotes E.S. Raymond on this (see also Benkler 2006, 60):

> [E.S. Raymond] first writes that "the best programs are written in response to a developer scratching his personal itch". He stresses that an important reason for high quality in open source is that people are passionate about what they are developing because it is personally meaningful to them and they autonomously decide to work it. (2010, 11)

This is one of the principles that the high quality open source production is based on, but perhaps the most important aspect of open source is the community. Without the co-operation of peers there would be no Linux or Wikipedia, both of which are instances of open source collaboration. Benkler (2006) introduced the term *commons-based peer production* to define this kind of activity:

> It suggests that the networked environment makes possible a new modality of organizing production: radically decentralized, collaborative, and nonproprietary; based on sharing resources and outputs among widely distributed, loosely connected individuals who cooperate with each other without relying on either market signals or managerial commands. This is what I call "commons-based peer production". (2006, 60)

As a form of organizing collective action peer production differs greatly from conventional work in which workers are motivated by their salary rather than by their eagerness to produce good products or do good work. Their work is managed by the organization of which they are employees and, in turn, the organization is managed by market signals.

The principles of peer production are in my opinion almost as revolutionary as the possibilities proposed by 3D printing. Peer production favours sharing instead of owning and attempts to achieve quality instead of profit – these ideas are subversive to the current capitalist system. Imagine the combination of 3D printing and peer production. 3D printing aspires to give the public the means of production and peer production aims for decentralized, nonproprietary, and freely collaborative production. It will be interesting to see the result of these two combined in the near future.

## 5. The Democratization of Art in the 19th Century

The definitions of art by William Morris, John Ruskin and the Arts and Crafts Movement open up an interesting perspective on production and democracy. Peer production involves some questions that seem similar to the ones which were aired within the Arts and Crafts Movement ideology or philosophy. These questions were largely based on the ideas of Morris and Ruskin.

### 5.1. Morris's Definition of Art

Before discussing the functions and characteristics the Arts and Crafts Movement assigned to the concept of art, we must take a closer look at the word *art*. In this study I have chosen to use the word art in the same broad meaning as William Morris because I approach the concept of art from his perspective. For Morris, the word art had a completely different meaning than it did for many of his contemporaries or, indeed, for most of us today. In a lecture that he held later in life, "The Socialist Ideal: Art," Morris defines in a very straightforward manner what he believes art to be:

> [A] house, a knife, a cup, a steam engine, or what not, anything, I repeat, that is made by man and has form, must either be a work of art or destructive to art. (1891)

The above idea of art as anything man-made is very exceptional, but extremely central to Morris's idea of a popular art which I return to later in this section. According to Bevir (1998, 179), Morris believed that everything made by man was art because it expressed the human spirit. However, I believe this is simply an indirect way to argue for the abolishment of inspiration and the creative genius. More importantly, Morris wanted to rebel against the long held idea that arts were the activities of the highbrow and the leisurely (painting and sculpture, for example), and to point out that they also included the so-called lesser arts (pottery and weaving) (Morris 1882C; Bevir 1998, 179). For Morris, the lesser arts are

inseparable from the higher arts. When you follow Morris's art historical timeline, the Middle Ages is treated as the spring of the arts, the time of blossom, and the time when art had "conquered everything, and laid the material world under foot" (Morris 1882B). After the Middle Ages, according to Morris, the "arts sundered into the greater and the lesser". He explains how before this division had happened the handicraftsman was considered an artist in his own right (Morris 1882B). This means that no distinction was made between the painter and the potter. In Morris's time, however, the former was considered an artist and the latter not. This division he objected to, and worked towards getting the lesser arts recognized as art.

Morris's line of thinking therefore entails that if the arts were thriving when they were not divided into the higher and the lesser, the best kind of art must be that which does not segregate, but that which encompasses all of man's work and recognizes it as art. But furthermore, for things made by man to be beautiful, to be real art, they should be the result of happy work. Accordingly, Morris described art to be "the expression of man's happiness in his labour" (Morris 1882A). Morris also advocated another view on art that is exceptional in our time. He expressed the need for art to be useful:

> [N]othing can be a work of art which is not useful; that is to say, which does not minister to the body [...] or which does not amuse, soothe, or elevate the mind. (1882C)

This definition of art may at first seem utilitarian. Rather, Morris's concept of usefulness is reminiscent of Aristotle's (2005) concept of the practical or useful which he separates into *poietikos* and *praktikos*. *Poietikos* separates the producer from the product, while *praktikos* does not make this separation. To be useful or practical in the sense of *praktikos* means that the product (outcome) is not severed from the producer (maker). It follows that Morris's concept of art's usefulness does not represent utilitarianism. In utilitarianism the product is

separated from the producer, thus removing all but empirically discernable outcomes, like motives (such as pleasure and greed) behind actions. In this way usefulness can be scientifically calculated: the greatest good for the greatest number. This utilitarian view suits capitalist logic well, as it allows possible moral questions to be disregarded in the search for profit. Morris's view, however, does not allow this, but rather entails that the producer, the product and the environment are all indivisible constituents that together form usefulness.

Furthermore, Morris's statement of art's usefulness is a call for sensibility. The Victorian era and its aesthetic were, due to industrialization, marked by clutter and lavishness. Victorian homes were crowded with various industrial products. Instead, Morris is calling for humble, sensible works of art which minister to actual needs. This view is in opposition to the capitalist logic which in order to attain more growth and profit creates needs. According to Morris, the capitalist system created products people did not actually need (1883; 2000 [1888], 170). The above quotation about usefulness written by Morris is fairly easy to interpret in numerous different ways, as I will continue to show below.

The idea that art should be useful in a more mundane sense – that is, art should have a function – is perhaps even clearer in another of Morris's exhortations:

> HAVE NOTHING IN YOUR HOUSES THAT YOU DO NOT KNOW TO BE USEFUL OR BELIEVE TO BE BEAUTIFUL. (Morris, 1882B, capitalization in the original)

Here Morris says that a common household item needs to be either useful or beautiful. Put in terms of the previous quotation, it must either "minister to the body," or "elevate the mind." Note that Morris does not mention art in this sentence, but generalizes and talks about all things, tying it to his view of art as everything man-made. This may sound odd to us. Very often we think of art as something that does not have practical value, but which only exists for the sake of its being art (you may call to mind Oscar Wilde's famous quip "all art is quite

useless"). Morris's concept of art as everything man-made does not allow this kind of thinking because useful things are considered to be art of the best kind. Morris (1882D) also regarded architecture to be one of the most important arts, and it may be difficult to think of another art form that is more useful than architecture.

Morris revered the highly use-oriented decorative arts. But his reverence can be interpreted as arising out of self-serving motives. Crawford (1997, 19) presents a cynical view of the Arts and Crafts Movement's program for changing society, saying that it was not concerned with the trades in factory production which were the most developed, but rather with the trades they were themselves occupied with, such as the decorative arts. Thus Crawford suggests that the Movement was perhaps only trying to paint a nobler picture of their work through their ideology or philosophy. Following this line of thinking may lead one to think that the Arts and Crafts Movement was only attempting to elevate the status of the decorative arts in order to improve their own status and to gain acknowledgment of themselves as artists. I do not believe it is this simple, however. Morris, for example, was already an artist of the higher kind – trained with the Pre-Raphaelites – and a poet before he turned his attention to handcrafts.

Notwithstanding the potential motivations behind the idea of elevating useful art, Morris's argument makes sense. There is no reason art should be restricted to painting and sculpture. There is no harm in designing everyday items to be aesthetically pleasing. According to Pevsner (1991, 22), William Morris witnessed this first-hand when he, as an aspiring young painter in 1857 was faced with decorating his first studio. He found that none of the available furniture satisfied his needs. The machines of the time could produce very intricate wares but in the hands of the manufacturers who had no education in arts the end result was disastrous. According to Pevsner, the industry did not house individuals capable of aesthetic thinking, as the industrial designer did not yet exist as a trade and the medieval craftsman had become extinct. The manufacturer could get away with anything as the general

public, the common man, was not knowledgeable in arts or aesthetics; "the consumer had no tradition, no education, and no leisure, and was, like the producer, a victim of this vicious circle" (Pevsner 1991, 46).

Morris defined art to be everything man-made. Bevir (1998, 179) argues that this allowed Morris to bring art to the forefront of people's lives. Then he declared that art, everything made by man, must be beautiful – to elevate the mind or be useful. In other words, to minister to the body and the mind. If art is to be in the lives of ordinary people it must have a function. If this utility of art was brought back into society, people would be happier. They would care about art, and life would be made beautiful. This, I believe, was Morris's goal. In the next section I am going to discuss the social aspect of art that is central to the Arts and Crafts Movement.

### 5.2. John Ruskin on the Social Nature of Art

William Morris's thinking is hugely indebted to John Ruskin. According to Bevir (1998, 180), Morris thought of Ruskin as his teacher in social theory. Morris also praises Ruskin in his lectures, so his influence on him is evident. Morris and Ruskin have their differences; the starkest one of all is probably that of political allegiance. Ruskin was a self-proclaimed Tory and Morris was a socialist. But, Morris had not always been a socialist. In his paper "William Morris: The Modern Self, Art and Politics," Mark Bevir brilliantly takes apart Morris's views of art and politics. According to Bevir (1998, 175), Morris was influenced by Romanticism, Protestantism, Ruskin, and later, Marx. From Romanticism he drew the idea of naturalness as a source of beauty, from Protestantism he took the stress on every-day life, and from Ruskin the social dimension of art. These he later incorporated into his socialistic views, all of which seemed to fit together quite well. What one carries away from Bevir's analysis, is that Morris did not so much conform to socialism, as did Morris conform socialism to match his own ideals. Some of these ideals had rather ironically originated with the right-wing thinker, John

Ruskin. Nevertheless, Ruskin has been described as a moralist (Wright 2000 [1901], 202), and I believe it is a good characterization of some of his views. Incidentally, it was those moral teachings without right-wing connotations that inspired William Morris. Without going into ethics in depth, I would argue that Ruskin's moral views are something that do not necessarily strictly adhere to his political stance, and thus are malleable enough to also fit a socialist ideology or philosophy.

What was Morris's debt to Ruskin and how remarkable was it? I would argue that Ruskin's perhaps most important contribution to Morris's thinking, and the one which Bevir also notes, was the idea that art was essentially social. In his *Chapters in the history of the Arts and Crafts movement* (1902), Oscar Lovell Triggs analyses Ruskin's definition of art. According to Triggs, Ruskin believed that art was a mode of expression like any other and thus had moral and social characteristics. Triggs summarizes Ruskin's thoughts as follows:

> It follows that the chief test of art is its inclusiveness, its lowly origin, its universality, its serviceability, its degree of satisfying genuine social needs. (1902, 37)

Furthermore, Bevir (1998, 180) argues that Ruskin believed good art was something that was produced by good labour: "a work of art reflected the society in which it was produced". Presuming that good art reflected a good society, so in turn would bad art also reflect a bad society. What that good society would be like, was in Morris's and Ruskin's minds different, as Morris advocated socialism and democracy, and Ruskin was rather against democracy (Triggs 1902, 34). Triggs further speculates that Ruskin believed that the medieval society was better than the Victorian: "It must be confessed that in respect to government Ruskin seems to incline to the mediaeval view of governance rather than to the modern" (Triggs 1902, 34).

Ruskin (2004A [1853], 28) believed that the society of the Middle Ages produced good art, and this entails, according to his theory of social art, the society of the Middle Ages

was, therefore, also good. Morris thought that the medieval society was not ideal because of its brutality, but did agree that in some ways it was better than his own time:

> That time was in a sense brilliant and progressive, and the life of the worker in it was better than it ever had been, and might compare with advantage with what it became in after periods and with what it is now; and indeed, looking back upon it, there are some minds and some moods that cannot help regretting it, and are not particularly scared by the idea of its violence and its lack of accurate knowledge of scientific detail. (1888)

According to Ruskin, in ancient civilizations the highbrow saw the workmen who executed their designs as always lacking in skill – unable to achieve perfection (2004A [1853], 10–14). Medieval Christian art, however, accepted how man and his work are imperfect, nulling the need for perfection and opening the door for individual freedom of creativity. In the Middle Ages the workman was freer to express his or her creativity than in the factories of Ruskin's day, where they were only doing repetitive tasks. This is the essence of Ruskin's famous line "You must either make a tool of the creature, or a man of him. You cannot make both" (2004A [1853], 14). Crawford (1997, 18) notes in his analysis that it almost seems as if to Ruskin slavery of the mind was worse than slavery of the body.

Both Morris and Ruskin felt that the current situation of the arts was deplorable and that one reason for it was a separation of the arts and the crafts and the consequent exclusiveness, something that was not so intense in the Middle Ages. William Morris writes grandly in his lecture of 1882, "The Lesser Arts," as follows: "I do not want art for a few, any more than education for a few, or freedom for a few" (1882C). The phrase, as well as showing that Morris represents egalitarianism, reveals how he felt about art. By juxtaposing art with education and freedom, he places them on the same level of importance. This remarkable phrase is a consummation of what he says in the paragraphs leading up to it. In them he deplores the current state of art caused by its confinement by a few "highly

cultivated men" who have the possibility to practice art (1882C). Art should not be exclusive. The separation of the arts and the crafts, according to Morris's history of art, had caused social disparity because the artists (of leisure) were elevated into the upper class and the craftsmen (of employ) fell into the working class. By the time industrialization came into play the craftsmen employed in the decorative arts were slowly being made useless by machinery that could substitute them and produce goods more efficiently. The new factory worker was only in charge of the mechanical output, while the design of the product was separated from the work itself; brain and brawn were separated. This division of labour reflected a corresponding class division. In Ruskin's words, "we call one a gentleman, and the other an operative" (2004A [1853], 24).

There was freedom of expression for the artists of the upper class and mechanical toil for the craftsmen – or by now they were called workers – members of the working class. This disparity reflected the misery of the arts in a social and artistic sense. The working men and working women who were supposed to be the primary creators of decorative art had no real part in art. For Morris and Ruskin this is the essential difference when compared to the situation in the Middle Ages. To right this wrong, the workers would need to be made artists yet again, and in doing that, they would be annulling the social inequality that existed between the brain and the brawn.

### 5.3. Art of the People

Morris stresses that great historical buildings and monuments were not built by kings and emperors but rather by mere handicraftsmen, men "who have left no names behind them, nothing but their work" (1882C). Morris pursued the same notion in another lecture in which he mentions Sir Walter Scott. He writes that Scott felt Gothic Architecture to be somehow romantic and that it moved him emotionally – something he felt ashamed of. According to Morris, Scott experienced beauty in the architecture and was puzzled. He could not

understand why he felt that way because he had been taught "nothing could be art that was not done by a named man under academical rules" (1882B). Morris's comment points out the deeply rooted thought that only someone of higher stature, a self-proclaimed artist, or a genius, can create art and beauty. With the example of Scott, who displays the effects of such thought, Morris also shows that this is not the case. For Morris, the fallacy of the genius only created inequality. For Morris, luxurious art, which is art for the few, was as immoral as it was for "a rich man to sit and eat dainty food amongst starving soldiers in a beleaguered fort" (1882C).

Morris also rejected the idea of inspiration, which again seems like a commentary against the genius. According to Pevsner (1991, 23), Morris believed that inspiration did not exist but that good art was merely good craftsmanship. In Morris's own words:

> That talk of inspiration is sheer nonsense. I may tell you that flat. There is no such thing. It's a mere matter of craftsmanship. (Quoted in Latham 1985, 4)

Without inspiration or without the concept of a creative genius art can be made relevant to everyone, more democratic. This, in effect, makes it possible for Morris to bring unto the stage the concept of a shared art, the democracy of art. This is how he defines it in his lecture "The Beauty of Life":

> That cause is the Democracy of Art, the ennobling of daily and common work, which will one day put hope and pleasure in the place of fear and pain, as the forces which move men to labour and keep the world a-going. (1882B)

The wish to ennoble daily and common work can be interpreted in the context of art's social character as the wish to re-unite brain and brawn, or, as Bevir does, as a sign of Protestantism (1998, 181). Notice especially the reference to fear and pain in the quotation above. The fear and pain can be interpreted as a reference to the hurt caused by machines whereas the

democracy of art could provide a return route to handcrafts and pleasure. I will be returning to this latter reading in more depth later on. I believe these are all accurate interpretations and they all have at heart the idea that art should belong to everyone. This is expressed even clearer in Ruskin's lecture, Arata Pentelici, in which he says: "[...] the beauty which is indeed to be a joy for ever, must be a joy for all" (Ruskin 2004B, xx). Crawford sees all of the above-mentioned ideas as central to the Arts and Crafts Movement:

> The Unity of Art (artists and craftsmen working together), Joy in Labour (the creative satisfaction of ordinary work), Design Reform (making manufactured objects better), all three can be seen as facets of a single idea which I take to be at the heart of the Arts and Crafts Movement. That is the idea that creativity can be part of the daily experience of ordinary people at work; that it is not something special, not the preserve of fine artists and geniuses. (1997, 20)

I agree. The idea of art's vital connection to the social environment and the wish to make art inclusive are central ideas to the Movement. They are also linked together. On the one hand, the social inequality was the root cause of art's exclusiveness, and it would need to be uprooted. On the other hand, if art were to be made inclusive, social inequality would have to be uprooted. By turning to socialism Morris tried to achieve social equality through political means. According to Bevir (1998, 184–185), in the end Morris was mainly concerned about his aesthetics, and therefore his aesthetics dictated his politics; socialism was for Morris a logical consequence of his pre-existing ideology. I partly agree with Bevir's view, but do contest it to some degree. Morris did not feel that the Arts and Crafts Movement could affect much change in society by only concentrating on the condition of art (Stansky 1996, 125). He believed that a change in the structure of society was needed for there to be a change in art, and therefore he advocated a revolution. I do not believe that Morris was advocating democracy and socialism just for art's sake but for the sake of all humanity.

The following five ideas are in my opinion the basis of the democracy of art that the Arts and Crafts movement presents: (1) the idea that everything made by man is art; (2) real art is the result of happy work; (3) real art is useful; (4) art is at its core linked to society and its well-being; (5) only public art can bring society the well-being it needs.

## 6. The Democratization of Art in the 21st Century

In the 21st century, along with technological developments, new, arguably socialistic ideas have emerged. They have risen up to challenge capitalism and its long-lived modes of action. Among these the most prominent are peer production and the different movements that call for openness in the same manner as open source software, but in other areas of human endeavour. These movements, as I will demonstrate, represent values that are reminiscent of the philosophy or ideology of the Arts and Crafts Movement.

### 6.1. Peer Production and the Logic of the Artist

The emergence of peer production and open source practices in the computer world have shown that the conventional methods of organizing labour and running a business are not the only viable options available. The open source practice, based on open access and free-willed participation, baffles corporate logic because it represents almost an opposite ideology: sharing instead of proprietary rights and voluntary labour instead of wage-driven work relationships. An open source community has, instead of pecuniary aims, more idealistic aims of creating good products for the sake of creating good products, something that does not fit into the mechanics of profit-driven entities. This new economic logic is called hyper-productivity by Bauwens (2009, 128). Hyper-productivity conveys "drive for absolute quality" (Bauwens, 2009 128). The phenomenon of hyper-productivity is also visible in more traditional self-managed worker co-operatives, where the products created often are of too high quality, and do consequently not meet the market demands (Holmström 1985, 10, more on worker co-operatives in section 6.4).

In my view this hyper-productivity, central to the open source culture and peer production, most likely derives from voluntary work. In other words, people collaborating in open source communities are most likely motivated to create products that respond to actual end-user needs – simply because they are themselves also end-users of the products – and

they believe they are working towards a goal that is intrinsically valuable: a good product. In his historical account of medieval practices in arts and crafts, Morris points out that artists created their products to suit real needs (1889, 67–68). This is likely also a motivating factor in peer production communities. Moreover, workers' co-operatives share the same objective of meeting consumers' real needs, instead of catering to "false needs simulated by advertising" (Holmström 1985, 8). Peer producers, and to some degree workers in co-operatives, are exceedingly autonomous (Benkler and Nissenbaum 2006, 405–406). Ideally, it would seem to imply that people in peer production communities contribute only to causes that they see worthy of contribution.

This logic differs from wage-driven labour where the worker is, quite obviously, most often only motivated by salary. This dissimilarity between market-oriented and quality-oriented work is also apparent in Morris's criticism of the industrial production of the 19th century. According to Morris, the ethic of the man of commerce, who is only geared toward the attainment of profit, is different from that of the artist who only aims to produce items as well as he possibly can. Consider the following quotation from Morris's lecture, "The Arts and Crafts of To-day"

> To the commercial producer the actual wares are nothing; their adventures in the market are everything. To the artist the wares are everything; his market he need not trouble himself about. (2000 [1889], 68)

The logic of the artist that Morris describes here bears resemblance to Bauwens's hyper-productivity. The artist and the peer producer are oriented towards the product, not the market. According to Morris, when the artisan is oriented towards the product in an industrial setting as a wageworker he or she loses touch with the wares themselves that he or she produces. As a result, the wageworker sees the wares only as a source of livelihood (1889, 66). This means that the business model itself eradicates the will or at the very least the

possibility of crafting proper products. Morris regards this type of commercialism as destructive to art. But how realistic is it to disregard the wage-oriented approach and pursue more idealistic and altruistic aims? At the moment, peer production is a system that operates within the capitalist system, and is to a large extent dependent on it. According to Bauwens (2009, 130), the current system allows people to operate outside of the commodity and wage logic, but only as a hobby. Peer production is a system that is "sustainable collectively, but not individually" (Bauwens 2009, 131). Thus perhaps the biggest problem that faces the peer producer and the logic of the artist is the difficulty of its incorporation into the capitalist system. At the moment, peer production creates use value in the form of wealth (social capital) but the larger part of this use value stays outside of the market economy because the market economy operates around money and profit, not wealth. The market operates only on the margins of peer production (Bauwens 2009, 134). The question remains: is peer production at all possible inside the capitalist system which operates this way?

Peer production is a type of social production. People take part in producing something for the common good (Benkler and Nissenbaum 2006, 396) and the whole modus operandi of a peer production society is based on – and revolves around – mutual co-operation of peers. Because peer produced products are created in co-operation with the society, peer production reflects the needs of the whole society, and the created product does not only serve to increase profits of a single entity, the latter point being a source of much of Morris's criticism. In this regard peer production resembles closely Morris's ideals. People are contributing to purposes they find worthwhile and taking part in the collaborative process of creating things, not just being passive consumers, is an act of being an artist in the Morrisian sense. The independence and autonomy of individuals collaborating in peer production, and them acting largely outside the economic sphere, would seem to guarantee that things produced are of actual use to the peer producers themselves. In the Morrisian sense this guarantees that the product, or the art, that is produced is useful, and serves to

minister either to the body or the soul. In short, if you produce what you need, you produce something useful.

### 6.2. Socialism of the 21st Century

Peer production is highly decentralized. It is production created by freely organized groups of people and managed by collective decision-making. In this sense it resembles leftist ideology to a high degree, providing another link to Morris's thinking. In my view, Morris's socialism can rather accurately be described as a form of anarcho-syndicalism. Consider the following quotation, referred to often by the acclaimed linguist and social critic Noam Chomsky:

> [Anarcho-syndicalism means] opening the way to an alliance of free groups of men and women based on co-operative labour and a planned administration of things in the interests of the community. (Rocker 1938, Chapter 4)

The above quotation comes from Rudolf Rocker's *Anarchosyndicalism* (1938).

It seems like a good assessment of peer production, too, but broader. Let me explain what I mean by saying that anarcho-syndicalism is a broader definition of peer production. Peer production has been purposefully kept apolitical in order to fashion it more attractive in the present society. Also, the term "open source" was coined as a move to depoliticize free software (Benkler 2006, 66). For the time being peer production is used to refer only to immaterial production, not all labour. The Arts and Crafts ideal of the workshop is also nearly identical to the concept of peer production but it only addressed the decorative arts. The principle idea is essentially the same. Bauwens (2009) contends that the similarities between peer production and 19th-century socialism are evident:

> Just as socialism was the social ideal of the nineteenth and early-twentieth-century factory worker, so peer-to-peer production is emerging as the social ideal of contemporary knowledge workers. Indeed, peer-to-peer production is the socialism of the twenty-first century. (2009, 131)

While the Arts and Crafts Movement, spearheaded by Morris, was crusading to change the way labour is organized, that is, to change how people relate to the production of goods and attempted to humanize production, the open source revolution is a much quieter one that started on the fringes and grew to challenge the contemporary paradigm of the software world. The apolitical guise that it was masked in most likely assisted its employment. Now that we are experiencing a remarkable shift towards open source software, it is evident that this concept of self-direction and free organization is not only a utopian dream – but that it actually works.

According to Noam Chomsky's (1973) account of Rocker's politics, before the toppling of the capitalist system the workers "embody in themselves the structure of the future society," which is a precursor for the appropriation of capital and the tools of labour. Because this structure cannot exist inside the capitalist system indefinitely, a revolution is unavoidable. According to Marx and Engels, the ruling ideas are the ideal expression of dominant material relationships, and vice versa, when one of them changes, the other changes also (1932A, see also Holmström 1985, 7). Marx's theory of the base and the superstructure, posits that the economic and material basis of the society, the base, determines the culture and its values, the superstructure. Based on this theory it would therefore be safe to assume that changes within the base, in this case affected by the openness movement and its principles, would change the material and economic relations to a great extent. This would also transform the superstructure of culture, thus transforming our perception of the world. Instead of our minds being geared for profit, as the capitalist system supposes, we would find the values of collaboration and altruism more appealing, found in the openness movement and in peer production. For the time being the current encapsulation of peer production inside the capitalist regime allows it to operate, but if it were to become the norm in all production, the current system would need to adapt radically or, perhaps more likely, face subversion.

Even some proprietary companies that take part in peer production, often representing cultural production such as the computer game company Valve, prize "flat" non-hierarchical structures where all workers are expected to take part in decision-making. In Valve's *Handbook for New Employees*, the company explains how organizational structures develop by themselves, but when these structures are held up too long or they have been prescribed from above they begin to serve their own interests, which is counter-productive in the long run (Valve 2012, 16). This is classic anarchist rhetoric that criticizes hierarchical power structures and questions their authority.

Morris and Marx had an ideal of common aesthetic creation that is visible in the following famous quotation from Marx:

> In a communist society there are no painters but only people who engage in painting among other activities. (Marx and Engels 1932B)

This ideal is reflected in the current way knowledge workers feel obliged to be constantly creative. Ceraso and Pruchnic (2011, 357) point out that the open source culture sees a strange inversion of this idea proposed by Marx. Workers are expected to engage in "aesthetic modes of production" by default, and they are consequently wishing for the option of not having to. The obligation of being artistic is not a desirable outcome, but it nevertheless goes to show that aesthetic modes of production are more integral a part of the individual's user-maker experience when they are involved in immaterial production or an open source project. This would seem to suggest that open source production might even have taken the approach of merging aesthetics with production too far – reflecting perhaps the possible complications in an entire system that would be based on peer production, or the medieval guild principles presented by the Arts and Crafts Movement. The question emerges: can a society actually be based on everyone being a craftsman (who may in this case be interpreted as artist), at least to some degree, as Ruskin would have preferred (2004A [1853],

24)? It does not feel plausible in the contemporary society, or any society, that the production of goods, whether material or immaterial, would be prescribed to all individuals as a duty, as seems to have become the case according to Ceraso and Pruchnic. Rather, the ideal solution would be offering the possibility of participation to individuals and making the relationship between the user and the maker more intimate.

### 6.3. Co-operative Individuality and the Workshop Ideal

When I was in junior high school I began to practise three-dimensional modelling. My hobby was sparked when I registered onto an online "modding" community called the Clan of the Dead Goat (CDG), an internet forum where people from around the world were participating in creating free content for the popular computer game *Counter-Strike*. Only until recently have I discovered that this community was in fact a prime example of peer production. When I entered the community I had not done much 3D modelling, but very soon after reading a few tutorials, I began to produce content. I posted my attempts at creating content on the forums and the community would critique the work, give tips and help. The entire process of crafting a 3D model and transforming it into the final product in the game was a result of numerous individuals who did their part altruistically, without charge and for the common good of the community. The modding community taught me how to do 3D modelling and other computer graphics, and some of my fellow "modders" have even landed jobs in the gaming industry – their only education being high school art courses and several years of attending an online forum.

Charles Robert Ashbee, a designer and an important Arts and Crafts affiliate, took Morris's ideas of the medievalist workshop (it was modelled on the medieval guild system (Triggs 1901, 155) and attempted to make them a reality. The principles of the workshop were not unlike those of open source or peer production communities. Ashbee set up the Guild and School of Handicraft in 1888 where his goal was the following:

> I conceive a workshop, or series of workshops and studios under a single roof, owned and conducted by the craftsmen themselves—so owned that the entire returns from the sale of products accrue to the workers, and so conducted that each craftsman works individually as a unit, and yet co-operatively as forming a part of a community or guild. (Quoted in Triggs 1902, 192)

The principle behind the workshop was perhaps the paradoxical-sounding concept that Triggs (1901, 158) calls co-operative individualism. Individualism entails in practice that the craftsman is given the freedom to be self-directed and autonomous. In other words, the craftsman is the designer and the maker of the product, not just a cog in the machine as exacted by the division of labour. Co-operative means that the craftsman works in a guild or workshop with other craftsmen who teach, provide inspiration and support and learn from each other (Ashbee 1894, 42–45). This concept is virtually the same as that of peer production communities like the Clan of the Dead Goat. The traditional workshop handed down craftsmanship skills and the new craftsmen would learn their skills entirely inside the workshop. This is also the way CDG functioned. Certain techniques, which were considered part of the tradition, were favoured among peers. And, modders of the old school, who were considered grand old men or women, were highly appreciated for the knowledge and skill they passed on. The guild itself provided a social side to production, which to Ashbee had a central role in art, and relates to the aspect of co-operation:

> In the coming together of men, in the magnetic affinities that spring up between them, are the forces that engender Art creativeness, just as in academical life they give rise best to speculation and literary creativeness. Ideas may be conceived in solitude, but they are brought to birth by co-operation. Men take creative force from each other. (Ashbee 1894, 42)

Ashbee takes this workshop idea to be radically different from the idea of 19th-century creativeness where introspection is at the centre of artistic creativity. Following Morris,

Ashbee exhibits here a view that diminishes the significance of the genius in favour of the collective. Ashbee (1894, 44) exemplifies this further by valuing the Pre-Raphaelite Brotherhood over William Turner, the Romanticist painter. The Pre-Raphaelite Brotherhood was a controversial and understatedly revolutionary band of painters who demonstrated a distinctive type of collaboration (Prettejohn 2007, 103). Ashbee built upon the Ruskinian and Morrisian principle of art as inherently connected to society. Ashbee criticizes the whole idea of the creative genius as he points out how "ideas may be conceived in solitude," but are executed inside a community (1894, 42). When art is detached from society it does not serve the society. In the close co-operation and communication between members of the community such a problem of detachment does not arise. The somewhat cynical notion of how people always act in their own interests (which according to Marx's theory of the base and superstructure, is created by the capitalist system) seems antithetical to the ideal of the workshop. When people are co-operating inside a community their interests would also extend to the interests of the community, making the hunt for individual gain less valuable. This line of reasoning is in harmony with the criticism of capitalism that was central to the Arts and Crafts Movement. At the same time the connection to peer production becomes evident, too.

### 6.4. Production of Material Goods

Even though most of the projects and companies that function in the non-hierarchical manner described above represent the relatively new field of immaterial production, the non-hierarchical structure is not at all restricted to it. The decentralization and self-directedness that is so characteristic of open source projects can also be seen in use in software companies whose products are proprietary, like in the case of Valve. Most importantly, the principles of co-operative individuality and non-hierarchical structure can be applied to most kinds of work and production. Prime examples of this are worker co-operatives in Italy as well as the

Basque Country, where centuries-long oppression has created a tightly knit social identity. These co-operatives work on the same principles accounted above, maintaining that the worker does not need to be employed by some third party who figures into the equation only as the owner of the means of production (Holmström 1985, 7). These co-operatives do have certain hierarchical structures, but they are not fixed from above but are agreed on by the workers themselves (Wolff 2012). Companies like the Mondragón group in the Basque Country are worker-managed and some in Italy are both worker-owned as well as worker-managed.

The principles of worker co-operatives correspond to a high degree with Ashbee's idea of the workshop. Consider the description by Holmström of worker co-operatives below:

> [M]ore human relaxed satisfying conditions at work; freedom for workers to speak their minds, make decisions, choose their pace of work, [...] and autonomy, freedom and responsibility, as values in themselves and things people want when they see a real chance of having them. (Holmström 1985, 8)

Holmström continues:

> Profits are reinvested or distributed to members. Wages are based on sales agreed between regional employers' federations and unions, with small supplements agreed locally. (Holmström 1985, 8)

These co-operatives have existed for long periods of time: the Italian CMC Ravenna was founded in 1901. Therefore, it is clear that this type of production can also succeed in more traditional fields of work. As this type of organization is also characteristic of peer production, it is evident that its principles are by no means unprecedented phenomena. What is new, however, is the emergence of peer production in connection with the relatively new technology of 3D printing which offers unprecedented opportunities in the production of material goods. The incorporation of material production – 3D printing – with the highly

creativity-oriented practices of immaterial production might well be a significant step away from the current capitalist, market-oriented system towards an actual paradigm shift.

### 6.5. 3D Printing Revolution

Additive manufacturing, or 3D printing, has been hailed as the new industrial revolution that will change the world. Newspaper reporters have shared this excitement, as exemplified in one New York Times (Vance 2010) headline: "3-D Printing Spurs a Manufacturing Revolution." The scientific community has likewise expressed excitement: "3D Printing is definitely an emerging technology that will change our world" (Kaur 2012, 360) and "This disruptive technology has the potential to drastically change the landscape of the conventional manufacturing supply chain" (Huang, et al. 2012, 1198). The anticipation and expectations that this technology has stirred are enormous – and with good reason. The potential that additive manufacturing, or 3D printing, promises is truly subversive: the possibility of anyone with a 3D printer to manufacture almost anything at home at a low cost. Calling 3D printing an industrial revolution might be too far-fetched at the moment, but at the very least, like in the statement above by Samuel Huang and others, it has the potential to change the manufacturing supply chain. Lately, 3D printers have aroused plenty of discussion with the early adopters printing fully functioning weapons. With full freedom to manufacture almost anything, the cons are as substantial as the pros, as is the case with any revolutionary technology.

The prospect of homemade weapons may be terrifying to law enforcement and some part of ordinary citizenry. To corporations the prospect of entirely changing the manufacturing landscape may be just as terrifying. According to Melba Kurman (Skype interview with Kurman 2013), the co-author of the book, *Fabricated, The New World of 3D Printing* (2013), a complete change in manufacturing is unlikely to happen. According to Kurman, mass manufacturing is not going to be substituted by 3D printing or by digital

manufacturing in general. Kurman believes that the change is going to be subtle with 3D printing technologies “creeping up unnoticed”. A sudden revolution, she believes, is not going to happen. This would seem a likely scenario. We have seen that open source and peer production rely on the current paradigm of capitalism in order to function. 3D printing has not, and will not, go unnoticed in the corporate world as it might in the eyes of an ordinary consumer. Large corporations, to suit their needs, will most likely be the first to harness the technology. This could happen in the form of cloud manufacturing, for example, where an order is placed into a cloud where small manufacturing nodes in different locations fabricate the product and then ship it to the customer (Lipson and Kurman 2013, 45–46). This is, in effect, decentralized mass manufacture, a strange strategy that utilizes the new technology but eliminates the most subversive developments that 3D printing can provide, such as bringing the producer closer to the user or merging these two altogether. The current system of manufacturing products is going to be with us for some time. However, 3D printing and other digital manufacturing methods offer us a new way of doing things that could perhaps one day become a more prevalent form of manufacture – one that would be more democratic.

The possible revolution that 3D printing could bring about is the change it could have on the way goods are designed, manufactured and consumed. If 3D printers were to become commonplace in homes or in publically funded institutions, such as libraries, or if 3D printing shops would pop up in towns in the form of small local businesses, supplying people with goods to satisfy most of their needs, there would certainly be much less need for mass production. It is not hard to imagine what would happen if anyone could print their toothbrush at home, for example. The toothbrush could be an open source stock model downloaded from the Internet for free, a customization of it, or it could be of the person’s own design. And if this person did not have a printer at home, they could go to a printing shop down the street and ask the shop owner to do the printing for them. While it is good to stay sceptical about predictions of large-scale do-it-yourself product manufacture, this kind of

prospect is not outlandish. It is in fact very akin to production before industrial production, or at its beginning. But this time over instead of doing it primarily without technology – it would be done with technology. And in this sense, returning to the way products were manufactured before the peak of mass production, it is also similar to what the Arts and Crafts Movement was trying to achieve. Atkinson (2011) acknowledges the similarities between the ways of the past and what is happening with 3D printing:

> Technology has moved the goalposts from a position of co-creation to one where the user has the capability to completely design and manufacture products by themselves. It is a return, if you will, to a cottage industry model of production and consumption that has not been seen since the earliest days of the Industrial Revolution. What at first glance appears to be a futuristic fantasy is revealed, in fact, to be just the opposite: a recurrence of past ways of doing things. (Atkinson 2011)

3D printing would offer a blend of the aspects of artisan and mass production (Lipson and Kurman 2013, 27 and Liedes 2013, 48). In the same vein of thought, Kurman (Skype interview 2013) believes that 3D printing could create a more intimate relationship between people who design things, those who manufacture them, and those who use them. In this limited sense we could be returning to a similar setting as before the industrialization and come "full circle"; people would create things themselves or have them made for them close-by:

> Not everybody is going to become a maker, I think that's an overstatement, but it raises a good point that this notion of in some ways coming full circle where production is democratized or at least it is near-by. Design and production are close, they are within reach of regular people, it is not something corporations do far away. I think there will be a new relationship between people who can design and make things and people who need them. In other words people who buy them or consume them. Is that a good thing? Absolutely. (Kurman, transcript of Skype interview, 2013)

Thus 3D printing would have a democratizing effect on production as people would have more say in the products they are using and their habits would not be so plainly dictated by manufacturing corporations. William Morris stated that centuries before his time wares used to be produced with the "genuine spontaneous needs of the public" in mind, not individual profits (1889, 67–68). Making the relationship of the maker and the user more intimate in this 'old' way anew, would not be an intelligent business move in the present capitalistic economy.

Crafting one's own things was as a phenomenon very widespread before the industrial revolution. Today it is called "DIY", short for "Do it Yourself." Atkinson's description of this type of activity echoes that what is happening with the openness movement and 3D printing at the moment:

> Historically, productive and creative activities of this kind have allowed consumers to engage actively with design and the design process at a number of levels, and to express a more individual aesthetic unbounded by the strictures of mass-production and passive consumption. (Atkinson 2006, 1)

Klaassen and Troxler (2011) interviewed Renny Ramaker in *Open Design Now,* who has also observed this phenomenon that seems to cut off the middleman and cater to the customer directly:

> Take the fashion collective Painted, for example; they would love to make products for the user. The designers would prefer to make clothes for real people, not averaged-out stuff in shops; they would much rather make things one-on-one, in direct contact with the user. And I think that this really what's going on in design at this very moment. (Klaassen and Troxler 2011)

There is a definite trend emerging with open source practices, peer production and 3D printing, that seems to favour more "pre-industrial" ways of production, including a closer bond between the maker and the user. In my view, these ideas correspond to dissatisfaction

toward the familiar top-down model of production, rather than being a nostalgic return toward older practices. As we have seen these characteristics are reminiscent of the Arts and Crafts workshop ideal, as well as Morris's concerns for incorporating art into society.

### 6.6. Ecological Considerations and the Value of Commodities

Our time is arguably marked by an overwhelming supply of "things" and very often those things are considered no more than means to an end. It is safe to say that the commodity fetishism of the Western culture has skewed the way goods ought to be viewed, especially so in a time when the environment is being abused and natural resources over-harvested in an effort to increase production. The Great Pacific Garbage Patch, an enormous area of sea full of waste, is more than an apt representation of the lack of appreciation for material things in our culture. Thackara (2011) notes that the trend of openness is not only a "commercial or cultural issue. It's a matter of survival." He believes that the problems humans are facing now in terms of resource depletion and climate change cannot be resolved with the same techniques that caused them to happen and suggests that "open research, open governance and open design are preconditions for the continuous, collaborative, social mode of enquiry and action that are needed" (Thackara 2011).

Things do not have to be in this unecological way. In his book *Morality in a Technological World* (2007), Lorenzo Magnani writes:

> Many things, or means, previously devoid of value or valuable only in terms of their market price can also acquire moral status or intrinsic value. (2007, 3)

Magnani's observation about respecting things and recognizing that they have intrinsic value is key to curing the Western culture of its commodity fetishism. If humanity fails to recognize the intrinsic value of things and continues manufacturing products without moral

considerations, an environmental collapse seems inevitable. Another viewpoint to manufacturing, differing from the current capitalist logic, is vital.

William Morris saw clearly the dangers of commodity fetishism already in the 19th century: "[Art] is helpless and crippled amidst the sea of utilitarian brutality" (1891). Utilitarian thinking was at its height in the 19th-century Victorian England and even though Morris was very Victorian in his character and while he could at first sight be viewed as representing utilitarian views, such as in the notion of the *usefulness of art*, it would be wrong to do so. To Morris, art was useful by its own right, not as a tool to be used to achieve other goals. Art – the beautiful result of pleasurable work by man – had intrinsic value. Triggs quotes Ruskin: "beautiful things are useful to men because they are beautiful, for the sake of their beauty only, and not to sell, or pawn, or in any way turn into money" (1902, 19). Morris held similar views. Spicer (2005) explicates Morris's view on nature and utility:

> Beauty is utility, and beauty resides in Nature; therefore, Nature cannot be sacrificed without sacrificing both beauty and utility. This inseparability of Nature, utility, and beauty creates a powerful basis for an ecologically sustainable system of life. Herein lies one of Morris's central challenges to capitalism, which typically assumes that utility is separable from nature and beauty, that mass production for profit can persist independent of its effects on the raw materials essential to such production. (Spicer 2005, 45)

Spicer continues:

> The capitalist tendency to separate "profitable production" from its ecological context has generated negative consequences from Morris's time to our own. The belief, for example, that one can produce a crop without attending to the biotic and abiotic forces that have historically maintained the top soil proved detrimental in the Dust Bowl. (Spicer 2005, 46)

Morris was vehement in his defence of the handicrafts, the Lesser Arts, and he fought to acquire them the same kind of appreciation as high art had in his time. Morris saw clearly

that the fall of the handicrafts and the rise of mass production signalled a lapse in morality. A similar decline in morality was also reflected in the bad treatment of workers in the new factories of the industrialized world. Morris was also appalled by the manner that wares and their production were viewed and treated in his time; as strictly commodities and not as art. The lack of art in ordinary wares was to Morris a sign of disease in the culture (Stansky 1996, 67 and Morris 2000 [1889], 62). This is exemplified in the following quotation:

> The Commercialist sees that in the great mass of civilized human labour there is no pretence to art, and thinks that this is natural, inevitable, and on the whole desirable. The Socialist, on the contrary, sees in this obvious lack of art a disease peculiar to modern civilization and hurtful to humanity. (Morris 1891)

3D printing could offer a new a perspective to commodities and morality. Kurman (Skype interview, 2013) claims that the 3D printing revolution would foster creativity. If 3D printing became commonplace, most people in the industrialized world could be inspired to create use items. It would change how people think about the items they use – perhaps not just as consumable goods, but something more salient, that is, as art. As I have speculated, it is possible that 3D printing could foster more than just creativity, but also a different way of looking at commodities.

Commonplace 3D printing would bring production closer to the people and consequently change the way people think about "things". 3D printing was already playing out a remarkable trend at the Consumer Electronics Show in Las Vegas in January of 2014. In Las Vegas Voice of Russia interviewed Jennifer Howard from the company Makerbot, a 3D printer manufacturer, who noted that 3D printing changes people's world view: "Instead of thinking of going to the store, you say you can make it yourself" (Voice of Russia 2014). As the production of goods would be democratized, the aesthetic value of goods would also be subject to closer scrutiny as consumer-makers would have a possibility to set higher demands for what they are buying or making. In his lecture "The Lesser Arts" (1882C)

Morris asked: "[H]ow can I ask working-men passing up and down these hideous streets day by day to care about beauty?" (1882C). To me, the core meaning of this question is that beauty is needed for more beauty to be created, and that people do not know beauty unless they see it. If products were manufactured by end-users themselves it is safe to assume that taste in design could change and become more varied. As design would not be imposed onto the consumer from above but it would rather start with the individual himself or herself, he or she would gain his or her own perspective into aesthetics. Taste in design could thus become entirely democratic and individualistic. The perspective of consumer-makers would therefore change, but it could also do away with certain waste-inducing factors that mass manufacturing entails.

Morris exhibited a fairly great amount of green thinking that probably stems from his Romantic views of nature and antagonism toward the manufacturing industry. He has even been termed a "proto-green*"* by some (for a good discussion, see O'Sullivan 2011). The bulk of his green thinking is usually extracted from his novel *News from Nowhere* (1890) where he envisages a socialist utopia. O'Sullivan (2011) compresses the green-oriented side of Morris's thinking as follows:

> [E]specially in *News from Nowhere*, Morris anticipated many aspects of modern green thought – alternative technology, renewable energy, simplicity of lifestyle, community self-reliance, production only for need, prolonging the life of goods in order to reduce resource depletion, reduction of waste, and above all the key role of what is defined as 'work' (for both men and women) in allowing us all to express our essential humanity in a free and sustainable society. (O'Sullivan 2011, 23)

3D printing technology could address many of these concerns put forth by Morris in his novel and therefore help with environmental issues by doing away with the need for mass production and by moving on to more use-based production of goods. The hyper-productivity found in peer production and the greater end-user co-operation would lead to better product

design and dispose of planned obsolescence in which products are designed to fail after a certain period or amount of usage by which time the customer is forced to purchase a new product. Planned obsolescence brings better profits for the manufacturing companies but leads to more waste.

There is, however, a flipside to 3D printing that may in fact have a more destructive effect to the appreciation of produced goods than an elevating one. In their book on 3D printing, Lipson and Kurman observe how 3D printing can induce "a spirit of 'irrational fabrication," where the ability to print item after item with utter ease leads to very wasteful behaviour – an effect not unlike the one which cheap laser printers created when they were first introduced (2013, 213). It is thus unclear whether the democratizing effect of 3D printing could be thwarted by the possibility of cheap replication and lead to even worse appreciation for material goods than before. On the one hand, this raises the question: is it at all possible to produce things responsibly without returning to handcrafting? On the other hand, relocating manufacture and design to the consumer would supposedly reduce mass manufacturing. This would in turn eliminate the excessive production of commodities that mass manufacturing entails and reduce waste and the overharvesting of natural resources. It would also decrease the need to manufacture commodities in developing countries whence they would need to be shipped to consumers, which, because transportation relies heavily on fossil fuels, is environmentally questionable. The development of new materials and technologies that would allow the user of a 3D printer to recycle printed matter would also be a step in the right direction.

### 6.7. 3D Printing as Democratization

Several projects have been established since 3D printing was introduced, a great number of them being based on open source principles. As noted earlier, 3D printing holds great promise of becoming a democratizing force in the world of manufacturing. One of the more

interesting developments in this regard is a non-profit project called *WikiHouse*. Their aim is to "allow anyone to design, download and 'print' CNC-milled houses and components which can be assembled with minimal formal skill or training" (WikiHouse). Despite the fact that WikiHouse incorporates CNC machinery (which cuts material with the help of a 3D design rather than creates objects by adding material) in its plans instead of 3D printers, CNC technology does fall into the larger category of digital manufacturing.

Alastair Parvin, the co-founder of WikiHouse, gave a talk on Technology, Education and Design (TED) in Longbeach California in February of 2013 in which he presents the guiding principles of WikiHouse operation. In his talk Parvin speaks about the importance of shifting the design of buildings to everyone instead of for the richest one per cent of the population. In his opinion, the citizens themselves, not large corporations, should develop cities. Furthermore, Parvin says that open source hardware and the 3D printing revolution allow people to build for themselves. He also says that these developments allow the design team to consist of *everyone* and that they make it possible to manufacture wherever manufacture is needed (Parvin 2013). Parvin also reflected on the social question related to owning the means of production, and how the technology could turn that notion around:

> [W]hen we think that the major ideological conflicts that we inherited were all based around this question of who should control the means of production, and these technologies are coming back with a solution: actually, maybe no one. All of us. (Parvin 2013)

Parvin's project WikiHouse reflects those sides of 3D printing and open source thinking that are perhaps the closest to William Morris's ideas and those of the Arts and Crafts Movement. Let us recall for example this exhortation by Morris for public, democratic art:

> [R]eal art, the expression of man's happiness in his labour, — an art made by the people, and for the people, as a happiness to the maker and the user. [...] That is the

> only real art there is, the only art which will be an instrument to the progress of the world. (Morris 1882A)

The title of Parvin's talk, "Architecture for the people by the people", echoes this sentiment. Morris contested the idea that the means of production should be in the hands of the privileged classes (1890). Parvin, like Morris, calls for the democratization of production:

> If design's great project in the 20th century was the democratization of consumption – that was Henry Ford, Levittown, Coca-Cola, IKEA – I think design's great project in the 21st century is the democratization of production. And when it comes to architecture in cities – that really matters. (Parvin 2013)

Architecture, Parvin says in his speech, should not only concentrate on designing and erecting buildings for the richest one per cent of the world's population. The Arts and Crafts Movement's architects Charles Voysey and Philip Webb were also concerned with building not for the rich alone. This is a notion that warrants attention, as this was fairly rare in the 19th century (Stansky 1996, 131). In a humoristic fashion Parvin points out a similarity between the new ways of doing things and the old pre-industrial ways of doing things: he refers to building with WikiHouse as an old time barn raising with an internet connection (Parvin 2013).

The democratization of production, however, will require some redefining of existing concepts. The Arts and Crafts Movement advocated a kind of amateurism – a meaning that has been preserved in the current usage of the term "arts and crafts*"* in the United States, where it is commonly used to refer to children's crafting or the hobbyists' DIY. The Arts and Crafts Movement was against professionalism because of the all-encompassing philosophy that was the ideal of the democracy of art – everyone was to be able to participate in it (Crawford 1997, 24). Ruskin talked about the "joy for all," and Morris said he did not want "art for a few." Atkinson (2011) writes about the emerging practices of open design as likely to cause the terms amateur and professional to transform. Atkinson sees a future where the

designer takes the role of an orchestra conductor who has to give up his privilege to the final product and allow individuals to participate and co-create the final product by moulding and adapting the designer's plans by themselves. As it is, this idea is reminiscent of Ruskin's praise of the Gothic architecture. I believe Ruskin thought that all men incorporated in the construction of buildings should have the same rights to affect the design: "the workman ought often to be thinking, and the thinker often to be working" (Ruskin 2004A [1853], 24). It means that the designer's task is not only the privilege of the designer but of everyone taking part in the process. To Ruskin the Gothic architecture was most admirable because it allowed the craftsman the possibility of free expression and relinquished the obligation to achieve perfection (Ruskin 2004A [1853], 11–12). At the same time, Atkinson's future vision is reminiscent of Morris's line that great buildings of the past were not built by kings but by men in co-operation. In fact, Henry Heathcote Statham writes about modern architecture and William Morris, in the eleventh edition of the *Encyclopaedia Britannica* (1911) in the following manner:

> The building artisans, in fact, were collectively to take the place of the architect and the form of the building [was] to be evolved by a natural process of growth. This was a favourite idea also with William Morris, who insisted that medieval art – the only art which he recognized as of any value [...] – was essentially an art of the people. (436)

In this light the co-operation of the past idolized by Ruskin and Morris is not at all dissimilar to that envisioned by Atkinson.

Open design is part of the openness movement that is now taking the world by storm. Open design shares the philosophy of open source software. The philosophy involves the emancipation of information, decentralized, flat power structures and the hacker ethic. If the slogan of the hacker movement is "information wants to be free," the slogan of open design would be "design wants to be free". I have already shown in this thesis how the principles of

peer production and open source are already being put to use in digital manufacturing. Open design approaches this state of affairs from a design perspective, while "Open Manufacturing," used by Bauwens, approaches it from the manufacturing perspective. These two are closely related because, in order to manufacture, design is needed (Bauwens 2009). Open design and open manufacturing are good examples of the fact that peer production and openness are becoming a reality in the material world. The socialist utopia that Morris envisioned seems almost within reach.

Michel Avital defines open design in his article, "The Generative Bedrock of Open Design," as follows:

> Open design signifies open-access digital blueprints that can be adapted at will to meet situated requirements, and can subsequently be used by consumers to fabricate products on demand by commercial, off-the-shelf production methods. The open design model diminishes the traditional vertical value chain that is formed by designer-manufacturer-distributor-consumer relationships and offers an alternative, open web of direct links between designers and consumers. The resulting short-spanned, transient and non-hierarchical relationships forge dynamic and flexible arrays of blueprints that are not only user-centred but also user-driven. (Avital 2011)

Thus open design shares the ideology of the open source movement, adapting its ideas to design and manufacture. Open design, along with open manufacture, are perhaps the best examples of physical creation of goods that follow open principles. Open design and open manufacture also bring out the similarities with the Arts and Crafts Movement.

Another good example of changes happening in manufacturing is the maker movement. Chris Anderson's book *Makers* (2012) is an analysis of the maker movement from a business perspective. In his book Anderson traces the roots of the movement to lone inventors working in their basement and the Web revolution that democratized publishing. According to Anderson, with these two things combined, we get the maker movement. Anderson's (2012) three-point-definition of the movement is the following:

1. People using digital desktop tools to create designs for new products and prototype them ("digital DIY").
2. A cultural norm to share those designs and collaborate with others in online communities.
3. The use of common design file standards that allow anyone [...] to send their designs to commercial manufacturing services to be produced in any number, just as easily as they can fabricate them on their desktop. (2012, 21)

Anderson is talking about precisely the same phenomenon as I have discussed in this thesis – the methods of the digital sphere being utilized in physical production. Anderson's discussion of the phenomenon, however, is conducted from a very business-oriented point of view. The book serves as an introduction for companies to get involved in open source business models and could be very cynically characterized as a handbook for taking advantage of the maker model. Anderson's attitude is visible in the following extract:

> [Openness] means cheaper, faster, and better research and development, which in turn can create unbeatable economics for companies whose products are developed this way. [...] Some of the most costly functions of traditional companies can be done for free, as long as the social incentives are tuned right. (Anderson 2012, 109)

Anderson does not, therefore, look at the "new industrial revolution*"* from the point of view of communities and public interest, but from the point of view of individual gain. This is interesting because peer production, which is a central part of the maker movement, has many aspects that go against the idea of individual gain amounting to a type of socialism, as I have claimed above. In section 3.4 I talked about the economic plausibility of peer production, arguing that it does not seem viable collectively, but only individually because of the supporting infrastructure of the capitalist system. The model that Anderson discusses, however, does seem to possess economic functionality at the moment (2012, 104). However, how it would function in an economy where the means of production are fully democratized is unknown.

In addition to other concerns, like the economic plausibility of peer production, the current corporate climate makes it difficult to implement open source practices. The pre-requisite for the democratization of production is the writing of sensible copyright legislature that allows open source practices to function unhindered. Restrictive copyright laws could make it difficult to establish a culture of sharing designs for commodities freely on the Internet. As developments toward openness are still nascent, the questions concerning copyright will become relevant in the near future.

## 7. Craftsmanship and the Machine in a Post-Industrial World

*Metropolis,* the German expressionist film of 1927, directed by Fritz Lang and written by Thea von Harbou, features a dystopian society divided clearly into the ruling leisure class and the oppressed working class. The working class that keeps the city running works hard in its depths, executing what look like entirely absurd tasks, such as turning the arms of a clock-like device to point them at different flashing lights. The scene can be interpreted as a commentary on the absurdity of industrial labour, which implies completing tasks that are monotonous and repetitive. The problem is that these tasks are highly important, but at the same time they downgrade the function of the workers into mere mechanical units, essentially turning them into the cogwheels of a machine. One of the film's most memorable scenes is the one in which the "Heart-Machine" of the city explodes. When the dust and the steam settle, the machine is revealed again but now it appears in the guise of the enormous mouth of the Ammonite god Moloch. Now the film portrays the workers concretely as slaves who shuffle as Dungeon keepers violently shove them, yoked together, into the Moloch's mouth. I read this particular scene as an early 20$^{th}$-century representation or commentary of the working conditions in the factories of the time. The portrayal of workers as slaves to the machine is a relevant one when discussing the cultural atmosphere of the time. These two scenes in the movie Metropolis would also have been representative of the views of the Arts and Crafts movement in the 1800s, notably that of John Ruskin.

After setting the scene in order to bring you into an appropriate mind-set, I will continue into the second analysis section and draw your attention to the question of the machine and its relation to handwork. First I will consider the different approaches to machines by Morris, Ruskin and the Arts and Crafts Movement. Then I will attempt to study the concept of art in relation to machines and mechanical reproduction, paying close attention to 3D printing and discussing its definition as a form of art.

### 7.1. The Opposition and the Compromise

To me one of the most interesting aspects of the Arts and Crafts Movement is its varying attitude towards machinery. Ruskin was strongly opposed to the use of machines and he believed that life in the factory was worse than life in a feudalistic society. In the Middle Ages, only workers' bodies, not their minds, were subject to oppression (Crawford 1997, 18; Ruskin 2004 [1853], 15–16). Morris, too, was opposed to the machine in principle. He believed that machines could not substitute the hands of men because they were not able to create art (1881). Morris did, however, believe that machines could relieve men of drudgery and dull, repetitive work (1884A; 2000 [1888], 172).

Morris said that workers who worked in factories could not produce worthy decorative art because they did not find joy in their work (1882A). Those "who do purely mechanical work do as a rule become mere machines" (Morris 1882D). The machine, in Marxist terms, alienated the worker. It means that the division of labour separated the worker from his or her work and did not allow him or her to express himself or herself. This is partly why I believe Morris advocated working by hand: the hammer and chisel do not subjugate workers and they allow the worker to channel thought into what they are working on. Following this line of thought, these workers could then rightly be called artists and they would find joy and meaning in their labour and, as a result, produce beauty.

The big question that lingers is whether Morris and Ruskin believed machines to be inherently evil. I believe that Morris was antipathetic to the machine mainly because of the division of labour and the bad working conditions workers were subjected to. Morris admits that machines would in principle be able to provide people better conditions of life (2000 [1888], 172) and "minimize repulsive labour and to give pleasure" but did not (1884A). Thus, in my view, the kernel of Morris's rejection of machinery originates from his rejection of capitalism; he did not oppose the machine in principle. Triggs writes about Ruskin's opposition to the machine in a similar vein:

> Probably Ruskin would admit to himself that his antagonism to the machine was too extreme; but to cry out against the machine is one way of insisting upon the value of human life. If the machine was always employed in the service of man, to relieve him of drudgery and of all work debasing in its nature, if it always did work for him, and produce the things he needed, little could be said against it. But in the service of mammon and greed, compelling men to be its slave and lackey, it is anything but a lovely spectacle. (Triggs 1902, 42)

Triggs notes that it is "mammon and greed" that drove men to the servitude of the machine. Similarly, Morris writes that the machine had grabbed hold of men and become the master instead of the servant:

> [I]t is the allowing machines to be our masters and not our servants that so injures the beauty of life nowadays. In other words, it is the token of the terrible crime we have fallen into of using our control of the powers of Nature for the purpose of enslaving people, we care less meantime of how much happiness we rob their lives of. (Morris 1884B)

Frank Lloyd Wright, the great American architect cited in the introduction, touched on the same subject in his 1901 address "The Art and Craft of the Machine," writing that Morris protested against the machine simply because it had been claimed by the few who were fuelled by greed and made the machine into something that enslaved people (2000 [1901], 202). Wright, in turn, was attempting to grant the machine absolution, and to convince that the machine is in fact the future saviour of art, while up until the time he was writing it had been its destroyer. Many of Morris's disciples in fact felt somewhat similarly about machines.

The Arts and Crafts groups in the 1880s, such as the Art Worker's Guild and the Century Guild, had generally more accepting attitudes towards machines than their father figure William Morris. According to Stansky (1996, 70), Arthur H. Mackmurdo, the driving force behind the Century Guild, believed that good design could only be brought to the

masses with the help of machines. Mackmurdo was thus in many ways following Morris's thinking, but he did not follow a socialist conviction. In other words, Mackmurdo was not hankering after a revolution, but instead he wanted to bring beauty and good design into manufacture – to fuse the arts and crafts ideology with what was possible at the time. This was a path far less ambitious than Morris's but no less contradictory. Much of the Arts and Crafts ideology was about making a difference not only artistically, but also socially. This is an obvious concern for many other people related to the Arts and Crafts Movement, some of whom were perhaps more politically inclined than Mackmurdo. John D. Sedding of the Art Worker's Guild writes with a clear nod to Ruskin:

> The problem of our industries has two sides – an art side, and a social side; it relates to bad art, and it relates to the bad social condition of the dwellers in [...] manufacturing towns. And if the evil be two-fold the remedy must be two-fold – we may not apply an art-remedy and leave the social maladies uncured. (Sedding [1888] in Greenstead 2005, 21)

The machine was the source of much of the malady of the time and, consequently, a large amount of the Arts and Crafts Movement's criticism is directed at the relation between handwork and machine work. Nevertheless, many, if not most, of the Movement's members chose the more reconciliatory path of ameliorating the conditions of the workers and the arts rather than tackling the whole economic system like Morris did. The solutions that the Movement came up with were all fairly similar. Sedding continues:

> [...] manufacture cannot be organized upon the basis of no machinery. We had better understand this, and make life square with facts, rather than rebel against the actual in striving for the ideal. [...] the man who made the design must be at hand at its manufacture. [...] The ideal factory is a place where the artist-designer is workman, and where the workman is an artist in his way. (Sedding [1888] in Greenstead 2005, 22)

It is imaginable that in his phrase "rather than rebel striving for the ideal" Sedding was referring to Morris's ardour for revolution. Following on similar lines, but taking it even further, Arthur Mackmurdo, according to Stansky (1996), envisioned a time when:

> [A]rtists, acting as businessmen, in control of their own manufacturing, would be enabled to make decisions, from the first sketch to the final realization. Mackmurdo believed that machinery could act as a liberating force that would free men to spend more time in pursuit of the idea of beauty itself. (1996, 71)

Mackmurdo's view would thus be very similar to that of Wright, who believed that only the machine could offer freedom and democracy to the arts. This is a crucial viewpoint when discussing 3D printing and its effects on manufacturing. For example, Ruskin's ardent antagonism would perhaps not allow the interpretation of the machine as a democratizing entity – but Mackmurdo and Wright, building on the Morris's and Ruskin's principles had already realized it in their time. It is because of this legacy that some scholars see William Morris as the key figure of the Modern movement. Pevsner (1991, 22–23) declares that because of Morris "an ordinary man's dwelling-house has once more become a worthy object of the architect's thought, and a chair, a wallpaper, or a vase a worthy object of the artist's imagination." Likewise Hermann Muthesius, the founder of the Bauhaus contemporary, Deutscher Werkbund, declared that their movement was "based on the results England achieved from 1860 up to the middle of the 1890's" (Stansky 1996, 117). Morris's influence can be seen prominently in the German Bauhaus School which combined fine arts and the decorative arts.

Could the 19th-century industrial mode of production have partly been the reason for Ruskin's and Morris's opposition to machines? Lewis Mumford points out in his article, "Art in the Machine Age," how the use of "machine methods to achieve forms and qualities that are antagonistic to the nature of the machine" had been a "pathetic error" (1928, 102). Mumford goes on to make his point:

> To deny that the machine can produce art is a fallacy; to believe that everything the machine produces is excellent art is also a romantic fallacy. To curb the machine and limit art to handicraft is a denial of opportunity. To extend the machine even into provinces where it has no function to perform is likewise a denial of opportunity. (1928, 102)

The last sentence here is of special interest. It is materially the same point I made in section 3.1. In other words, in the 19th century when mass manufacturing was still fairly new, the culture of manufacturing had not yet matured and most of the wares were of questionable aesthetic quality. Pevsner (1991, 45) writes about this state of affairs in the following manner: "With the extinction of the medieval craftsman, the shape and appearance of all products were left to the uneducated manufacturer". Mumford shares this notion when he writes of the period of industrial revolution and notes that "knowledge and taste occupied different compartments" (1928, 102). Machines were used to achieve goals they were not suited for. In the words of Mumford,

> [T]he pathetic error of using machine methods to achieve forms and qualities that are antagonistic to the nature of the machine: under this header comes the introduction of machine-carving in the manufacture of, say, Tudor chairs in order to simulate the ancient handicraft designs on a scale that will meet the vulgar mind. For anyone with an honest sense of design, the cheapest bent wood chair is superior to the faked replica of the machine. (Mumford 1928, 102)

Mumford criticizes the type of machine production that was likely the only kind that Morris witnessed. Mumford was already living in an age where the possibilities for better machine work could be seen. Presently, machine-made items can be seen as being aesthetically pleasing in their own right when they are not masquerading as handmade items. However, the question still lingers: what exactly is Mumford's "nature of the machine"?

### 7.2. Lewis Mumford's Criticism of Technology

Lewis Mumford was an American sociologist and philosopher who formulated the concepts of *Megamachine*, *polytechnics* and *monotechnics*. In my opinion, these concepts can present a fruitful perspective for studying Morris's and Ruskin's anti-machine sentiments. Mumford seems to show great empathy toward machine critical thinking – recognizing the ills of technology – but proposes like Wright that technology, when laid underfoot, can drive the cause of humanity further.

Mumford defines the Megamachine, which is not a physical machine, as a construct that allows supremacy of one group over another. According to Mumford (1972 [1966], 82–83), the Megamachine originated in Ancient Egypt, where a hierarchical organization under one monarch formed a great machine of flesh and bones that could achieve feats such as the great pyramids (see also Marx 1989, 18). According to Mumford, only later into the era of industrialization parts of the Megamachine were mechanized, but in essence it was still the same system. One difference between the ancient Megamachine and that of later periods was the replacement of ritual – very important in Ancient Egypt – by work which was more potent than ritual or law (Mumford 1972 [1966], 83). Mumford's criticism of this Megamachine in modern times is the commitment society pledges to it:

> For we must then go on to question the basic soundness of the current scientific and educational ideology, which is now pressing to shift the locus of human activity from the organic environment, the social group, and the human personality to the Megamachine, considered as the ultimate expression of human intelligence – divorced from the limitations and qualifications of organic existence. (1972 [1966], 84)

It seems that Mumford holds the scientific, positivist worldview responsible for the retardation of a more "organic" human existence. Mumford believes that new technologies that aim to "maximize energy, speed, or automation, without reference to the complex conditions that sustain organic life, have become ends in themselves" (1964, 5). Mumford,

however, does not resent this technology itself, even though he envisages a dystopian future of the "megatechnic wasteland" where access to technology is in the hands of the few and all humane characteristics are surrendered to efficiency and productivity (Witzel 2005, 392). Instead of arriving at a dystopian society, he proposes using technology in a way that would preserve a more "organic" and human way of life:

> Automation is indeed the proper end of a purely mechanical system; and, once in its place, subordinate to other human purposes, these cunning mechanisms will serve the human community no less effectively than the reflexes, the hormones, and the autonomic nervous system – nature's earliest experiment in automation – serve the human body. But autonomy, self-direction, and self-fulfillment are the proper ends of organisms; and further technical development must aim at re-establishing this vital harmony at every stage of human growth by giving play to every part of the human personality, not merely to those functions that serve the scientific and technical requirements of the Megamachine. (Mumford 1964, 85)

It is therefore plainly obvious that Mumford is not opposed to the machine itself, and even less opposed to automation. He believes that when technology is in a subordinate state – not the master, but the slave – society can benefit immensely.

In my opinion, the most salient point Mumford makes is that of separating the technology itself from the construct (the Megamachine) that utilizes it. This grants us an interesting viewpoint into Ruskin's antagonism toward the machine. Triggs's observation of the machine under "mammon and greed" being the prime motivation for Ruskin's antipathy seems very fitting. According to Swer's account of Mumford:

> [The modern Megamachine] arose due to the convergence of several social forces and tendencies; namely, mechanistic science and modern capitalism. (2004, 59)

Apart from making the separation between technology and the construct, Mumford makes interesting points about the character of technology within certain kinds of societies. Mumford's terms polytechnics and monotechnics, follow the same line of thinking which he

applies in his concept of the Megamachine. Mumford defines them as democratic technics and authoritarian technics, respectively. Polytechnics, being democratic technics, represent the uses of technology that do not dominate the society but rather form only one aspect of social existence (Swer 2004, 58). In a polytechnic society no authority exists that would dictate technology (Stoll 2003, 210). A society under polytechnics benefits from technology:

> The development of forms of technics that secured the necessities of existence and that enabled art and other acts of creativity and self-expression resulted, and it is technics of these types that characterize polytechnics. (Swer 2004, 58)

However, under an authoritarian, monotechnic society where technology is subservient to the needs of a small minority, using it as a means of control over nature and humanity, technology often has harmful effects (Swer 2004, 58). The monotechnics are fueled by an insatiable desire to increase dominance, the *will-to-power*, that eliminates other human concerns, the *will-to-function*, the urge for well-being, and the *will-to-life,* the urge to develop as a human being. These concepts he seems to have borrowed from Nietzsche who coined the notion of "Wille zur Macht" in *Thus Spake Zarathustra* (1883–1885). Once these human concerns have been eliminated, technology becomes an end in its own right. Here is what Stoll says about the matter:

> Mumford writes that [mining] depended on a disregard for human life akin to that of warfare, that it caused environmental destruction and poverty where it appeared, and that it offered the possibility of profit far beyond human needs. [...] Worst of all, the entrepreneurs and inventors who have sponsored monotechnic thought over the last two centuries "sacrificed human autonomy and variety to a system of centralized control that becomes increasingly more automatic and compulsive". (Stoll 2003, 210)

Mumford's view of technology and the ideologies that are operating behind it gives an interesting perspective to the machine antagonism that Morris and Ruskin displayed. It calls attention to what is actually being opposed. Is it the machine itself or the system that wields

power over the machine? Furthermore, the concepts of monotechnics and polytechnics invite us to draw comparisons between Morris's socialist utopia and his own time. Is the utopia described by Morris in *News from Nowhere* not clearly a polytechnic society, and the industrial England of his time, a monotechnic society? The same question could be asked for contemporary capitalism and the world of 3D printers, peer production and openness.

### 7.3. Criticism of the Capitalist System

Like Ruskin and Thomas Carlyle, Morris was a stern critic of the capitalist system. Morris's criticism of the capitalist system centred on the way it saw the production of goods only as a source of profit. For Morris the capitalist system had distorted the relationship of the maker and the user of products. Ruskin was in his own words "a violent Tory" (1998, 10) and Carlyle advocated a kind of aristocracy: "instead of Mammon-Feudalism with unsold cotton-shirts and Preservation of the Game, noble just Industrialism and Government by the Wisest!" (Carlyle [1843] in Norton 2001, 1888) Morris, in contrast, was inspired by Marx. Despite differing views on the governmental system, they all criticised the contemporary system for being fuelled by greed. Because the capitalist system was to a large extent responsible for the division of labour and industrialisation, an integral part of Morris's and the Arts and Crafts Movement's views of art is criticism of the profit-driven manufacturing system. The creation of cheap goods was a source of criticism to Morris, Ruskin and Carlyle alike. Indeed, the drive to create products cheaper and to gain a higher consumption of them is the way the capitalist system creates surplus value. This mechanism is inherently contradictory to Morris's view, according to which only things needed by society must be produced, and produced as well as possible:

> [T]he end proposed by commerce is the creation of market-demand, and the satisfaction of it when created for the sake of production of individual profits:

> whereas the end proposed by art applied to utilities [...] was the satisfaction of the genuine spontaneous needs of the public. (1889, 67–68)

Here Morris is referring to the days before 19th-century commerce and laissez-faire capitalism became the driving forces behind the manufacture of goods. Morris believed that goods should be manufactured for actual needs, and they should be manufactured well. In today's neoliberal economy the production of goods is likewise seen only as a source of profit, which does not entail a healthy relationship between the maker and the user. It is thus not surprising that the latter is called a consumer. The word "consumer" expresses well how the task of the user of products is reduced only to consumption. Hence, the relationship between the maker and the user is more of a one-way street rather than a reciprocal bond. I have noted earlier in section 6.5 that the latter is preferred in emergent movements such as open design, which I will discuss further in subsequent sections.

In Morris's company, "The Firm," work tended to be divided in the way of the modern (in the 19th-century sense of the word) assembly line and workers did repetitive work that would have been better done with the aid of machines (Stansky 1996, 31). This inconsistency between what Morris was advocating and what he did seems hypocritical. Stansky writes that Morris recognized this inconsistency but at the same time he had to acknowledge that what he wanted was not possible – that the world he lived in was imperfect and he had to make the best of it. What may also seem rather backwards is the fact that Morris was unwilling to substantially increase the wages of his workers for fear that they would become part of the middle class (Stansky 1996, 47). The disenfranchised lower classes were to Morris the nucleus of his revolution and if they would become content members of the bourgeoisie there would be no revolution. This makes it obvious that Morris was clearly not trying to change the world in any small way, but was in fact attempting to use the capitalist system against itself. By increasing his workers' wages he would have accommodated to the contemporary regime and perhaps proven that it could sustain art

craftsmanship – but he did not want to ameliorate the capitalist system, he wanted to eliminate it and instate socialism.

The Arts and Crafts Movement was more lenient toward the machine than Morris and Ruskin. The Movement believed that the machine's power could be harnessed to build a more beautiful and more democratic society. However, the Movement still rejected capitalism to a large degree and wanted to build on medieval practices, not returning to the epoch per se, but using the practices to the advantage of the people. Selwyn Image, an Arts and Crafts associate writes on the aims of The Century Guild:

> [...] to render all branches of Art the sphere, no longer of tradesmen, but of the artist. (Quoted in Stansky 1996, 99)

Image continues:

> [...] and by thus dignifying Art in all its forms it hopes to make it living, a thing of our own century, and of the people. (Quoted in Stansky 1996, 99)

The medieval influences of the Movement were mainly visible in the way the different groups were organized. As I have explained in sections above, co-operativity was a buzzword for the Arts and Crafts movement. Furthermore, the fact that these groups decided to call themselves guilds highlights their reverence for values and ideas connected with the medieval tradition. Ashbee's Guild of Handicraft went so far as to even try to apply the guild system of Medieval Italy (Triggs 1901, 155).

Despite the best attempts of the Arts and Crafts Movement and the subsequent developments that shared its philosophy or ideology, such as the Modernist movement of which Bauhaus and other continental movements like the Dutch *De Stijl* were part, they were unable to create a public art and a functioning system of co-creation. In Kennedy's (2011) interview of Joris Laarman, who is a Dutch designer, Laarman expresses the failure of co-creation by the Modernist movement as follows:

> "I think true modernists wanted open source design one hundred years ago," says Laarman, "but back then it wasn't possible. Rietveld [a designer belonging to the De Stijl] published manuals about how to make his chairs, but nobody could really use that information, because there were no networks of skilled artisans. [...] These days, we can distribute knowledge in a way that can potentially bring craftspeople back to the centre of design – not in an idealistic, naïvely romantic way, but in an economically sound way." One of modernism's core flaws was the huge amount of power that ended up in the hands of a few big factories and design firms. The movement was supposed to be about the democratization of design – that was their big idea – but somewhere along the line it became nothing more than an aesthetic. [...] Industrialization led to mass production, which meant production had to be centralized and its products transported across the globe from countries with the lowest wages at great environmental expense. (Kennedy, 2011)

Kennedy and Laarman reveal the core of the contradiction that faced the Modernist Movement. It was also a problem that Morris and the Arts and Crafts Movement faced, too. Morris catered almost exclusively to the upper-class audience in total contradiction to his beliefs (Shiner 2001, 239). As I noted earlier, Morris aimed for something more, a revolution, and that is also the reason why he did not take a more active part in the Arts and Crafts Movement that followed his ideology:

> I do not believe in the possibility of keeping art vigorously alive by the action, however energetic, of a few groups of specially gifted men and their small circles of admirers amidst a general public incapable of understanding and enjoying their work. I hold firmly to the opinion that all worthy schools of art must be in the future, as they have been in the past, the outcome of the aspiration of the people towards the beauty and true pleasure of life. (Morris quoted in Stansky 1996, 125)

Morris understood that his aspirations were not possible to implement without a radical change in the society and its economy. Avital (2011) describes the different economic business models that differentiate between industrial mass manufacture and that of the pre-industrial era. Avital explains that open design encourages a shift from the push business

model, favouring economies of scale and cost efficiency, to a pull business model that is "based on flexible manufacturing and emphasize[s] mass customization." Avital continues:

> In previous centuries, most artefacts – from shoes to carriages – were custom-designed and built on demand by a craftsperson. [...] Building on push business models, the industrial revolution almost wiped out cottage manufacturing and shifted its lion's share to production lines and mass-scale manufacturing in factories that offer economies of scope and scale. (Avital 2011)

The pull model entails that instead of the manufacturer imposing upon consumers, the consumers have more, or total influence on the products created. This business model was definitely not possible in Morris's time. In our time, however, it becomes possible anew.

### 7.4. Handcrafts versus the Machine

Despite the varying attitudes toward machinery among different Arts and Crafts affiliates, it is safe to say that handcrafts were seen as the ideal. The use of machines was simply acknowledged as an inescapable element of production – inescapable but destructive to the crafts:

> Machinery, by making less immediate the contact of the artizan [sic] with the object of manufacture, and by its tendency to specialise the artizan's work, has rendered obsolete, so far as many industries are concerned, the old traditions of design, and these have not as yet been replaced by new. [...] The adoption therefore of artistic design to modern methods of manufacture, and *the cherishing, or rehabilitation, of many crafts which are independent of machinery, and in which the individuality of the workman's touch is an essential feature, are matters of high importance at the present time*. (Sedding [1888] in Greenstead 2005, 17, emphasis mine)

Thus the handcrafts were very clearly a thing of importance even though the development of art and machinery was also noted as a select goal. Why were the handcrafts thought of as being better than machine work? To the Arts and Crafts Movement, what separated honest

handwork from servile attention to detail (equal to men working as machines) and machine work was handcraft's imperfectness. This idea comes from Ruskin:

> [...] *the demand for perfection is always a sign of misunderstanding of the ends of art.* (2004A [1853], 26, emphasis in the original)

Ruskin continues:

> The second reason is, that imperfection is in some sort essential to all that we know of life. It is the sign of life in a mortal body, that is to say, of a state of progress and change. Nothing that lives is, or can be, rigidly perfect; part of it is decaying, part nascent. The foxglove blossom, – a third part bud, a third part past, a third part in full bloom, – is a type of the life of this world. And in all things that live there are certain irregularities and deficiencies which are not only signs of life, but sources of beauty. No human face is exactly the same in its lines symmetry. All admit irregularity as they imply change; and to banish imperfection is to destroy expression, to check exertion, to paralyze vitality. All things are literally better, lovelier, and more beloved for the imperfections which have been divinely appointed [...] (2004A [1853], 27)

In the artist's hand the touch of the brush or the stroke of a chisel is never absolutely perfect and never fully reproducible. This imperfectness that to Ruskin was evident in all nature was that what gave handcrafts its beauty. Categorizing beauty in this manner effectively excludes machine work from the sphere of art. However, Morris defined art as the result of pleasurable work both to the maker and the user. At the same time Morris also claimed that machines were unable to create art. Does this imply that machines cannot create art because they cannot experience pleasure? This would definitely be a legitimate interpretation, as to Ruskin and Morris the worker that is subjected to non-pleasurable, machine-like repetitive work is reduced to the state of a machine, albeit one made of flesh and blood. It is obvious that in the Victorian period working with machines was very excruciating, and even though in modern times there has been notable progress bettering the working conditions, factory work is still considered tough. However, in the case of "machine work" with 3D printers we are looking

at a completely different set of circumstances because toil, as it was known particularly in the 19th-century factory, would not enter into the equation. Thus, could machine work in the 3D printing age in fact be pleasurable work?

When working with 3D printers there are no workers in the conventional sense. The 3D printer autonomously executes the work that was previously relayed to the worker. Ultimately the only task that is then left to the user of the machine is design. If we reach back a few sections and bring to mind Triggs's quotation about Ruskin's antagonism toward the machine where he writes that if the machine always served mankind, did for him what he wanted and freed him of useless work, there would be hardly any opposition against it. Now, in my opinion, if there ever were a technology that could achieve this kind of scenario, it would have to be 3D printing. This new technology could ideally transcend debasing industrial working conditions. Then again, 3D printing technically scores high on the amount of division of labour, as the lion's share of the work, the actual fabrication of the object, is left to the 3D printer and only the design is delegated to humans.

### 7.5. Digital Handcrafts as Art

To what extent is creating digital models an art? *Digital handcrafts* or *digital craftsmanship* are terms that have not caught on yet – at least in this specific context. I think these terms depict accurately what the future may hold for us if 3D printing becomes commonplace technology: artist-craftsmen designing and creating items and objects digitally and either selling them online or giving them out for free in accordance to the open source principle. I first heard about this term when reading a *New York Times* article where the reporter had interviewed Charles Overy, the founder of a company that creates 3D models of buildings. Overy said: "We are moving from handcraft to digital craft" (Vance 2010). The term digital craft is very interesting as it retains the idea of artisan work, yet proposes that instead of

doing the work by hand it is done with the *finger:* the word *digital* derives from *digitus,* the Latin word for finger.

In their survey study, Moilanen and Vadén (2013) found that the second most used application of 3D printers was the manufacture of artistic items. This would seem to reinforce the notion that 3D printing fosters creativity. It is worthwhile to note that in this study the creators of 3D printed objects placed the objects under the label *artistic items*. Therefore it may have simply been an easy way of describing objects whose denotation is not absolutely clear (that is, "useless," quirky objects were defined as art). It is also possible that people are simply experimenting with the technology and its limitations, creating all the different kinds of shapes and forms that are now possible with 3D printing. This behaviour, searching for boundaries and breaking them by experimentation, is in fact often characteristic of artists. Consequently, I believe that the labelling of printed objects as artistic items is an indication of the way people engaging in 3D printing identify themselves as doing.

Designing 3D printed items would not be handcrafting in the conventional sense because the items are completely reproducible. However, is there another obstacle why shaping immaterial, "digital clay" could not be defined as art in the Morrisian sense? If we take Morris's pleasurable work argument and propose that digital crafting and its result are pleasurable to both the maker and the user, there is no contradiction. But if we take Morris's definition of art as anything made by man*,* we encounter a problem. The digital model could be considered art as man created it in direct contact with the tool (the computer) – in spite of the fact that the end product is immaterial. However, the reproduction of the model into physical form by the 3D printer would not be considered art because it would not be man's own work.

The relationship between the object and its reproduction is a predicament that Walter Benjamin analysed in his well-known essay of 1936 "The Work of Art in the Age of Mechanical Reproduction" where Benjamin introduces the concept of *aura*. While discussing

this concept it is good to keep in mind that Benjamin analyses art from the viewpoint of the recipient rather than from the viewpoint of the maker like Morris did. According to Benjamin, works of art are tied to their history and tradition, making them unique and giving them their aura. Mechanical reproductions cannot have an aura, thus making the reproduction of lesser value than the original. However, Benjamin notes that when objects are specifically designed to be reproduced, the value is not depreciated:

> To an ever greater degree the work of art reproduced becomes the work of art designed for reproducibility. From a photographic negative, for example, one can make any number of prints; to ask for the "authentic" print makes no sense. But the instant the criterion of authenticity ceases to be applicable to artistic production, the total function of art is reversed. (Benjamin 1936)

Benjamin claims that art had sensed it was approaching a crisis with the advent of photography, the first revolutionary means of reproduction, and that is when it spawned "l'art pour l'art*"* (Benjamin 1936). This was occurring around the same time as Ruskin and Morris were actively writing. Benjamin also claims that the primary question of what effect photography had on art was completely ignored. He suggests that the adoption of photography and other forms of reproduction had in fact reversed the "entire nature of art":

> The dispute [about whether photography was art] was in fact the symptom of a historical transformation the universal impact of which was not realized by either of the rivals. When the age of mechanical reproduction separated art from its basis in cult, the semblance of its autonomy disappeared forever. The resulting change in the function of art transcended the perspective of the century [...] The primary question – whether the very invention of photography had not transformed the entire nature of art – was not raised. (Benjamin 1936)

Thus the picture becomes ever hazier. What was this new "nature of art" like? Is it possible to categorize any reproduced pieces as art, or does this transformation in fact imply that reproductions could now be defined as art?

Surely linography, one of the earliest forms of reproducing art, or printing, which Morris himself also tackled with, can be thought of as art? Or can they? I believe they can. As pointed out by Benjamin, the nature of art in the age of mechanical reproduction is different from that of the time before the possibility of widespread reproduction. I argue that this is the difference between Ruskin and Morris and their disciples in the Arts and Crafts Movement and especially those in the Deutscher Werkbund and the German Bauhaus School. Morris and Ruskin, in their opposition against the machine, still held fast to the rapidly antiquating views of the nature of art which had reigned for thousands of years but was now changing. Their disciples and followers, however, who were either less critical or warmly welcoming of the machine, were children of a transient age that saw reproduction in a different light. The Arts and Crafts Movement, as noted earlier, was more critical still. The Bauhaus School, which I have mentioned but not discussed in detail, took even more significant strides in furthering the development of art with mechanical reproduction. I would condense the thought as follows. It is not possible to compare the art before and after the age of reproduction side by side as they are based on different principles – that of designed for reproduction and that of unique existence. Patokorpi (2006, 96–97) points out that Benjamin's concept of aura is based on the Romantic idea of the uniqueness of objects and their creators. Hence the concept of aura is in itself a historical construct, not a fixed idea. Uniqueness need not necessarily be the determining characteristic of an authentic object, much less so in modern times when the digital sphere and new means of reproduction have changed the playing field.

There is, however, always an aspect of uniqueness in everything, challenging the real denotation of reproduction. Firstly, think of books, for example. First editions are always valued more highly than subsequent editions. Secondly, if we think about modern art, Andy Warhol originals are far more valuable than reproductions sold at the museum boutique. And finally, this apparent contradiction with Benjamin's idea of reproductions as always being of

equal value can also be seen in the article by Peter Troxler which features open designer Ronen Kadushin. Kadushin had created a prototype of a shelf, the designs of which were open source, and put it up for auction:

> [The buyers] probably knew beforehand that the shelf was Open Design and that anybody else could copy it and build it, so there is an interesting conflict between the rarity of an object and the fact that anybody can copy it. Even so, they got the prototype. There is no real difference between the prototype and a copy. [...] The limited edition is exactly the same as any other copy to be produced anywhere by anybody, legally. This is an interesting intellectual puzzle. (Troxler 2011)

It seems therefore obvious that reproductions are not always of equal value. This is true in cases where a further reproduction is of inferior quality to the preceding reproduction, such as in the case of classic silverware: the same exact design is used today as one hundred years ago but the quality of the moulding and the finishing is inferior. And as the above case indicates, this seems also to be true when the reproductions are the same in a strong sense, that is, when not only the outcome but also the material and the production process are the same. This would seem to suggest that people today are prone to see uniqueness as a value that is ascribable to an object from the outside instead of seeing it as being the object's material attribute (Patokorpi 2006, 96).

There is another factor in the new mode of manufacture that provides further food for thought: programmed variability. The 3D printer allows individual objects to be made each time so that there is no need for standardization. Chris Anderson (2012, 71) addresses this question in his book *Makers*: "What does *artisanal* mean in a digital world? In his 2011 book, *The Alphabet and the Algorithm,* Mario Carpo, an Italian architectural historian, argues that 'variability is the mark of all things handmade.'" Anderson goes on to quote Carpo:

> Now, to a greater extent than was conceivable at the time of manual technologies ... the very same process of differentiation can be scripted, programmed, and to some

> extent designed. Variability can now become part of an automated design and production chain. (Anderson 2012, 71)

But is programmed variability sham variability? It would still mean that the construction is formally perfect and the imperfection only a kind of simulated imperfection. Is programmed imperfection as valuable as the imperfection created by man? After all, programmed imperfections do not speak about their maker in the same way as marks of hand carving in wood do. Indeed, perhaps that is what people find compelling in handwork: a human connection. The human connection is the knowledge that behind every handmade object lies a personal history that the owner of the object can be a part of. This seems to be in line with Ruskin who upheld that the craftsman must be thinking about what he is doing and not only executing orders as a means to produce good art. Why else would there be a need for mindful work, unless it conveyed something into the object being worked? This point is even better visible with Morris:

> As for the second quality, imagination: the necessity for that may not be so clear to you, considering the humble nature of our art; yet you will probably admit, when you come to think of it, that every work of man which has beauty in it must have some meaning in it also; that the presence of any beauty in a piece of handicraft implies that the mind of the man who made it was more or less excited at the time, was lifted somewhat above the commonplace; that he had something to communicate to his fellows which they did not know or feel before, and which they would never have known or felt if he had not been there to force them to it. (Morris 1881)

It seems that this idea of something being conveyed or communicated with handwork, at the very least the existence of a human being behind the object, seems relevant to the definition of handwork. Even if the design is handmade, the design alone may not be enough to convey a human connection if the piece is mechanically reproduced. But are we truly able to find an authentic human connection in handmade objects? Considering that the viewer conveys meaning to the object, instead of the meaning being found in the object itself, it may be

possible to fool the viewer into believing that the object is in fact handmade when it is not. It is entirely possible that a sophisticated algorithm could effectively mimic the imperfection found in human work. This idea further questions the validity of uniqueness as the source of the object's authenticity. But there is yet a still more fascinating point to be made: organic design.

In their book, *Fabricated*, Kurman and Lipson discuss the new field of generative and organic design with the title: "Computers that act like nature" (2013, 176–195). With advanced computing algorithms computers can create shapes and complex structures found in nature based on the Fibonacci series, a sequence of numbers in which each number is the sum of the previous two numbers (Kurman and Lipson 2013, 176). There is also the Mandelbrot set, a sequence of numbers that can endlessly generate shapes that resemble the growth pattern of trees or the contours of coastal lines. Organic designs that are created this way are impossible to reproduce with any other technology than 3D printing. This type of design is the antithesis of Morrisian design principles, or any that have become before it, because instead of relying on compositional design, it relies on iteration, much like nature. It means that the design "grows" – think of tree branches, the growth of which is iterative. The obvious point to make is that this type of design was unthinkable in the 19th century. However, Morris and the Arts and Crafts Movement did have a deep Romantic reverence for nature. All of Morris's own tapestry and wallpaper designs depicted flora (with the occasional bird). But his work is always representational of nature, not imitative. He says in his lecture "Some Hints on Pattern-Designing":

> Of course you understand that it is impossible to imitate nature literally; the utmost realism of the most realistic painter falls a long way short of that; and as to the work which must be done by ordinary men not unskilled or dull to beauty, the attempt to attain to realism would be sure to result in obscuring their intelligence, and in starving you of all the beauty which you desire in your hearts, but which you have not learned to express by means of art. (Morris 1881)

The idea of creating designs by harnessing principles found in nature seems like a nail in the coffin of Romantic ideas such as the sublime which are contingent on the notion that nature is unexplainable, mysterious, and perhaps even irreproducible as can be interpreted from Morris's quotation above. Morris seems to say that naturalism does not succeed because of the lack of skill of even the best painter. If machines really can create not only realistic organic structures and shapes much better than humans ever could, but ones that actually follow nature's principles, where does the real difference between organic and inorganic lie? For Romantic thinkers like Morris and Ruskin nature (which represents a kind of ultimate "organicness") held the foremost position of authority in matters of beauty: nature was beautiful in itself. Morris believed that inorganic beings such as machines were unable to create beauty. Organic design questions this assumption entirely. It questions the notion that the machine is something separate from nature – extra-environmental, even inorganic.

The idea of organic design is related to the discussion about handwork and machine work for beneath this discussion looms another: that of the relationship between nature and machines. Therefore, organic design provides an important addition to the conversation of the possibilities of 3D printing, namely that of how this new technological development could allow us to bridge the gap between the organic and the inorganic. Organic design also returns us to consider Romanticism and its concepts of nature from a fresh perspective. In my view, this topic would be a topic for further study.

## 8. Conclusion

William Morris was an artist, craftsman and socialist who rebelled against capitalism and the ensuing culture of inequality. Morris held that art was not the preserve of geniuses but belonged to everyone. Because Morris defined art as everything man-made, including fine art and crafting, his concept of art is translatable to production or manufacture as well as to the contemporary sense of the word art. John Ruskin was fiercely antagonistic toward the machine. Morris, too, was in principle against the machine, but admitted that it could ameliorate exhausting and wearisome work. Yet Morris's and Ruskin's disdain for the machine should not simplistically be treated as Luddism, or outright opposition to technology. They opposed the machine because in the ruthless hands of the capitalist system it oppressed workers, seeing the production of commodities merely as a source of profit.

The Arts and Crafts Movement followed Morris's and Ruskin's teachings of art and society, but was slightly more lenient in their attitude toward the machine. Later in the 20th century Lewis Mumford formulated the concepts of the monotechnics and polytechnics which separate technology into oppressive forms of technology and forms of technology that support natural human development, respectively. Mumford's view highlights the fact that technology is not inherently good or bad but is instead dependent on its user's philosophy.

What peer production, the idea of the Arts and Crafts workshop, as well as workers' co-operatives, all share is a similar effort toward the attainment of quality for its own sake and the appreciation of co-operation. The underlying idea behind these phenomena seems to be a kind of socialism that proposes that the common good and good quality products in themselves are more important than individual gain and profits. In the 21st century, these ideas are subversive to the current economic system. At the same time, these ideas are reminiscent of the pre-industrial conventions of manufacture and organization.

The capitalist logic has led to severe environmental concerns and distorted the way society perceives the value of commodities. 3D printing, peer production and the open source

philosophy could change the way the economy (base) is organized, and therefore also change the culture (superstructure) and its view of material objects. It would also reduce wasteful mass manufacturing and fossil fuel reliant transportation, both of which are important causes of environmental decay, but at the same time induce wasteful manufacturing behaviour due to the ease by which 3D printers function.

3D printing has definite revolutionary potential. It promises a new way of manufacturing items and along with the open movement and peer production, a new way of organizing an economy. In an ideal world 3D printing would be able to give everyone access to the means of production, and as a consequence, democratize production or at least make the connection between the maker and the user more intimate. In the end, 3D printing could turn out to be a technology that would support human development; it could be polytechnics. Different projects that aim to take the society in this direction have already been established, such as the WikiHouse project which proposes to give everyone the possibility of constructing buildings. The ideas behind these projects are reminiscent of the philosophy or ideology of the Arts and Crafts Movement of creating a public and democratic art.

Designing 3D models could become the primary occupation of craftsmen who would practice digital craftsmanship. The machine in this situation is very different from that which Morris criticized in the 19$^{th}$ century, as it does not relegate workers into performing menial, repetitive tasks. Morris defined art as pleasurable work, and digital craftsmanship can indeed be considered pleasurable activity. Morris's definition also entails, however, that the end product is also the product of human hands. This is not the case with 3D printing.

The question whether a reproduction can be art was brought up by Walter Benjamin. Benjamin formulated the concept of aura which was based on the uniqueness of handmade objects. Benjamin's concept of authenticity is problematic because it is a product of a bygone historical understanding of objects. In today's world authenticity of objects does not necessarily need to rely on uniqueness. In spite of that, even reproducible objects appear to

sustain some level of uniqueness. All reproductions are not as valuable, even if they are in some sense exactly the same. This is because humans ascribe authenticity to objects and thus authenticity is not a material attribute of the object.

Ruskin found the value and beauty of handwork in its imperfection. Morris believed artisans could communicate something salient through their work. This would seem to suggest that a handmade object is valuable because it can convey humanity (Morris would perhaps call it 'the human spirit') and tell something about its maker. The question arises whether 3D printed objects can convey a human relationship in the same way. The matter gets even more complicated when computerized design and mathematical algorithms appear on stage. Computerized design and certain algorithms can simulate imperfections created by handwork or organic forms and patterns that can be found in nature and which can only be recreated with 3D printers.

It is evident that the concepts of art, craftsmanship, reproduction, and authenticity have transformed through the centuries. During this time technological developments have pushed the boundaries of these concepts. In the 21st century post-industrial world 3D printing will move these boundaries again. Further inquiries into the subject of democratization of art, and into the relationship between man, the machine, and nature, ought to be made. The Deutscher Werkbund and the German Bauhaus School of the 1920s–1930s and their role in the development of the concept of the democratization of art would be a fitting continuation for the work done in this thesis. Finally, I think William Morris and Lewis Mumford warrant more academic attention as they continue to offer valuable perspectives into the societal and cultural issues of the post-industrial world.

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