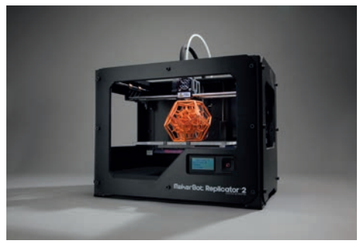
THE HOT ’BOT



THE MACHINE PICTURED HERE – THE MAKERBOT REPLICATOR 2 – IS A 3D PRINTER. IT IS ONE OF MANY IN A TECHNOLOGY FIELD WHICH GOLDMAN SACHS DESCRIBED AS A “CREATIVE DESTROYER”. IT’S COMING SOON TO A DESKTOP NEAR YOU, BUT HOW WILL IT CHANGE ART, AUTHENTICITY, METAPHOR AND PRODUCTION? WHAT DOES THE 3D PRINTING REVOLUTION REALLY MEAN FOR ARTISTS?

ESSAY — Susanna Davies-Crook

JON RAFMAN
New Age Demanded (Zigzagman Malevich), 2013

All new in 3D! The realer the better! More dimensions, more depth, more reality; a visual technology used to promote escape into alternate realities across media. Upon hearing the word "3D" a new dimension scythes through the imagination from the world of commercial advertising, something we didn't have with the 2D industry, now rendered drab and lifeless by comparison.

Before that came the film camera and with it a 2D slice of "reality" – the world represented on silver gelatine. It changed art and "authenticity" and aligned images with manufacture and processing. In time, the gelatine has become digital, an exact process of zeroes and ones kept within the field of human data interpretation and code. Rather than the loss of quality stemming from an original, as in the printing of analogue material, binary data is infinitely reproducible code – there is no loss of quality as long as the code is copied. Not a representation, but an actuality.

The digital development soon to enter our daily routine is the 3D printer. Also known as CNC (Computer Numerical Control) printers or Rapid Prototypers, they print the object by layering material, usually plastic or resin. Unlike mould manufacturing which cuts away an object from a larger sheet, there is hardly any waste and newer and cheaper consumer printers are popping up every week. And so, 117 years after the explosion of image-capture, a new dawn is upon us: images rendered in 3D. Only, not rendered but rather, objects scanned or designed in software that informs the dual axis of the machine where to place the layers of material.

This page
DANIEL KELLER
FUBU Career CAPTCHA
(Provisual Omniventist), 2013

Multicolour 3D Print
38 x 25 x 1.2 cm

Opposite page
FUBU Career CAPTCHA
(Progresist Betworks), 2013

Multicolour 3D Print
38 x 25 x 1.2 cm
Both images courtesy Kraupa-Tuskany Zeidler, Berlin

The internet community are dining out on it, from 3D-printed hermit crabshells to blogs of 3D print fails, it's the new magic – delighting and fascinating. Perhaps more magic than former civilisations could ever have imagined: conjuring something from thin air in an act reminiscent of the past and future fictions of Arthurian legend or "Star Trek".

Considered historically, the 3D printer can be positioned somewhere at a predetermined apex, its wheels whirring into action with the irreversible advent of the printing press, the Spinning Jenny and, most recently, the internet. The dissemination of knowledge and our drive to each own a slice of reality suggests we were always headed for this point, yet it's still coming as a surprise to some people. The Design Museum in London recently mounted an exhibition entitled "The Future is Here" and surveyed 994 people in Great Britain, asking such questions as, "do you have an interest in owning a 3D printer?" The response somewhat surprisingly was that just six per cent wanted one. As opposed to being simply a statement, the exhibition title seems more a desperate plea to the UK – "The Future IS here" – though it is not an everyday reality just yet.

Curator Alex Newson suggests that this particular future is no small shift: "[in the exhibition] we wanted to look at the changes that the first Industrial Revolution brought – the creation of cities, the centralisation of manufacturing, the birth of mass production… people are claiming that we are on the brink of a new Industrial Revolution, what will that mean? Will there be a similar change in the way that we live and use objects? It could mean a significant shift in the way things are made – we won't see as many things made in factories, we can have a repatriation of manufacture back from the Far East to the West, a repatriation of manufacture back from centralised industries in cities to rural locations. A return to Cottage Industry manufacturing, if you like. Mass customisation. There is no economy of scale in digital techniques." The 3D printing market at present is dominated by hobbyists, "makers", who are using this new tool to create. In the future, perhaps each high street will have the local 3D printer where you can order an item, as you would in Argos. But what do the artists have to weigh in on?

Recently a wave of practitioners have begun to investigate the process's implications and possibilities. Berlin-based artist Oliver Laric picked up on the technology in 2009 as a part of his "Icon" series. He sent these defaced icons from the Protestant reformation off to be 3D modelled, then printed them, a process reminiscent of the trend for self-printing classical statues or iconic monuments such as the Venus de Milo or the Eiffel Tower. As a contemporary artist using this technique to reproduce and make a new original work, Laric contemporises the discussion of authenticity from Walter Benjamin's "aura" and applies it to ever-emerging ways of producing. The differencing point is that Benjamin talked of "The Work of Art in the Age of Mechanical Reproduction," but with 3D printers, the item no longer needs to be made first to be reproduced: it can be designed from scratch. We are in a new age of production, of "makers" propped up by internet enablers like Etsy and Kickstarter.

I HOPE TECHNOLOGY WILL SOON REACH A POINT WHERE TEENAGERS WILL BE ABLE TO BUILD THEIR DREAM CARS IN A 3D PROGRAM AND THEN ORDER THE MODEL TO BE PRINTED THE NEXT DAY.

JON RAFMAN

Fellow Berlin ex-pat artist Daniel Keller addresses what this will mean for the future of manufacture in his series "FUBU Career CAPTCHA", an extrapolation of texts taken from an essay published in Wired Magazine in 2000 entitled "Why the Future Doesn't Need Us", by Sun Microsystems founder Bill Joy. Keller has 3D printed selected slogans into wall ornaments that are testament to processing power and collaboration in the man / machine creative partnership. His introduction to the exhibition reads, "IMAGINE a world where… labour, consumption, marketing, leisure and protest have been hybridised, automated and outsourced into oblivion. We'll still need a mass market to consume our products, but we won't need people to do much else. Seventy per cent of current jobs won't exist in 30 years and humanity will become, absurdly enough, 'unnecessary' to the continued maintenance and growth of the global economy." It's a bleak view on the logical conclusion to the Industrial Revolution narrative, and a coagulating spectre of the automaton fears that have haunted science fiction ever since the rise of Fordism.

The titular FUBU refers to the Nineties NYC clothing company intended to be worn by African Americans (the acronym stands for "For Us By Us"), as Keller explains: "FUBU's 'Us' is reimagined as a tongue-in-cheek rallying call for the humanist resistance against (the unstoppable) disruptive trends of automation and outsourcing to the Twentieth Century's model of Western prosperity." They are intended as "imaginary futuristic portmanteau job description CAPTCHAS" (the acronym stands for Completely Automated Public Turing Test to tell Computers and Humans Apart). As a way of considering what the relationship to work for a middle-class white male might be in the future, Keller imagines, "either you're some genius provisual omniventist, you've got some dead-end Developmenture Creategist position at a Mass Archine localcult, you work the streets as a Glittersweet D'hortalker – or it's the welfare grind."

Artists are, predictably, concerned with the future of this technology, and the heart of the argument it brings: will this change everything?

In his exhibitions "The Prison Painter" and "Centers in Pain", American Jasper Spicero's 3D printed works are inspired by his idea that the technology "will eventually lead to new modular architecture and urban planning… imagine that entire rooms will be printed. The rooms will connect in complex arrays to form buildings… ways of organising people will become excessively complex – mimicking microbiology." This link to nature is what can perhaps still inspire optimism. Whatever humanity will produce from the 3D revolution will be limited by what exists and what has

OLIVER LARIC
Versions (Relief) [OLVF01] (detail), 2010

Polyurethane sculpture
48 x 66.5 x 12 cm
Courtesy Seventeen Gallery, London

YNGVE HOLEN
Hater Head, 2013

3D printed in Titanium using DMLS (EOS Direct Metal Laser Sintering)
Designed with the help of Volker Junior from Phoenix Innovation
Courtesy Société and the artist

gone before, the bounds of creation will halt at our own minds, our finite reality – yet it is the management of this daily reality that is cause for concern.

In his curatorial project "Open Shape", Spicero invites artists dealing with the same line of inquiry to contribute designs which are then hosted for sale on Shapeways.com, simultaneously creating artworks that have discursive value but also presenting new economic paradigms for art. As he explains, "I thought about the emergence of 3D printing like wintertime – printed objects like snowflakes and the process of printing like water freezing. The object begins as a liquid form in the mind of the designer, is expressed through 3D modelling programs and then frozen by a printer. On-demand 3D printing shops like Shapeways.com emphasise individuality – that each print is exceptionally unique to the designer." Spicero's model suggests the possibility that selling the designs for sculptures could give agency to the individual artist, privileging quantity over scarcity (like the iTunes model) and adding another thread to their income stream independent of gallery or fair transactions.

Other forms, such as the #BCC curatorial model started by Aurélia Defrance, Julie Grosche and Aude Pariset, where artists emailed instructions for how to install their work rather than posting or installing a physical object, have used curatorial platforms as a way of discussing the possibility of networked data sharing and the impact on the art object. The ramifications of this new material reality for the world of art and the role of the artist are, though embryonic, beginning to become apparent. Will the craftsman only exist in the future in relation to automated software machines? Or, as with the most ancient of tools – flint axe, bone knife, clay vessel – is this just another weapon in the artist's arsenal?

For his recent solo exhibition at Société Berlin, Yngve Holen 3D printed his own screw with a unique "Hater Head" that requires a custom drill to use. The action is a direct conflation of the tools that have defined humanity since the Seventh Century. His accompanying text explains that "a screw is just a simple object. A tiny piece of metal. But in the hands of a person who knows how to use it, it turns into a machine."

As Holen notes, the idea of the unique key also parallels digital keys like those used to access the WLAN network or Apple's unique screws that it uses for its products. Once again, the reality of the technology relies on the

JASPER SPICERO
Designer's Bowl From Winter, 2013

Taken from the series Open Shape (OS)
Laser sintered plastic 3D printing process
Dimensions variable
Courtesy the artist

unique; on the desire to own and to own something individual – it is beholden to the Fountainhead dream, one of product exclusivity conversely wrapped in a technological advancement that will push to revolutionise open-source models and keep courts and IP lawyers even busier. "You can look at the music industry and see how they were quite slow coming to terms with piracy," Alex Newson points out. "The design manufacturing industry has been looking to that so they don't make the same mistakes."

Jon Rafman's recent exhibition "Annals of Lost Time" at Future Gallery in Berlin muses on the archive and its essential properties and shifting pragmatism. By conflating an image of a bust with a 3D replica of a bust via one new and one almost obsolete technology (a Microfiche filter used to view the images), Rafman deals with dimensionality as well as how images are preserved and looked after, a material investment in knowledge and learning. The work therefore considers ownership of, and access to knowledge via historical objects used for study. These are contextualised alongside the more immediate producers of knowledge, specifically the internet and its dominant corporations, cast as the new filter through which we learn and experience organised knowledge. Whether a library catalogue or Google search term, taxonomy can never be impartial.

So, the future is here, and forming, but the actuality of it relies on the way we store past knowledge and disseminate information, and use the knowledge and creation freely. Though, as curator Alex Newson points out, we are not going to see the end of the production line just yet. "The dystopian perspective is that everyone just presses a button and things come out, almost like the 'Star Trek' replicator, and there is no craft or technique or manufacturing or making anymore. That would be depressing. There will still be products made in mass-manufactured volumes because it makes sense – if you're going to make a toothbrush or a rubber duck you're going to mass manufacture it because you need thousands of identical copies of something. To 3D print it would be ridiculous."

For Jasper Spicero, "the most interesting conversation about 3D printing will be based in fiction and metaphor. More poetic than political, economic or theoretical." The world of the imagination is the alchemic currency of the artist at this intersection. The clash of the dream and the real – with policy, corporations and individuals clamouring to make sense of it en route to Keller's dystopia. However, the dream is still out there, as Jon Rafman remarks: "I hope the technology will soon reach a point where teenagers will be able to build their dream cars in a 3D program and then order the model to be printed the next day. It feels like the creative possibilities of 'Second Life' are penetrating the real world."

The implication is that we are moving further toward a world of our own making. "I've been really interested in the idea of reality as informational at its most essential level," says Daniel Keller. "I think that 3D printing is one of many technologies that together could allow matter to become 'smart matter' – information that is mutable at will. There is a sci-fi concept of 'utility fog' which is a transparent cloud of self-assembling nanobot-computer-assembly-blocks that float around, waiting for an instruction to 'condense' into a simulacra of any object imaginable. A liquid reality."

But the future of conjuring matter at-will is still a distant one; the current reality is domestic – and really, what use does one have for a desktop Eiffel Tower anyway?

The seeds of doubt and mis-use are sown, and the public, as the Design Museum discovered, are still sceptical. As with the Cold War-developed laser, which ironically is now being used in Blu-Ray and adapted by Formlabs to make one of the cheapest consumer 3D printers on the market, the 3D printer is at the mercy of human free will. A new tool in the box for good or ill, just as the internet almost enabled the dream of openness – a Utopian ideal of cooperative connectivity – it has served both sides, with the responsibility falling to the individual as to how to use the tools of anonymous communication (trolling) or global corporations to attempt to keep it free (copyright crackdowns and homogenised platforms).

It is up to us. "There's a Marx quote," notes Alex Newson. "'Those who control the power of production control political power.' What if you did take that away from the big producers and enable people to make things? What if we could make anything we wanted? That does give power back to the consumer. It requires the consumers to demand… it's up to us."

JON RAFMAN HAS A SOLO SHOW AT ZACH FEUER, NEW YORK, UNTIL OCTOBER 26 2013. PURCHASE JASPER SPICERO SCULPTURES AT WWW.SHAPEWAYS.COM/SHOPS/OPENSHAPE

OLIVER LARIC
Versions (Relief) [OLVF02] (detail), 2010

Polyurethane sculpture
48 x 66.5 x 12 cm
Courtesy Seventeen Gallery, London