

Bio-fabrication: an Alternative to Leather in Luxury Fashion

Lana Toskan

London College of Fashion, United Kingdom

lanatoskan@gmail.com

Abstract

It is no secret to anyone interested in sustainability that raising livestock is one of the most impactful industries out there. Using leather as a raw material is the first cause of environmental impact for the majority of luxury fashion companies. How do we approach this issue? Just like so many other problems, this could also be solved by our continuous developments in the fields of biology, science and technology. What if, instead of going through the laborious and unsustainable process of raising livestock, we could, quite simply, skip it and go straight to the product? One way out of this could be through bio-fabrication. We have in the past years achieved outstanding accomplishments in the field of bio-fabrication which has primarily been used to grow both tissues and organs. What if the same process could be applied to animal cells? This is precisely what Modern Meadow, a New York based company, have set out to achieve. By extracting and isolating tissue samples, they are able to reproduce them artificially resulting in a product free from animal use and land degradation. My essay will compare and analyse both current and future leather sourcing methods whilst raising both ethical and environmental questions that surround the use of the material. Furthermore, it will address how bio-fabrication may help us in bringing significant change into the world of raw material sourcing. Finally, it will also analyse and critically respond to the current pre-assumptions surrounding bio-fabrication in order to come to a realistic conclusion of when and how bio-fabrication will become a reality.

Keywords: bio-fabrication, fashion, luxury, future, science, biology, materials, leather, Stella McCartney, Modern Meadow

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Statement of Originality

“I, Lana Toskan, certify that:

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- I have acknowledged (appropriately referenced using the Harvard Referencing system) all sources and citations;
- No section of this essay has been plagiarised;
- This work has not been submitted for any other assessment.”

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‘EXPLORING THE VALUE OF LEATHER TODAY AND IN THE FUTURE’ **Erro! Marcador não definido.**

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Introduction

The world is saturated with information. Not only that, it is saturated with products and an endless greed that makes us eternally dissatisfied. This essay will attempt to understand and critically respond to the use of animal-based products such as leather and their relation to moral as well as sustainable practice within fashion, ultimately understanding what the value of leather is today and how it might be changed in the future. I will achieve this through analysing and understanding the relations between our morals, ethics, sociology and capitalist consumption practices. Furthermore, the following piece of writing will also serve as a documentation on my personal experience of exploring how I aim to approaching this industry as a womenswear fashion designer aware of both the environmental and social impacts of my profession. Clothing is, in fact, much “more than just body-covering” (Gibson and Stanes, 2011, p. 169).

In order to understand what I will be writing about thoroughly, I will firstly aim to explore the idea of fashion itself. By reading the works of Elizabeth Wilson, a renowned critical fashion author and academic, as well as Joanne Entwistle, a fashion sociologist, I will analyse and question the meaning as well as influence of fashion over the history of human kind.

I shall then attempt to approach the subjects of fashion and capitalism from different angles and position myself within the circumstances of others in order to truly try and understand the current state of our consumption habits. Our understanding differs not only due to cultural differences, but also within cultures themselves; a result of personal beliefs and opinions that we have been brought up to see as the truth. In his book *Textual Analysis: A Beginner's Guide*, Alan McKee describes a “realist” way of thinking by suggesting that throughout history, different cultures have always “seen reality in a variety of different ways,” but pointing out that we have a history of answering to them with an already made up mind, suggesting *our* reality is the *only real one* (McKee, 2003, p. 14). I will seek to depict this theory in relation to fashion and, specifically, the use of animals as commodities within the industry.

This exploration branching into the fields of ethics, psychology, sociology and capitalism surrounding the business of fashion will be followed by a research chapter on one of the most influential designers in the field of sustainable luxury fashion, Stella McCartney. Focusing on the analysis of one of her most recent products and campaigns, as well as commenting on some of the responses to her practice that I was able to gather from my research, this chapter will further help in envisioning all that can be done in the realms of sustainability, especially when it comes to the non-compromising issues revolving the design and production processes used in luxury fashion.

After reflecting upon this information, I will briefly look into the very pressing environmental and ethical implications that surround the production of leather, leather's correlation to the food industry as well as what it might take to challenge the current mind-set of the luxury consumer.

Finally, through conducting a brief case study of 'Modern Meadow', a company which is re-imagining leather through bio-fabrication, I will suggest a future possibility and idea that could transform our approach to the production of one of luxury fashion's key raw materials.

Fashion and Ethics

What is Fashion?

So, what does the word ‘fashion’ truly mean? It has been a long time since we have, as a species, been covering up our bodies, but only in relatively recent history have we started doing so for other reasons than practicality. Ultimately, according to Wilson (2003), it all came down to class terms and individuality. Both her and Entwistle (2000) would argue, that it was when individuals passing each other on ‘city streets’ started feeling the “desire to differentiate themselves from one another based on their social status, dress came into play as a means of expression” (1971, p. 296, quoted in Sullivan, 2016, p. 33). This is also when the idea of the term ‘dress’ slowly started to make its transition into ‘fashion’. The notion of fashion has since escalated into a continuity of characteristics and influences, all of which have been connected by the “rapid and continual change of styles” (Wilson, 2003, p. 4-5, quoted in Sullivan, 2016, p. 31). On the notion of fashion, Wilson also argues that it might seem distinctively relative and be perceived as “a senseless production of style meanings” but ultimately concludes that it is still “coherent in its ambiguity” (Wilson, 1985, p. 14).

It is important to note, that when travelling approximately 70 years back in history it was still very much a normality to have your clothes “made for you” (Rouse, 1989, p. 244). Lemire, the author who closely analysed 17-19th century fashion, suggests that “unlike today’s ecologically damaging culture of throwaway fashion, clothes in the eighteenth and nineteenth centuries were kept as long as possible” (1997). It would, therefore, seem safe to conclude that clothes in the past had a higher level of value to them. Perhaps this was due to the fact that the sheer numbers of production per person were significantly smaller than they are today. Clothes were also repaired, carefully treated and reused for different purposes. In modern-day society of the 21st century where the rates of production are increasing indefinitely, buying a replacement instead has become the standard. But what does that mean for the idea sustainability and more importantly, our planet? This act of replacement is actually, in the words of Barthes, exactly what fashion itself *is*. As he puts it, fashion happens when the “rate of replacement exceeds dilapidation” (Barthes, 1998, p. 297-298, quoted in Sullivan, 2016, p. 34). This idea is further enforced by the work of Fletcher, who suggests that “fashion is consumption, materialism, commercialization and marketing.” She goes on to explain how we have become the “unwilling victims” of a system driven by capital (Fletcher, 2008, p.139).

One could argue, that fashion itself in the past few centuries has been detrimental to where we are as a cultured society today. It has, in fact, been able to act as an irreplaceable medium when it comes to expression and individualism. It has allowed us to expand our understanding of dressing merely for decency and functionality and has managed to create a world within which each of us has a voice and a say.

For hundreds of years, society has been completely ignorant of personal differences and changes (Lipovetsky, 2002, p. 18). Consequently, in pre-modern society, individualism was simply something that was beyond the grasp of understanding, where most accessories and decoration were merely based on “traditional and cultural influences” rather than personal style (Lipovetsky, 2002, p. 18). But in order to transcend those beginnings, change must occur step by step. In the words of Sullivan, “any change from one type of society to another did not come about gradually, but through ruptures and antagonisms rooted in conflicting ideas about how people understood the world” (Sullivan, 2016, p. 30).

I believe that a similar change is happening today with how we understand the concept and approach to sustainability, especially when it comes to luxury fashion. We are at a point where we are starting to realise that all our actions and purchases have very tangible consequences.

Ethical Consumption and Capitalism

Having been evaluated at £1.74 trillion pounds at the end of 2016, fashion has established itself as one of the largest industries on this planet (Business of Fashion and McKinsey & Company, 2018). These alluring figures are unfortunately accompanied by worrying rates of growth and production, which have spiralled out of control over the last century alone. 21st century fashion is, scarily “today’s treasure but tomorrow’s trash” (Joy et. al., 2012, pp. 283). Where are we heading? In their introduction of *Ethical Consumption*, editors Tania Lewis and Emily Potter shed light on ethical consumption practices. They discuss how documentaries such as “Al Gore’s *An Inconvenient Truth* (2006)” have brought more light to the matter of consumption and set the tone for a disapproval of materialistic ideologies (Lewis, T. and Potter, E., 2011, p. 7). But how long will this change in attitude take, and will it be able to reach its full potential before it is too late?

Contrary to the positive outlook on the future of ethical consumption and awareness that Lewis and Potter write of, Jo Littler, on the other hand, argues that the idea of consuming ethically is “ultimately ineffective” and is only “used as a panacea for middle-class guilt” (Littler, 2011, p. 27). By analysing current happenings and marketing schemes, she comes to a conclusion that social change is indeed very complex, and does not come about all at once. Furthermore, she explains why ‘ethical consumerism’ is for the vast majority merely an illusion, by arguing that “neoliberal capitalism relies on structural disparity between rich and poor, and is therefore not an ‘ethical’ system in itself” (Littler, 2011, pp. 27-28). In the words of Wilson, summarised by Sullivan, “for just like the capitalist system which spawned it, fashion is ‘double faced’ (Wilson, 2003, p. 13), a source of both pleasure and pain, expression and exploitation” (Sullivan, 2016, p.28). After reflecting upon this, I truly began to question whether or not the whole idea of sustainability is dubious from the start. Are we merely tricking ourselves into a, as she puts it, ‘guilt-free’ lifestyle?

Is the idea of not using products such as fur and leather, an idea that only applies and is relevant to those living in first-world countries who have the luxury of choice? This notion is reinforced by a chapter in Arnold's *Fashion: A Very Short Introduction*, which puts emphasis on the current growing number of luxury companies looking into promoting sustainable and ethical practices. Although she approaches these new ideas with positivity, she quickly comes to a conclusion, that there is a real 'danger' in these practices ending up as nothing else but a fleeting 'trend' (Arnold, 2009). Following these readings, I went on to immerse myself even deeper into the roots of our need for consumption beyond survival.

In his book, *One Dimensional Man*, philosopher and political theorist Herbert Marcuse, explores our relation to materialistic possessions and our infinite desire for the new. He claims that change only happens when "the process replaces one system of preconditioning by another." Expanding on that, he continues by saying that ultimately, our goal is to eradicate the 'false' and bring forward the 'true' needs which would eventually lead to "the abandonment of repressive satisfaction" (Marcuse, 1991, p. 7). Could the same theory be applied to the changing perceptions that have been linked to the use of animals as resources and commodities? Marcuse criticises materiality with arguing that "the products indoctrinate and manipulate; they promote a false consciousness which is immune against its falsehood" (Marcuse, 1991, p.12). Truth is subject to both culture and relativity and can be interpreted in many different ways. It is, in fact ever-changing, so how do we then know when we have finally found the 'right' truth?

Giles Lipovetsky, a French sociologist views the problem from his own profession when explaining fashion. He labels it as a "system for social regulation and social pressure" (Lipovetsky, 2002, p. 29). It is within us to aspire to be greater, more important than our current selves and more respected by the people that surround us, both friends and strangers. He argues that fashion has an important part in this role-play of life. In his words, "it is by virtue of the human desire to resemble people deemed superior" (Lipovetsky, 2002, p. 29).

Overall, it seems ever more likely, that what would change people's perception of ethics, sustainability and the use of animals in fashion, is not necessarily their own individual moral and ethical capabilities, but instead the moral and ethical beliefs that their environment portrays. In simpler words, leather should be viewed as a 'lesser' and less desirable resource due to its conflicting nature to the early majority, before it could eventually be considered as such by the general public.

Methodology

Prior to continuing with deconstructing previously introduced content, I would like to further clarify the methodology that will be used throughout this extended essay.

Following up on what I have gathered from my initial textual research, I will begin an investigation into image analysis, specifically looking into Stella McCartney's recent advertising campaign. In the words of McKee, "the image needs to be interpreted as much as words do" (McKee, 2003, p. 62).

Case Study

Sustainability and Leather in Fashion: Stella McCartney



Figure 1: Stella McCartney Autumn-Winter 2017 Advertising Campaign, WGSN

many of them appearing relatively unused. (See appendix for whole content)

As a campaign shot, this image promotes a very clear vision of a designer who is aware of the impact of her trade on the environment. Upon first seeing it, we recognise the green as a colour of nature and nature-friendly products and we recognise the background as a reminder of our daily consumption habits as well as daily contributions to the ever-increasing problem of waste.

Without using any words, it gives us a very straightforward visual confirmation, that what we are purchasing has value far beyond just the product. It strengthens the brand identity for McCartney who has long been a champion in the promotion of sustainable and responsible practices.

The image on the left is one of the photos used for Stella McCartney's Autumn-Winter 2017 campaign. On it, we see a young woman laying down and looking at the camera. The model is dressed in a green jersey dress, which is overlaid with white and cream embroidery carefully beaded on top of a subtle transparent tulle layer. She wears a turtleneck but her legs are almost completely uncovered, and while laying down with open arms, she wears a pair of brown flat shoes.

When looking at the image, we are first struck with the intensity of the green top and detail, which attract our attention by being positioned at the centre of the composition. Shortly after, though, the attention moves to the background of the image. We start to wonder and deconstruct what she is laying on top of. Pieces of card, plastic, old bags,

In an era that has been increasingly popularising celebrity culture through social media, celebrity figures have become the key behind promoting a brand's identity. And as Winge states, they are the ones that have the 'leverage' and possibility of shining a bright light on both environmental and animal rights issues. Through campaigners and activist such as "Leonardo DiCaprio, Natalie Portman, Paul McCartney and Pamela Anderson", the group of consumers who are aware both of animal rights and the environmental impacts of their purchases is growing quickly (Winge, 2008, pp. 512-513). And, perhaps most importantly, the group most influenced is precisely the group of young adults that are soon to transcend into potential customers for the luxury fashion market.

When following the response to Stella McCartney's campaign on 'Instagram', a social media platform, I found that several individuals, who would call themselves fashion enthusiasts and practitioners, were 'amused' by the image in other ways. They mocked the way McCartney chose to depict her collection and commented with disrespectful remarks.

These particular responses raised a lot of questions for me as a designer, most of which were aimed towards the, perhaps uneducated commentators that would dare make such uneducated statements. How are we, and how am I, to promote sustainable fashion amongst such an audience? How do we approach sustainability from within the luxury department? Are sustainability and luxury forever going to remain antonyms? And how is it possible, that there are still individuals out there, who blatantly refuse to see or accept the extent to which our actions and habits are not only damaging, but destroying the planet we inhabit?

Taking all this into account, I went on to do more in-depth research on Stella McCartney and the sustainable products she sells and advertises. Whilst visiting her store in London, one particular bag caught my attention – the newly released 'Falabella Bag.' Pictured on the right, the bag is advertised as 'eco suede' and the description states the lining is made from 100% recycled polyester. Here, the brand's commitment to the re-use of material is very much present and reflects the previously discussed advertising campaign. By touch, the material feels extremely soft and luxurious, and not a hint of the less-pleasant plastic aspect typically associated with leather alternatives is present. The bag comes in a traditionally black colour and a box design, decorated with surface embroidery. Considering it is advertised as 'eco suede,' the average consumer might not be aware that the bag is actually not made from genuine leather.

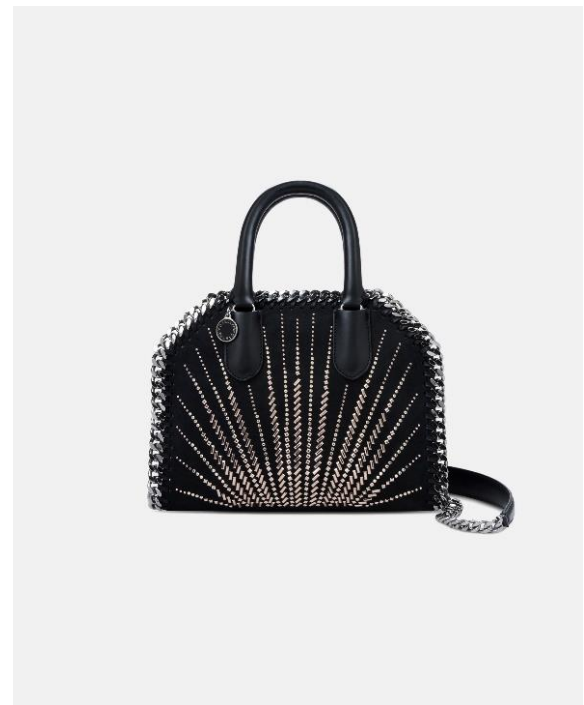


Figure 2: Stella McCartney Black Falabella Box Mini Eco Suede Top Handle

Being a fashion design practitioner, I began to question, whether this does not take away from the entire idea of not using living beings as commodities? Or is Stella McCartney trying to appeal to both markets in creating a bag that would be indistinguishable from animal-based leather, which at the moment still persists on top of the luxury chain?

After reading more about her and the brand philosophy, I was actually able to come to a conclusion that what she is doing, is attempting to change the luxury fashion industry from within. Upon being asked about her products in a 2014 British Vogue interview, she suggested that the majority of women are very likely “unaware of the fact that the bags are not made of real leather,” and that she found that “extremely exciting” (British Vogue, 2017). She has created a platform for products that are sustainable, but can still stand side by side to the highest quality leather and not look or feel inferior. This way of approaching the luxury client seems particularly effective also according to Streit and Davies who went on to research the amount of awareness there is in regards to sustainability. In their article titled *Sustainability isn't sexy*, they discussed how exciting fashion has never come out of anything that was considered ‘good’ and ‘ethical.’ Furthermore, they argue that in fashion “you have got to be bad to be good” (Streit and Davies, 2013, p. 219). After conducting a series of interviews with luxury retail clients, they were able to come to a conclusion that none of them were particularly concerned about the ethic or sustainability aspects of the brands they were buying into. Instead, they affiliated the problem of sustainability with lower quality brands that get accused of manufacturing in third world countries. They admitted they would never go and research whether the brand they were buying into was sustainable, but that they would instead have to be made aware of it (Streit and Davies, 2013, p. 215). I found this information, especially coming from a luxury consumer, rather alarming.

Going back to the product, one particular thing that is worth mentioning, is the price of the luxury goods Stella McCartney sells. Valued at £925, the Falabella bag is not exactly sold at a bargain price. This brings me to another question that I have been asking myself all too often. Is sustainable fashion a luxury? Is living truly sustainably a privilege reserved for those in the highest ranks of society who can afford bags and clothing at such a price? How can we make a difference otherwise, and how can I, as an upcoming womenswear designer, pass on this message without the added pressure on the consumer? I found initial research into this territory in the work of Bourdieu, who early on assigned the concern to “keep up with fashion” to the women who were wives of successful men (Bourdieu, 1984, pp. 379). At this point, I would agree with Winge’s statement, who argues that fashion as we know it “exists at a high cost to animals, humans, and the local and global environment” (2008, p. 513). But it is starting to seem all too likely, that in order to oppose it, we, as designers and as consumers, need to pay a higher price. Is there possibly another way around this?

Leather in Fashion

Sourcing of Leather: Environmental and Ethical Implications

So, why is it that leather is getting a ‘no’ when speaking of sustainability? After all, it is a natural material and a by-product of the food industry. Unfortunately, that does not necessarily make it a sustainable practice. Even though leather, which in most cases comes from a cow or her calf is not a man-made product, it involves a significant amount of toxic chemicals and dyeing techniques, which ultimately make its production unsustainable. To put it into perspective, Kering, the company that amongst others also partially owns Stella McCartney, has in their 2016 EP&L statement confirmed that 23% of the entire group environmental impact is due to cattle ranching (Kering, 2018).

I think it is important for anyone who is interested in promoting or speaking of sustainability to know just how much of an impact animal agriculture has on our planet. In his analysis of animal agriculture, Christopher Hyner shines light onto this problem that is far too commonly overlooked. In addition to it amounting to the 18% of all greenhouse gas emissions on Earth, which is more than all transportation emissions combined, this industry also requires tremendous amounts of land and water use (Georgetown Environmental Law Review, 2017).

Leather is therefore, a product that requires tremendous amounts of resources and processes. Is there a way we could surpass this and create a more sustainable, futuristic industry? One in which, by not using animals in such production we would not only solve the sustainable but also the moral questions that surround conventional leather production?

When it comes to luxury fashion, though, based on the previous arguments by Streit and Davis’s 2013 article, the customers that buy into these luxury goods tend to generalise and assume that due to the nature and price of the products they are purchasing, those are ‘without a doubt’ sustainably and ethically produced (Streit and Davis, 2013, p. 218). In response to this statement and their other findings in relation to luxury consumers, I would say that it is up to the brands to commence with integrating these changes. The market is shifting towards a more transparent future and is constantly evolving towards the needs of the modern day ‘eco-savvy’ consumer who wants to know what the story and impact is behind the product (Streit and Davis, 2013, p. 218).

It remains undisputable that what consumers expect from luxury brands is first and foremost, quality. I would therefore argue, that no change to the status and use of leather will be made, until a viable opportunity comes along. Currently, the alternatives available are of lower quality and tend to last less than animal-based leather. Incredibly interesting alternatives, such as Stella McCartney’s Falabella bag are certainly providing a challenge for the fashion industry, but a general change in consciousness will be required before such products are consumed because of what they are and not how they look. In the words of Wilson, fashion truly is “modernist irony” (Wilson, 1985, p. 15).

Bio-fabrication: The Future of Fashion?

In her article on ‘Eco-Tech Fashion,’ Sarah Scaturro investigates the role of technology and our scientific advancements in conjunction with sustainability. Initially she labels the idea of merging the two as a “contrasting ideal,” but goes on to argue that the role of technology should by no means “be diminished” when it comes to ethical and sustainable production methods (Scaturro, 2008, pp. 469-488).

As uncertain as the future may seem at the present time, even though the change might not be rapid, it is still happening. The consumers of luxury goods today are not those of tomorrow. At the present time, a significant rise is occurring in young adults who are paving the way for a world free from both human and animal exploitation and they are those who the market will be catering to not so many years from now.

An answer to the problem of leather consumption, could, like so many other ones, lie in our technological advancements. Significant progress has been made in the past decades in the field of bio-engineering. In this paragraph, I will be analysing, for me, one of the most interesting projects in the field of raw material innovation for years, if not decades. ‘Modern Meadow’ are a Brooklyn-based company that has managed to challenge what we think we know of leather production. Co-founded in 2011 by Andras Forgacs and his father, the company started with the aim of producing meat without killing the animal, but later on shifted to leather due to lengthy processes involving food protocols and the market needs. By merging design, biology and engineering, they have set on to be the pioneers of change and leading in the field of a new era and lifestyle (Modern Meadow, 2016).

Bio-fabrication could truly pave the way towards a more sustainable future. Ultimately, the production of such bio-fabricated materials would result in a substantial decrease in energy use, greenhouse gas emissions and also land use, which is bound to be of ever-higher importance with our growing population (Tuomisto and de Mattos, 2010). According to Scaturro, by ingeniously applying “both the material and digital manifestations of technology to fashion in order to achieve an ethical and sustainable ideal, eco-tech fashion succeeds in pushing the entire fashion system forward towards a promising future” (Scaturro, 2008, pp.470).

Attached on the right is a photo from the Museum of Metropolitan Art in New York, where both Modern Meadow and Bolt Threads, another bio-engineering company who focuses on the production of man-made silk, showcased their products. For this unique exhibition, Bolt Threads partnered with Stella McCartney, who produced the dress on the far right using man-made spider silk.



*Figure 3: LEFT: Modern Meadow / MoMa T-Shirt
RIGHT: Bolt Threads & Stella McCartney / Man Made Spider Silk Dress*

Conclusion

The question is no longer what fashion is, but rather what fashion could and will be. We are all becoming increasingly more aware of what is happening around us and are making more informed choices as a result of that awareness. But the question remains – is it just us and what we buy, or is it the entire idea of fashion which continues to persist as the main problematic? Is fashion in itself a continuous cycle of buy, change and replace, which is what ultimately makes it unsustainable from the very start? By analysing fashion, delving into the psyche of the consumer and works by Wilson and Lipovetsky, I was able to understand and apply that knowledge to further sections. I continued by exploring fashion as a corporate business and its relation to the capitalist society in which we currently exist. After analysing how and why fashion is subject to such rapid changes by reading the works of Marcuse as well as Lewis and Potter, I managed to build a perception of what it will take to change the current mind-set when it comes to the use of animal products such as leather.

This essential theoretical framework was followed by a detailed case study of Stella McCartney's recent advertising campaign, as well as one of her artificial leather box bags through image analysis. This investigation enabled me to understand the current needs and market challenges that she faces going head to head with her competitors who are still adamant about using conventional leather.

After gaining insight into the social and consumer-driven economy of fashion, I went on to explore how and why leather specifically might present a problematic choice for fashion products. Through investigating its environmental as well as social impacts and by taking into account the arguments made by Streit and Davies I was able to come to a conclusion that presented itself in the form of a double-edged sword, as it seemed unlikely that fashion would ever be a fully sustainable or even responsible practice.

Eventually, my eyes were opened by Scaturro's article, where she stresses the importance of both scientific and technological advancements of our time. I have then set out to discover what it would mean to revolutionise the conventional production of leather as we know it and I found my answer in bio-fabrication. The process that has over the past years enabled us to reproduce organ and bone tissue samples, is the same process that allows us to replicate mammalian cells and isolate collagen, which is then used in the creation of lab-grown leather. 'Modern Meadow,' the company behind this, has a vision of making their product into a commercial reality in the upcoming years, which is incredibly exciting for myself as an upcoming fashion designer.

So, to summarise, fashion is indeed an ever-changing industry that thrives on ups and downs and a continuous cycle of newness and replacement. On the other hand, I also think the change in consciousness and a genuine interest into where raw materials are sourced and processed is starting to arise and is louder than ever. Furthermore, I believe that we, as designers should be at the very forefront of these changes and initiate collaborations with innovations rising up in the fields of science and technology as this is the only way to invent something truly new. I would dare say that the 'value' of leather has reached an interesting new step and has slowly began to tread the same grounds as fur has in previous decades.

At this point I would like to reflect back on to Sullivan's argument that suggests all reformations of 'society' happened "through ruptures and antagonisms rooted in conflicting ideas about how people understood the world" (Sullivan, 2016, p. 30), and this is precisely what is happening and needs to continue to happen today in order for us to sustain our life on this planet. Change will not be imminent, nor will it be easy, but it needs to happen.

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Figure 8: Christopher Hyner / Animal Agriculture Study
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Figure 10: Modern Meadow / MoMa T-Shirt Prototype
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Appendix



Figure 4: Stella McCartney | Autumn-Winter 2017 Advertising Campaign II.



Figure 5: Stella McCartney | Autumn-Winter 2017 Advertising Campaign III.

As a vegetarian brand, we never use leather, skin, fur or feathers. By taking this stance we are proving it is possible to create beautiful, luxurious products that are better for everyone – animals, people and the environment.



When we established our brand in 2001, there were doubts in the industry that it would be possible to create a luxury fashion brand without using leather or fur. But we proved, and continue to prove, that it is possible.

By choosing vegetarian leather, we are demonstrating how a luxury fashion brand can push the boundaries to make products that are beautiful, sustainable and cruelty-free. No compromises.

A better environmental impact

Our leather alternatives do not just look good, they are also better to the environment. Using recycled polyester instead of Brazilian calf leather, for example, creates 24 times less of an environmental impact, as calculated through the Environmental Profit and Loss (EP&L).

Figure 6: Stella McCartney / Mission Statement: Approaching Leather

Innovative materials and safer chemicals

Since 2013, we have been using alter-nappa for our shoes and bags. This breakthrough material is made from polyester and polyurethane and has a recycled polyester backing. This reduces the amount of petroleum we use in our products. And the alter-nappa coating is made with over 50% vegetable oil, a renewable, natural resource.

We are also switched our polyurethanes to water-borne and solvent-free polyurethanes. As well as being less energy and water intensive, they are made without solvents and therefore much safer for people to work with.



Our decision to not use leather has enabled us to reduce our environmental impact. However, we do acknowledge that the synthetic alternatives we use are not without environmental concerns. The EP&L has shown us that the majority of the impact associated with synthetic fibres is due to processing oil into yarn. We are working to reduce the impact of our alternative materials by using recycled and bio-based materials.

The future of vegetarian leather

We are excited for the future of cruelty-free leathers. One opportunity we are currently exploring is lab-grown leather. What may have seemed impossible just a few years ago is quickly becoming a reality. As a modern business, we want to bring these incredible feats of design to the fashion industry and pave the way to a more progressive approach to materials.

Figure 7: Stella McCartney / Mission Statement: Future of Vegetarian Leather

A Leading Cause of Everything: One Industry That Is Destroying Our Planet and Our Ability to Thrive on It

By Christopher Hyner, Managing Editor—Georgetown Environmental Law Review

This post is part of the Environmental Law Review Syndicate, a multi-school online forum run by student editors from the nation's leading environmental law reviews.

Climate change. Ocean dead zones. Fisheries depletion. Species extinction. Deforestation. World hunger. Food safety. Heart disease. Obesity. Diabetes. The list goes on. There is one issue at the heart of all these global problems that is too often overlooked by private individuals and policy makers alike—our demand for and reliance on animal products. We can take a substantial step towards addressing all these problems simultaneously through reducing or eliminating our reliance on meat and dairy products. This begs the question — what are the United States' major governmental environmental policy enforcers doing to address animal agriculture's contribution to climate change, if anything? This piece briefly highlights two things: (1) animal agriculture is a leading cause of many major environmental problems we face globally and domestically—most importantly, climate change; and (2) animal agriculture is too often left out of the policy discussion.

First, the interconnectedness of animal agriculture and the environment.

A multitude of environmental problems our planet faces share a common instigator: animal agriculture and our reliance on meat and dairy products. According to the United States Department of Agriculture (USDA), global agriculture—dominated by livestock production and the grains grown to support it—accounts for 30% of greenhouse gas emissions.^[1] A 2006 study by the United Nation's Food and Agriculture Organization (FAO) finds that 18% of global greenhouse gas emissions is *directly* attributable to livestock production, which is more than the emissions attributable to the entire transportation sector.^[2] Whichever number is relied upon, agricultural emissions are only going to increase as rising incomes and urbanization drive a global dietary transition towards increased consumption of meat and dairy products.^[3] The growing demand for animal agriculture is expected to be a major contributor to a roughly 80% increase in global greenhouse gas emissions from the agricultural sector.^[4] This means that animal agriculture must be a central element of our efforts to mitigate climate change.

Figure 8: Christopher Hyner | Animal Agriculture Study



This is Zoa™. The world's first bioleather materials brand. Able to be any density. Hold to any mold. Create any shape. Take on any texture. Combine with any other material. Be any size, seamlessly. A liquid. A solid. An anomaly. Grown with the intention for making things of real value, that exist not just to serve humans, but to co-exist with everything.

Figure 9: Modern Meadow / Bio-fabricated Leather



Figure 10: Modern Meadow / MoMa T-Shirt Prototype