

Could fungi save the fashion world?

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Environmental action group Extinction Rebellion is disrupting London Fashion Week to highlight the harms of [throwaway culture](#) and the concurrent climate emergency that the clothing market contributes to. Calling for the cancellation of future fashion weeks in acknowledgment of the crisis, it plans to target show venues and hold a funeral procession called "[London Fashion Week: Rest in Peace](#)".

These may be new tactics but the problems with the industry have long been known. Very high water usage, pollution, a high carbon footprint and bad working conditions mean that the fashion industry, and in particular cheap cotton garments such as denim jeans, are known to be extremely environmentally and socially damaging. This is before we even consider the impact of fast fashion, inexpensive clothing produced rapidly in response to the latest trends. Such items inevitably end up in an overfull landfill site before they are even near "worn out."

This is common knowledge, and so many "solutions" to this situation have been suggested.

Currently in vogue is the concept of "[slow fashion](#)", an approach which considers the processes and resources required to make clothing and recommends that we buy quality garments that will last for longer. Another often touted option is the recommendation that we simply buy less, something encouraged by the protest groups involved in "[Buy Nothing Day](#)" and initiatives such as Oxfam's "[Second Hand September](#)".

Designing a way out

Attempting to reduce the demand for new clothes is certainly going to be an important part of a more [sustainable future](#). But what this ignores is the fact that the fashion industry is not a system that is about need. Rather, it is driven by desire, aspiration, gender politics and celebrity culture. Changing behavior—by encouraging consumers to stop buying new things at all—would, to us, seem more immediately difficult and multifaceted than creating an alternative, aesthetically viable material solution.

But this does not seem to be reflected in most design attempts so far to create sustainable, circular fashion. Take the rise of "fair trade fashion"

and organic cotton, for example. In our view, most of these purportedly sustainable alternatives do not seem to be able to tackle the complexity of the fashion system or the different components of it adequately. Organic cotton is still environmentally harmful and the price of "fair trade" fashion is often prohibitively expensive for many consumers.

Another recent design trend is the use of electronics and "[smart materials](#)" to make garments interactive and more engaging, supposedly giving them longevity. But there is little research into how such textiles may be disposed of—and they are not likely to be cheap, either.

As such, we feel that materials that are already abundant in nature offer the best alternatives. Think of polylactic acid (PLA), a substance made from vegetable starch and already used to make biodegradable carrier bags but have the potential to be [developed into textiles](#). Or Tencel and Lyocell, materials that are made from sustainable wood pulp and are already on the market.

Then there's anything made from collagen, "animal protein" and a natural polymer, which although not so popular with vegans, has been developed into "[Zoa](#)", a luxury leather alternative by Modern Meadow, and [our own experiments](#) working with waste materials. Sustainable materials of this kind are what we should be focusing on.

Mushroom materials

Particularly exciting are the growing number of companies producing mushroom alternatives to packaging, building materials and leather. Stella McCartney, for example, is collaborating with Bolt Threads on a "Mylo" mushroom leather range of accessories.

There are several projects and companies working in this area and their outputs are diverse and inventive. Of particular note are [MycoWorks](#),

who have created "a new kind of leather grown rapidly from mycelium and agricultural by-products in a carbon-negative process." They say that the material is sustainable, versatile, and animal-free.

[MuSkin](#), another leather alternative, is made out of *Phellinus ellipsoideus*, a fungus that rots wood in subtropical forests. Meanwhile, [Ecovative Design](#), who started out making an alternative to plastic packaging but have branched out into creating leather and foam from mycelium.

And in a similar area—not using fungi but microbes—is leather made from the cellulosic scoby bacteria that is used in the making of kombucha tea. There are lots of companies experimenting with this technique, such as [Biocouture](#). This material, when dried out, looks like a clear, pale brown leather with a flexible plastic texture.

We have our own experience in this field: a couple of years ago we collaborated on an attempt to make a material out of mushrooms. We grew our material from the vegetable waste from a tuber-derived cellulose powder product made by a [company in Scotland](#). We wanted to create a location-specific fungal material, differing from the other current projects mentioned.

Our initial samples looked and had the texture and appearance of furry burnt crisps: it was clear we weren't going to grow jeans or undermine the denim industry in the short space of time we had. But this objective and passion for the possibilities of mycelium in this context has stayed with us, and we are not the only ones.

The benefits of growing a textile-like material from fungi or bacteria as opposed to cotton, man-made fabrics or worse still, blends such as "poly-cotton" are many. Fungi are naturally abundant in nature, quick to grow (on a range of [waste materials](#)) and their growth uses a lot less water than traditional textile manufacture. In theory, a fungal product is also

completely biodegradable, can be strong, can be colorful, water repellent, can be edible, and can have medicinal properties. And the list [goes on](#).

As a way to disrupt the fashion system as a whole, fungi or bacteria based textile alternatives might still be some way off. But while the over consumption and toxic wastefulness of the [fashion](#) and traditional textile industry continues, design in this area can also be seen as an act of environmental protest.

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