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# Challenging perceptions of fast and slow in contemporary fashion: A review of the paper dresses trend in the United Kingdom and the United States during the 1960s

**ABSTRACT**

*Writing in 2022 we are at a global crisis point, as our use of the planet's finite resources outstrips supply. Our current lifestyles continue to perpetuate this problem by encouraging excessive and wasteful models of consumption. One of the most detrimental industries for this is the clothing industry. Our fashion cycle*

**KEYWORDS**

paper dress
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*is now programmed to be 'ultra-fast', encouraging excessive consumption of garments causing myriad environmental issues. This article argues that there are developing models of both manufacture and consumption, which can satiate this need for 'fast' fashion whilst being part of the wider sustainable fashion conversation. Rather than understanding the short-term life cycle of clothing as inherently unsustainable, this can be reframed as matching a garment's use phase to the longevity of the material it is made from. This article uses a material culture approach to explore original 1960s paper garments, alongside a critical analysis of the sustainability of their manufacture and disposal from a green chemical perspective. Using the combined knowledge and experience of its authors, from historians and sustainable fashion designers to green chemists and biochemical engineers, this article demonstrates how such garments could inspire new models of sustainable fashion production and consumption. We argue that the current paradigm of slow fashion as the only antidote to fast fashion must be challenged. Instead, the fashion and textile sector must consider a range of solutions to the environmental burden of fast fashion that are human-centred and sympathetic to all consumer demographics and needs.*

## INTRODUCTION

In 2022 climate breakdown has become a frightening reality, accelerated by our usage of the planet's finite resources. Excessive and wasteful models of consumption dominate internationally, and the clothing industry is amongst the most damaging. New solutions are needed to try and balance the demand for clothing.

Using the paper dress phenomenon of the 1960s as an early exemplar of fast fashion can help us explore potential solutions. At its core this trend offered a cheap material with which to make clothing that could then be easily discarded after use. A precursor to fast fashion as it might be understood today, these dresses offered high fashion at a low price, allowing consumers to frequently update their wardrobes. However, these dresses were arguably flawed – difficult to wear and incapable of being recycled due to the use of mixed fibres. Though these paper garments are regularly dismissed as a fashion fad, fads are often a manifestation of potent philosophies and ideologies and therefore still worthy of consideration (Palmer 1991: 85–104). Whilst paper dresses were not designed for circularity, we can draw important information about material properties and user experience from these historical garments. This technique of reusing and reinterpreting historical models of design to inform sustainable systems is recognized by the Centre for Circular Design as a way to approach sustainability (The TEN n.d.).

Fashion's speedometer is now set to 'ultra-fast'. Between 2000 and 2015, fuelled by fast fashion, social media and online e-commerce platforms, clothing production doubled (Ellen MacArthur Foundation 2017: 36). Furthermore, the number of fashion seasons has increased dramatically (Bhardwaj and Fairhurst 2010: 167). A 2019 Swedish study of clothing consumption determined that nearly 80 per cent of climate impact happens during the production phase, highlighting the harm created purely by increased demand (Sandin et al. 2019: 70). In response, there have been increasing calls for 'slow fashion' models of production and consumption, where clothes are valued and kept in circulation for longer.

'Good On You', a leading source for brand ratings, articles and expertise on ethical and sustainable fashion, defines slow fashion as encompassing an awareness of fashion that considers the processes and resources required to make clothing. This outlook advocates buying better-quality, long-lasting garments and values fair treatment of people, animals and the planet (Good On You 2021). Similarly, campaigns such as 'Love Your Clothes' (Love Your Clothes n.d.) and 'Love Not Landfill' (Love Not Landfill n.d.) aim to provide consumers with tools to care for their existing clothing longer. However, there are drawbacks to slow fashion, such as price point; slow fashion can be unattainably expensive, with consumers of slow fashion willing to accept a '30 to 40 percent price premium' (Štefko and Steffek 2018: 3). Affordability coupled with quickly changing trends and a consumer desire for new garments means that a universal adoption of slow fashion is unlikely in the short to medium term.

The basic definition of slow fashion tends to ignore the complexities of garment use and is therefore not appropriate for all garments. Though we often require different lifespans from our garments, there is currently a lack of viable routes for disposal. A 2017 report estimated that out of 53 million tonnes of fibre produced annually, 73 per cent will end up either in landfill or incinerated (Ellen MacArthur Foundation 2017: 20). Prioritizing longevity in textiles means we ignore the potential detriment of that longevity.

Such a complex problem cannot be simplistically divided into good and bad models for sustainability; instead our approach must be more refined. Herein, we argue that there are alternative models of manufacture and consumption, which can satiate the desire for fast fashion whilst also engaging in the wider sustainable fashion conversation. Rather than understanding the short-term life cycle of clothing as unsustainable, this can be reframed as matching a garment's use phase to the longevity of the material it is made from.

## METHODOLOGY

This article takes an integrative cross-sector approach to explore – through the lens of fashion history, fashion and textile design and green chemistry – the potential for the paper dress to be used as a framework for a new and novel solution to the environmental burden of fast fashion. This builds upon the technique of re-examining historical models of design to inform sustainable systems proposed by the Centre for Circular Design (The TEN n.d.). The brief trend between 1966 and 1968 for paper dress forms the basis of this case study. The authors analyse paper dresses against three main criteria – manufacture and construction; consumer experience; and end of life – to better understand the life cycle of these garments and how they might inform a circular economic model for textiles. Combining research from archives, newspapers and magazine articles, contemporary journal articles and object analysis, the authors argue that new models of fast fashion can develop that are human-centred, sustainable and sympathetic to consumer demographics and needs.

## 1. MANUFACTURE AND CONSTRUCTION

Whilst 1960s disposable dresses were referred to as 'paper', they were not what we traditionally think of as paper but instead made from a variety of cellulose-based materials. For clarity we will hereafter describe this as 'paper material'. Paper materials lie somewhere between fabric and conventional

paper – combining textiles fibres with techniques utilized in paper manufacture to create a non-woven material (Wilson 1967: 16–17). Typically, these textile fibres, primarily cellulose, were pulped and calendared into sheets or rolls that could be easily printed (Anon. 1967c: 8). Often the paper was bonded with glue or coated in plastic to make it water-repellent and fire-retardant (Anon. 1967g: 9). Even at the height of its popularity there was consumer confusion surrounding paper materials. A 1967 article called for a 'proper definition' of paper so that consumers had a clear understanding of 'what to expect in terms of wear and what to pay in consequence' (Anon. 1967c: 8).

### *1.1 Paper material makers*

Several types of paper material were used for garments in the 1960s; however, the most popular was made from a paper or cellulose pulp, strengthened with a layer of nylon or rayon scrim.[1] This paper material was cheap to produce, and in Britain the wholesale price was around 1*s* per yard for plain fabric, or 2*s* per yard for printed (Anon. 1967c: 8). Both the paper and textiles industries produced variations of paper material (Lippall 1967: 55).

The United States was an advanced producer of paper materials for fashion garments with several companies recognizing the potential for high-volume sales. Scott Paper Co. was one of the earliest firms to manufacture paper dresses on a mass scale, selling 500,000 dresses at $1 each (plus $0.25 handling) during 1966. Their dresses were made from 'Duraweave', a three-ply paper reinforced with rayon scrim. Despite the success of these garments, Scott Paper Co. regarded them simply as a marketing ploy, designed to encourage purchase of their other disposable paper products (Anon. 1966a: 8).

Kaycel, produced by Kimberley-Stevens, was amongst the most common paper materials used by firms, made from a blend of 93 per cent cellulose and 7 per cent nylon. This material was fire-resistant, unless washed, which would remove the finish (Met Museum 1986.91.7a–c). Mars of Asheville, North Carolina, one of the most prolific paper dress firms, used Kaycel for their garments. Unlike Scott Paper Co, Mars were already garment manufacturers, specializing in hosiery and swimwear. They identified a gap in the market and turned their production lines over to paper garments, ranging from basic A-line shift dresses (retailing at $1.29) to evening gowns ($5) and even bell-bottom jumpsuits ($4) (Goodman 1966: 31). Examination of a Mars dress (as well as a paper dress by the designer Elisa Daggs) at the Metropolitan Museum of Art, New York, clearly shows the nylon content of the Kaycel material in the form of a scrim layer running through it, giving a distinctive grid-like structure (Figure 1). Mars worked closely with American department stores, and their 'Wastebasket Boutiques' were added as concessions to stores including Abraham & Strauss and B Altman's in New York (Shepard 1967: 4–5, 34). In 1966 it was reported that Mars were selling 80,000 paper dresses a week (Goodman 1966: 31).

### *1.2 Paper material qualities*

The nylon or rayon scrim layer running through paper materials helped to ensure they behaved more like traditional textiles. Many accounts indicated that paper garments were strong, durable and not prone to tearing (Anon. 1966b: 38–39).

1. At this time newspapers and journals use the terms rayon and viscose interchangeably to describe the scrim, although primarily, in Britain, it was described as rayon.

*Figure 1: Elisa Daggs,* Evening Dress, *1967. The Metropolitan Museum of Art, New York. Author's photograph.*

Paper materials took colour extremely well and garments were often printed with exuberant op or pop art patterns in vibrantly saturated colours. For example, a 1967 advertisement for *Petticoat* magazine's paper dresses described the colours available as 'crazy pink and orange candy or glowing lime and mauve combo' (Anon. 1967d: 11). Manufacturers exploited the boxy silhouettes of paper dresses, using them as canvases to print large abstract or photo-realist prints and even political campaigns. Amongst the most striking were those manufactured by Harry Gordon; his poster dresses included an overblown eye design, 'mystic eye', which was printed boldly across the dress.

Object analysis conducted by the authors in 2022 indicated that paper dresses produced between 1966 and 1968 were primarily printed using water-based formulations. This is hypothesized because the designs appear quite flat and the fibre structures are generally visible under the printed sections, which other printing methods would obscure (Merritt 2022: n.pag.). Water-based inks are typically made up of acrylic resins or polyurethanes in water, commonly with a volatile co-solvent to reduce drying time. Some contained formaldehyde to aid in pigment binding. These dyes could be cured at relatively low temperatures (Ukena 2005: 8–11; Kiurski et al. 2012: 18–25).

The crisp A-line silhouette of most paper dresses was central to their appeal. Whilst paper material was ideal for creating such silhouettes, the

potential flammability of paper was concerning to retailers and consumers. Generally paper materials were treated with flame-retardants which would have slowed the flame spread. However, washing did typically remove these coatings, but as the consumer was forewarned of this on the label and the garments were designed for short-term use only, this was deemed acceptable (Anon. 1967a: 9).

It cannot be ascertained what flame-retardant finish was used on paper materials; however, due to their cellulosic nature, it is likely that flame-retardants designed for use on cotton were employed (Horrocks et al. 2005: 3–12). There were a host of flame-retardants developed for use on cellulose in this period, but given the warnings about laundering of the garments leading to removal of the flame-retardant coating, it is likely that one of the following methods was used:

- The binding of phosphoric acid to cellulose via esterification using formaldehyde and stabilized by either urea or titanium salts. This method results in a hydrolytically unstable P-O bond with reduced resistance to washing.
- Application of an inorganic salt, such as titanium or antimony salts, to the surface of the cellulose, creating a non-durable or semi-durable flame-retardant coating.

Both are environmentally concerning on a process and disposal level. Formaldehyde is a toxic, volatile compound that causes serious health issues for manufacturers and consumers. Metals such as titanium and antimony, if leached into groundwater via laundering or disposal, have the potential to endanger aquatic life (Horrocks 1986: 62–101).

### *1.3 Garment construction*

The rise of paper dresses must be understood as part of wider fashion trends of the 1960s. Increasingly there was a desire for simpler silhouettes, and less layers of underpinnings – such as corsets and petticoats – to give garments structure. Internationally, designers were creating bold garments that no longer necessarily followed the contours of the body. Novel paper materials provided excellent scope for experimentation. Between 1966 and 1968 a wide variety of paper dresses were produced – ranging from simple creations made with just two pattern pieces to elaborate designs more akin with haute couture.

Most paper dresses were sleeveless, produced in limited size ranges (sometimes just small and large) and were designed as simple A-line mini shifts, tent shapes or baby smock styles. The dresses were typically left un-hemmed as paper material does not fray. Garments were assembled in various ways; most surviving examples have stitched seams, but articles indicate that some were bonded or even sellotaped together (Murgatroyd 1967: 1; Anon. 1967a: 12). Paper dresses tended not to have fastenings and were designed to slip over the head, with necklines cut relatively wide to allow for this. These design decisions helped to keep manufacturing costs low, both in terms of amount of material used and the need for skilled or time-consuming labour in production. Consequently, this meant that paper dresses could be retailed at low prices.

Surviving examples of paper garments, such as a 'Paperdelic' dress at the Met (Met Museum 1994.468 – Figure 2), illustrate the simplistic construction

methods generally used. This garment has a basic batwing silhouette, avoiding the need for shaping through darting. The stitching is poorly executed and looks rushed, and unlike some other paper dresses viewed, it has not been overlocked. On the other hand, Scott Paper Dresses, amongst the cheapest available, had relatively complex and detailed finishing (Met Museum 1995.444.1). These dresses had features including pockets and facings and used bias binding on the armholes. The overall design was still relatively simplistic, consisting of two main pattern pieces and a raw hem, but the execution was of a high standard.

Garment construction was also sometimes left to the consumer, and paper dresses were offered as flat pattern pieces for the home seamstress. *Petticoat* magazine, for example, offered a paper dress 'ready cut-out'

*Figure 2: Paperdelic*, Dress, *1965–75. The Metropolitan Museum of Art, New York. Author's photograph.*

– designed to be sewn at home 'in a matter of minutes' (Anon. 1967a: 11). These were more complex than many of the commercially available paper dresses, sent with matching bias binding and utilizing at least three pattern pieces. Advertisements and editorials for paper dresses highlighted the 'at home' customization opportunities, allowing consumers to effectively become designers themselves. Paper material could easily be cut into interesting shapes as it did not fray. An advertisement for Ac'cent paper dresses suggested that they could be 'scissored any way you want … maxi, micro, slanted' (Anon. 1967b: 35–37). A 1968 editorial featuring Nescafe dresses went even further, suggesting that one could 'cut the hemline into scallops or a fringe, or make an openwork pattern of diamonds or flowers, or cut midriff holes front and back' (Anon. 1968: 12).

In contrast to this, some designers created elaborate garments from paper, recognizing that its low cost offered scope for experimentation. Judith Brewer's Kaycel garments typically retailed between $10 to $40; however, she also offered extravagant garments including custom-cut 'fur' coats made of shredded paper priced at $200 from her boutique in Beverly Hills, California (Carlton 1966: 130–36). From a construction perspective, American designer Elisa Daggs' paper garments are amongst the most complex, utilizing multiple pattern pieces to create striking silhouettes. Daggs created a variety of paper garments including striped kaftans (retailing at $7), specially treated raincoats ($7.50) and even bikinis ($4) that could be worn in water two or three times (Goodman 1966: 31). One of her most complex garments was a rainbow-striped paper sun dress comprised of eight pattern pieces (Met Museum 1986.91.6 – Figure 3). The design relies on aligning print to accentuate the line of the dress, a time-consuming design choice. Palmer notes that unlike other designers of paper garments who exploited the natural qualities of paper, Daggs approached designing with the material as if it were 'a cloth dress […] [with] little care for its transience' (Palmer 1991: 91).

As we have illustrated, the construction methods associated with paper dresses were often in contrast with their short-lived existence. This can still be seen today, whereby time-consuming manufacturing processes are used for 'low cost' items. Many garments and the fibres used to make these garments have a potential lifespan that 'far outweighs their short fashionable life' (Stanes and Gibson 2017: 27). This concept of mismatched speed cycles has previously been explored in various papers (see Goldsworthy et al. 2019; Stenton et al. 2021a, 2021b).

Kate Fletcher, who has written extensively on slow fashion, has suggested that the terms 'fast' and 'slow' fashion are misnomers that generally refer to the economic models of consumption rather than the garment itself; the processes involved in producing the fibres and garments still take the same amount of time; it is the delivery and consumption that is sped up or slowed down (Fletcher 2007: 189–218). The concept of slow fashion, as outlined by Fletcher, focuses on alterations at a systems level to the way we interact with, value and use clothing and not as a subvariant of the traditional model of high consumption and waste (2010: 259–65). Fletcher concludes that instead of the antidote to fast fashion, slow fashion and fast fashion are in fact complimentary (2012: 124–30). In considering this outlook of fast and slow when assessing the techniques used in paper dresses, there are lessons to be learnt from their construction such as bonding rather than stitching seams. This contributes to the reduction in time, energy and resources required to construct garments, ultimately leaning towards a more matched speed cycle.

*Figure 3: Elisa Daggs,* Evening Dress, *1967. The Metropolitan Museum of Art, New York. Courtesy of the Metropolitan Museum of Art/Art Resource/Scala, Florence.*

## 2. CONSUMER EXPERIENCE

Paper dresses were the epitome of a new direction in fashion – on the whole these were lost-cost items – designed to appeal to the increasingly affluent teenage market who were spending their disposable income on clothes, music and their social lives. They were generally seen as a garment reserved for 'fun' occasions where one might desire to wear something new. This is suggested in the wording of advertisements – an advertisement for Wall's ice cream paper dresses described them as 'the raviest ever! Guaranteed to steal party scenes!' (Anon. 1967b: 11). Increases in pay alongside annual leave given to British workers in the 1960s led to new opportunities for middle- and working-class people to travel internationally. Paper dresses were the ideal item to take on holiday, taking up very little room in a suitcase, and disposable before return.

There was no incentive to wash paper garments as their cost was less than laundering similar garments made from cotton or synthetic fibres (Smith 1968: 24). The popularity boom in paper dresses highlights the importance of matching design and manufacture process to consumer wants and desires.

Paper dresses should be understood as part of a broader change in fashion whereby there was an increasing demand for inexpensive clothing, produced quickly to meet ever-emerging new trends. Young adults were both the designers and consumers of much of this low-cost fashion, and their influence was seen across the industry (Scott James 1960: 6). Young consumers were seen to have a fickle attitude to fashion. As an *Irish Times* article suggested, they did not 'wear dresses more than a few times' before discarding them (Anon. 1966a: 6). The move towards disposability suggests not only a desire for perpetual 'newness' but also the decreasing material value of clothes. Many consumers were not seeking out 'quality' garments which were made to last, and aesthetic value trumped material value.

### *2.1 Experiencing British paper dresses*

In 1961 British designer Teddy Tinling, already well known for his tennis dresses, produced a range of tennis fashions in paper. The dresses were made from paper mounted on a nylon lattice work, imported from America (Anon. 1961: 6). Despite Tinling's early experimentation, British consumers were slow to adopt paper dresses. Ossie Clark launched a dress made from Ascher paper material, printed with a floral design by Celia Birtwell, in December 1966. The first dress retailed at just 17*s* and 6*d*, and early in 1967 he launched a range of twelve different paper dresses, none costing more than £1 (Lowe 1967: 15).

Mornessa, until the mid-1960s a coat and suit specialist brand targeted primarily at the middle-aged consumer, pivoted and produced some of the most striking paper dresses as part of their 'Marcus boutique range'. These dresses were designed by Paco Rabanne and made from Vilbond. This paper material had a crinkly texture, was non-rustling, soft to the touch, flame-proof and had been tested for stress. The Mornessa dresses were not sewn. Seams were joined by a strong bonding process, and each was expected to last two or three wears (Thomas 1966: 3). This range included evening, cocktail and day dresses and fashion overalls, retailing at between 7*s* 6*d* and 25*s*. Rabanne's designs were particularly bold, and some garments were appliqued with paper and plastic discs (Hackett 1967: 7).

Dispo, established by Diane Meyersohn & Joanne Silverstein, was a popular British disposable dress brand. One particularly bold garment they produced was inspired by Art Nouveau designs seen at the Victoria and Albert Museum. This dress, costing 22*s* and 6*d*, was widely promoted in the fashion press and appeared in a 1967 *Rave* editorial in three colours – pink and orange, lime and pink, and green with turquoise (Figure 4) (Anon. 1967f: 4–5). The paper material used in these dresses was a type of Vilene, produced by Bondina Ltd., a company formed by Bradford Dyers' Association in 1956 to produce non-woven fabrics. Different to many American examples that used a supporting rayon mesh structure, Vilene has a random fibre structure which can be seen on the reverse of the fabric. It should be noted that Bondina made fabrics under license from German company Carl Freudenberg. Freudenberg initially experimented with creating a leather substitute before turning to create interlinings for garments (Welling 1962: 17). For the paper consumer,

*Figure 4: Dispo (Meyersohn & Silverstein Ltd)*, Art Nouveau Dress, *1967. The Victoria and Albert Museum, London. © Meyersohn & Silverstein. All rights reserved, DACS 2022.*

Vilene had advantages over other paper materials – and was able to be washed several times.

### *2.2 Target markets and retail*

The visual merchandising of paper dresses in department stores highlighted their fun and even gimmicky nature. For example, in America, B Altman's 'Wastebasket boutique' took a 'light-hearted carefree attitude' with four large round tables covered in brightly coloured felt standing in front of large New York City sanitation department wastebaskets. Paper dresses hung from hangers attached to the wastebaskets (Shepard 1967: 4–5, 34). In Britain there is less evidence of how paper dresses were retailed and the associated visual merchandising. Several articles suggest that store buyers were 'cautious' of them, even stores well known for supporting young designers and the latest trends, like Fenwick's in London (Ashdown-Sharp 1967: 4). However, Peter

Robinson's 'Top Shop' in Oxford Circus certainly stocked paper dresses, as did Harrod's 'Way-In' department, which opened in 1967. One journalist, who visited during its opening week, provided a detailed description of this space, which points to how stores, particularly department stores, were trying to entice new, younger consumers.

> Beat music throbs through the midnight blue atmosphere – walls and low ceilings are painted blue, low chunky seats […] are covered in the same shade of blue. Dimly, because it's all mixed up amongst the merchandise, I noticed that a coffee bar was being well patronized. Gear for both sexes is also mashed together.
>
> (Curry 1967: 6)

Paper dresses represented a new dichotomy in fashion – a high-fashion item sold in boutiques and simultaneously given away as a 'freebie' or in exchange for coupons. The 'freebie' was a highly popular marketing technique towards the end of the 1960s, encouraging consumers to make purchases they otherwise would not have done (Castle and Marriot 1968: 4). The language of 'freebie' paper dress advertisements, and the editorials that promoted them, points to the young target consumer, often described as a 'dolly' or 'dollybird'. Wall's suggested their paper dresses enabled the wearer to be 'cuts above ordinary paper dollies!' (Anon. 1967b: 11). The term 'dollybird' was broadly associated with young, carefree women – interested in the latest fashions and music. The 'dollybird' transcended class – and indeed, much of the fashion of this period was supposedly classless (see Breward 2004: 151–77). Whilst paper dresses were low-cost dresses in reach of most, they were worn by women across the class spectrum who wanted fun, novel clothing.

Young consumers, as the paper dress trend indicates, have always been the key target markets for low-cost fashion. Today, whilst young consumers are increasingly environmentally conscious, they are also amongst the most voracious consumers of fast fashion. A 2021 survey indicated that 64 per cent of British 16–19-year-olds admit to buying clothes they have never worn, compared with 44 per cent of all adults surveyed (Kale 2021: n.pag.). This illustrates that contemporary disposable fashion would need to consider the wants and needs of the young consumers likely to purchase it.

### *2.3 Experience of wear*

In 1966 *Women's Wear Daily* published a series of comments from staffers exploring their experience of wearing a paper dress – largely their views were negative. Complaints related to the drapability of the dresses, seen as 'too stiff' and that the garments were uncomfortable against the skin. Overall, comments highlight that these garments were seen as unflattering, and one writer suggested she felt like 'a frump' (Anon. 1966b: 38–39).

Using an unconventional approach, Liz Tregenza, who is also a vintage dealer, wore a paper dress from her personal collection to better understand how these dresses behaved on the body. The dress used for this experiment is made from a vibrant red paper material which has been reverse-stencilled with a gold logo (Figure 5). The paper material, likely Vilene, is very strong. The reverse of the paper material is visually identical to Dispo garments. The dress is made from six pattern pieces – three main pieces and three internal


*Figure 5: Player's cigarette advertising paper dress, c.1967. © Liz Tregenza*

facing pieces. It has been sewn together, and the two side seams have been overlocked; it also has a zip inserted in the centre back seam. The workmanship is basic, but neat overall. The silhouette means the dress stands away from the body, creating airflow, showing how the dress would be suitable in hot weather. Whilst stood or dancing, the dress behaved as one might expect, moving with the body. However, the paper material does not have flexibility and bags in an unflattering way when seated. Furthermore, the armholes are cut quite large, likely to give flexibility in terms of sizing. As the paper material is very lightweight, this means it does not sit properly, with space above the shoulder. Overall, the biggest issue with the dress is how it feels – when seated this is more obvious; the paper material is itchy and uncomfortable against bare skin.

## 3. END OF LIFE

In July 1967 a *Guardian* article predicted that by the end of that year sales of 'short-life' dresses were expected to reach $76 million (Anon. 1967c: 8). Despite this prediction, the bottom had dropped out of the market by winter 1967. There were various reasons why paper garments fell from popularity, but one of the biggest issues was price, either deemed too cheap – the cheapest described as 'just about as attractive as paper towels' (Sheppard 1967: 6) – or more often too expensive, to compete with conventional garments (Knight 1969: 4).

Perhaps more enduring than the paper dresses themselves was the fashion cycle they embodied; the same article describes how 'bold prophets' in the trade predicted that within five to ten years there would be a 'great dividing line between quality apparel for long wear and attractive short-wear styles which will be thrown away as casually as a paper napkin' (Anon. 1967c: 8). Certainly, by the mid-1970s the fashion cycle had further sped up; however, paper material was no longer widely used.

Ultimately paper material could not displace the popularity of typical woven and knitted fabrics, nor compete in functionality. Indeed, paper material must be seen against a backdrop of decreasing prices for synthetic fibres. Whilst initially seen as an intriguing possibility, paper was ultimately seen as a gimmick (Knight 1969: 4).

The declining demand for paper clothes from 1968 onwards also reflected a shift in design trends. The properties of paper materials meant they worked best for garments with boxy silhouettes. It was unsuitable for the diaphanous shapes and bias-cut lines, inspired by silhouettes of the 1930s and 1940s, which were becoming fashionable.

### *3.1 Disposal and survival*

Whilst paper dresses were promoted as disposable, they were not recyclable in the modern sense, and many of the materials and processes used in their manufacture were inherently environmentally damaging. The inclusion of nylon, in particular, takes the paper dress from being theoretically compostable to a mixed polymer material. Nylon is manufactured from petroleum, which is non-renewable, non-biodegradable and associated with high emissions of $CO_2$ (Chen and Burns 2006: 248–61; Boustead 2005: 10; Muthu et al. 2012: 66–74; Muthu 2020). While viscose, also found in some paper dresses, can be made from renewable resources and is biodegradable, it is not necessarily environmentally friendly because of the amount of water, chemicals and effluent used and emitted in its manufacture (Muthu et al. 2012: 66–74). Furthermore, viscose has contributed to the destruction of ancient woodlands and, as a result, has impacted biodiversity (Stenton et al. 2021b: 13). There are also concerns over the use of carbon disulphide, a neurotoxic, volatile component used within viscose production (Philipp 1993: 704–14). Modern processes have worked hard at 'closing the loop' to prevent leakage of hazardous chemicals into the environment (White et al. 2005; Goswami et al. 2009: 455–65), but during the 1960s, the production of viscose was certainly environmentally damaging (Blanc 2016).

In the mid-1960s 'disposability' was a term with positive connotations, synonymous with convenience and saving the consumer time. There was no need to wash paper garments, and their cost was less than laundering similar garments made from cotton or synthetic fibres (Smith 1968: 24). As early

as 1969 however, the problems of disposability were already being discussed; one newspaper article suggested the term 'affluent effluent' was applied to the waste and discarded products of modern society. The article went on to state that 'planned obsolescence [had] brought problems of waste disposal on a scale not previously envisaged' (Anon. 1969: 15). In a domestic setting during the 1960s, there were not the same recycling opportunities that we have today, meaning products were improperly disposed of. The 1969 article cited previously suggested that plastic bottles were 'non-returnable' to store, unlike their glass predecessors, and that many were simply dumped. This is still a problem today, and many consumer goods, despite improved recycling opportunities, are disposed of inappropriately.

## 4. A PAPER DRESS FOR THE TWENTY-FIRST CENTURY?

The paradigm of disposable dresses as an alternative to current industry practice is not completely novel. Goldsworthy et al. explored this in their Mistra Future Fashion project where they questioned the place of fast garment cycles with appropriate end-of-life mitigations. One outcome of this project was the 'throwaway dress' designed in collaboration with Filippa K – a disposable single-use garment that would 'provide the wearer with an opportunity to update their wardrobe for a special occasion with reduced associated environmental impacts' (Goldsworthy et al. 2019: 45).

In the 1960s, the environmental burden of paper garments was not considered. The chemicals and processes used focused on increasing the functionality of the garments without consideration to the environmental ramifications of their disposal. This is evident in the mixing of paper (theoretically compostable) with synthetic materials such as nylon to improve the handle and drape of the material, the use of petroleum-derived inks in the printing and the coating of garments with environmentally hazardous flame-retardant coating. So, how practically could we create a paper dress for the twenty-first century?

### *4.1 Manufacture and construction*

Paper garments of the 1960s were commonly a combination of 'paper' cellulosic pulp and either nylon or viscose scrim – neither of these added polymers lend themselves to sustainable production or disposal; however, recent efforts have been made in the development of more sustainable, biodegradable polymers (see Patti and Acierno 2022). Lenzing AG, for example, have developed closed-loop processing of viscose for their 'ecovero' and 'lyocell' brands (White et al. 2005: 157–88; Periyasamy and Militky 2020: 63–95). Consequently, today a cellulose-based non-woven material could be developed that was relatively green. Furthermore, a range of new fashion and textile initiatives and organizations are emerging to produce viscose that does not involve harmful deforestation and works to preserve forests and genetic diversity. For example, Canopy works with brands to transform supply chains whilst prioritizing biodiversity and forest protection (Canopy n.d.: n.pag.); Textile Exchange is also supporting regenerative agriculture and has recently published an analysis of the emerging regenerative textile landscape (Textile Exchange 2022); Fashion for Good recently launched the 'Untapped Agricultural Waste Project' with the aim of developing technologies capable of transforming agricultural waste into textile fibres (Fashion for Good 2022); and Fibershed develop regional fibre systems which replenish the soil and protect the biosphere (Fibershed n.d.).

Coloration of 1960s paper dresses used chemistry and processes that have since been proven to have significant environmental costs (Horrocks et al. 2005: 3–12; Kahane 2015: n.pag.). Water-based inks have petroleum-derived plastics present within them, alongside volatile solvents and formaldehyde that pose safety and emission concerns during manufacture (Kahane 2015: n.pag.). Water-based inks also tend to require significant energy to cure due to the need to drive off excess solvent through evaporation (Aydemir and Özsoy 2020: 12). Today, demand for green ink alternatives is growing rapidly. Initiatives such as water-based and UV-curing inks are starting to replace those based on volatile solvents, and petrochemical-derived pigments are being replaced by alternatives sourced from either natural or renewable feedstocks (Robert 2015: 287–92).

Printing technology has advanced since the 1960s, and if paper dresses were made today, digital printing could be utilized. Digital printing reduces the water and ink wasted during the printing process, making it more environmentally friendly and often cheaper and quicker than traditional printing methods (Tkalec et al. 2022: 105–15). The concerns over the flammability of garments made from paper are valid today. While many of the flame-retardant coatings used now remain broadly unchanged since their invention between the 1950s and 1980s (Horrocks et al. 2005: 3–12), there is a push to find sustainable, environmentally benign alternatives (see Horrocks 2020: 2160; Malucelli 2020: 4046; Piao et al. 2022: 2711–29; Zhu et al. 2022: 106–688).

Garment construction would also need to be carefully considered. In order to make an affordable and environmentally friendly garment, it would need to be simply manufactured – either with as few stitched seams as possible or with bonded seams. This should guarantee more straightforward disposal, but also simple manufacturing would help ensure that those making the garments could be paid fair wages for their work.

### *4.2 Consumer experience*

Paper dresses were targeted at the youth market in the 1960s. Today, it is that same market that heavily consumes fast fashion, and consequently they would be the ideal target market for a contemporary paper dress. In Britain, Pretty Little Thing (PLT) – part of the Boohoo Group – is amongst the most popular fast fashion brands with the 16–24 demographic. PLT offers their garments at extremely low prices; party dresses typically cost £30 or less, and regular discounts are offered. The company came under criticism for their '100% off' sale in November 2021, effectively offering garments for free (Rogers 2021: n.pag.).

Extremely low-cost fashion encourages excessive consumption and decreases clothing utilization – the average number of times a garment was worn before it ceased to be used decreased by 36 per cent between 2002 and 2017. Consequently, many garments are estimated to be discarded after just seven to ten wears, and as a 2017 report by the Ellen MacArthur Foundation indicated, more than half of fast fashion produced is disposed of in under a year (2017: 19, 36).

The speed at which fashion is consumed is intimately connected with social media; there is a continuous thirst for new outfits to post on Instagram or TikTok. PLT heavily target consumers through social media, working closely with influencers and reality TV personalities of a similar age to their consumer,

such as Gemma Owen, appointed a brand ambassador in 2022 at just 19, and Molly-Mae Hague, appointed creative director of PLT in 2021.

It is inevitable that some consumers will wear garments simply for social media content creation or a night out. Rather than deny this, a change in mindset around material choice and matching speed cycles for such garments could offer an innovative solution.

### *4.3 End of life*

In order to create an environmentally friendly paper dress, more sustainable coloration and coating chemistry could be utilized with composability in mind. The nylon present in some paper garments could either be replaced by a compostable fibre, or the paper itself chemically modified to improve drape and strength. Progress is being made in the development of materials created from agricultural waste, which could enable the creation of garments that are compostable or biodegradable. Designers such as Suzanne Lee have experimented with fully compostable materials made from waste, and in Italy, 'Orange Fiber' is currently working with citrus waste to produce textiles (Biofabricate n.d.; Orange Fiber n.d.). Finally, household recycling and composting infrastructure more broadly would also need to be improved to make an environmentally friendly disposable dress truly viable.

## CONCLUSION

Undoubtably, there is a lot of work still to be done to transform the historical design of the paper dress into a commercially viable and consumer-attractive product, but the concept of a truly compostable, 'disposable' garment to help alleviate the environmental burdens represented by the current ultra-fast fashion cycle should not be disregarded.

The 1960s paper dress trend was extremely short-lived, but briefly provided consumers with viable garments designed for single (or limited) use. Whilst the paper dresses themselves were not sustainable, this technology, as we have shown, could be reimagined today. This paper has utilized cross-discipline collaboration, bringing together designers, historians, chemists and textile engineers to explore the history and potential future of the paper dress.

Presently the discourses around sustainable systems for fashion have centred around rejection of the fast fashion cycle in favour of slower methods of consumption. This argument assumes that fast fashion is inherently negative, yet its prominence persists. While some consider fast fashion to be a new phenomenon, originating in the twenty-first century, it is clear that the desire for rapid modes of fashion consumption were present during the twentieth century.

In 1967, Glen Seaborg predicted the year 2000 would bring low-cost disposable dresses made from new synthetic fabrics, enabling women to never be seen in the same outfit more than once (Anon. 1967b: 15). At the time, the idea of using synthetics for disposable fashion was exciting; however, now the ramifications of these materials are better understood; it is rightfully unsettling.

The current trend of ultra-fast fashion cycles is essentially creating pseudo-disposable clothing, with prices set so that a garment is financially comfortable to purchase with a single wear in mind. However, the materials and processes used are designed for extremely long-lived products, with synthetics that take hundreds of years to degrade and pose significant

environmental challenges while doing so. It is the authors' belief that through continued similar collaborative efforts, the sustainable future of the textile industry can be based on concepts from the past combined with modern knowledge and techniques to design and build a more sustainable future.

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