

**'Do Not Flush Feminine Products!'**

**The Environmental History, Biohazards and Norms Contained in the UK Sanitary  
Bin Industry since 1960**

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**Abstract**

The sanitary bin and warnings such as 'Do Not Flush Feminine Products!' have become a feature of women's public bathrooms throughout Britain. Begun in the 1950s by family-owned companies such as Personnel Hygiene Services and Cannon Hygiene, and developed into large corporate systems, these items and their cleaning structures have expanded into nearly every university, hospital, office, café, school and gym in the country. This article examines the three historical phases of sanitary bin technology and its meanings. First, the pioneering phase when the bin was needed to tackle the problem of flushing menstrual products and unpopular incinerators, and was developed and popularised by creative entrepreneurs. Second, the environmental phase when campaigners, especially the Women's Environmental Network, boosted the industry as they called for more regulations regarding menstrual product waste in the 1970s and -80s, leading to the popularisation of the bin exchange and cleaning services now commonplace throughout the UK. Third, the high-tech phase of the 2000s, when the industry sought to reinvent the object by adding no-touch technology, more chemicals, and aesthetic innovations. This article thus presents the sanitary bin in its historical context for the first time, and argues that reveals changing attitudes towards menstruation, the environment, and bathroom politics.

**Key words:** Sanitary bin; Menstruation; Waste; Twentieth-Century Britain;  
Environmental Activism; Bathroom Politics

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**Bin Industry 1960-2020**

Number one requirement, unsurprisingly, is that a bin should offer the very highest level of hygiene since blood waste is potentially hazardous.

'Meeting Women's Expectations?' *European Cleaning Journal*, 17 March 2011.

Every week, across the UK, (mostly) men enter women's public bathrooms, replace the small grey bin located under signs stating 'Do Not Flush Feminine Products!', and carry away the used bin. This article examines the history leading up to the normalisation of this waste management system, and argues that the sanitary bin sits at the intersection of debates about technology, the environment, gender, and business in the twentieth- and twenty-first centuries.



*Fig. 1 PHS sanitary bin, University of XXX, July 2018. Photo: Author*



*Fig. 2-3. Left: Clean PHS bins in office corridor waiting to be exchanged.*

*Right: PHS sanitary bin truck at the University of XXX, both February 2018.*

*Photos: Author*

By the time menstrual activist, academic, educator and comedian Chella Quint started thinking critically about menstruation in the 2000s, sanitary bins had become a mainstay in nearly every public building in the UK. She was concerned about ‘the smallest elephant in the room’ because it served as a reminder of women’s ‘biohazard’ status, a view emphasized strongly in the industry’s own focus on potential dangers in menstrual blood.<sup>1</sup> Quint started collecting menstrual product disposal bags featuring the enigmatic ‘crinoline lady’ and inserting her own educational zines at every opportunity. Alongside artist Judy Chicago, whose *Menstruation Bathroom* installation from 1972

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<sup>1</sup> Chella Quint quoted in Kira Cochrane, “It’s in the Blood”, *The Guardian* (2 October 2009) <https://www.theguardian.com/lifeandstyle/2009/oct/02/menstruation-feminist-activists> (all websites last accessed 17 August 2018).

featured several overflowing bins, theirs remain lone critical voices in a society in which the bin had largely gone unexamined.<sup>2</sup>



Fig. 4-5: Chella Quint, *Disposal bag zine*, 2010s (gift to author). Photos: Author

As Quint and other menstrual activists galvanized a new public discussion about menstruation in the 2010s, the sanitary bin was rarely discussed, understandably drawing less interest than the political and economic causes of menstrual poverty,

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<sup>2</sup> Many artists have focused on menstrual products to make similar points, for example Jay Critchley, whose performances as Miss Tampon Liberty involves a dress made of plastic tampon applicators found on beaches. For an overview of menstrual art, see Ruth Green-Cole, 'Widening the Cycle: A Menstrual Cycle & Reproductive Justice Art Show', ed. *Menstrual Health & Reproductive Justice Conference Proceedings* (Blurb, 2015), pp. 11-16. The exhibition was curated by menstrual artist Jen Lewis.

equity, taxation, pain, and health.<sup>3</sup>

The sanitary bin industry, on the other hand, continues to grow against a backdrop of changes in the world of bathroom politics and aesthetics. A trend for more beautiful public bathrooms was spurred on by the ‘bathroom selfie’ trend, the ‘Loo of the Year’ campaign to raise standards in the UK, and debates about gender in the 2010s.<sup>4</sup> For the sanitary bin industry, this has resulted in aesthetic, chemical and practical improvements, with examples like Cannon Hygiene’s round wall-mounted innovation<sup>5</sup> and Initial’s introduction of brightly colored bins in the 2010s.<sup>6</sup> Despite the 2000s turn towards chemicals and high-tech improvements at the high-end of the industry, most toilets are still outfitted with older pedal-operated models.

Today, a standard sanitary bin is usually grey, with two foot-operated pedals that control an opening at the top, called a ‘modesty flap’ in the industry. Most are

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<sup>3</sup> For surveys on the recent surge in menstrual activist discourse see Chris Bobel. *New Blood : Third-Wave Feminism and the Politics of Menstruation*, (2010); Abigail Jones, ‘The Fight to End Period Shaming Is Going Mainstream’, *Newsweek* 2016; Jennifer Weiss-Wolf. *Periods Gone Public: Taking a Stand for Menstrual Equity*: Arcade, (2017).

<sup>4</sup> For an industry discussion of the beginnings of the aesthetic trend see ‘The Essential Facility’, *Facilities* **19** (2001).

<sup>5</sup> ‘Cannon Hygiene Says Cannoncurve Feminine Hygiene Unit Is Better Looking’, *European Cleaning Journal* (14 March 2013).

<sup>6</sup> ‘Sanitary Waste Bin’, Initial website (2018): <https://www.initial.co.uk/sanitary-disposal/sanitary-bin/>

constructed from Acrylonitrile Butadiene Styrene (ABS) plastic, and measure 46 x 42.5 x 20 cm, with a capacity of 23 litres.<sup>7</sup> The sanitary bin in many offices are PHS' popular Eclipse™ model, which promises to be fully licensed, compliant with waste management regulations, with an antibacterial surface protection, and the inclusion of 'the only germicide which conforms to BS1276 and BS137272 regulations'.<sup>8</sup> The list of protections this chemical solution offers includes 'dramatically reducing the risk of the spread of pathogenic germs such as E.coli, salmonella and MRSA (...) HIV, Hepatitis B and Hepatitis C'.<sup>9</sup> The use of words like 'sanitary', 'conceal', 'modesty', and 'discreet'

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<sup>7</sup> ABS plastic is a thermoplastic that can be re-melted at low temperature, making it a good candidate for recycling and a highly used option in for example computer keyboards, LEGO toys and sockets.

<sup>8</sup> The BS (EN) system is a common European standard corresponding to challenges in cleaning environments. BS(EN)1276 is one of the most common standards in the industry, regulating nearly all bactericidal cleaning fluids and sprays, dealing specifically with E.coli in food preparation areas. BS(EN)137272 refers to regulations for chemical disinfectants and antiseptics, normally in regard to the medical environment, and including evaluations of bacteria, yeast and staphylococcus aureus (the bacteria some women carry, and which is linked to Toxic Shock Syndrome). 'Sanitary Bin Disposal – Eclipse', PhS Group website (2018): <https://www.phs.co.uk/our-products/washrooms/cubicle-products/sanitary-bin-disposal-eclipse#tabscontent2>

<sup>9</sup> Including Braille is an inclusive step, but it would also suggest that blind or visually impaired users would have to touch an object deemed to dangerous for cleaning staff to handle. The Royal National Institute of Blind People reminded me that most blind people do have some degree of sight, making the issue of Braille necessary for some.

dominate the company's websites, reinforcing the larger menstrual product industry's focus on concealment.<sup>10</sup> The bins themselves are removed and exchanged with clean copies every fortnight, in a system that promises 'discretion and efficiency.'

This list of facts seems to raise more questions than they answer. What did women do before the bins existed? Where did the lucrative sanitary bin exchange system come from? Why is it utilised so thoroughly in the UK, but not elsewhere? Can you really contract HIV and E.coli from used menstrual products? What does it mean to be 'modest' about menstrual waste? Why the chemicals? And where does it all end up? This article goes some way in answering these questions, while also hoping to raise concerns that might begin new lines of inquiry into this overlooked everyday object.

### **Scavenger methodology**

Documentation about the first years of the sanitary bin industry is largely lost, due to the chaos of recent mergers and handovers in key businesses such as PHS and Cannon Hygiene. Thus, a "scavenger methodology" consisting of various collection avenues has been utilised through the combined insight glimpsed from the Wellcome Library Collection, Unilever Archives, the online Museum of Menstruation and Women's Health, and the National Archives, the Internet, discussion, visual analysis, and close observation of local sanitary bin units and systems.<sup>11</sup>

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<sup>10</sup> Chella Quint, "I've Stopped Saying 'Feminine Hygiene Products'. Here's Why You Should Too", *The Independent*, 14 October 2017.

<sup>11</sup> Jack Halberstam argues that this refusal of disciplinary coherence can result in experimentation across disciplines, and is particularly useful when queering a subject or

Some information about the corporate history is available via Companies House, trade publications, and the Intellectual Property Office.<sup>12</sup> Further information comes from company websites, where contemporary products and services are detailed, and potted company histories provided directions for further research, although this material is presented for a commercial purpose.<sup>13</sup> Some sanitary bin companies were willing to share information via email or on the phone, offering links to relevant articles and historical moments in sanitary bin history, although the larger companies did not respond in detail to any communication.<sup>14</sup> Information about the founders of PHS came from retired colleagues, and from their own publications. Interviewees and sources were contacted via LinkedIn, and a snowball approach to finding others followed, many

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adopting a queer methodology, Halberstam. *Female Masculinity* (Durham: Duke University Press, 1998).

<sup>12</sup> PHS and the industry is also briefly covered in Sebastien Canderle. *The Debt Trap: How Leverage Impacts Private-Equity Performance*: Harriman House Limited, 2016). Chapter 7.

<sup>13</sup> 'Our History', PHS Group website: <https://www.phs.co.uk/about-us/history>.

<sup>14</sup> PHS declined to be part of this study. PHS also provides documentation shredding services. Cannon Hygiene stopped communicating after two rounds of emails, and provided no information. Rentokil did not respond. Cathedral Services, based in XXX, provided generous information, as did former employees of PHS.

leading nowhere.<sup>15</sup> Eric Pillinger, who is retired from PHS, proved tremendously helpful in his recollection of the Tacks and sharing of primary resources. Smaller sanitary bin companies generously shared their insights and recollections of the early industry, whereas PHS declined to be part of the study and did not respond to emails or calls. The many available sanitary bins at my place of work also became part of the research project, and made close visual and physical analysis possible. The Estates office at the University of XXX provided information about changes in cleaning systems, as well as valuable institutional memories.<sup>16</sup>

## Literature

The sanitary bin was designed to be discreet, to the point where scholars have largely overlooked its place in the history of environmentalism, bathroom politics, hygiene business and menstrual history. While clearly linked to these literatures, this article also aims to contribute to the growing academic literature and interest in the history of menstrual technologies.<sup>17</sup> The gap in the literature is in itself an example of the success

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<sup>15</sup> All interviews were conducted by the author via telephone or email. Information about the project was shared beforehand, and interviewees signed consent forms where agreed.

<sup>16</sup> Dennis C. Grube Jack Corbett, Heather Lovell, Rodney Scott, 'Singular Memory or Institutional Memories? Toward a Dynamic Approach', *Governance* XXX (2018).

<sup>17</sup> For literature about menstruation in history and culture from the last decade, see for example Breanne Fahs. *Out for Blood: Essays on Menstruation and Resistance* (New York: SUNY, 2016); Cathy McClive. *Menstruation and Procreation in Early Modern France*: Routledge, 2015); Lauren Rosewarne. *Periods in Pop Culture : Menstruation in Film and*

of the sanitary bin as business model, with its promise of hiding, cleaning and removing all evidence of menstruation in professional or public settings – including, as it turns out, its own history. Without traditional archive material or assistance from the industry itself, the following literatures have been valuable in shaping the empirical and theoretical framework for this project.

### ***Waste Studies and Rubbish Theory***

Although there has not been an independent study of the sanitary bin, waste has been explored as related to politics and power for decades. Anthropologist Mary Douglas' influential ideas about dirt as 'matter out of place' inspired a generation of interdisciplinary academics to consider waste in a new light from the 1960s onwards.<sup>18</sup> A decade later, anthropologist (and soldier) Michael Thompson's 1979 'Rubbish Theory' launched the discipline of Waste Studies by asserting that societies could be analysed through what they considered trash, as well as what they claimed to value.<sup>19</sup> Environmental, feminist, and post-colonial analysis of waste history and meaning has followed, with historian Martin Melosi introducing the idea of the 'sanitary city' as a tool

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*Television* (Lanham, Md.: Lexington Books, 2012); Bobel, *New Blood : Third-Wave Feminism and the Politics of Menstruation*; Lara Freidenfelds. *The Modern Period : Menstruation in Twentieth-Century America* (Baltimore: Johns Hopkins University Press, 2009); Elissa Stein and Susan Kim, 'Flow : The Cultural Story of Menstruation', (2009).

<sup>18</sup> Mary Douglas. *Purity and Danger: An Analysis of Concepts of Pollution and Taboo* (London: Routledge and Keegan Paul, 1966).

<sup>19</sup> Michael Thompson. *Rubbish Theory: The Creation and Destruction of Value* (Oxford: Oxford University Press, 1979).

for historians to make sense of the networks of hygiene and power behind supposedly advanced, progressive Western societies.<sup>20</sup> Historian, doctor and poet Warwick Anderson has linked empire itself to a 'poetics of pollution', rendering brown and black bodies toxic, entire continents 'waste-lands', and the white body as virtuous.<sup>21</sup> In parallel to this social reading of waste, the developing field of object-study introduced ideas about 'things charged with significance', bringing together scholars from the humanities and sciences to critically examine seemingly mundane objects. Daston's 'object lessons' argues that things are both charged with significance and refuse parting with their 'gritty materiality' – things such as sanitary bins are saturated with cultural significance, and shed light on the existing histories of gendered waste.<sup>22</sup> What we consider dirty, these histories argue, reveal more about societies than what we categorize as clean. Considering menstrual waste in this context, shows how the increased and connected disposal and hiding of menstrual evidence links to wider historical trends towards

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<sup>20</sup> Martin Melosi. *The Sanitary City: Environmental Service in Urban America from Colonial Times to the Present*: University of Pittsburgh Press, 2009); *Effluent America: Cities, Industry, Energy and the Environment*: University of Pittsburgh Press, 2001).

<sup>21</sup> Warwick Anderson, 'Excremental Colonialism: Public Health and the Poetics of Pollution', *Critical Enquiry* **21** (1995): 640-69, 640; Dipesh Chakrabarty, 'Open Space/Public Place: Garbage, Modernity and India', *Journal of South Asian Studies* **14** (2007): 15-31; Birsen Bulmus. *Plague, Quarantines and Geopolitics in the Ottoman Empire* (Edinburgh: Edinburgh University Press, 2012); Gay Hawkins. *The Ethics of Waste: How We Relate to Rubbish*: Rowman & Littlefield, 2006).

<sup>22</sup> Lorraine J Daston, ed., *Things That Talk: Object Lessons from Art and Science* (Zone Books, 2004).

increasingly sterile environments devoid of bodily traces.

Modern menstrual waste management is also intrinsically linked to the emergence of disposable products in the early twentieth century. Historians have described how Western societies became enthralled by consumerism, often neglecting the necessity of responsible waste management. In *Waste and Want*, historian Susan Strasser explained how the now commonplace act of discarding items transformed America into a society based on mass consumption.<sup>23</sup> One example of this occurred when women in the West stopped making and washing cloth pads, opting instead for the disposable and flushable pads and tampons that entered the market in the 1930s.<sup>24</sup> The sanitary bin thus became a solution for a new type of waste, at a time when, as architectural historian Barbara Penner pointed out, public bathrooms became increasingly normal, and politicized in debates about racial, gender, and accessibility segregation.<sup>25</sup>

By the mid-century, the normalization of disposable products, including pads and tampons, was identified as a crisis, and the first wave of new environmental histories

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<sup>23</sup> Susan Strasser. *Waste and Want: A Social History of Trash* (New York: Owl Books, 2000).

<sup>24</sup> Tampax applicator tampons and Kotex pads, both leading international brands, both advertised flushing in from their first adverts onwards, see image at Harry Finley, "Is This The First Tampax Menstrual Tampon?", Museum of Menstruation and Women's Health website ([www.mum.org](http://www.mum.org)), 2005. Similar historical trajectories have occurred with nappies, condoms, and wet wipes.

<sup>25</sup> Barbara Penner. *Bathroom* (London: Reaktion Books, 2013).

and analysis questioned consumer culture.<sup>26</sup> Historian Sarah Payne has traced the environmental problems tied to disposing of increasingly popular contraceptive methods, which in turn caused political and activist debates about nature and waste management.<sup>27</sup> Historians are also writing about contemporary and future waste management, exploring the environmental and ethical consequences of blood, sperm and milk banks, in addition to frozen body parts<sup>28</sup> and cryopreservation<sup>29</sup>, as the profitable rise of each makes them valued parts of many modern economies, similar to the sanitary bin.<sup>30</sup> These histories of profitable body waste in turn draw on longer established histories of nuclear and toxic waste.<sup>31</sup> As part of ‘throw-away society’,<sup>32</sup>

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<sup>26</sup> Most notably, although not initially connected to consumer goods, the discussion that sprang up after the publication by Rachel Carson. *Silent Spring* (Houghton Mifflin, 1962).

<sup>27</sup> Sarah Ruth Payne, ‘Cleaning up after Sex: An Environmental History of Contraceptives in the United States 1873-2010’ (University of New Mexico, 2010).

<sup>28</sup> Naomi Pfeffer. *Insider Trading: How Mortuaries, Medicine and Money Have Built a Global Market in Human Cadaver Parts* (Yale: Yale University Press, 2017).

<sup>29</sup> Emma Kowal Joanna Radin, ed., *Cryopolitics: Frozen Life in a Melting World* (MIT Press, 2017): Pages.

<sup>30</sup> Kara W Swanson. *Banking on the Body: The Market in Blood, Milk, and Sperm in Modern America* (Harvard: Harvard University Press, 2014); Joanna Radin. *Life on Ice: A History of New Uses for Cold Blood* (Chicago and London: University of Chicago Press, 2017).

<sup>31</sup> Maria Rentetzi, ‘Packaging Radium, Selling Science: Boxes, Bottles and Other Mundane Things in the World of Science’, *Annals of Science* **68** (2011): 375-99; Ryan Johnson, ‘Tabloid Brand Medicine Chests: Selling Health and Hygiene for the British Tropical Colonies’, *Science as Culture* **17** (2008): 249-68; Allison MacFarlane, ‘Underlying Yucca

menstrual waste nevertheless has some unique challenges and characteristics of its own.

Since the 1970s, histories of menstruation have appeared at intervals, several concerned with the creation of the 'feminine' or 'sanitary' waste category, which includes pads, tampons, liners, and blood itself. Scholars of women's history have related this to specific historical instances, such as the 1970s women's health clinic and consciousness-raising movements,<sup>33</sup> the 1980 Toxic Shock Syndrome (TSS) crisis,<sup>34</sup> and the increase of menstrual references in popular culture.<sup>35</sup> However, within this literature the sanitary

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Mountain: The Interplay of Geology and Policy in Nuclear Waste Disposal', *Social Studies of Science* **33** (2003): 783-807; Jacob Ward Jon Agar, ed., *Histories of Technology, the Environment, and Modern Britain* (London: UCL Press, 2018): Pages.

<sup>32</sup> The term 'throwaway' society or culture, originated in *Life Magazine's* August 1955 issue, in the article "Throwaway Living". Whiteley has shown that concern about consumerism was critiqued parallel to its explosion, in the 1950s and -60s, Nigel Whiteley, 'Toward a Throw-Away Culture. Consumerism, 'Style-Obsolescence' and Cultural Theory in the 1950s and 1960s', *Oxford Art Journal* **10** (1987): 3-27.

<sup>33</sup> Signe Hammer. *Women : Body and Culture : Essays on the Sexuality of Women in a Changing Society* (New York: Perennial Library, an imprint of Harper & Row Publisher, 1975).

<sup>34</sup> Nancy Friedman. *Everything You Must Know About Tampons* (New York: John Wiley & Sons., 1981); Sharra L Vostral, 'Rely and Toxic Shock Syndrome: A Technological Health Crisis', *Yale Journal of Biology and Medicine* **84** (2011): 447-59; Stephen Berger and Inc Gideon Informatics, 'Toxic Shock Syndrome : Global Status', (2015).

<sup>35</sup> Rosewarne, *Periods in Pop Culture : Menstruation in Film and Television*.

bin has largely been forgotten. Historian Sharra Vostral, in *Under Wraps: A History of Menstrual Hygiene Technology*, discusses them briefly as regards to disposal of menstrual products.<sup>36</sup> Elsewhere, architectural historian Kathryn Anthony, who is concerned with exploring inequality through questions of design, neglects the bin in her chapter on bathroom design, although she offers a useful wider bathroom context from which to understand the unique design history of these private spaces.<sup>37</sup> Within historian Julie-Marie Strange's coinage of 'menstrual etiquette' as a set of norms governing women's behaviour when they menstruate, the sanitary bin also has a natural home as a norm, although not discussed in detail.<sup>38</sup> Inserting the UK sanitary bin story into these literatures, shows how its history is intertwined with many changing concerns, and helps explain how this influential object has been hiding in plain sight.

### **Towards normalisation**

The emergence of the modern sanitary bin is here examined in three interlinked stages. First, the pioneering years when entrepreneurs created the bin as a competitor to the already existing incinerator option of waste disposal in the 1950s and -60s. Second, the anti-flushing environmental campaigns and growth of sanitary bin businesses in the 1970s and -80s. Third, the modern phase of total normalisation when sanitary bins

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<sup>36</sup> Sharra Louise Vostral. *Under Wraps: A History of Menstrual Hygiene Technology* (New York: Lexington Books, 2008).

<sup>37</sup> Kathryn H Anthony. *Defined by Design: The Surprising Power of Hidden Gender, Age, and Body Bias in Everyday Products and Places*: Prometheus Books, 2017).

<sup>38</sup> Julie-Marie Strange, 'The Assault on Ignorance: Teaching Menstrual Etiquette in England, C. 1920s to 1960s.', *Social History of Medicine* **14** (2001): 247-65.

proliferated in the UK and businesses competed in a saturated market by offering chemical and service improvements. This approach does not suggest that the history is straightforward nor that the various stages do not interlink with on another. Historians have in recent years warned against a simplistic conflation of invention with implementation. Notably, David Edgerton has pointed out that technological normalisation can be better understood historically in terms of the first utilisation of a particular idea or invention.<sup>39</sup> Although, the following three-stage approach might seem to fall into the trap of invention-focused history writing, the history of the sanitary bin is also a useful test for Edgerton's assertion. The lack of adequate disposal facilities for menstrual products was, as this article reveals, a widespread and known problem in the early twentieth century. The sanitary bin exchange system solved the problem and the uptake of the invention happened soon after. The final stage of increased chemical infusion also happened quickly, and saturated the entire industry as all sanitary bin providers interpreted legal frameworks and activist concerns to call for more bactericides. This article thus provides the first history of the sanitary bin in interlinked stages in order to show how immediate and intense the process of normalisation happened in Britain. In other countries, Edgerton's assertions are indeed correct, as the bin remains only sporadically utilised and the sanitary bin exchange system a less viable business idea.

### **Burning evidence in the 1950s and -60s**

Prior to the advent of the modern sanitary bin, British public bathrooms only

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<sup>39</sup> David Edgerton, *The Shock of the Old: Technology and Global History since 1900* (Oxford: Oxford University Press, 2006).

sporadically included solutions for managing menstrual product waste. The incinerator, which shredded and burnt used products, was sometimes available in the communal areas of women's bathrooms, such as schools, places of work, and leisure centres. One early model was produced under the Southalls' Sanitary Requisites brand, and sold in the early twentieth century. A 1916 leaflet aimed at employers provided details of a patented 'Southalls' Cremator' for the combustion of 'Southalls' Sanitary Towels',<sup>40</sup> thus providing early evidence of the link between the increased popularity of disposable menstrual products and the need for waste management in the UK. The same advert also gave details about small bags 'bearing the words – to be burnt' for the same purpose.

Southalls' had been in the menstrual business since the 1870s, and became a leading brand in the UK. An image from 1976 by photographer Nick Hedges shows Southalls' large Victorian-era Birmingham factory at the end of a normal working day, as the majority female, BAME and/or immigrant workforce left the building. Soon after, the business would face competition from large multi-national corporations, and the advent of new solutions for menstrual product waste.

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<sup>40</sup> Jevons & Mellor, 'Southalls' Sanitary Requisites', (Birmingham, 1916), Wellcome Library General Collection, P/942.



*Fig.6-7. Left: 'Southalls' Cremators', Southalls' Sanitary Requisites leaflet, 1916.*

*Image right granted from the Wellcome Trust archives.*

*Right: Southalls' factory, 1976. Copyright Nick Hedges.*

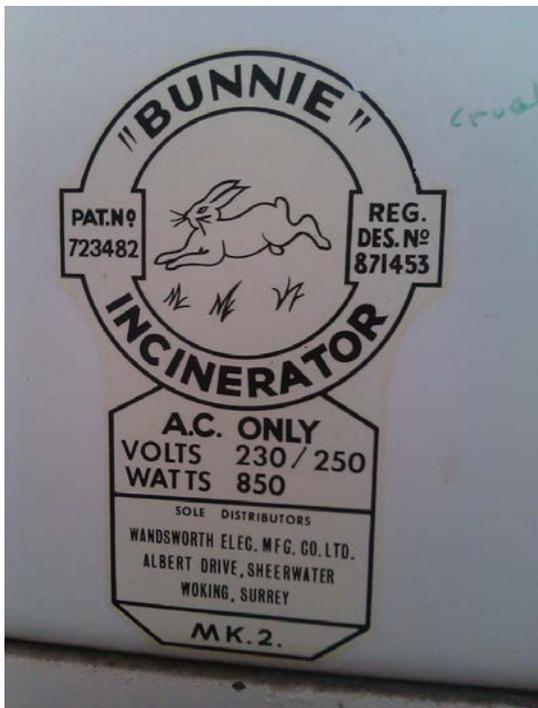
By the mid-twentieth century, leading menstrual product businesses like Tambrands Inc. (Tampax until 1997, then Procter & Gamble), Kimberly-Clark (Kotex), and Svenska Cellulose Aksjebolaget (the Swedish Forestry Company, or SCA; Libresse and Bodyform) were recognizing the potential problems of used tampons and pads. In a Libresse<sup>41</sup> leaflet titled 'Growing up today', the author warned that 'not all WC's have bins/bags [but some have] special machines fixed to the wall, called incinerators [...] which burn up the used towels.'<sup>42</sup> By the mid-century, Wandsworth Electrical Manufacturing Company was the largest provider of these machines, nicknamed 'bunnie incinerators'

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<sup>41</sup> The Libresse pad brand is today sold only in Scandinavia, and is known as Bodyform in the UK. Both brands are owned by Essity, previously under the forestry company Svenska Cellulosa Aksjebolaget (Swedish Cellulose Company, or SCA).

<sup>42</sup> Pauline Richards, 'Growing Up Today' (Libresse Advisory Service, undated – mid-20<sup>th</sup> century), p 11, Wellcome Library General Collection P/4037.

after the slang term for menstrual products consisting of looped towels that had some resemblance to lagomorph ears. Incinerators featuring a binkyng rabbit were mounted in the communal parts of bathrooms, resulting in a public performance of menstrual status. Because of the risk of being ‘discovered’, school girls sometimes opted for flushing items, although some grew more confident by each cycle, picking up the courage to use the loud incinerator, even though it meant walking past the older girls who would use the machine to quickly burn evidence of smoking.<sup>43</sup>



*Fig. 8: Wandsworth Electric Manufacturing Company Ltd., “Bunnie” incinerator.  
Open access photo from user ‘R.F.K’ on Flickr.*

The incinerator option was however not a consistent feature, and in many bathrooms

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<sup>43</sup> Memories of ‘bunnie incinerators’ collected via Twitter in August 2018. Transcripts available, and sources consented to publication.

users were left with no other option than flushing, hiding, or carrying items out of the space. Sporadically, normal bins and wrapping paper would be available, but these were not popular. The Menstruation Leaflet Committee of the Medical Women's Federation (MWF) grew interested in the problem by the end of the Second World War:

Endless trouble was encountered in persuading service women to use the bins and wrapping paper provided, and the storage of soiled towels behind pipes, in drawers, and down lavatories was one of the real trials of N.C.O.S. and officers.<sup>44</sup>

The MWF pointed out that 'disposal is a relatively new problem. Up to fairly recently, nearly all women, and many poorer women still, use washable articles.'<sup>45</sup> The Federation understood that this was changing quickly, and tried to scope out the extent of the problem. Following the conclusion of a 1949 school survey, MWF was shocked to find that not all schools provided waste management: 'it seems inexcusable that 75/112 schools have neither bins or other disposable method.'<sup>46</sup>

Ten years later and following further research, the MWF and the Scottish Council for Health Education went on to suggest a solution which would become the one we know today: provision of a small bin in each bathroom, with paper bags, and instruction notices stating 'Please Do Not Flush Feminine Products Down the Toilet!' This, in turn,

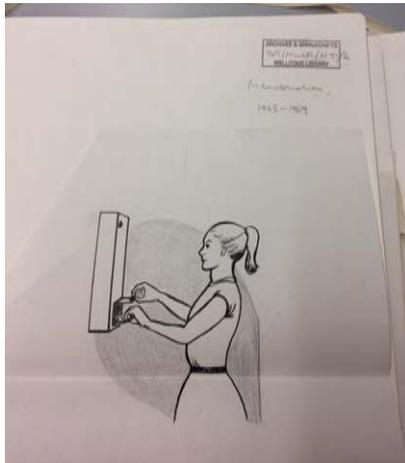
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<sup>44</sup> Notes on *Lancet* article (published 28 May 1949), Menstruation Leaflet Committee 1930s-1960s, Wellcome Library Collection: SA/MWF/B/4/5: Box 8 (6), p 2.

<sup>45</sup> *Ibid*, p 5.

<sup>46</sup> *Ibid*, p 6.

should be emptied into an incinerator or furnace, with MWF warning that ‘this work should not be left to male staff.’<sup>47</sup>



*Fig. 9: ‘Incinerator’, MWF draft illustration for ‘Menstruation leaflet 1963-1968’.*

*Image rights from Wellcome Trust archives. Photo: Author.*

But who would provide these small bins, and who would put up the notices? And who would be willing to clean them? By the early 1960s, entrepreneurs would begin thinking about how to solve the problem of menstrual product waste, and cash in on the solution.

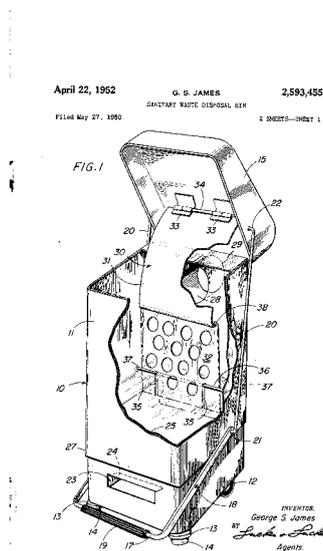
### **The invention of Comdiscan in the 1950s**

Ever since Thomas Crapper patented the modern toilet in the 1880s, new ideas about improving the innovation were on the market. The large-scale entry of women into offices and public spaces, meant that women’s bathrooms became an especially exciting

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<sup>47</sup> Medical Women’s Federation and the Scottish Council for Health Education, ‘feminine hygiene’ (Edinburgh: C.J. Cousland & Sons Ltd., 1963). Wellcome Library Collection: SA/MWF/B/4/5: Box 8, p 7-8.

business opportunity in the mid-twentieth century.<sup>48</sup> However, this historical lagging behind meant that women's bathrooms were designed in already existing architectural spaces, and at the same size as those for men, despite the omission of the non-restrictive and communal urinal. With the entrance of baby-changing station, menstrual product vending machines and sanitary bins, women's bathrooms became increasingly crowded, and commercialised. In the US, inventor George S. James first patented what can be recognized as a modern sanitary bin in April 1952, and UK entrepreneurs quickly followed.



*Fig. 10: George S. James, Patent number US2593455, 22 April 1952. Image from the United States Patents Office.*

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<sup>48</sup> Sheila L Cavanagh. *Queering Bathrooms: Gender, Sexuality, and the Hygienic Imagination* (Toronto: University of Toronto Press, 2010).

Cannon Hygiene lays claim to being the pioneer, but the following information is only available via their own website: 'Back in 1955, Cannon Hygiene revolutionised feminine hygiene by introducing the first ever feminine hygiene disposal units'.<sup>49</sup> As Cannon are unwilling to answer further questions about this history, the website must be approached with agnosticism, although some details can be verified. There is no patent linked to the bin, and there may be many reasons for this ranging from the borrowing of already existing ideas to company ideologies that believe patents may restrict the market.<sup>50</sup>

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<sup>49</sup> 'Feminine Hygiene Services', Cannon Hygiene UK website:

<https://www.cannonhygiene.com/services/washroom-care/feminine-hygiene>. Cannon Hygiene did not respond to any of my requests for interviews, but at the time of writing their website still states that they pioneered the sanitary bin idea.

<sup>50</sup> On the historiography of patents, their potential negative effects on new markets, and reasons for why companies might chose not to apply for them see Joseph E. Stiglitz, 'Economic Organization, Information, and Development' in the *Handbook of Development Economics* (North Holland, 1998), pp. 93–160; Barry J. Nalebuff, Stiglitz, 'Prizes and Incentives: Towards a General Theory of Compensation and Competition', *The Bell Journal of Economics*, Vol. 14, No. 1 (1983), pp. 21–43, M. Boldrin, D.K. Levine, 'The Case Against Patents.' *The Journal of Economic Perspectives*, 27(1) (2013), pp. 3-22; Adrian Johns, *Piracy. The Intellectual Property Wars from Gutenberg to Gates* (Chicago: The University of Chicago Press, 2009).



*Fig. 11-12: Original blue Cannon Hygiene hand-operated bins can still be found, these in XXX in XXX, 2018. Photos: Author*

Wife and husband team Alys and Stanley Ostle Kennon created the first sanitary exchange unit system; the 'Comdiscan' ('a COMplete DISposal of all waste by CANNON').<sup>51</sup> The bins were, then as now, rectangular in order to fit into the slim space between toilets and walls, with later versions sporting 'modesty flaps' (industry speak for the plastic lids that block any view into the bin) and foot-operated pedals (the first models were hand operated). The design was simple and the plastic cheap, but the marketing of it as a 'special sanitary bin' caught the attention of the growing number of employers with increasingly female workforces. The major selling point was the offer of exchanging and cleaning the bins in special Comdiscan depots in Bradford and London. It is unfortunate that we do not have more information about this important moment of innovation, as the non-patented system was subsequently was adopted by several other businesses, most successfully by PHS.

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<sup>51</sup> 'History', Cannon Hygiene India website: <https://cannonhygieneindia.com/history>.

Alys name does not appear on Cannon's websites, but rather on a blog by a former employee.

## **The Tack brothers**

The 1960s origin story for Personnel Hygiene Services revolves around the founder's female secretary.<sup>52</sup> Brother and entrepreneur duo George and Alfred Tack (1906 - 1993/95) had already started several businesses, and were being sent proposals for more. At the time, the secretary was reading the many investment ideas they were too busy to consider.<sup>53</sup> Recognizing the business opportunity, she talked to the brothers about the sanitary bin exchange system as an investment idea.<sup>54</sup> Soon after, Track Retail Consultants (PHS from 1966) was founded on 14 August 1963, the same year the MWF and Scottish Council suggested bins as a waste solution.

The establishment of PHS was not the first or last time the Tacks became entrepreneurs, despite the disruptions of service in the First World War. Alfred was a private in the Machine Gun Corps,<sup>55</sup> while George first served in the Huntingdonshire Cyclist Battalion and later in the Oxfordshire and Buckinghamshire Light Infantry.<sup>56</sup> Once back from the

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<sup>52</sup> Unfortunately, no one I contacted could remember her name.

<sup>53</sup> Interview with Pillinger, 19 March 2018.

<sup>54</sup> It is unclear what letter the secretary was reading, and which pioneering bin competitor was suggesting that the Tacks got involved, but it is likely to be Cannon Hygiene.

<sup>55</sup> WO 372/19/139125 Medal card of Alfred Tack, 1914-1920, War Office Armed Forces Service Records, The National Archives.

<sup>56</sup> WO 372/19/139138 Medal card of George Tack, 1914-1920, War Office Armed Forces Service Records, The National Archives. George was part of a contingent of 130 men of the Huntingdon Reserve Battalion who volunteered for active service in December 1914,

war, the brothers founded heating and ventilation company NuAire, which rapidly grew due to a professional sales team, an unusual attribute at the time. As early actors in the new concept of 'sales training' in Europe, other businesses soon asked for help to train their sales teams, and the brothers founded 'TACK Training' in 1948.<sup>57</sup> On the back of these successes, the Tack's could invest in new business ventures.

A former PHS manager remembers them 'dressing and speaking like two British gentlemen', never mentioning their past (including the war) or private matters such as politics.<sup>58</sup> The brothers were Jewish, but apart from weekly outings to the synagogue their faith was not discussed. They married sisters,<sup>59</sup> who played an important part in making the companies feel like 'caring family businesses'.<sup>60</sup> Enthusiastic, creative younger Alfred was described as 'the abrasive amalgam of ideas and action', while George 'was the gentlemanly iron fist in the velvet glove'.<sup>61</sup> Together they created professional environments where immigrants and women were welcome, and testimonies show how warmly they supervised their employees, while growing the business in a careful way, even during the booming 1980s. They worked under the

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leaving Huntingdon station in specially attached carriages. Martyn Smith, 'G. Tack',

Huntingdonshire Cyclist Battalion website overview of soldiers, 9 April 2012:

<http://www.huntscycles.co.uk/Soldiers/T/G.%20Tack.htm>

<sup>57</sup> Eric Pillinger, 'Tack International Booklet', ed. TACK International (2017), 3.

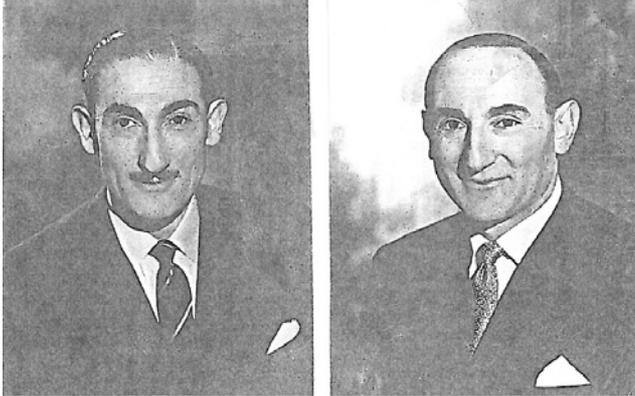
<sup>58</sup> Interview with Pillinger, 19 March 2018.

<sup>59</sup> Unfortunately, no one I contacted could remember their names.

<sup>60</sup> Pillinger, 'Tack International Booklet', 8.

<sup>61</sup> Ibid.

ethos: 'A man has three loyalties: - First his family; - Second to his country; -Third to his company'.<sup>62</sup>



*Fig. 13: Alfred and George Tack, date unknown. Photographer unknown. Rights to republish from Eric Pillinger.*

The key to the Tack's success was hard work and aggressive sales training, but also creativity, which they exercised through prolific writing. The brother's main written output where a range of self-help sales training books, all entertaining (!), frank and informative. Alfred's characteristic brutal honesty and tendency to generalise was mixed with practical advice and emotional support. In a 2016 review of the books, it was correctly noted that Alfred and George never lent on stereotypes in their work and warned against sexist and racist jokes.<sup>63</sup> For this reason, it is worth quoting the books at length, as they provide insight to the type of men who would soon become a influential in a field many felt squeamish about. The brothers' approach was summarised thus: 'The

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<sup>62</sup> Ibid.

<sup>63</sup> John Park, 'How to Overcome Nervous Tension and Speak Well in Public', blog entry from World Across Time' blog, 18 November 2016:

<http://wordacrosstime.tumblr.com/tagged/Alfred-Tack>

correct way to treat a woman buyer is to sell to her in exactly the same way as you would if she were a man.’<sup>64</sup> In general, their sales advice revolved around the idea of ‘kindness as a sales tool’.<sup>65</sup> This approach to selling, was also reflected in Alfred’s anti-racist stance:

I have seen salesmen, when selling to a foreign buyer, speaking very, very slowly, articulating each word, while looking at the buyer as if he were a little simple. This, of course, is salesmanship at its worst, and it also shows a complete lack of understanding of human relations and good manners. Whoever you sell to, wherever he may come from, whatever his nationality, you should sell to him in exactly the same way as you sell to anyone else. <sup>66</sup>

Alfred, ‘the happiest executive in London’,<sup>67</sup> continued writing letters to *The Times*, included a ‘how-to guide for selling’ in the midst of ‘Government cuts and the freezing of prices and wages’ four days after Christmas 1967.<sup>68</sup> The duo seemed inexhaustible, and stayed involved with PHS till their last years. By the mid-seventies, the company reported healthy growth numbers that proved that their new invention had a place in British life, despite never having been needed previously: £87,340 in 1974 and £92,541

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<sup>64</sup> Tack, *1000 Ways To Sell*, p 200.

<sup>65</sup> Tack, *1000 Ways To Sell*, p 161.

<sup>66</sup> Tack, *1000 Ways To Sell*, p 167-8.

<sup>67</sup> Tack quoted in *The Times*, 5 September 1967, p 21.

<sup>68</sup> Tack, ‘Letters to the editor: Making of a salesman’, *The Times*, 28 December 1967, p 17.

in 1975.<sup>69</sup> By 2018, PHS reported a net worth of £130.6 million, with plans for streamlining their portfolio to focus on their largest success: the sanitary bin exchange system.<sup>70</sup> Fittingly, even the brother's name reinforced their commitment to the ballooning sanitary industry. 'Tack' originated in the French word 'tache', originally meaning spot or stain. Finally, Alfred's parallel prolific output of business-themed murder mysteries (*Selling is Murder*, *Killing Business*, *The Prospect is Dead*, etc.) often described blood, and could be seen as part of his long career in solving messy problems.<sup>71</sup> For all these reasons the businessmen and brothers were the right people at the right time to establish the sanitary bin exchange system as a necessity through their effective sales teams, and by the 1970s their pitch would be further strengthened by public debate about the environment and menstruation.

### **'Environmenstrualism' in the 1970s and 80s**

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<sup>69</sup> 'PHS Accounts for the year ended 27th December 1975', Companies House, GOV.UK. Available at: <https://www.gov.uk/government/organisations/companies-house> (Accessed 24 June 2019).

<sup>70</sup> 'PHS Annual report for the year ended 31 March 2018', Ibid.

<sup>71</sup> Alfred wrote as many fiction books as non-fiction outputs about sales training, for example *PA to Murder* from 1966. The title refers to a sociopathic personal assistant to a manager of a London-based office equipment company not unlike Track (PHS), and his plan to kill his boss. A reviewer of the book was positive, but slightly baffled by the amount of business-specific details. In fact, most of Alfred's crime stories were inspired by the world of business, for example *Selling's Murder* (1946), *Interviewing Killing* (1947), *The Prospects Dead* (1948), *Killing Business* (1949), and *Forecast Murder* (1967).

Once the sanitary bin exchange system was established by Cannon Hygiene and PHS, it grew in tandem with the explosion of menstrual product use in the 1960s and -70s. As new products with more packaging and plastic came on the market (liners, night-time pads, plastic applicator tampons, etc.), the need for bins, bags and frequent changes of both also increased.<sup>72</sup> The medical community was already engaged in a debate about medical and blood waste spurred on by a controversial case study of colostomy bags. A doctor writing in the *British Journal of Medicine* in 1970, declared the disposal of products designed to soak up bodily waste a ‘very real problem’, and suggested a solution based on an advert for a new sanitary bin idea:

... a cardboard disposable sanitary bin (where) (...) all dressings and “disposables” can be placed where they are soaked with disinfectant and, when full, the bin is sealed and dumped (by the local council) on the communal tip. These containers become buried and most of the contents rot harmlessly. The cost is about 5s per week.<sup>73</sup>

The doctor’s conflation of toxic, medical and menstrual waste is notable, and would become a familiar part of future debates about the dangers of menstrual blood. It also shows how commercial actors such as the unnamed creator of the cardboard sanitary bin, Cannon Hygiene, and PHS were alone in providing sanitary product waste solutions in an era before the law dealt with waste. By the early 1970s, the medical community’s

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<sup>72</sup> Vostral, *Under Wraps: A History of Menstrual Hygiene Technology*.

<sup>73</sup> Dr B.V. Harris, ‘Disposing of “Disposables”’, *British Journal of Medicine* Vol. 3, No. 5716 (25 July 1970), p. 228.

concern for the problem was increasingly also debated alongside environmental issues. As one article in *Nursing Times* put it: 'There's a problem of disposal. Women were tired of the neat little semi-disposable bags, adorned with a crinoline lady, which had to be stuffed into overfilled tin bins or put into clogged and smelly incinerators.'<sup>74</sup> But while the article celebrated the new option of 'flushing pads', others protested against it.

No one advocated louder and more effectively on the issue of 'environmenstrual' (*sic.*) policy in the UK than the Women's Environmental Network (WEN). For more than twenty years, the network, consisting initially of campaigners Bernadette Vallely, Alison Costello and Josa Young, has campaigned for greater awareness of the health and environmental consequences of disposable menstrual products.<sup>75</sup> Originated in the Women's Liberation Movement, their message started intersecting with that of PHS and its competitors in the late 1970s, and helped change the way menstrual products were discarded. WEN argued that tampons, pads and plastic applicators generated vast and unmanageable amounts of waste in the UK, which in turn had consequences for landfill, air (through incineration), and oceans.<sup>76</sup> They also argued that the production methods

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<sup>74</sup> Irene Heywood Jones, 'The History of Sanitary Protection', *Nursing Times* (6 March 1980) Wellcome Library pam(H)/Jones/7, p 407-8.

<sup>75</sup> Sarah-Jane Ewart, 'The Environmenstrual Diaries' Part 1-3, WEN blog, (10 February 2017): <https://www.wen.org.uk/blog/2017/2/the-environmenstrual-diaries-part-1-introduction>.

<sup>76</sup> Bernadete Vallely Alison Costello, Josa Young. *The Sanitary Protection Scandal: Sanitary Towels, Tampons and Babies' Nappies - Environmental and Health Hazards of Production, Use and Disposal*. (London: Women's Environmental Network, 1989).

caused excessive pollution. These arguments were rooted in feminist concerns, and never on the idea that menstruation was dirty.

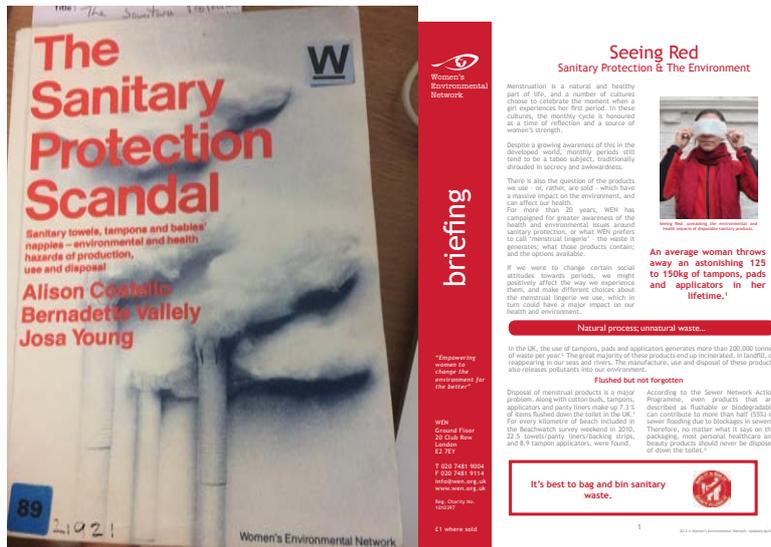


Fig. 14-15. Left: Cover of WEN publication *The Sanitary Protection Scandal* from 1989. Photo: Author.

Right: From WEN's newest 'environmenstrual' campaign, 2018. Available from: [www.wen.org.uk](http://www.wen.org.uk) (accessed 24 June 2019).

WEN operated at a time when the public imagination was first gripped by environmental activism, following books like Rachel Carson's *Silent Spring*, nuclear threats, and the resulting activism and policy galvanized through events like Earth Day and the Greenham Common Women's Peace Camp.<sup>77</sup> The cover of their 1989 publication, *The Sanitary Protection Scandal*, showed applicator tampons as smoking

<sup>77</sup> Carson, *Silent Spring*; Joy Parr. *Sensing Changes: Technologies, Environments, and the Everyday, 1953-2003*: UBC Press, 2010); Carolyn Merchant. *Reinventing Eden: The Fate of Nature in Western Culture*: Routledge, 2003).

factory pipes, and argued that manufacturers of disposable tampons, pads and nappies should take responsibility for what ultimately happened to their products in the wider ecosystem:

Disposal facilities for sanitary towels and tampons have always been inadequate in Britain. As far as manufacturers are concerned, their responsibility ceases with the disappearance of their product down the lavatory pan. Adequate provision for hygienic and non-polluting disposal should be the industry's research priority.<sup>78</sup>

At the time, many menstrual products were marketed as flushable, exemplified by Prince Charles very public humiliation during 'Camillagate', when his private comments about accidentally becoming Camilla Parker Bowles's tampon reveals the general waste-management mechanism that was still in place in the 1980s:

Charles: My luck to be chucked down the lavatory and go on and on forever swirling round on the top, never going down.<sup>79</sup>

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<sup>78</sup> Alison Costello, *The Sanitary Protection Scandal: Sanitary Towels, Tampons and Babies' Nappies - Environmental and Health Hazards of Production, Use and Disposal.*, 78.

<sup>79</sup> For an analysis of the scandal and discourse surrounding the event as related to menstruation, see David Linton, 'Camillagate: Prince Charles and the Tampon Scandal', *Sex Roles* 54 (2006): 347-51. Prince Charles has since become an advocate for the environment.

The issue of clogged pipes was also frequently discussed following the 1987 publication of the Marine Conservation Society's survey (with accompanying photographic evidence) of plastic tampon applicators on Britain's beaches, including on *Woman's Hour* in 1988.<sup>80</sup> As the public attention to the issue ebbed and flowed in the 1970s and -80s, WEN was consistent in arguing that flushing products was damaging to plumbing and the ecosystem at a time where the flushable quality was a seductive and new selling point.<sup>81</sup> WEN wrote that women did not *want* to flush the items, but were often left with no option:

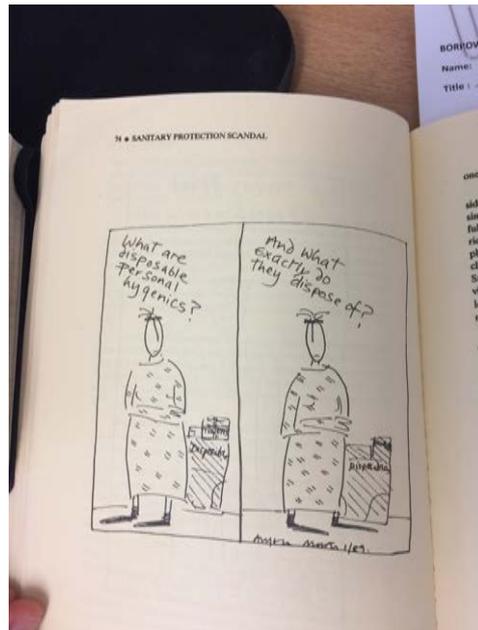
The immediate problem of disposal for women occurs in public places where there is inadequate or no provision for disposal (...) As women, we are faced with the problem of whether to dispose of our used sanitary towels/tampons down the toilet or take them home with us. The amount of time and money wasted by fixing drains blocked by sanitary products must be taken into account when considering disposal problems. In publically-owned properties it is the public who pay for these drains to be unblocked.<sup>82</sup>

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<sup>80</sup> Mario Travaglini, chairman of the technical committee of the Association of Sanitary Protection on BBC *Woman's Hour*, 7 December 1988. The Marine Conservation Society, 'Clean Britain's Beaches', 1987.

<sup>81</sup> 'Environmenstrual Campaign', Women's Environmental Network website:  
<https://www.wen.org.uk/environmenstrual/>

<sup>82</sup> Alison Costello, *The Sanitary Protection Scandal: Sanitary Towels, Tampons and Babies' Nappies - Environmental and Health Hazards of Production, Use and Disposal.*, 85.



*Fig. 16: Angela Martin's comic in WEN's 1989 publication. Right to republish from WEN. Photo: Author.*

Linking the environmental issue to one of public funding and responsibility, WEN lobbied for industrial and consumer change. Archival information shows that the industry was responding to the calls for action slowly, despite being fully aware of the problems caused by flushing.<sup>83</sup> By the 1990s, stickers informing consumers not to flush the products appeared on packaging, and notices to 'not flush feminine products down the toilet' were routinely taped to bathroom doors, although the problem of flushing was

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<sup>83</sup> Throughout the 1970s and 80s, Unilever was trying to branch into the disposable menstrual market. The archived material for the 'Hyacinth Project' reveal commercial ideas about menstruation and disposal at the time. Unilever executives consistently commented on flushability as a product-asset *and* problem, and monitored the activist situation. EFL/7/13/3 and UNI/BD/SC/3/486 papers on Project Hyacinth, 1976-1980, Unilever Archives and Records.

not entirely solved.<sup>84</sup> But WEN's success also had unforeseen consequences, specifically the rise of chemical solutions and the proliferation of the sanitary bin exchange system.

### **Rentokil and the bactericide solution**

WEN's early call for action coincided with new research done by the sanitary bin sector, notably late-comer Rentokil's 1979 bacteriological survey of 331 used pads and 71 used tampons (an example of the dominance of the pad market).<sup>85</sup> In order to make their case for more bactericide, Rentokil published their findings in the esteemed University of Cambridge *Journal of Hygiene*, utilizing a methodology that involved collecting used pads and tampons from their own bins during a 1-2 week period from 50 premises ('40 offices, 8 factories and 2 schools') in South-East England. The materials were removed, classified by 'degree of soiling', and analysed for contamination. Rentokil explained that it had removed its normal chemicals for this experiment, and instead utilized perfumed water in the bins. While WEN continued campaigning, the industry utilized the environmental and medical arguments as levers to show how important their services was to public health. The research showed that over 70 per cent of the products were contaminated with fecal matter and bacteria, which Rentokil's researchers used to suggest the need for a bactericide and a chemical bin exchange system. The resulting

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<sup>84</sup> Marine Conservation Society, 'Marine Plastics Pollution and Position Statement', (2013).

<https://www.mcsuk.org/downloads/pollution/PPPS%20Marine%20Plastics.pdf>

<sup>85</sup> C.M. Lucas; M.F. Mendes, 'A Bacteriological Survey of Sanitary Dressings, and Development of an Effective Means for Their Disposal', *The Journal of Hygiene* **84** (1980): 41-46.

paper, published in *Journal of Hygiene* in 1980, reported on the use of a trial run of bins with 'buffered sodium metabisulphite' (an inorganic compound often used as a disinfectant) that released sulfur dioxide (a toxic gas) as a vapor bactericide emitted at controlled rates during the day, and patented as Rentokil's 'Sanitact Powder'. Animal testing on mice and rats confirmed that the amount of toxin was too low to be poisonous in a human, whereas the liquid formulation and smooth design of the bin took care of fire hazards at a time when smoking in bathrooms was still normal.<sup>86</sup> The conclusion argued strongly for introducing a bactericide in all sanitary bins, thereby creating a need in the market and filling it with 'Sanitact Powder'. The work was also exceptionally timely, published as the Toxic Shock Syndrome (TSS) crisis related to Rely tampons in the United States (recalled by Procter & Gamble in 1980 after women developed TSS, fell ill, and, in several cases, died) resulted in global public debate about menstrual product hygiene and safety, especially concerning the bacteria *staphylococcus aureus* – which was mentioned several times in Rentokil's paper.<sup>87</sup> Furthermore, the panic, fear and misinformation created around the HIV/Aids crisis in the early 1980s, meant that blood was becoming increasingly politicized. WEN and other environmental campaigners did not get distracted by blood panic, and never called for chemical or plastic solutions, rather advocating for critical research into the use of bleach, chemicals and dioxins in menstrual products, and for simple bathroom solutions such as a small bin emptied by cleaning staff.<sup>88</sup> Their work continued, and is today invested in reusable menstrual

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<sup>86</sup> Ibid., 44.

<sup>87</sup> Vostral, 'Rely and Toxic Shock Syndrome: A Technological Health Crisis', pp.

<sup>88</sup> There is a parallel story to be told here about the cleaning industry. Today, cleaners in the UK receive 'Bodily Fluids' training where necessary, and are specifically instructed

products and a focus on plastic-free periods.

Rentokil's argument for bactericide reinforced the larger menstrual industry's historical promotion of 'secure' and 'protective' measures throughout its advertising and packaging, in order to capitalise on fears of 'leaking'.<sup>89</sup> Whereas blood itself is not normally classified as waste (nosebleeds, paper cuts, haemophilia, etc.), used menstrual products become garbage the minute they exit undergarments or bodies. Despite the lack of evidence to suggest that any dangers lurk in a sanitary bin, the industry has engaged in a technology war since Rentokil's research was conducted, with an ultimate goal of creating a completely sterile environment. The 'sterile turn' in architecture and urban planning in the late twentieth-century has been criticised by architect and critic

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to avoid contact with blood. An often low-paid and challenging job, bathroom cleaners have increasingly unionised and pushed for more dignified treatment. Demanding not to clean overflowing sanitary bins may be part of this. Little is known about the cleaners who work in the sanitary bin industry, whether they are unionised, or how they feel about their work, although anecdotal evidence available through job-rating websites like GlassDoor.co.uk suggest that driver-exchangers in the large companies are not content.

<sup>89</sup> Berg & Block Coutts argue that menstrual product advertising claims to dispel myths, while subtly reinforcing them through text and image, L.Block Coutts D.H.Berg, 'Virginity and Tampons: The Beginner Myth as a Case of Alteration', *Health Care for Women International* **14** (2009): 27-38.

Jennifer Bloomer, who argues that dirt is often tied to women's bodies.<sup>90</sup> The suggestion that women's bodies in general, and menstruation in particular, is gross, is neither new nor insignificant. Pliny the Elder is often counted as the first to describe menstruation as both disgusting and dangerous, and decades of scholarship has confirmed that the combined negative mythologies about menstrual blood as smelly, vile and embarrassing has harmed girls and women.<sup>91</sup>

As public interest and knowledge about the issue of flushing increased, behavior started to change. Any office that did not have a sanitary bin, quickly acquired one during the WEN publicity and policy stunts of the 1980s and -90s, resulting in financial growth for outfits like PHS, Cannon Hygiene, and Rentokil, and the cropping up of various competitors in the 1990s. From this period onwards, the environmental conversation was no longer just driven by activists like WEN, but promoted and shaped to fit the goals of the sanitary bin industry.

### **Changes to the law in the 1990s**

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<sup>90</sup> Jennifer Bloomer, 'Abodes of Theory and Flesh', *Assemblage* **17** (1992): 6-29; Barbara Penner Iain Borden, Jane Rendell, ed., *Gender Space Architecture: An Interdisciplinary Introduction* (Routledge, 2002): Pages.

<sup>91</sup> Barbara Christian Robert Snowden, 'Patterns and Perceptions of Menstruation: A World Health Organization International Collaborative Study in Egypt, India, Indonesia, Jamaica, Mexico, Pakistan, Philippines, Republic of Korea, United Kingdom and Yugoslavia', (New York 1983); Shirley Johnson Loudell Snow, 'Modern Day Menstrual Folklore', *Journal of the American Medical Association* **237** (1977): 2736-39.

By 1990, concerns about the lack of sanitary waste solutions had again expanded into debates about class and educational inequality in the UK, as well as environment. A number of instances, alongside a general turn towards environmental concerns in law, drew attention to an embarrassing national problem.

A 1990 survey of the Bloomsbury health district in London found that none of the primary or secondary schools had hygienic or adequate toilet facilities, and included plenty of examples of poorer schools that did not stock toilets with sufficient toilet paper or soap, and secondary schools that provided no sanitary waste solutions.<sup>92</sup> Despite PHS and their competitors decades-long existence, their services and products were not on the radar of these institutions. The Education (School Premises) Regulations act of 1981 was put in place to ensure good hygiene in schools, but it was routinely overlooked or broken, because of lacking funds to improve conditions and sporadic reinforcement.<sup>93</sup> Educational campaigners argued that stronger laws would be needed to protect children.

The public environmental WEN campaigns and debates about hygiene in UK educational institutions influenced and coincided with several changes to the law in the nineties. The Environmental Protection Act of 1990 imposed a 'Duty of Care' on organisations that

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<sup>92</sup> The context for this article was medical concern about a recent outbreak of viral gastroenteritis in the area. Brendan H O'Connor Rachel K Jewkes, 'Crisis in Our Schools: Survey of Sanitation Facilities in Schools in Bloomsbury Health District', *British Medical Journal* **301** (10 November 1990): 1085-87.

<sup>93</sup> Ibid.

produced, kept or disposed of menstrual waste. In 1991, the Water Industries Act finally addressed the plumbing issue, by declaring that ‘no sanitary waste should be flushed away’ if it could cause harm to a sewer or drain.<sup>94</sup> Most significantly for the history of the sanitary bin industry, the Workplace (Health, Safety & Welfare) Regulation from 1992 recommended that *all businesses* should ensure that women’s toilets should be provided with a suitable method of disposing sanitary waste.<sup>95</sup> Finally, in 2005, the Hazardous Waste Regulations Act stated that the responsibility for determining if waste is dangerous rests with the producer of the waste, meaning that public spaces actively opted *in* to the analysis of menstrual waste as a hazard.<sup>96</sup> These laws and regulations meant that any public place involving what could be or become menstruating girls and women had to consider menstrual product disposal.<sup>97</sup> PHS and its competitors took

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<sup>94</sup> ‘Water Industry Act 1991’ (The Stationary Office (Printer of Acts of Parliament), first published 1991, reprinted 2001).

<sup>95</sup> ‘In toilets used by women, suitable means for the disposal of sanitary dressings should also be provided’, Approved Code of Practice no 192, Regulation 21, ‘Workplace (Health, Safety & Welfare) Regulation 1992’, *Health and Safety Executive* (Crown copyright, first published 1992, second edition 2013), p 38.

<sup>96</sup> Chrissie Rowlinson, ‘Getting to the Point of Infection Control’, *Practice Management* Vol. 26, Issue 3 (March 2016), p 16.

<sup>97</sup> During the late-nineties and early 2000s, several hormonal birth control options that advertised as ‘menstrual suppressants’ became more available, leading to lighter and fewer menstrual cycles for consumers. The original pill, developed in the 1950s, had the same inbuilt system for ‘skipping’ periods, but was not advertised as such. For more on the history of menstruation and ‘the Pill’ as ‘lifestyle drug’, see Jonathan Eig. *The Birth of*

advantage of the regulations, and added information about how their services discreetly solved the legal requirements, while not putting more pressure on in-house cleaning staff, who were in the midst of a separate race to keep up with increasing hygiene standards. Although the law does state that disposal methods must be provided, no law states that it is necessary to utilise a specialized bin and sanitary bin exchange unit system. Fundamentally, the bin is a requirement by law, whereas the system has become a norm.

By the mid-1990s, and for all the above reasons, sanitary bins became normal and measures were made to educate a new generation of girls about their importance in 'menstrual etiquette'.<sup>98</sup> In a 1994 booklet by the Family Planning Association, the author writes: 'towels should not be put in the toilet. They must be wrapped up and put in the bin. Many toilets have special bins for this... and if they don't, ask a female teacher why not!'<sup>99</sup> The historical continuity of relying on support from female professionals

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*the Pill: How Four Pioneers Reinvented Sex and Launched a Revolution* (London MacMillan, 2014); Lesley Hoggart Victoria Louise Newton, 'Hormonal Contraception and Regulation of Menstruation: A Study of Young Women's Attitudes Towards 'Having a Period'', *Journal of Family Planning and Reproductive Health Care* **41** (2015): 210-15; Laura Mamo and Jennifer Fosket, 'Scripting the Body: Pharmaceuticals and the (Re)Making of Menstruation', *Signs* **34** (2009): 925-49.

<sup>98</sup> Strange, 'The Assault on Ignorance: Teaching Menstrual Etiquette in England, C. 1920s to 1960s.', pp.

<sup>99</sup> Kate Goodwin, 'Periods: What You Need to Know' (Family Planning Association, 1994), Wellcome Library P/10984, p 7.

continued throughout the century, and by the millennium, the sanitary bin industry had succeeded in making theirs a necessary object.

### **Sanitary bins in the future**

After the normalisation stage, the industry quickly saturated the market. Today, companies compete for large tenders (for groups of hospitals or universities for example) based on environmental and chemical technicalities, price, and, to a lesser extent, aesthetics. Only a minority of modern sanitary bins have no-touch sensor solutions, colours beyond black and white, and/or non-rectangular shapes.<sup>100</sup> But such options may become more important in the future, as the ‘bathroom selfie’ trend spurred on by celebrities like reality TV-star Kim Kardashian West, the UK ‘Loo of the Year’ awards, and innovation in the Asian industry have made bathrooms more of a palatable talking point in recent years.

Meanwhile, environmental and menstrual activists persist in critiquing the industry and calling for more sustainable menstrual practices, especially in terms of what happens to the waste.<sup>101</sup> As in the 1970s, PHS mirrors environmental activists concerns; this time regarding the industry’s dependence on landfills. The company argues that their new Lifecycle™ system, which burns dried (as opposed to energy-slow wet) waste and

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<sup>100</sup> Linda Knuutinen, ‘Improving Hygiene and Comfort in Public Restrooms.

Development of a Sanitary Bin for Sca Tissue Europe’ (Chalmers University of Technology, 2006).

<sup>101</sup> Bobel, *New Blood : Third-Wave Feminism and the Politics of Menstruation*.

converts it to energy, is better for the environment.<sup>102</sup> In addition to this paradoxical return to the incinerator system of the 1950s, this solution might not be as effective as it seems because the LifeCycle™ system is located in the West Midlands, meaning that the entire system will continue to rely heavily on trucks transporting bins around the country.

Finally, debates about accessibility and ‘Potty Parity’ may also play a role in the future of the industry, as architects and architectural historians query whether some demographic groups, in particular trans,<sup>103</sup> non-binary, young and/or disabled users, are ‘disadvantaged by design’.<sup>104</sup> For these groups, the issue is *where* the sanitary bin

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<sup>102</sup> ‘LifeCycle™’, PhS website (2018): [www.phs.co.uk/lifecycle](http://www.phs.co.uk/lifecycle)

<sup>103</sup> Notably, the cover of *Time* magazine 29 May 2014 covered the ‘Transgender Tipping Point: America’s Next Civil Rights Frontier’ in public discourse.

<sup>104</sup> Historically, this issue has been most fraught as related to racially segregated toilets, see Elizabeth Abel, ‘Bathroom Doors and Drinking Fountains: Jim Crow’s Racial Symbolic’, *Critical Enquiry* 25 (1999): 435-81; Katie Nodjimbadem, ‘Apartheid, Twenty-Five Years after Its Repeal: Segregated Public Facilities, Including Beaches, Were Commonplace, but Even Today, Inequality Persists’, *Smithsonian Magazine* (2015),

[www.smithsonianmagazine.com/history/what-did-apartheid-south-africa-look-](http://www.smithsonianmagazine.com/history/what-did-apartheid-south-africa-look-180956945/?no-ist)

[180956945/?no-ist](http://www.smithsonianmagazine.com/history/what-did-apartheid-south-africa-look-180956945/?no-ist). Since 2011, the American Restroom Association has called for ‘potty parity’ after a public debate about the lack of women’s bathrooms in the House of Representatives. In the UK, a YouGov poll from 2018 showed that 59 per cent of women regularly queue as opposed to 11 per cent of men, see Matthew Smith, ‘Potty Parity: Would It Be Fairer to Make Women’s Toilets Bigger?’, *YouGov UK* (2018). See also the

should be placed, and *who* counts as a potential user in a system that design and architecture historian Kathryn H Anthony has described as rife with 'built-in structures of gender bias'.<sup>105</sup> Interestingly, there is no evidence to suggest that the sanitary bin industry is aware of the potential profits that would come from serving *all* bathrooms, despite their indirect contribution to the conversation through employment of men to enter women's bathrooms.<sup>106</sup> As call for gender parity within bathrooms grow louder, the industry might utilise gender politics to advocate for more availability of their products, but this has not yet happened.<sup>107</sup>

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debate about identity politics and architecture in *Architectural Review*, 'Women in Architecture', *Architectural Review* **243** (2018). Anthony, *Defined by Design: The Surprising Power of Hidden Gender, Age, and Body Bias in Everyday Products and Places*, 126-27.

<sup>105</sup> *Defined by Design: The Surprising Power of Hidden Gender, Age, and Body Bias in Everyday Products and Places*.

<sup>106</sup> Some debate about trans people centre on the perceived threat of transwomen entering women's bathroom. No such threat has been detected or proven. It should not escape notice that the weekly entrance of men (cis and trans) into women's bathroom for sanitary bin removal purposes has not been part of this debate, despite providing ample evidence that violence does not automatically occur when genders mix in bathrooms.

<sup>107</sup> On current debates about trans people and bathrooms, see Mia Fischer, *Terrorizing Gender: Transgender Visibility and the Surveillance Practices of the US Security State* (University of Nebraska Press, 2019). The context for this study is US-based, but

While issues such as aesthetics, environmental concerns, and access are becoming increasingly mainstream, the industry is still leaning on its biggest selling point: the guarantee of safety through the use of bactericide, under trademarks such as BioFresh™, Envirosan® Active spray, or Integrated Anti-Microbial Surface Technology.™ It is unclear what ingredients are used, but the solutions are usually described as a combined disinfectant and odor-control, promising to protect against bacteria, HIV, staphylococcus aureus, E.coli, and more.<sup>108</sup> This index of dangers are listed on the major companies websites, and are, no doubt, part of what has made them so successful. There is, however, no research that shows a link between touching used menstrual products and acquiring any of these serious conditions. In fact, there is by now decades of research

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nevertheless provides useful context on violence towards transpeople and how the debate about bathroom politics is harmful mostly to minority groups.

<sup>108</sup> Genesis Biosciences, makers of a competing non-chemical sanitary bin solution, claims to have the capability to develop safer antimicrobial products, and as part of their 2016 marketing argued that well established companies ‘wriggled around measures validating their formulations and making ambiguous disinfectant claims’. The company picked apart PHS sanitary bin claims, arguing that their promises of fulfilling European regulatory hygiene codes numbers BS1276 and BS13727 are part of an irrelevant water-based system. As sanitary bins are not full of water, the germicide’s effect is questionable. Although Genesis Biosciences is first and foremost interested in harming its competition, it points out the logical fallacy in PHS and other’s promised outputs, and correctly states that no-one seems to know whether chemicals in sanitary bins solve the problems they promise to.

that shows the opposite.<sup>109</sup> Despite some superficial aesthetic modernization in the form of no-touch options and new shapes, the industry has in essence not changed much since the Tack brothers and their secretary first seized the business opportunity in the 1960s.

## **Conclusion**

What then, can we make of the modestly flapped container in the corner of the room?

This article has begun telling its history, with a hope that future research might help identify the many remaining questions, such as the story of Cannon Hygiene and the Kennons, the ingredients used in sanitary bins, the connection to the HIV and TSS crises, the name of the Tack's secretary, and the unique British aspects of this story. Based on what has been discussed above, some conclusions are offered in an attempt to summarise the entangled yarn of environmental, gender, business and toxicity concerns that are concealed within the sanitary bin.

First, in an industry profiting of the bodily fluids of women, it is notable how persistent myths about menstruation remain. In the industry-publication *European Cleaning Journal*, a typical view of sanitary bins and women is laid out by explaining that

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<sup>109</sup> Dr Koop's influential 'Surgeon General's Report on Aids' (22 October 1986) first made it clear that HIV cannot be spread casually. Numerous medical studies resulting from the Rely TSS crisis showed staph aureus is carried randomly within a woman's body and will only become dangerous under specific conditions, such as the use of a super-absorbent tampon. E.coli is primarily caused by cross-contamination, and is related to food, fecal, or animal bacteria, and there are no studies tying menstrual blood to it.

marketing sanitary bins is difficult because bins and menstruation are taboo. Because of this, the industry argues, the bins need to be discreet – ‘because this is what women want’ -, and because the waste produced by women’s bodies is dangerous:

Number one requirement, unsurprisingly, is that a bin should offer the very highest level of hygiene since blood waste is potentially hazardous.<sup>110</sup>

Ideas about menstrual blood as disgusting and toxic have shaped the industry into a successful solution for an exaggerated problem. There is little scientific evidence to suggest that menstrual product waste is toxic, but the industry continues building its case on this assertion, often relying on Rentokil’s 1980 commercial survey for evidence. This in turn makes it possible for PHS and its competitors to drive each other into a technology war where the desired outcome is a sanitary bin solution that is increasingly sterile and chemical. A high-tech solution also happens to be more expensive, reminding us that the Tack brothers were willing to overcome any squeamishness towards menstruation in favour of capitalising on its stated toxicity. These attitudes reinforce menstrual taboos, starting with Pliny, escalating with the 1920s debate about deadly menstrual blood (‘menotoxins’), and reaching its chaotic climax in the HIV/Aids and TSS crises of the 1980s.<sup>111</sup> In general, the lack of scientific studies regarding the properties of menstrual blood has served the sanitary bin industry well, and no mention is made of evolutionary biologist Margie Profet’s ideas about periods as important and

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<sup>110</sup> “Meeting Women’s Expectations?” *European Cleaning Journal* (17 March 2011).

<sup>111</sup> Mary Jane Lupton Janice Delaney, Emily Toth. *The Curse: A Cultural History of Menstruation* (Urbana and Chicago: University of Illinois Press, 1976).

protective.<sup>112</sup> Menstruation, then, is valuable only if commercialised through a series of corporate interests and cleaning stages. From disposable products, to the sanitary bin, and straight back into the incinerator or landfill, the menstrual economy is based on dirt, despite the lack of evidence that the original ‘polluter’, menstrual blood itself, is toxic.

However, in regards to the gendered labour involved in the industry, some features have changed. Men and unnamed women were behind the concept of the sanitary bin, its initial marketing and financial success, and the early decades relied heavily on a cheap immigrant, and largely female, workforce. As the industry started to include more unisex services, such as soap, men were more frequently employed and today dominate in the roles of drivers and cleaners. This gender-swapped work intersects with current debates about identity and bathroom politics, but the industry seems to be unknowingly championing inclusiveness in bathrooms by hiring predominantly men to enter women’s bathrooms, whilst failing to capitalise on the obvious business opportunity presented by men’s bathrooms. Today, the UK government is calling for more sanitary bins in all bathrooms, tied to the issues of flushed wet wipes, the negative publicity surrounding the London ‘fatberg’, and the £12 million spent annually on unblocking

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<sup>112</sup> Margie Profet, ‘Menstruation as a Defence against Pathogens Transported by Sperm’, *The Quarterly Review of Biology* **68** (1993): 335-86. Profet’s work was criticised in the 1990s, although scholars disagree about how effective the critique was. Profet disappeared for over seven years in the early 2000s, and her research has since largely been forgotten.

London's sewers alone, rather than only menstrual equity, but the industry has yet to respond.<sup>113</sup>

The history of the sanitary bin provides context and material for scholars outside the history of menstruation as well. In the growing literature on trans history, it provides evidence of gendered and corporate influence on decision making. For researchers exploring environmental history, the sanitary bin emerges as a solution and a problem – future research on the related final destination of menstrual waste is sorely needed, and understanding the financial and practical workings of the industry can be a first step towards this. For historians of women in business, the constant lack of women (at least named women) emerges as a thread throughout this story – despite the sanitary bin's link to gendered notions of the body and menstruation. In this, it joins other menstrual products and the 'femcare' sector at large, both claiming to empower women but seldom operating with women in leadership roles. Finally, the history of the UK sanitary bin has implications for historians in these fields beyond Britain. As a decidedly British innovation, corporate success story, and employer obsession, the sanitary bin is a norm in its motherland. Outside Britain, people utilise different bins, cleaned by non-specialised staff, or they flush materials, recycle them, or gather them in other containers. However, scholars of British and global histories of the environment and

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<sup>113</sup> Fiona Harvey, "Sanitary Bins Could Come to Men's Toilets in War on Wet Wipes", *The Guardian*, 14 August 2018. The figure comes from London Assembly Environment Committee, 'Single-Use Plastic: Unflushables', ([www.london.gov.uk](http://www.london.gov.uk): London Assembly Environment Committee, 2018). National numbers were not available at the time of writing.

bodily waste may well ask whether the normalisation of the sanitary bin has solved all the problems it promised, when other countries so clearly have established different norms. Furthermore, although environmental historians no doubt can agree that it is positive that the flushing of menstrual products was somewhat slowed down when the bin entered the bathroom, it must be admitted that every product not flushed is another product burned. For all these reasons, both historical and very current, the sanitary bin emerges as an evocative object 'to think with' and to revisit – both because of and despite its norm status.<sup>114</sup>

In conclusion, the sanitary bin and exchange systems have become strong norms in the UK, but not elsewhere – thus proving that the need for the object itself is not as urgent as promised. Throughout the World, sanitary bin provision is inconsistent, with geographical locations in Europe, North America and Scandinavia often providing bins without the attached bin exchange and cleaning system that has become so normalised in the UK. The invention of the system by the Tacks and others in Britain no doubt helped make the sanitary bin exchange and cleaning system commonplace in the UK. The industry relies on old ideas to convince customers of its necessity, but the prevalence of the sanitary bins throughout the UK shows that someone is buying what PHS and its competitors are selling. In solving the serious problem of flushing pads and tampons, employers may well pat themselves on the back for accommodating women in such a 'discrete and hygienic' manner. But the sanitary bin stopped being an environmental solution the day it started depending on chemicals, trucks, and landfill. As the Society for Marine Conservation continues to document, there is no way of

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<sup>114</sup> Sherry Turkle (ed.) *Evocative Objects: Things We Think With* (Cambridge, MA: MIT Press, 2007).

properly getting rid of plastic and similar waste materials. Imagining that a modesty flap and a discrete dance of bin exchanges across the nation will solve this environmental issue, is as fictional as the story Alfred Tack once wrote about a sales pitch that saved the world.

## Bibliography

- Abel, Elizabet 1999. 'Bathroom Doors and Drinking Fountains: Jim Crow's Racial Symbolic'. *Critical Enquiry* **25**: 435-81.
- Alison Costello, Bernadete Vallely, Josa Young 1989. *The Sanitary Protection Scandal: Sanitary Towels, Tampons and Babies' Nappies - Environmental and Health Hazards of Production, Use and Disposal*. London: Women's Environmental Network.
- Anderson, Warwick 1995. 'Excremental Colonialism: Public Health and the Poetics of Pollution'. *Critical Enquiry* **21**: 640-69.
- Anthony, Kathryn H 2017. *Defined by Design: The Surprising Power of Hidden Gender, Age, and Body Bias in Everyday Products and Places*. Prometheus Books.
- Berger, Stephen and Inc Gideon Informatics 2015. 'Toxic Shock Syndrome : Global Status'.
- Bloomer, Jennifer 1992. 'Abodes of Theory and Flesh'. *Assemblage* **17**: 6-29.
- Bobel, Chris 2010. *New Blood : Third-Wave Feminism and the Politics of Menstruation*.
- Boldrin, M., D.K. Levine, 'The Case Against Patents.' *The Journal of Economic Perspectives*, 27(1) (2013), pp. 3-22.
- Bulmus, Birsen 2012. *Plague, Quarantines and Geopolitics in the Ottoman Empire*. Edinburgh: Edinburgh University Press.
- Canderle, Sebastien 2016. *The Debt Trap: How Leverage Impacts Private-Equity Performance*. Harriman House Limited.
- 'Cannon Hygiene Says Cannoncurve Feminine Hygiene Unit Is Better Looking'. *European Cleaning Journal* (14 March 2013).

- Carson, Rachel 1962. *Silent Spring*. Houghton Mifflin.
- Cavanagh, Sheila L 2010. *Queering Bathrooms: Gender, Sexuality, and the Hygienic Imagination*. Toronto: University of Toronto Press.
- Chakrabarty, Dipesh 2007. 'Open Space/Public Place: Garbage, Modernity and India'. *Journal of South Asian Studies* **14**: 15-31.
- Committee, London Assembly Environment, 2018. 'Single-Use Plastic: Unflushables'.  
[www.london.gov.uk](http://www.london.gov.uk): London Assembly Environment Committee.
- D.H.Berg, L.Block Coutts 2009. 'Virginity and Tampons: The Beginner Myth as a Case of Alteration'. *Health Care for Women International* **14**: 27-38.
- Daston, Lorraine J, ed. 2004. *Things That Talk: Object Lessons from Art and Science*: Zone Books.
- Douglas, Mary 1966. *Purity and Danger: An Analysis of Concepts of Pollution and Taboo*. London: Routledge and Keegan Paul.
- Edgerton, David. *The Shock of the Old: Technology and Global History since 1900*. Oxford: Oxford University Press, 2006.
- Eig, Jonathan 2014. *The Birth of the Pill: How Four Pioneers Reinvented Sex and Launched a Revolution*. London MacMillan.
- 'The Essential Facility'. 2001. *Facilities* **19**.
- Fahs, Breanne 2016. *Out for Blood: Essays on Menstruation and Resistance*. New York: SUNY.
- Fischer, Mia, 2019. *Terrorizing Gender: Transgender Visibility and the Surveillance Practices of the US Security State*. University of Nebraska Press.
- Freidenfelds, Lara 2009. *The Modern Period : Menstruation in Twentieth-Century America* [in English]. Baltimore: Johns Hopkins University Press.

- Friedman, Nancy 1981. *Everything You Must Know About Tampons*. New York: John Wiley & Sons.
- Green-Cole, Ruth, 2015. 'Widening the Cycle: A Menstrual Cycle & Reproductive Justice Art Show'. edited by Menstrual Health & Reproductive Justice Conference Proceedings, 11-16: Blurb.
- Halberstam, Jack 1998. *Female Masculinity*. Durham: Duke University Press.
- Hammer, Signe 1975. *Women : Body and Culture : Essays on the Sexuality of Women in a Changing Society* [in English]. New York: Perennial Library, an imprint of Harper & Row Publisher.
- Hawkins, Gay 2006. *The Ethics of Waste: How We Relate to Rubbish*. Rowman & Littlefield.
- Iain Borden, Barbara Penner, Jane Rendell, ed. 2002. *Gender Space Architecture: An Interdisciplinary Introduction*: Routledge.
- Jack Corbett, Dennis C. Grube, Heather Lovell, Rodney Scott 2018. 'Singular Memory or Institutional Memories? Toward a Dynamic Approach'. *Governance* **Pre-Publication**.
- Janice Delaney, Mary Jane Lupton, Emily Toth 1976. *The Curse: A Cultural History of Menstruation*. Urbana and Chicago: University of Illinois Press.
- Joanna Radin, Emma Kowal, ed. 2017. *Cryopolitics: Frozen Life in a Melting World*. MIT Press.
- Johnson, Ryan 2008. 'Tabloid Brand Medicine Chests: Selling Health and Hygiene for the British Tropical Colonies'. *Science as Culture*. Vol. 17, pp. 249-68.
- Johns, Adrian. *Piracy. The Intellectual Property Wars from Gutenberg to Gates*. Chicago: The University of Chicago Press, 2009.

- Jon Agar, Jacob Ward, ed. 2018. *Histories of Technology, the Environment, and Modern Britain*. London: UCL Press.
- Jones, Abigail, 'The Fight to End Period Shaming Is Going Mainstream'. *Newsweek*, 2016.
- Knuutinen, Linda 2006. Improving Hygiene and Comfort in Public Restrooms. Development of a Sanitary Bin for Sca Tissue Europe. Chalmers University of Technology.
- Linton, David 2006. 'Camillagate: Prince Charles and the Tampon Scandal'. *Sex Roles* **54**: 347-51.
- Loudell Snow, Shirley Johnson 1977. 'Modern Day Menstrual Folklore'. *Journal of the American Medical Association* **237**: 2736-39.
- MacFarlane, Allison 2003. 'Underlying Yucca Mountain: The Interplay of Geology and Policy in Nuclear Waste Disposal'. *Social Studies of Science* **33**: 783-807.
- Mamo, Laura and Jennifer Fosket 2009. 'Scripting the Body: Pharmaceuticals and the (Re)Making of Menstruation'. *Signs* **34**: 925-49.
- McClive, Cathy 2015. *Menstruation and Procreation in Early Modern France*. Routledge.
- Melosi, Martin 2001. *Effluent America: Cities, Industry, Energy and the Environment*. University of Pittsburgh Press.
- Melosi, Martin 2009. *The Sanitary City: Environmental Service in Urban America from Colonial Times to the Present*. University of Pittsburgh Press.
- Mendes, C.M. Lucas; M.F. 1980. 'A Bacteriological Survey of Sanitary Dressings, and Development of an Effective Means for Their Disposal'. *The Journal of Hygiene* **84**: 41-46.
- Merchant, Carolyn 2003. *Reinventing Eden: The Fate of Nature in Western Culture*. Routledge.

- Nodjimbadem, Katie, 'Apartheid, Twenty-Five Years after Its Repeal: Segregated Public Facilities, Including Beaches, Were Commonplace, but Even Today, Inequality Persists'. *Smithsonian Magazine* (2015).  
[www.smithsonianmagazine.com/history/what-did-apartheid-south-africa-look-180956945/?no-ist](http://www.smithsonianmagazine.com/history/what-did-apartheid-south-africa-look-180956945/?no-ist).
- Parr, Joy 2010. *Sensing Changes: Technologies, Environments, and the Everyday, 1953-2003*. UBC Press.
- Payne, Sarah Ruth 2010. *Cleaning up after Sex: An Environmental History of Contraceptives in the United States 1873-2010*. University of New Mexico.
- Penner, Barbara 2013. *Bathroom*. London: Reaktion Books.
- Pfeffer, Naomi 2017. *Insider Trading: How Mortuaries, Medicine and Money Have Built a Global Market in Human Cadaver Parts*. Yale: Yale University Press.
- Pillinger, Eric, 2017. 'Tack International Booklet'. edited by TACK International.
- Profet, Margie 1993. 'Menstruation as a Defence against Pathogens Transported by Sperm'. *The Quarterly Review of Biology* **68**: 335-86.
- Rachel K Jewkes, Brendan H O'Connor 10 November 1990. 'Crisis in Our Schools: Survey of Sanitation Facilities in Schools in Bloomsbury Health District'. *British Medical Journal* **301**: 1085-87.
- Radin, Joanna 2017. *Life on Ice: A History of New Uses for Cold Blood*. Chicago and London: University of Chicago Press.
- Rentetzi, Maria 2011. 'Packaging Radium, Selling Science: Boxes, Bottles and Other Mundane Things in the World of Science'. *Annals of Science* **68**: 375-99.
- Review, Architectural 2018. 'Women in Architecture'. *Architectural Review* **243**.
- Robert Snowden, Barbara Christian, 1983. 'Patterns and Perceptions of Menstruation: A World Health Organization International Collaborative Study in Egypt, India,

Indonesia, Jamaica, Mexico, Pakistan, Philippines, Republic of Korea, United Kingdom and Yugoslavia'. New York.

Rosewarne, Lauren 2012. *Periods in Pop Culture : Menstruation in Film and Television* [in English]. Lanham, Md.: Lexington Books.

Smith, Matthew, 'Potty Parity: Would It Be Fairer to Make Women's Toilets Bigger?'. *YouGov UK* (2018).

Society, Marine Conservation, 2013. 'Marine Plastics Pollution and Position Statement'.

Stein, Elissa and Susan Kim 2009. 'Flow : The Cultural Story of Menstruation'.

Stiglitz, Joseph E. 'Economic Organization, Information, and Development' in the *Handbook of Development Economics*. North Holland, 1998, pp. 93–160.

Stiglitz; Barry J. Nalebuff, 'Prizes and Incentives: Towards a General Theory of Compensation and Competition', *The Bell Journal of Economics*, **14** No. 1 (1983), pp. 21–43.

Strange, Julie 2001. 'The Assault on Ignorance: Teaching Menstrual Etiquette in England, C. 1920s to 1960s.'. *Social History of Medicine* **14**: 247-65.

Strasser, Susan 2000. *Waste and Want: A Social History of Trash*. New York: Owl Books.

Swanson, Kara W 2014. *Banking on the Body: The Market in Blood, Milk, and Sperm in Modern America*. Harvard: Harvard University Press.

Thompson, Michael 1979. *Rubbish Theory: The Creation and Destruction of Value*. Oxford: Oxford University Press.

Turkle, Sherry (ed.) *Evocative Objects: Things We Think With*. Cambridge, MA: MIT Press, 2007.

Victoria Louise Newton, Lesley Hoggart 2015. 'Hormonal Contraception and Regulation of Menstruation: A Study of Young Women's Attitudes Towards 'Having a Period''. *Journal of Family Planning and Reproductive Health Care* **41**: 210-15.

Vostral, Sharra L 2011. 'Rely and Toxic Shock Syndrome: A Technological Health Crisis'.

*Yale Journal of Biology and Medicine* **84**: 447-59.

Vostral, Sharra Louise 2008. *Under Wraps: A History of Menstrual Hygiene Technology*.

New York: Lexington Books.

Weiss-Wolf, Jennifer 2017. *Periods Gone Public: Taking a Stand for Menstrual Equity*.

Arcade.

Whiteley, Nigel 1987. 'Toward a Throw-Away Culture. Consumerism, 'Style-

Obsolescence' and Cultural Theory in the 1950s and 1960s'. *Oxford Art Journal*

**10**: 3-27.