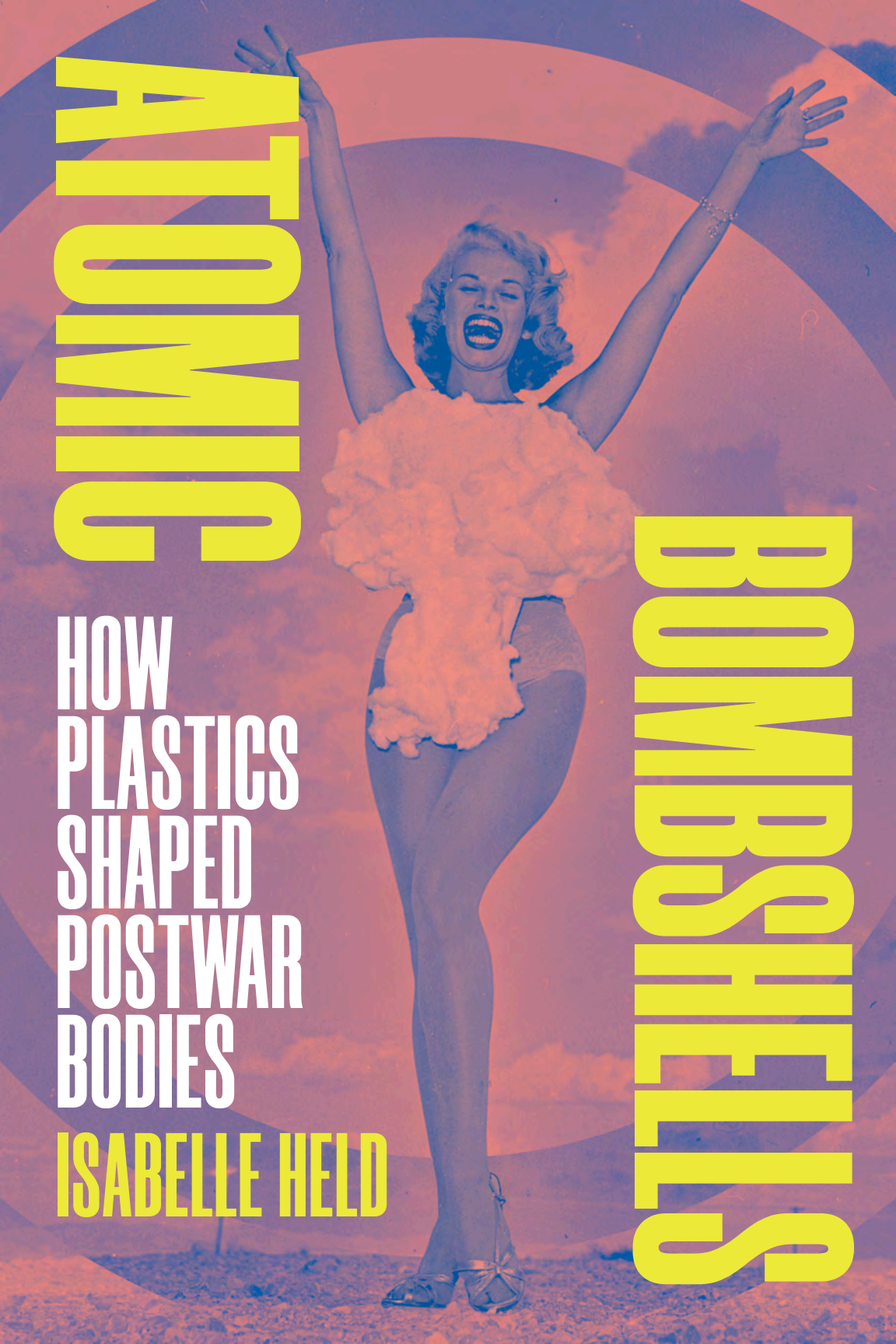
ATOMIC
BOMBSHELLS
HOW PLASTICS SHAPED POSTWAR BODIES
ISABELLE HELD

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DUKE

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For my dream wife, Melissa.

I could not have written this book without you.

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ABBREVIATIONS

AMA	American Medical Association
CGW	Corning Glass Works
DCCAMR	Dow Corning Center for Aid to Medical Research
DPAD	DuPont Advertising Department
FDA	Food and Drug Administration
GE	General Electric
QLF	Queens Liberation Front
R & D	Research and development
SCAP	Supreme Commander for the Allied Powers
STS	Science and technology studies

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INTRODUCTION

One day, toward the end of World War II, a young white American man sank into the soft seat of a captured German bomber and marveled at its plastic foam padding. The upholstery's plush synthetic material was unlike anything he had experienced before. Sitting in its cushioned embrace felt particularly good to him after the hours he had spent observing plastic surgery for the Royal Canadian Air Force in Toronto. A sergeant pointed to a cutaway in the seat, explaining that this was a new type of lightweight synthetic foam developed by German chemists—a replacement for foams made from rubber.

A decade later, in 1950s Hollywood, a blonde striptease artist, frustrated with her flat chest, sought the services of a famous cosmetic surgeon known as the Beauty Surgeon. She requested that he permanently enhance her body to emulate that of a famed brunette bombshell: "I want you should give me a chest like Jane Russell's."[1] The surgeon regretfully replied that he could do nothing for her at that time; while surgeries existed to reduce breast size, methods to increase the bust, such as fat transplants, had proven unsuccessful to date.

When searching for a solution to her request, the Beauty Surgeon recalled a moment, earlier in his career, when he experienced the novel pleasure of the bomber's wartime upholstery and its uniquely spongy properties. He tracked down a sample of the bomber seat and, after a series of experiments, determined it was ideal for use in breast implants. This is the origin story that Robert Alan Franklyn repeatedly told in countless publications throughout the 1960s to frame his research for developing "Surgifoam," the synthetic material he designed for his "Breastplasty" operation to augment the bustline cosmetically.

Expedited during wartime and now freed from military applications, plastics were becoming increasingly available on the US consumer market

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in the postwar era.[2] The whitestream press celebrated them as miracles of Big Science.[3] These plastics were widely considered chemically inert—and therefore understood as benign. A postwar plastics boom also resulted in more medical applications. Franklyn noted, "Along with surgeons all over the world, I had rejoiced in the age of plastics."[4] The blonde who entered his office would "never have to wear any kind of padded brassiere again."[5] Instead, the Beauty Surgeon would perfect her body with plastic foam inserts sheathed in nylon—another synthetic material—implanted within the body. Theoretically, this surgery offered a permanent solution for achieving the fashionable, fuller bust that many women desired, eliminating the need for an external shaping device. It thereby destabilized seemingly fixed limits of the body. This technoscientific tale of self-actualization used military-industrial technology to position the postwar American female body as plastic in new and different ways.

From bullet bras to bazookas, Franklyn's Breastplasty origin story fits into a broader cultural context of referencing military technology in relation to the sexually desirable female body. The fashionable white, cisgender, heteronormative feminine ideal promoted by Hollywood and whitestream media was increasingly sheathed in synthetics and commonly referred to as a "bombshell." Hollywood and entertainment culture exported the glamorous, curvaceous bombshell to audiences worldwide. But there was never just one bombshell.

Atomic Bombshells challenges the usual narrative and trajectory of how war technologies enter domestic use. Starting in the late 1930s, it traces the early development of a set of synthetic materials to show how these technologies were originally created and imagined by decision-makers within a white, male-dominated industry. Continuing through the Cold War, I analyze the context of how these surplus materials were commercialized and marketed as domestic innovations for capitalist consumption that largely targeted a narrow definition of woman. The typical technology narrative within material science is complicated by incorporating a wider range of makers and users who used plastics to (re)shape gender.

This book follows plastics on their journey into women's bodies. It explores the effects of military-industrial science, as manifested in various synthetic products—nylon, silicone, and plastic foams—on embodied and expressive configurations of gender, sexuality, and race. By tracing materials across multinational networks, I show that the links between women's bodies and wartime technologies were not simply symbolic but materially and corporeally manifest via plastics research and development.

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Through working closely with plastics as an artifact and focusing on their materiality, my analysis moves from *outside* the body to *inside* the body. I follow these materials across networks of production and consumption to show both their hegemonic and counterhegemonic uses. In mapping makers and users, I highlight the multitude of actors that influenced the many different uses and meanings of plastics' application in reimagining and reshaping femininities. Ultimately, this book argues that the histories of femininity and the fashioned female body cannot be understood as purely binary, as they are always entangled with intersectional queer and trans histories. Concepts of gender and the body are never fixed, but rather shaped by the cultural, historical, sociopolitical, and material conditions in which they are created.

The primary focus of this book is the United States from the late 1930s, with the launch of nylon—widely celebrated as the world's first fully synthetic fiber—to the late 1970s, when shifts in policy relating to the dangerous health consequences of implantable plastics, such as polyurethane foam and silicones, were enacted. Franklyn's anecdote, located at the center of this book's chronology, provides a useful starting point for retracing the biopolitical history of plastics as a technology of the gendered body. It raises many interconnected questions about the provenance of plastics, practices of self-fashioning the feminine body, and American postwar constructions of racialized gender.

While Franklyn is a known figure in the history of US cosmetic surgery, the cultural-historical significance of the military-industrial materials he used—and their intimate relationship to the shaping of feminine body ideals—has remained largely unexplored. Perhaps this critical absence of attention to the material reflects the omnipresence of plastics today. They have infiltrated every aspect of contemporary life—and the body—making it challenging to imagine a world without them. But for this precise reason, it is essential to examine their history more closely. These materials and practices continue to circulate and affect bodies across a wide range of communities and social groups today. This makes it all the more urgent to critically revisit their histories.[6] In order to guide the search for more sustainable and equitable alternatives, it is essential to improve our understanding of the materials' behaviors and provenance, as well as make the power structures in which they are created more visible.

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The history of materials is not neutral. Histories of science, technology, and medicine do not exist in a vacuum; they are shaped by actors involved and the sociopolitical conditions of their time. This book contrasts with material science histories that are gender- and race-neutral, devoid of social or cultural context beyond a technoscientific one. It joins feminist STS scholars who have challenged such approaches to history and highlighted the power relations within which science and technology are created.[7]

This book is structured around materials. Centering on the transnational story of three types of materials used for military and industrial applications during World War II—nylon, foam plastics, and silicone—I trace their development, actors, networks, and their applications in shaping feminine bodies. Nylon, unveiled by the explosives manufacturer DuPont in 1939, was promoted as the world's first fully synthetic fiber and introduced to the domestic women's intimate apparel market. Plastic foams made from wartime rubber substitutes were molded into 3D objects and used to augment bodies through padded bra inserts known as "falsies," as well as padded foundationwear, prosthetics, and implants. Silicone, an engine lubricant developed to aid the US war effort, was later used in cosmetics, aesthetic body contouring, and breast augmentation surgery.

By giving greater attention to the materials themselves, I am able to trace how their uses and meanings change as they circulate through a wider network of users and include histories that have been less documented. In this book, I untangle a complex network of people, including chemical company representatives, cosmetic and plastic surgeons, individuals working without medical licenses, chemists, beauty salon workers, film directors, actresses, sex workers, go-go dancers, journalists, nightclub owners, dermatologists, fashion and industrial designers, and Hollywood agents and producers—all part of the wider network that brought plastics to (and often into) postwar bodies. Only by identifying, mapping out, and critically analyzing the embedded structural inequities of these materials—from their development to their access—can one begin to deconstruct them, write new histories, and reimagine and reclaim futures. This process of deconstruction can also make visible the ways in which a wider range of users and makers conformed to, challenged, complicated, and subverted the power structures that influenced plastics creation. Through this process, *Atomic Bombshells* also highlights how complex power relations affected the applications and cultural meanings of the materials themselves.

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Mapping Plastics

The thread of this book's story is nylon. In 1938, DuPont announced the creation of nylon, a new synthetic material that they promoted as the world's first *fully* synthetic fiber. Unlike earlier "artificial silks," such as rayon, a semisynthetic fiber made from plant-based cellulose, nylon was made from coal derivatives and unlocked a new range of possibilities, eventually leading to the commercial launch of other revolutionary synthetic materials, including polyester and Lycra.[8] Nylon was first made available as a synthetic replacement for pig bristles and fishing lines. However, it was the more sensual launch of this material as women's stockings that captured the attention of the American public.

Nylon's shifting identity moved from the lab to glamorous, intimate fashion items, to wartime parachutes, and back again. Resistant to mold, rot, and pests, nylon embodied DuPont's slogan, "Better Things for Better Living . . . Through Chemistry," and contributed to an imagined synthetic future, independent of foreign natural fibers such as silks and rubbers. By the late 1930s, plastics like nylon were no longer understood as mere imitations of nature but as superior materials, scientifically engineered by chemists for specific purposes. The history of plastics and other synthetics is rooted in such hierarchical binaries and tension between culture and nature, as well as the "natural" and "unnatural." In this dualist discourse of science conquering nature, malleable plastics were frequently gendered as feminine, while white men were associated with power and control. Chemical companies like DuPont advertised plastics as materials that man designed to his own specifications. This discourse's gendered, racialized, and colonial rhetoric reveals the heteropatriarchal power structures and ideological hierarchies within which plastics were originally created.

Nylon's history establishes connections between military-industrial materials R & D and women's bodies through its promotion and domestication. I explore how the historical moment of nylon's public launch, along with the discourse surrounding it, established a paradigm of racialized, gendered bodies within a web of science, industry, fashion, and the military. While nylon's history and relation to the military-industrial complex has been clearly charted in ongoing scholarship, the history of plastic foams and silicones, much like these materials' properties, is less easily defined and discussed.[9] The high level of recognition that nylon has received is partly due to the familiarity of its brand name and association with DuPont.

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Polyurethane foam and silicone, on the other hand, are wider categories: Unlike nylon, they do not bear the name of a singular synthetic patent licensed by a particular chemical company and are thus more challenging to chart. But it is important to do so, as they also have similar ties to military and industry and continue to affect self-fashioning practices today.

At the dawn of World War II, the demand for natural rubbers and textiles outgrew supply amid disintegrating colonial networks, prompting an international push for cheaper synthetic replacements. When the United States entered the war, key military decision-makers annexed American industrial plastics R & D, demanding near-exclusive use of the latest developments, such as nylon, for parachutes and mosquito nets. US plastics production rapidly intensified during the war, almost quadrupling from 213 million pounds in 1939 to 818 million pounds in 1945.[10] Government funding during World War II supported the rise of what came to be known as the military-industrial complex, part of a wider historical legacy of the US government as a major sponsor and agent of technological change.[11] Interconnections between technology, warfare, government, and industrial R & D changed profoundly during World War II and the postwar years.[12] World War II was the first time US scientists and engineers were almost fully mobilized for a common effort.[13] In 1941, President Franklin Roosevelt established the Office of Scientific Research and Development (OSRD), a new organization that employed engineers and scientists to support the crucial role R & D would play in the war effort.

US military demand for weapons and equipment in World War II resulted in a proliferation of new materials, products, and technologies. This included silicone fluid, which was developed in secrecy as an engine lubricant by Dow Corning under urgent navy orders. While polyurethane foam was originally developed in Germany during wartime, its rapid postwar transfer to the United States via intelligence reports was driven by political military-industrial power structures, a history of US-Germany chemical industry competition, and the potential for civilian applications. All these materials were initially independently developed in industrial labs for commercial production. Only after their creation did the military increasingly take note and commission them for war supply, expediting their development while simultaneously restricting their commercial uses.

After World War II, the US military no longer needed large quantities of nylon, plastic foams, and silicones. With wartime restrictions lifted, chemical companies could finally make these products commercially available and were keen to establish new markets for peacetime conversion, particularly

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targeting the domestic market and female consumers. Chemical companies frequently promoted their materials as having withstood the test of war, reasoning that if the materials were safe and suitable for military use, they would also meet the demands of the American housewife.[14] Consumers found that some of the plastics they previously encountered before World War II had been improved and further developed during wartime. Design historian Cynthia Lee Henthorn refers to America's military-industrial R & D cycle "as a strain of commercial fallout," where better living and defense became synonymous.[15]

This was the Age of More and Better Plastic Things for Better Living Through Big Science. Synthetic materials, once developed for particular industrial and military uses, now proliferated on the American market during the booming postwar economy. The plastics manufacturing industry grew exponentially. By 1960, more than six billion pounds of plastics were produced annually.[16] Advertising executives, journalists, and designers, among others, celebrated plastics as modern miracles of science that grew from military research. The abundance of synthetics on the consumer market in the Atomic Age delivered the plastics utopia that chemical companies had promised the American public throughout World War II. Nylons were finally available in large quantities. Fashionable padded silhouettes, such as the conical "Sweater Girl" look (figure I.1), which became popular in the late 1930s, were made more accessible by synthetics that had been refined during wartime and were now available on the domestic market. Silicone lotions protected hardworking hands, pan glaze improved baking, and injections reportedly enhanced feminine gender presentation. A postwar surplus of synthetic materials flooded the consumer market, becoming more intimately entangled with everyday life and the body.

Plastic materials were not the only scientific miracles celebrated during this period. Cosmetic and plastic surgery were also hailed as miracles of science.[17] Cosmetic surgery, still in its nascent stages, was the commercial by-product of plastic surgery, a discipline that grew in response to changes in warfare during World War I. Before the 1930s, materials for medical applications were largely limited to those found naturally, such as ivory, glass, silk, wood, and metals. Wartime advances in polymer science unlocked a greater range of previously unavailable materials. These synthetic discoveries differed greatly from their predecessors, offering physical properties more closely resembling biological tissue and greater ease of sterilization. Therefore, they found popular applications as implantable materials. The

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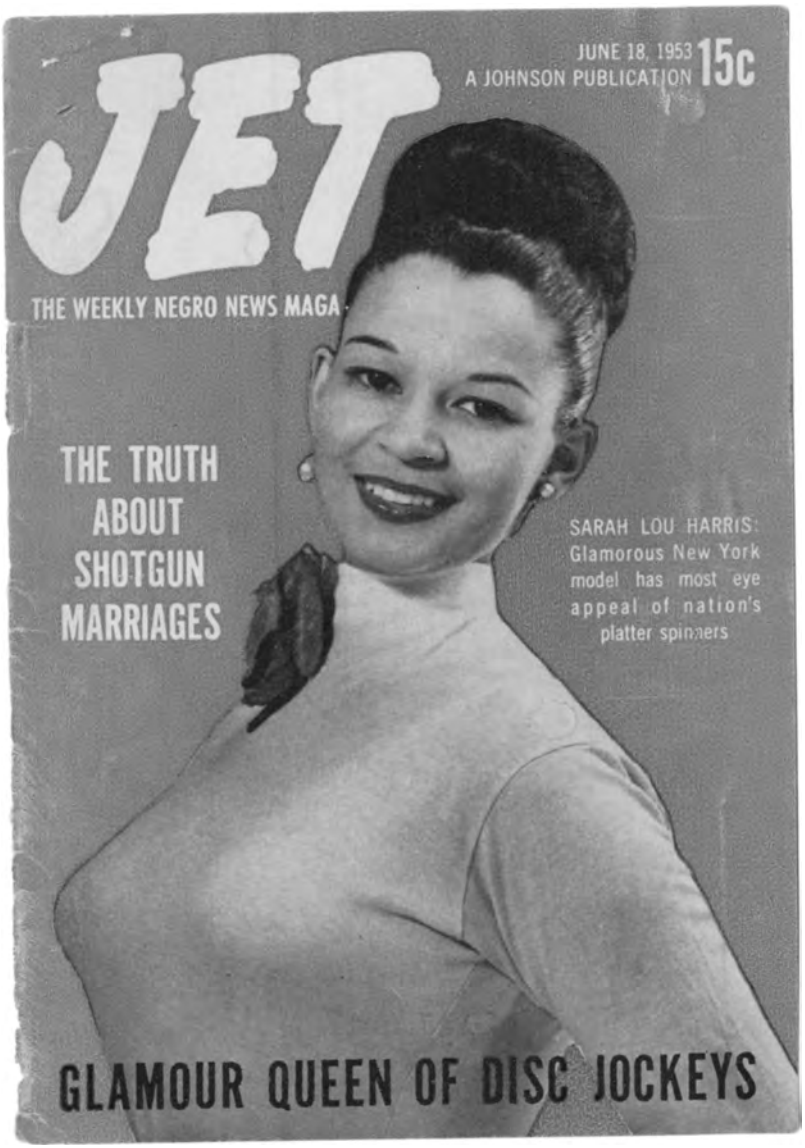

I.1 A Sweater Girl look modeled by Sarah Lou Harris on the cover of *Jet*, June 18, 1953. New York Public Library. https://digitalcollections.nypl.org/items/d3a0fac0-81dc-0135-cde1-5dceb882b926.

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use of plastics grew as the development of antibiotics reduced mortality rates, thereby increasing the demand for prostheses. Surgeries benefited from synthetic materials that became available as plastics developments and the disciplines of plastic and cosmetic surgery flourished.

Postwar US bodies were increasingly transformed as part of a larger shift toward medical consumerism during the productive economy of the 1950s.[18] However, the relationship between medicine and consumerism was not new. In the early twentieth century, historian David Serlin argues, "medical products came to be understood as amenities of a prosperous economy and a modern social self."[19] Plastic surgery is an example of this. In the 1920s, it was used to surgically reconstruct World War I veterans, but high-income individuals also accessed it for aesthetic purposes. Identity became increasingly rooted in self-presentation throughout the twentieth century.[20] Wartime developments in cosmetic surgery meant that the face and body could be shaped acquisitively, promising social mobility and self-actualization, as well as reflecting "competing aims between customization and standardization."[21] In the postwar United States, newspapers, magazines, and journals celebrated medical miracles as offshoots of military R & D.[22] This discourse of life-changing medical advancements through postwar science and plastics affected cosmetic surgery's reception in popular culture. Medical science came to embody a postwar utopian concept of better living and progress without conflict.[23]

The interplay between military-industrial materials R & D and postwar bodies continued in foundationwear and spacesuit design. Synthetic foam rubbers were likely the first military transfer technology used in foundationwear.[24] Companies like Maidenform and Frederick's of Hollywood advertised products padded with new and improved wartime "poly foams" to shape the body into a curvaceous silhouette. In the postwar United States, racialized and gendered corporeal technologies of foundationwear were also applied to the design of spacesuits and the development of high-performance aviation materials. The industrial division of Playtex, a company that specialized in foundationwear, was commissioned to design the spacesuit for the Apollo mission.[25] The spacesuit is an example of how technologies once widely available to the public were transformed into classified R & D materials for enhancing corporeal performance.

The book's central narrative ends around 1976. By that point, it was becoming clear that implantable materials, initially considered inert and therefore benign, could have significant and even fatal health

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consequences. In the thirty-seven years following DuPont's introduction of nylon through its "Test Tube Girl," plastics increasingly shaped bodies from within. This eventually resulted in laws regulating the industry of implanted materials and permanent body contouring, directly affecting millions of Americans. The 1976 Medical Device Regulation Act marked a pivotal shift in US implant legislation.[26] It intended to provide reasonable assurance, risk-based classification, and formal safeguarding criteria for medical device safety and effectiveness. Regulatory pathways and procedures, as well as postmarket requirements, were introduced for new medical devices. For the first time, the FDA was given the authority to ban devices, thereby legally regulating what could and could not be implanted in the body. This marked the end of a largely unregulated market of actors in chemical companies, medicine, and cosmetic surgery experimenting with plastic materials in the body. However, many materials from this period were grandfathered in under the 1976 Medical Device Regulation Act and are still used in body-contouring practices today.

Queering Bombshells

In this book, I queer existing narratives of postwar women's bodies. To do so, it is important to first establish the conventional history of the bombshell, as it has been told to date. The cultural concept of the bombshell is intertwined with narratives comparing women with weaponry. During World War II, US pilots often named their bombers after their female sweethearts and painted the sides with pin-ups and topless women. Aggressively pointed conical bra designs were named "missile" or "bullet." The highly revealing new two-piece style of women's swimwear was called the "bikini," after the nuclear testing site. Yet the most enduring link is perhaps the "bombshell," which often denoted a slender yet curvaceous woman. The term entered common usage to describe a glamorous, attractive, and often sexually alluring woman with the release of the Hollywood movie *Blonde Bombshell* (1933), starring Jean Harlow, a bottle-blonde, white actress.[27] The word was later applied to countless other white actresses, such as 1950s blonde icons Jayne Mansfield and Marilyn Monroe. As military-industrial technologies changed, the meaning and scale of the bombshell shifted. For instance, in *Gilda* (1946), Rita Hayworth epitomized the femme fatale bombshell. A nuclear bomb tested at Bikini Atoll was named after the film and had Hayworth's photograph pinned

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to it.[28] Scholars have explored how the pin-up functioned as a military morale-booster and, on a larger scale, as an icon of modern American female sexuality.[29] This book extends this thinking by moving beyond the purely representational links and exploring how wartime advancements in materials research and development affected the shaping of feminine bodies, both symbolically and materially.

The image of the bombshell acquired new meaning with the arrival of the Atomic Age and the Cold War. A wide range of publications featured imagery that likened seminude female models to nuclear weaponry. One of the most famous images associated with the atomic bombshell is that of Lee Merlin, who had been crowned "Miss Atomic Bomb" in 1957 (figure I.2). Posing in the Nevada desert, she appears to be nude except for a fluffy white cotton mushroom cloud that erupts upward from between her legs, almost entirely concealing a light nude-colored bikini bottom. This image was created in the context of Las Vegas atomic viewing gatherings, when Nevada's nuclear bomb testing spawned a spectator culture of "dawn bomb parties," "atomic cocktails," and the "Miss Atomic Bomb" beauty pageant, starring white women dressed as mushroom clouds.[30] Merlin was the last model to be featured as "Miss Atomic Bomb," a marketing campaign conceptualized by Vegas nightclub owners that featured their dancers to give atomic testing a sexy image.[31] Other, lesser-known examples include Edy Rich, a light-skinned nylon stocking- and bikini-clad dancer from Miami, who in 1956 in San Francisco was billed as "TNT Girl" and referred to in the press as an "H-Bomb Beauty," whose potent sexuality was off the seismic charts.[32] "Miss Bomarc," named after the US missile, was a white, blonde bombshell from Utah who captured the attention of journalists when she entered a 1958 hairstyling competition.[33]

In the Atomic Age, the normative white cisheteropatriarchal domestic sphere was associated with new cultural and political connotations. During the Cold War, America's nuclear dominance was cast not only as a threat but also as progress driven by science. Cultural anxieties around gender roles also marked the period. National ideals of female identity were transformed during wartime and once again in the postwar United States. Wartime work and the reduction in the number of men available for work within the United States gave women, particularly white, middle-class, able-bodied, cisgender women, increased opportunities. However, women's growing sexual and economic emancipation threatened established racialized, cisheteropatriarchal norms and social structures. Female

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1.2 Don English, *Lee Merlin: "Miss Atomic Bomb"* (1957), Las Vegas News Bureau. LVCVA Archive, Las Vegas.

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sexual potency was seen as explosive when it was outside the home, with no strong male authority to control it.[34] The atomic bomb, and thus the bombshell, was characterized by institutions such as the American Social Hygiene Association as a potential carrier of sexually transmitted infections and linked to Communism and careerism, serving as a threat to the social order embodied by the white, heteronormative nuclear family.[35] The bombshell posed an increasing threat to postwar American gender stability.

In this book, I explore how the bombshell trope was both a threat to patriarchal norms and a product of it. The vivacious, disarming sexual allure of the postwar bombshell arguably aided acceptance of Big Science products while simultaneously illustrating the complexities of the Atomic Age. In the Cold War context, the conflation of the bombshell with US consumerism and democracy in the face of Communism became political. Design historians argue there was a "doubling" effect in the Big Science context of Cold War culture, where a "threat" was also framed as "progress" or even desire.[36] Similarly, the bombshell embodied the tension between spectacular hyperfemininity and overt sexuality, often constructed by and contained within restrictive foundationwear and American gender norms, but one that also had the contradictory potential power to disrupt them.

Postwar American cultural narratives equated female sexuality with the bomb: Just as nuclear power could be harnessed for the greater good, so, too, could the bombshell.[37] Marriage and domesticity could put her sexual power to "good use," benefiting US Cold War society by appeasing husbands and raising children according to traditional gender roles. A sexualized, commodified female became an ideological, biopolitical, and weaponized symbol of US freedom, one that could tackle the threat of sexually "perverse" Communism as the "other" to wholesome American patriarchal, capitalist values.[38] The threatening potential of the bombshell was thus harnessed and controlled through cultural channels, including propaganda, entertainment, and domestication.

The domestication of female sexuality is shown in the blonde striptease artist of Franklyn's story. After reinventing herself as "Chesty," she excelled in her career. Franklyn recalled her transformation: "Chesty's profession was not the most dignified in the world but that didn't bother me. What mattered was that just a month later she dropped by to tell me she was going to be married. Now that she didn't have to hide the fact that Nature had neglected her, she wanted to marry and settle down. And today, there

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isn't a more ardent PTA mother in San Fernando Valley than the ex-Miss 'Chesty' of Main Street, Los Angeles."[39] Scientific advancements enabled "Chesty" to transform multiple times: Her physical transformation supported economic growth and social mobility, facilitating a shift from sex work to the socially acceptable realm of heteronormative feminine domesticity and motherhood.

Histories of the bombshell tend to focus almost exclusively on an unmarked white, cisgender, heterosexual, and often blonde bombshell.[40] In this book, I seek to actively queer this historiography and highlight a range of bombshells with intersecting identities. From the 1930s onward, journalists in whitestream and African American publications celebrated a number of Black female performers as "bronze bombshells," including Vivian Henderson, Joyce Bryant, Vickie Henderson, Leslie Uggams, Tina Turner, Lena Horne, and Eartha Kitt.[41] Further examples of bombshells include the Japanese-born Jewish performer Marie Misakura, known as the "Oriental bombshell," and the Portuguese-born Carmen Miranda, who was billed as the "Brazilian bombshell."[42] In September 1945, *Life* magazine dubbed Linda Christian, a Mexican actress wearing a two-piece swimsuit, the "anatomic bomb."[43] The language of the bombshell also circulated in underground print media, including *Bombshells Burlesque* and various trans feminine publications. In an issue of *Female Mimics*, a white model named Vicky (figure I.3) was described as "power packed, explosive . . . these are just a few of the words that have made Vicky known as *the Bombshell*."[44]

An internationally famous blonde glamour girl of the Cold War era is Christine Jorgensen, widely recognized as the first transsexual person to gain significant press coverage.[45] In December 1952, Jorgensen made worldwide headlines when a *New York Daily News* front-page story titled "Ex-GI Becomes Blonde Beauty" reported that she had received gender-affirming surgery in Denmark. The American media initially celebrated Jorgensen's story as a postwar medical miracle, "another testament to the magnitude of modern science," and its power of transformation.[46] Journalists described Jorgensen as a "GI turned glamour girl," stressing the respectability of her military background while simultaneously demonstrating their acceptance of her as an American bombshell beauty by applying the same language they reserved for Hollywood stars like Marilyn Monroe.[47] Here, as Susan Stryker notes, a "macho archetype such as 'the soldier' could be transformed into a stereotypically feminine 'blonde bombshell.'"[48]

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I.3 "Vicky 'the Bombshell,'" *Female Mimics* 1, no. 11 (1968): 52.

Trans visibility increased in the postwar period, but its representation in US whitestream media often subscribed to established racialized gender norms.[49] While the stories of a select number of trans feminine people who transitioned within professional medical structures were highlighted, most trans individuals had very different experiences and pursued DIY forms of transition.[50] Jorgensen played a central role in the American media's construction of what historian Emily Skidmore critically describes as the "good transsexual," a racialized image that embodied "the norms of white womanhood, most notably domesticity, respectability, and heterosexuality."[51] Through this lens, Jorgensen could be considered a bombshell put to "good use." This vision of malleability and capacity for transformation was frequently limited in its application in whitestream media to individuals who fit within established rigid, racialized gender norms that continued to dominate in the 1950s.

Coverage of Jorgensen and other trans feminine individuals arguably also contributed to destabilizing dominant cultural understandings of sex and gender as fixed. Ultimately, as Stryker notes, in this era "questions of what made a man a man or a woman a woman, and what their respective roles in life should be, were very much up for debate."[52] As figure I.4 shows, the postwar abundance of gendered consumer goods made from the latest plastics—including padded foundationwear, prosthetic "falsies," and implants—were part of a wider politicized debate and deeply rooted anxieties about the shifting nature of feminine gender presentation and sexuality. Historian Jules Gill-Peterson argues that the United States' postwar geopolitical, economic, and cultural hegemony, paired with its position as ideologically opposed to Communism, "relied upon a vision of a new scientific malleability to the American body in the Atomic Age, one for which the idea of transsexuality was well suited."[53]

Increased access to new materials in the postwar US also enabled users operating outside military-industrial structures to develop their own design innovations using plastics. For example, trans feminine publications circulated advice on making foam falsies and foundations using the latest plastics R & D and techniques for dyeing these objects to match one's skin tone. Ultimately, increased access enabled a wider range of users and makers to engage with plastics in various body-shaping practices that upheld, conformed to, challenged, subverted, or resisted dominant postwar American racialized gender ideals and unmarked norms of womanhood.

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I.4 "What Are American Women Made Of?," *Pageant*, May 1953.

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The Plastic Biopolitics of Bombshells

The concept of the desirable, healthy, "natural," and ideal body is always socially, politically, and culturally constructed. Feminist STS scholars, critical theorists, and historians have shown the biopolitical dimensions of defining the human body in universal terms, particularly when bodies are made ideal.[54] There is no single, natural, "pure," or "original" body; all bodies are modified.[55] I do not intend to argue that bodies only become plastic with the emergence of soft plastics that can be used in a variety of body-shaping practices. Indeed, from diet and exercise to adornment, people engage daily in bodily transformation and have done so throughout history using various materials, technologies, and techniques.

The postwar explosion of plastics, developed within Big Science, destabilized established hierarchies and boundaries of natural/artificial. I articulate how these materials, along with other scientific and medical developments, offered new possibilities for permanently reshaping the body. I explore how these possibilities—and the ways a wide range of actors used them—disrupted established borders of the body, opening it up to the liberatory potential of self-authorship.[56] In the Cold War United States, prosthetics, implants, and cosmetic surgery became increasingly recognized as what Alka Menon describes as "part of a deliberately fashioned identity."[57] In theory, these and other plastic technologies enabled individuals to exercise agency over the body and acquisitively determine their outward appearance.

However, it was not so straightforward. I explore how, when technologies of gender made from the latest synthetic materials emerged, access to these technologies and the possibility of self-authorship was not meted out equally. In the postwar United States, as gender norms shifted and the "realness" of sex and gender was increasingly questioned, biopolitical restrictions and attempts to restabilize sex and gender were simultaneously put firmly in place by medical, legal, and political institutions where decision-makers were usually not the ones using the technologies.[58] *Atomic Bombshells* discusses how gatekeepers frequently imagined and allowed only the gendered body to be malleable within their rigid established structures and binary ideals. Ultimately, I argue that intersecting forms of oppression informed material access and use, privileging the legitimacy and safety of certain bodies and gender expressions over others.

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To do this work, I draw on feminist, queer, and trans studies. Femininity is frequently positioned as inherently malleable, artificial, fake, and frivolous, whereas masculinity is understood as fixed, natural, real, and serious. These binary positions, as I explore throughout this book, are also often employed in the gendered and racialized promotion of plastics and their application in feminine body-shaping practices. In addition to the gender binary, other related dualisms—such as the nature-culture and mind-body divide—are persistent in Western traditions and structures, where they are used to legitimize forms of oppression.[59]

While femininity is disparaged irrespective of whom it is performed by, society imposes a gender hierarchy where trans expressions of femininity are deemed as more artificial and with heightened suspicion.[60] The oppression this is based on is directly related to the biopolitical plasticity of definitions of sex and gender across other identity categories.[61] For example, as Stryker has critiqued, "'Woman' typically has been mobilized in ways that advance the specific class, racial, national, religious, and ideological agendas of some feminists at the expense of other women."[62] But as Black, Indigenous, and feminists of color have established, there is no universal definition of woman, womanhood, or femininity.[63] This thinking is foundational to my argument.

Feminist scholars' use of metaphor also informs this analysis. In response to exclusionary essentialist definitions of "natural" womanhood within some strands of feminist thinking in the 1970s and 1980s, Donna Haraway famously proposed the concept of the cyborg as a hybrid entity—neither entirely technological nor fully organic—to challenge and undo binary concepts and oppressive systems. While the cyborg is often considered to be the most famous metaphor in feminist STS studies, it also has a complicated and violent history rooted in the military-industrial complex and pathologization.[64] Recent feminist STS scholarship has further critiqued the limitations of this figure while also acknowledging the important groundwork it laid out for future discussions and reimaginings.[65] Haraway reminds us, "The main trouble with cyborgs, of course, is that they are the illegitimate offspring of militarism and patriarchal capitalism."[66] However, Haraway's formulation argues that these particular technocultural origins paradoxically hold the radical potential to be subverted and can work to destabilize the very power relations they were created within. This line of thinking is particularly relevant to my exploration of technologies of femme embodiment with military-industrial origins.

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In this book, I use the term "bombshell" as a metaphor and an identity that moves beyond its military origins. Feminist STS scholars argue that "it is useful to consider *how* metaphors (are) matter."[67] The bombshell is both discursive *and* real. Individuals referred to themselves as bombshells and continue to do so. I leverage the bombshell as a way of more closely exploring how the discursive informed the material, and vice versa. I aim to show how plastics as a form of military-industrial technology shaped feminine bodies discursively *and* physically. I argue that the impact of World War II on technologies of embodiment is reflected in how the bombshell ideal shifts as technologies and gender norms change over time in the postwar United States. Thus, the bombshell can offer a helpful feminist model for rethinking technocultural bodies and the power relations within which they are created. By showing the hegemonic history of materials used in feminine self-fashioning, the book makes all the more clear *how* histories of science, technology, and medicine are not neutral and *why* counterhegemonic histories are so important.

From Bullet Bras to Bombshells

The research journey behind this project began with an object that signified a major design change: the bullet bra, a colloquial term used to describe a type of conical bra, often padded with foam and finished with whirlpool stitching to create an enhanced, structured point to the bust. As a high-femme-presenting fashion and design historian who has worn a range of padded foundationwear, I had long been fascinated by this pointy silhouette, which first emerged in the 1930s and appeared to reach peak popularity by the mid-1960s. Since then, there have been smaller-scale revivals including within vintage subcultural contexts and high-end fashion. For example, in the late 1980s, designer Jean Paul Gaultier created his now-infamous structured pieces of underwear as outerwear, popularized by Madonna during her Blond Ambition tour, which were recently manufactured and sold again. Yet, the conical bustline ideal seemed to never return to the same widespread popularity of earlier decades. As this book shows, the conical silhouette that persisted for decades in bra design and Sweater Girl looks ranged in extremes, from more discreet stitching to thick foam padding. But why hasn't this conical style come back in quite the same way? How did social, political, cultural, and technological

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changes affect the construction of this ideal? And how did these factors shape material bodies?

This book is driven by materials and a desire to connect seemingly disparate but closely interconnected disciplines. I use a wide range of interdisciplinary archival materials to explore a diverse set of actors, including doctors, designers, drag queens, and decision-makers in the US military. To map this complex network, I use a variety of approaches, drawing on histories of fashion, design, technology, science, medicine, and cultural studies. Building on established methods within these disciplines, along with engagement with the feminist, queer, and trans critical theory outlined earlier, I employ extensive archival research with various sources—including foundationwear company papers, surgeons' papers, plastics manufacturers' corporate records, magazines, and plastic objects—to generate the arguments presented in the book. I also work expressly with a number of archives, from established collections within museums and other heritage institutions, as well as community-driven collaborative resources such as the Digital Transgender Archive.

A note on language: I draw on an intersectional approach to deconstruct unmarked definitions of womanhood that are prevalent in dominant visual and material culture, as well as archival sources. I am a white, queer, high-femme-presenting nonbinary lesbian with an invisible disability from a mixed-class background. As a feminist historian, I seek to push back against received exclusionary histories, "unmarked norms" of woman, and repeated problematic myths within scholarship. However, it is important to note that many of the sources I engage with do not acknowledge gender outside the binary, gender fluidity, or intersectionality. Most of these primary and secondary sources use the term "woman" in a singular way, while I aim to use it intersectionally.

Attention to language is important to this book's methods. The widespread usage of the word *transgender* has only been adopted in recent decades to describe "a range of gender-variant identities and communities within the United States in the early 1990s."[68] Just as its core definition is rooted in movement away from an assigned, unchosen gender position, its meanings are continuously being shaped and reimagined. While Stryker defines it as "the widest imaginable range of gender-variant practices and identities," she also notes that the abbreviated term "trans" is more expansive, as "contemporary connotations of transgender are often limited."[69] Hence, the abbreviated term is used in this book. Moreover, Gill-Peterson

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states that "trans" is also used to "mark a *political* distinction from medical or pathological meanings that have accrued to the term 'transgender' in recent years, many of which have been borrowed from the earlier term 'transsexual.'"[70]

Terminology plays a key role in trans studies and in telling stories about the political history of gender variance that are not limited to one experience.[71] Terms have changed over time and will continue to do so. Wherever available, I aim to include the original language and pronouns that a person used to describe themselves: for example, terms such as "transvestite," "transsexual," "drag queen," "cross-dresser," and "female impersonator." While "female impersonator" was used in the past, it is no longer commonly used in trans studies today.[72] However, it is critical to include the original terminology and categories for historical context.[73] People who referred to themselves as female impersonators covered a wide range of intersecting identities, including self-identifying as gay, lesbian, bisexual, straight, transsexual, transvestite, drag queen, and cross-dresser. Some female impersonators additionally described themselves as "professional" and "amateur." It is key to note that the way people described themselves in the historical sources used throughout this book is only a snapshot of a particular moment, and how they identify may have changed over time.

While I endeavor to make the histories of individuals who have been left out of historical narratives more visible, much of the historical content in *Atomic Bombshells* focuses on often-unmarked white actors. There are four main reasons why this occurs. First, it is important to establish the origin stories of plastic materials and the ways white men in Big Science shaped racialized gender ideals. Second, due to the historical nature of my research, people in decision-making roles within the military-industrial complex tended to be white men. Third, due to inequitable societal power structures in the postwar United States, those who were able to afford these new materials and procedures when they were commercially launched within established structures tended to be middle-class white cisgender women. Fourth, archives and collecting institutions have largely privileged the documenting of these actors. I establish the whitestream, heteronormative network of postwar plastics in the United States to show how these structures were disrupted and queered by individuals who have been left out of historical narratives.

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Atomic Bombshells is a road map to the actors, plastic materials, and politics that shaped femme bodies and gender expression in the postwar United States. The book is arranged by material and chronology in three parts—nylon, plastic foams, and silicone. Tracing the material's relation to R & D and women's bodies, each part starts with the material's origins and progressively explores key actors, gender, the body, and agency. *Atomic Bombshells* sequentially follows plastics' journey into the body, beginning with their use on the skin's surface with the launch of nylon and progressing to plastic foams, which start on the surface and eventually move inside the body. The final part focuses on silicone, which was initially injected into the body before being used in breast implants and external prostheses.

The first part, on nylon, shows how this material's history connects racialized gendered bodies, chemical companies, and military-industrial materials. By doing so, it weaves a key conceptual thread that runs throughout the book: the relationship between women's bodies and emerging plastics. In the first chapter, I establish the explosive history of nylon, launched by DuPont as the world's first entirely synthetic fiber. In the 1930s, DuPont executives were eager to reinvent the company's public image, shifting from that of the explosive "powder people" associated with war and destruction to providers of "Better Things for Better Living . . . Through Chemistry." Some individuals initially feared nylon, concerned that this new material, "conjured from coal and air," might be hazardous, potentially exploding or melting upon contact with the skin. I trace and analyze the reception of nylon's materiality, from its earliest displays to the politics surrounding its wartime and postwar applications. Nylon was used as a substitute for silk imports from Japan and came to embody promises of an American postwar plastic utopia. I show how nylon's associations with women's bodies are key to understanding changing attitudes toward synthetic materials, their political dimensions, and their proximity to the body.

In 1939, DuPont unveiled nylon stockings to the public at two US world's fairs. DuPont's "Wonder World of Science" exhibitions featured a white female figure known as the Test Tube Girl, who embodied the latest in scientific developments, including nylon. In the second chapter, I contextualize the Test Tube Girl and related imagery within wider cultural discourse around racialized gender within fashion, streamline design, and eugenics at the time. I critically examine a range of examples of visual and material culture to demonstrate how whiteness was presented as the unmarked norm. Racialized gender was coded into experimental synthetic objects, such as white skin-toned "wear-test" underwear. I also present a

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counterhistory, highlighting how individuals pushed back against these exclusionary practices in the ensuing decades and crafted nylon hosiery for a wider range of consumers, including Black, queer, and trans feminine people.

The second part of the book is dedicated to foam plastics and padding. It explores polyurethane foam, which offers a distinct materiality compared to nylon and silicones: lightweight, fluffy, pliable, spongy, compressible, and filled with interconnected air pockets. It "breathes," becomes lifelike, and is anthropomorphized, expanding into US markets after World War II. In chapter 3, I trace the history of polyurethane foams, starting with a series of World War II US military intelligence reports that recommended the postwar transfer of plastic foams from Germany to the "soft power" politics of US postwar domesticity. I explore how, in the postwar United States, polyurethane foam's materiality and soft appeal to the body aided its movement from the lab to domestic spaces. Actors central to the promotion of plastic foams, including chemical company advertising staff, journalists, and industrial designers, harnessed these sensual properties for foam's postwar domestic promotion and applications, often presenting a carefully constructed ideal of white womanhood and heteronormativity.

Chapter 4 covers polyurethane foam's corporeal application in foundationwear, falsies, and cosmetic surgery. Polyurethane foam's soft materiality and seemingly endless array of molded forms made it easily malleable, allowing it to be shaped into a point that defined the conical bustline ideal. The chapter begins with a discussion of external shaping devices designed to achieve this look, such as the bullet bra and padded girdles. It discusses different types of bombshells and the role of foam plastics research and development in shaping fashions, including falsies, butt pads, and padded girdles. I demonstrate how these body-contouring designs appealed to a wide range of consumers and were featured in the wardrobes of stage and screen celebrities, those who survived breast cancer, contestants in drag balls, models, and sex workers. Polyurethane foam's soft pliable properties also attracted cosmetic surgeons, who crafted implants that resembled this fashionable silhouette. A range of archival materials is used to illustrate the close resemblance between these implants and the foundationwear and prostheses worn externally on the skin's surface.

Chapter 5 explores how women's bodies in the Atomic Age were culturally compared to weaponry, domestic interiors, and automobiles. Moving beyond such symbolic cultural comparisons, I examine how plas-

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tic foams produced by chemical companies supplying the automobile and furniture industries were being cosmetically implanted in women's bodies in the postwar United States. These examples demonstrate how an amalgamation of technological changes and shifting attitudes to the body as a site of consumer improvement were made possible by plastics, resulting in permanent modifications to women's bodies using foam padding sourced from industrial and military suppliers.

The final part turns to silicone, which offered a new kind of inert and "othered" fluidity for shaping the body. In contrast to foam plastics, early silicone applications aimed at shaping the body were injected directly, moved beyond borders, and could not be contained within easily classifiable objects. Fluid in both materiality and classification, it slipped through cracks in established medical structures and regulations, went underground, and quickly reached sex workers as well as queer and trans feminine communities.

Chapter 6 focuses on silicone's complex military-industrial origins and its immediate postwar entry into the commercial market. I examine silicone's provenance, R & D, and changing meanings and applications through a variety of primary archival sources, ranging from chemistry engineering textbooks to Dow Corning's promotional materials and women's magazines. The chapter traces how new postwar applications of silicone, as promoted in these texts, moved increasingly closer to the body, in both representation and reality. Promoted as inert and an American miracle of peacetime conversion, silicone inevitably began making its way more overtly into the body.

Building on the previous chapter's exploration of silicone *on* the skin's surface, chapter 7 offers a deeper exploration of silicone *beneath* the surface. *Atomic Bombshells* utilizes new archival evidence to complicate the problematic, unreferenced, and frequently repeated Japanese origin myth of silicone bust-augmentation injections. Silicone was racialized and othered by various actors—including licensed American medical practitioners and journalists—who cast it as something distasteful, associated with Japanese sex workers. I further contextualize this process of othering and Orientalism within the wider discourse of postwar American politics and popular culture by analyzing representations of Japanese women, including Akiko Kojima—crowned Miss Universe in 1959—and the "Hiroshima Maidens."

Chapter 8 explores how silicone shaped West Coast US strip culture and the "topless craze." Silicone's visceral materiality, purported inertness,

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and the immediacy of its fluid injection into the body forever changed the landscape of body-shaping practices and cosmetic surgery. Implantable silicone materials proved challenging for the FDA to categorize: Was the silicone material a liquid (drug) or an object (prosthetic)? As an injectable fluid, it could operate outside traditional medical structures, leading to an underground market in silicone injections more readily accessible to trans feminine and queer communities, as well as sex workers. In this chapter, I illustrate how silicone, fluid and other in its material identity, also became a means for simultaneously complicating and upholding gender norms. Using trans feminine publications, I show how queer and trans feminine communities shared information about various methods of shaping the body with silicones, as well as its potential harms. The chapter builds up to the 1976 US Medical Device Regulation Act, which granted the FDA federal jurisdiction over the regulation of medical devices and had a groundbreaking effect on the largely unregulated implantable plastics market.

The legacy of plastics developed, initially by chemical companies for industrial and military applications, endures in practices of self-fashioning femme bodies. Today, plastics, including nylon, polyurethane foams, and silicones, continue to shape and affect the body. In the epilogue, I turn to this legacy by exploring examples that model the contemporary queering of these materials and the lasting impact of the bombshell.

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NOTES

Archives and Abbreviations

acc.	accession number
BMJ	*British Medical Journal*
DPA	DuPont Archives, Hagley Museum and Library, Wilmington, DE
DPAD	DuPont Advertising Department
DTA	Digital Transgender Archive, https://www.digitaltransgenderarchive.net/
GGIE	Golden Gate International Exposition
HCP	Herbert Conway Papers, Medical Center Archives, Weill Cornell Medicine, New York
JMP	Joseph Murray Papers, Harvard Center for the History of Medicine, Boston
JPW	Jerome Pierce Webster Papers, Columbia University Health Science Library, New York
JAMA	*Journal of the American Medical Association*
LOC	Library of Congress, Washington, DC
NMAH	Smithsonian National Museum of American History, Washington, DC
NMAH TLC	Smithsonian National Museum of American History, Trade Literature Collection, Washington, DC
NYT	*New York Times*
NYWF	1939 New York World's Fair
PRS	*Plastic and Reconstructive Surgery*
RAF	Robert Alan Franklyn Files, Series: 284 Franchises Frauds and Rackets, American Medical Association Archives, Chicago
SHI	Science History Institute, Philadelphia
WEGP	Walter E. Gloor Papers, Science History Institute, Philadelphia

Introduction

1 Franklyn, *Beauty Surgeon* (1961), 11.

2 As plastics expert Susan Lambert stresses, "There are literally thousands of different plastics, each with their own composition and

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characteristics." I follow Lambert's lead in pluralizing plastics whenever possible to represent the plurality of the material. See Lambert, "Introduction," 1.

3 In *Work!*, historian and queer studies scholar Elspeth Brown uses the term "whitestream" to describe high circulation American media produced for a largely white audience; she also uses this term as a replacement for "mainstream" in order to mark the often-racialized bias of this word's usage.

4 Franklyn, *Beauty Surgeon* (1961), 13.

5 Franklyn, *Beauty Surgeon* (1961), 18.

6 For a selection of recent critical studies of plastics and their impact on bodies, human and otherwise, see Liboiron, *Pollution Is Colonialism*; Davis, *Plastic Matter*; Gabrys, Hawkins, and Michael, *Accumulation*; Cirino, *Thicker Than Water*.

7 For a selection, see Haraway, "Cyborg Manifesto"; Stone, "Empire Strikes Back"; Balsamo, *Technologies of the Gendered Body*; Seu, *Cyberfeminism Index*; Murphy, *Seizing the Means of Reproduction*; Murphy, *Sick Building Syndrome*; Kafer, *Feminist, Queer, Crip*; Hamraie, *Building Access*; Russell, *Glitch Feminism*; Liboiron, *Pollution Is Colonialism*; Davis, *Plastic Matter*; Angus, *Camera Geologica*.

8 Polyester refers to both a category of polymers and the common name for a specific textile fiber (aka polyethylene terephthalate). Lycra (aka spandex or elastane) is the trade name for fibers made from polyurethane.

9 Meikle, *American Plastic*; Handley, *Nylon*; Ndiaye, *Nylon and Bombs*; Hounshell and Smith, *Science and Corporate Strategy*.

10 Meikle, *American Plastic*, 1.

11 See Cowan, *Social History of American Technology*. US President Dwight D. Eisenhower is credited with coining the term "military-industrial complex" in his 1961 farewell address. For more on the historical development of the US Cold War military-industrial complex, see also Epstein, *Torpedo*; Leslie, *Cold War and American Science*; Pursell, *Military-Industrial Complex*; Ndiaye, *Nylon and Bombs*; Hitch and McKean, *Economics of Defense*; Koistinen, *Military-Industrial Complex*.

12 Cowan, *Social History of American Technology*; Pursell, *Military-Industrial Complex*; Leslie, *Cold War and American Science*.

13 Cowan, *Social History of American Technology*.

14 Henthorn, *From Submarines to Suburbs*.

15 Henthorn, *From Submarines to Suburbs*, 221.

16 Meikle, *American Plastic*, 2.

17 Serlin, *Replaceable You*; Haiken, "Modern Miracles."

18 Serlin, *Replaceable You*, 3.

19 Serlin, *Replaceable You*, 3.

20 See, for example, Haiken, *Venus Envy*, 7; Serlin, *Replaceable You*, 4; Gilman, *Making the Body Beautiful*.

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21 Menon, *Refashioning Race*, 12. For more on self-actualization and cosmetic surgery, see Plemons, *Look of a Woman*.

22 Serlin, *Replaceable You*, 4; Haiken, "Modern Miracles," 184.

23 Serlin, *Replaceable You*; Hamraie, *Building Access*.

24 Farrell-Beck and Gau, *Uplift*, 124.

25 Hersch, "High Fashion"; de Monchaux, *Spacesuit*; Weitekamp, "Technology."

26 U.S. Food and Drug Administration, "A History of Medical Device Regulation and Oversight in the United States," FDA: U.S. Food and Drug Administration, August 21, 2023, https://www.fda.gov/medical-devices/overview-device-regulation/history-medical-device-regulation-oversight-united-states.

27 May, *Homeward Bound*, 106; Smith "Bombshell."

28 McLuhan, *Mechanical Bride*, 99.

29 Kakoudaki, "Pin-Up"; Buszek, *Pin-up Grrrls*.

30 For more on Las Vegas atomic viewing parties, see Titus, *Bombs in the Backyard*, 9; Knepp, *Las Vegas*; Denton and Morris, *Money and the Power*, 139–40. For Atomic Age culture in relation to the bikini and gender, see Xiang, "Bikinis and Other Atomic Incidents"; Taha, "Atomic Aesthetics"; Cole, "Bikini."

31 Voyles, "Anatomic Bombs."

32 "Rich Exotic Shake," *Vue*, May 1956, 126–30.

33 Bright, *Continental Defense*.

34 May, *Homeward Bound*. For more on wartime and postwar US gender roles, see Anderson, *Wartime Women*; Meyerowitz, "Beyond the Feminine Mystique."

35 See May, *Homeward Bound*, 92–93; Preciado, *Pornotopia*.

36 Crowley and Pavitt, *Cold War Modern*.

37 May, *Homeward Bound*; Smith, "Bombshell"; Preciado, *Pornotopia*.

38 May, *Homeward Bound*, describes the perceived threat of transgressive gender roles that became politically linked to Cold War Communist Eastern ideology. See also Loftin, "Unacceptable Mannerisms."

39 Franklyn, *Beauty Surgeon* (1961), 19.

40 Voyles, "Anatomic Bombs"; May, *Homeward Bound*, 106; Smith, "Bombshell"; Bailey, *From Front Porch to Back Seat*; Preciado, *Pornotopia*, 69–78; Sullivan, *Bombshells*.

41 See, for example, Vivian Henderson, "Stage Show at Yazoo Theater: The Bronze Manikins Will Be Presented Here Next Wednesday," *Yazoo City (MS) Herald*, December 23, 1938, 6; "Bronze Bombshell of Rhythm," *Alton (IL) Evening Telegraph*, March 20, 1939, 11; "Joyce Bryant's Best Kept Secrets," *Jet*, March 31, 1955, 58–61; "Vickie Henderson," *Ebony*, October 1960, 49–54; "Leslie, a Cool Bombshell," *Life*, June 23, 1967, 88–89; Tina Turner mentioned in "In Orbit," *California Eagle* (Los Angeles), March 26, 1964, 11; "Brown Bombshell" Eartha Kitt mentioned in "Broadway's Newest Darling," *Jet*, July 31, 1952, 56–57.

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42 See "Oriental Bombshell," *Pittsburgh Post-Gazette*, April 23, 1964, 48; "Japanese Jewess to Entertain at Beth Israel's Donor Dinner," *Detroit Jewish News*, March 16, 1973, 34; Brazilian bombshell Carmen Miranda in "Beauty Arts," *Crenshaw-Mesa Southwest Wave* (Los Angeles), August 15, 1941, 13.

43 "Anatomic Bomb," *Life*, September 3, 1945, 53–54; Boyer, "United States"; Boyer, *By the Bomb's Early Light*.

44 "Vicky 'the Bombshell,'" *Female Mimics* 1, no. 11 (1968): 52–53, DTA.

45 See, for example, Meyerowitz, *How Sex Changed*; Stryker, *Transgender History*; Serlin, *Replaceable You*.

46 Snorton, *Black on Both Sides*, 140.

47 See Dorothy Kilgallen, "On the Bulletin Board," *Record-Argus* (Greenville, PA), January 8, 1953, 11; Aline Mosby, "Hollywood Keeps Up with Headlines," *Sandusky (OH) Register*, February 19, 1953, 7; Dorothy Kilgallen, "The Voice of Broadway," *The Mercury* (Pottstown, PA), January 6, 1953, 13.

48 Stryker, *Transgender History*, 66.

49 Serlin, "Christine Jorgensen and the Cold War Closet"; Serlin, *Replaceable You*; Skidmore, "Constructing the 'Good Transsexual'"; Meyerowitz, *How Sex Changed*, 52; Stryker, *Transgender History*, 104; Snorton, *Black on Both Sides*; Plemons, *Look of a Woman*, 8–9; Gill-Peterson, "DIY."

50 Gill-Peterson, "DIY."

51 Skidmore, "Constructing the 'Good Transsexual,'" 271.

52 Stryker, *Transgender History*, 66.

53 Gill-Peterson, "DIY."

54 For a selection, see Kafer, *Feminist, Queer, Crip*; Hamraie, *Building Access*; Haraway, "Cyborg Manifesto"; Stone, "Empire Strikes Back"; Stryker, *Transgender History*; Balsamo, *Technologies of the Gendered Body*; Serlin, *Replaceable You*; Cogdell, *Eugenic Design*; Carter, *Heart of Whiteness*; Strings, *Fearing the Black Body*; Gill-Peterson, *Histories of the Transgender Child*.

55 See Haraway, "Cyborg Manifesto," 151; Stryker, *Transgender History*, 30; Wark, "Introduction," 12.

56 For more on the concept of self-authorship see Menon, *Refashioning Race*.

57 Menon, *Refashioning Race*, 11.

58 Stryker, *Transgender History*, 105; Kafer, *Feminist, Queer, Crip*, 125; Balsamo, *Technologies of the Gendered Body*.

59 Haraway, "Cyborg Manifesto." Three aspects are crucial in understanding Cartesian dualism, also known as mind-body dualism. First, the mind and body are entirely separate. Second, the mind is privileged over the body, where the latter resembles a machine or object in which the self is located. Third, thought is performed by the mind, making it the producer of the self via cognitive rationalization. See Howson, *Body in Society*.

60 Serano, *Whipping Girl*; Gill-Peterson, *Short History of Trans Misogyny*; Stryker, *Transgender History*.

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61 See, for example, Spillers, "Mama's Baby, Papa's Maybe"; Gill-Peterson, *Histories of the Transgender Child*; Schuller and Gill-Peterson, "Introduction"; Snorton, *Black on Both Sides*; Kafer, *Feminist, Queer, Crip*; Butler, *Who's Afraid of Gender?*; Halberstam, *Trans**.

62 Stryker, "(De)subjugated Knowledges," 7.

63 For scholarship that critiques universal definitions of woman, see Moraga and Anzaldúa, *This Bridge Called My Back*; Lorde, "Age, Race, Class and Sex"; Anzaldúa, *Borderlands*; Crenshaw, "Demarginalizing the Intersection of Race and Sex"; Crenshaw, "Beyond Racism and Misogyny"; Hill Collins and Bilge, *Intersectionality*.

64 Cowan and Rault, "Introduction." For more on the cyborg's complicated history, see Kafer, *Feminist, Queer, Crip*, 126–28.

65 Russell, *Glitch Feminism*; Seu, *Cyberfeminism Index*; Kafer, *Feminist, Queer, Crip*; Puar, "'I Would Rather Be a Cyborg'"; Balsamo, *Technologies of the Gendered Body*; Cowan and Rault, "Introduction"; Wark, "Blog-Post for Cyborgs"; cárdenas, "Android Goddess Declaration."

66 Haraway, "Cyborg Manifesto," 151.

67 Cowan and Rault, "Introduction," 6.

68 Williams, "Transgender," 232; see also Stryker, *Transgender History*; Rawson, "Introduction."

69 Stryker, *Transgender History*, 39.

70 Gill-Peterson, *Histories of the Transgender Child*, 8.

71 Stryker, *Transgender History*; Gill-Peterson, *Histories of the Transgender Child*.

72 Angell and Roberto, "Cataloging."

73 Gill-Peterson, *Histories of the Transgender Child*.

Chapter 1. Spinning Nylon

1 As is typical in the history of science, accounts vary as to who was "the first" team member to draw nylon. This is often difficult to pinpoint and disentangle, as many important actors collaborated in the lab over prolonged periods. See Joseph X. Labovsky, interviewed by John K. Smith, in Wilmington, Delaware, on July 24, 1996, SH1, oral history transcript 0148, 19; Hounshell and Smith identify Gerard J. Berchet in *Science and Corporate Strategy*, 259. Others focus on Julian W. Hill; see Meikle, *American Plastic*, 130–36; Handley, *Nylon*, 32–33. In his oral history, Howard E. Simmons Jr. claims that his former boss Donald Coffman was "the first to really spin nylon"; see Simmons, interviewed by James J. Bohning, in Wilmington, Delaware, on April 27, 1993, SH1, oral history transcript 0111, 19.

2 Handley, *Nylon*, 33.

3 Handley, *Nylon*, 35.

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