

# Introduction

## Crafting Anatomies

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### Introduction

*Crafting Anatomies* places the human body at the center of a transdisciplinary exploration, revealing how it acts as a catalyst for craft-based collaborative research, using archives, creative dialogues, and technologically advanced fabrications. As the book demonstrates, nothing happens without collaboration in fashion and textiles, which involves intense, creative dialogues at all stages of the process (Anderson 2017). Increasingly, this applies to all contemporary artistic design practice—where the tradition of the “isolated auteur” and mastery of a specific discipline is challenged by the provocative and disruptive nature of information and technology (Mower 2017).

This collection of illustrated narratives seeks to highlight how critical making and conversation around the contemporary body is manifest through a range of material and immaterial responses. The contributors, drawn from a network of creative thinkers and practitioners based in Europe, North America, and Oceania, exploit methodologies that resonate with wider transnational philosophies, “[paying] no attention to the boundaries between fine and applied art, high and low culture, gendered and racial identity, let alone, fashion, textiles and craft”<sup>1</sup> (Hemmings 2015: 157). So, through the shared lens of *crafting anatomies*, researcher/practitioners in materials (textiles) and product (fashion) design are united with artists, writers, scientists, and curators to demonstrate how their/our response to the corporeal is constantly flexing and changing.



**Figure 1.1** Ana Rajcevic, “Animal: The Other Side of Evolution” (2012). Photograph by Ana Rajcevic.

## Craft

While many of the contributors to this book could be described as “designers,” the term “crafting” is adopted, both literally and metaphorically; revealed through the unique relationships makers have with the fabric of, and for the body. Adamson (2007: 1) asks provocatively “Isn’t craft something mastered by the hands, not the mind? Something consisting of physical actions, rather than abstract ideas?” Skilled making, or craftsmanship, is widely understood as “expertise in technique”; the result of a learned repertoire of refined gestures informed by hand and mind, sustained through supplemental material-based practice (ibid.: 4; Sennett 2008). However, the influence and impact of craft is no longer tied to the Western constructed definition or terrain of “the crafts,” following new insights into the role, value, and “power of making”<sup>2</sup> to the creative economy and culture.

The authors within this book demonstrate an inherent understanding of craft’s capacity for collaboration; to communicate across distinct ideologies,

domains, and cultures (Niedderer and Townsend 2019; Solomon 2013). The reconceptualization of craft, in parallel with other practices<sup>3</sup> has resulted in the melding and dissembling of different genres of making (Ravetz, Kettle, and Felcey 2013). Exchanges between individuals across disciplinary boundaries are shared and through joint endeavor leave one or both sides significantly changed; haptic and reflective dialogues leading to the generation of new and unexpected ideas (Schön 1984). In *Crafting Anatomies*, therefore, we define craft as a holistic “approach” to the body, realized through the actions and concepts of practitioners who utilize it as a form of “material intelligence” (Adamson 2019).

## The body

In *Shapeshifters*, Francis (2019: 3) discusses our evolving understanding and treatment of the human body from ancient history to the present, observing that “it is in constant flux, with porous physical and psychological borders that are shaped by the environments we inhabit.” Francis also makes connections between the systems of the natural world and humankind’s biological capacity to grow, recover, and adapt based on a continual process of metamorphosis.<sup>4</sup> As this study demonstrates, skin,<sup>5</sup> the body’s largest organ and regenerative frontier between the inside and outside of the human form, is the source of groundbreaking textile advances. What goes on “beneath the skin,” how our internal organs appear, function, and influence the human condition (Lynch in Alderman et al. 2018) also represents an expanding territory for hybrid practitioners to intervene in.

“The singular, bounded, carbon-based body is being replaced by the proliferation and emergence of technologies and practices which enable the enhancement, alteration and invention of new bodies” (Blackman 2008: 2).

Designer/makers are adapting their existing toolkits and mindsets toward hybrid approaches to the corporeal, drawn from different domains. Consequently, the repair and transformation of the body is no longer restricted to medicine and surgery, with the crafting of its internal and external architectures increasingly located at the intersection of technology and biology (Oxman 2015). The merging of mechanized and natural systems, via hand, augmented and virtual realities are extending the engineering of “the digital body”;<sup>6</sup> through the employment of biotechnologies and robotics to enhance its capabilities and ontology.

A plethora of temporary exhibitions and permanent gallery spaces dedicated to the body have also appeared globally (e.g., the Wellcome Collection, Science Gallery, Cité du Corps Humain, and Deutsches Hygiene Museum), stimulating new dialogues and perspectives.

## Crafting the body

As Turner (2008: 1) identifies “humans both have bodies and are bodies” the exception being, as Entwistle expands, that “humans are dressed bodies” (Entwistle 2015: 31). Thus, the body, in both its natural and clothed state, has continued to intrigue artists and designers since the beginnings of classical Western culture.<sup>7</sup> Cloth and clothing “represent the body as a fundamentally liminal phenomenon by stressing its precarious location on the threshold between the physical and the abstract, the literal and the metaphorical” (Wilson 2003: 273). It is therefore difficult to consider the concept of “crafting anatomies” without contemplating the codes, matrices, and materials of the system in which the body is fashioned (Barthes 2010).

Entwistle (2015: ix) observes “how much the field [of fashion] has massively complexified and breached discipline boundaries” since the beginning of the new millennium. Similarly, the “end of fashion” has been proclaimed and debated by theorists and practitioners alike, acknowledging that its “former paradigms have been exhausted” (Geczy and Karaminas 2019: 1). This is evidenced by changes to the conceptualization, processes, and dissemination of fashion, resulting in a more critical design environment “which has its core in the body and its way of being in the world, of its representations, its masking, its disguises, its measures, and its conflicts with stereotypes and myths” (Calefato 2019: 33). Such change has led to a more focused exploration of the somatic through “corporeal design,” involving subtle and spectacular modifications using decoration and accessories (Zellweger 2011).

One of the most critical issues relating to the crafting of the fashionable body is how fashion and textile products are resourced, designed, and made; the bodies and labor involved (von Busch et al. 2017). Resultantly, a growing number of organizations, including Fashion Revolution<sup>8</sup> and the Union of Concerned Researchers<sup>9</sup> are attracting international membership and affecting change in the fashion system. Sustainable design is acknowledged by the contributors to this book both implicitly and explicitly; via methodologies that utilize craft as both method and philosophy toward enhancing human expression, health, and well-being, and reducing human impact on the environment.

As the collated examples illustrate, craft-based methodologies often engender slower, co-creative, human-centered models, “away from assembly and closer to growth” (Oxman 2015). Some contributors are materially orientated, e.g., regenerating historical artifacts, growing natural biomaterials, making use of the whole cloth, and dematerializing the current fashion system. While others question

the values associated with the industry, including the wasteful nature of mechanized garment production, how a closer affinity with the human body, its natural assets, materiality, and functionality can inform how we design, manufacture, and consume, for a better future (Solanki 2018; Franklin and Till 2018).

Viewing the disciplines of fashion and textiles through alternative lenses challenges established perceptions and practices within the field. Access to laboratories to engage with new methodologies and techniques, usually reserved for scientists, is creating innovative material and technological applications to benefit body and society. Residencies and cross-sector ventures are enabling practitioners to cast fresh eyes on the corporeal through interdisciplinary interactions facilitated by those who are the “other to each other in their views, their disciplines, or their cultures” (Ginsberg and Chieza 2019).

By crafting both subject and substance of the body designers are evolving a more fluid perception of how the human form is materialized and philosophized in contemporary culture, which the contributing authors seek to convey through this text.

## The exhibition

The concept for *Crafting Anatomies* emerged from an exhibition<sup>10</sup> staged at Bonington Gallery (2015) in the School of Art and Design, Nottingham Trent University. The project was the outcome of two years’ work by the editors, who were invited to curate an exhibition to anticipate the School’s 175th anniversary.<sup>11</sup> The aim of the curators was to explore how the body is interpreted and reimaged through historical, contemporary, and future contexts. Following a call for participation and an independent panel selection process, forty-five artworks by international researchers and practitioners were curated via the themes of: Material, Performance, and Identity. The contributors employed a variety of contrasting craft approaches to reconceptualize, speculate upon, and frame the body through art, design, and medical practices. Selected artists from the exhibition have also contributed to chapters in this book.<sup>12</sup>

### Material

Artifacts employing advanced textile and surgical imaging technology to visualize the hidden, internal structures and systems of the human body, were employed to develop solutions in clinical settings. These included embroidered



**Figure 1.2** View of the *Crafting Anatomies* exhibition at Bonington Gallery, Nottingham Trent University (2015). Artifacts by various artists including “Embroidered Implants” by Ellis Developments; “Gendered Postures” by Julia Schuster; “Material Compulsion” by Marloes Ten Bhömer; and “Dress Block” by Jo Cope. Image reproduced courtesy of Bonington Gallery / Nottingham Trent University.

implants for orthopedic surgery by Julian Ellis (Ellis Developments<sup>13</sup>) and hand-modeled and 3D-printed “phantom” human hearts (to train surgeons) by Richard Arm<sup>14</sup>. Together with other examples, these artifacts demonstrated the importance of hand and digital craft knowledge to create pioneering devices for, and of, the body.

The embracing of biotechnologies and their application to fashion were further interrogated by projects that blurred the boundaries between skin, cloth, the body, and dress and which conceptualized skin as a symbolic interface between the self and the world (Paterson 2004).

Speculative works by designer Amy Congdon, proposed a “future where materials are not made, but grown, where luxury goods are fashioned from skin



**Figure 1.3** Richard Arm, “Synthesizing the Human Heart” (2014), 3D-printed heart, cross-sectional internal anatomy study. Photograph by Richard Arm.

cells, not fabric” (Congdon 2016). The fabrication of biodegradable scaffolds for human hearts (constructed by silk worms) was investigated by Veronica Ranner—“shifting our understanding of industrial and bio-technological manufacturing from ‘hardware’ to novel ‘wetware.’” (Ranner 2018).

Designers exploring the deconstruction of traditional fashion approaches also featured within the Material section of the exhibition. Fashion film *The Liquid Game* (2013), by avant-garde studio Boudicca, emphasized the transitions for designers working between physical and digital material constructs; preempting the increasing permeability of fashion and art (Calefato 2019). This

project acted as an example of the dematerialization of fashion through the hybrid use of computational material languages, which are now challenging established understandings of surface and skin (Solanki 2018; Harris 2013).

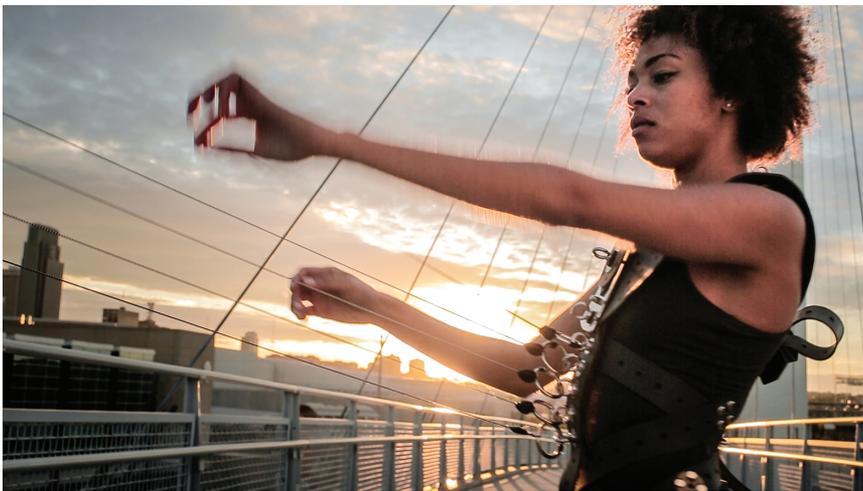
## Performance

In the context of performance, the body was explored by exhibitors through the development and testing of fabrications as second skins within fashion, sport, and science. Interactive accessories, controlled through the performative actions of the wearer, were presented alongside projects that monitored emotional responses and connectivity through such devices.

The “Human Harp” project<sup>15</sup> developed by Di Mainstone transformed its wearer into an instrument. When attached to the wires of a suspension bridge, the body accessory enabled the wearer to “play” the bridge, translating the structure’s vibrations into sounds.

Marloes Ten Bhömer’s series of films entitled *Material Compulsion* (2013) illustrated the mechanics of the accessorized body through systematic experiments, documented using high-resolution motion capture techniques. Here, the intricate physiology, form, and movement of the foot were meticulously recorded to inform experimental approaches to future footwear design.

In her film *The Choreography of Making* (2015), Fo Hamblin visualized the unspoken languages of embodied knowledge; capturing reflective conversations



**Figure 1.4** Katie Raine playing the Human Harp on Bob Kerrey Suspension Bridge, Omaha, Nebraska, USA, by Di Mainstone (2018). Photograph by Miguel Cedillo.



**Figure 1.5** Fo Hamblin, installation “Choreography of Making” (2015) integrated with *Choreography of Making* film by Fo Hamblin and R&A Collaborations (2015). Images and photographs, F. Hamblin.

occurring between materials and maker “along multiple paths of sensory participation” (Ingold 2011: 18).

Julia Schuster exposed the gendered nuances, present in intuitive bodily actions, by recording playful interactions with ceramic objects, visualizing the often very subtle and overlooked gestures of physical expression. These and other examples reinforced the diverse ways and contexts in which bodies express their biomechanical, haptic selves.

## Identity

Divergent approaches to the construction of identity were communicated through interpretations that reflected on how our characters are crafted through objects of material culture. Exhibits were selected to illustrate how worn objects and prostheses enable us to concurrently expose and conceal our individuality, “materialising questions of identity in particularly intimate ways” (Woodward 2007: 3).

The work of John Pacey-Lowrie reinforced craft’s role in the sensitive reconstruction of the self; conveying both the skill of the ocularist in creating prosthetic eyes, and the resultant close relationships forged through regular consultations with patients.

Individual biographies embedded within clothing were investigated within *Every Contact Leaves a Trace*, by Shelly Goldsmith, who applied different textile processes to reclaimed garments and accessories to create forensic objects exploring the human traces left at crime scenes perpetrated by female serial killers. Amanda Cotton also exposed the evidence of blueprints assumed by artifacts crafted from human biological matter, including ear wax, hair, and urine. Her work served to critique our bodies' material make-up, its relationships with commercial goods alongside deeper ethical concerns surrounding the use of living matter in design. These exhibits stretched the definition and agency of the craft practitioner and what their chosen materials might comprise, pre-empting the use of human biological waste as radical sustainable matter (Franklin and Till 2018).

### Evolving the concept

The *Crafting Anatomies* exhibition highlighted a return to “the body” within contemporary culture, accessing technologies to understand how “the body is



**Figure 1.6** View of the *Crafting Anatomies* exhibition, Bonington Gallery, Nottingham Trent University (2015), showing “Every Contact Leaves a Trace” by Shelly Goldsmith, and screen, photography, and material-based artifacts by Emma Montague, Amy Congdon, Aminder Virdee, and other artists. Image reproduced courtesy of Bonington Gallery / Nottingham Trent University.



**Figure 1.7** Anatomical votives, c. sixth century BCE, loaned by Nottingham Castle Museum and Art Gallery for the *Crafting Anatomies* exhibition, Bonington Gallery, Nottingham Trent University (2015). Image reproduced courtesy of Bonington Gallery / Nottingham Trent University.

moving into a complex array of entangled, material, social and historical forces” (Blackman 2008: 12). The project also celebrated the diversity of contexts that contemporary designers and makers were operating in at the time and, in doing so, opened up debate around the future role of creative fashion and textile practitioners within scientific, technological, and engineering fields.

The migration of the domains of fashion and textiles into radically different fields has rapidly progressed since the exhibition in 2015, suggesting a need to document such developments in this book. The initial emphasis for the curation of items within Material, Performance, and Identity has since morphed into themes that relate more specifically to each of the editors’ area of research interest—“The Archived Body,” “The Body in Dialogue,” and “Fabricating the Body,” as outlined in the following sections.

## The Archived Body—Amanda Briggs-Goode

*An archive may indeed take in stuff, heterogenous, undifferentiated stuff . . . texts, documents, data . . . and order them by the principles of unification and*

*classification. This stuff, reordered, remade, then emerges—some would say like a memory—when someone needs to find it or just simply needs it, for new and current purposes.*

*Steedman 2001: 68*

Intrigued by the thrill of a potential discovery from the past, contributors to “The Archived Body” focus on the transformation of these objects into contemporary creative works. The aim: to enlighten our understanding of our current and future relationship with objects, our bodies, and materiality.

The chapters offer perspectives on approaches that artists and designers take to archives and the body as well as their seductive effects: Derrida talks of “archive fever” (Checinska and Watson 2016: 284), Foster (2004) of “archival impulses,” and Huizinga of “historical sensation” (Jefferies et al. 2016: 193). These nouns are all connected by an active, palpable, and instinctual response to material culture but equally to sensuality and the body. It is this intersection that offers such a rich opportunity for artists to explore the body through archives, as well as the fashion and textiles which cover it.

The section opens with a chapter by **Amanda Briggs-Goode** and **Gail Baxter**, “The Archived Lace Body: Contemporary Artist Designer Responses,” which focuses upon the rich potential for creative practice offered by exploring lace heritage. The chapter considers the enticing effects of the archive and lace as a fabric loaded with connotation and meaning. This synergy becomes even more expressive when it is worn on the body. Unpacking these concepts, exploring their relevance and significance to creative practice, the authors examine the seductive efficacy, sensorial value, and the ritualized meaning of archives, lace, and the body. The creative practice of Joy Buttress, Cal Lane, Mal Burkinshaw, and Danica Maier offer a new perspective, of the “stuff” that Steedman (2001) refers to, but also exposes new insights into our personal and collective histories, challenging our biases and assumptions, and revealing some of the narratives that inform them.

Clothes form part of our memories; both our personal embodied narratives and the skill and traditions of their makers. Clothes talk about “us”—and therefore the material culture of both cloth and clothes and how they restrain or liberate our bodies offers possibilities to interrogate their meaning. In “Disarmed: Lasting Impressions,” **Johannes Reponen** uses an “in conversation” approach to elicit from artist **Jo Cope** her use of archives and past narratives to explore a conceptual fashion design language. In the chapter we begin to understand how Cope is fascinated by speculative objects that sit at the boundary between art,

craft, and fashion. This is explored by her use of both craft skills and new technology to make work that has been informed by past narratives and future potentials. Born out of frustration with the “standardization” and sterile environment of commercial fashion, Cope explains how she focuses upon the body’s interactions. The playful and surreal artifacts that Cope creates explore the sensory and practical aspects of wearing and moving in clothes. Craft skills are key to unlocking these narratives and she describes the development of a language to communicate with the skilled “last makers” from Northampton, as well as a new visual language that she uses to articulate fashion in motion.

Narratives of identity can be reflected upon through our own personal physical, documented clothing and photographic archives. As Entwistle states (Entwistle and Wilson 2001: 16) “We are invited to play this game of fashion and perform our identity through our choices of dress.” It is in this context that **Ania Sadkowska** proposes a phenomenological approach to explore the experience of aging, fashion, gender, and identity.

This research develops a deeper understanding of the role of clothes as the communicators and mediators between self and society and our understanding of older male identities. As Entwistle positions “dress, as both a social and personal experience, is a discursive and practical phenomenon ... thus requir[ing] understanding of both the socially processed body which discourses on dress and fashion shape, as well as the experiential dimension” (2010: 16). The work addresses this experiential dimension as a way of understanding and reflecting upon bodily practices over time. Sadkowska produced and exhibited three responses in the form of customized jackets, to reflect the themes emerging from her case studies: “Pioneering,” “Nonconforming,” and “Rematerializing.” These she has identified as key male behavioral traits that reflected her research participants’ previous fashion “desires” in a contemporary context to create alternative insights into their lived experiences through making. Sadkowska observes that it is precisely in the context of mundane everyday practices that phenomenological understanding of the lived body can emerge.

The final chapter, “The Electric Corset and Other Future Histories,” explores an experimental and collaborative research project aimed at speculative design for wearable technology. **Katherine Townsend**, **Sarah Kettley**, and **Sarah Walker** were inspired by Dr. Scott’s electric corset, designed in 1883 using “medical and scientific principles” to enhance the health and well-being of the wearer. Dissecting not only the subtle languages of the performing body but that which is embedded within its construction led the team to consider this historical fashion accessory as a metaphor for speculative, future “wearables” design.

Through their selection of garments from historical dress collections, it became apparent that wearables are not solely developments of the late twentieth and early twenty-first centuries but are present as concepts integrated into historical artifacts. They communicate and represent the ensuing practice-led research, as an integral, choreographed aspect of the creative design process, involving numerous iterative stages, actions, and technologies.

The project uses a craft-based methodology, looking back to move forward, by studying objects across time to inform the way we design and connect with future wearables. As Pierce (2017) proposes an “archive can have relevance to contemporary design by stimulating design and material innovation.” The aim of this work is to conceptualize the future potential of wearables through an imagined ontology.

These chapters demonstrate how viewing archives and the body can stimulate new concepts, practices, and approaches to material investigation and exploration, which in turn offer new insights to our view of our past, present, and future selves.

## The Body in Dialogue—Rhian Solomon

“The Body in Dialogue” is considered from multiple perspectives from contributors to the second core section of this text, each of the authors exploring the “body as a meeting place”<sup>16</sup> to invoke discussion across diverging ideologies.

In Chapter 6, “Fashion and Participation in the Hands of X,” **Andrew Cook** and **Graham Pullin** explore the materiality of collaboration. Here, the role of material libraries at The Institute of Making<sup>17</sup> provides a platform to forge new conversations between prosthetics wearers, designers, prosthetists, and engineers, during the redesign of prosthetic hands and associated services. Their Hands of X project<sup>18</sup> poses a shift from a medicalized model of design, production, and supply to one that is democratically co-produced; facilitating the involvement of the wearer throughout the design process, as specialist of their own life and experience (Cottam and Leadbeater 2004; Donetto et al. 2015).

Using carefully crafted participatory design methods, the duo connect distinct cultures who are working with and designing for the body (and wearer). Their approach not only serving to challenge subject-specific boundaries but confronting the cultural and biological borders of the self. By repositioning prosthetic hands as understated fashion items, not medical devices, Cook and Pullin are able to challenge engrained perceptions of disability, shifting the role

of the user from patient to wearer, designer, and collaborator; advocating for “disability-led design to ultimately become more nuanced.”

In Chapter 7, “Tissue Engineered Textiles: Craft’s Place in the Laboratory,” **Amy Congdon, Lucy Di Silvio, and Carole Collet** evidence how the specialisms of tissue engineering and constructed textiles collide; sharing technical craft skills across disciplines, identifying a need for translating conventional design techniques, in order to accommodate new ones.

Dialogue in this context is centered on the “cellular body”; serving as a site for conversation and collaboration. The trio also highlight the importance of recognizing both similarities and differences between science and design approaches and between the spaces in which “practice” is undertaken—the laboratory and textile studio.

Craft in these circumstances is “relational, adaptable and influential in modes of cross fertilisation” (Ravetz et al. 2013: 10) allowing for boundaries between disciplines to be disrupted. Congdon has since extended her approach, to apply craft’s role in the laboratory, to a recent position as Associate Director of Materials Design, at Modern Meadow,<sup>19</sup> her abilities in tissue engineering and cell culture facilitating the development of biomaterials, to produce sustainable leather alternatives for the fashion industry.

In Chapter 8, “Mind–Body–Garment–Cloth,” **Holly McQuillan and Timo Rissanen** propose a holistic approach to designing for the body, confronting complex and wasteful fashion manufacturing practices “that have given rise to new and pernicious forms of power” (Rocamora 2015: 191). Emphasizing the complexity of the fashion system, made up of individual and collective agents, the pair introduce creative projects that facilitate global and local discourses concerning the sustainably clothed body.

In select examples of practice, dialogues between objects, people, and institutions are navigated (machine, factory worker, wearer, designer, and manufacturer) in divergent contexts and at various speeds (Brand 1999) and are explored conceptually by the authors as a complex interplay between the themes of Mind–Body–Garment–Cloth. McQuillan and Rissanen celebrate the role of the designer as catalyst for systemic change, rethinking established Fordist systems of production that have dominated manufacturing in the fashion industry to date.

In Chapter 9, the final chapter in this section, “Empowerment and Self-Care: Designing for the Female Body,” **Giulia Tomasello and Teresa Almeida** consider the female body as a political site in medical thought and practice, taking inspiration from feminist theorists and activists of the 1960s and 1970s

(Women's Health Movement).<sup>20</sup> Responding to a distinct lack of knowledge that is available to women about their bodies in medical practice, the duo have developed DIY toolkits (employing digital and biotechnologies) to promote “bodily awareness,” ultimately enabling women to hold intimate dialogues with their own bodies and enhanced conversations with clinicians (and others).

Tomasello and Almeida draw upon the ubiquity of clothing in daily life (particularly underwear), exploiting its intimacy with the body to foster dialectics between body and self. Woman-Centered Design approaches (Almeida 2017) such as these not only serve to confront gendered positions of authority and power within institutional care, they also widen societal discourse on “taboo” subjects related to gynecological health, and lived experiences of gender and of the female body in contemporary society.

As each of the chapters in “The Body in Dialogue” identify (and indeed within the *Crafting Anatomies* book), a major shift is repositioning the role and skills of designers (Thackara 2013; Manzini 2015), who are no longer responsible for designing products and artifacts, but are engaged in the transformation of entire systems and service ecologies (Buchanan 2002; Prendiville 2016). Design is migrating into increasingly complex territories (Conklin 2006), and as a result, designers are responding by developing interdisciplinary, discursive methodologies.

The projects introduced within this section successfully facilitate differences in power, culture, or “language” in order to radically transform practices within the contexts in which they are applied. Dialogue is invested in materials (Binder et al. 2019; Eriksen 2012), in future-focused making (Sanders and Stappers 2014), which provides a conduit to broker meaningful interactions concerning the body. The body becomes a site for potentiality; a place where new discourses can emerge and (in some cases) where hybrid disciplines are formulated.

As the borders of the self are becoming ever more fluid through technological advancement and philosophical debate, should the pursuit of a more holistic, multifaceted understanding of the human body be encouraged—observing the body not as subject *or* object (from the viewpoints of specific communities or disciplines) but as “Body Multiple” (Mol 2003).

“Our bodies are always extending and connecting to other bodies, human and non-human, to practices, techniques, technologies and objects which produce different kinds of bodies and different ways, arguably of enacting what it means to be human” (Blackman 2008: 1).

## The Fabricated Body—Katherine Townsend

In the final section of the book, physical and human dimensions are examined through projects that pose questions around mimicry, simulation, and biological experiments with the materials of the body. All of the contributors to this section are post-digital artisans who readily synthesize physical and virtual crafting strategies using hand manipulation with the digital tactility of code, across art, science, design, fashion, and architecture (Solanki 2018; Openshaw 2015).

Each of the four chapters provides a different perspective on how the body acts as both catalyst and armature for fabrications and visualizations that reimagine the fashioned, human form. The resulting experimental *and* experiential prototypes, substrates, performances, and films have been developed by creative practitioners applying research methodologies informed by the paradigms of “technology driven design, sustainable design and human-centred design” (Giacomin 2014: 607). Human-centered design particularly embraces “multidisciplinary skills and perspectives, explicit understanding of users, tasks, environments and experiences” (ibid.) as demonstrated by the following contributions.

In “OurOwnsKIN: The Development of 3D-Printed Footwear Inspired by Human Skin,” **Manolis Papastavrou**, **Liz Ciokajlo**, and **Rhian Solomon** question whether a deeper understanding of how human skin behaves as a material, informs the design of 3D-printed shoes.

OurOwnsKIN is a specialist design consultancy, which seeks to “translate materials for the body”<sup>21</sup> focused on the conceptualization and production of innovative footwear to fashion apparel. The consultancy’s work is informed by an interest in materials that can replace traditional substrates, such as leather. Biomaterials offer more environmentally friendly alternatives to impactful oil-based, natural, and animal-based fiber production. This is exemplified by Ciokajlo’s collaboration with Suzanne Lee, on the BioCouture Shoe (2013) grown from bacterial cellulose, providing a non-leather biodegradable alternative.

Experiential knowledge of these biomaterials has inspired the OurOwnsKIN team to seek technologically led solutions, by using Additive Manufacturing and biopolymers to construct a new footwear solution; one that blurs the boundary between the biological and man-made material structures of the human foot and shoe.

The company has studied the mobility of the foot and collagen make-up of its skin, to digitally craft a seamless 3D-printed carapace, by tailoring the inherent microstructure of the skin to the shoe. This bespoke, zero-waste approach

disrupts conventional footwear design, construction, and sizing. OurOwnsKIN demonstrates that if we are to create better, more sustainable products using bio-design as a philosophy and/or method (Ginsberg and Chieza 2019), we must look not only to nature, but to the materiality of our own bodies.

**Amy Winters** also creates various skin-like surface constructions, discussed in “Material Robotics: Shaping the Sensitive Interface,” where explicit connections are made between the elements and materials from the natural world and her bioscientific approach. Winters’ research and development of soft robotic, actuated materials, focuses on their potential to interact with the body; unlocking new categories of immersive experiences in Virtual Reality, Intelligent Mobility, and Fashion.

In her “Skin Series” (2016) Winters reinterpreted different qualities found in human skin, beginning with the pore, to create soft, sponge-like silicone textures that can absorb and dispel liquid—referencing the underlying anatomy of the spleen, breast tissue, and lungs, known as “the light organ” (Nagra in Alderman et al. 2018). Winters discusses the various roles encompassed in her practice, from hacker and bricoleur to alchemist, where she synthesizes textile knowledge and highly developed tactile sensitivity with color chemistry and synthetic biology.

By adapting the medical diagnostic application of “microfluidics”<sup>22</sup> she has created a “soft programmable toolbox” whereby liquid channels are integrated into textile membranes, with the capacity to trigger novel “synthetic sensations” based on body-responsive stimuli. Winters mimics natural materials and systems negotiating the surface fabrication of the body by interfacing between physical making (Ingold 2011) and artificial interaction (Vigneshwara 2018). Her most recent work builds on Lanier’s (2011: 190) concept of “post-symbolic” communication through tactile, sensory languages using nonverbal communication.

In “The Genetics Gym,” **Adam Peacock** discusses a year-long design residency at The Fashion Space Gallery, London College of Fashion, University of the Arts London, where he investigated how science-based and imaging technologies provide the potential means for us to redesign ourselves, from our DNA upwards. Originally trained as an architect, Peacock speculates on how advances in human genetics, social media, and brand marketing could influence how we personalize our future selves. Peacock’s research involved “speculative body design” in collaboration and consultation with experts in fashion, public health, genetics, fertility, psychology, and reconstructive surgery. These included Agi Haines, a surgical artist and synthetic biologist whose work asks: “How

might people respond to the possibilities of our body as another everyday material and how far can we push our malleable bodies while still being accepted by society?”<sup>23</sup>

Peacock pushes this concept to the limit through the physical and virtual creative development of five characters, based on participating male and female models, selected for their different physiological and cultural characteristics. By adopting a multimedia approach to body imaging, Peacock envisions his models as post-human avatars, rendered to express a range of imagined brand ideologies. The resulting “Genetics Gym” installation reflected the “undecidable” (after Derrida) nature and influence of photography on the body, and the long-held tradition of “retouching as a cultural act . . . aimed at adapting photographs to the dictates of mass culture” (Vainshtein 2019: 50). The characters in the “Genetics Gym” make uncomfortable viewing; they are familiar, yet alien (even to the models themselves) encompassing an uncanny mix of analogue and digitally manipulated features. The work is raw and powerful and questions the reliability of the imagery of fashion and the need to remain attentive to the impact of emergent technology on the contemporary body (ibid.: 63).

In “The Body as Factory,” Lara Torres explores “a post-productivist fashion practice through film,” her immaterial response to the unsustainability of the established fashion system (Barthes 2010). Having worked in a garment factory, she witnessed and was subsumed into the manufacturing process, her body becoming lost in the dehumanizing process of mass production. This experience affected her deeply and her approach to the “productive body” (Guéry and Deleule 2014), leading to a theoretical and artistic position from which to interrogate how we make and, indeed, unmake our fashion selves through fashion. By considering fashion as a “situated bodily and social practice” (Entwistle 2015: 40), Torres documents the hidden, but highly skilled, relational gestures (Adamson 2010: 2) of hand sewing, draping, and dressing. The body of the craftsman, therefore is represented in the films in action, as the embodiment of both fashion maker and wearer.

Torres’ films capture the residual, immaterial nature of fashion, as a significant form of fabrication in itself. For example, *Mimesis* (2008), an interdisciplinary project, situated between fashion, ceramics, and jewelry, utilizes traditional metalwork and mold-making, to reproduce found clothing and accessories as a critique of their functionality. This is redolent of Margiela’s integration of time and memory into his work, the value of the fashion relic (Verhelst and Debo 2008); the referencing of ghosts of past wearers and makers (or indeed machinists). Emphasis is placed on the procedural stages of the fashion

fabrication process; the choreography of body through making *is* the material, without which the fashion system cannot exist.

Entwistle and Townsend conclude the book in Chapter 14 with “On Fashioning Anatomy,” where they reflect on the contributions by considering how the work reintroduces and reconceptualizes the body into fashion related praxis, “in all its variations and complexities [which has] completely disappeared from the creative chain” (Visceral in Pecorari 2016).

In “working with the material” the authors consider how the book challenges the established parameters of fashion research by prioritizing practices that craft the body. Parallels are raised with the “material turn,” which drew attention away from texts toward the materiality and praxiography of bodies (Clever and Ruberg 2014); and the sensory and emotive interrelationships forged between body and cloth (Millar and Kettle 2018; Townsend and Sadkowska 2017).

In “the unarchived body” connections are made between the ghosts of past and future anatomies, located in “museumized” things (Calefato 2019). The body is represented through: artworks using lace as pattern and metaphor; performed artifacts, fabricated using historical blocks; deconstructed menswear expressing phenomenological experience; and archived dress objects reanimated as wearables.

“Dialogues between nature and culture” explore the possibilities of collaborative conversations with and around the body, leading to biomedical and biomaterial interventions, the personalization of prostheses by wearers and the use of biophilia to self-heal. The need for a holistic, zero-waste approach to the equating of Mind–Body–Garment–Cloth, champions the needs of nature over global, capitalist culture in the “fashioning the future body.” Second-skin-like accessories and membranes for the evolving body use biological blueprints as inspiration, toward the notion of a post-growth, post-petroleum society. Digital crafting is used as a tool for criticality, to decode the fashioned identity by “creating new things through presentation, styling and self-fashioning” to make the world a more inclusive and sustainable place (Quinn in Pecorari 2016).

In *Crafting Anatomies*, the comingling of fashion and textiles with craft, science, medicine, and art make it challenging to ascertain where the materials of the self/body end, and dress/culture begins.

## Notes

- 1 Comment attributed to the multimedia practice and Soundsuits made by the African artist Nick Cave.

- 2 *The Power of Making* (Charney 2011) exhibition and publication was one of the most visited shows ever held at the Victoria and Albert Museum.
- 3 In 2014 the Crafts Council Innovation Programme, UK, held the first of its Make:Shift conferences and introduced two projects: “Make:Shift:Do” and “Parallel Practices.”
- 4 Francis (2019: 3) cites Ovid’s poem *Metamorphoses* and Kafka’s *Metamorphosis* to reiterate the resonance of “bodily transformation” in art and literature.
- 5 *Skin*, exhibition, Wellcome Collection, June 10–September 26, 2010, London.
- 6 “The Digital Human,” BBC Radio 4. Available online: <https://www.bbc.co.uk/programmes/b01n7094/episodes/player> (accessed March 15, 2019).
- 7 For an historical account of the classically draped to the modern fashionable body, see Hollander (1978).
- 8 Fashion Revolution is a not-for-profit global organization consisting of 100 member countries founded in the wake of the Rana Plaza disaster, Bangladesh on April 24, 2013, where 1,138 garment workers were killed when a garment factory collapsed. See: <https://www.fashionrevolution.org/about/> (accessed August 9, 2019).
- 9 Following the *Global Fashion Conference: What’s Going On?*, Centre for Sustainable Fashion, University of the Arts London, 2018, the “Union of Concerned Researchers in Fashion” was formed by Kate Fletcher, Timo Rissanen, Mathilda Tham, and Lynda Grose. A manifesto setting out actions can be accessed at: <http://www.concernedresearchers.org/> (accessed August 9, 2019).
- 10 *Crafting Anatomies: Material, Performance, Identity* (2015). Available online: <http://www.boningtongallery.co.uk/exhibitions/crafting-anatomies> (accessed May 20, 2019).
- 11 The School of Art and Design was established in 1843 to service the lace industry. See Jones (1993).
- 12 Selected artists from the exhibition also featured in this book in chapter order include: Briggs-Goode (2), Cope (3), Sadkowska (4), Townsend, Kettley, and Walker (5), Congdon (7), and Solomon (10).
- 13 Ellis Developments Ltd. Available online: <http://www.ellisdev.co.uk> (accessed May 20, 2019).
- 14 BBC News, “3D Printed Body Parts to Help Trauma Surgeons,” September 26, 2016. Available online: <https://www.bbc.co.uk/news/uk-england-nottinghamshire-37497182> (accessed June 15, 2019).
- 15 “Human Harp” (2019). Available online: <https://www.humanharp.org> (accessed June 10, 2019).
- 16 See Rhian Solomon, PhD: <http://ldoc-cdt.ac.uk/designer-facilitator/> (accessed August 3, 2019).
- 17 “The Institute of Making is a multidisciplinary research club for those interested in the made world: from makers of molecules to makers of buildings, synthetic skin to spacecraft, soup to diamonds, socks to cities” (<https://www.instituteofmaking.org.uk>, accessed August 9, 2019).

- 18 See: <https://www.instituteofmaking.org.uk/research/hands-of-x> (accessed August 9, 2019).
- 19 Modern Meadow is “pioneering the creation of biologically advanced materials. [They] seek to transform the material world by unlocking the power of nature to inspire design for a healthier planet.” Available online: <http://www.modernmeadow.com> (accessed April 10, 2019).
- 20 The Women’s Health Movement is a feminist movement (originating in the late 1960s) that works to improve all aspects of women’s healthcare.
- 21 OurOwnsKIN (2019). Available online: <https://ourownskin.co.uk/> (accessed April 10, 2019).
- 22 Microfluidics is the science of manipulating and controlling fluids, usually in the range of microliters in networks of channels with dimensions from tens to hundreds of micrometers.
- 23 Agi Haines (2019). Available online: <https://www.agihaines.com/home> (accessed April 10, 2019).

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