

## 2 Of flesh and mesh

### Time, materiality, and health in surgical recovery

*Rebecca Lynch*

Surgical interventions are not often the focus of medical anthropological projects and yet offer a way in which anthropologists might go ‘beyond the body proper’ (Farquhar and Lock 2007). This call for a different type of engagement with the body, alongside approaches that seek to include more material aspects of health and illness within an ethnographic study, challenge a division between the biological (or ‘nature’) as the site of investigation for medicine, and the social (or ‘culture’) and the point of interest for anthropology. Instead, this position argues that we can never be separated from the material world – our bodies and our health are both constituted of, and made through, the material.

A more traditional anthropological approach to surgery might focus on accounts of the experience of (in this case) the women undergoing surgery, decisions they have made around this, and attitudes towards their body and to medicine. It might also consider relations between medical professionals and how they interact with patients. By focusing on accounts and experiences and leaving everything within the skin as the domain of medicine, a distinction between the biological and the sociocultural is set up, with clinicians working in the domain of the former while the anthropological gaze is restricted to the latter. This dualist separation suggests that ‘nature’ and ‘culture’ can, and should, be examined separately, the boundaries between both clear and stable. Such a separation is directly challenged by work both within medical anthropology and in biomedicine, for example, on chronic conditions, epigenetics, and so-called lifestyle diseases. Through such examples, the social and biological cannot be so clearly drawn apart, and medical anthropologists increasingly look to include the materiality of the body in their work. Such an approach also challenges an acceptance of the body as a universal, uniform, and standard ‘body proper.’

The body is obviously not a new focus within anthropology and has generated many different approaches, such as Durkheim’s (1995 [1912]) split between higher socialised bodies and the physical body, Mary Douglas’ (1973) natural bodies used as social analogies, and Foucauldian disciplinary bodies of governmentality (Foucault 1978, 1979). Embodiment approaches and the work of theorists such as Bourdieu (1984) and Shilling

(1993) point out that bodies are not born but made – by definition our bodies are cultural, not natural, as they are formed over time through experiences. More recently, Farquhar and Lock have drawn attention to the classic analysis of relationships between society and individuals drawn on by many social scientists. This requires what they term a ‘proper’ body through which to view the individuals who collectively make up society. The body proper is constructed in these analyses as ‘a skin-bounded, rights-bearing, communicating, experience-collecting, biomechanical entity’ (2007:2), a ‘common sense’ view of the body that does not allow for the diverse range of human experiences and relationships, and which separates mind from body, and subjective experience from material things. It also does not align with understandings within biomedicine, where medical interventions and implants, and understandings of ways our external and internal environments contribute to human health, challenge taken-for-granted ideas of biological separateness and the ‘natural.’ Instead Farquhar and Lock argue for ‘an expanded anthropology of embodiment’ (2007:12), the ‘proper body’ not sustainable with neither changing understandings of the make-up of the body, nor how cultural understandings and experiences, and the wider environment, affect it. The use of surgical mesh that becomes permanently attached to the interior of the body is one such example of troubling the boundaries of the body proper; it is less clear what is considered part of the ‘natural’ body and what is not. I draw on mesh not only to look at how we might think beyond the body proper through bodily integration, but also to consider when and where differences might be important and perhaps inevitable.

This chapter examines the use of mesh in surgery for stress urinary incontinence (SUI), an involuntary loss of urine during exertion, coughing, sneezing, or laughing, and pelvic organ prolapse (POP), the collapse of parts of the vagina. While leaking urine is connected to ‘normal’ ageing in men and women, this chapter examines the use of surgery offered by the UK NHS for women who experience a considerable impact on their quality of life from regular, and often significant, uncontrolled loss of urine. Both SUI and POP are understood to share a common cause: the weakening of muscular and connective tissues in the pelvic floor (Gigliobianco et al. 2015). This has been connected to not just ageing, but also obesity, pregnancy, and childbirth as well as menopause and genetic aspects of women themselves so that the range of women affected is broad. Physiotherapy is usually offered initially to address the problem; however, if symptoms persist, corrective surgery is seen as a more effective and longer lasting treatment. Synthetic mesh is commonly used during such surgery to reinforce pelvic floor repairs, and once inserted into the body it remains in place, integrating with and supporting the local tissues that form around it.

While surgeries for SUI and POP are recognised to be largely successful, both surgeries can cause complications such as pain, inflammation, and ‘erosion’ of tissues around the site of insertion. These complications

differ between the surgeries, with greater problems with mesh erosion identified for women undergoing POP repair than SUI surgery (Gigliobianco et al. 2015). Significantly, complications from the use of mesh are difficult to resolve: once mesh has started to integrate with flesh, it is not easy to remove. The last decade has seen a growth of reports of complications from POP mesh surgery, particularly drawing the attention of media and television in England in 2017. As such, non-success of such surgeries is also part the story of these interventions.

Taking up understandings that the material body is shaped by (and, indeed, shapes) society, what is more novel in newer approaches is the inclusion of material entities, including the non-human, within an ethnography. Part of acknowledging that society can never be separated from the material world is to see the material as part of society; a fuller ethnography also takes 'things' into account (Latour 2005). In fact, rather than starting with human-to-human relations and accounts, in the case of mesh surgery for pelvic floor repair, we might instead focus on the nub of the issue: where flesh and mesh meet. To look only at surgical decision-making, or on patients' understandings and accounts of their experiences, misses the crucial aspect of surgery: its materiality.

Rather than focus on the (social) experiences of these women, I consider the materials themselves: the properties, affordances, and temporalities brought together during these surgeries and through which mesh and flesh integrate to create a new form within the human body. As Donna Haraway (2008) suggests, part of becoming human is embracing and touching other things, and drawing on her work examining what is touched when humans and non-human are brought together may give us an alternative understanding of these surgeries, and perhaps a different way of viewing the body. Here, then, is the story of the integration of a material body and material technology, an action that folds in wider times and wider spaces. It is also a relationship forming over time, both the living organism of the body and a manufactured material implant in states of flux and change, neither 'finished objects' but both 'becoming' into being (Ingold 2012). Because pelvic floor surgery is sometimes unsuccessful, it is also a story of how such a positive relationship may not develop, the failure as well as success of bringing together mesh and flesh.

### **Becoming material bodies**

The turn moving 'beyond the body proper' in anthropology has also been undertaken in actor-network approaches and by philosophers of science and technology. Theorists such as Latour (2005), Hacking (1986), Haraway (1991), Mol (2002), and Barad (2007) have been part of this materialist movement, attending to ways in which bodies are made through practices and relations, not existing independently from these. Like Ingold, these scholars largely recognise bodies as a result of ongoing processes of

becoming, the body ‘a dynamic centre of unfolding activity, rather than a sink into which practices are sedimented’ (Ingold 2012:439). Following Ingold (2010), Nading (2016) notes that health itself can be seen as constituted of and by things, non-living entities involved in its making and unmaking. Through these understandings, ‘things’ are integral to our well-being, part of dynamic processes that contribute to living. Things are also entities in process (Ingold 2010, 2012); humans and non-humans not only co-existing but generating conditions of possibility for their inter- and intra-action (Barad 2007; Ingold 2010). This, therefore, suggests a temporal dimension to these relationships and the potential for movement and flux; bodies and materials are not static, and neither are their connections to each other.

While Haraway’s work on cyborgs has often been drawn on to consider the relationship between humans and technology and to deconstruct dualisms of self:other and natural:artificial (Haraway 1991), it is Haraway’s concept of ‘becoming with’ that I wish to draw on here to look at the ongoing and temporally located relationships between mesh and flesh that these surgeries create. Developed through considering human relationships to other species, Haraway notes that the human body is made up of a range of bacteria, fungi, protists, and different microbiota and that becoming an adult human being is undertaken in company with these symbionts: ‘To be one is always to *become with* many’ (1991:4, emphasis in the original). Her work looks at the ways in which human and other lives (including her own and her dog’s) are constituted in intra- and interaction with each other, co-shaping their existences through time. Her work advocates a multi-species ethnography and (as her cyborg work also proposes) challenges ideas of human exceptionalism, what she terms the ‘Great Divide’ between human and other. Like Latour, then, she suggests that the social is not exclusively made up of humans but also of other ‘things’ and our relations to these. For Haraway, becoming human involves relationships with non-humans, in and on our bodies as much as around them. Such an approach not only invites us to ask where the boundaries of the body might lie but also to attend to how we live with, and become through, such relations over our lifetimes (and beyond!) – how our bodies are ‘becoming with’ others.

Haraway’s concept of ‘becoming with’ starts by asking ‘what do I touch when I touch my dog?’ (2008:3). To answer this question, Haraway demonstrates that she needs to consider the natural, social, cultural, political, and economic history of her dog’s breed through colonialism alongside the natural, social, cultural, political, and economic properties shaping her interaction with her dog today. Haraway’s approach, unlike Latour’s flat ontology, is a critical social theory perspective of materiality through which we might bring together the multiple properties, practices, and discourses around the use of surgical mesh for pelvic organ collapse and urinary incontinence. If we follow Haraway’s logic to look at non-human microorganisms as entities that are ‘becoming with’ the body, why not also include the material technologies embedded within it: the medical technologies and implants that

also, in time, become part of the body? More significantly, perhaps, what new directions and questions might this approach open up when looking at surgical interventions?

The particular usefulness of this approach for looking at surgery results from two crucial aspects implicit in Haraway's question and its answer. First, that time is integral to becoming with: the properties of both sides being brought together while 'becoming with' is formed in time. Second, what Haraway terms 'touch across difference' reminds us that differences remain even as they encounter and shape the other. By attending to both time and difference, we might follow Haraway's line of questioning to ask, 'what is being touched when mesh is attached to flesh?' In so doing, we consider the natural, social, cultural, political, and economic history of both the mesh and the flesh as well as the time and space 'folded' into these (Latour 2002). As such, we might think of bodies and medical materials not only in the process of becoming as Ingold suggests, but also as 'becoming with.' Furthermore, in the context of pelvic floor surgery, we may also acknowledge 'failing to become with,' instances where touching does not bring integration and positive health outcomes, but instead stubborn difference and resulting iatrogenesis (harm caused by biomedical diagnosis or therapeutic intervention).

### Touching mesh and flesh

Latour (2002) and others have drawn on Serres' work to suggest that pasts are enfolded in objects. As Latour (2002) illustrates with his workbench hammer, technologies enfold heterogeneous temporalities and spaces: the antiquity of the planet within the moulded mineral hammerhead, the age of the oak in the handle, the year it was created through factory production as well as the different locations of forest, mine, factory, sales van, and workshop. But, he suggests, this is not enough. The actor, the other entities involved (such as nails), and action of the hammer are also folded in, the different forms hammers have taken in different places and the possibilities of use suggesting an additional focus on the affordances of the technology. I focus here on how temporalities and properties and affordances enfolded in mesh technology and the flesh onto which it is placed enable 'becoming with,' so that body and implant continue to work together.

### *Mesh*

A range of medical devices has been implanted in people for many decades, including artificial knees and hips, and metallic support for bones. These devices are intended to stay within the body and become part of it, as is also the case with mesh technologies. Mesh becomes integrated into the area of the body it is used on, forming a permanent attachment that reinforces the tissue it is fixed to. The use of mesh to support prolapsed organs and

the urethra requires the recognition of particular symptoms being resolved through such supportive interventions: that urinary incontinence is, for example, a particular kind of problem with a particular kind of solution. In this case, it was Ulmsten and Petros' 'integral theory of urinary incontinence' (Petros and Ulmsten 1990; Ulmsten and Petros 1993) that initiated the development of these surgeries. Following the success of mesh slings implanted under the middle of the urethra to support it, mesh was later introduced in pelvic organ prolapse repair.

Transvaginal mesh (for POP) and mid-urethral slings (for SUI) are made of polypropylene, the same material used for repairs of hernias and for sutures. Polypropylene was made initially in 1954, with its usefulness for mesh hernia repair understood by herniologist Francis C. Usher in 1962, partly due to its ability to be autoclaved (sterilised using steam) (Kelly et al. 2017). Polypropylene mesh has undergone intensive testing for its use on hernias, where there is good evidence of effective outcomes (Gigliobianco et al. 2015). However, its approval for POP and SUI was not based on long-term supportive data. Instead, a 'grandfather clause' where a new material was permitted based on its similarity to its use elsewhere (i.e. in hernias) allowed its introduction for use in other places in the body. This policy suggests that it is the material composition and physical properties of the technology that are of most concern in relation to the insertion of biomaterials in the body, rather than where in the body the technology is being used. Through this argument, mesh technology is seen as somewhat neutral, acting the same way in one part of the body as in another. It assumes that 'flesh' and 'mesh' relate to each other in broadly the same way, no matter which flesh and which mesh are being brought together.

At the level of design, however, mesh appears less neutral. While meshes for the treatment of stress incontinence and vaginal prolapse have similarities, they are configured differently for these different interventions (Kelly et al. 2017), the affordances of different mesh configurations bringing different possibilities into being. Mesh is classified into four groups depending on pore size, with larger sized pores allowing for 'superior tissue integration,' as collagen can better form across them. As well as promoting integration, pore size also has a role in preventing bacterial infection. Pathogens are smaller than the cells involved in the body's immune response; as such, mesh pores that allow pathogens but no immune response cells to penetrate could mean that bacteria would be able to remain on the mesh unchallenged (Kelly et al. 2017). The weight of the mesh is also important. The heavier the mesh, the greater the stiffening of tissue and the inability of the tissue to contract, a particular issue when attached to the walls of the vagina. However, mesh that is too light may not be suitable for handling, as the mesh is folded when it is inserted. Any material used needs to be robust enough to withstand surgical handling and insertion as well as provide flexible support within the body. Mesh design demonstrates that in reinforcing flesh, mesh also needs to be able to do other work: supporting collagen growth, allowing immune

response to bacteria, sustaining manipulation during surgery, and so on. Mesh is thus active in repairing flesh in a number of different ways.

There are also different entry points to surgical insertion and different procedures used in such instances to attach the mesh to different points. These are associated with different degrees of success; for example, there is an increased risk of infection associated with vaginal insertion (Kelly et al. 2017). While a similar grade of mesh is used in different pelvic organ surgeries, as it is configured differently for different surgeries, interventions for SUI and POP are not singular but take multiple forms, allowing for differences between patients and surgeons. While this might, again, at the surface level, imply that mesh is a neutral material but patients and surgeries are different, we might instead suggest that different practices make different mesh (Mol 2002). Different sites and methods of insertion therefore make the affordances of mesh as variable as the affordances of flesh.

### *Flesh*

One of the inevitable impacts of inserting mesh into the body is that it triggers a 'foreign body response' (Brown and Finch 2010). This causes inflammation and pain, and yet is also desirable to some extent. Inflammation is an important and complex process that not only clears the wound of abnormal cells and debris but also enables the remodelling and regeneration of tissue (Moalli et al. 2014). Some degree of response in the flesh is helpful, therefore, whereas too much becomes detrimental. The degree of response can alter depending on where in the body the mesh is implanted – in other words, which flesh is involved. For example, a number of studies have found that mesh used in the vaginal area is more susceptible to complications and a greater foreign body response than when mesh is inserted into the abdomen (Kelly et al. 2017). Individual bodily anatomy and immune systems also affect the body's response: obese bodies, older bodies, bodies with other illnesses, and those that have suffered trauma during parturition are viewed as being more problematic. If the inserted material is recognised as non-self and isolated from the body, it is not integrated with surrounding tissue. The mesh may not be sufficiently attached, tissues around the implant eroded through bacterial infection, or failure of flesh and mesh to integrate in particular areas. The affordances not only of different flesh in the body but also different bodies allow 'becoming with' mesh in different ways.

That these bodies are presented for surgery in the first place is also understood to rely on patient difference. Guidelines recommend that surgeons choosing between different surgical procedures should weigh up the potential risks and 'adverse events' of such interventions against the goals and wishes of the patients, the weighting of particular complications potentially differing not only between surgeon and patient but also between patients. Decisions might be whether 'objective cure' of urinary incontinence is more important than sexual function following surgery, for example (Schimpf

et al. 2014). Which does the patient value more? This suggests a difference not only in the physical bodies of patients therefore, but also in their values and experiences. Temporalities are enfolded in the body and body parts, creating particular affordances of the flesh: women's experiences, age, lifestyle, childbearing, anatomy, and immune system all contribute to the degree of the problem and the possibility of change.

Also enfolded within flesh are the material and structural understandings of the cause of urinary incontinence, the availability of surgeries to intervene, and a wider movement from woman needing to put up with leaking to being able to discuss and have such symptoms addressed. Neither the patient nor the patient body are singular and standard, and each brings different surgeries and surgical outcomes into possibility. Surgical expertise based on training and experience are also considered to be key factors in the outcomes of pelvic floor procedures (Gigliobianco et al. 2015); such guidelines assume a degree of difference in surgeons as well as patients. It should be noted too that polypropylene mid-urethral slings are not the only treatment for SUI, and there is disagreement within urogynaecology around the use of tests to diagnose SUI before surgery (Lee and Zimmerman 2016). Biomedicine is not monolithic, and surgeons too are not a singular whole.

An approach focusing on patients' values and experiences, and perhaps also the experiences and decision-making of surgeons, not only reinforces a nature:culture divide but also misses the ways in which surgical outcomes are embedded in material possibilities. The temporalities, properties, and affordances of both mesh and flesh suggest the many complex relationships from which becoming with is possible including the sheer diversity present in both mesh and flesh. There is no one nature and one culture at stake here. Embodied experiences of childbirth, ageing, and (in the case of surgeons) undertaking surgery itself, the history and development of mesh of a particular size and shape, the location of surgical intervention and mode of insertion, the body's physicality, and the body's immune response are all relevant and the success of the surgery is distributed across these aspects. This is not the result of pure relationally but rather what Ingold (2012) terms 'webs of life.' Rather than suggesting a standardised and singular surgery on a singular body proper, a positive outcome needs to occur *despite* such different bodies and different surgeries. Becoming with does not rely on sameness or complete merger, therefore, but of retaining and working with difference.

### *Mesh-flesh*

Two different materials with different properties, affordances, and temporalities enfolded within them are brought together through surgery to form a new integrated material: mesh-flesh. It is the successful creation of mesh-flesh that will support portions of the woman's internal structure by becoming part of her body, a meshing that will allow for 'normal' functioning.

Integration does not occur immediately in surgery, however; this new material develops over time. Rather than a sole touching and co-existence of flesh and mesh, a constantly developing process is required that the surgery itself merely instigates. This highlights two crucial coalescences of time in relation to the fusing of mesh-flesh: the surgical event and recovery after surgery. While there is clearly a relationship between the two (how the mesh is put in, how the surgery is carried out including the use of instruments and their cleanliness, for example), the many months, and sometimes years, of bodily repair that follow surgery are when the process of developing mesh-flesh takes place. Recovery takes time; indeed, recovery is time. As Ingold notes, 'Materials are not *in* time: they are the stuff of time itself' (2012:439).

These are, of course, not the only changes taking place within the body. The body is always in a state of repair and flux. Cells die and are replaced, the immune system works to identify and neutralise pathogens and cancer cells, nutrients are absorbed through the gut, hormones are released, blood flows, the body is never static. These go on alongside, and contribute to, the integration of flesh and mesh. Over time, these result in longer term bodily changes. We age, become fat, build immunity, and lose flexibility, skin elasticity, and bone density. The mesh becomes part of the body. Ingold's (2012) proposition that the body is dynamic and always in a state of becoming not only is a material observation but also suggests a movement forward in time that alters: the body is always in process, and that changes us. We are neither static, nor returning to homeostasis (Canguilhem 1989 [1978]); we are not the person we were yesterday. As part of the body changing over time, the boundaries between self and non-self are always being negotiated, including within the body itself.

Surgical recovery is 'successful' if mesh and flesh come together in a way that improves a woman's health and experiences. 'Becoming with' relies on a positive relationship, and 'health' here relies on a particular type of integration to occur, demonstrable on some occasions and not on others. A failure to sufficiently integrate can cause damage, disease, distress. Bodies are not standard, and mesh is not inert: they both carry different temporalities and practices, and it is perhaps not surprising that sometimes different types of integration occur. Failing to become with involves a drawing away. Both mesh and flesh may fail to integrate with the wider body and become foreign objects within it, causing damage rather than contributing to the health of its wider whole. Their difference is unable to be integrated and becomes intolerable.

Even in cases of successful becoming with, we might ask when the integration is complete. Both flesh and mesh continue to change and become more and more interwoven over time, but this is merely an issue of scale. The closer one looks, a point at which they remain separate becomes visible. At the cellular level, mesh never becomes flesh. Similarities and differences between what is 'flesh' and what 'mesh' are, therefore, determined not only over time, but also by scale. At what point might we suggest there

is no difference? Such a separation between the two is problematic only when these do not fully work together. Lack of separation is also an issue as partially integrated mesh-flesh cannot be pulled apart and so moved or extracted from the body. To try to remove this would cause greater damage than leaving failing mesh-flesh in place. Mesh-flesh remains hyphenated, therefore, always two things as well as being one. Difference is retained, even at the optimal level of integration.

### Recovery and health

When we consider the use of synthetic surgical mesh as a method of repairing or supporting damaged tissue such as supporting the vaginal wall following prolapse, to exclude the material interaction between mesh and flesh excludes the key issue. A focus on the material, however, also allows us to see the surgery and the body in a different way. The meeting points between flesh and mesh are not about the problems of a 'natural' body encountering a 'synthetic' material, but how two things work alongside each other, how they are becoming with. This is not dissimilar from other components in the body; indeed, health results from just such an integrated difference, and mesh is, therefore, similar in this way to any other part of the body.

No body is a single entity but is made up of different elements that integrate with each other, working together but not merging. Blood, for example, passes around bodily organs but does not become them. Blood itself is not singular: it includes red blood cells, white blood cells (leukocytes), platelets, water, and serum (which itself contains antibodies, anti-microbial proteins, etc.). Even at the level of the cell, there is a compartmentalisation of the nucleus, mitochondria, Golgi, and ribosomes. Depending on scale, these are part of the same thing or separate entities: like mesh-flesh, the body is at once one entity and many different things at the same time. Such differences are important for becoming with, a story of relatedness and incorporation. Mesh-flesh is not about becoming the same thing but rather aligning together over time again, much like the rest of the body. The division between 'natural' and 'artificial' materials in the body is, therefore, difficult to locate: at one scale, the same and at another, quite different.

As with the problems of correcting complications caused by mesh, we might consider whether it is detrimental to the whole to pull these materials apart. A focus on mesh-flesh suggests that the body is always about distinction *as well as* integration. Furthermore, this is a continual incorporation and integration of difference, never complete as the body creates new cells and gets rid of others; it circulates, metabolises, excretes. The body is always literally becoming. Health is distributed across, but also relies on such processes: processes that take place over time and change our bodies in doing so. Recovery is not, therefore, to return to what one once was but rather to be changed, and to be able to continue to change: the body becoming with.

Differences are inherent in the properties and affordances of bodies, and in the surgical interventions in which they are involved. Surgeries bring together new combinations of these and start new relationships between entities inserted or removed, initiating new temporalities and processes of change, and setting up the conditions of possibility for incorporation of difference over time. Once the conditions of possibility for the body's becoming are in place, integration and difference depends on scale as well as time. Recovery is dependent on these factors coming together.

Material properties and affordances 'do' things, therefore: they bring various possibilities into being, including if we scale up, improvements to everyday life. Attending to the properties and affordances of the material, the normative assumptions within their design, manufacture, and use, as well as the changes they initiate over time and at particular scales, allows us to bring together material changes within cells and tissues with individual experiences and with wider socio-cultural ideals and understandings. The turn to materiality brings a 'zooming in' through which difference and integration at different scales in the body is visible, but if we attend to what else is enfolded within the material, it may also allow us to 'zoom out,' even to helping us think through ways in which we might examine the body in medical anthropology.

As noted earlier, being human involves becoming with many (Haraway 2008). Maintaining difference at different scales can be productive as well as inevitable. Understanding that the body is neither singular nor static, and its boundaries are always up for negotiation, we might take these arguments further to recognise how medical anthropological approaches to the body are likewise plural, dynamic, and changing, and not clearly bounded. Rather than separate, exclude, or neatly demarcate one approach from another, we might instead think about ways, places, scales, and times in which we might integrate or keep as different these various approaches. How might we pull together material approaches to the body with Douglas' (1973) symbolic 'natural' bodies, for example, and what might this tell us in doing so? What novel directions and questions are raised by attending to time in the body in relation both to biological processes and bodily experiences? How might we best bring together the complexities of bodies at different scales so that individual biologies can also be related to global health policy? Such questions appear increasingly salient as anthropologists conduct ethnographies not only of laboratories but also of multinationals, health and the body appearing as different things at these different scales (Yates-Doerr 2015). If a more in-depth ethnography also involves things, and if fieldsites could potentially be exponential, defining the foci of ethnography might also depend on how to speak across scales and incorporate difference. Mesh, flesh, and mesh-flesh in this case provide the perfect analogies – at some points integration occurs where elsewhere difference is inevitable, while tearing apart integrated material may be detrimental to the whole. As with the insertion of surgical mesh too, bringing together different approaches to the body in

medical anthropology might initially involve agitation and inflammation; however, this is a necessary part of fuller integration.

In line with this argument, therefore, is not a call to abandon all previous anthropological approaches to the body but to use material aspects to think through these more broadly, bringing together different pieces and raising new questions. Here, I have drawn attention to where the boundaries of our bodies might lie, how we live with and become through relations with non-humans, and how becoming with occurs despite and across difference involving distinction as well as integration. Using the idea that a healthy body is one that is able to tolerate and integrate difference, and can continue to become with in correspondence with different elements over time, may help us move from a focus on ill bodies to bodies in health and perhaps cause us to ask, what is a body in the first place?

### Acknowledgements

Many thanks to Simon Cohn for his comments in the development of this chapter. The chapter was written while employed on the National Institute of Health Research project ‘Surgical Care for Female Urinary Incontinence’ (NIHR HS&DR 14/70/162). I am grateful for the support of the wider project team at LSHTM, led by Prof. Jan van der Meulen.

### References

- Barad, K. (2007). *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham: Duke University Press.
- Bourdieu, P. (1984). *Distinction: A Social Critique of the Judgment of Taste*. London: Routledge.
- Brown, C.N. and J.G. Finch (2010). Which mesh for hernia repair? *Annals of the Royal College of Surgeons of England* 92(4):272–278.
- Canguilhem, G. (1989). *The Normal and the Pathological*. Reprint of 1978 issue. New York: Zone Books.
- Douglas, M. (1973). *Natural Symbols. Explorations in Cosmology*. Second edition. London: Barrie and Jenkins Ltd.
- Durkheim, E. (1995 [1912]). *The Elementary Forms of the Religious Life*. Trans. Karen E. Fields. New York: Free Press.
- Farquhar, J. and M. Lock (2007). Introduction. In M. Lock and J. Farquhar (Eds.), *Beyond the Body Proper: Reading the Anthropology of Material Life*. Durham and London: Duke University Press.
- Foucault, M. (1978). *The History of Sexuality*, Vol. 1. New York: Pantheon Books.
- Foucault, M. (1979). *Discipline and Punish: The Birth of the Prison*. New York: Vintage.
- Gigliobianco, G., S.R. Regueros, N.J. Osman, J. Bissoli, A.J. Bullock, C.R. Chapple and S. MacNeil (2015). Biomaterials for pelvic floor reconstructive surgery: How can we do better? *BioMed Research International* 2015 Article ID 968087, 20 pages. DOI: 10.1155/2015/968087.

- Hacking, I. (1986). Making up People. In T.C. Heller, M. Sosna, and D.E. Wellbery (Eds.), *Reconstructing Individualism: Autonomy, Individuality, and the Self in Western Thought*. Stanford: Stanford University Press, 222–236.
- Haraway, D. (1991). *Simians, Cyborgs, and Women: The Reinvention of Nature*. London: Free Association Books.
- Haraway, D. (2008). *When Species Meet*. Minneapolis: University of Minnesota Press.
- Ingold, T. (2010). Bringing things to life: Creative entanglements in a world of materials. *Realities Working Paper Series No.15*. Manchester UK: Economic and Social Research Council.
- Ingold, T. (2012). Toward an ecology of materials. *Annual Review of Anthropology* 41:427–442.
- Kelly, M., K. Macdougall, O. Olabisi, and N. McGuire (2017). In vivo response to polypropylene following implantation in animal models: A review of biocompatibility. *International Urogynecology Journal* 28(2):171–180.
- Latour, B. (2002). Morality and technology: The end of the means. *Theory, Culture & Society* 19:247–260.
- Latour, B. (2005). *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press.
- Lee, D. and P.E. Zimmerman (2016). Evaluation of stress urinary incontinence: State-of-the-art review. *European Medical Journal* 1(3):103–110.
- Moalli, P., B. Brown, M. T. F. Reitman, and C. W. Nager (2014). Polypropylene mesh: Evidence for lack of carcinogenicity. *International Urogynecology Journal* 25(5):573–576.
- Mol, A. (2002). *The Body Multiple: Ontology in Medical Practice*. Durham & London: Duke University Press.
- Nading, A. (2016). Local biologies, leaky things, and the chemical infrastructure of global health. *Medical Anthropology* 36(2):141–156.
- Petros P. and U. Ulmsten (1990). An integral theory of female urinary incontinence. *Acta Obstetrica et Gynaecologica Scandinavica* 69(Suppl.153):1–79.
- Schimpf, M.O., D.D. Rahn, T.L. Wheeler, M. Patel, A.B. White, F.J. Orejuela, S.A. El-Nashar, R.U. Margulies, J.L. Gleason, S.O. Aschkenazi, M.M. Mamik, R.M. Ward, E.M. Balk, V.W. Sung, for the Society of Gynecologic Surgeons Systematic Review Group (2014). Sling surgery for stress urinary incontinence in women: A systematic review and metaanalysis. *American Journal of Obstetrics & Gynecology* 211(1):71e1–71e27.
- Shilling, C. (1993). *The Body and Social Theory*. London: Sage.
- Ulmsten, U. and P. Petros (1993). An integral theory and its method for the diagnosis and treatment of female urinary incontinence. *Scandinavian Journal of Urology and Nephrology Supp.* 153.
- Yates-Doerr, E. (2015). Intervals of confidence: Uncertain accounts of global hunger. *Biosocieties* 10(2):229–246.