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Qualities of Connective Tissue in Hospital Life: How Complexes of Practices Change Over Time

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> "The design of the Pavilion hospital was, of course, closely connected with the expression of a specific theory of disease - the miasmic theory of disease. Within the terms of this theory the essential elements of a hospital architecture are to be found in such features as the spaces between patients, the flow of air through the wards and the patterns of ventilation between wards… one of the greatest advocates of such design was Florence Nightingale, whose Notes on Hospitals (1859) is inscribed in the very discourse of a zymotic theory of disease". (Prior, 1988)

> "It sounds obvious, but hospital environments with access to views, light and greenery can improve patient recovery and outcomes, acting as healing balms to the body and mind. In the old Alder Hey... with its 18-bed Nightingale wards and unrelenting corridors, often the only panoramas were of dispiriting brick courtyards." (Slessor, 2015: 1384:1382)

Introduction

In many ways 'hospital life' has changed dramatically in the last 150 years. In other ways it has remained remarkably the same. These changes (and lack of changes) can be seen in the design of the New Alder Hey Children's Hospital in Liverpool. Whilst architects and hospital planners have done away with the traditional, department connecting central corridor, the New Alder Hey maintains many of the now essential features of hospital design that were advocated by Florence Nightingale in the 1850s, including the spacing between patient beds and the use of verandas for patient access to daylight and fresh air (Prior, 1988). Moreover, it has been designed in such a way as to facilitate a whole host of practices that would have been completely out of place in the old Pavilion style hospital, but that are now essential to hospital design, including socialising and shopping. "Resembling a more salubrious version of an airport concourse, the internal street [of the New Alder Hey] is the entry point and social condenser, colonised with shops, café, specially designed furniture and a giant, conical structure containing a multi-faith space." (Slessor, 2015: 6). Hospital life is made up of different combinations of activities at different points in history.

But how do these combinations of activities change? And why do they stay the same? These are our starting questions in exploring how hospital life has changed over time. In order to tackle these questions, we begin with complexes of practices and not 'a practice'. This starting point reflects other contributions in this volume and echoes recent developments in theories of practice that are moving away from a focus on the constitution and trajectories of specific practices to an emphasis on the interdependencies, connections and configurations that are central to the constitution, reproduction and transformation of social life.

Conceptual headway regarding how practices hang together has been made on several fronts. Steps that have been taken include recognising that: practices become organised in time in different ways (Southerton, 2006); practices gather around particular places (Shove et al., 2012: 84); and that

practices compete and collaborate for time (Schatzki, 2010b). Multi-practice configurations have been described as bundles, complexes, constellations and systems in order to capture issues of scale, fixity, flexibility and structuration in connection. Whilst these ways of conceptualising complexes of practices are useful for understanding how one practice is connected to another, they are of less value in helping us understand relationships between the connections that hold practices together. To date, much less has been said about how different types of connection impact on and matter for each other. For example, how are we to understand the changing material-spatial organisation of practices in hospitals and how those changes are affected by and shape the temporal sequencing of activities that take place within and beyond the hospital?

In what follows we propose that in order to understand how complexes of practices change, we need to consider the multiple ways in which practices hang together and to show how these different types of connection matter for one another and ultimately for the reproduction of the complex itself. Our ambition is to build the foundations of a theory of practice (and of change) that is concerned from the outset with relationships between connections (*inter*connections). In our schema, new elements of practice are not the source of change. Rather trajectories of change are an expression of the ways in which practice complexes *inter*connect. In our description of these *inter*connections we put forward an understanding of complexes of practices as held together by a connective tissue that is itself an essential feature of practices.

We develop and illustrate this idea through a discussion of the transformations of complexes of practices that make up 'hospital life'. A hospital is an intriguing site in which multiple activities necessarily combine and coordinate in routine and observable ways. What seem to be outwardly static structures have changed radically over the past century meaning that any one hospital is constituted by historically specific complexes of practices: so how has that happened? The multiple activities that go on in a hospital, and their orchestration to make an institution that functions 24 hours a day, 365 days a year, means that hospitals are sites in which temporal aspects of connection are especially visible; hospitals have multiple socio-temporal peaks, sites and cycles and they have been studied as such (Zerubavel 1979). But they also vary in terms of the kinds of infrastructure, built environment and technology which constitute them and the past design and implementation of these material arrangements is obviously important for contemporary hospital life. As such, hospitals provide a revealing setting in which to pursue our goal of understanding change as an outcome of the constitution of practice complexes.

Drawing from more recent developments in theories of practice (e.g. Shove et al., 2012; Schatzki, 2010b; Schatzki, 2010a; Shove et al., 2015), as well as from established ideas in social theory (e.g. Zerubavel, 1979; Abbott, 1988; Prior, 1988), we develop the beginnings of a conceptual scheme that can better account for changes in the complexes of practices that make up 'hospital life' from the 1850s to 2015, as described in the two architectural accounts of hospital design introduced at the start of the chapter. Analysing the organisation of activity in architectural designs has been proposed by others (Prior, 1988; Shove et al., 2012). For example, Shove et al. write:

> "Since buildings represent sites in which practices are contained, separated and combined, the history of domestic architecture provides a telling record of how daily life is organized and how this changes." (Shove et al., 2012: 84).

We recognise that activity cannot be explained in full from building design alone, and indeed that is one of our central arguments. We claim that the architecture and layout of hospital buildings, such as

the newly built Alder Hey Children's Hospital in Liverpool, is not simply the outcome of design trends, but represents one facet of multiple registers of transformation in institutional life. Others include: vast advances in medical science and in theories of infection and disease; a reconfigured and extended system of health professions, with their altered, emergent and redundant jurisdictions and areas of expertise; cultural shifts in social categories like children and childhood, social class, gender and age, all of which have implications for ideas of good hospital care; along with changed schedules and rotas of staff and patients associated with new forms of training, departmental opening hours, and different kinds of treatment, therapy and surveillance.

Given these multiple registers of transformation it seems obvious that changes in 'hospital life' cannot be revealed only through a story of developments in architectural design and professional planning, nor through a narrative of changing medical knowledge and professional organisation, nor through an understanding of the temporal organisation of the hospital. Instead, what is required is an account that reveals the dynamic interplay between these registers and their historical development. Such an account would get at changes in configurations of complexes of practices. What is needed is a method of understanding how different types of connection between practices matter for each other and how these connections matter for the reproduction of complexes of practices over time. Our original contribution is to focus on the different qualities of what we call the connective tissue (Shove et al., 2012)[1] of complexes of practices, and the *inter*connections within the connective tissue, in order to understand how the combinations of activities that make up routine and everyday hospital life have changed and how they have stayed the same.

We begin by briefly mapping some of the ways in which theorists of practice have dealt with connections between practices in order to situate our notion of connective tissue. In the subsequent sections we develop three qualities of connective tissue in more detail, namely jurisdictional qualities, temporal qualities and material-spatial qualities. In the final section we focus on *inter*connections among these three qualities to show how such a focus helps to better understand how complexes of practices change and stay the same.

(*Inter-)* connections in complexes of practices

Work that has looked at complexes of practices has, for the most part, focussed on singular dimensions of connectivity (e.g. temporal, material) without accounting for how that connection is itself related to other types of connection (e.g. Southerton, 2006; Shove et al., 2012). Similarly, this work has yet to account for how connections have shaped complexes of practices in the past and in ways that influence present and future connections and configurations. As a result, theories of practice tend to describe one dimension of connection when accounting for how practices hang together in the present. We argue that we need a more precise account of how multiple forms of connectivity between practices have come to be and how they matter for future iterations of a given complex of practices.

One example of recent writing on connections is Southerton's examination of the temporal organisation of practices. Southerton tells us that "[t]he temporal organisation of the day can be characterised as being constituted by practices that have a fixed position within schedules" (Southerton, 2006: 451). This fixed position is a result of various features of a given practice, for example, that it involves co-participation with others, that it requires a high degree of obligation to

[1] We build on and extend the notion of connective tissue as developed by Shove et al. in *The dynamics of social practice* (2012).

others, or a significant degree of personal commitment and a relatively long duration. These features of a given practice are understood in terms of tempo, periodicity, duration, coordination and synchronisation. Practices that 'have' different temporal features have a more or less malleable position within sequences of activity that make up the day. This description of how practices connect in time is important because it shows us that certain features of a practice matter for the ways in which it can link with others. However, from this account it remains unclear how a given practice came to have these features in the first place. How did it come to require a high degree of obligation to others, or personal commitment, or co-ordination with others? Why does a certain practice have a particular tempo, duration, or periodicity?

Place has also been considered as a significant dimension of ordering, organising and connecting practices. For example, different combinations of practices happen at home as compared to those that happen at work, facilitated by various spatial and material topographies. Shove et al. write that:

> "… there are various ways in which spatial arrangements constitute and underpin potentially important patterns of association. Some have to do with physical location of material elements. For example, practices requiring good supplies of running water converge around taps and drains." (Shove et al., 2012: 84)

Technological infrastructures also bring practices together in ways that allow their mutual influence. Shove et al. go on to draw on an example from De Wit et al. (2002) who write about the office as an innovation junction. Their argument is that spatial and material arrangements are important for the re-structuring of administrative practice. In this explanation it is the emergence of a new technology, the typewriter, that allows a new kind of practice to emerge, typing, and for the re-combining of different practices in office life, such as filing, storing etc. As Shove et al. explain this demonstrates that 'the office' as a space, and the typewriter as a technology, facilitate new linkages between practices. Although historical comparison shows that these spatial and material arrangements have changed over time, de Wit et al.'s account is driven by a narrative of technological innovation and does not comment on further qualities of connectivity. It is unclear in what ways (and if at all) the temporal features (i.e. the periodicity, tempo, duration, etc.) of typing and its fixity in the working day were affected by the material and spatial reconfiguration of practices in the office. Indeed, each of these accounts gives an example of a single kind of connection, temporal or material-spatial, without addressing the relationship between them.

Building from these arguments, our aim is to develop an explanation that both accounts for the multiple ways in which practices connect and that shows how relationships between connections have come to be. To do this we propose a method of conceptualising practices not as entities that have external and singular connections, but as being held together by a connective tissue which has multiple qualities. We make the case that as qualities of connection interact they change the shape of the complex of practices and therefore potential future connections that practices are able to make.

In the following sections we give examples of three different qualities of connective tissue[2], namely temporal, material-spatial[3] and jurisdictional. In each section we begin by drawing out important and

[2] Of course there will be other identifiable qualities of connection. These will depend on empirical questions and sites of enquiry. We give these three as examples because we think they are the three most pertinent to hospital life.

[3] We have separated out temporal and spatial qualities not because we consider them as somehow separate. Instead we want to actively explore how the layering of spatial and temporal relationships works and how temporalspatial qualities shape and are shaped by other kinds of connections / qualities.

useful ways of thinking about how practices hang together and then build from these ideas to show how the jurisdictional, temporal and material-spatial qualities of the connective tissue *inter*connect to form enduring, morphing practice complexes across time.

Jurisdictional qualities

The division of expertise and labour in a hospital offers a useful starting point for understanding how practices of hospital life hang together. Hospitals typically have departments that serve different functions, such as cardiology or ophthalmology, and draw on professions with different knowledges and skills including nursing and prosthetics. These divisions are important for connections between practices in hospital life and for how professions depend on each other. For instance, doctors rely on radiologists to provide X-rays and scans that are vital in diagnosing patients (see Abbott 1988). Though jurisdictions and their related forms of connection are important they are not the whole story. The constitution of hospital life depends on the *inter*connection of jurisdictional qualities with temporal and material-spatial qualities too, and in the subsequent sections we discuss why this is so.

For Abbott (1988), jurisdiction is a concept that is useful for analysing how the division of expert labour is reproduced over time and how it changes. Jurisdictions are the categories of social problems around which expert tasks are organised. These categories include the (re)framing of the social problem itself, tools and equipment, and natural objects and facts. To give an example of each in turn, alcoholism might be (re)framed as a medical, psychological or moral condition respectively, placing it within the jurisdiction of doctors, psychologists or the clergy. Expertise might develop around specific skills or technologies: in a hospital we might think of the radiology profession, and the kinds of previously non-existent expertise that have emerged around different ways of looking inside the body, including x-ray, CT, MRI and ultrasound. Also common in health related professions is the organisation of expert knowledge around 'natural'[4] objects and facts such as podiatry, dermatology and ophthalmology which are respectively concerned with feet, skin and eyes, and paediatrics, midwifery and geriatric medicine which have formed around 'natural' facts of life course and gender.

For Abbott, the complexes of practices that make up hospital life and how these change are explained through shifting jurisdictions and the relations between them. Patterns of interdependence are observable in key processes such as those of diagnosis and treatment. Assembling a picture of the patient involves identifying which experts are and are not relevant to them, and the order in which they should be seen. It is through everyday activities like this that the organisation's map of jurisdictions is both revealed, and reproduced. Abbott also accounts for historical change in interrelated jurisdictions, pointing out that social problems are reframed (e.g. if experts are unsuccessful), that new technologies and associated knowledges develop whilst others wane, and that illness and disease itself changes.

These are valuable insights. We agree with Abbott that the categorisations of expert knowledge and actions, and the dynamics of power between such groups are very important for the organisation of practice complexes in hospital life. However, since Abbott is concerned to analyse professions in general, his account cuts across institutions and specific sites of action producing an analysis which is 'systemic' and fractal. He has little to say about the day-to-day goings on of hospital life and their material and temporal qualities.

[4] Abbott is referring to categories like 'the body' when he uses the term 'natural', though we note that natural facts are social constructs or outcomes of scientific interventions.

As noted at the beginning of this chapter, a Victorian hospital provides a very different material-spatial infrastructure of practice than a newly designed facility. This has implications for the spatial organisation of experts within a hospital, potentially complicating the abstract system of professions that Abbott describes, and resulting in a variety of distinctions and patterns on the ground, as layouts vary and are used in different ways. Such spatial arrangements have implications for temporal patterns of hospital life too – the relative location of departments and experts affects patterns of time within the working day – a fact that might result in ideal sequences of diagnosis being adapted to local settings.

Jurisdictions, that is, the abstract organisation of expert tasks, play a vital part in the organisation, reproduction and transformation of what is done in hospital life. Put another way, they form a vital quality of connective tissue within complexes of practices. However, to argue against Abbott, any moment of performance does not simply reproduce a jurisdictional map. Rather moments of performance reproduce practice complexes; phenomena that are an outcome of jurisdictional qualities *inter*connecting with temporal and material-spatial qualities.

Temporal qualities

Practices are clearly linked together through a range of temporal connections. For example, Shove et al. (2012: 87) make reference to Zerubavel's work to show that practices in 'hospital life' hang together by virtue of their connection across a number of temporal scales. They explain that the timing of an operation depends only in part on the patient's condition; it depends significantly more on the scheduling and co-ordination of parallel practices that themselves depend on shift patterns, the day of the week, the time of the year, and various stages of career training. In this account, the position of a practice within the socio-temporal order is less a result of the seemingly essential features of the practice itself and much more about the organisation of patterns of practices and hence time in the hospital as a whole.

Beyond this, Zerubavel's work highlights a relationship between temporal and jurisdictional connections. In Zerubavel's account it is the temporal order of activities in the hospital that solidifies group boundaries and that defines the organisation of everyday activity - who works where, when and with whom. A hospital's schedule of activities does not only reflect the social structure of the organisation, but actively establishes and consolidates social boundaries. He writes: "… the temporal structure of hospital life confirms the definition of group boundaries within the hospital…" (63). In his account jurisdictions are (re)produced through temporal patterns of working activity.

We find three problems with this position. First, it implies that temporal connections define group boundaries. It therefore fails to give a more nuanced and balanced account of how changes in jurisdictions matter for the reproduction of the socio-temporal order. Second, this account of the socio-temporal ordering of practices says rather little regarding the material-spatial connections between activities in the hospital: including the production of space and equipment, the built environment and objects. Finally, it side-lines analysis of how socio-temporal orders (or complexes of practice) become established, how the temporal organisation of activity is contested and therefore how jurisdictions and temporal orders change over time.

Schatzki's position developed in 'The Timespace of Human Activity' (2010b) helps us develop a more persuasive account of how complexes of practice form and change. In that work he argues that the dimensions of practices that orient activity within a sequence represent one means through which practices hold together. These sequences constitute activity timespaces that are multiple and

interwoven. This activity timespace forms a kind of backbone or temporalspatial landscape that orders social phenomena. He writes:

> "… interwoven timespaces form an infrastructure that runs through and is essential to social affairs." (2010: 65)

The notion of a landscape or infrastructure of temporalspatial connections that underpins or runs through complexes of practices is a powerful one. It helps to get across the ideas that practices are not free to connect with just any other practices and that it is not easy for them to be reproduced in different places, different times, or by different groups. But, moving on a step from Zerubavel's account, it also helps to explain that changes in practices matter for the organisation of activity timespaces that run through social affairs.

However, this conceptualisation is not without its problems. First, it positions the dimensions or features of a practice that orient activity as intrinsic to the practice. Second, it extracts activity timespace as the landscape, or infrastructure of temporalspatial connections and sets it apart from the complex of practices itself. Finally, because it combines temporalspatial connections, it forges an analysis of how temporal connections matter for spatial ones and vice versa, privileging the temporalspatial over other types of connection.

Building on these positions we need an account of how different connective qualities impact on each other. A first step is to recognise that individual practices do not have intrinsic dimensions, features, or temporal qualities; instead they are always bound up with other activity. What look like features of a practice are rather outcomes of a practice's positioning within a complex. Telos / teleology, the future dimension of practice, for example, is not an inherent aspect of an individual practice itself, but a product of interacting, changing and metamorphosing complexes of practices. Similarly, the temporal qualities of practices that Southerton (2006) describes such as periodicity, tempo, synchronisation and coordination, duration and sequence are not the property of an individual practice, but an outcome of the practice complex, which is itself formed and connected in various ways beyond the temporal.

In other words it is not that "The organization, regularities and settings of a practice engender a net of interwoven timespaces…" (Schatzki 2009: 40). Instead it is the landscape of the complex of practices itself and its *inter*connections that define sequences, periodicities, durations and its telos. More than that, all of these temporal qualities depend upon and shape a variety of other qualities of connection including the jurisdictional and, as we discuss in the next section, the material-spatial.

Material-spatial qualities[5]

[5] In this section we take the material-spatial qualities of connection to be a category that encompasses all kinds of physical-spatial connections between practices, including objects, technologies, the built environment and the physical landscape. We are not attempting to demonstrate a particular relationship between the material and the spatial so that we might then analyse the relationship between the material and the temporal, the material and the jurisdictional. Instead we distinguish between our own position and Schatzki's notion of timespace, that positions timespace as necessarily immaterial. We argue that the physical environment, artefacts and tools form part of the 'technological infrastructure' of place that connects practices together. The term 'material-spatial' signifies the physicality of space and includes the range of equipment that might be found in that place.

Materiality has been conceptualised in various ways by different theorists of practice. Whilst 'things' barely feature in the writings of Bourdieu and Giddens, science and technology scholars have demonstrated that physical objects and technologies are mobilised in the doing of practices and are vital to their existence and perpetuation. Shove, Pantzar and Watson's self-described "slimline interpretation of practice theory" (2012: 119) positions materials as one of three constitutive elements of practice (alongside meanings and competencies), in order to emphasise the importance of the material in action. Positioning materiality as a key component of practices however, does not quite capture the connective quality of materials such as infrastructures and built environments which cut across and connect multiple practices at once (a quality that we argue belongs to technologies and artefacts as well). Indeed conceptualising the built environment and networked infrastructure as constitutive materials of practice arguably side-lines their spatial and spatialising properties.

Schatzki's concept of 'material arrangements' (2002) provides a better representation of the spatial quality of material connections between practices. He writes:

> "Human coexistence is inherently tied, not just to practices, but also to material arrangements. Indeed, social life, as indicated, always transpires as part of a mesh of practices and arrangements: practices are carried on amid and determinative of, while also dependent on and altered by, material arrangements. I call the practice-arrangement nexuses, as inherently part of which human coexistence transpires, sites of the social." (Schatzki, 2010a: 130)

The 'hanging together of people's lives' depends in part on interconnected material entities, that is the material arrangements amidst which practices are enacted. Materiality for Schatzki connects human activity. However, conceptualising 'material arrangements' in this way as somehow 'outside of practices' loses something of the constitutive property of materiality as described by Shove et al. So whilst Shove et al. position materials as constitutive of practice and Schatzki positions material entities as part of separate arrangements that connect practices, in our notion of connective tissue we want to capture both the constitutive and connective features of materiality, by positioning it as a material-spatial quality of connective tissue.

Shove, Watson and Spurling's recent (2015) account of infrastructures moves a step closer to our position. These authors recognise that "… practices are partly constituted by and always embedded in material arrangements…" (Shove et al., 2015: 1) and use this position to advance the argument that infrastructures are both shaped by and shaping of complexes of practices. In their examples, road networks and journeys connect emerging complexes of car dependent practices, distributed in time and space. As they explain, car dependence has become integral to a number of practices including shopping, commuting and getting to school, and through an iterative process involving transport and town planning, infrastructural development, and emerging patterns of daily life, material-spatial arrangements and complexes of practice come to reflect one another.

These are useful ideas in thinking about material-spatial changes in the complexes of practices that make up 'hospital life'. We share the central premise that 'things' both constitute and connect practices, but rather than attributing the spatialising properties of 'things' (that is the ways in which objects connect activities) to either constitutive elements of individual practices or to external 'material arrangements', we attribute this material-spatial quality to the connective tissue that holds the practice complex together.

By way of example, we might consider hospital plans and layouts as historical records of the ways in which practices have connected and disconnected. Prior's (1988) account of the design of children's wards from the early 1850s to the present demonstrates how ward layouts reflect changing theories of illness and disease as well as the changing practices of nursing, pedagogy, play and doctoring that characterise different periods in the history of treating sick children. These changing theories, jurisdictions, definitions and practices were materialised in 1900 wards which used glass partitions to isolate child patients from one another and from physical contact with parents, that had the sisters' office in a centralised panoptic location and that had only the bed and no other kinds of furniture in the room. All of these material-spatial qualities reflect and serve to maintain a particular patient-professional relationship and set of medical, nursing and patient practices on the ward.

Whilst Prior's (1988) work is limited in an analysis of plans, and designs cannot reveal patterns of use, it nevertheless points us in the direction of two key ideas. First, materials are clearly constitutive of practices on the ward. Isolation chambers matter for what patients and staff do. Isolation chambers with a single bed mean that children cannot play, while playrooms mean that they can. But beyond this it shows that materials enable and disable different types of connections between multiple activities. The redesign of the built environment is part and parcel of a change in complexes of practices which are also changing in other ways: in response to changing theories of disease, in response to changing professional jurisdictions, in response to changing medical practices and the timings of those practices.

In science and technology studies the case has been made that the built environment pervades and orders daily life, establishing more and less obdurate patterns of social activity (Hommels, 2005). This is just one form of structuring and other qualities of connection such as the temporal and the jurisdictional are no less or no more obdurate or flexible. Indeed each of these qualities (and there could be others depending on the empirical site and question) form an historical layering of the connective tissue which holds practice complexes together. Material-spatial qualities of connection consequently exist alongside and in overlaying and fluctuating relationships with jurisdictional and temporal connections. No one form prefigures or dominates another, rather each exists in relation to one another and all are mutually shaping.

Connective tissue: a method for understanding how complexes of practices change over time

See comment – an alternative title could be 'The past and present of connective tissue: a method for understanding how complexes of practice change over time'

Having argued that complexes of practices are held together by their connective tissue, which has various qualities, we now consider how complexes of practices change. Our starting question was this: how can we account for the changes (and lack of changes) over the last 150 years in the complexes of practices that make up 'hospital life'? To answer this we need to account for changing complexes over time, and for changes in how these complexes are constituted. One response is to suggest that the connective tissue of a given complex of practices, its qualities of connection and relationships between the different types of connection, has a history. What we mean is that past *inter*connections shape qualities of contemporary complexes of practices that matter for the kinds of connections they make and enable in the present and the future. Understanding, in these terms, the connective tissue that holds complexes of practices together allows us to consider the significance of past and present *inter*connections. These lines of enquiry offer an alternative, sociological way of thinking about how past activity matters for present and future social action.

Prior (1988) provides a more classical historical account of the development of the design of children's wards. She demonstrates that the design of children's wards is both shaped by and shapes changing medical knowledge. She describes that in 1852 (when the first children's ward in an English hospital was opened) that there were no special design requirements in that both adult and child medicine were underpinned by a miasmic theory of disease (the idea that prominent diseases of the time were spread by 'bad' or stagnant air). The Pavilion plan of the hospital, advocated by Florence Nightingale (1859), was designed to facilitate the dissipation of miasma and allow the flow of fresh air. "Space in the pavilion hospital is necessarily, then, full of light and air. The use of verandas, to which patients can be expelled during the hours of daylight, facilitates the circulation of air…" (Prior, 1988: 95). The architectural features of openness that allow the flow of air and light are repeated in contemporary hospital design despite medical knowledge having moved on from this theory of disease. The design director for the New Alder Hey Children's Hospital writes: "The sense of openness extends to the clinical areas… to optimise observation and daylight. In the Critical Care Unit this approach has produced an innovative layout with patient bays curved around a central staff base and a rooflight that floods the eight-bed cluster with daylight." (Zucchi 2015: 6).

Whilst medical knowledge and with it the organisation of medical, nursing and administrative practices, has clearly progressed significantly in the last 150 years, many design features remain. According to Prior "… it is essential to underline the fact that these features of physical environment were woven into entirely different discourses on disease and medical practice." (Prior, 1988: 101). To understand why some features of 'hospital life' remain the same, whilst others have changed, we need to turn not just to aspects of knowledge and design, but to a more subtle account of the organisation and hanging together of 'hospital life'.

The shift in medical knowledge from the miasmic theory of disease to 'germ theory' is important but knowledge is only one aspect of the connective tissue that holds complexes of practices together. Instead of viewing architectural features (the isolation cubicle or glass doors to restrict the flow of air and germs) as a material expression of changes in medical knowledge, we would see these developments as part and parcel of changing jurisdictions that connect nursing with practices of sanitation and isolation, and that disconnects it from practices involving socialisation and interaction. We would see that these changing jurisdictions matter for the temporal organisation of activity on the ward (so that nurses spend less time interacting with patients and more time cleaning up etc.) and beyond. These changing jurisdictional and temporal qualities of how practices on the ward hang together matter for and are shaped by the material-spatial qualities imposed by isolated beds and separate wards.

Similarly, jurisdictional qualities change as practices of education, socialisation and recreation fall under the medical and nursing remit and as they do so, temporal qualities change as play and interaction, and not just observation, become fixed practices in nursing schedules. Visiting hours become more flexible as children are no longer isolated from their parents. Instead, parents are encouraged to be with their children to lessen the 'emotional shock of a hospital visit'. The inclusion of 'mother's divans' and 'playrooms' in wards connects medical and nursing practices to practices of parenting and socialising. And as all these examples show, material-spatial qualities do more than just reflect changes in other domains.

The contemporary design of the large glass-sliding doors to patient's rooms in the newly built Alder Hey Children's Hospital embody and reproduce this multiple layering of historical *inter*connections. The doors can be closed completely and blinds pulled down to isolate and facilitate patient privacy.

They can be closed and transparent to enable observation and they can be fully drawn back to open the patient's room into the ward to assist socialisation and interaction with staff and other patients.

Our point is that past *inter*connections shape features of contemporary practices that matter for the connective tissue, its qualities and *inter*connections in the present. The design of the hospital does not simply reflect changes in the complex of practices that make up 'hospital life', rather, the spatial organisation of the hospital is in a recursive relationship with the organisation of activity, but so too is the temporal organisation of the hospital and the organisation of jurisdictions within it. In connecting through the built environment, through patterns of time, and through systems of professional responsibility those multiple *inter*connections become features or characteristics of the complex of practices, the connective tissue that holds practices together.

Finally, whilst this historical layering of *inter*connections, and the development of connective tissue, appears structuring and directive, we stress that human activity remains indeterminate and that past connections and *inter*connections do not directly determine present activity or what will happen in the future. That current activities are indeterminate does not mean that they have no relation to the past. We follow Schatzki when he writes:

> "…past phenomena circumscribe, induce-orient, and underwrite the public manifestation of – but do not cause or antecedently pin down – present activity." (Schatzki, 2010b: x)

In any specific instance, the relation of the past to the present and the influence of past *inter*connections (of the connective tissue) in current complexes of practices is an empirical question. Our aim has been to lay some foundations from which to begin investigations of these relations, and thus of how practices hang together.

Conclusion

We are calling for a version of practice theory which begins with complexes of practices and not 'a practice', and that focuses on relationships between connections and on how different types of connection matter for each other. We have developed an approach which is concerned from the outset with how complexes of practices hang together. Central to our framework is the idea of a connective tissue that both holds complexes of practices together and that is itself an essential feature of the practices involved. With this idea in place it is possible to focus on the different qualities of connective tissue, and the *inter*connections between those qualities, to understand changing complexes of practices over time.

Taking the *inter*connections of connective tissue as a starting point is significantly different to focussing on the constitution and trajectories of specific practices. It also contrasts with work that has focussed on singular dimensions of connectivity: instead we have sought to account for multiple registers of change at the same time. We consequently argue against the conceptualisation of connective qualities as either background or as part of a practice, instead we contend that they are both. Finally we suggest that no particular *inter*connection should have ontological privilege, but rather, that understanding the character of *inter*connection is a question for empirical research.

These ideas point to new ways of thinking about the relationship of the past to the present. In viewing the present as an outcome of intersecting registers of reproduction and change, we challenge the view that the past somehow causes the present, and the view that future trajectories can be anticipated by extrapolating from the past. Providing an exhaustive catalogue of processes by which past

*inter*connections influence present shapes or forms of connective tissue is beyond the scope of this chapter. However, we hope to have demonstrated the potential of such an approach and given some clues as to how it might be developed.

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