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## The Tactual Ground, Immersion and the “space between”

Clare MacCubbaill

I ask whether figure-ground structure can be realised in touch, and if so, how. Drawing on the taxonomy of touch sketched in Katz’s 1925 *The World of Touch*, I argue that the form of touch that is relevant to such consideration is a species of immersed touch. I consider whether we can feel the space we are immersed in and, more specifically, the empty space against which the surfaces of objects, as I shall urge, ‘stand out’. Harnessing M.G.F. Martin’s account of bodily awareness and touch, I defend a positive thesis, *pace* Graham Nerlich on whose *The Shape of Space* (1994) I otherwise rely, both to defend the supposition that empty space can in principle be felt and to argue that touching empty space is not a mere species of absence perception. Along the way, I defuse a causal worry that might be thought to arise in the case of touching empty space.

Key words: empty space; tactual experience; absence perception; figure/ground

### §0. *The Puzzle and the Plan*

In his 1925 *The World of Touch*, David Katz introduces the notion of a tactual ground, remarking: “Rubin certainly would not object if we were to apply his very stimulating reflections concerning visual figure-ground, *mutatis mutandis*, to three-dimensional tactual structures”. He considers the experience of moving a hand over the bristles of a stiff brush:

... you will feel a discontinuous space filled with points, a tactual figure...Between the points there is not “nothing” in a tactual sense, but rather empty tactual space that is not covered by matter. The tactual space is covered discontinuously with the tactual matter of the brush points; the space between forms the tactual ground. (1989, p.61)

Merleau Ponty cites this passage in *The Phenomenology of Perception*, seemingly unfazed (2005, p.368).<sup>1</sup> But there is reason to ask for some further gloss. The notion that empty space could act as a *tactual* ground is puzzling – how can empty space be felt? This is the main question I take up. A subsidiary one is to wonder how touch can realise figure/ground structure as Katz supposes. I answer it only in part, with reference to the peculiar case that Katz isolates – “the space between”.

We can get a sense of how strange it might be to suppose that empty space can act as a tactual ground when we consider an assumption that may well be tacit in some discussions of the bipolarity of touch, namely that the *body* may be understood as the ground against which objects tactually ‘stand out’. Gallace and Spence (2014), for instance, urge:

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<sup>1</sup> See also the brief invocation in Scott (2001, p.157), Ratcliffe (2011, p.421), who cites Merleau Ponty’s formulation, and Sorensen (2008, p.128).

As far as the tactile modality is concerned, common sense would appear to suggest that in order to recognize objects by touch alone, we need to separate them from their background. As soon as an object is placed in our hand, this is physically separated from its background...In this case, a neat separation between figure and ground is provided by a person's ability to recognise their body as belonging to themselves. That is, bodily self-awareness might be considered as constituting the most important aspect of figure/ground segregation in touch" (ibid., p.22)

But Katz's notion of a 'tactual ground' unsettles this thought. If the *body* is conceived as the tactual ground against which objects stand out, how can *empty space* act as a tactual ground, the space the body qua ground occupies (or so we are supposing) itself being full, namely *with the body*?

I detail and offer a partial defense of a thesis which is compatible with the assumptions that frame this worry, but which remove its force. I suggest that we can preserve the idea that the body figures as a 'background' for touch insofar as tactual awareness is constituted by bodily sensation and awareness in a sense to be made plain. But I propose too that we ought not to suppose that all episodes of tactual awareness necessitate the experience of contact or connexion with the body in the sense that would give rise to cutaneous experience, or to experience of resistance. And this is since, as I try to show, such an assumption, when suitably construed, can be found to invite skepticism about the possibility of our tactually experiencing the surfaces of objects *qua surfaces*, surely a datum for any theory of touch – we plainly feel the surfaces of things. But if feeling surfaces *qua surfaces* requires feeling whatever is outwith those surfaces, including sometimes empty regions, in some cases, tactual surface *qua* surface perception requires the tactual perception of empty space. The task of the paper is to offer a sketch of the nature of such perception.

I argue that kinesthetic sensation and awareness in the absence of any noticeable cutaneous stimulation or experience of resistance is typically what is required to tactually experience empty space – here I draw on M.G.F Martin's (1992, 1993) account of bodily awareness and touch which I introduce via a detour through Elizabeth Anscombe's supposition that certain descriptions of bodily sensation are, in a sense to be explained, non-separable. But to this extent I disagree with Graham Nerlich on whose work I otherwise rely, both to motivate the idea that empty space can be felt as well as to make sense of the idea that perceiving empty space is not a mere species of absence perception, as might be supposed. Accordingly, as will become clear, the 'method' of the paper is an orchestrated conversation between these diverse authors, among others.

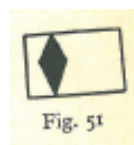
In the first part of the paper (sections §§1-3), I explore whether some features of figure-ground structure, as it is realised in the visual case, may be used as a comparative yardstick for touch and I uncover an ontological preference often implicit in considerations of touch that forecloses discussion of the possibility of 'touching' empty space – a preference that manifests itself in an emphasis on states of contact and events whereby contact is made. In the second part (§§4-7), through a brief consideration of silence, I spell out a causal worry that might be thought to arise in the case of empty space, and I defuse it, first by spelling out a somewhat naïve thought – our perceptual awareness of empty space is purely kinesthetic – and then by reifying that solution by placing a constraint on how what counts as *kinesthetic* awareness should be understood. The result is novel treatment of the possibility of our tactually experiencing empty

regions, and a defusion of the puzzlement which might otherwise attend Katz's invocation of "the space between" as a tactual ground.

### §1. *A Tactual Ground?*

In a later work, *Gestalt Psychology*, Katz evaluates the Gestalt principles he had applied in his own empirical investigations, rehearsing a series of Gestalt 'laws' – principles which organise the visual field into independent units (1951, pp.24-29).<sup>2</sup> These are familiar: lines which enclose a surface tend to be seen as a unit, elements that are in close proximity tend to form groups, as do items that are similar, move simultaneously, have a "common destiny" or seem to "belong" together (p.27). These laws pertain to the determination of visual *form*.<sup>3</sup> A form, however, is not yet figure. A figure is a contrastive notion; it needs a ground. Kurt Koffka uses the idiom of unification and segregation to sort between these two – forms involve unification, figures require segregation (1935, p.129).

This much understood the temptation is perhaps to ask questions of a *genetic* sort. One might ask by what processes the figure comes to be distinguished or segregated from the ground – this is a psychological question.<sup>4</sup> Or it might be wondered what the conditions on the possibility of such segregation are. The Gestaltist project, however, is *descriptive* and phenomenological. Where a figure is apprehended, it is apprehended as segregated from the ground; this is just what it is to be a figure, namely to be so apprehended. Accordingly we might ask: In what ways can the figure be described as appearing segregated and distinct from the ground? Here I take my cue from Koffka. This is a warm up to our translation to the tactual case, for once we have a sense of how visual figure and ground differ, we can try to establish whether there is a case for such differentiation in the tactual realm.



From Koffka (1935, p.181)

Consider the figure above, borrowed from the *Principles of Gestalt Psychology*. We see a leaf-like quadrangular figure within an oblong, or so things may be described. What does this description entail? Says Koffka, that the larger unit does not appear to cease to be where the smaller unit is – it appears to stretch behind it. But, as such, he theorises, the part of the total field that coincides with the area of the leaf-like figure is "*twice* represented in our environmental field" (my emphasis, 1935, p.178); part of the field which is segregated from the rest of the field in *one* representation (the representation of the figure) is connected with it *in the other* (the representation of the ground). This he calls 'double representation', an attendant feature of which is the attribution of the contour, in

<sup>2</sup> It is worth noting that Katz did not regard himself as a Gestaltist.

<sup>3</sup> See Katz 1951, Chapter IX on attributes of forms.

<sup>4</sup> The Gestaltist goal is to articulate laws, not to uncover the processes by which laws are instantiated. For a recent example of the latter see Gilad et al (2014).

one representation, to the figure. The contour is thereby said to have a ‘one-sided function’ (ibid. pp.178-184).<sup>5</sup>

This is one difference distinguishing the figure from the ground - the figure appears bounded, while the ground appears to stretch behind it. Other distinctions are descriptively marked like so: ‘The figure typically appears ‘smaller’ and ‘shaped’, ‘thing-like’ or ‘solid’, ‘harder’, and ‘more impressive’ (p.189). The ground, conversely, seems ‘loose’, ‘stuff-like’ and ‘soft’; its parts seem less ‘articulated’ (p.187). Since some of these terms are tactually suggestive, our parallel is naturally encouraged. But how might it be drawn?

Take first the requirement on double-representation. We can certainly make sense of one tactual medium enclosing another – cotton wool enclosing a jewel say, the contours and shape of which can be felt through the soft mass. Katz calls this *volume touch*. He offers a visceral example: a doctor palpates a patient’s body so as to feel the internal organs through the enveloping tissue. Or think, somewhat differently, of the princess and the pea - the pea is felt despite the bedding she feels it through. But if double-representation is a requirement on figure-ground articulation in touch as it is in the visual case, then it seems that mere enclosing or feeling through in this enveloping and voluminous sense is not yet enough. Why? For it seems that *the place* at which the pea is must also be represented, and *tactually*.

An example helps spell this out. Imagine walking down a flight of stairs. Double-representation, if it applied, would require not merely that one tactually represent the steps on which one treads and their tactile properties, but also that one represent *the space at which the steps are*. But if the steps are, as one might hope, impenetrable, then how? Prima facie, it seems that double-representation applies only unhappily in touch. So might the translation be secured in some other way?

In addition to volume touch, Katz offers a characterization of ‘surface’ and ‘immersed’ touch (2009, pp. 50-52). Surface touch recalls surface colour, first detailed by Katz in the earlier *The World of Colour* and which, he tells us, offers “resistance to the gaze” (1935, p.51) – we cannot see through opaquely coloured surfaces. Analogously, surface touch involves *tactually* experienced resistance: “an obstacle bounded in space, presents itself to our consciousness” and we encounter “a continuous, unbroken palpable area...located at the surface of...the object” (1989, p.50). The surface in surface touch, then, is *tactually opaque*.

Compare volume touch. When the jewel is felt *through* the cotton wool, one doesn’t tend to notice the surface of the cotton wool. But unlike the seeing of something through plane glass, the felt quality of the cotton qua intervening volume may *itself* ‘colour’ the felt quality of the surface of the thing felt – the ‘feel’ of the cotton wool may mask certain surface properties of the jewel. This suggests a sense in which volume touch may *preclude* surface touch, even while it might allow for the performance of what Avrum Stroll calls certain ‘surface operations’ (1988, p.24).<sup>6</sup> A domestic example helps bring this out. Polishing is a surface operation that logically entails touch but which is best carried

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<sup>5</sup> Note this contrasts with duo-formation in co-ordination where the boundary has a two-sided function, see Koffka 1935, p.192. See also Casati and Varzi (1994, pp. 160-161) on what they call ‘border’ attribution.

<sup>6</sup> As Stroll (1988, p.22) indicates, not all operations on objects are surface operations – that is, operations *on* surfaces. For example, slicing an object.

out under volume touch, say with a soft cloth. Nonetheless one feels the surface polished (*pace* Stroll who writes: “there is no way of touching a solid glass marble without touching its surface” (ibid. p.27). This gestures at one way in which volume touch may not wholly capture the kind of touch involved in feeling the tactual ground.

Perceptual transparency or translucency involves *spatial ordering* - in volume touch the candidate figure, is felt through and so behind something else, the candidate ground. Typically, however, it is the *ground* that runs behind the figure, with the boundary or surface apprehended as belonging to the figure not the ground<sup>7</sup> - recall, in vision the contour has a one-sided function. Further, transparency involves the ordering of *two* surfaces in three dimensions both of which occupy or are enclosed *by the same space*. But to be apprehended as a figure is to be apprehended as enclosed by a ground which, qua ground, *is not apprehended as enclosed by anything else*. Accordingly, to be a ground, the tactual surface of the enveloping medium must not merely be transparent in the sense of translucent, rather it must tactually evanesce entirely or become *intangible*. If so however, we are no longer considering volume touch, but rather a form of tactual immersion, or what Katz’s characterizes as immersed touch.

Immersed touch occurs when one’s body (or part of it) is immersed in, or surrounded by, the substance felt – water say. But since the subject is immersed, there is no path *through* space that connects her to the substance felt. Rather, she is *in* it. Immersed touch, then, typically characterises a substance or stuff, not an object.<sup>8</sup> The requirement that the subject be immersively *in* the tactually perceived substance or stuff such that the subject is not path-connected to the substance felt (recall, there is no path through space that connects her to the substance felt) requires that even in cases where the substance felt is comprised of parts that have surfaces – sand, for example, is comprised of tiny grains - there are no operations that the subject can perform on those surfaces *through immersed touch* – the subject cannot polish or scratch them for example. In this sense then immersed touch is entirely ‘figureless’, and, as such, seems apt to characterize the experience of the tactual ground, at least in the presence of a tactual figure. This is what I shall assume.

Some examples. Consider reaching into a bucket of wet sand to find a sea-shell. The hard shell is the felt ‘figure’ to the tactual ground that the wet, uniform sand forms and in which the (reaching) subject is immersed. Somewhat differently, consider reaching into one’s pocket to retrieve keys – the keys are the ‘figure’ to the ground of the pocket-lining, as well as the *empty* space that it encloses.<sup>9</sup> Such enclosure brings back into view the “space between”.

Let us suppose that ‘immersed touch’ involves tactual experience of surface-less substances in which the subject is. There are features of space that answer to that characterization.<sup>10</sup> We are not path-connected to the space *we are in* and surface talk is likewise abject in the case of space. But this suggests some reason for thinking that the kind of tactual experience involved in touching empty space may also be conceived as a

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<sup>7</sup> Though see Casati and Varzi (1995) for counterexamples.

<sup>8</sup> Here ‘object’ picks out solid items that have a more or less permanent shape and which are mostly resistant to deformation and penetration. The notion of an object ‘of perception’ is naturally more embracive.

<sup>9</sup> Thank you to a referee for these lovely examples.

<sup>10</sup> As will become clear, this paper assumes a form of metaphysical substantivalism about space. This assumption is undefended here, but see Author X.

species of immersed touch, assuming, that is, that Katz's taxonomy is correct and exhaustive.<sup>1</sup> Still, even if we grant the notion of a tactual ground is best spelt out on the model of immersion – and this may be disputed - there is compelling reason to question the conceptual extension of immersed touch to *empty* regions, both in cases where empty regions act as the tactual ground (“the space between”), and more generally. Moreover, this is so *even by Katz's lights*.

On Katz's specification of immersed touch, when *resistance* is removed *so is the sensation* or feeling (1989, p.51). But since we experience no resistance in moving through empty space, this should surely throw doubt on the possibility of our feeling it. Below I harness work by Graham Nerlich to dissolve this worry. As I go on to show however, Nerlich's solution leaves the space *in our vicinity* impalpable, with consequences that we should want to waylay. For, as I explain in §3, the possibility of our touching surfaces is thereby undermined. In the remainder of the paper, I mostly focus on the possibility of our feeling empty space.

## §2. *Convoluting Paths*

Space in our vicinity is nearly Euclidean – it is almost flat. But, as Nerlich teaches, things might have been otherwise, with consequences for perception. He asks us to imagine a region of empty space of non-uniform curvature. Assuming it is not radically convoluted, such a region could, he says, in principle be felt. Accordingly, it is not the *ontic* nature of space that makes it intangible, but its *geometric* kind. In *Time and Space*, Barry Dainton explains how so, here designating such regions as ‘holes’:

Like light rays, moving particles follow geodesics unless acted on by a force. Suppose you take a sizeable cube of soft foam rubber and move it into the hole. What would happen? Would it pass freely through? There are no material barriers to prevent it, just air and empty space. In fact, you would very likely feel a resistance. On entering the hole, the particles in the rubber will follow geodesic paths, and so initially they will converge then diverge. But this convergence will be resisted by the inter-particle bonds: you can imagine these electromagnetic forces as akin to elastic bands connecting the particles; as the particles try to converge, the bands have to stretch. Consequently, for the rubber cube to succeed in entering the hole a force needs to be supplied – to stretch the bonds – and hence you feel resistance when pushing the cube forwards”. (2001, p.222)

Dainton imagines that the valency that binds the particles that constitute the rubber are ‘elastic’. To pass through the relevant region then the interparticle bonds would have to contract and stretch, which would require the application of force. Hence, if you were to attempt to force the cube through such a hole, you would feel resistance. Of course, our bodies are material too. But this being so, one might wonder: Does the same thought apply? Dainton supposes it would, and not only would we feel resistance exerted from *without* in such instances (in this case explained *not* by the presence of some material that resists our passage, but by the shape of the region), we would feel it too from *within* – “since stress tensions would be generated among your middle parts you would feel a distinctly queasy sensation” (ibid.). Nerlich, to whom this idea can be traced, provides a distinct analogy. In palpating non-Euclidean regions one would, he ventures, *ache*, though happily he also reassures: “if the curvature were slight, the rheumatism might be easy and bearable” (1994, p.39). Of course, such percepts are imaginary. But for Nerlich they trace

out and are grounded in the actual geometry of space. Just how will become plain as the paper progresses. But what should we suppose of the space we are in?

Nerlich, it seems, implicitly treats the 'feel' of empty space on the model of immersion. In immersed touch, when resistance is removed *so is the sensation* (Katz 1989 p.51). Imagine walking against a blustery wind. One only feels the wind when one feels resistance to one's movement - one cannot feel the air after it has stilled. On Nerlich's understanding, the same is true in the case of near Euclidean space. Since our bodies need not change shape to be and move through the spaces in which we find ourselves, the resistance Dainton hypothesizes is absent; there is hence no queasiness, no aches. Consequently, the empty space in our vicinity cannot be felt.

Significantly, however, Nerlich also places a *cognitive* constraint on the possibility of so feeling. Returning to the case of non-Euclidean holes, he conjectures:

Let us suppose that the changes are noticeable and the effort to move into the hole perceptible too. Then we would *feel* non-Euclidean holes. They would be more or less obstructive some of them downright barriers to progress. We could palpate their contours and ache with the pressures of keeping our hands in the parts of deepest curvature (underlined emphasis added, ibid. p.39)

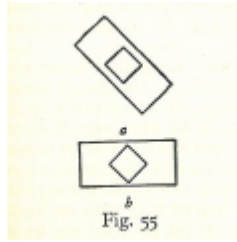
Noticing then is, for Nerlich, a condition on feeling. But in the space in which we are there is nothing to notice – there is no convolution and hence no resistance. But since there is no resistance, there is no feeling. I will question this conclusion later. For the moment, the following may be noted. Recall that for Nerlich what grounds the possibility of feeling is the shape of space. But hence even in the near Euclidean case in which we are, we are in 'contact' with the ground of those grounds, namely, *space itself*, which in our vicinity is flat. And we are in contact with that ground *by being in it*. I return to this point later when I say a little more about the nature of the contact involved; I also reflect on kinds of feeling that Nerlich supposes would play a tactual role in the non-Euclidean case, namely aches and pains. First, an initial way of making sense of the notion of 'touching' empty space.

For Nerlich, we do not tactually experience the empty space in our vicinity. Perhaps then we can elucidate the notion of empty space as a 'tactual' ground, simply in terms of *the absence of tactual experience*, where the peculiar quality of the experience that is absent is *tactual*. This solution strikes me as intuitive. As I show in the next section however, there is reason to think that it invites skepticism about the possibility of tactually experiencing surfaces *qua* surfaces, surely something that a philosophical theory of touch ought to be able to capture.

### §3. *Holism, intervals and sensory atoms*

In §1, I listed a variety of ways in which figure and ground can be described as distinct. For Katz, as for the Gestaltists, our explanation as to why things so appear must be *holistic* (Katz 1951, p.vii, see also Ash 1998), where here holism contrasts with *atomism*. Take orientation in the visual case.





From Koffka (1935, p.185)

As is often noted, the same figure may be seen as a diamond or a square depending on how it is oriented with respect to the ground (in this context construed as a ‘larger figure’ or framework). But on an atomistic treatment that emphasises only point-to-point stimulation, this datum cannot be honoured.<sup>11</sup> How might a failure to appreciate holism shore up in touch?

One obvious sense seems purely artefactual. Katz observes how the discovery of punctiform sense organs of the skin – “individual cutaneous sense spots” - were “realities to which one could cling; their isolated stimulation corresponded to the individual sensations themselves, the “atoms” of sensory experience” (Katz 1951, p.5).<sup>12</sup> But this emphasis is wedded to a further conceptual point, one that arguably reveals an ontological preference in our explorations of touch.

A subject can touch or be touched. In *The Catcher in the Rye*, Holden Caulfield says of Jane:

She was terrific to hold hands with. Most girls if you hold hands with them, their goddam hands dies on you, or else they think they have to keep moving their hand all the time, as if they were afraid they'd bore you or something.  
(2010, p.71)

Holden’s hand is touched. But what can we say of the forms of hand-holding in which “most girls” are said to participate? One, it seems, is passive, the other active or haptic (see Gibson 1962). Both, however, involve sustained contact such that it is true *over some interval* that the subject is in a *state* of touching something. This is one ontological category that theorists of touch favour – states of being in content. Another is the *events* whereby those states come to obtain. Like noticing or winning a race, such events happen *at a time*.<sup>13</sup> With this in mind, here is an attempt at isolating some phenomenology that I take to be a datum for an account of touch and which such an ontological predilection may dishonor, at least when coupled with a further assumption which I detail shortly.<sup>14</sup>

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<sup>11</sup> Christian Von Ehrenfels showed that a melody is not the mere sum of its notes. A tune, for example, is transposable – “the result may be that the original tune has not one single note in common with the transposed tune. Yet the tune itself is retained” (Katz 1951, p.35). See also Ash (1998).

<sup>12</sup> Such an emphasis shores up in discussion of what O’Shaughnessy called the “unit case” (1989, p.42) – momentary point contact.

<sup>13</sup> See Vendler (1957) and also the discussion of the verb categories Vendler identifies in Soteriou (2007)

<sup>14</sup> Given that most accounts emphasise active or haptic touch (after Gibson 1962), what follows might be thought something of a parody of the state of the art. Nonetheless, I persist in my

Imagine the first time that Jane moves her hand through the darkness of the cinema to touch Holden's. Imagine too that she succeeds. Intuitively, part of the tactual experience we imagine when we imagine what such an event must have been like to undergo, is the experience of touching the surface of something – a hand. What is involved in tactually experiencing *the surface* of something? Prima facie, it might be thought that one need only reference the experiencing of the tactile properties of the surface felt – Holden's hand feels *smooth* and *soft*. But intuitively it involves more than that. For surely tactually experiencing the surface of something involves tactually apprehending it as a *bounded* thing, a thing beyond which, or outside of which, *nothing*, in a sense to be made clear, *is felt*. I pick up discussion of the superficial below. But meanwhile notice that a tactual parallel of the diamond/square case is suggested.

Consider two intervals: One in which Jane moves through the darkness to make contact with Holden's hand and another in which she holds his hand throughout the interval. And compare the phenomenology of the experience had at the instant in the interval whereby contact is made with an instant in the interval over which it is sustained. In the first, but not the second, Jane has a tactual experience of *having come into in contact with a surface* even though the tactual properties apprehended at that instant are the same. That is to say, it seems there is a phenomenal contrast in how things seem in both cases where this is not determined by stimulation at an instant<sup>15</sup> But if this is right then perhaps our account of the phenomenology of touching something, a *bounded* thing, must likewise be holistic, where the ground, as in the square/diamond case, plays a determining role. Here a requirement on the possibility of the ground playing a determining role is that we appeal to experience *over an interval of time*. This is one way in which I read the requirement for holism and notice that it gestures at a kind of 'extensionalism' about experience – the thought that experience is not limited to instants, a by no means uncontroversial assumption, though just how it is best accommodated I leave aside (see Phillips 2014, Hoerl 2013, especially p.383, fn,14). The second way brings into view the connexion between atomism and an emphasis on the cutaneous. For consider: if tactually experiencing surfaces qua surfaces involves experiencing objects as bounded in space, and if experiencing objects as so bounded involves feeling whatever is outwith those surfaces, including empty regions, then assuming that we *can* touch surfaces qua surfaces, we cannot fail to feel the empty space in our vicinity however that feeling is to be specified. Here the assumption of extensionalism staves off the general sceptical worry that applies to all experience of change and movement. But endorsing extensionalism does nothing to help specify the character of the *tactual* experience involved in perceiving the 'outside'. This being the case, in trying to account for the phenomenology that is our datum, we should be looking for a mode of tactual awareness that does not involve our 'clinging' to the sensory realities that only cutaneous connection can seem to make manifest. I hinted at a specification above. I can now be perspicuous.

Earlier I used the phrase 'nothing is felt' without gloss but there is reason to think that there *are* tactual experiences of nothing, or, better, of no thing. C.B. Martin provides our parade case:

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analysis since most theorists suppose that haptic touch must involve, in addition to kinesthesia, cutaneous stimulation. For example, Fulkerson (2011, p.493) writes: "Haptic touch is an inherently active and exploratory form of perception, involving both coordinated movements and an array of distinct sensory receptors in the skin".

<sup>15</sup> See Siegel (2010) for an account of the method of phenomenal contrast.

The blind feel for the absence of solid impediment to their progress. The sensation of their hand or limb passing through the space that is empty of such impediment is the desired perception of absence or emptiness in a perfectly straightforward way (1996, p.64).

Such experiences may not display figure-ground articulation. Arguably too they have a certain intensional structure – they are feelings *for* or searches (see Ryle 1951). Still, as I explain §4, there is reason to think that they involve the tactual perception of emptiness. Before that it is worth highlighting an assumption that Martin makes which seems to unsettle the supposition that we earlier attributed to *Nerlich*. This brings into view our first modification of Nerlich’s insight, as well as helping to reify a little further the phenomenology that I have been supposing it is our task to theoretically capture.

Martin tells us that the world “is divided into presences of...entities (individuals, properties, states or relations) and absences of them for the provision of their being and the limits of their being” (1996, p.57). But, as such, it might be thought that a requirement on the tactual experience of surfaces qua surfaces is tactual experience too of the outside *in which they are not* and against which they ‘stand out’ – this is the point I raised in excavating my datum and I owe it to Soteriou 2011.<sup>16</sup> But if that is right then, contra Nerlich, we ought not to suppose that in traversing empty regions, there is an absence of tactual experience *toto caelo*, even in the near Euclidean case in which we are. Rather, it seems that we have some kind of *tactual experience of absence*. In the next section, I pursue this supposition, defusing a familiar worry that at once arises. For assuming that perception requires causation of an appropriate kind, how can one tactually perceive no thing?

#### §4. *Sky and Silence*

One theorist who has not neglected the tactual ground is Roy Sorensen. In *Seeing Dark Things*, he supposes that holes can be tactually apprehended. A materialist identifies holes with their ‘linings’, the material that ‘lines’ the hole (see Lewis and Lewis 1970), but Sorensen advocates a form of immaterialism. Holes are individuated by their linings but are made up of empty space. Hence to feel a particular hole, one must touch *both* the lining and the empty region lined (“feeling holes requires a holistic experience that encompasses transitions between the hole and its host” (pp.128-9)) This thought applies to surfaces too. Sorensen imagines a giant caressing the face of the earth, “much as a blind man explores the face of his wife” (p.130). Feeling the face of the earth isn’t feeling the sky. Rather, the sky is the tactual ground against which the face of the earth ‘stands out’. Accordingly, to feel the surface the giant must feel the sky. Assuming a causal constraint on perception however, we might wonder how.

Sorensen grants the coherence of negative causation. Absences can be causes, he says; they are causally relevant and so are difference makers. Kukso (2006), on whom he draws, explains: When an entity makes a difference, a difference is made between *two* total states of the universe – the state in which the entity is present and the state in which it is absent. So “both the presence and the absence of the entity is required in order to establish its causal relevance” (p.32). How does this translate to the perceptual case?

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<sup>16</sup> The characterisation of counterfactual sensitivity below is also inspired by Soteriou (2011).

Take two possible states of a universe: a room in which a light is either on and off and suppose the switching on and off of the light makes a difference to a subject's experience in the usual way - when it is on she sees light, when it is off darkness. Since this difference is explained by adverting to *both* the presence and absence of light, the absence of light, like its presence, is causally relevant to the character of the subject's experience *at a time*. Of course, all of this assumes that the subject is counterfactually sensitive to the presence or absence of light. So how should we make sense of this notion, and how might it pattern in the tactual case? Here Sorensen's take on silence illuminates.

Silence can be heard, says Sorensen. There is something it's like to hear silence. What's more, we can hallucinate hearing silence:

Consider a man who experiences auditory hallucinations as he drifts off to sleep. He "hears" his mother call out his name, then wait for a response, and then call again. The cycle of calls and silence repeats eerily. As it turns out, his mother has unexpectedly paid a late-night visit and is indeed calling out in a manner that coincidentally matches the spooky hallucination. The hallucinator is not hearing the calls and silence of his mother. (2008, p.269)

A tactual parallel is not difficult to line up. A child skips her hand over park railings. In skipping her hand between the railings, she passes over gaps, the spaces between the railings, where, had something been present – some debris say - it would have been felt. But suppose the subject is caused to undergo an indiscriminable hallucinatory experience. In such cases, though the subject may undergo a phenomenally indistinguishable experience, she is no longer counterfactually sensitive to the possibility of feeling things at those regions – the gaps between the railings. Why? It is tempting to respond on the model of Sorensen: because the subject is hallucinating. But Soteriou (2011) invites us to puzzle further.

Say I am asleep and surrounded by silence. I am nonetheless sensitive to the presence of sound at least insofar as some sounds may rouse me – if a door were to slam, I would wake up. Still, for the most part, I am typically insensitive to the *absence* of sound and this is so even if I may sometimes be woken by certain *changes* in my environment – a radio tuning out, my sleeping partner breaking off their embrace. Our intuitive response as to why positive presences (door slammings) or even changes involving positivities (decouplings) may unsettle while the silent presence of absence does not *is that we are asleep*. But this leaves open what the import of being awake is in the context of absence perception. I gesture at this below. First, a comment.

What Soteriou's reflection shows is that we cannot in general secure the causal relevance of absences merely on the basis of the subject's being sensitive to certain properties at a time, as Kukso supposes. This is since in certain cases the relevant sensitivity is skewed in favour of the positive. However, for the theorist invoking negative causation, recall, the effect must be *symmetrical*. But this in turn explains why the orthodox appeal to hallucination so as to explain failures of counterfactual sensitivity is inadequate. Why so? Because we don't in general tend to think that the possibility of a subject undergoing distinct experiences at a time is best explained by the fact that the subject is *not hallucinating*. Rather it seems natural to think that this possibility is explained by the fact that the subject perceives perceptible properties and objects that are only contingently located in space and time and which only contingently have those properties. Different objects and properties might have been perceived. But on this understanding,

counterfactual sensitivity is not, after all, a monadic dispositional property of a subject - a property that is manifest whenever a subject *not hallucinating*. Rather it is a relational dispositional property, a property that is manifest whenever a subject *is perceptually related to regions* at which perceptible properties and objects are only contingently found.

On this understanding then the subject's being consciously aware of regions *explains* her counterfactual sensitivity – her experience would have been distinct were different properties present or absent at those regions. Thus: *because* the child feels the gaps between the railings, leaves, twigs or any other autumn detritus, had it been located there, would have been felt. But this just seems to recapitulate our worry. For how can we be tactually aware of such regions?

Return to the wakeful. As Sorensen emphasizes, a shell-shocked soldier can wonder if he is hearing silence or has gone deaf. For *prima facie* the phenomenology of being deaf and of hearing silence are the same.<sup>17</sup> Notice, however, that similar problem does not arise in the case of touch. A wounded soldier cannot wonder if he is numb or touching empty space. Why so? In the course of his exposition, Sorensen quotes from H. H. Price.

We are never destitute of tactual data; and very rarely (if at all) of auditory ones, for what we call 'silence' can be heard (1922, p.39, quoted in Sorensen 2008, p.270)

Sorensen notes that “What?” has been scribbled in the margin of his copy of *Perception*. The earlier reader had balked at the latter claim. But the former provides the resources to defuse the causal worry. Recall Martin's confidence:

The blind feel for the absence of solid impediment to their progress. The *sensation* of their hand or limb passing through the space that is empty of such impediment is the desired perception of absence of emptiness in a perfectly straightforward way (1996, p.64).

But if we are never tactually destitute, at least when awake and typically moving – as deVignemont (2014, p.3) notes “complete stillness can make you lose your body, so to speak” – then perhaps, as Martin suggests, tactual sensation or feeling can ground the relevant awareness. I explore this thought in more detail in §5-6. First I sketch how it fits into the picture so far painted.

We have supposed that empty space can be tactually perceived so long as a subject is counterfactually sensitive to regions where tactual material, were it present, would have been felt, where the relevant counterfactual sensitivity involves conscious awareness of those regions. This, however, need not involve appeal to negative causation, for even in the absence of tactual material, the subject is not left tactually “destitute”. Rather, the subject feels, in a sense to be explained, its body pass through empty regions and hence feels, in a *perceptual* sense, those regions. I defend this claim below. Notice, however, that this gives us additional reason to dispute Nerlich's supposition that the space in our vicinity is not felt. For arguably, we feel it, as Martin means to suggest, *by moving through it*. But so too does Nerlich give us reason to suppose that Martin's analysis is mistaken in conflating the perception of the absence of material with the perception of empty space. For although we can pass through regions of space that are empty of tactile *material*, so

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<sup>17</sup> See Phillips (2013) for a critique of this assumption.

too does the shape of space make a difference to our passage. For Nerlich, recall, what grounds the possibility of feeling space is its shape, granting that even in the near Euclidean case in which we are ‘in contact’ with those grounds. But we can now say too in what sense that ‘contact’ should be understood.

Merely being immersed or ‘in’ space, as we are when we are asleep, is not enough. Rather we must be consciously aware of space and moving through it.<sup>18</sup> But if such awareness is grounded in bodily sensation through movement, as Martin supposes, then Nerlich’s supposition that space in our vicinity cannot be felt should surely be revisited. For it seems that what Nerlich has mistakenly emphasised, on the model of contact, is *cutaneous* activation – the feelings or sensations that arise through deformation of the skin. Granted, in moving through empty space *this* aspect of tactual experience is noticeably absent. But this does not yet mean that empty space cannot be felt. This is what the positive proposal I now detail allows.<sup>19</sup> In §6, a refinement of the view is offered.

### §5. *A positive proposal*

Earlier I noted a theoretical emphasis on contact or connection. Yet touch, as a modality, is heterogeneous, perhaps even too heterogeneous (see Ratcliffe 2011 DeVignemont and Massin 2015) – it encompasses the sub-modalities of proprioception and kinesthesia, as well as cutaneous stimulation. But such heterogeneity, *when assumed* - rather than skepticism about the unity of touch - is key to our solution.

In passing through empty space, there is an absence of cutaneous activation, for no *thing* is touched. So here we can agree with Nerlich – there is an absence of *this* aspect of touch. Nonetheless, one experiences empty space kinesthetically. But since kinesthetic sensation is a species of tactual sensation, or so we are assuming, we are thereby tactually aware of empty space. This is what my solution proposes and, in its favour, it explains both Nerlich’s intuition concerning the space we are in *and* his cognitive condition on feeling.<sup>20</sup> For arguably, we only *notice* cutaneous activation.

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<sup>18</sup> See also Sorensen who writes: “a hand suspended in the empty space of the hole does not feel the hole” (2008, p.128). Note that the notion of conscious awareness that is invoked here is supposed to contrast with the kind of putative awareness of space one might have in cases of hallucination. As I have explained, being consciously aware of space is what explains counterfactual sensitivity in the non-hallucinatory case.

<sup>20</sup> The proposal I detail in this paper adverts primarily to kinaesthetic experience or experience of movement, so as to make conceptual room for the possibility of tactual awareness of empty space. This might suggest that I endorse what Anton Ford (2016) has recently designated as a *corporealist* philosophy of action – one which supposes that *actions* are to be identified with bodily movements. In fact, a bare corporealist treatment of action will have difficulty accounting for what I take to be a datum in this paper – namely, that we experience our bodies as bounded, something that is spelt out in the latter half of §6. A full-dress account of the proposal offered here would develop a philosophy of action that can make sense of this datum, and also explain how the simple episodes of movement that I am invoking are best understood as parts of *wholes* which explain why the subject is moving at all (to wit: she is *acting*). For example, in walking to the table to pick up a book that I want to reference in this article, I traverse an empty region. The argument of this paper is that the empty region traversed is tactually apprehended through kinaesthetic experience, suitably understood.

So how compelling is this somewhat naive view? I argue we should embrace it, though only once suitably understood.

The proposal builds on a cleavage between kinesthetic and cutaneous activation. Empirically, however, in addition to receptors in muscle spindles, cutaneous activation contributes to kinesthesia in the form of information from skin stretch. For example, stretch of skin during flexion of the elbow can provide information about movement of the forearm (see Proske and Gandevia 2009). I leave this aside. Much more important is a conceptual point. What we *call* kinesthetic *sensation* is the sensation of *movement*. Take Martin's example of the blind passing their hand through an empty region. What they feel he says is "the sensation of their hand or limb passing through the space that is empty of such impediment" and this, he says, "*is* the desired perception of absence of emptiness in a perfectly straightforward way". But how should we understand the role that such sensation plays in grounding *perceptual* awareness? And what should we make of the fact that it is kinesthetic or a sensation *of movement*? Harnessing a distinction drawn by Elizabeth Anscombe, I take up these questions below.

#### §6. Reification and Anscombe's Distinction.

In responding to one Mr. Braybrook in her 1962 'On Sensations of Position', Anscombe writes:

If we are considering an expression of the form "sensation of X", we need to ask whether the words "of X" are a description of the sensation content, or whether the sensation has some different content and X is what produces or goes along with it etc. The sensation of going down a lift is a sensation of sudden lightness and as it were of one's stomach lurching upwards; "of going down a lift" is not an internal description of the sensation (1981, p.72)

With this in mind, take Martin's description of the blind whereby "the sensation of their hand or limb passing through the space that is empty of such impediment is the perception of an empty region". We might ask: Is what follows the "of" in this sentence – the phrase underlined – an internal or external description of the sensation, that is, of how it feels? I consider the identity claim at the close of this section. First I spell out Anscombe's distinction as I understand it.

*External* descriptions of sensation reference whatever event is conceived as 'producing' or 'going along with' the occurrence of the sensation, but where it is assumed that the relevant sensation *can be described some other way*. For example, in the case of the lift, the sensation of "going down in a lift" can be described some other way – as a sudden lightness, the lurching of one's stomach upwards. Such descriptions are internal, while "going down in a lift" is an external description. The question is: Can the sensation that attends the passing of one's limb through space be otherwise described? That is, can we describe how it feels to move one's hand or limb through an empty region *without* referencing the event that, on the face of it, produces or goes along with the relevant feeling? What would that require?

One requirement would be perhaps that the relevant sensation or feel could vary in its quality or intensity. Feelings of lightness, for example, seem to be describable in terms of

their onset or strength, just as a headache can. But it seems odd to suppose that sensations of movement can be so described. Rather we are apt to describe *the movements themselves* – one may move suddenly say, quickly, or with effort. Second, and perhaps more importantly, no reference would need to be made to things ‘outside’ the experiencing subject. But of course Martin’s description *does* refer to something outside the experiencing subject; just a lift is something outside the subject, so is the space in which the subject is and moves through, at least once suitably understood. I return to this point below.

Ostensibly, then, it seems that the relevant sensation - the feeling of passing one’s limb through an empty region - *cannot* be otherwise described. Might this lead one to suppose that there are *no* sensations of movement after all? This is not what Anscombe says. Rather her claim is negative. She claims that sensations of movement are not *separately* describable. They cannot be described independently of a description of the event with which they unfold. But, perhaps surprisingly, this suggests that we should resist reading Martin’s “of X” as an *external* description of the sensation felt.

Sensation that can be externally described can be described *some other way*. Arguably that is why it is even possible to speak of such sensations as being produced or going along ‘with’ other events – those that ostensibly produce the sensation. For it might be thought that implicit in such talk is the reckoning that it is possible to cleave apart the sensation from the event ‘with which’ it putatively ‘goes along’. But in the case we are considering there *is* no ‘production’ or ‘going along with’ if by that it is assumed that there is some sensation that it is possible to speak of as produced by that event or as going along with it, where the *it* is separately describable. Rather the feel of passing one’s hand through space cannot be separately described at all - one can only describe the phenomenology by *describing the event*. But since the description is in this sense non-separable, *nor can it be external*.

In what follows I take it that Anscombe’s observation is right so far as descriptions of the phenomenology go. Still, there are two features of her account as I have described it, that need further gloss: non-separability and internality

Anscombe allows that there are *non-separable* internal descriptions of sensations. But if the internal/external description distinction spins on the possibility of sensations being separately described (*viz.* as being either internally or externally described), then where such sensations are only non-separably describable, why class the relevant descriptions as *internal* at all? Anscombe does not, it seems, speak to this issue. Here then is one suggestion:

Sensation is felt ‘*within*’ our body even while non-separately describable. Hence the legitimacy of designating the relevant descriptions of sensation as *internal* – as descriptions of what is felt to be within one’s body. Though I have cast this in the spirit of Anscombe, here I follow M.G.F. Martin (1992, 1993).

For Martin, sensations that are *bodily* have a certain character – they are felt to be ‘within’ one’s body. For sensations to be felt to be ‘within’ however, a subject must be aware too of a region of space ‘without’ the body where sensation *cannot be felt*. Call this region unfelt space. Space, then, enters into the character of bodily experience since in experiencing bodily sensation as ‘within’ and hence – as I am using the term – as *bodily*, a subject experiences her body as bounded and so as occupying a space that extends



beyond it, space which *is not felt in the same way*. This is a *structural* requirement on experiencing sensation as ‘within’. How might this apply to kinesthetic sensation and awareness?

In kinesthetic awareness, one is aware not only of one’s body but of its *moving*. While proprioceptive awareness involves awareness of the spatial position of one’s limbs, kinesthetic awareness involves more than this. It involves awareness of the *displacement* of one’s body and hence of a region through which movement occurs. But, of course, whatever awareness one has of such a region, it cannot be *through* bodily awareness, for otherwise the distinction between ‘within’ and ‘without’, necessary for the awareness of bodily movement, would collapse.<sup>21</sup> I spell this point out in more detail in the section that follows.

This accounts for the *internality* of the description of the sensation. How can we make sense of the notion of *non-separability*? For Anscombe, inseparability is a relation between *descriptions*. When one describes how one feels, one describes an event or state of affairs, but not one that can be found to ‘go along with’ or ‘be produced by the event’ such that the sensation can be described some other way. For when sensations are genuinely non-separably describable, there is no other way. I suggest we can apply this to the present case as follows:

When a subject is touching something, there is a way its body is. And, likewise, when it is touching nothing. But, as such, it might be thought that *what it is like* for the subject to be in that state is not separably describable from a description of how her body is disposed with respect to that thing *or* to things that are relevantly like that thing.<sup>22</sup> I suggest that M.G.F. Martin’s template model of touch helps make sense of this.

For Martin, feeling how things are ‘within’ one’s body provides for awareness of how things are ‘without’ the body. The structural feature of bodily awareness detailed above then also provides for touch. An example. Consider the sensation one feels in one’s fingertip when it presses against the rim of a glass. It feels, says Martin:

...to be within one’s body and at the limits of one’s body, at the skin. One also feels one’s fingertip to be pressing against an object, one which resists the further movement of one’s finger down through the rim. (1992, p.204)

Here the spatial location the sensation is felt to have - it is felt to be *within* one’s fingertip – provides for awareness of that which is *outwith* one’s body – the rim – the material properties of which resist one’s movement. In experiencing resistance then, one tactually apprehends those properties, for one presses and one’s finger is not merely deformed *but does not move*. In this way, bodily awareness is said to provide for touch or to be a form of tactual awareness (Richardson 2013).

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<sup>21</sup> This then is consistent with Anscombe’s insistence that knowledge of movement is non-observational. This is since the within/without distinction that is required for experience of sensation to be bodily, to be felt as *within*, pertains to the structure of the experience and *not the content*. Cf. Harcourt 2008.

<sup>22</sup> A full-dress account of such tactual descriptions – descriptions as to how things tactually appear – would allow for such comparisons. For example, we might say that feeling a nut on one’s palm is like feeling a pebble on one’s palm. I leave this complication aside. Note too that there is nothing it is relevantly like to feel empty space.

This is one case Martin has us consider. Here's another. One rests one's five fingers on the rim of the glass. In this case, one's body is a template insofar as the spatial configuration of one's body mirrors or matches the spatial configuration of the glass with which one is in contact. But in this sense awareness of how one's body is arranged in space is concomitantly an awareness of a *distinct* mind-independent property – not the nature of the materiality of the glass but its shape.

Martin then implicitly sorts between two distinct modes in which one can have perceptual tactual awareness, through<sup>23</sup> bodily awareness, of the external world.<sup>24</sup> First, one can have awareness of the shape of an object through awareness of the spatial configuration of one's body. Second, one can have awareness of the material composition of an object or, minimally of its materiality, through the experience of felt resistance in trying to pass through or manipulate it in some way. The temptation is perhaps to conflate these two, but once it is realised that impenetrability, a property of things, does not yet *entail* experience of resistance (Katz *ibid.* p.51), they can be cleaved apart - after all, one may lightly place one's fingers on the rim.<sup>25</sup> But with these two modes distinguished, the conceptual resources for 'touching' empty space can, I think, be assembled, and, at least in certain places, Martin's text can be read as sympathetic to this thought. For instance:

We are embodied in a world which contains potentially many other bodies. We can come into contact with other bodies, and they impede our movement and distort our shape. Such physical impingement on us is reflected in the awareness we have of our bodies. One is aware when one's movement is impeded, and when one's skin is in contact with objects or distended by them. In being aware of one's body, sensing how it is disposed, where it can and cannot move, and where one has sensation, one can attend to the objects in virtue of which these are true. One measures the properties of objects in the world around one against one's body. So in having an awareness of one's body, one has a sense of touch (my emphasis, *ibid.*, p.203)

Granted on first reading, it might seem that Martin's template model of touch applies only to objects, but if what we are supposing is on the right track, the scope of the model is wider. For consider: By sensing where one's body *can* and cannot move, one can attend to the objects *in virtue of which this is so*. When we freely move, however, we do so in virtue of our moving through space that is "empty of impediment", space which, as I claim, we are tactually aware of in having non-separably describable bodily experience.<sup>26</sup> But, if correct, this finally allows us to make sense of the identity claim that C.B. Martin urges. The sensation of one's hand passing through empty space *is*, he says, the desired perception of empty space. And this is since, we can now conclude, awareness of the movement of one's body through space – kinesthetic awareness - *is* a form of tactual awareness of that region, where here the relevant awareness is understood to be *bodily*.

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<sup>23</sup> See Richardson (2013) for an explanation of how to read 'through' here.

<sup>24</sup> Critics of the template model have perhaps conflated these.

<sup>25</sup> Critically the claim here is not that there is *no* resistance - the rim must activate cutaneous pressure receptors in order to be felt - but only that what Katz calls *active resistance* is not experienced. Active resistance is the phenomenal marker of the presence of impenetrability and is felt whenever pressure is exerted beyond a certain threshold.

<sup>26</sup> As will become clear shortly, the 'in' here should *not* be read as suggesting that the relevant sensations play an epistemic role that *tell* one that one is moving through empty space.

So let us revisit Nerlich in light of all this. Recall that the kinds of bodily sensations that Nerlich supposes would render the contours of non-Euclidean spaces sensible or felt are aches and pains (“if the curvature were slight, the rheumatism might be easy and bearable” (1994, p.39) But such sensations are often cast as *intransitive* insofar as they don’t represent one’s body as being some mind-independent way. As Richardson (2013) explains:

Take, for example, a headache. There is no mind-independent way my head seems to be, just in having a headache. In virtue of having a headache, I am not in a state that represents my head as being some mind-independent way. There is a less committal description of the phenomenal character of this sensation than one that refers to a state representing a mind-independent quality, such as being damaged. One less committal description would just be that my head *hurts* (p.141).

But Nerlich’s ‘tactual’ sensations are no more committal. It is hence not clear why *those* feelings should serve to ground genuine tactual perception rather than some unspecified kind of bodily experience *that* one is in regions that are variably curved. Genuine tactual experience however requires transitive sensation – sensation that is committal about the mind-independent way one’s body is and hence, the world.

Nerlich, however, implicitly endorses a model of tactual experience on which the transitivity of tactual sensation can seem to be accommodated by sensations *which are nothing more than signs of*, or for, the presence of something outwith the body – something that can be externally described and with which those internally describable sensations (aches and pains) ‘go along’. But, on such a model, the mind-independent way one’s body is arrayed in space, even in cases where it is touching nothing *cannot yet be recruited to explain tactual phenomenal character*. And this naturally explains why, for Nerlich, the empty spaces in our vicinity cannot be felt. We sail through empty regions in our vicinity, without pain and without queasiness. But if what I have argued is on the right track, this does not yet mean that empty regions are not felt, at least once suitably understood.

In the penultimate section, I consider an exegetical worry that might be thought to arise from my use of the M.G.F. Martin’s template model, as well as an objection.

### §7. *Polo Mints and Unfelt Space*

For Martin, objects and the space in which they are are *visually* experienced in the same way – his idiomatic example is the polo mint. One sees the mint and the hole. But bodies and the space in which they are located are *not* experienced in the same way. Why? Because to experience one’s body as bodily one has to experience it as located in a space *which one does not feel in the same way*. Given that Martin’s account shows how touch is constituted by bodily awareness however, this might lead to the following mistaken extrapolation: Objects and empty space are visually apprehended in the same way – they are *visible*. But objects and empty space are not tactually apprehended in the same way – objects are felt, empty space is not.<sup>27</sup>

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<sup>27</sup> This seems to be the assumption of Scott (2001, p.157)

In fact, Martin does not speak to this issue. He urges only that touch is grounded in bodily sensation and that bodily sensation involves awareness of space without the body, space that is not felt in the same way. Here, of course, he means ‘feeling’ in a bodily sensation sense, *not* in a perceptual sense. Why so? For if one did feel a region in this bodily way, one’s body would be felt to extend to that region. Granted, it might be insisted that the examples Martin appeals to invite this exegetical parallel - viz. comparing the visual experience of a Polo mint with tactual experience of an empty glass - but emphasising this commonality seems to me to miss a critically relevant point: the space outwith the body, awareness of which grounds the within/without distinction, is neutral between objects and empty space – it is simply unfelt space, space that is not felt in a bodily sense. But given that bodily sense provides for touch this does not preclude feeling empty regions. When? As I have urged, *when moving through them*. That this is so however brings into view a further, somewhat intuitive worry.

When one’s body moves through empty space, the relevant space is *not*, after all, empty since, on the view I have been defending, in order to feel empty space, one must feel one’s body to extend to that region – this follows from the template model. But, if so, the relevant region is full!

This echoes the concern at the opening of the paper: If *the body* is conceived as the tactual ground against which objects stand out, it is hardly surprising that we may have difficulty in appreciating in what sense empty space may act as a tactual ground, the space the body qua ground occupies (or so we are supposing) itself being full, namely *with the body*. But we now have the conceptual resources to address this assumption.

The body acts as the *background* in touch – this is what the template model teaches. However, qua background, the body can nonetheless yield tactual perceptual awareness of empty regions which, in certain cases – specifically those of surface qua surface perception – can thereby act as the tactual ground against which a tactual figure may stand out. Importantly here the requirement for extentionalism must be recalled. In order to be tactually aware of empty space, *one must move through it*, which takes time. Hence, even while it may be true that when moving through a certain empty region, one’s body fills a *sub-part* of that region at an instant, it is not true, at every moment within the interval through which one traverses a region, that one fills the entirety of that region. Otherwise, one would not be moving through it.<sup>28</sup>

### §8. *In nuce*

I have suggested that one can be tactually aware of empty space even in the absence of noticeable cutaneous sensation, where this involves moving through it. I provided some motivation for thinking that this must be so. Many of the surfaces we meet with in touch are met with through empty space but tactually apprehending the superficiality of those surfaces, and not merely the tactile properties that those surfaces have, involves apprehending the empty space ‘outside’ those surfaces, regions where those things are not.

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<sup>28</sup> It is important to note that relative velocity will also play an important role here. For if movements are progressively slowed down, the sense of movement will transmogrify into a sense of changed bodily position (compare the first and second hands of a clock).

At the outset I iterated a number of features of figure-ground structure in vision that might be found to shore up in touch. I listed a series of descriptive terms, some of which encourage the parallel - figures seem 'solid', 'hard', 'impressive'; grounds appear 'soft' and 'loose' – and I explained how such a translation might be effected. While surface touch seems apposite for figures, immersed touch best captures the notion of ground. In the case of empty space, however, I urged that we appeal both to the absence of surfaces at those regions and – drawing on Nerlich - to properties of those regions themselves, namely their shape.

In closing, however, I submit that some resistance to this proposal is likely to remain (if not, I hope trenchantly so!) This is not only because of the reliance on a certain metaphysics of space, but just as a matter of semantic principle. After all it might be objected, very naturally I think, that it just doesn't flow from what we *mean* by "touch" that we can touch empty space.

I think we should admit this much. We should happily grant that empty space cannot be "touched", where here the notion of to "touch" something captures the Nerlichean intuition that there is no experience of cutaneous contact with the body nor active resistance, however this is to be explained. But our words are not monolithic, and the word "touch" can admit numerous uses, some less covert than others. Katz writes that the "space between" is not "nothing" in a tactual sense. If what I have argued is on the right track, I think we can be less circumspect: empty space is felt.

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