

Passions before Passivity, Actions after Self-Certainty  
Binding the Philosophy and Neuroscience of Affects

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## ABSTRACT

This thesis examines the turn to affect in both philosophy and neurobiology beginning in the 1990s. Both fields shared themes of a return to emotional aspects of the body; a rapprochement between natural sciences and humanities; and rethinking of causality, intentionality, identity and temporality. Yet the field remains contentiously divided. Disputes arise mainly from differences in understanding of key terms (notably between affect and emotion) and the place of the intentional subject within expanded, flattened conceptions of agency, causality and the animate/inanimate, differences ultimately between implications in and overcomings of past metaphysics of coupled opposites and the philosophy of the subject. Implication because conceptions of affect have been historically dominated by the active and passive understood as a doing and being done to; affects then become quantitative, external impositions disrupting purely self-present subjects requiring philosophies of defence that privilege sameness over difference. Whereas overcomings posit a pure activity or passivity, simultaneities of active and passive, or a non-temporal ‘before’ prior to activity/passivity. This thesis explores the alternative possibility that ‘active/passive’ never really translated the Greek ποιεῖν/πάσχειν that is its root and root of affect as translation of πάθος.

The thesis is in two parts: in philosophy, I uncover a broader sense of πάσχειν as bindings of implicit differences prior to any explicit separation of agent and patient. Meanwhile, in contemporary neuroscience, action is being redefined through ‘prediction processing’ theories where error as the difference between world and an organism’s implicit models of that world motivates action. Affective neurobiology then describes this radical contingency of expectation and actuality in specifically affective terms as the organism in its self-difference.

I conclude by binding the radical transformations in active and passive each turn effects to understand affect still as a pairing of active/passive but where these terms signify not an oppositional agent acting on patient, but as the binding of contingent, implicit differences with their making explicit through the affections of error in the organism’s necessary difference and togetherness with world.



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I would like to dedicate this thesis to the memory of my sister, Liz, who died in my first year of research, 2015.



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## INTRODUCTION

Today fields as diverse as philosophy, aesthetics, anthropology, history, neurobiology, and archaeology all agree that we need to be affected, whether that ‘we’ is the brain, the body, or materiality itself: body and world touch each other and themselves in reciprocally affecting encounters while world affects itself in an existence unaffected by thought.<sup>1</sup> But few can agree on what this ‘to affect’ means. This thesis examines the recent turn to affect in the humanities and neurobiology. Despite these turns occurring independently, in different disciplines, three themes became common to both: a return to the emotional body; a rapprochement between humanities and natural sciences; and a renewed engagement with materialist philosophies and questions of simultaneity, causality and temporality. Throughout the varying use of affect, what remains consistent is a concern with relationality and reciprocity, of affects as a ‘between,’ simultaneities, entanglements or bindings and not simply a synonym for the inner emotional experience of a purely self-present human subject. Instead, affect lies at the heart of material change as the means by which space-time-matter relations differentiate.

The thesis makes three main claims: first, that affect has been historically understood as perturbing, quantitative, external intrusions which need to be mechanistically discharged. This leads to a privileging of identity over difference and to philosophies of defence that achieve this discharge through reversals to privileged poles of coupled opposites (from passivity to activity, recipient to giver, slave to master). This serves to reduce disturbances of otherness by recognising them in advance of any possible affection as movements on a known scale from what is present to its opposite, hot to cold, orderly to disorderly. Affect is then reduced to quantity so that any affect is merely increase or decrease in some pre-existing something (such as energy) rather than any radical qualitative transformation. The ‘active’ often becomes identified with reason that must ‘master’ its affects, often by comparison to a ‘purely active’ entity such as a God or a transcendental. Passivity becomes something to be avoided, or at least mastered and reversed, and philosophy becomes a desire for sameness arising from fear of separation that ultimately results in it being understood as the preparation for the ultimate separation, death. Irigaray identifies this move as a ‘masculine auto-affectation’ and shows how this metaphysics had produced a place for woman in advance of her speaking,

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<sup>1</sup> Notably Meillassoux: ‘the discovery that the world possesses a power of persistence and permanence that is completely unaffected [*n’ affectait*] by our existence or inexistence [...] a world that is essentially unaffected [*inaffecté*] by whether or not anyone thinks it.’ *After Finitude*, 116.

with and through her silence, as merely the opposite of man, aligned with matter, passive, body in their inferiority to the privileged ‘masculine’ poles of form, active mind.<sup>2</sup>

Second, that the turn to affect presented an alternative to this economy: in philosophy in the positing of a non-temporal ‘before’ that precedes active/passive and other binaries or bindings of digital with analogue. Within neuroscience it tends to be an exclusion of the passive – for example, perception is now conceived as purely active – or a radical collapse of cause and effect and the simultaneity of active and passive. The alternative explored here, however, is whether we would do better to uncover a meaning and economy of affect, still understood as a binding of active/passive, but where these terms are radically reconceived and not as simple opposites. Specifically, the philosophy section traces the roots of this binding to the ancient Greek coupling *ποιεῖν/πάσχειν*. Affect is then located as the latter half of this coupling through its Latin translation of the deverbative noun *πάθος*. In this translation, this verb and noun becomes dominated by a sense of ‘passivity’ understood as being-acted-on from an external agent. I instead uncover a broader sense of the verb as bindings of implicit differences prior to the separation of agent and patient. As to the other of the coupling, ‘activity,’ in contemporary neuroscience actions are today being reconceived as the felt experience of differences between organismal expectations and world.

Finally, these two transformations are combined in a conclusion that aims toward a conception of affect understood as the togetherness of bindings of implicit differences with the errors that manifest such bindings. The aim is to further manifest this alternative, less violent discourse on affect that can accommodate both philosophical and neurobiological perspectives as well as rethink the relation between the two.

#### **COMMON THEMES IN THE AFFECTIVE TURN**

The turn to affect in philosophy can be read as an attempt, in Neurobiology, of overcoming the perceived neglect of emotions and affective phenomena of behaviourism and cognitive science; in philosophy, to return to the body after the perceived privilege given to language and neglect of the biological by social constructionists. Different causes, although similar neglects, led to shared themes and a turning toward one another.

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<sup>2</sup> Irigaray, *In the Beginning, She Was*, 148ff and Chapter 2.

*Return to the body*

The renewed interest in the body included a rethinking of all aspects of the body's immanence in the world, its 'entanglement' as Hodder calls it, 'compounded by conceptual abstractions and bodily resonance, a reverberation between mind, body and the world of things.'<sup>3</sup> It sought to understand how the 'outside' realms of the pre-/extra-/para-linguistic intersected with the 'lower' or proximal senses (such as touch, taste, smell, rhythm and motion-sense, or, alternately/ultimately, the autonomic nervous system). Neurobiology also sought to extend the work of ethology to include the 'black-box' of the neural systems which partook in the social and ethological.

There was also the emergence of the category of the 'nonconscious' body, differentiated from the unconscious and often working to critique Freudian psychoanalysis. As Massumi argued, unlike the unconscious, the nonconscious is not subject to repression and could equally apply to nonorganic matter. The nonconscious was also foundational to the neurobiologist Damasio's account of the homeostatic affects that comprise the nonconscious 'proto-self' on which conscious and unconscious selves are built.

The body in its relation to its environment will be consistently affirmed as plastic, a concept reinvigorated by both Malabou's philosophy and Neuroscience's continuing discoveries of the extent of neural plasticity.<sup>4</sup> This plastic body was then taken up by historians who no longer considered the body 'as an "instrument" used by an agent in order to act,' but as the place where 'mental, emotional, and behavioural routines are inscribed.'<sup>5</sup> Smail's *Deep History and the Brain* affirmed the fact that bodies or physiologies changed less frequently than desired by social constructivists: 'civilisations did not, could not, invent new forms of body chemistry. Instead civilisations, found new devices for exaggerating existing neuro chemical states.'<sup>6</sup> Smail therefore introduced the concept of the autotropic or teletropic to show how the ways in which we alter bodily states is itself a reaction to the environment. This provided the necessary link between the social and physiological.

This new body also produced radical new perspectives on the relation of emotion to reason, most notably from neurobiology. Damasio's *Descartes Error*, for example, argued that emotion is central to rational decision-making, evidence for which was provided by

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<sup>3</sup> Hodder, *Entangled*, 206.

<sup>4</sup> See Malabou, *Future of Hegel, What Should We Do with Our Brain?*

<sup>5</sup> Spiegel, *Practicing History*, 19.

<sup>6</sup> Smail, *Deep History*, 200.

experiments with brain damaged patients. The necessity of an emotional intelligence was foregrounded in the humanities too. The archaeologist Chris Gosden, for example, proposed ‘a conception of human intelligence which includes thought and the emotions, and the links the body has with material culture.’<sup>7</sup>

But this ‘body’ was not solely a human or animate body: there was a radical redrawing of the boundaries of bodies. No longer merely anthropomorphic, neurobiology’s claims of the evolutionary structures of the brain that share similarities with all mammals, as well as the focus on the molecular transmission of chemical flows radically challenged the distinction between human and animal and animate and inanimate. Bodies became redistributed bindings of human/machine/inorganic with affect implicated as their interaction and affect took its place in posthumanism and ‘the nonhuman turn.’<sup>8</sup>

*Rapprochement between humanities and natural sciences*

In humanities, the redefinitions of bodies and their interactions came from a renewed enthusiasm for the natural sciences, no doubt a result of its shift toward a paradigm of plasticity and epigenetics, ending the period of enmity during its deterministic genetic paradigm. Neuroscience’s essentialism of plasticity and epigenetics allowed for collaboration between disciplines on the reciprocal relation between culture and the biological. It proposed necessary limits to the wild ‘absolute plasticity’ of social constructionists and offered a way out of the aporetic alternative of homogenizing binaries or trivializing infinities: the body became a more stable site of inscription around which change occurs.

Neuro-plasticity was central to Smail’s ‘deep history of humankind’ that bundled together the Paleolithic and the Neolithic together with the ‘Postlithic’ through a focus on ‘biology, brain and behaviour.’<sup>9</sup> He argued that ‘the new science of the brain cannot make sense without history.’<sup>10</sup> What made deep history intelligible, Smail argued, is the brain because ‘many features of the brain and brain-body chemistry are deeply rooted in our evolutionary history and were put there by natural selection.’<sup>11</sup> The brain then becomes as much a cultural artefact as a biological entity, ‘a dynamic co-evolutionary process of deep enculturation and

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<sup>7</sup> Gosden, *Aesthetic, Intelligence and Emotions*, 33.

<sup>8</sup> Seigworth, Gregg, *Affect Theory Reader*, 6.

<sup>9</sup> Smail, *Deep History*, 2.

<sup>10</sup> *Ibid.*, 200, 202.

<sup>11</sup> *Ibid.*, 7.

material engagement.<sup>12</sup> This was a reciprocally affecting engagement: ‘by bringing the neurophysiology into history, we also bring history to neurophysiology.’

### *Renewed materialisms*

Finally, this concern with renewed bodies as differently distributed plastic composites of human/inhuman, inanimate/animate, and cultural/biological necessitated a renewal of materialist philosophies that penetrated not just philosophy but art/aesthetics, archaeology, anthropology, and history. These ‘renewed materialisms’ affirmed Raymond Williams’s necessity of always ‘moving beyond one after another “materialism” ’<sup>13</sup> and sought to continue the arguments of post-structuralism and social constructionism whilst insisting that, as Coole and Frost in their summary of new materialisms put it, ‘the material realm is irreducible to culture or discourse and that cultural artefacts are not arbitrary vis-a-vis nature.’<sup>14</sup> Such a move aimed to avoid ‘dualism or dialectical reconciliation by espousing a monological account of emergent, generative material being.’<sup>15</sup> Materiality thus conceived is ‘always something more than “mere” matter: an excess, force, vitality, relationality, or difference that renders matter active, self-productive, unpredictable.’<sup>16</sup> In neuroscience, the search was for a new field, that of ‘affective neuroscience,’ that would combine the evidences of ethology, anthropology with that of neurobiological understandings of emotions against the ever-present straw man of ‘Cartesian dualism.’

In these renewed materialisms the question of temporality re-presented itself. Neurobiology’s affirmation of fragmented, nervous organisms of differential networks gave rise to the problem of how an organism successfully affects the world and itself, how it manages to effect a simultaneity and work in it to achieve its goal. A key role for emotionality as integrative occurs in theories of keeping time in the neural that leads the likes of Damasio, LeDoux and Panksepp to develop their own conceptions of brain-body-world simultaneity. For Sedgwick and Frank, drawing on Tomkins, affects draw ‘a boundary line or barrier, the “introduc[tion] of a particular boundary or frame into an analog continuum.” ’<sup>17</sup> Similarly, Massumi, citing Whitehead, argues: ‘affect is not in time, it makes time, it makes time present, it makes the present moment, it’s a creative factor in the emergence of time as

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<sup>12</sup> Smail, *Deep History*, 45.

<sup>13</sup> Williams, *Problems in Materialism and Culture*, 22.

<sup>14</sup> Coole and Frost, *New Materialisms*, 27.

<sup>15</sup> *Ibid.*, 8.

<sup>16</sup> *Ibid.*, 9.

<sup>17</sup> Sedgwick and Frank, *Shame*, 520.

we effectively experience it, it's constitutive of lived time.'<sup>18</sup> Affect is thus often thought prior to time and space, or as that which produces time and space, to enable a greater attention to the transformations involved in the dynamics of materialization that the dependence on space and time often occluded. Within many past thinkers, time acted as the silent differentiator of affects but today the question is posed: what if it is the reverse, what if affects differentiate time?

### **AIM, METHOD, STRUCTURE**

The task of this thesis is therefore to further develop the difference the turn to affect in both neuroscience and philosophy produces and the reasons for its resistance and critique by manifesting residual dependencies on past metaphysics.

The thesis is split into two sections governed by the two main fields in the 'affective turn': philosophy and neurobiology. These sections can be read in either order and do not refer to each other. The aim was to draw out their specificity and independence from each other as well as question the extent to which science and philosophy can remain independent. The philosophy section begins with the contemporary to trace its key concepts backwards to a time before a metaphysics of coupled opposites and uncover a broader sense of πάθος and hence affect. The neurobiology section goes in the reverse direction by starting with the foundations of neurology in Galen to draw out its dependence on past metaphysics and the challenges contemporary neurobiology poses to this foundation. The reasoning for this reverse chronology was to present a kind of circular narrative: read linearly, in whichever order, the trajectory would be from modern to ancient, ancient to modern. This also aimed to better manifest the simultaneous dependence on past metaphysics with the challenge, implicit or explicit, to that metaphysics.

From my own perspective, I found it easier to exclude the biological from the philosophical, the physical from the metaphysical, no doubt mainly because my field is philosophy, but also perhaps because it is easier to show an implicit dependence of neuroscience on past metaphysics rather than the reverse (is there an implicit dependence on the biological in philosophy yet to be manifested?). One reason for this might be that the biological is subjected to the conceptual, a purely passive nature awaiting the active formation by cultural concepts imposed on it.<sup>19</sup> Indeed, one aim of the thesis is to show how

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<sup>18</sup> Massumi, *Politics of Affect*, 61.

<sup>19</sup> Malabou of course recognises this in her *One life only: Biological resistance, political resistance*.

neurobiology actually manifests a resistance in the biological that necessitates another relation of culture to biology other than the traditional active/passive of hylomorphism.

Whilst humanities scholars cite and critique much neuroscience – even if a relatively small and consistent subset – the same is less true in neuroscience: despite their interest in epigenetic and plastic bindings of culture and biology, the extent of their engagement with cultural perspectives is typically with other scientists rather than any critical engagement with the anthropological discourses or the critiques of, say, Ruth Leys.

Given the diverse range of texts and materials, there is a heterogeneity of methods, particularly in part one and the jump from hermeneutic readings of contemporary philosophy to linguistic and literary analyses of ancient Greece. Whilst this ultimately continues to be hermeneutic, etymology is brought in for support due to the difficulties of ancient languages. Any rooting in etymology, however, given its ‘probable’ status, is not meant as any ‘authentic’ or ‘hidden’ history of affect, but it is to assume something left a trace in the history of language which can assist in differing the discourse surrounding affect. As Austin argues, ‘a word never well, hardly ever shakes off its etymology and its formation. In spite of all changes in and extensions of and additions to its meanings, and indeed rather pervading and governing these, there will still persist the old idea.’<sup>20</sup>

As regards the selection of texts, the literature on affect and emotion is vast which necessarily led to omissions – particularly in the jump from post-structuralism to the moment of Latin translation and from Galen to 19<sup>th</sup> century neuroscience – that might mean diverse transformations in the concepts may have been missed. My defence is that, during this period, ‘masculine auto-affection’ still largely prevailed due to the continued influence of Greek philosophy and so the space was best used by attempting to trace thought prior to the establishment of Greek philosophy. Furthermore, my intention was to give an outline of an object that could be examined in more detail within a problematic of philosophy and neurobiology bound through a renewed understanding of affect as radically reconceived bindings of actions after self-certainty and passions before passivity.

Chapter one presents a survey of contemporary affect theory in philosophy. Two main streams are identified: affect as difference (exemplified by Sedgwick and Frank) and affect as continuous variation (exemplified by Massumi). This chapter argues that, while both acknowledge the challenge critiques of the philosophy of the subject presented to traditional

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<sup>20</sup> Austin, ‘Plea for Excuses,’ 149.

metaphysic couplings of subject/object and active/passive through the positing of a non-temporal ‘prior’ or originary difference, subsequent affect theorists tended to neglect this overcoming by reinstating the active/passive in treating emotions themselves as causal rather than differential. At root is an insufficient acknowledgement of the radically different concepts of affect in play in Massumi, Sedgwick and Frank.

Chapter two therefore manifests this radically different affect by arguing the focus on affect arose from its use in the concept of auto-affection introduced by Heidegger and taken up by Derrida, Deleuze and Irigaray but where the affect of auto-affection had radically different conceptions than merely human emotion. Chapters one and two could then be taken together as an interrogation into the extent to which the attempt to overcome the self-certain subject of past metaphysics succeeds or fails in contemporary affect theory.

Chapter three then goes into more detail as to what the affect of the turn to affect and auto-affection means through a genealogy of ‘affect’ and its semantic field. The chapter locates the key moment in this history in the translation of Greek philosophy into Latin; specifically, the translation of the Greek noun πάθος (from the verb πάσχειν) as *affectio*, *passio*, or *perturbatio*. The privileged treatment given to πάσχειν is justified by its choice of translation but also because of its use as pro-verb to verbs of activity: while these verbs of activity pluralise and differentiate (ποιεῖν, δρᾶν, ἔργα, ἐνέργεια, *ago*, *facio*, etc.), πάσχειν (and *patior*) remains the same. I argue that, as a result of these couplings, πάθος comes to be dominated by its sense of passivity (understood as a being-acted-on by an external agent) and affect as translation of πάθος becomes implicitly bound up with this active/passive. Furthermore, this opposition governs the other key terms of emotion, perturbation, perception and sensation.

To unfold and loosen this binding, chapter four interrogates the meaning of the verb πάσχειν prior to the privileging of its sense of passivity as opposite to activity. This requires a diachronic study of the changing senses of the verb to derive its broadest sense prior to the dominance of a metaphysics of opposites. This is achieved through an interrogation of early Greek literature of Homer, the philosophy of the Pre-Socratics, its invocation in grammar as well as its ‘probable’ Proto-Indo-European roots in the era of the ‘pre-pre-Socratics.’ The result is a broad sense of πάσχειν as bindings of implicit differences prior to any extraction of external agent / internal patient.

Turning to Neuroscience, chapter five examines the roots of contemporary neuroscience in Greek philosophy, specifically Hippocrates and Galen to draw out the already conflictual

relation between medicine and philosophy in the differing attitudes of Hippocrates (medicine must be separated from philosophy) and Galen (the two can reciprocally influence each other). The difference in these two will structure the argument for ‘two neurosciences,’ one aligned with unstable, uncertain knowledge more akin to the navigator, politician and sophist (Hippocrates) and one more associated with philosophy and Platonic truth (Galen). The Galenic model with the admiration for Plato and Aristotle and rejection of the Stoics permeated early conceptions of the nervous organism that would remain relatively unchallenged for the next 1500 years to the neglect of the ‘other neuroscience.’ The central concept is again πάθος as that which binds the physical discourse of medicine (πάθος as diseases) with the metaphysical (πάθος in its opposition to ποίημα).

Chapter six then examines 19<sup>th</sup> century neuroscience for the challenge it finally presents to Galenic frameworks and the early beginnings of the return of a Hippocratic neuroscience. The concepts affect and emotion, like πάθος, again unite the physical and physiological and the active/passive continues to influence the field through the naming of key concepts such as neuron and synapse using Greek and the privileging of mechanistic, successive flows of energy. This focus on flow and succession neglects the radical contingency at the heart of the organism that the ‘second neuroscience’ will manifest.

Chapters seven and eight then turn to contemporary neuroscience. Chapter seven focuses on the more mainstream computational theories that currently dominate neuroscience, particularly theories of predictive processing and their invocation of free energy and Bayesian probability. In these theories, action is reconsidered as the experience of error in the difference between the organism’s expectations of its binding with world and itself and actuality in the effects of its actions. This chapter also draws out the implications of plasticity, where any pure mechanistic, activity-dependent plasticity is undermined by the radical contingency of non-Hebbian plasticity.

Chapter eight focuses on the turn to affect in neurobiology for the radically new understanding of key concepts of affect and its semantic field they present. The argument here is that affective neuroscience similarly manifests this radical contingency conceptualising it as an auto-affective binding of differences that are felt. What affective neuroscience adds, therefore, is that the privileging of mechanism is lessened for a focus on how mechanism is bound with contingency, bindings that are specifically conceptualised using affect, emotion and feeling. With the reconceived actions of predictive processing theories, and passivity as describing some of this non-Hebbian plasticity, these radically

transformed understandings of the active and passive actually signify the binding of mechanism and contingency in their coupling.

The conclusion then considers these separate turns together, bound by the transformed concept of affect as the *πάθος* of early Greek thought with the actions of contemporary neurobiology. The turns to affect in neuroscience and philosophy thus together effect a strange time and place: that of a pre-pre-Socratic Neurology in which one is only affected to the extent one manifests the implicit difference between oneself and/or the environment in the felt difference between expectation and actuality.

# I PHILOSOPHY



# 1

## THE AFFECT OF THE TURN TO AFFECT

The turn *to* affect in the humanities is commonly held to originate in two papers of 1995: Sedgwick and Frank’s ‘Shame in the Cybernetic Fold’ and Massumi’s ‘The Autonomy of Affect.’ These took place within a more general return to the body and its emotionality, to non-linguistic, material practices and to a re-engagement with natural sciences as a turn *from* the sedimented *doxa* of post-structuralism. Fields as diverse as anthropology, archaeology, history, cultural studies, philosophy, aesthetics and economics interrogated how previous attempts at discussing emotions relied on binary oppositions of emotion/reason, material body/immaterial mind, private/public, internal/external and inauthentic/authentic. Political motivations from queer studies, feminism and post-colonial studies identified the gendered and racialised violence contained in these binaries and their closed metaphysical systems. Different conceptions of emotionality were therefore sought that accommodated the critiques of the subject in post-structuralism but enlarged them from a perceived over-dependence on representation, language and discourse to include other aspects of the body, a body considered as any assemblage of organic and non-organic, animate and inanimate. Such an expansion continued the challenge to traditional conceptions of intentionality, causality, agency and sociality. The two works exemplify the two main approaches in this project: Sedgwick and Frank’s engagement with Silvan Tomkins’s psycho-biological theory of affect as self-differentiating bindings of analog and digital and Massumi’s Deleuzian account that separates affect as pre-linguistic intensities from its partial capture as emotion.

### 1990S THEORISM: POST-STRUCTURALISM, ANTI-ESSENTIALISM

The ground motivating the turn was an exasperation in the early 1990s with post-structuralism and its emphasis on language, discourse and culture that in turn had partly arisen in opposition to universalizing anthropologies and the genetic paradigms of the natural sciences. This had led to polemic separations between humanities and natural sciences. Sedgwick and Frank characterised the theory of their day (1995) by three aspects: the centrality of language as ‘the most productive if not the only possible models for understanding representation’; the concern for dismantling dominant organizing tropes of the ‘bipolar, transitive relations’ of active/passive, subject/object, self/other using ‘symbolisation through binary pairings of elements, defined in a diacritical relation to one another and no more than arbitrarily associated with the things symbolised’; and where the distance from

biological basis correlates with its potential for doing justice to difference.’<sup>21</sup> In short, Sedgwick and Frank argued that “‘theory” has become almost simply coextensive with the claim (you can’t say it often enough), *it’s not natural*.’<sup>22</sup> This retreat from the ‘natural’ sought to oppose the violence of a perceived deterministic essentialism, biologism or scientism in the sciences with an alternative strong constructionism. But Sedgwick and Frank argued that ‘theory’ itself had become a kind of scientism as its alternative to perceived essentialist scientific theories of emotions had become so widely sedimented as to be considered common sense:

The fact that one sounds cockamamie and the other virtual common sense – or that one sounds ineluctably dated and the other nearly as fresh as print – may reveal less about the trans historical rightness of ‘theory’ than about the dynamics of consensus formation and cross-disciplinary transmission.<sup>23</sup>

Massumi argued that social constructionist ideas had dead-ended because they bracketed the nature of the process. Gender race and orientation, he argues, are ‘interactive kinds,’ ‘logical categories that feed back into and transform the reality they describe (and are themselves modified by in return).’<sup>24</sup> Constructivism tends to lead to cultural solipsism where nature either appears ‘as immanent to culture (as its construct)’ or is neglected entirely to become ‘transcendent to culture (as its inert and meaningless remainder)’; this lost the idea of nature as having a dynamism of its own, of nature naturing, and

theoretical moves aimed at ending Man end up making human culture the measure and meaning of all things in a kind of unfettered anthropomorphism precluding—to take one example—articulations of cultural theory and ecology. It is meaningless to interrogate the relation of the human to the nonhuman if the nonhuman is only a construct of human culture, or inertness.<sup>25</sup>

Massumi’s project focused on the conceptual schema ‘body – movement/sensation – change’ to argue cultural theory had tended to ignore the middle terms and their unmediated connection. This arose from a fear of falling into ‘a “naive realism,” or reductive empiricism that would dissolve the specificity of the cultural domain in the plain, seemingly unproblematic, “presence” of dumb matter.’<sup>26</sup> Culture instead occupied the place between

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<sup>21</sup> Sedgwick and Frank, ‘Shame,’ 496-7.

<sup>22</sup> *Ibid.*, 513.

<sup>23</sup> Sedgwick and Frank, ‘Shame,’ 497.

<sup>24</sup> Massumi, *Parables for the Virtual*, 12.

<sup>25</sup> *Ibid.*, 39.

<sup>26</sup> *Ibid.*, 1.

matter and systemic change, as ideological apparatuses that mediated and structured the dumb material interactions of things. The body in this theory was a thoroughly mediated body, a ‘discursive’ body with signifying gestures in which sensation becomes utterly redundant or, worse, destructive because it appeals to unmediated experience and to a ‘naive subjectivism.’ It instead became all about subjectivation, a subject constructed by power, discourse and culture, ‘a subject without subjectivism.’<sup>27</sup> The body was then thought in terms of ‘positionality’ or ‘coding’ on a grid conceived as ‘as an oppositional framework of culturally constructed significations: male versus female, black versus white, gay versus straight, and so on. A body corresponded to a ‘site’ on the grid defined by an overlapping of one term from each pair.’<sup>28</sup> The problem with this is that all possibilities for a body are then coded in advance by the ideological master structure. The potential for change is diminished and movement, as qualitative transformation, becomes ‘entirely subordinated to the positions it connects.’<sup>29</sup>

This strong or ‘pure’ constructivist position that posited no essentialised components, that everything is cultural and constructed, was characterised by Reddy as assuming an ‘absolute plasticity of the individual’<sup>30</sup> and that ‘human nature is entirely variable (and therefore cannot be studied in a lab), entirely reshaped by every culture humans devise for themselves.’<sup>31</sup> But Reddy argued this made understanding historical change and ethical questions of liberties and rights difficult: if human experience and emotion are entirely malleable, ‘then why concern ourselves with the suffering of others or the liberty and dignity of the individual? Suffering, in distant times and places, becomes just another by-product of a cultural context and liberty becomes a purely modern Western preoccupation, of local significance only.’<sup>32</sup> If everything is cultural, from what position do you critique culture? In response, Reddy aimed to elaborate a theory of emotion as ‘largely (but not entirely) learned’:

‘Largely’: the theory leaves plenty of room for cultural variation. ‘But not entirely’: the theory establishes a core concept of emotions, universally applicable, that allows one to say what suffering is, and why we all deserve to live in freedom. With reference to this concept of emotions, historical change again becomes meaningful;

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<sup>27</sup> Ibid., 2.

<sup>28</sup> Ibid., 2.

<sup>29</sup> Ibid., 3.

<sup>30</sup> Reddy, ‘Against Constructionism,’ 327.

<sup>31</sup> Reddy, *Navigation of Feeling*, xi.

<sup>32</sup> Ibid., xi.

history becomes a record of human efforts to conceptualise our emotional makeup, and to realise social and political orders attuned to its nature.<sup>33</sup>

Reacting against this led to many theorists returning to the life sciences for their perspective on human nature. Connolly, for example, in his development of a ‘neuropolitics,’ defended his re-engagement with neurobiology against hostile critiques of consensual constructivists:

By *neuropolitics* I do not mean that politics is reducible to genetically wired brain processes or that scientific observation of body/brain activity captures the actual experience of those observed. Reactions in cultural theory against such reductions are well taken [...] But, unfortunately, those very reactions often issue in arid conceptions of thinking, culture, ethics and politics. To escape the curse of reductive biology, many cultural theorists reduce body-politics to studies of how the body is *represented* in cultural politics.<sup>34</sup>

The result, he argued, is that ‘in their laudable attempt to ward off one type of reductionism too many cultural theorists fall into another: they lapse into a reductionism that ignores how biology is mixed into thinking and culture and how other aspects of nature are folded into both.’<sup>35</sup> It is worth also noting that while Connolly was initially repelled by ‘a reductive model of science,’ which was ‘unappreciative of the need to enter into communication with phenomenological experience,’ he recognised this situation had changed around the mid 1990s.<sup>36</sup>

Similarly, Smail tried to show how culture gets wired into human physiology as ‘a key to appreciating human sameness as well as cultural difference’ from hypotheses that ‘the neurochemicals associated with feelings, moods, and emotions are highly susceptible to cultural input.’<sup>37</sup> Whilst post-structuralism, he argued, offered ‘a ready riposte to the essentialism of biological differences postulated by pop sociobiology,’ biology now agreed with this anti-essentialism: ‘natural selection does not homogenise the individuals of species.’<sup>38</sup> As evidence, Smail cites the phenomena of spandrels and exaptation – for

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<sup>33</sup> Ibid., xii.

<sup>34</sup> Connolly, *Neuropolitics*, xii.

<sup>35</sup> Ibid., 2.

<sup>36</sup> Ibid., xii.

<sup>37</sup> Smail, *Deep History*, 8.

<sup>38</sup> Ibid., 124.

example, the large cognitive brain that evolved for one purpose but became available for other, different purposes.<sup>39</sup>

But perhaps the most sustained analysis of the situation is in Sedgwick and Frank. To understand Sedgwick and Frank's 'turn to affect', it is necessary to understand their motivation for reading the psycho-biologist Silvan Tomkins. Their turn did not aim at a 'truth' of affect, nor to argue for the rightness of one theory over another (something critics of the paper often neglect), but was an attempt to find a way out of the 'conceptual impasse' they found themselves in. Sedgwick identified the structure of this 'conceptual impasse': 'where it is possible to recognise the mechanism of a problem, but trying to remedy it, or even in fact articulate it, simply adds propulsive energy to that very mechanism.'<sup>40</sup> Attempts to critique something (essentialism, repression, etc.) often remained, unknowingly, within that economy rather than overcoming it or producing an alternative.

Sedgwick and Frank identified two main manifestations of this. First was the claimed opposition to essentialisms, particularly biologisms. The theory of the day, influenced by Foucault, had sedimented into claims that demonstrating how something is not 'natural' or 'essential' was always a powerful act. The reflexive antibiologism and rejection of the 'natural' arose in part through an identification of the essential and natural with the biological and in part through a rigorous adherence to digital models of on/off representation and the erroneous identification of the machine with the digital and the analog with the animal. The digital was privileged because of a fear that analogic, qualitative differences risked reproducing a biologizing essentialism with the consequence that the space between  $n > 2$  and infinity became voided because of 'some strong adhesion between the specification finitely many ( $n > 2$ ) values and that conversation stopping word, innate.'<sup>41</sup> Sedgwick and Frank acknowledged it was difficult to conceptualise, say, eight or thirteen different kinds of anything important 'without having a biological model somewhere in the vicinity.'<sup>41</sup> Whilst not minimizing the necessity of opposing 'continuing histories of racist, sexist, homophobic or otherwise abusive biologisms,' they feared that 'with the installation of an automatic antibiologism as the unshifting central tenet of "theory" we will lose conceptual access to an entire thought realm, the analogic realm *finitely many ( $n > 2$ ) values*.'<sup>42</sup> Access to this realm

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<sup>39</sup> Ibid., 125.

<sup>40</sup> Sedgwick and Frank, 'Shame,' 635.

<sup>41</sup> Ibid., 511.

<sup>42</sup> Ibid., 512.

was necessary, they argued, for, among other things, ‘enabling a political vision of difference that might resist both binary homogenization and infinitizing trivialization.’<sup>43</sup>

They acknowledged the reoccupation of the conceptual space between two and infinity may indeed make some kind of biologism necessary, but this risk was not obviated by any scrupulous digitalization. There is an essentialism of the digital as much as the analog, one that is perhaps more dangerous because it is not recognised as essentialist. In the digital model, essence is displaced from finite multiple qualitative differences to ‘some prior place where an undifferentiated stream of ordinary matter or energy is being turned (infinitely) on or off’; to see this as less essentialist only reflects ‘the habitual privileging of digital models wrongly equated with the machine over analog models wrongly equated with the biological.’<sup>44</sup>

Secondly, the concept of an ‘undifferentiated stream’ was developed further in a critique of Ann Cvetovich’s *Mixed Feelings*, which exemplified several theoretical currents and conceived affect as ‘discursively constructed.’ Cvetovich’s theory of affect had no feelings in it, no specific affects, no room for differentiation between, say, being amused, being disgusted or ashamed. Sedgwick and Frank argued this was because ‘it would risk essentialism to understand affects as qualitatively different from each other.’ Affect was therefore treated as a unitary category, with a unitary history and politics that meant little differentiation between specific affects or differentiation between things by the kinds of affect they may provoke. Far more simply, differentiation occurred ‘by the presence or absence of some reified substance called Affect.’ Anti-essentialism’s dependence on an erroneously machine-identified model of digital, on/off representation meant that ‘insofar as they are “theorised,” affects *must* turn into Affect.’<sup>45</sup>

But this theory of affect was actually congruent with Schachter's cognitive psychology theory of emotion that proposed ‘different emotional experiences arise out of the same visceral background’ with cognitive appraisal determining the quality of the emotion.<sup>46</sup> This was amenable to current theory because an undifferentiated visceral state of arousal presents no danger of encountering the fallacy that ‘a representation might bear any nonarbitrary relation to the thing represented.’ Discursive construction of affect was guaranteed by the

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<sup>43</sup> Ibid., 511-12.

<sup>44</sup> Ibid., 515.

<sup>45</sup> Ibid., 514-15.

<sup>46</sup> Ibid., 516.

idea that ‘the raw material of our arousal is infinitely malleable by a fully acculturated cognitive faculty.’<sup>47</sup> Regardless of whether this account is ‘true’, the point Sedgwick and Frank wished to make is that this was no less essentialist than Tomkins’s theory: whilst differentiating emotions for Tomkins was located in the body, in Cvetovich it lay in cognition.

Sedgwick and Frank therefore argued it cannot be a question of essentialism or no essentialism. Rather it must be a question of ‘differently structured residual essentialisms.’<sup>48</sup> In this choice of essentialisms, they asked, why limit oneself to the digital model? Why not have ‘a periodic table of the infinitely recombinable elements of the affect system, a complex, multi-layered phyllo dough of the analog and the digital?’<sup>49</sup>

### **TWO VECTORS OF AFFECT THEORY: SEDGWICK AND FRANK, MASSUMI**

The turn to affect can thus be read as a turn against the hackneyed essentialism versus constructionism debates for differently structured essentialisms that would affirm the interweaving of the biological and cultural without falling back into reductive biologisms, subjectivism or naive realism and retain post-structuralist insights into the interweaving of discourse, power and culture. As Plamper characterised the turn, tiring of an ‘absolute plasticity’ or trivializing infantilizations of constructed entities without limit based on a restless ground of arbitrary differences, they instead asked themselves, ‘how much longer must identities remain fluid, borders porous, discourses shifting, without knowing why something has shifted?’ The search was therefore for new foundations: ‘a more solid anchor in the world: a more robust conception of reality and much clearer causal relationships.’<sup>50</sup> Similarly, Massumi argued that ‘the “postmodern” was an image of communication out of control. Seeming to have lost its mooring in objective conformity or correspondence, it appeared uncaused, unmotivated, in endless, unguaranteed “slippage.”’<sup>51</sup> Affect (or emotion) provided a way out. For example, Reddy claimed ‘emotions are the real-world-anchor of signs’:

in post-structuralist terms, there is a feeling that goes with every sign; emotion generates parole against the backdrop of langue. Philosophers and researchers have not been able to find language’s anchor in the world when regarding signs or language

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<sup>47</sup> Ibid., 516.

<sup>48</sup> Ibid., 517.

<sup>49</sup> Ibid., 517-18.

<sup>50</sup> Plamper, *History of Emotions*, 227.

<sup>51</sup> Massumi, ‘Autonomy of Affect,’ xv.

as referring or pointing to a world and have wrongly concluded that signs and language must therefore float free of any possible world. But the world they belong to is the world in which feelings occur, in which utterances and texts grow directly out of feelings. One does not need a questionable Western-style subject to provide the link between them.<sup>52</sup>

Affect offered a ground firstly by displacing the centrality of language and discourse for all other aspects of the body such as emotions, sensations and movements, conscious, unconscious or nonconscious. Secondly, with the paradigm shift in the biological sciences toward epigenetics and plasticity and a corresponding turn to affect occurring there in 'affective neuroscience,' affect also provided a rapprochement with the natural sciences and its redefinition of the 'natural' that challenged reductive biologisms. This shift offered alternative relations between biology and culture other than the reactionary binary of absolutely plastic, cultural constructionist or genetically determined mechanism; it permitted a new consideration of the mutual influence of each in their interrelation. Thirdly, through its rich philosophical heritage, the concept affect reopened the question of what affects what, whether only like affects like, or unlike affects unlike, and to what effect. Rather than what *is*, affect permitted a focus on process and change and, for Sedgwick and Frank, offered a way out of conceptual impasses by differentiations through affects of  $2 < n < \infty$ .

Let us now turn to Sedgwick/Frank and Massumi who exemplify two main streams in this turn to affect.

*Sedgwick and Frank: affect as self-differentiation*

Sedgwick and Frank engaged with the work of Silvan Tomkins who, they argued, implicitly challenged contemporary theorism from the period before its installation as theory: in the moment of cybernetics and structuralism that preceded post-structuralism.

Tomkins produced a list of qualitatively differentiated affects, a basic set of affects as shame, interest, surprise, joy, anger, fear, distress, disgust, and, later, contempt (or 'dis smell'). These were then placed in polarities such as 'shame-interest' that suggested 'the pulsations of cathexis around shame, of all things, are what either enable or disable so basic a function as the ability to be interested in the world.'<sup>53</sup> Many anti-essentialists of course reactively rejected this 'basic' list as an essentializing biologism. Sedgwick and Frank's

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<sup>52</sup> Reddy, 'Against Constructionism,' 331.

<sup>53</sup> Sedgwick and Frank, 'Shame,' 500.

closer, ‘reparative’<sup>54</sup> reading, however, revealed a Tomkins who actually undermined any biological essentialism. Firstly, Tomkins blended the contingent with identity in his taxonomies of emotions so that Sedgwick and Frank likened him to Proust as Tomkins countenanced ‘both the Proustian fascination with taxonomies of persons and the Proustian certainty that the highest interest of such taxonomies is ever in making grounds for disconfirmation and surprise’<sup>55</sup>:

The suggestion of sheer, unlimited extent marks all possible outcomes as radically contingent. Yet the items on the lists, far from random, are always carefully chosen to open and indicate new vistas, to represent new kinds of possible entailments involved in any generalization. They can be read as either undoing or suggesting new taxonomic work. Tomkins’s lists probably resemble most the long sentences in Proust where a speculation about someone’s motive is couched in a series of long parallel clauses that begin “Whether because ...; or because ...; or because... .” A postmodern syntax that seems to vitiate the very possibility of understanding motive by pluralizing it as if mechanically, infinitely, seems with the same gesture to proffer semantic tools so irresistibly usable that they bind one ever more imaginatively and profoundly to the local possibilities of an individual psychology.<sup>56</sup>

Secondly, Tomkins proposed the idea of a ‘co-assembly’ of drive and affect system as amplifiers which meant,

A human being could be, and often is, terrified about anything under the sun. It was a short step to see that excitement had nothing per se to do with sexuality or with hunger, and that the apparent urgency of the drive system was borrowed from its co-assembly with appropriate affects as necessary amplifiers.<sup>57</sup>

This enabled a thinking of sexuality no longer as a binary of express / repress because although ‘sexuality as a drive remains characterised here by a binary (potent/impotent) model, yet its link to attention, to motivation, or indeed to action occurs only through “co-assembly” with an affect system described as encompassing several more, and more qualitatively different, possibilities than on/off.’<sup>58</sup> Indeed, Tomkins habitually layered digital and analog representation and biological with machine or computer models – for example, he analogically quantified Hebb’s neural firing as discrete fire/don’t fire events through the dimension of time which in turn led to on/off digital activation of several discrete affects. A

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<sup>54</sup> See Sedgwick, ‘Paranoid Reading and Reparative Reading.’

<sup>55</sup> *Ibid.*, 502.

<sup>56</sup> *Ibid.*, 509.

<sup>57</sup> Tomkins, ‘Quest for Primary Motives,’ 309.

<sup>58</sup> Sedgwick and Frank, ‘Shame,’ 504.

purely digitalizing schema would have missed the fact that ‘Tomkins’s theory ramified into a “many-valued” (and in that sense analogic) understanding of affect: if the on/off of “neural firing” is qualitatively undifferentiated, the on/off of affect activation is qualitatively highly differentiated.’<sup>59</sup> The result was, they argued, citing Tomkins, “the general advantage of affective arousal to such a broad spectrum of levels and changes of levels of neural firing is to make the individual care about quite different states of affairs in quite different ways.”<sup>60</sup> The advantage Tomkins offered Sedgwick and Frank was therefore his capacity to discuss *how* things qualitatively differentiate, ‘how quantitative differences turn into qualitative ones, how digital and analog representations leapfrog or interleave with one another’<sup>61</sup>. And, of course, access to the  $n < 2 < \infty$  realm.

This ability to discuss how things differentiate was then applied to the problem of the conceptual impasse they had identified, particularly through reference to Tomkins’s theory of shame. Shame and theory, they argued, ‘are partially analogous at a certain level of digitalization’ as shame, like theory, is activated ‘by drawing a boundary line or barrier.’<sup>62</sup> This boundary is the introduction of a boundary into an analog and a distinction between figure and ground. They cite Wilden’s cybernetics to clarify:

‘A gestalt . . . is formed by the decision to digitalize a specific difference, so as to form a DISTINCTION between figure and ground. There is in effect a decision-which may be neural, or conscious, or unconscious, or habitual, or learned, or novel-to introduce a particular boundary or frame into an analog continuum.’<sup>63</sup>

In order for a system to be open to an environment . . . the system must be capable of punctuating itself as distinct from that environment so as to select messages within it.”<sup>64</sup> Such punctuations occur in affects like disgust which punctuates by recognising in the spitting out of food the distinction between inside and outside body. But, with shame, there must be positive affect too: ‘only something which engages your interest can make you blush.’ Similarly, shame is ‘characterised by its failure ever to renounce its object cathexis, its relation to the desire for pleasure as well as the need to avoid pain’ and suggests how theory becomes Theory and how a critique of essentialism could remain, unknowingly, essentialist, because of this simultaneous splitting from yet attachment to its rejected object:

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<sup>59</sup> Ibid., 507.

<sup>60</sup> Ibid., 507 quoting from Tomkins, ‘Quest for Primary Motives,’ 318.

<sup>61</sup> Sedgwick and Frank, ‘Shame,’ 510

<sup>62</sup> Ibid., 520.

<sup>63</sup> Ibid., quoting from Wilden, *System and Structure*, 174.

<sup>64</sup> Ibid., 520 quoting from Wilden, *System and Structure*, 174.

critiques are critiques of something that affect us and in their negative form we need to be attentive to what in the object actually attracts us.<sup>65</sup>

Anti-essentialists separate themselves from perceived essentialisms yet cannot renounce this object so remain implicitly essentialist. Sedgwick and Frank's sustained engagement with Tomkins's affect theory was then not so much a search for which affect theory was 'true' but a more strategic engagement with an outside perspective to manifest one's own affects and effect a way out of a conceptual impasse.

*Massumi: affect as continuous variation*

The second vector of affect theory is exemplified by Massumi's paper *The Autonomy of Affect* also published in 1995. There he describes an experiment designed to test the responses of children to three versions of a TV advertisement that had scared children: the original silent version, a version with accompanying 'factual' narration and a 'emotional' version with added emotional descriptions.<sup>66</sup> Responses were recorded on three levels: verbal-cognitive (using self-report measures of pleasant-unpleasant, happy-sad and verbal recall of the film); physiological (using autonomic responses of heart rate, breathing and skin resistance); and motoric (analysing recordings of the children's bodily reactions to the film). The findings proved to be 'extremely complex': the factual version produced the highest physiological recordings of heart rate and skin conductance; the verbal level showed the factual to be more unpleasant than the other two with the original the most pleasant. Dividing the film into scenes, the results showed the children rated sadder scenes as more pleasant and the more pleasant scenes were the ones that were best recalled.

Massumi claims the experiment demonstrated '*the primacy of the affective* in image reception' and that there is a gap between content and effect with no seeming logical connection between the two.<sup>67</sup> He links 'strength or duration of the image's effect' to intensity to claim 'there is no correspondence or conformity between qualities and intensity. If there is a relation, it is of another nature.'<sup>68</sup> Sadness is rated pleasant, so image reception is at least bi-level, a bifurcation that means both are embodied, but in two different embodiments, two systems, and that

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<sup>65</sup> Ibid., 520-21.

<sup>66</sup> Sturm and Grewe-Partsch, 'Television – The Emotional Medium,' 25-36.

<sup>67</sup> Massumi, 'Autonomy of Affect,' 84.

<sup>68</sup> Ibid., 85.

the level of intensity is organised according to a logic that does not admit the excluded middle. This is to say that it is not semantically or semiotically ordered. It does not fix distinctions. Instead, it vaguely but insistently connects what is normally indexed as separate. When asked to signify itself, it can only do so in a paradox. There is disconnection of signifying order from intensity—which constitutes a different order of connection operating in parallel.<sup>69</sup>

This ‘intensity’ is then posited as ‘a nonconscious, never-to-be conscious autonomic remainder.’<sup>70</sup> Massumi equates intensity with affect although affect is elsewhere variously defined: as a ‘so pure and productive receptivity that it can only be conceived as a third state, an excluded middle, prior to the distinction between activity and passivity’;<sup>71</sup> as ‘a critical point, or a bifurcation point, or singular point, in chaos theory and the theory of dissipative structures’;<sup>72</sup> as ‘the simultaneous participation of the virtual in the actual and the actual in the virtual, as one arises from and returns to the other’;<sup>73</sup> as ‘synesthetic, implying a participation of the senses in each other: the measure of a living thing’s potential interactions is its ability to transform the effects of one sensory mode into those of another’;<sup>74</sup> ‘Affect is the whole world: from the precise angle of its differential emergence.’<sup>75</sup> Affect thus seems to signify almost everything but what is common is, like Sedgwick and Frank, vast permutations of combinations and bindings that effect differentiations. These differentiations, the punctuation of an analog continuum are marked by the difference Massumi makes between affect and emotion:

An emotion is a subjective content, the sociolinguistic fixing of the quality of an experience which is from that point onward defined as personal. Emotion is qualified intensity, the conventional, consensual point of insertion of intensity into semantically and semiotically formed progressions, into narrativizable action-reaction circuits, into function and meaning. It is intensity owned and recognised.<sup>76</sup>

Massumi appropriates the results of another experiment to bolster his theory. He discusses an experiment by Libet that required subjects to move their finger and note the position of a clock hand when they felt aware of the intention to move. By measuring brain activity using

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<sup>69</sup> Ibid., 84-85.

<sup>70</sup> Ibid., 85.

<sup>71</sup> Ibid., 93.

<sup>72</sup> Ibid., 93.

<sup>73</sup> Ibid., 96.

<sup>74</sup> Ibid., 96.

<sup>75</sup> Ibid., 105.

<sup>76</sup> Ibid., 88.

an EEG machine, Libet showed that, although the conscious intention to move preceded the actual movement by about 200 milliseconds, significant brain activity was recorded 550 milliseconds before the finger moved. Massumi claims this ‘missing half second’ showed sensation involves ‘a “backward referral in time,” ’ i.e. that ‘sensation is organised recursively before being linearized, before it is redirected outwardly to take its part in a conscious chain of actions and reactions.’<sup>77</sup> Massumi interprets this as implying will and consciousness are ‘*subtractive,*’ ‘*limitative, derived functions* that reduce a complexity too rich to be functionally expressed’ and that

what we think of as ‘free,’ ‘higher’ functions, such as volition, are apparently being performed by autonomic, bodily reactions occurring in the brain but outside consciousness, and between brain and finger but prior to action and expression. The formation of a volition is necessarily accompanied and aided by cognitive functions.<sup>78</sup>

Massumi clarifies that to speak of affect as intensity in this way, is not to appeal to ‘a prereflexive, romantically raw domain of primitive experiential richness – the nature in our culture’ because something happening outside the mind in the body cannot be said to be experienced.<sup>79</sup> Such a complex rethinking requires a rethinking of the body and its inexperienced experience. Massumi invokes the concept of the ‘virtual’ to describe ‘something that happens too quickly to have happened, actually’, a ‘lived paradox’ where, ‘what are normally opposites coexist, coalesce, and connect; where what cannot be experienced cannot but be felt—albeit reduced and contained.’<sup>80</sup> The ‘autonomy of affect’ to which Massumi’s title refers is then described as ‘its participation in the virtual’: ‘Affect is autonomous to the degree to which it escapes confinement in the particular body whose vitality, or potential for interaction, it is.’<sup>81</sup> Emotion is therefore the expression of the *capture* of affect and the escaping of something, something that remained unactualized. This is why emotion has been classically understood as being outside oneself, ‘at the very point at which one is most intimately and unshareably in contact with oneself and one’s vitality.’<sup>82</sup> This escape of affect ‘cannot but be perceived, alongside the perceptions that are its capture.’<sup>83</sup>

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<sup>77</sup> Ibid., 89.

<sup>78</sup> Ibid., 90.

<sup>79</sup> Ibid., 90.

<sup>80</sup> Ibid., 91.

<sup>81</sup> Ibid., 96.

<sup>82</sup> Ibid., 96.

<sup>83</sup> Ibid., 97.

Thus Massumi, like Sedgwick and Frank, exhibits the shared themes of a return to the body and its non-linguistic aspects, a reengagement with science that does not lead to any reductive biologisms, and an intense focus on how things differentiate. All the while continuing the post-structuralist critiques of the subject by avoiding any self-identity of subjectivity through the escape of affect.

#### DEVELOPMENT OF AFFECT THEORY

These vectors have been developed and diversified by a wide range of affect theorists that continue the reengagement with science, with the body and non-linguistic and materialist questions of what affects what to what effect, how things differentiate and how things do not. For example, Scheer, influenced by Bourdieu's concept of *habitus*, develops a concept of 'emotional practices' defined as 'practices involving the self (as body and mind), language, material artefacts, the environment, and other people' to emphasise that 'the body is not a static, timeless, universal foundation that produces ahistorical emotional arousal, but is itself socially situated, adaptive, trained, plastic, and thus historical.'<sup>84</sup> Practice 'offers a way to integrate the material, bodily facets of emotional processes without having to resort to the ahistorical, universalist assumption that the body is conditioned only by evolution.'<sup>85</sup> She adds, emotions change over time because the practices in which they are embodied and bodies themselves undergo transformation. Scheer engages with the question of the causality of emotions. Instead, of viewing emotions as causing or caused by something, she argues that emotions are this very act of establishing causal relations:

Instead of searching the historical record for the "trigger" to explain the emotion that followed, the emotions can be viewed as the meaningful cultural activity of ascribing, interpreting, and constructing an event as a trigger.<sup>86</sup>

Meanwhile, Hodder's *Entangled* investigated the body in all aspects of its immanence to the world, 'compounded by conceptual abstractions and bodily resonance, a reverberation between mind, body and the world of things.'<sup>87</sup> It sought to understand how the 'outside' realms of the pre-/extra-/para-linguistic intersect with the 'lower' or proximal senses (touch, taste, smell, rhythm and motion-sense, or, alternately/ultimately, the autonomic nervous system) while also arguing for a much wider definition for the social or cultural. In this work, Hodder focuses on 'things' rather than, say, 'objects' because of its sense from the Old High

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<sup>84</sup> Scheer, 'Are Emotions a Kind of Practice,' 193.

<sup>85</sup> Ibid., 220.

<sup>86</sup> Ibid., 206.

<sup>87</sup> Hodder, *Entangled*, 206.

German meaning ‘a gathering’ or ‘to deliberate on a matter under discussion,’ a reading he takes from Heidegger’s analysis.<sup>88</sup> Ingold also invoked Heidegger’s view in his work on *Making* to stress the importance of the ‘with’:

the object, he argued, is complete in itself, defined by its confrontational ‘over-againstness’ – face to face or surface to surface – in relation to the setting in which it is placed. We may look *at* it or even touch it, but we cannot join *with* it in the process of formation. However metrically close our interaction with the object may be, it remains affectively distant. But if objects are *against* us, things are *with* us.<sup>89</sup>

In this vein, we can also mention Sparrow’s project that seeks a new concept of sensation as ‘the basic material of subjectivity’ by arguing that ‘sensation is responsible in a non-trivial way for the subject’s power to exist.’<sup>90</sup> Rooted in phenomenology, Sparrow seeks a ‘post-phenomenology’ that would challenge the first-person perspective as well as enlarge sensation to both animate and inanimate.

The archaeologist Gosden also criticised the frequent absence of emotions from studies of how social relations are created through material relations, arguing we respond emotionally to people and things, and ‘if this is true in the present, so it must also have been in the past.’<sup>91</sup> His claim is not to understand the emotions of prehistoric people, but that ‘we might start to look at the overall emotional texture of people’s lives and how this was manifest through objects.’<sup>92</sup>

This focus on entanglements, ‘with,’ and bindings as establishment of causality conceives specific affects as configurations. For example, Berlant describes ‘cruel optimism’ as ‘a relation of attachment to compromised conditions of possibility whose realization is discovered either to be impossible, sheer fantasy, or too possible, and toxic.’<sup>93</sup> This conception means the affect of ‘cruel optimism’ can describe specific situations or phenomena to understand their circular logic that ensnares to destructive effects such as ‘obsessive appetites, working for a living, patriotism, all kinds of things,’ anything where ‘the very vitalizing or animating potency of an object or scene of desire contributes to the attrition of the very thriving that is supposed to be made possible in the work of attachment in the first

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<sup>88</sup> Heidegger, *Poetry, Language, Thought*.

<sup>89</sup> Ingold, *Making*, 86.

<sup>90</sup> Sparrow, *Plastic Bodies*, 22.

<sup>91</sup> Gosden, ‘Aesthetic, Intelligence and Emotions,’ 34.

<sup>92</sup> *Ibid.*, 34.

<sup>93</sup> Berlant, *Cruel Optimism*, 99.

place.<sup>94</sup> Such configurations take into account more than just language, discourse and power for a focus on the very aspects of relations of body to world, culture to biology, in short the affects.

Furthermore, the ‘bodies’ of affect theory are not just human or animate bodies: bodies become redistributed bindings of human/machine/inorganic and affect becomes implicated in posthumanism, ‘the nonhuman turn’<sup>95</sup>. This expanded concept of body meant there was an accompanying expansion in such concepts as the social, agency and intention.

On the social, Appadurai argued that, as economic exchange creates value, and value resides in the commodities that are exchanged, a focus on these things rather than the forms or functions of exchange shows that what links exchange and value is politics and therefore that ‘commodities, like persons, have social lives.’<sup>96</sup>

The expansion of agency is notably addressed in Jane Bennett’s *Vibrant Matter* which attributes an agency to things: ‘thing-power.’<sup>97</sup> Similarly, Connolly argues it is ‘plausible to construe human agency as an emergent phenomenon, with some nonhuman processes possessing attributes bearing family resemblances to human agency and with human agency understood by reference to its emergence from non-human processes of proto-agency.’<sup>98</sup> But the archaeologist Malafouris raises the critique that, if the agentic field is to be reconceptualised, the problem then arises of where to draw the boundary as everything could be implicated in the spreading agency. What was once delimited by an easy inside/outside boundary of the human ego needs redrawing. As a result, Malafouris argues we should not ask *what* is an agent but ‘when is an agent?’ as ‘what’ implies a universal property or substance whereas ‘when’ implies a distributed agentic property.<sup>99</sup>

Rethinking of intentionality led from the fact that intention, traditionally conceived, differentiated the mental and physical because intentional states were always of or about things. The problem with this, however, was that things seemed not to actively participate in this thinking nor shaped it in any real sense. Nor can things themselves have intentional states. Ingold identifies the root of the problem as a dependence on a hylomorphic ontology

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<sup>94</sup> Ibid., 94

<sup>95</sup> Seigworth and Gregg, *Affect Theory Reader*, 6.

<sup>96</sup> Appadurai, *Social Life of Things*, 3.

<sup>97</sup> Bennett, *Vibrant Matter*.

<sup>98</sup> Connolly, *World of Becoming*, 23.

<sup>99</sup> Malafouris, *How Things Shape the Mind*, 147.

of active mind over passive matter.<sup>100</sup> So some seek different ontologies. Ingold draws on Deleuze and Guattari to replace this hylomorphism with an ontology that ‘assigns primacy to the processes of formation as against their final products, and to the flows and transformations of materials as against states of matter.’ Malafouris argues for an ‘intention-in-action’ which is differentiated from a ‘prior intention’ and that the intention is now *in* the action.<sup>101</sup> This means the activity and the intentional state are inseparable together with the boundary between the mental and the physical. A view shared by Smail who argues for a de-privileging of human intentions in making history, noting how great changes often emerge unintentionally, a process described by the concept of exaptation – for example, an unintentional effect of census-makers was to consolidate a focus on identity as they were required for the census completion.<sup>102</sup>

These greatly expand the field of affect from merely the felt emotions of an intentional subject to the vast realm of materiality that generates ‘renewed materialisms.’<sup>103</sup> Malafouris argued that archaeology, specifically cognitive archaeology, is the discipline that should carry the main burden of this transformation in materialism with its concern for the material object. The goal of cognitive archaeology was ‘to incorporate mental, ideational, symbolic and other such elements into theories about prehistoric peoples.’<sup>104</sup> Inscriptions on ancient tablets are not records of mental states but are extensions of those states: material facts like clay’s fast drying time and inalterability once dried shaped the cognition as much as the cognition shaped the tablet. Cognition and action arise at the same time and human thinking is not something that occurs inside a brain, body or thing but something that ‘emerges from contextualised processes that take place “between” brain, bodies and things.’<sup>105</sup> This materialism is combined with the redefined body so that objects get transformed into ‘emotional anchors’ that ‘help people to construct a material order of emotions and feelings that gradually forms an ecology of relationships and expectations about the self and others.’<sup>106</sup>

These renewed materialisms also foreground questions of temporality. Gosden’s *Social Being and Time* (1994) focuses on the long-term past, on deep history, which is

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<sup>100</sup> Ingold, ‘The Textility of Making,’ 97.

<sup>101</sup> Malafouris, *How Things Shape the Mind*, 137-140.

<sup>102</sup> Smail, *Deep History*, 65, 109.

<sup>103</sup> Coole and Frost, *New Materialisms*, 4.

<sup>104</sup> Bell, ‘On Capturing Agency,’ 48 quoted in Malafouris, *How Things Shape the Mind*, 24.

<sup>105</sup> Malafouris, *How Things Shape the Mind*, 77-8.

<sup>106</sup> *Ibid.*, 86.

conceptualised as layers of habitualities both material and temporal. But a single linear notion of time is inadequate for understanding this long-term human past. Instead, Gosden sees the present as ‘a point of oscillation between past styles of action and thought and the potentials held by the future.’<sup>107</sup> Similarly, Hodder’s book *Entangled*, is fundamentally about time. He analyses Heidegger’s discussion of the jug stating there is a hint it’s being might be defined by temporality, by its duration. Things endure over different temporalities and the temporality of things is central. Hodder argues, ‘things are organised into sequences and humans get drawn into these chains, waiting for one thing to happen before another step can be taken.’<sup>108</sup>

Perhaps the potential of affect theory lay not in a reified ‘Affect’ but in this identification and renewed understanding of immanent being in the world that is manifested by the affects defined now as interactive configurations of materiality prior to traditional separations of body/mind, subject/object, cause/effect, etc. What is sought is a binding ‘before’ or ‘prior’ to such separations in order that different separations could be effected. Such configurations open to different possibilities of analysing such bindings and understandings of the enmeshments of biology and culture after a period of enmity between these two fields. Such an approach is perhaps most powerful when it manifests those circular bindings where attempts to extricate oneself merely enmesh one deeper or the very thing that allures and binds is the thing which kills the allure, like Sedgwick and Frank’s analysis of conceptual impasses or Berlant’s ‘cruel optimism.’<sup>109</sup>

### CRITIQUES

The question arises, however, of whether there are finite, ‘basic’ entanglements or whether they are all individual, so *sui generis* as to preclude any synchronic or diachronic comparison? Can we think bindings within a set of  $2 < n < \infty$  and not as reductive binaries or trivializing infinitizations? Is there some bond that remains the same across differences that would allow non-reductive cross-cultural comparison and permit questions of ethics and history? These questions give rise to some of the main themes of critiques of the turn to affect. First that affect, particularly in the Massumi vector, came to signify almost anything. For example, Lawrence Grossberg argued

[affect] has come to serve, now, too often as a “magical” term. So, if something has effects that are, let’s say, non-representational then we can just describe it as “affect.”

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<sup>107</sup> Gosden, *Social Being*, x.

<sup>108</sup> Hodder, *Entangled*, 59.

<sup>109</sup> I am reminded here also of the image of Goya’s two fighters who, by their fighting, bury themselves further in the mud as discussed in the opening of Serres, *The Natural Contract*.

So, I think there is a lot of theorizing that does not do the harder work of specifying modalities and apparatuses of affect, or distinguishing affect from other sorts of non-semantic effects.<sup>110</sup>

The result, he argued, particularly in those who used Deleuze and Guattari's ontology in concrete work, is 'a leap from a set of ontological concepts to a description of an empirical and affective context.'<sup>111</sup> What this fails to do, is 'analysing the articulations between (and hence, the difference between, as well as how one gets from) the ontological and the "empirical."<sup>112</sup>

Another criticism is affect theory's rapprochement with life sciences often remains at the popular science level, citing popular science books by a few prominent scientists, rather than engaging seriously at the wider level of journal papers. As Reddy has argued:

my principal frustration with reading popularisers is that they offer a candidate theory to explain the trends in research as if this candidate were already recognised as the unchallenged, new explanation of brain and mind functioning. They systematically downplay the diversity of the research, in order to extrapolate dramatic answers from a select number of recent, fashionable breakthroughs.<sup>113</sup>

And, as Plamper notes, most affect theorists,

draw upon a small number of popularizing texts: counting generously, in Connolly's *A World of Becoming* it is eleven, in Bennett's *Vibrant Matter* eighteen. Most of these references are not articles, but books by the popularisers, and they are all based on LeDoux's hypothesis of the two roads to fear, on Damasio's Somatic Markers, on mirror neurons, and also sometimes on the Libet experiment.<sup>114</sup>

But perhaps the most vocal critic of the turn to affect is Ruth Leys. Her main complaint is that most affect theorists conceive affect or emotion (Leys questions the distinction between the two) as 'inherently independent of meaning and intention.'<sup>115</sup> Affects then become 'a set of innate, automatically triggered brain-body behaviours and expressions operating outside the domain of consciousness and intentional action.'<sup>116</sup> Leys then sets these 'non-intentional' or 'non-cognitivist' theorists of affect (exemplified by Silvan Tomkins and his student Paul

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<sup>110</sup> Grossberg, 'Affect's Future,' 315.

<sup>111</sup> Ibid., 314.

<sup>112</sup> Ibid., 325.

<sup>113</sup> Plamper, *History of Emotions*, 248.

<sup>114</sup> Ibid., 236.

<sup>115</sup> Leys, 'Turn to Affect,' 450.

<sup>116</sup> Ibid., 465

Ekman) against her preferred cognitivist-intentional theorists that concentrate on ‘one’s intentions with regard to objects or of the meanings those objects might have for one.’<sup>117</sup> For example, Lazarus, who argued ‘viewing stressful films could induce powerful emotional and physiological responses that depended crucially on the viewer’s appraisals, beliefs, and coping styles.’<sup>118</sup> Her personal favourite (who will become even more central to her book *The Ascent of Affect*) is Alan J. Fridlund who made intentionality central to his account of the emotions in his ‘behavioural ecology’ theory. This argued ‘humans and nonhuman animals produce facial behaviours or displays when it is strategically advantageous for them to do so and not at other times, because displays are dynamic and often highly plastic social and communicative signals.’<sup>119</sup> As a result,

facial movements should not be viewed as expressions of hard-wired, discrete internal emotions leaking out into the external world, as Tomkins and Ekman claim, but as meaningful behaviours that have evolved in order to communicate motives in an ongoing interpersonal or interindividual context or transaction.<sup>120</sup>

This intentionalist interpretation of affect forces ‘thick descriptions of life experience of the kind that are familiar to anthropologists and novelists but are widely held to be inimical to science.’ Leys adds one is therefore obliged ‘to engage with an array of very difficult questions about the nature of intentionality, including the intentionality of nonhuman animals, which have traditionally belonged to the domain of philosophy.’<sup>121</sup>

But are these not exactly the kind of questions the turn to affect were concerned with? Do Sedgwick and Frank not produce, in their reading of Tomkins, ‘thick descriptions’ of life experience even comparing Tomkins at one point to the novelist Proust? And is it not unfair to criticise scientists for not producing ‘thick descriptions of life experience’ that anthropologists and novelists do? Would this not be like criticising novelists for not experimenting on rats? Furthermore, when one closely examines Leys’s ‘alternative’ in Fridlund, their proposal starts to appear not that different from those she critiques. For what ultimately is the difference between a set of behaviours, movements and relations labelled ‘fear,’ and a behavioural ecology view of this same behaviour as ‘readiness to submit or escape’? Is not fear a readiness to submit or escape? Of course, the difference is not just

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<sup>117</sup> Ibid., 465

<sup>118</sup> Ibid., 470

<sup>119</sup> Ibid., 471

<sup>120</sup> Ibid., 470-1

<sup>121</sup> Ibid., 472

terminological, in question is the possibility of the contribution of any understanding of this behaviour from a biological perspective and the elements that can be included in this behaviour. It is a question of who or what can contribute to bindings that, unfortunately, seems to be based more on disciplinary myopia and boundary policing. And, in privileging the anthropological, the same problem nevertheless arises of whether there are ‘basic behaviours’ that have evolved to communicate basic motives. Are these configurations of a shared materiality so individual as to obviate any attempt at biological study of the neurological components, so different as to limit any cross-cultural comparison? Perhaps what is missing here is an account of how behaviours are named and bound to their configurations of materiality, how words are bound to series of bodily movements and feelings in a changing external environment. That displays are highly plastic has not been contested by either Sedgwick and Frank or Massumi, the only question is to what extent this plasticity obtains.

Moreover, Leys is perhaps too quick to group Sedgwick and Frank and Massumi and most other affect scholars into this all too neat binary of intentional/non-intentional where intentionality or cognition become reified such that there is a digitalization: either there is intention/cognition or there is not. It does most violence, perhaps, to the nuance and intentional self-reflection of Sedgwick and Frank, but to both, moreover, it neglects their insistence on relationality, entanglements, intermixtures and interweaving of affect. Instead, pushed to an extreme, Leys characterises these thinkers as effecting an absolute separation between affect and cognition/intentionality. Is it possible to think both the union and distinction of affect and cognition? To ignore this question puts us back in the familiar territory of essentialism versus constructionism and the  $n=2$  or  $n=\infty$  in the choice between intentional/anti-intentional where the intentional can only be conceived as a trivializing infinitizing of all the combinable elements of a solely anthropological or novelistic world.

A final problem in this debate is that key terms like cognition, affect, emotion, agency and intention become so differently defined as to make comparison and critique of positions difficult.<sup>122</sup> The diffusion of agency in affect theory throughout the organism and its environment (such as Bennett’s *Vibrant Matter*), and affects as bindings prior to any separation of agent and patient, need not be *anti*-intentional but a differently conceived,

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<sup>122</sup> Terada makes a similar point: ‘Lawrence Grossberg disputes Jameson’s ascription of weak affect to postmodernity, but only by drawing a distinction between emotion and affect that removes most of the point of disputing’ (Terada, *Feeling in Theory*, 6).

distributed agency and intentionality that opens to the possibility of conceiving agents other than the traditional substantial, ego pure to itself. Leys seems to aggrieve this loss of the traditional emotional subject purely present to itself.

### OVERCOMING, IMPLICATING OR NEGLECTING PAST METAPHYSICS?

Ultimately, the reasons for the debate arise from a difference in concepts and underlying philosophies. For Leys, affect is equivalent to emotion and emotions are of a purely self-present ego with its intentionality acting in the world that depend on active ego/passive matter rather than any complex, mutually affecting enmeshment of the two. This overlooks most affect theorists' heritage in post-structuralist critiques of the subject. And yet in some affect theorists, there seems to be a residual implication in past metaphysics that critiques of the subject tried to overcome. Implicated because much of the discussion of affect is still dominated by bindings and blendings that can only be conceived as relations of active and passive and where the expansion of the concept of affect in its distinction to emotion from merely human emotions of a purely present self-ego to more general (re-)configurations of materiality that would equally apply to assemblages of animate and inanimate has yet to fully permeate conceptions of affect. As we will see, this 'expansion' will actually turn out to be a 'return' to the *πάθος* of ancient Greek philosophy after its narrowing by Latin translations of the term.

Evidence of such active/passive is in Tomkins, quoted in *Shame and the Cybernetic Fold* where a series of pairs such as 'If you like to be looked at and I like to look at you' represent a pairing conceived as active/passive with the problem I am reduced to merely the opposite of the other and not qualitatively different.<sup>123</sup> Meanwhile, Scheer, despite her attempt to thing emotions as the establishing of causality, writes 'like thoughts, emotions are active and passive in that they can be a more or less voluntary sentiment, but they can also emerge from the receptiveness that dispositions create.'<sup>124</sup> Or Solomon, 'we are not merely passive victims of our emotions but quite active in cultivating and constituting them.'<sup>125</sup> Probyn seems to ascribe an agency and causality to affects as active that then risks understanding 'us' as passive:

a general gesture to Affect won't *do* the trick. If we want to invigorate our concepts, we need to follow through on what different affects *do*, at different levels. The point

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<sup>123</sup> Sedgwick and Frank, 'Shame,' 499 quoting Tomkins, *Affect Imagery Consciousness*, 411-12.

<sup>124</sup> Scheer, 'Are Emotions a Kind of Practice,' 206.

<sup>125</sup> Solomon, *True to Our Feelings*, 3.

needs to be stressed: different affects *make* us feel, write, think and *act* in different ways.<sup>126</sup>

If affects are to be thought as bindings that precede separations of agent/patient, is it true to say affects *act*? Perhaps this continued prevalence of active/passive stems from the influence of Spinoza who is read as saying affect is a capacity to affect or be affected, expressed in the active/passive voice. Although, as we will see, this coupling has a much older heritage. This conceptualisation persists throughout the introduction to Gregg and Seigworth's *Affect Theory Reader*: 'Affect arises in the midst of in betweenness: in the capacities to act and be acted upon';<sup>127</sup> 'affect as potential: a body's capacity to affect and to be affected.'<sup>128</sup> Such a persistence overlooks the attempt by Sedgwick and Frank and Massumi to overcome the dominance of this active/passive: in Sedgwick and Frank by the blending of analog and digital; in Massumi, with the positing of affect as that which ontologically precedes the distinction between active/passive.

What is required, therefore, is to manifest why the active/passive so doggedly haunts the discourse on affects as well as the difference of affects to emotions, passions, sensations or feelings. The task requires a genealogy of the concepts to better manifest their implication in the past metaphysics that continues to haunt the debate. The next stage in this journey will be to show how the roots of the turn to affect can be located in three key thinkers of post-structuralism that link it to previous philosophies: Deleuze's source in Spinoza, and Derrida and Irigaray's source in Heidegger's concept of auto-affection which in turn derives from *Affekt* as translation of *πάθος*.

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<sup>126</sup> Probyn, 'Writing Shame,' 74.

<sup>127</sup> Gregg and Seigworth, *Affect Theory Reader*, 1.

<sup>128</sup> *Ibid.*, 2



## 2

# THE AFFECT OF AUTO-AFFECTION: DERRIDA, DELEUZE, IRIGARAY, HEIDEGGER

The previous chapter understood the turn to affect as reacting against a sedimented theorism inherited from post-structuralism; in particular, the perceived centrality of language as the only model for understanding representation, bipolar transitive relations that can only be arbitrarily paired and anti-essentialisms that opposed any notions of a biological body. But, at the same time, as a project that sought to continue the critique or deconstruction of the self-certain subject. Balibar summarises how this critique united disparate philosophical projects:

the ‘critique of the philosophies of the subject’ (or, more precisely, ‘the *originary subject*, referring to an ideal lineage that connects statements from Descartes, Kant, and Husserl) constituted the point of intersection (but also of friction) between the discourses of phenomenological (or post-phenomenological) deconstruction of the ‘metaphysics’ of foundation, the structuralist ‘decentring’ of the immediate data of consciousness, and the Marxist, Freudian, or Nietzschean critiques of the ‘illusions’ that beset the claims of consciousness to truth.<sup>129</sup>

The turn to affect continued this critique by attempting an account of the affects, emotions and feelings of this deconstructed or decentred, error-prone subject. For Sedgwick, Frank and Massumi it was a question of conceptualizing an affective non-coincidence with self whether through the self-difference of affects or the separation of affect and affections.

But why affect? Of all the concepts around that time, why does affect emerge as the concept around which the turn revolves? We saw in the last chapter how affect enabled a return to the body and its non-linguistic aspects, a reengagement with natural sciences and a challenge to the dominance of arbitrary binaries for a focus on how things bind and differentiate. But why not emotion or sensation? And why the confusion over the identity or difference of affect to these other terms?

This chapter argues that affect emerged because of its central importance to three key thinkers of the critique of philosophies of the subject. Whilst this is most clearly evidenced in Deleuze and his reading of Spinoza, affect is also central to Derrida and Irigaray through the

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<sup>129</sup> Balibar, *Citizen Subject*, 2.

concept of auto-affection introduced by Heidegger. Whilst there are many differences between these three thinkers – notably Derrida and Irigaray’s continuance of the Heideggerian theme of the ‘end of metaphysics’ and its overcoming whereas Deleuze sees himself as a ‘pure metaphysician’ interested in the as yet undiscovered metaphysics of modern science<sup>130</sup> – all three authors will understand auto-affection as, most generally, a binding of difference between a ‘one that is two’ often described using the Greek term *heteros* meaning other but other specifically as one of two not one of many (*allos*). In question will be what binds this *heteros* in its difference.

### ORIGINS OF AUTO-AFFECTION

The term auto-affection was introduced by Heidegger in *Kant and the Problem of Metaphysics*.<sup>131</sup> He coined it to describe Kant’s split in subjectivities that co-exist: the transcendental, logical ‘I think’ and the empirical, intuitive form: the ‘I that I think,’ pure apperception, differs from the ‘I that intuits itself’.<sup>132</sup> Communication between the two is through affect: ‘we intuit ourselves only as we are internally affected.’<sup>133</sup> The form of this inner sense is time which leads Heidegger to state ‘time as pure self-affection forms the essential structure of subjectivity.’<sup>134</sup> Kant says ‘the standing and lasting I (of pure apperception) constitutes the correlate of all our representations’<sup>135</sup> and ‘time itself does not elapse, but the existence of that which is changeable elapses in it.’<sup>136</sup> Heidegger glosses this as it is only on the basis of this transcendental ‘abiding and unchanging’ that ‘an object is capable of being experienced as remaining the same through change,’<sup>137</sup> this experience of change arising through empirical intuition. The subject perceives itself through the way in which it remains the same through change, the way change affects the unchanging. Auto-affection is thus the temporal difference within the self and the self is temporal self-difference.

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<sup>130</sup> Villani, *La Guêpe*, 130.

<sup>131</sup> Heidegger, *Kant and the Problem of Metaphysics*.

<sup>132</sup> Kant, *Critique of Pure Reason*, B155.

<sup>133</sup> *Ibid.*, B153.

<sup>134</sup> Heidegger, *Kant and the Problem of Metaphysics*, 194.

<sup>135</sup> Kant, *Critique of Pure Reason*, A123.

<sup>136</sup> *Ibid.*, A144.

<sup>137</sup> Heidegger, *Kant and the Problem of Metaphysics*, 198.

But before being named as such the idea of auto-affection had a long and privileged place in philosophy as spontaneity and self-enclosure, the ‘noble’ auto-affection privileged over any causation by something other or external, any ‘hetero-affection.’ As Nietzsche remarked:

everything of the first rank must be *causa sui*. Origin in something else counts as an objection, as casting a doubt on value. All supreme values are of the first rank, all the supreme concepts [...] all that cannot have become, *must* therefore be *causa sui*.<sup>138</sup>

#### **DERRIDA: AUTO-HETERO-AFFECTION**

Derrida links directly the question of auto-affection with the analysis of the touching-touched relation in Husserl that binds myself to myself as toucher and touched and which ensures the passage to meaningful sensations, emotions and the very experience of self itself. Derrida characterises this experience as ‘auto-affection’ which he describes as:

a universal structure of experience. All living things are capable of auto-affection. And only a being capable of symbolizing, that is to say of auto-affecting, may let itself be affected by the other in general. Auto-affection is the condition of an experience in general. This possibility – another name for ‘life’ – is a general structure articulated by the history of life and leading to complex and hierarchical operations.<sup>139</sup>

An example of such auto-affection is given in Derrida’s analysis of Husserl on ‘hearing-oneself-speak.’ Derrida characterises this as ‘an auto-affection of an absolutely unique type’ because Husserl claims that, through this auto-affection,

the subject is able to hear himself or speak to himself, is able to let himself be affected by the signifier that he produces without any detour through the agency of exteriority, of the world, or of the non-proper in general. Every other form of auto-affection must either pass through the non-proper or renounce universality.<sup>140</sup>

Derrida will deconstruct this ‘pure’ auto-affection for an originary auto-hetero-affection in which in affecting myself, I affect something other in myself; I do not coincide with myself but actually require a detour through an exteriority internal to me as the other in me. To further understand this deconstruction, let us consider another example in Derrida’s reading of Husserl’s phenomenological approach on the question of intersubjectivity in *Cartesian Meditations*. There, Husserl argued that I differentiate myself from others through a self-founding in ‘a peculiar kind of *epoché*’ where we ‘disregard all constitutional effects of

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<sup>138</sup> Nietzsche, *Twilight of the Idols*, 47.

<sup>139</sup> Derrida, *Of Grammatology*, 165-66.

<sup>140</sup> Derrida, *Voice and Phenomenon*, 67.

intentionality relating immediately or mediately to other subjectivity' and limit ourselves to a 'sphere of peculiar ownness' that we constitute within ourselves. This yields a primary 'founding stratum,' a 'unitarily coherent stratum of the phenomenon world' in which nothing other exists.<sup>141</sup> In this reduction, my own body proper [*Leib*] is 'uniquely singled out' as the only body [*Körper*] that is 'not just a body but precisely an animate organism [*Leib*].' It is the 'sole Object within my abstract world-stratum to which, in accordance with experience, I ascribe fields of sensation' and in which I "'rule and govern" immediately.'<sup>142</sup> I rule and govern because I am perceptually active and can experience 'all of Nature, including my own animate organism [*Leiblichkeit*]' because my *Leib* is 'reflexively related to itself' – I can touch one hand with the other, touch my eye with my hand, see my hand with my eye, etc. It is this broader self-reflexivity that gives 'the ownness-essence of the Objective phenomenon: "I, as this man."<sup>143</sup> In this reduction, I obtain my animate organism [*Leib*], my psyche and my psycho-physical unity in which 'my personal Ego who operates in this animate organism and, "by means of" it, in the "external world."<sup>144</sup>

Derrida shows how this reflexivity actually necessitates a 'detour by way of the foreign outside,'<sup>145</sup> a detour through this *Körper* that implies a 'spacing' between me and myself, which enables 'me' to say this is 'my' *Körper*, a unity of 'my' psychic and physical which makes it my *Leib*. Given this spacing, Derrida asks 'shouldn't a certain introjective empathy, a certain "intersubjectivity," already have introduced an other [...] to give rise to an experience of the body proper allowing one to say, "it is I," "this is my body"?'<sup>146</sup> If so, we should therefore reintroduce 'the inanimate, "material nature," as well as death, the non-living, the nonpsychical in general, language, rhetoric, technics and so forth' into this phenomenological sphere of ownness.<sup>147</sup> Because auto-affection is self-enclosed yet requires a detour through an outside within the self-enclosure, it introduces an alterity right into the very place it was most thought to be excluded, inside for-itselfness. Any pure auto-affection is therefore always already an auto-hetero-affection, the affection of something other in me.

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<sup>141</sup> Husserl, *Cartesian Meditations*, 96 (§44).

<sup>142</sup> *Ibid.*, 97 (§44).

<sup>143</sup> *Ibid.*, 97 (§44).

<sup>144</sup> *Ibid.*, 97 (§44).

<sup>145</sup> Derrida, *On Touching*, 175.

<sup>146</sup> *Ibid.*, 176-7.

<sup>147</sup> *Ibid.*, 180.

Derrida can thus be read as continuing Husserl's phenomenological analyses but where the analyses turn toward this paradoxical auto-hetero-affection in all its maddening guises: as a one that is two in difference, often exemplified through language and its contronyms such as *pharmakon* or the supplement.<sup>148</sup> Now this 'one that is two' has historically been conceived as bound together by the active and passive – for example, active toucher, passive touched – in which the active is privileged. This leads to the positing of purely active entities that can only act *on* something else but cannot be acted on (God, Plato's Ideas, Authentic Temporality, etc.) and/or purely passive entities (matter). In Husserl, this took the form of a purely active ego acting in the world or, on itself which was split into an active toucher and passive touched. Derrida also includes past conceptions of time within this critique of pure auto-affection in a discussion of early Heidegger, where this pure activity became primordial temporality:

The extraordinary trembling to which classical ontology is subjected in *Sein and Zeit* still remains within the grammar and lexicon of metaphysics. And all the conceptual pairs of opposites which serve the destruction of ontology are ordered around one fundamental axis: that which separates the authentic from the inauthentic and, in the very last analysis, primordial from fallen temporality.<sup>149</sup>

But what is the affect of auto-affection? It seems able to describe the touching-touched, hearing-oneself speak, self-reflexivity in general even though Husserl does not use the term affect (*Affekt*) in *Cartesian Meditations*, *Logical Investigations*, *Ideas I or II*. Or it characterises the relation of time to itself. So is touch an affect? Speaking? Time? The affect of auto-affection would then seem to function as the most general, capacious term that can signify all these things in their relation to something other. If Derrida's *On Touching* described a shift from logocentrism to *haptocentrism* (the privileging of touch over all the other senses in the metaphysical tradition) does Derrida's work therefore manifest an *affectcentrism*? But an *affectcentrism* that remains implicit and in which affect remains largely unconceptualized and relatively undifferentiated from related terms like emotion and passion.

Let us turn then to where Derrida explicitly speaks of emotions and passions to see if it can help clarify these terms from affect and, in so doing, clarify Derrida's understanding of affect. In *Of Grammatology*, Derrida discusses Rousseau's theory of the origin of

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<sup>148</sup> See Derrida, 'Plato's Pharmacy,' and *Of Grammatology*, 141-64.

<sup>149</sup> Derrida, 'Ousia and Gramme,' 630.

metaphorical and literal language. In this discussion, the problem of activity and passivity appears again in the question of whether passions are active and causal and the question of the metaphorical and the literal. Rousseau writes:

Upon meeting others, a savage man will initially be frightened. Because of his fear he sees the others as bigger and stronger than himself. He calls them *giants*. After many experiences, he recognises that these so-called giants are neither bigger nor stronger than he. Their stature does not approach the idea he had initially attached to the word giant. So he invents another name common to them and to him, such as the name *man*, for example, and leaves *giant* to the fictitious object that had impressed him during his illusion. That is how the figurative word is born before the literal word, when our gaze is held in passionate fascination; and how it is that the first idea it conveys to us is not that of the truth.<sup>150</sup>

The active and passive is, therefore, already on the scene as Rousseau writes: ‘because of his fear he sees the others as bigger and stronger than himself’: fear is attributed a causal role. Derrida glosses this as: ‘fear makes me see giants where there are only men.’ ‘Fear’ is thus something which *makes* (me see giants) or *is made* (in me by the first sight of other men). The passions are attributed a causal role that bind self to world in a binding of active/passive. No doubt this arises from ‘passion’ itself which conceptually denotes a ‘passivity’ often in opposition to action.

But Derrida challenges such a reading by interpreting Rousseau using the discourse of Saussurean linguistics and metaphor:

Before it allows itself to be caught by verbal signs, metaphor is the relation between signifier and signified within the order of ideas and things, according to what links the idea with that of which it is the idea, that is to say, of which it is already the representative sign. Then, the literal or proper meaning will be the relationship of the idea to the affect that it expresses. And it is the *inadequation of the designation* (metaphor) which *properly expresses* the passion. If fear makes me see giants where there are only men, the signifier – as the idea of the object – will be metaphoric, but the signifier of my passion will be literal. And if I then say, ‘I see giants,’ that false designation will be a literal expression of my fear.<sup>151</sup>

An expression of fear is thus a simultaneity of literal and metaphorical, of giant and man, as well as a relation to time or at least repetition in the fact that it is only with repeated exposure that the ‘giants’ are finally acknowledged as ‘men.’ As Terada clarifies in her

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<sup>150</sup> Rousseau, ‘Essay,’ 13.

<sup>151</sup> Derrida, *Of Grammatology*, 275.

reading of emotion in post-structuralism, this ‘inadequation of the designation’ ‘*properly expresses*’ the passion because: it is ‘the *difference between* the sign’s falseness with respect to its object and its accuracy with respect to its idea that represents the passion.’<sup>152</sup> Passion, then, is self-difference, a difference of true, literal expressions of false designations.

Derrida therefore challenges the simple active//passive binary of past metaphysics and the question of the causality of the passions through a focus on difference. Differences between literal and metaphorical, self and world, subject and object become no longer differences of active and passive but more originary, prior to the distinction between active and passive and produced by what Derrida calls *différance* (combining senses in French of differing and deferring): ‘differences, thus, are ‘produced’ – deferred – by *différance*.’ But shifting agency to *différance* merely raises the question of ‘*what* defers or *who* defers? In other words, *what is différence?*’<sup>153</sup> It is again a question of causality and identity: does *différance* act? Derrida recognises that to shift causality onto *différance* would mean that

*différance* has been derived, has happened, is to be mastered and governed on the basis of the point of a present being, which itself could be something, a form, a state, a power in the world to which all kinds of names might be given, a *what*, or a present being as a *subject*, a *who*.<sup>154</sup>

Within this alternate conception, passions are no longer ‘passive’ in opposition to an active entity, nor causal in themselves, but, differential, differences between literal and metaphorical that are ‘produced’ (the verb is in quotations for reasons that will shortly become apparent), differed or deferred by *différance* that manifest the metaphorical in the literal.

Derrida further explains how *différance* evades the binding of active/passive through reference to the grammatical ‘middle voice’ (something that will become significant to Chapter 4):

We will see why that which lets itself be designated *différance* is neither simply active nor simply passive, announcing or rather recalling something like the middle voice, saying an operation that is not an operation, an operation that cannot be conceived either as passion or as the action of a subject on an object, or on the basis of the categories of agent or patient, neither on the basis of nor moving toward any of these terms. For the middle voice, a certain nontransitivity, may be what philosophy, at its

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<sup>152</sup> Terada, *Feeling in Theory*, 43.

<sup>153</sup> Derrida, ‘Différance,’ 14.

<sup>154</sup> *Ibid.*: 15

outset, distributed into an active and a passive voice, thereby constituting itself by means of this repression.<sup>155</sup>

Yet within Derrida's analysis of Rousseau, the signifier of fear is nevertheless 'the signifier of *my* passion'? How is this 'my' produced, this sense of ownership? Through difference with *différance* as its dynamic centre that displaces the centrality of the subject as a purely self-present entity. I am only able to say *my* fear to the extent that this fear is not strictly causal but an 'effect' of *différance*, an auto-hetero-affection that produces a sense of ownership. These 'effects' don't find their *cause* in a subject or a substance, in a thing in general or a passion, a being that is somewhere purely present that would elude the play of *différance*.

Whilst the system of *différance* no longer tolerates the opposition of activity and passivity, or cause and effect, and treats consciousness not as 'the absolutely central form of Being but as a "determination" and as an "effect," ' Derrida continues to use these terms (in quotation marks) because 'one continues [...] to operate according to the lexicon of that which one is de-limiting.'<sup>156</sup>

It is thus not fear that *makes* me see giants but a more originary *différance* that 'produces' the difference between me and world, giants and men, metaphorical and literal which is the passion. *Différance*, remaining in endless differing and deferral, and not an originary identity, nevertheless leaves a trace of itself in the world. Fear is a supplementary structure (augmenting and replacing simultaneously) in which it gives the subject as the subject exceeds itself.

Others, particularly Lacan and Žižek, have argued it is precisely this discontinuity or decentring that is subjectivity. Responding to this view, Derrida argues

Some might say: but what we call 'subject' is not the absolute origin, pure will, identity to self, or presence to self of consciousness but precisely this noncoincidence with self. This is a riposte to which we'll have to return. By what right do we call this 'subject'? By what right, conversely, can we be forbidden from calling this 'subject'? I am thinking of those today who would try to reconstruct a discourse around a subject that would not be predeconstructive, around a subject that would no longer include the figure of mastery of self, of adequation to self, centre and origin of the

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<sup>155</sup> Derrida, *Différance*, 9.

<sup>156</sup> Derrida, 'Différance,' 17.

world, etc. ... but which would define the subject rather as the finite experience of non-identity to self.<sup>157</sup>

Derrida resists this move as it would not deconstruct the historical binding of subjectivity with the human and preclude ‘subjectivity’ being broadened again to the animal, vegetal the inorganic, ‘nothing should be excluded’:

Why have I rarely spoken of the ‘subject’ or of ‘subjectivity,’ but rather, here and there, only of ‘an effect’ of ‘subjectivity’? Because the discourse on the subject, even if it locates difference, inadequation, the dehiscence within auto-affection, etc., continues to link subjectivity with man. Even if it acknowledges that the ‘animal’ is capable of auto-affection (etc.), this discourse nevertheless does not grant it subjectivity – and this concept thus remains marked by all the presuppositions that I have just recalled.<sup>158</sup>

We see that, for Derrida, the critique of the subject takes the form of positing a non-temporal ‘before’ the subject-object (and active/passive, cause-effect, etc.) divide and seeks to deconstruct the narrowing of subjectivity to the human.

#### **DELEUZE’S SPINOZA: ONTOLOGICAL AFFECTS**

If affect remains relatively unconceived in Derrida, with Deleuze this is less the case. He, perhaps more than most, has exhibited what he means by affect through his engagement with Spinoza. Throughout Deleuze’s interpretation of Spinoza as well as his own philosophy, it is again essential to keep in mind the seemingly paradoxical two that is one, separate yet unified and is perhaps where most criticisms of Deleuze’s affect as pure, as absolutely separate from cognition arise. This might give the impression of a dualism, but the important point is that for difference *at least* two are required: ‘there must be at least two multiplicities, two types, from the outset. This is not because dualism is better than unity but because the multiplicity is precisely what happens between the two.’<sup>159</sup> But Deleuze’s difference is more radical than the difference between two pre-existing identities. Deleuze argued difference had always been subordinated to identity and, as with Derrida, Deleuze inverts this so that identity becomes something produced by a more originary difference.

In his lectures on Spinoza in 1978, Deleuze argues the two most important concepts in Spinoza are affect and power. Let us begin with affect. Deleuze first highlights the distinction

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<sup>157</sup> Derrida, ‘Eating Well,’ 103-4.

<sup>158</sup> Ibid., 105.

<sup>159</sup> Deleuze and Guattari, *What is Philosophy?*, 152.

Spinoza makes between *affectus* (affect) and *affectio* (affection) criticising those who fail to respect this difference or who translate *affectus* as feeling [*sentiment*]. For Deleuze (and Massumi), *affectus* is *not* feeling [*sentiment*] and would be better translated by the French (and English) ‘affect.’ Spinoza defined *affectus* thus: ‘By affect [*affectus*] I understand the affections [*affectiones*] of the body by which the body’s power of activity is increased or diminished, assisted or checked, together with the ideas of these affections [*affectionum*].’<sup>160</sup>. Deleuze explains:

I would say that for Spinoza there is a continuous variation – and this is what it means to exist – of the force of existing or of the power of acting .... An affect is a continuous variation of the force of existing, insofar as this variation is determined by the ideas one has.<sup>161</sup>

Affect is a mode of thought that in itself represents nothing. For example, with love, there is the idea of the loved thing but love itself represents nothing. Ideas determine the variation but ‘determined’ here does not mean that variation is reducible to the ideas one has, nor is it a question of comparison. It is a fall or rise in the power of acting, a continuous variation which defines affect ‘in its correlation with ideas and *at the same time* in its difference in nature from ideas.’<sup>162</sup> This understanding of affect will remain consistent throughout Deleuze’s work.

Affection, *affectio*, meanwhile, is ‘a state of a body insofar as it is subject to the action of another body.’<sup>163</sup> For example, in feeling the sun on me, this affection of the body ‘is not the sun, but the action of the sun or the effect of the sun on you’; ‘a mixture of two bodies, one body which is said to act [*agir*] on another, and the other receives [*recueillir*] the trace of the first. Every mixture of bodies will be termed an affection.’<sup>164</sup> The active/passive thus belongs to the realm of affections, not affect. Affection envelops affect not as a comparison of mind but as a lived passage: ‘every affection envelops the passage by which we arrive at it, and by which we leave it, towards another affection, however close the two affections considered are.’ Deleuze gives the example of being in a dark room and someone turning on a light: ‘the

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<sup>160</sup> Spinoza, *Ethics*, 70 (IHD3).

<sup>161</sup> Gilles Deleuze, *Cours Vincennes 24 January 1978 (Lectures on Spinoza)*, Accessed February 11, 2018, <https://www.webdeleuze.com/textes/14/>

<sup>162</sup> Ibid. Emphasis added.

<sup>163</sup> Ibid.

<sup>164</sup> Ibid.

affection is the dark state and the lighted state. Two successive affections, in cuts. The passage is the lived transition from one to the other.<sup>165</sup>

The difference between affect (*affectus*) and affection (*affectio*) is not that one refers to the body and the other to the mind but that between ‘the body’s affection and idea which involves the nature of the external body, and the affect, which involves an increase or decrease in the power of acting, for the mind and body alike’<sup>166</sup>. This helps clarify those critiques like Leys who argue Massumi, in his Deleuzian distinction between affect and emotion merely repeats a dualism of body/mind.<sup>167</sup>

A further split (and one without which Deleuze says we can understand nothing of *Ethics*) is the two registers Spinoza works in in discussing bodies. A body for Spinoza is ‘permanence of a relation of movement and rest through all the changes which affect all the parts.’<sup>168</sup> But here Spinoza is working in two registers at the same time. First *kinetic* where each body ‘is defined by relations of movement and rest, of slowness and speed between particles.’<sup>169</sup> This understands each living individuality, not as a form or through functions, but as ‘a complex relation between differential velocities, between deceleration and acceleration of particles.’<sup>170</sup> Second, *dynamic* where each body is defined by its power of affecting or being affected. If kinetic means you cannot define a body by its form or function, dynamic means it can neither be defined as a substance or subject. For Spinoza, bodies and minds are modes, not substances or subjects. Hence you define, say, an animal by the affects of which it is capable, of what it can do and what it can undergo. Spinoza can alternate from dynamic to kinetic definitions because an affection destroys a relation and a body is known by its power of being affected. Whereas kinetic power is defined as differential relations, dynamic power is characterised by the active and passive, yet it is always both kinetic and dynamic at the same time.

The key difficulty will be how these splits (between affect and affections, kinetic and dynamic powers) are bound together, how difference is bound. For, contra Leys and other critics of Deleuze via Massumi, there is not an absolute separation between the two in their difference but a separation *and* a determining. This determining is based on Spinoza’s

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<sup>165</sup> Ibid.

<sup>166</sup> Deleuze, *Spinoza*, 49. For Leys’s claim, see *Ascent of Affect*, 326.

<sup>167</sup> Leys, *Ascent of Affect*, 326.

<sup>168</sup> Deleuze, *Cours Vincennes. 24 January 1978*. February 11, 2018, <https://www.webdeleuze.com/textes/14>.

<sup>169</sup> Deleuze, *Spinoza – Practical Philosophy*, 123.

<sup>170</sup> Ibid.

naming the determination of an action ‘association.’ Deleuze explains that association is ‘the link that unites the image of the action with an image of a thing. That is the determination of the action. The determination of the action is the image of a thing to which the image of the act is linked.’<sup>171</sup> Deleuze gives the example of two acts: hitting his mother and hitting a bass drum; these are the same action in terms of bodily movements but different because of their associations. Every action can then be analysed along two dimensions: ‘the image of the act as power of the body, what a body can do, and the image of the associated thing, that is to say the object on which the act bears. Between the two there is a relation of association. It’s a logic of action.’<sup>172</sup> It is worth remark that this association is no longer merely a binding of active/passive, this coupling only features in dynamic power. It is a binding of the active/passive dynamic *and* the kinetic.

What Sedgwick and Frank admired in Tomkins and his split between object and drive, we can similarly see what Deleuze’s finds in Spinoza for the critique of the self-certain subject in the confusion of cause and effect in the passions. Given this possibility for error at the heart of subjectivity, it will be the goal of reason to gain adequate knowledge of the causes and make these passions ‘active affects.’ Spinoza does this by separating action and passion to argue affects as passions can be determined by reason as action:

all the actions to which we are determined from a feeling which is a passion, we can be determined to do them without it (without the feeling), we can be determined to do them by reason. Everything that we do when pushed by passion, we can do when pushed by pure reason.<sup>173</sup>

To become rational, therefore, you must first discover your affects through passions:

the first effort of reason, you see, exactly, it is to do everything in my power in order to increase my power of acting, that is in order to experience passive joys, in order to experience the joys of passion. The joys of passion are what increase my power of acting according to still equivocal signs in which I don't possess this power.<sup>174</sup>

It is through this direction toward ‘active affects’ that Deleuze introduces auto-affection to characterise ‘essence ideas’ in Spinoza. Deleuze discusses Spinoza’s concept of an idea, ‘a mode of thought defined by its representational character’ such as ‘the idea of a triangle is the

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<sup>171</sup> Deleuze, *Cours Vincennes 13 January 1981*. February 11, 2018, <https://www.webdeleuze.com/textes/34>

<sup>172</sup> Ibid.

<sup>173</sup> Deleuze *Cours Vincennes 13 January 1981*. February 11, 2018, <https://www.webdeleuze.com/textes/34>

<sup>174</sup> Ibid.

mode of thought that represents the triangle.<sup>175</sup> It has an objective reality insofar as it has a relation to the object it represents (extrinsic character) and a formal reality insofar as the idea itself is something which means I can form an idea of an idea (intrinsic character).

There are three kinds of idea. First, *affectio* ideas, representations of effects without causes. These are inadequate ideas as they indicate the nature of the modified body not modifying, they are passions. Second, notion ideas. These represent ‘the internal agreement or disagreement of the characteristic relations of the two bodies’;<sup>176</sup> for example, knowledge of arsenic and body relation: it would poison me. There are common notions such as motion and rest which are common to all bodies. This knowledge is a vital enterprise in which one begins to leave passions behind and gains power of acting. And finally, essence ideas. Deleuze adds,

Ideas of the second kind and [those] of the third kind are affections of essence, but it would have to be said following a word that will only appear quite a bit later in philosophy, with the Germans for example, these are auto-affections. Ultimately, throughout the common notions and the ideas of the third kind, it’s essence that is affected by itself.<sup>177</sup>

In essence-ideas all essences are ‘internal to one another and internal to the power called divine power’ and ‘since all essences are internal to one another, an essence that affects me is a way in which my essence affects itself.’<sup>178</sup> Deleuze exemplifies them in reference to Pantheism and the sun. The first involves us saying ‘oh the sun, I love that!’ and are external relations act on my external relations of corpuscles. The second is a kind of communion with the sun. But the third is a mystical union, an intrinsic distinction which the distinct essences ‘distinguish themselves on the inside from one another. So much so that the rays by which the sun affects me are the rays by which I affect myself, and the rays by which I affect myself are the rays of the sun that affect me. It’s solar auto-affection.’<sup>179</sup>

Deleuze maintains there is no difference between auto-affection and active affect: ‘auto-affections or active affects assume that we possess our power of acting and that, on such and such a point, we have left the domain of the passions in order to enter the domain of

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<sup>175</sup> Deleuze *Cours Vincennes 24 January 1981*. February 11, 2018, <https://www.webdeleuze.com/textes/14>

<sup>176</sup> Ibid.

<sup>177</sup> Deleuze *Cours Vincennes 24 March 1981*. February 11, 2018, <https://www.webdeleuze.com/textes/114>

<sup>178</sup> Ibid.

<sup>179</sup> Ibid.

actions.’<sup>180</sup> When my power of acting increases or decreases, I am still separated from it, I am not the cause of my own affects, they are produced in me by something else and I am therefore in the realm of passions. But in auto-affection, ‘the power of acting is conquered instead of passing by all these continuous variations.’<sup>181</sup>

We see again throughout Deleuze’s reading of Spinoza the insistence on separation and distinction, of the one-that-is-two and here the auto-affection, this union of the third kind is conceptualised through this togetherness of same/different, inside/outside. If ‘the rays by which the sun affects me are the rays by which I affect myself, and the rays by which I affect myself are the rays of the sun that affect me’ I am and am not, at the same time, of the essence of the sun and of the essence of myself.<sup>182</sup> This complex identity and separation arises from the ontological privilege of difference, not sameness.

### **IRIGARAY: MASCULINE AND FEMININE AUTO-AFFECTION**

Let us turn finally to Irigaray for her understanding of auto-affection. Her work can be approached through three aspects: the critique of past patriarchal thinking, how to elaborate a feminine subjectivity, and how to think the relation between this feminine subjectivity and masculine subjectivity. Crucial to this project will be manifesting a specifically feminine auto-affection in distinction to a masculine auto-affection.

The critique of masculine philosophy is the critique of how ‘the paradigms of masculine transcendency, which is sometimes considered neutral or bisexual, must be modified in order to establish a feminine transcendency.’<sup>183</sup> This involved a critique of past metaphysics, particularly the logic of coupled opposites and quantification, which had produced a place for woman in advance of her speaking, with and through her silence, as merely the opposite of man, the other of the same, or as the ‘sex which is not *one*.’ Woman was aligned with matter in the form/matter opposition, the passive in the active/passive, the body in the body/mind, each being inferior to the privileged ‘masculine’ pole. Irigaray demonstrates an example of such privileging in the primacy accorded to the intellect over the senses:

Philosophy teaches the eyelids to close tighter and tighter to bar anything still presented by the senses, teaches the gaze to turn inward to the soul, that screen for the projection of ideal images. The horror of nature is magicked away: it will be seen only

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<sup>180</sup> Deleuze *Cours Vincennes 24 January 1978*. February 11, 2018, <https://www.webdeleuze.com/textes/14>

<sup>181</sup> Ibid.

<sup>182</sup> Deleuze *Cours Vincennes 24 March 1981*. February 11, 2018, <https://www.webdeleuze.com/textes/114>

<sup>183</sup> Irigaray, *Elemental Passions*, 3.

though the blind of intelligible categories, and the weaknesses that ultimately will lay man low will be laid at the door of an insufficiently lofty point of view.<sup>184</sup>

But Irigaray will not seek to reverse these oppositions or collapse them into simultaneities by showing how both apply to both sexes. As Judith Butler has summarised, the feminine must be elaborated from outside this closed system of coupled opposites as its ‘constitutive outside’:

Irigaray’s task is to reconcile neither the form/matter distinction nor the distinctions between bodies and souls or matter and meaning. Rather, her effort is to show that those binary oppositions are formulated through the exclusion of a field of disruptive possibilities. Her speculative thesis is that those binaries, even in their reconciled mode, are part of a phallogo-centric economy that produces the ‘feminine’ as its constitutive outside. [...] The economy that claims to include the feminine as the subordinate term in a binary opposition of masculine/feminine excludes the feminine, produces the feminine as that which must be excluded for that economy to operate.<sup>185</sup>

Irigaray pursues this critique in readings of key texts from the history of philosophy, notably Freud and Plato in *Speculum of the Other Woman*. With this critique of masculine philosophy, Irigaray then embarks on elaborating a female subjectivity by a woman without and apart from the oppositionality ascribed to her by men. For example, her work *Elemental Passions*

offers some fragments from a woman's voyage as she goes in search of her identity in love. It is no longer a man in quest of his Grail, his God, his path, his identity through the vicissitudes of his life's journey, it is a woman [...] Between nature and culture, between night and day, between sun and stars, between vegetable and mineral, amongst men, amongst women, amongst gods, she seeks her humanity and her transcendency.<sup>186</sup>

Irigaray finds this subjectivity through a self-affection which she argues is different in woman because of the difference of the lips of the vagina to the penis of man:

So, when she touches herself (again), who is ‘she’? And ‘herself’? Inseparable, ‘she’ and ‘herself’ are part the one of the other, endlessly. They cannot really be distinguished, though they are not for all that the female same, nor the male same . . . . And even if ‘to touch oneself,’ for the masculine gender, is defined as that which begins to set up the distinction subject-predicate, subject-object, in the most archaic fashion, i.e., in the relation of attribution: x is (to, in, . . . ) y – which still allows

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<sup>184</sup> Irigaray, *Marine Lover*, 99.

<sup>185</sup> Butler, *Bodies that Matter*, 35-36.

<sup>186</sup> Irigaray, *Elemental Passions*, 4.

passivity to have a place in auto-affection, or else a suspension between activity and passivity in the attribution of being – it will never be known who/what is x, who/what is y in the female.<sup>187</sup>

This conception of self-affection in feminine thus presents a challenge to the past masculine metaphysics coupling of opposites, especially the active/passive as it relates to the relation of oneself to oneself. As Irigaray writes, woman's autoeroticism remains outside this active/passive:

for woman, she touches herself in and of herself without any need for mediation, and before there is any way to distinguish activity from passivity. Woman 'touches herself' all the time, and moreover no one can forbid her to do so, for her genitals are formed of two lips in continuous contact. Thus, within herself, she is already two but not divisible into one(s)-that caress each other.<sup>188</sup>

Again, it is a question of a binding, of the two that is an indivisible one in the binding of the lips, doubled, but which precedes or evades the couplings of active and passive. What then holds them together? What is this one, at once same and different? Whilst in the masculine, the touching-onself would set up the active/passive, the subject/object, it is not so in the female.

The difference between masculine and feminine self-affection and its consequences for philosophy is most clarified in *In the Beginning She Was*. Admitting she is not a man and therefore can only analyse culture in the masculine, the *effects* of masculine, she argues

masculine subjectivity did not become differentiated enough from the maternal world. Thus the total relation that the male child has with his mother – the first other for him – has not been cultivated as such and, one could add, has not been submitted to a dialectic process.<sup>189</sup>

This has entailed several consequences: it is by establishing a logic of coupled opposites that the masculine tried to emerge from the undifferentiated link with its first other, that of the mother. To the extent man sees his mother as merely his opposite, he has not differentiated from her, merely remaining the opposite of the same. Such opposites separate masculine subjectivity from its 'natural and affective origin' and become 'substitutes for difference between humans belonging to the two sexes and, first, between the mother and the

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<sup>187</sup> Irigaray, *Marine Lover*, 90-91.

<sup>188</sup> Irigaray, *This Sex*, 24.

<sup>189</sup> Irigaray, *In the Beginning, She Was*, 148.

male child.<sup>190</sup> Particularly in relation to the couplings central to relational life (active/passive, love/hatred, male/female, I/other) these impact the possibility of a reciprocity between people and the definition of a sexuate masculine subjectivity. Relations between subjects become relations between “ones” or “somebodies” who are neutralised and can be substituted for one another.<sup>191</sup>

A further consequence is that affect is then seen as troubling, perturbing or disordering, ‘imposed on the subject from the outside and ... more a source of imbalance than of harmony, or of enriching becoming.’<sup>192</sup> This leads to philosophies that defend against affect, against perturbation to become philosophies of defence against otherness and difference. One has to remain the same, unperturbed, unseparated, affect must be ‘reduced by a turning back to homeostasis.’<sup>193</sup> This results in closed metaphysical systems where everything is reduced to known-in-advance positions on networks of coupled opposites that in turn leads to a ‘closed mental world in order to protect oneself against affects.’<sup>194</sup>

Finally, this defence against difference, particularly subjective sexuate difference, leads to a quantification, where difference and affect are reduced to more or less of the same, as increase or decrease of some pre-existing thing that takes one away from homeostasis and to which one must return.

By contrast, auto-affection in the feminine is different because ‘a girl does not form a ‘dyad’ with the mother but a real duality’ due to ‘the similarity of their bodies and their psyches in their relational dimensions.’<sup>195</sup> This, however, is not enough for it risks perpetuating the original situation of a dependence on the mother. The duality, not dyad, of mother and daughter continues with the importance of the morphology of woman’s two lips doubled. Both mother and daughter therefore require the elaboration of another culture and the keeping of a transcendental dimension that cannot be overcome between the other and herself. A transcendental that is not deferred to

an absolute ‘you’ of a God – who, in fact, substitutes himself for the mother, the first other’ as with masculine subjectivity. This allows ‘turning the sensible immediacy of the relation into a cultivation of affect which can save the irreducibility between the

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<sup>190</sup> Ibid., 149.

<sup>191</sup> Ibid.: 149

<sup>192</sup> Ibid.: 149

<sup>193</sup> Ibid.: 149

<sup>194</sup> Ibid.: 149

<sup>195</sup> Ibid.: 154

other and myself, the insuperable difference between the two – the ‘you’ and the ‘I’.<sup>196</sup>

Yet Irigaray argues that the masculine can achieve a different auto-affection because the man too has lips of the mouth. This different practice of self-affection, she writes in *To Be Born*, can be further enhanced through a cultivation of breath, something she discovered in traditions other than those of the West with its traditional derogation of the body, in practices of yoga and meditation. She writes,

Self-affection has nothing to do either with auto-eroticism or with narcissism, which are more familiar to us. Contemplating Buddha in meditation can lead us to glimpse what it is about. The matter consists of calmly staying in oneself, being silent, preferably with one’s eyes closed, trying to perceive and concentrate in this way one’s own inner energy. To succeed in this, I suggest focussing, at least in the first instance, one’s attention on the perception of one’s lips, one’s hands and one’s eyelids touching one another. Such a gesture—that I call ‘re-touch’—contributes to realizing what our limits are and the thresholds between the inside and the outside of the space that is ours, something which favours a repose in ourselves.<sup>197</sup>

It is through such practices that a repose in or ‘return’ to oneself can be achieved. A return that is absent from much of Western culture which corresponds to a culture of the outside without suitable cultivation of the interiority of the self. This lack of interiority arises from the privilege of thought and intellect that prevents any cultivation of sensible immediacy. It is no coincidence, Irigaray argues, that the earliest reference of Greek culture, the *Odyssey*, tells both of the departure of Odysseus and his eventual return home. But, she argues, this return is not a return to himself and certainly not a return to any sexual relation with his wife. She writes,

With this first epic of Greek culture, love is already becoming an institution bound to the πόλις. And lovers already obey external public rules as much as, if not more than, their own affects. They are moving away from nature, from the body, from the economy of affects, and are becoming subjected to external laws.<sup>198</sup>

Nevertheless, she argues, Odysseus still manifests a self-affection: he is moved, weeps, worries and these are expressed in the form of the middle voice, ‘a morphological form which expresses that he is affected in himself, with himself, outside of the economy of the pair of

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<sup>196</sup> Ibid.: 158

<sup>197</sup> Irigaray, *To Be Born*, 17.

<sup>198</sup> Irigaray, *In the Beginning, She Was*, 141.

opposites: active-passive.<sup>199</sup> The middle-voice is again invoked, as with Derrida, as linguistic exemplar of this binding that precedes the active and passive. But Odysseus's self-affections often happen in secret, with a certain loneliness and without an other to share the affect. It will be through a cultivation of self-affection not as conceived by masculine philosophies but by a feminine subjectivity, and in the relation of one to the other, that Irigaray will present an alternative to this masculine metaphysics.

With this sexuete difference, Irigaray then moves on to the relation between the sexes. If the *heteros* can be related to forms of the body, at once the same and other, of the lips, hands and eyelids, it can also be applied to the relation between the sexes, the one as one of two. The relation between the two is significant because

these forms are necessary for passing from the solitary self-affection that can happen with the lips, the hands, the eyelids touching one another to the self-affection that can exist between two sexuete bodies in kissing or embracing. This represents a crucial stage in going from oneself as individual to community without losing the possibility of staying in oneself that self-affection grants.<sup>200</sup>

To encourage this separation yet union of two that is one, we must practice a sort of 'negative ontology' in meeting the other so that

the matter is no longer one of learning how to integrate each being into an already existing totality, but of lingering on it, posing wondering about it and deconstructing what it represents for ourselves until we return to its living singularity, the one which exists before any human making and which develops with forms of its own.<sup>201</sup>

This can be achieved when two self-affections that are not that of traditional masculine auto-affection meet. Writing of this encounter, Irigaray suggests the advantages it entails:

If, in affecting you, I affect myself, the body instrument opposition no longer holds. For the instrument which I am in order to affect you is itself affected as a body, just as your body, which I affect, is an instrument which affects me. In that exchange of affection the producer and the product become one, the organ and the body can no longer be divided, myself and yourself are no longer embodied as distinct and rival universes. That is not to say that the irreducible no longer exists. For what affects me is what affects you. As well. [...] Experiencing you, experiencing me, espousing you, espousing me, we are more than one. And two. The accounts overflow, calculation is

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<sup>199</sup> Ibid., 141.

<sup>200</sup> Irigaray, *To Be Born*, 50.

<sup>201</sup> Ibid., 62.

lost. If neither I nor you are appropriated by the one or the other. But simply, for the one or the other.<sup>202</sup>

It is a question again of bindings of implicit differences, of bindings that are precede any active/passive, do not seek to reduce the other to the opposite but instead achieve a relation that respects the difference of the other, as open to the different divisions and separations and does not seek to incorporate this difference into a pre-existing totality or conceptual schema. Nor seeks to quantify this difference or idealise it into some God-like status that would only be a substitute for the undifferentiated mother.

### **A NEGLECT OF THE BIOLOGICAL BODY?**

Auto-affection thus appears in each of these writers as the process by which the same is different to itself (passion, body, sexuate beings, etc.), a simultaneous union and distinction, a *heteros* as one-that-is-two. In question throughout are bindings of implicit differences that are prior or other to the active/passive. For Derrida, it is through the positing of the non-temporal 'before' of *différance*, non-temporal because it 'produces' the difference between time and space and that precedes or produces the active/passive as 'effects.' For Deleuze, the active/passive is only one power, the dynamic, in the *heteros* of dynamic *and* kinetic. There is then a difficult logic of association and determination that binds these together in their irreducible difference. For Irigaray, this binding of difference is taken up as the relation between two sexuate human subjectivities, masculine and feminine.

All three thinkers continue the critique of the originary subject as self-certain, self-present and introduce error and difference into the heart of this subject and, for Irigaray, a non-transcendable difference between sexuate beings. But in both Derrida and Deleuze this seems to require a neglect of the biological body, a neglect that, as we saw, became sedimented into a theorism that was one target of the turn to affect. The neglect of biology in these thinkers has notably been taken up by Malabou. She writes, 'to bring to light the originary process of heteroaffection, Derrida and Deleuze need to delocalise the natural body' and 'the thought of heteroaffection in Derrida always require the thought of a *heterobody*, that is, of a nonorganic body or of body without organ.'<sup>203</sup> This neglect of natural sciences in Derrida and Deleuze risks a kind of immaterial affect and Malabou asks whether they dematerialise the process of affects the way the phenomenological body was dematerialised: 'When I clasp my hands, is it

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<sup>202</sup> Irigaray, *Elemental Passions*, 58-9.

<sup>203</sup> Malabou and Johnston, *Self and Emotional Life*, 68.

two planes that I join? [...] Why put the body at a distance, a distance from its own organs?’<sup>204</sup> She continues, ‘is it necessary to transcend biology to articulate a concept of affects that is not related to subjectivity or to its self-touching?’<sup>205</sup>

Furthermore, with Derrida, the lack of clarification of the affect of auto-hetero-affection means affect itself risks becoming reified and specific affects replaced with Affect or, moreover, with Difference. This risks neglecting the process of differentiation, of how things differentiate and matter, another accusation levelled at post-structuralism in the turn to affect. For example, writing in 1990, Sedgwick argued,

Deconstruction, founded as the very science of *diffèr(e/a)nce*, has both so fetishized the idea of difference and so vaporised its possible embodiments that its most thoroughgoing practitioners are the last people to whom one would now look for help in thinking about particular differences.<sup>206</sup>

One needs to focus not only on difference but on the bindings of implicit differences, of what can bind and how and to what effect but without any metaphysical abstraction that would neglect the biological body or its limits.

With Irigaray, these criticisms do not hold. In her insistence on the sexuate body, on its morphology and the difference capacities for affects, Irigaray perhaps provides a better resource for thinking through differences and affects and manifests most the economy of affect produced by past metaphysics as well as possibilities for an alternative.

### ROOTS OF AFFECT

If, then, the concept of affect is central to these thinkers (in the auto-affection of Derrida and Irigaray and in Spinozistic affect in Deleuze) and all maintain the necessity of manifesting an alternative binding to that of active and passive (as continuous variation of differential velocities, or *différance*, or a feminine auto-affection), why is it that the active/passive continues to haunt contemporary discourses around affect?

Perhaps it is the lack of clarity of exactly what the affect of auto-affection signifies. Despite Deleuze’s extensive differentiation of affect as continuous variation from active/passive affections and feelings, their conflation continues to dog the field. What seems to underlie the debate, particularly around intentionality, is the question of causality: who or

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<sup>204</sup> Ibid.: 68

<sup>205</sup> Ibid.: 68

<sup>206</sup> Sedgwick, *Epistemology of the Closet*, 23.

what causes a passion? Are passions themselves causal? Is it the intentional subject, with its beliefs, desires and history, that *makes* the fear or in which the fear *is made*, as Leys would insist on, or are passions and the sense of ownership of these passions ‘produced’ by differential relations that ‘produce’ the subject of, say, fear and its inside/outside as an ‘effect’? Is this perhaps how Sedgwick uses this theory by deploying affective analyses as manifesting differential structures to break out of conceptual impasses? Furthermore, the imbrication of active/passive is implicit to the term passion with its sense of passivity. What is required, therefore, is a detailed discussion of this conceptual field to attempt to extricate the active/passive from these concepts.

In terms of its use in Heidegger’s auto-affectation (*SelbstAffektion*), affect (*Affekt*) was Heidegger’s choice to translate the Greek πάθος. In *Being and Time*, Heidegger writes of the existential constitution of *Befindlichkeit*, variously translated as ‘state-of-mind,’ or ‘attunement,’ the ‘there’ of the ‘being-there’ of *Dasein*. These states, Heidegger writes, ‘have long been well-known ontically under the terms ‘affects’ [*Affekte*] and ‘feelings’ [*Gefühle*] and have always been under consideration in philosophy.’<sup>207</sup> Yet these affects, Heidegger continues, have been narrowed to merely psychological phenomena and incorporated into a psychological discourse that perhaps gives rise to their conflation with human feeling. Heidegger argues this misses the fact that in Greek thought these πάθη or affects

are not states pertaining to ensouled things but are concerned with a disposition of living things in their world, in the mode of being positioned toward something, allowing a matter to matter to it. The affects play a fundamental role in the determination of being-in-the-world, of being-with-and-toward-others.<sup>208</sup>

If we are to understand the reasons for Heidegger’s of *Affekt* to translate πάθος and further extricate it from its implication with passivity or activity, we need to produce a genealogy of the concept and its purported synonyms of emotion, feeling and passions. This will be the topic of the next chapter.

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<sup>207</sup> Heidegger, *Being and Time*, 178.

<sup>208</sup> Heidegger, *Aristotelian Philosophy*

### 3

## AFFECT FOR ΠΑΘΟΣ – LATIN TRANSLATION OF GREEK THOUGHT

The previous chapters identified a problem that affect often remained implicated within a past metaphysics of coupled opposites, particularly the active/passive and that affect remained difficult and differently differentiated from other concepts like passion, emotion and feeling. As well, the question of whether emotions are causal and to what extent should an intentional subject be implicated in this causality. This enmeshment of affect with past metaphysics has most been identified with Irigaray's characterisation of masculine auto-affectation: that affects are seen as quantitative disturbances coming from without leading to philosophies of defence or installations of Gods or Ideals. This chapter will therefore further this manifesting by interrogating the semantic field of affect in its etymological, metaphorical, translational and historically changing usage to manifest this enmeshment and to attempt to extricate for the clarification of the field of affect and its critics. The argument will be that a broader sense of πάθος gets lost in the translation of Greek philosophy into Latin and its sense of passivity as external impositions opposed to activity comes to dominate it.

As the concern is affect's intertwining with past metaphysics through its roots in Latin and Greek philosophy, the focus on Greek and Latin does mean a lack of attention to the often radical redefinitions of concepts between this moment and post-structuralism. The justification, however, is that, if the economy of affect is still implicitly governed by past metaphysics, making this explicit can be most effectively achieved within the space available through attention to this moment.

#### SEMANTICS OF ΠΑΘΟΣ / ΠΑΣΧΕΙΝ

Let us first try to understand the Greek πάθος which Heidegger translated as affect (*Affekt*). Πάθος derives from the verb πάσχειν meaning, most generally, that which happens, i.e. experience, but often with a negative sense as being made to experience by something external and so an undergoing, although it can have positive meanings to be well off or receive benefits. The noun πάθος (plural πάθη) inherits these senses to mean anything that befalls one, what one has suffered, a passion or emotion of the soul, any passive state or condition, experience in general. In Aristotle, it becomes the pathetic mode of expression.

And in early grammar, it was used to describe one of the ‘voices’ [διάθεσις] alongside ἐνέργεια which will be translated as passive and active voice. Let us examine further its wide semantic application.<sup>209</sup>

*As experience*

Most generally, πάθος signifies that which has been experienced. For example, in the *Apology*, Socrates speaks of how, after his death, he imagines meeting Palamedes and Ajax, who also died from unjust convictions, and hopes ‘to compare my experiences (πάθη) with theirs.’<sup>210</sup> This sense of what happens gets applied to inanimate things – in *Phaedo*, πάθος is used to designate that which happens to everything [πάντα].<sup>211</sup>

*As ‘emotion’*

Πάθος becomes translated as emotion mainly because of its use with pleasure and pain and other ‘emotional’ terms like wonder. For example, Epicurus argues there are two πάθη, pleasure and pain and these exist in every animal.<sup>212</sup> In the *Phaedo*, Phaedo says when he contemplated that Socrates was going to die, he felt a strange feeling [πάθος], an unaccustomed mixture of pleasure and pain. All of them were affected [διεκέιμεθα] in the same way, sometimes laughing, sometimes crying.<sup>213</sup> Socrates also mentions this strange mixture of two feelings, pain and pleasure, in *Phaedrus* where Socrates speaks of desire (ἕμερος), which is a play on words deriving from μέρος (“particles”) and ῥεῖν (“flow”); desire that arises in receiving the stream of particles flowing from Phaedrus’s beauty.<sup>214</sup> Or, in *Theaetetus*, Socrates says to Theaetetus: ‘for this feeling of wonder [τὸ πάθος, τὸ θαυμάζειν] shows that you are a philosopher, since wonder is the only beginning [ἀρχή] of philosophy.’<sup>215</sup> This links πάθος with beginning, ἀρχή, suggesting to be ‘affected,’ to be put in a state of wonder is an ἀρχή; with each new πάθος we begin again.

Aristotle defines πάθος in Book 2 of *Rhetoric*:

The emotions [πάθη] are all those affections which cause men to change their opinion in regard to their judgements [κρίσις lit. a separating or distinguishing] and are accompanied by pleasure and pain; such are anger, pity, fear, and all similar emotions

<sup>209</sup> Liddell and Scott, *Greek-English Lexicon*, s.v. πάθος.

<sup>210</sup> Plato, *Apology*, 41b.

<sup>211</sup> Plato, *Phaedo*, 72b5.

<sup>212</sup> Diogenes, *Lives*, X.34, 564-5.

<sup>213</sup> Plato, *Phaedo*, 59a.

<sup>214</sup> Plato, *Phaedrus*, 251c

<sup>215</sup> Plato, *Theaetetus*, 155d.

and their contraries. And each of them must be divided under three heads; for instance, in regard to anger, the disposition [διάκειμαι] of mind which makes men angry, the persons with whom they are usually angry [of habit, ἔθω], and the occasions which give rise to anger [ποιοίς]. For if we knew one or even two of these heads, but not all three, it would be impossible to arouse that emotion.<sup>216</sup>

In this short definition, Aristotle links ποιεῖν, κείμαι (as passive to τίθημι) and ἔθος, three words that will recur frequently. In his history of emotions, Jan Plamper notes how this sentence has been differently interpreted: some have taken it to give a list of ‘basic emotions’ while others believe Aristotle’s emphasis on judgements makes him ‘a forerunner of the experimental psychology of cognitive appraisal.’ Others still read Aristotle as a forerunner of contemporary social psychology with his emphasis on the ‘intersubjective and communicative function of emotion.’<sup>217</sup>

*As attribute, state or condition*

Another use of πάθος is given by Plato in the discussion of Parmenides’s statement Being is One, τό ἓν εἶναι, that Being is a unity.<sup>218</sup> In this saying, being has had the attribute One imposed on it, the One is a πάθος of Being and being will no longer be the same as the One because it is absurd to agree there are two names when there is only the one. Thus πάθος not only determines what Being is but simultaneously differentiates it from itself and from that which is attributed to it. Without such affections we could only speak tautologies: being is being. No doubt πάθος applies here because of this ‘reception’ of an attribute. Here lies a paradoxical import of πάθος: to avoid tautologies something has to be given (and so receive) an attribute, subject is bound to predicate, but this binding means subject is no longer self-identical and so different to itself.

This raises the question of whether a πάθος is an attribute of a being or an integral part of it. Aristotle tackles this question in *Categories* where he distinguishes four types of qualities [ποιότητα from ποιεῖν]: states (ἕξις) and conditions (διάθεσις, again τίθημι), natural capacities (δύναμιν), affective qualities (παθητικά ποιότητες) and form (μορφή).<sup>219</sup> The difference between a state and a condition is their relative duration: a condition is a short-lived state, arising and passing away again quickly whilst a state is an enduring and difficult to change state. But Aristotle also applies this short-livedness to affections (πάθη) which, as a result,

<sup>216</sup> Aristotle, *Rhetoric*, II, 1378a.

<sup>217</sup> Plamper, *History*, 13.

<sup>218</sup> Plato, *Sophist*, 245b.

<sup>219</sup> Aristotle, *Categories*, VIII, 8bff.

cannot be called qualities for we do not attribute the quality of anger to a man if he has been annoyed by something, but only if he is often or constantly angry. But if affections are long-lasting, they become a condition which may in turn become a state. Only affective qualities are actual qualities defined as qualities that can produce a sensation in something else; honey has the affective quality of sweetness because it can produce sweetness in taste, not because it has been affected by something sweet. Heat is an example of both a condition and an affection so a πάθος can also be a διαθεσις if it can *make* the affection in another. Aristotle therefore manifests a relation between πάθος, τίθημι and ἔξις: with sufficient repetition or duration, πάθος becomes a quality like the sometimes-angry man who, if often angry, becomes an angry man: πάθη become conditions become states.

The sense of πάθος as state is used in medical discourse to describe the state of the patient suffering an ailment although, in a long discussion of the different views of other writers, Galen makes a distinction between πάθος and νόσημα:

I apply [the term] “disease” [νόσημα] only to the condition that is opposite to health, by which I mean the function is damaged, whether it (i.e. the disease) is of long or short duration, or momentary. All other conditions contrary to nature that precede this and have the ground of cause, I term causes alone and not affections. I call those things that follow these causes, when they are damages of functions, symptoms and affections [πάθη] in the same way as I do disproportionate excretions and retentions.<sup>220</sup>

### *As Binding*

With its opposition to nouns of ‘action’ - notably ποίημα but also ἔργα, πράξις, and ἐνέργεια - πάθος gets implicated in metaphysical discussions. But if this applies also to ποιεῖν, this applies more to πάσχειν because, whilst other verbs will be substituted for ποιεῖν (δρᾶν, ἐνέργεια, etc.), πάσχειν remains the same. Something that continues into Latin and *patio*. Plato provides us with an ontological example of the coupling in the *Sophist*. There, Plato gives his mark of what is as a δύναμις of active or passive, the ποιεῖν/παθεῖν opposition. This mark is offered to overcome the disagreement between those who believe only tactile bodies are real, the ‘materialists’ and those who believe only immaterial forms are, the ‘friends of the forms.’ Plato writes (note also how this παθεῖν is translated as ‘to be affected’):

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<sup>220</sup> Galen, *Method of Medicine*, II 90K (140-41).

I suggest that everything which possesses any power [δύναμις] of any kind, either to produce [τὸ ποιεῖν] a change in anything [literally to make other, ἕτερος] of any nature or to be affected [τὸ παθεῖν] even in the least degree by the slightest cause, though it be only on one occasion, has real existence. For I set up [τίθημι] as a definition which defines being, that it is nothing else but power [δύναμις].<sup>221</sup>

Plato uses ἕτερος to describe the making other – it is a making other but where the other is one of two. In a metaphysics of coupled opposites particularly evidenced in *Phaedo*, things can only be made to go from their present state to its contrary, from hot to cold, changeable to unchangeable. These opposites form a ἕτερος as one of two. Thus πάσχειν describes *being made* to alternate to the contrary of one's present state. Plato repeats this definition of a δύναμις of 'active/passive' three other times in the course of the dialogue using ποίημα/πάθημα, δρᾶν/πάσχειν and ποιεῖν/πάσχειν. So while the 'active' side changes from ποιεῖν to δρᾶν, the 'passive' side remains always πάσχειν.<sup>222</sup>

As with πάθος, this coupling of affecting or being affected in verb forms is often conveyed using other verbs for the 'active' pole instead of ποιεῖν, such as δρᾶν, whereas the 'passive' pole is nearly always παθεῖν.<sup>223</sup> The coupling ποιεῖν/παθεῖν was said by Sextus Empiricus to have originated with Pythagoras in relation to bodies: 'some say that Body is that which is capable of being active or passive [ποιεῖν ἢ πάσχειν].'<sup>224</sup> He ascribes this view to the Pythagorean school: 'those who conceive body as "what is capable of being acted upon or of affecting" (and of these it is recorded that Pythagoras was the leader).'<sup>225</sup>

So we can understand Plato as here trying to reconcile the school of Pythagoras (said to be a great influence on Plato) with his own theory of Forms through the binding of ποιεῖν and παθεῖν that applies to bodies *and* Forms. A major difference, however, will be that the Forms are purely active entities which only affect and cannot be affected. And so, for Plato, πάθος is both an empirical and metaphysical concept and binds the two in their difference. What delimits beings is what can enter into such communions, a δύναμις κοινωνία.<sup>226</sup>

For Aristotle there are many ways of speaking of being and Aristotle lists four in *Metaphysics*: one in relation to categories with the primary category to which all others refer

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<sup>221</sup> Plato, *Sophist*, 247d-e.

<sup>222</sup> Plato, *Sophist*, 248b, 248c.

<sup>223</sup> e.g. Also Plato, *Timaeus*, 33c-d where Plato uses δρᾶν/πάσχειν. This gets translated as *pateretur et faceret* in Cicero, *Timaeus* VI.

<sup>224</sup> Sextus Empiricus, *Pyrrhonism*, III.VII.

<sup>225</sup> Sextus Empiricus, *Against the Physicists*, I. 366.

<sup>226</sup> See Plato, *Sophist* for greater exposition of the δύναμις κοινωνία.

being οὐσία; another in accordance with potentiality, actuality and action (δύναμις, ἐνέργεια, ἔργον); third in relation to true and not-true; and finally, in relation to accidents. In the categorial way, the active and passive are formalised as two such categories: a doing [ποιεῖν] and a ‘being-affected’ [πάσχειν]. But these also feature in the speaking of being through δύναμις and ἐνέργεια. Whilst Aristotle does not consider how the four ways of speaking being are connected and interrelated, it is worth noting that the opposition ποιεῖν/παθεῖν is common to at least two (categorial and δύναμις/ἐνέργεια).

Aristotle defines δύναμις as a ‘starting point [ἀρχή] of change [μεταβολή] in another thing or in the thing itself *qua* other.’<sup>227</sup> This is defined first in relation to movement [κίνησις]. There are two ways of being acted on: first, the δύναμις to tolerate something from another, like water permits being heated [ἡ δύναμις τοῦ παθεῖν]; second, the capacity to resist deterioration or annihilation by another [ἡ ἔχτις ἀπαθείας τῆς ἐπὶ τὸ χειρὸν].<sup>228</sup> In the latter, there is resistance to a being-affected, an *apathy* [ἀπάθεια] whereas in the former there is no resistance. This resisting or allowing is then related to another δύναμις, the δύναμις τοῦ ποιεῖν, that which does the something to the resisting or allowing.

Aristotle goes on to discuss whether the ποιεῖν and παθεῖν are one or two. His answer will be that they are both one and two at the same time, a unity of the difference of ποιεῖν and παθεῖν. To the extent there is δύναμις, that δύναμις is coupled opposites of outward and inward directions, what will be called ‘active and passive,’ each of which can also be considered as the origin or terminus of a doing or undergoing, ‘agent and patient.’

In a separate text, Aristotle tackles the question of whether only like can affect like or whether only different things can affect each other. It seems previous thinkers were unanimous: like is unaffected by like. Even when a smaller fire is destroyed by a greater fire, it is because of the contrariety small/large. But Democritus argued agent and patient are identical. If two different things act on each other, it is because they both have an identical property [ὑπάρχει]. Aristotle argues the disagreement arises because each treated a part of the problem and not the whole. Treating it as a whole, ‘agent and patient must be like (i.e. identical) in kind [τὸ ποιοῦν καὶ τὸ πάσχον τῷ γένει] and yet unlike (i.e. contrary) in species [εἶδος].’ The agent and patient must be like in genus but contrary [ἐναντία] in species and, in

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<sup>227</sup> Aristotle, *Metaphysics*, IX (Θ) 1, 1046a10.

<sup>228</sup> *Ibid.*, 1046a.

species, the patient must turn into [μεταβάλλω] the agent. This is why fire heats and a cold thing cools and things move or are moved between contraries.<sup>229</sup>

The disagreement between previous authors is explained by the fact some spoke of the *hypokeimenon* as suffering action, e.g. ‘the man as being healed, being warmed and chilled,’ but others of *what is cold* being warmed or *what is sick* being healed. The difference is grammatically conveyed: the *hypokeimenon* examples are middle-passive present infinitives [ὕγιαζεσθαι, θερμαίνεσθαι, ψύχεσθαι] while the others are articular adjectives [τὸ ψυχρόν] or articular participles (which can function as adjective) [τὸ κάμνον]. The difference ultimately arises from a confusion of form/matter: in one sense it is matter, in another it is its contrary, matter. Difference is made the same by positing the differences as coupled opposites, different in their identity as opposite.

The pairing of ποιεῖν/πάσχειν is also central to Epicurus and the Stoics. Epicurus uses ποιεῖν/πάσχειν to mark a difference between bodies and void: only bodies are capable of action and passion. The void merely provides for the motion of bodies through itself and is the only thing that is incorporeal and intangible (*intactus* in Lucretius).<sup>230</sup> As intangible, it cannot act or be acted on because touch is required for the acting/being acted on.<sup>231</sup> The Soul, for Epicurus, is thus corporeal and can act or be acted on. Whereas the Stoics differentiate between bodies and incorporeal entities. Bodies have tensions, physical qualities, states and actions and passions. These states and actions and passions are determined by the mixture of bodies. But, for the Stoics, these properties and accidents are as much bodies as bodies themselves. These Bodies in relation to each other are all causes but there are not causes and effects, merely causes. The effects of these causes lie in a second realm of incorporeal entities which neither act nor undergo anything but are merely the effects of actions and passions. The Stoics thus reverse Platonism by splitting cause and effect: the ideational or incorporeal are thus no longer anything other than inactive and impassive ‘effects.’<sup>232</sup>

### *The impassive*

With the historic privileging of the active, passivity will be derogated such that the search becomes for something that is impassive, something that cannot be affected from without but is purely active. In Plato this takes the form of the purely active Forms that suffer no

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<sup>229</sup> Aristotle, *Generation*, 232b1.

<sup>230</sup> Lucretius, *Nature*, i.454.

<sup>231</sup> *Ibid.*, iii.161-7.

<sup>232</sup> Deleuze, *Logic*, 5-12.

passions: whatever participates in the Form is ‘affected by’ the Form but the Form itself is never affected, it only affects. Aristotle will apply this ἀπαθῆ to *ousia*:

there is some substance which is eternal and immovable and separate from sensible things; [...] and moreover that it is impassive and unalterable.<sup>233</sup>

Yet although described as immovable, immovable is elsewhere defined as ‘either that which is wholly incapable of being moved, or that which is scarcely moved in the course of a long time.’ Perhaps a more careful reading of Aristotle might manifest the relation of πάθος to time as the means not only by which qualities change but how time itself is generated in this affecting or being affected.

Meanwhile, Augustine transferred Plato’s Forms to a Christian God:

I kept trying to imagine you—though I was a mere mortal, and such a mortal at that! – you who are supreme and sole and true God; and I believed with all my heart that you were imperishable and invulnerable and immutable. I did not know from where or why, yet I saw clearly and was convinced that what can be corrupted is worse than what cannot be; and what cannot be harmed I unhesitatingly preferred to what can be; and what allows of no alteration [*nullam patitur mutationem*] is better than what can be changed.<sup>234</sup>

Later this impassive or unaffectable takes the form of a transcendental as we saw in Derrida’s critique of the early Heidegger’s primordial temporality split into a purely active aspect that temporalizes itself into a ‘fallen, inauthentic’ temporality. Or Spinoza’s God/Nature or Deleuze’s affect.

#### TRANSLATION OF ΠΑΘΟΣ: AFFECT, PERTURBATION, PASSION

With this understanding of πάθος we can now examine the different choices used to translate this term and the effects of the choice. There were three main words used to translate the Greek term πάθος: *affectus*, *passio* or *perturbatio*.

##### *Afficio / affectus*

Gellius chooses *affectus*: ‘the rest of the emotions [*motus animi*] which the Latin philosophers call *affectus* or *affectiones*, and the Greeks πάθη.’<sup>235</sup> He uses the verb *afficio* to describe, for example, a mother ‘overwhelmed’ by grief and sorrow or a ‘bodily condition’

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<sup>233</sup> Aristotle, *Metaphysics*, 12.8. 1073a4-12.

<sup>234</sup> Augustine, *Confessions*, VII.I.

<sup>235</sup> Gellius, *Attic Nights*, 1.26.11.

[*corporibus affectis*].<sup>236</sup> Both these uses are passive voiced. Quintilian also states *πάθος* is translated by *affectus* and discusses the difference between *πάθος* and *ἔθος*.<sup>237</sup>

Why was *affectus* an apt choice to translate *πάθος*? Let us examine first its meanings in Latin and then the verbs it is cognate with in Greek to find an answer. The roots of *affectus* derive from two Latin words *affecto* and *afficio*. *Affecto* means to strive after a thing, to endeavour toward, to pursue, etc. *Afficio* means to exert an influence on body or mind so that it is brought into a certain state together with a sense of furnished with or having.<sup>238</sup> There is also a sense peculiar to Cicero that Gellius comments on, to describe ‘things which had advanced, or been carried, not to the very end, but nearly to the end.’<sup>239</sup> Affect as noun [*affectio*] means a state or disposition also of body or mind, a mood, especially produced in one by some influence, and also a relation or disposition toward a thing again produced in a person by something else.<sup>240</sup>

These Latin senses continue into English with the exception of Cicero’s unique sense. Affect as a verb in modern English has two main senses. Firstly, the earliest sense, has two main meanings: as having a predilection or preference for, disposition to or to be drawn toward, to like or be fond of (although most of these are now rare or obsolete) or of assuming a false appearance or putting on a pretence (one might affect sincerity or interest). The second main sense is, most broadly, to change, to have an effect on, physically or mentally. One can affect physical objects or the mind and so be affected with feelings or emotion. As noun, affect means a state, mood or emotion again in relation to the mind or body.<sup>241</sup>

The Latin ultimately derives from the composite *ad-* + *facio*. *Ad-* in composition signifies to, toward, at, by, on, upon or against something whilst *facio* has a very broad signification including to make, build, construct, produce, etc.<sup>242</sup> Thus to affect signifies to make on or against something and so to have an effect on.

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<sup>236</sup> *Ibid.*, 3.15.4; 4.11.

<sup>237</sup> Quintilian, *Orator’s Education*, 6.2 20-21.

<sup>238</sup> Charlton T. Lewis and Charles Short, *A Latin Dictionary*, s.v. “affecto, afficio”.

<sup>239</sup> Gellius, *Attic Nights*, 3, 16.

<sup>240</sup> Lewis and Short, s.v. “affectio, affectus”.

<sup>241</sup> *Oxford English Dictionary*, s.v. “affect (*n*, *v.1*, *v.2*),” accessed 11 February 2018, <http://www.oed.com>. Hereafter referred to as *OED*.

<sup>242</sup> The *Oxford Latin Dictionary* lists thirty senses.

*Facio* is cognate with the Greek τίθημι (to set, put, place, to put in a certain condition) and its aorist form ἔθηκα (to accustom, habituate).<sup>243</sup> Whilst the differing senses of *facio* ‘to make’ and τίθημι ‘to set’ might not immediately suggest similarity, we should heed Benveniste’s warning that ‘in the evaluation of the differences in meaning that intervene among the members of a formally bound ensemble, the linguist is always inclined to let himself be guided unconsciously by the categories of his own language.’ Even though their correspondence is ‘an elementary datum of comparative linguistics,’ we should not assume that their common Proto-Indo-European root of \**dhe-* admits both a sense of ‘set’ and ‘make’ but instead understand the sense-relation between ‘set’ and ‘make’ through a precise definition of the uses. Benveniste argues ‘set’ ‘properly signifies ‘set down something which will last from now on, which is destined to endure’ and this is why it can signify ‘to establish in existence, to create.’ This shows that ‘the distinction between “set” and “make” does not correspond to Indo-European reality in the settled form it has for us.’<sup>244</sup>

It is worth also noting that the verb τίθημι often serves as ‘active’ to the ‘passive’ verb κεῖμαι, to be laid. It is from κεῖμαι we get ὑποκεῖμενον signifying a lying under and from which we will get *subject* as translation of this *hypokeimenon* which we should note for its relation to the critique of the subject mentioned in previous chapters.

Interestingly, whilst Cicero will not translate πάθος with *affectio* but *perturbatio* (see below), he does use *affectio* for a ‘disposition of the soul’ (*adfectio animi*).<sup>245</sup> Lewis and Short note this use of *affectio* is equivalent to the Greek διάθεσις and so Cicero observes the cognate sense of *affectio* with τίθημι.<sup>246</sup>

Thus we can already see affect’s imbrication in Greek metaphysics as a persisting laying down or setting of something. One significance of this choice to translate πάθος is that the same verb can signify both affecting or being affected through the active or passive voiced form; whereas πάσχειν was only active voiced. But with this choice the difference between πάσχειν and τίθημι that existed in Greek is overlooked as affect in Latin seems to signify more τίθημι than πάσχειν and privileges the senses of state in πάθος to the neglect of its other senses and would also overlook the difference Aristotle introduces between πάσχειν and

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<sup>243</sup> Henry George Liddell and Robert Scott, *A Greek -English Lexicon*, s.v. τίθημι.

<sup>244</sup> Benveniste, *Problems*, 251.

<sup>245</sup> Cicero, *Disputations*, 4.15.34 (362-3).

<sup>246</sup> Lewis and Short, *Latin Dictionary*, s.v. ‘*affectio*.’

τίθημι in *Categories*. What is required, therefore, is to understand what sense is specific to πάσχειν in distinction to τίθημι that is lost.

### *Perturbatio*

The second choice to translate πάθος was *perturbatio* mainly by Cicero in *Tusculan Disputations*:

I might have called them “diseases,” [*morbus*] and this would be a word-for-word rendering: but it would not fit in with Latin usage [*consuetudo*]. For pity, envy, exultation, joy, all these the Greeks term diseases, movements that is of the soul [*motus animi*] which are not obedient to reason; we on the other hand should, I think, rightly say that these same movements of an agitated soul are “disorders,” [*perturbationes*] but not “diseases” [*morbus*] in the ordinary way of speaking.<sup>247</sup>

He echoes this in *De Finibus*: the problem is that ‘the word ‘disease’ [*morbus*] would not suit all instances; for example, no one speaks of pity, nor yet anger, as a disease, though the Greeks term these πάθος’.<sup>248</sup> Cicero opts instead for *perturbatio*:

far too much attention is devoted by the Stoics, principally by Chrysippus, to drawing an analogy between diseases of the soul [*morborum animi*] and diseases of the body [*morbis corporum*]. Let us neglect such passages as quite unnecessary and busy ourselves only with the pith of their argument. Let it be understood then that, as the waves of belief toss in capricious confusion, disorder is in perpetual motion.<sup>249</sup>

*Perturbatio* signifies this confusion. It is formed of *per-* meaning ‘through, through the midst of, throughout, all over, all along’ and *turbo* meaning to disturb or move disorderly, to throw into confusion.<sup>250</sup> Through this choice, Cicero intervenes in the reception of Greek philosophy by replacing the metaphor of disease with that of physical movement. This shift of emphasis takes its impetus from a model of mind in Plato and Pythagoras who divided the soul into two parts as Cicero describes:

to the one they assign a share in reason, to the other none; that which has a share of reason they make the seat of peacefulness, that is, a consistent state of quiet and tranquillity; the other part they make the seat of stormy emotions [*motus turbidos*] both of anger and desire which are contrary and hostile to reason.<sup>251</sup>

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<sup>247</sup> Cicero, *Disputations*, 4.4.10.

<sup>248</sup> Cicero, *De Finibus*, 3.10.35.

<sup>249</sup> Cicero, *Disputations*, 4.10.24.

<sup>250</sup> Lewis and Short, s.v. *perturbatio*.

<sup>251</sup> Cicero, *Disputations*, 4.5.10.

But the replacement of medicine by physics is not a trivial substitution, it has implications on the treatment of πάθος. For if diseases suggest the possibility of healing treatments, those of physics mean that it is essential to avoid being perturbed in the first place as movement once set in motion must run its course until it ends, hence the *per-* of perturbation and perhaps is why Cicero did not consider *afficio* given his use of it to convey ongoing or uncompleted action. Cicero writes:

He therefore who looks for a ‘limit’ to vice is doing much the same as if he were to think that a man who has flung himself headlong from Leucas can stop his fall when he will. For just as that is impossible, so it is impossible for a disordered and excited soul to control itself or stop where it wishes.<sup>252</sup>

Thus, for Cicero, it becomes essential to avoid being moved in the first place and a philosophy of defence is required. Such a view of affects may have been influenced by Cicero’s circumstances while writing *Tusculan Disputations*: after the death of his beloved only daughter, Tullia, who had died in childbirth. In a letter, he speaks of writing this work as a form of therapy, although ‘reading and writing bring me, not solace indeed, but distraction.’<sup>253</sup>

### *Passio*

The third choice to translate πάθος was the Latin *passio* by, for example, Apuleius. In *De Deo Socratis*, Apuleius discusses Plato’s philosophy and chooses *passio* to describe the fluctuations of mind [*turbationibus mentis*] that Plato’s *daimons* undergo just like us.<sup>254</sup> *Passio* comes from the verb *pati*, to bear support, undergo or suffer from which also derive patient, passivity and passive.<sup>255</sup> *Pati* is a deponent verb and so only passive voiced whereas the Greek πάσχειν is only active voiced. This choice of translation therefore emphasises the sense of passivity when compared to *affectio* which can be active or passive voiced.

The modern-day English ‘passion’ has three main senses: those relating to physical suffering and pain, those relating to emotional and mental states particularly strong or overpowering ones, positive or negative (although mainly understood positively today). The notion of strength gives rise to the adjective *passionate* with senses of ardent enthusiasm, zealous devotion or attachment. Finally, senses relating to passivity which denote a being

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<sup>252</sup> Cicero, *Disputations*, 4.18.4.

<sup>253</sup> Cicero, *Letters*, XII.16.

<sup>254</sup> Apuleius, *De Deo Socratis*, 12-13 (372-3).

<sup>255</sup> Lewis and Short, *Latin*, s.v. “passio”, “pati”.

acted on, in opposition to acting, an action produced by an external rather than an internal cause and so also an absence of activity, an inertia or unresponsiveness.<sup>256</sup>

In *Summa Theologica*, Aquinas provides a helpful discussion of the meaning of passive in Latin, giving its three senses and thus three ways to speak of a passion of the soul [*anima passionem*]. First and most generally, ‘whatever receives something is passive’ but where nothing is taken away from it. Secondly, in its proper sense, something must be received ‘while something else is taken away’ and this happens in two ways: sometimes the loss is something unsuitable to the thing as when sickness is healed, other times the contrary occurs, i.e. sickness is received, and health lost. This latter is passivity in its most proper sense:

for a thing is said to be passive from its being drawn to the agent: and when a thing recedes from what is suitable to it, then especially does it appear to be drawn to something else.<sup>257</sup>

When the change is for the worse, it has more of the nature of a passion, hence ‘sorrow is more properly a passion than joy.’<sup>258</sup> Aquinas also differentiates sense or intellect [*sentire et intelligere*] from passion: sense and intellect can be a kind of passion in the sense of mere reception but passion as the loss of something can only be a bodily change and so passion cannot strictly be said to be in the soul.

### Passion and action

It is worth discussing here the term often opposed to passion, action. This comes from the Latin *actus*, the passive perfect participle of *agere*, which has literal meanings of to lead, drive or conduct, to push forward or move, excite and metaphorical meanings of guiding, governing, leading etc.<sup>259</sup> In this it bears similar meaning to the Greek ἄγειν which can also carry a sense of draw out in length and, in the middle voice, to carry away for oneself.<sup>260</sup> It can be differentiated from the verb *facere* that we discussed earlier by time: whereas *facere* tends to signify instantaneous actions, *agere* signifies ongoing actions of greater duration.

Translationally, it is often used to translate ἐνέργεια as actuality as compared to δύναμις as potentiality. But it is also the preferred choice to translate the παθεῖν in the ποιεῖν/παθεῖν opposition. For example, Plato’s mark of what is in the *Sophist*, as δύναμις of ποιεῖν and

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<sup>256</sup> *OED*, s.v. “passion”, “passivity”.

<sup>257</sup> Aquinas, *Summa*, IaIIae, 22. 1.

<sup>258</sup> *Ibid.*

<sup>259</sup> Lewis and Short, s.v. “actus”.

<sup>260</sup> Liddell and Scott, s.v. ἄγειν

παθεῖν, is translated by Ficino as ‘*agendum vel patiendum*.’<sup>261</sup> Or where this opposition is made by Plato in *Timaeus* using δρᾶν and πάσχειν (33c), this is translated by Ficino again as *agat* and *patiat*;<sup>262</sup> but by Cicero as *pateretur et faceret*.<sup>263</sup> We again see the tight imbrication of these terms but where differences are lost and gained in the choice of Latin translation.

*Augustine: conflation or clarification of affect, perturbation and passion?*

Augustine takes up the problem of translating πάθος in *City of God*, again on the topic of whether the wise man is affected by πάθος:

There are two opinions among the philosophers concerning the mental emotions [*animi motibus*], which the Greeks call πάθη, while certain of our fellow countrymen, like Cicero, describe them as disturbances [*perturbationes*], others as affections or affects [*affectiones vel affectus*], and others again, like Apuleius, as passions [*passiones*], which renders the Greek word more explicitly.<sup>264</sup>

Augustine divided philosophers into two camps, Stoics and Platonists/Aristotelians, to argue the former held disturbances do not assail the wise man whereas the latter do. But Augustine goes on to argue that actually the two sides hold the same view: ‘both parties defend the wise man’s intellect and reason against enslavement to the passions’; the only difference is that the Stoics speak of advantages or disadvantages – such as their life or bodily welfare – which the wise man sets store by such that he does not wish to lose them in the face of perturbations. The other philosophers call these good or evil. But what does it matter what you call them, Augustine concludes,

so long as Stoic, no less than Peripatetic, trembles and grows pale at the thought of being deprived of them? [...] So the mind in which this principle is firmly rooted permits no perturbations, however they may affect the lower levels of the soul, to prevail in it over reason. No, on the contrary, the mind itself is their master and, when it will not consent but rather stands firm against them, upholds the sovereign rule of virtue.<sup>265</sup>

In both, it is a question of becoming ‘governed by subjection to reason [*moderatas rationique subiectas*], so that his mind as master lays down, as it were, laws for them,

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<sup>261</sup> Ficino, *Platonis Omnia Opera*, 160G.

<sup>262</sup> *Ibid.*, 528B.

<sup>263</sup> Cicero, *Opera*, 528.

<sup>264</sup> Augustine, *City of God*, 9.4.

<sup>265</sup> *Ibid.*

whereby they may be held to a minimum.<sup>266</sup> We again see the continuation of the Greek ὑπο into the *sub*- and the necessity of mastering them by laying down laws.

Yet unlike Cicero's physical metaphor that sought to avoid becoming perturbed, Augustine argued for the necessity of being affected and rejected the Greek concept of apathy [ἀπάθεια]:

if we were to feel no such emotions [*affectiones*] at all while we still bear the weakness of our present life, then rather should we not live a proper life. [...] For complete freedom from pain, while we are in this place of misery, surely 'befalls us,' as one of our worldly men of letters has said, stating his opinion, 'only at the great cost of savagery of mind and torpor of body.'<sup>267</sup>

Now some have claimed Augustine does not really choose between the terms affect, passion or perturbation but uses the terms interchangeably. For example, Susan James argues that

the view that these terms are all roughly synonymous quickly became fixed, and Augustine's discussion continued to be widely invoked and reiterated. Aquinas cites it, and a range of English and French authors of the seventeenth century either replicate Augustine's list or unselfconsciously employ the range of terms it contains.<sup>268</sup>

But this is not strictly true. Augustine differentiated affections from passions in criticising the Stoic view that all passions and affection were wrong: affects [*affectiones*] 'attend upon right reason when they are shown under proper conditions' and so we should not therefore call them 'diseases [*morbos*] or morbid passions [*vitiosas passiones*].' For Augustine, our affects are a necessary condition of our fallen existence as sinners on earth and it is only through them we can proceed to eternal life with God. It is not the affection itself that is wrong or right but the affection in combination with the way in which the life to which it belongs is lived:

Among us Christians, on the other hand, in accordance with the holy Scriptures and their sound doctrine, the citizens of the holy City of God feel fear and desire, pain and gladness while they live in God's fashion during the pilgrimage of their present existence, and because their love is right, all these feelings of theirs are right.<sup>269</sup>

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<sup>266</sup> Augustine, *City of God*, 9.4.

<sup>267</sup> Augustine, *City of God*, 14.9.

<sup>268</sup> James, *Passion and Action*, 11.

<sup>269</sup> *Ibid.*

Aquinas, also made a distinction between passions and affections depending on which part of the soul they belong:

it is evident that the passions of the soul [*passiones animae*] are the same as affections [*affectiones*]. But affections manifestly belong to the appetitive, and not to the apprehensive part. Therefore passion [*passio*] is in the apprehensive part more than in the appetitive.

Thus the translation of *πάθος* intervenes into Greek philosophy through the choice of words used, choices that will go on to influence the transition from Latin to English (and French). If we consider these choices, of the varied senses of *πάθος* as emotion, experience, attribute, and binder of metaphysical and physical, we see that *afficio* tended to privilege a setting or state through its link to τίθημι and its PIE root of *\*dhe-*. This will become significant when we examine the PIE roots of *πάσχειν* below to mean ‘binding.’ With the privileging of a setting instead of a binding, we perhaps see the root of where affect comes to be dominated by the active/passive as setting implies an activity and, because *afficio* can be active or passive voiced, can convey both a setting and a being set, something *πάσχειν*, as active voiced only, could not convey. Meanwhile, *perturbatio* linked *πάθος* with thoroughly disrupting movements and shifted the discourse from one of diseases to one of physics, something continued in the rise of ‘emotions’ in the 18<sup>th</sup> century. Finally, *passio*, whilst the most literal choice of the three, tended to privilege the sense of being imposed on from without because of the fact it was only passive voiced verb. Perhaps the problem is that no one word can adequately translate *πάθος*?

#### FROM AFFECTS, PERTURBATIONS AND PASSIONS TO EMOTION

If Cicero’s choice of *perturbatio* to translate *πάθος* brought it within a realm of physical movement, the modern-day emotion also carries this sense with its literal meaning of ‘motion outwards.’ This motion takes us back to the Latin *motus* and *motus animi* (literally movements of the soul), another choice to describe the phenomena in question. Let us examine the rise of the term ‘emotion’ and how it came to supplant perturbations, affections, and passions in modern-day English.

In English, the use of emotion emerged at the beginning of 17th century to mean a ‘political agitation, civil unrest; a public commotion or uprising’ or more generally, an instance of movement; disturbance, or perturbation.<sup>270</sup> A key figure in its extension to mean

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<sup>270</sup> OED, s.v. “emotion”.

agitations of the mind and strong feelings or passion was Montaigne and the English translation of his *Essais* by John Florio in 1603. For example,

Nero taking leave of his mother, whom he sent to bee drowned, felt notwithstanding the emotion [Fr. *l'émotion*] of that motherly farewell.<sup>271</sup>

In the move from emotion as social disturbance to disturbances of the mind, social and political disturbance is transferred to the mental, a move perhaps aligned with the 17th century consolidation of philosophies of individualism. The increase in popularity of emotion also arose from secularisation that sought to avoid the associations of passion and affection with the biblical and theological preferring emotion for its alternative network of relations to psychology, law, observation, evolution, etc. This resulted in differing causal explanations for the phenomena:

The assumption, still made by Christian philosophers and psychologists at this time, that passions and affections were instances of the soul acting upon or using the body, was replaced with the assumption that emotions were instances of the brain and nerves acting upon other parts of the body. The mind or soul per se was not given an active role.<sup>272</sup>

Dixon claims that by 1850, the category of emotion had subsumed ‘passions,’ ‘affections’ and ‘sentiments’ in most English-language psychological theorists such as Hume’s *Treatise of Human Nature* (1739-40). The most important, Dixon claims, was Thomas Brown’s *Lectures on the Philosophy of the Human Mind* (1820) who first gave the term ‘a coherent, systematic and central.’<sup>273</sup> Brown distinguished sensations from emotions through a mental/physical difference: where sensations were purely physical in origin, emotions had a mental origin.<sup>274</sup> Baldwin’s *Dictionary of Philosophy* (1905) further evidences this split between emotion and sensation:

The use of the word emotion in English psychology is comparatively modern. It is found in Hume, but even he speaks generally rather of passions or affections. When the word emotion did become current its application was very wide, covering all possible varieties of feeling, except those that are purely sensational in their origin.<sup>275</sup>

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<sup>271</sup> Montaigne, *Essays*, i. xxxvii. 117.

<sup>272</sup> Dixon, *Emotions*, 23.

<sup>273</sup> Dixon, *Emotions*, 101.

<sup>274</sup> Brown, *Lectures*, 1, 316.

<sup>275</sup> Baldwin, *Dictionary*, I, s.v. “emotion”, 316.

Etymology derives emotion from *e-moveo* from the past participial stem of *ēmovēre* to remove, expel, to banish from the mind, to shift, displace. Lewis and Short give the following definitions: a literal definition of to move out, move away, remove or disturb citing examples from Livy:

...and after they had attempted to drive that crowd out [*emovere*] of the Forum...<sup>276</sup>

Or, in Silius, to agitate or excite:

Then Venus, appalled by the sight of the raging [*emoti*] deep.<sup>277</sup>

It also has a metaphorical sense to drive away or expel pain or anguish:

By these words his cares are dispelled and for a little space grief is driven from his anguished heart [lit. his anguish was expelled, *emotae*].<sup>278</sup>

But the Latin usage of this verb was limited and, as a noun, was practically non-existent, only occurring in post-Classical Latin to signify an agitation or disturbance in general or an agitation or disturbance of the mind, *emotio mentis*.<sup>279</sup> While, in English, it was the reverse: its derived verb ‘emove’ to mean ‘to rouse or excite feeling in (a person); to affect with emotion’ became obsolete around the middle nineteenth century and now only used in noun form.<sup>280</sup>

Yet, if passion and affection were discarded, there remains a link from perturbation to emotion through motion (*turbo/motus*). We are still, therefore, in the metaphorical domain of Cicero, of physical movement despite the shift in terms. But there is a difference of prefix and verb. The main difference between *turbo* and *moveo* is *turbo* has a stronger sense of disturbance, disorder and confusion whilst *moveo* can signify this but can more generally signify a more neutral motion or indeed a positive excitement. Emotion seems to add a sense of discharge of motion outward rather than an inner perturbing. It also seems to introduce a difference in activity and passivity – once perturbed, one can do nothing but wait for the movement to cease; but with emotion, there seems to be the possibility for an active banishing or driving out.

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<sup>276</sup> Livy, *History*, 25.1.

<sup>277</sup> Silius, *Punica*, 17, 284.

<sup>278</sup> Virgil, *Aeneid*, 6, 382.

<sup>279</sup> Dixon, *Emotions*, 39.

<sup>280</sup> OED, s.v. ‘emove’ (v.).

The motion of emotion also more directly links us to the κίνησις of Greek philosophy as *motus* was generally the preferred term to translate it. To understand κίνησις, we can turn to Aristotle's *Physics*. There, Aristotle defines those things created by nature, [φύσις] as having within themselves a 'principle [ἀρχή] of movement [κίνησις] and rest [στάσις].'<sup>281</sup> Aristotle also defines κίνησις as μεταβολή, not merely as movement or change of place, this is just one species of the genus κίνησις, but also as generation and destruction, alteration and growth or diminution.<sup>282</sup>

κίνησις cannot occur [ἀδύνατον] except in relation to place, void and time so that these four things – movement, place, void and time – become 'universal conditions common to all natural phenomena.'<sup>283</sup> This relation, Aristotle adds, is applied either with reference to quantity, the more or less, or to the active/passive, 'to agent and patient' [τὸ ποιητικὸν καὶ παθητικὸν]. The active/passive relates to κίνησις as

that which has the power of producing a change can only act in reference to a thing capable of being changed; and that which is capable of being changed can only suffer change under the action of that which has the power to change it.<sup>284</sup>

But, with the translation of κίνησις using motion, the wider senses of κίνησις have been lost in the privileging of movement. This might explain why physical accounts of affect as quantitative disruptions of discharge and flow have become so central to the field of affect. We have come a long way from the Greek πάθος to affect as active or passive setting and emotion as discharge of physical movements.

#### **OTHER TERMS: PERCEPTION, SENSATION, TOUCH, FEELING**

Whilst the key debate in critiques of the turn to affect often centre around the identity or difference of affect and emotion, we should briefly discuss also affect's identity or difference to other terms like 'perception,' 'sensation,' and 'touch' to trace their philosophical use with the aim of clarifying how, in Greek philosophy, their roots were differentiated from πάθος yet governed by it in its coupling of 'active and passive.' Finally, we will turn to 'feeling' and the difference it introduces as the only word of non-Romance language origin.

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<sup>281</sup> Aristotle, *Physics*, 2.1, 192b13-14.

<sup>282</sup> Ibid., 3.1, 200b12; 192b14-16; 7.7, 261a27-36.

<sup>283</sup> Ibid., 3.1, 200b22.

<sup>284</sup> Ibid., 3.1, 200b31.

Perception in English has two main senses derived from the verb ‘to perceive.’ Both involve the taking in, apprehending or taking possession of something with the first sense being a taking in with the mind or senses and the second a now obsolete taking in of rents, profits or spirit and breath. In the first sense, it can mean a becoming aware of conscious of things in general and is closely related to sense as it is sensation, sensitivity or sensibility that delivers the objects to the faculty of perception.<sup>285</sup>

Perception is composed of the prefix *per-* which, as we saw with perturbation, means thoroughly + *capere* to take, seize, lay hold of, thus to take hold of or seize completely and so a taking, receiving, gathering in or collecting. The noun was introduced by Cicero to translate the Greek κατάληψις of Stoic philosophy (alongside the more literal translation *comprehension*) in an epistemological discussion of the views of Plato, Aristotle, Stoics and Sceptics on whether there can be certain knowledge of objects or merely probabilistic: ‘the essential nature of knowledge or perception [*perceptio*] or (if we wish to give a literal translation) ‘mental grasp [*comprehensio*],’ the Stoic term κατάληψιν.’<sup>286</sup> The noun κατάληψιν is derived from the verb καταλαμβάνω; λαμβάνω means to take or receive and, in the middle voice, to take hold of, lay hands on while the prefix κατά usually adds a sense of downwards, in answer to or against in a hostile sense. Cicero describes Zeno’s differentiation between assent, comprehension and knowledge:

Zeno used to demonstrate by gesture: for he would display his hand in front of one with the fingers stretched out and say ‘A visual appearance is like this’; next he closed his fingers a little and said, ‘An act of assent [*adsensus*] is like this’; then he pressed his fingers closely together and made a fist, and said that that was comprehension [*comprehensionem*] (and from this illustration he gave to that process the actual name of κατάληψιν, which it had not had before); but then he used to apply his left hand to his right fist and squeeze it tightly and forcibly, and then say that such was knowledge [*scientiam*], which was within the power of nobody save the wise man.<sup>287</sup>

The relation of this example of perception to the active/passive in the gesture of the hand in moving from open, to closed fist, to fist gripped by the other hand (an auto-affection) has been drawn out by Auvray-Assayas and Ildefonse:

the close interweaving of activity in the course of a process that is also a passive reception is stressed by Cicero’s translations of *phantasia καταληπτική*. The adjective *καταληπτική*, generally interpreted as having an active sense, also has a passive sense:

<sup>285</sup> OED, s.v. “perception”, “perceive”.

<sup>286</sup> Cicero, *Academica*.

<sup>287</sup> *Ibid.*, II. XLVII, 145.

Cicero uses not καταληπτικόν but καταληπτόν, which means “grasp” or ‘what can be grasped’; he translates this term by *comprendibile*, so that we understand more clearly, thanks to this translation, that representation is what permits grasping, because it can itself be grasped.<sup>288</sup>

Thus perception takes its place under the economy of the active/passive and also incorporates an ‘auto-affection’ as the exercise of an activity on itself.

The modern ‘sense’ and ‘sensation’ are related to a wide range of other concepts including sense, sentiment, sensibility, sensitivity, etc. Deriving from the Latin *sensus* from *sentire* ‘to perceive, feel, know’ which is probably ‘a figurative use of a literal meaning “to find one’s way,” or “to go mentally,”’ its use to describe the external or outward senses (touch, sight, hearing, etc.) is first recorded in English around the 1520s.<sup>289</sup> The ambiguity in perception over whether it applied to the mental or physical also intervenes in the discourse of sense such that sense can mean both physical sense as well as intellectual. Added to these two meanings is a sense of sense as ‘signification.’ For our purposes we will focus on the first two meanings.

Philosophically, *sensus* is linked to its translation of αισθάνομαι meaning again to apprehend by the senses, to understand or to take notice of. In *Timaeus*, Plato gives an etymology of the noun αἴσθησις from αισθάνομαι as from άίσσω, to move with a quick shooting motion as, in the beginning, souls were ‘bound within a mighty river’ in disorderly, violent and irrational movements.

with violence they rolled along and were rolled along themselves, so that the whole of the living creature was moved, but in such a random way that its progress was disorderly and irrational.<sup>290</sup>

These disorderly movements produced collision between bodies which impinged on the soul [ψυχῆν] and so, Plato states, ‘for these reasons all such motions were then termed “sensations” [αἴσθησις] and are still so termed to-day.’<sup>291</sup>

In Aristotle, sensation is one of the powers of the soul [δυνάμεων τῆς ψυχῆς] used to differentiate living beings. The powers are nourishment, appetite, sensation [αἰσθητικόν], movement in space and thought. Plants have the nutritive faculty only, animals have appetite,

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<sup>288</sup> Auvray-Assayas and Ildefonse, ‘Grasping: *Katalépsis* and *comprehensio*’ in Cassin et al., *Dictionary of Untranslatables*, 91.

<sup>289</sup> OED, s.v. “sense”.

<sup>290</sup> Plato, *Timaeus*, 43b.

<sup>291</sup> Plato, *Timaeus*, 43a-c.

sensation and movement, but only man has the power of thinking and intelligence.<sup>292</sup>

Aristotle defines sensation in *On the Soul*: it consists in ‘being moved [κινεῖσθαι] and acted upon [πάσχειν] for it is held to be a change of state [ἀλλοίωσις].’<sup>293</sup> Sense is ‘that which is receptive [λαμβάνω] of the form of sensible objects without the matter.’<sup>294</sup>

Sensation is also linked to the discourse of potentiality and actuality. It means ‘both to possess the faculty and to exercise it’: sensation (αἰσθητικός) is potentiality but the sense object [αἰσθητός] is actuality, it is its potentiality actualised [ἐντελέχεια].<sup>295</sup> In the process of being acted upon [πάσχει], sensation and sense object are unlike but, just as the patient must become like the agent, at the end of the process (conveyed by the *perfect* tense (*per-facio*) of πάσχειν, πεπονθός), sensation has been made like that object and shares its quality.<sup>296</sup> The identity or difference between sensation and sense object is again conveyed using difference of activity and passivity and their completion in ἐντελέχεια, they are what binds us to the world in the process of becoming other.

Next, touch. In English this word (as verb and noun) has three main senses. First, to make contact with where the idea of physical contact dominates. Second, where physical contact is again present, but the focus is more on the result or effect of contact rather than the contact itself such as to injure or damage something. Thirdly in figurative senses that include to relate to, to discuss a topic, and to affect a person with feeling or emotion, frequently in the passive voice, (gained from the 14th century onward) and to produce an effect on the senses.<sup>297</sup>

Etymologically, the verb derives from the vulgar Latin *toccare* but is also semantically related, via ‘tactile,’ to the Latin *tangere* which also had a sense of to touch, move, affect, impress both in relation to the body and to the mind, or to feelings. *Tangere* is central to notions of contingency, this term being formed from *con-* + *tangere*, a co-touching.<sup>298</sup> *Tangere* was the most common choice to translate the Greek ἅπτω. For example, Ficino translates ἅπτων with *tangique*.<sup>299</sup> This word is invoked by Aristotle to describe the sense of touch in *On the Soul*. Like the other senses, it is again a question of potentiality and actuality:

<sup>292</sup> Aristotle, *On the Soul*, 2.3.414a29-b19.

<sup>293</sup> Ibid., 2.4;415b26.

<sup>294</sup> Ibid., 2.12; 424a19-21.

<sup>295</sup> Ibid., 2.4; 418a4-5.

<sup>296</sup> Ibid., 2.4; 418a.

<sup>297</sup> OED, s.v. “touch”.

<sup>298</sup> Lewis and Short, s.v. “tangere”.

<sup>299</sup> Ficino, *Opera*, 160G from Plato, *Sophist*, 247b.

what is capable of touch [ἀφή] is what potentially has these qualities and the tangible [ἄπτός] is that which actualises this potentiality. Aristotle raises several aporias of touch: is touch a single sense or several and what is the organ of touch: is it flesh or is flesh only the medium and the organ is something distinct and internal.<sup>300</sup> Secondly, what is the single substrate [ὑποκείμενον] of touch that would correspond to sound with hearing.<sup>301</sup> Finally, the aporia that if, when bodies have a third between them, they cannot touch, this would mean bodies in water could not touch because of the water between them.<sup>302</sup> So do we touch through contact and the other senses through distance?

This final aporia reveals the importance again of the acting/acted on coupling. Common opinion suggests we can touch without separation but actually *all* sensation according to Aristotle requires a medium. The difference between the tangible and the other senses is that we perceive the latter because the medium *acts* [ποιεῖν] *on us* whereas with the tangible we sense *at the same time* as the medium. So, if air is required for hearing, vision and smell, to place a sense object directly on the organ, without air, there would be no sensation. But with touch, if it is placed directly on the flesh there is sensation, hence the medium of the tangible is flesh.

Thus we can see that perception, sensation and touch are distinct in Greek philosophy from πάθος but πάθος seems to govern the use of these verbs either by being explicitly named or through the grammatical voice of the verbs. The active/passive seems to govern these fields by accounting for how, in the process of making or being made other, one can both be this other and not be the other, how the two that is one locked in a unidirectional movement of change can yet be separated into an agent and patient, a perceiving/perceived, sensing/sensed, touching/touched.

Finally, ‘feeling.’ This word stands out in that it is not Romantic in origin. Originating from the Old English *felan* which meant ‘to touch or have a sensory experience of; perceive, sense (something),’ it is also the source also of the German *fühlen*, and *Gefühl*. In English, the word has two main meanings: those relating to sensation or touch and those relating to emotion, sentiment, mental sensitivity or awareness. In the former, feeling often describes those senses not strictly attributable to the senses of sight, hearing, taste or smell; can apply both externally and internally; and, like sensation itself, can refer to the capacity to feel as

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<sup>300</sup> Aristotle, *Soul*, 2.11.422b.

<sup>301</sup> Ibid.

<sup>302</sup> Ibid. 423a.

well as the specific feelings.<sup>303</sup> Meanings relating to emotion originated around 1400 in, for example, Chaucer's translation of Boethius's *Consolation of Philosophy* where Chaucer uses *felyng* to translate the Latin *sensus*:

Euery weleful man hap a wel delicat *felyng* [*delicatissimus sensus*].<sup>304</sup>

But what seems to be excluded from feeling is any strong signification of intellectual feeling. When feeling does relate to an intellection in the form of consciousness or awareness of something, it retains a sense of indeterminacy or doubt, a belief or intuition that something is about to happen that can be conveyed by the expression 'to feel out' or 'feel one's way through.'

One distinction between modern-day feeling and the other terms discussed here may be made through determining which of these is most general and substitutable. Passion and emotion are now obsolete as verbs and it is more common to say sensations, emotions, passions or affects are *felt* than the reverse; 'I felt a sensation' is more common than 'I sensed a feeling.'

#### **HAS A SENSE OF ΠΑΘΟΣ BEEN LOST?**

Let us now try to gather together the significance of all these analyses. In the difficult moment of translation from Greek to Latin and on into modern languages, we can observe several effects. First, the choice of affect to translate πάθος privileges the sense of an active or passive setting or being set that would be conveyed in Greek using τίθημι. In this choice, it loses the ways in which πάσχειν differed to τίθημι. Furthermore, the same verb, affect, can now convey both ποιεῖν or πάσχειν because *afficio* can be active or passive voiced whereas πάσχειν was only active voiced. With the choice of *perturbatio*, πάθος become wholly negative as disruptive movements. What of the πάθος of wonder? Even if it is still disorder, as the beginning of philosophy should this initial disorder not be avoided but encouraged? *Passio* too privileges the active/passive sense of πάσχειν given it is a deponent Latin verb, only passive voiced. And, with Aquinas's clarification, *passio* strictly means an external imposition that leads to a change for the worse. Finally, emotion, given its verbal form 'emove' is now obsolete, cannot express a becoming emotional, hence perhaps why affect stepped in to enable this – 'to be affected with emotion' – which in turn gave rise to the conflation of affect with emotion.

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<sup>303</sup> OED, s.v. "feel (v.)".

<sup>304</sup> Boethius, *Consolation*, II.IV.54-57 (194-5).

Moreover, with all these choices of translation, we can see the consolidation of the masculine auto-affection Irigaray identified. With the emphasis on passivity and activity, passive affects are seen as disturbing, imposed from without, that must be avoided or discharged to return to a homeostasis through philosophies of defence or discharge. There is little mention of affects as positive except perhaps in Augustine, but this again is a masculine auto-affection in the sense that to be affected is to progress toward some Godly life.

And yet a sense of πάσχειν not dominated by passivity or masculine auto-affection can still be glimpsed. The ‘strange mixtures’ of feeling Socrates’s companions described, the πάθος of wonder as the *beginning* of philosophy, the link of πάθος to ἀρχή to beginnings or renewals, that breaks tautologies and is the root to change of states and dispositions. Is there a sense of πάθος that conceives them, not purely as something negative to be avoided, but also positive or at least undecidable as that which changes, makes new, grows, enlarges and are necessary if we are to avoid remaining in tautology? This will be the aim of the next chapter.



## 4

### ΠΑΘΟΣ BEFORE 'PASSIVITY'

If πάσχειν, πάθος and affect became dominated by a sense of 'passivity' as opposite to 'activity' to the neglect of its other senses (its difference to τίθημι; as that which changes, makes new, grows, enlarges; differentiates tautologies) this chapter seeks to draw out these other senses by tracking the changing usage of the verb and deverbative nouns in Greek writing as well as Proto-Indo European roots in order to produce a broader and more precise sense that is neglected in the Latin and subsequent reception of Greek philosophy.

The methodology applied here can be compared to Benveniste's discussion of the two seemingly unrelated meanings of τρέφω, 'to nourish' and 'to curdle.' Benveniste examines the possibility there might actually be one shared meaning, and that 'nourish' 'is itself only an acceptance of both a broader and a more precise sense.'<sup>305</sup> The difficulty inherent in such tasks arises from the difference in lexical resources of the two languages: because the same word τρέφειν requires translation into two different words, nourish or curdle, in asking how to reconcile these two, the linguist falls victim to a false problem which arises 'either by an insufficient definition of the terms under discussion or by an unjustified transposition of the values from one semantic system to another.'<sup>306</sup> Benveniste suggests defining τρέφω more broadly as 'to encourage (by appropriate measures) the development of that which is subject to growth.' Then the particular technical sense of 'curdle' can be understood as the idiomatic application 'to encourage the natural growth of milk, to let it attain the state towards which it is tending.'<sup>307</sup> Similarly, with πάσχειν, there lies the risk of transposing modern understandings of activity and passivity as coupled opposites onto an earlier, different semantic system that distributed them differently to the neglect of other, broader senses.

My analysis is largely dependent upon an unpublished thesis by Leonard Boreham, *A Study of πάσχειν in Greek Literature from Homer to 300 BC* which examines the word in all its uses, its synonyms or antonyms and its valid and invalid structures (for example, πάσχειν is incompatible with ἡ εἰρήνη (peace): one does not 'undergo peace' but one does 'make peace') to show the directions in which it develops to uncover the broadest and most precise

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<sup>305</sup> Benveniste, *Problems*, 252.

<sup>306</sup> Benveniste, *Problems*, 252-3.

<sup>307</sup> *Ibid.*, 252.

sense.<sup>308</sup> We begin first with a discussion of πάθος (and related nouns) and its specialised use to signify one of the grammatical voices of early grammars. Then we turn to an analysis of the root verb πάσχειν and its Proto-Indo-European roots to conclude with a suggestion of the broadest and most precise understanding of the term as binding of implicit differences prior to separation into active/passive.

**NOUNS: ΠΕΝΘΟΣ, ΠΑΘΟΣ, ΠΑΘΗΜΑ**

The main historical development in noun use is a move from τὸ πένθος in Homer (misfortune, misery, grief or sorrow) toward τὸ πάθος and τὸ πάθημα which do not appear in Homer at all. Though there is no conclusive evidence that πάθος/πάθημα did not exist in Homeric times, the words do not occur in the Iliad, Odyssey, Homeric or Hesiod. Instead, πένθος fulfils part of the function of both these later words, in addition to its own specialised sense of ‘grief,’ ‘mourning.’ The use of πένθος then declines: only four examples in Plato work and only one in Aristotle.<sup>309</sup>

Πάθος first appears in the Greek Melic poets (700-500BC).<sup>310</sup> It does not occur in Pindar or Theognis but emerges suddenly in Aeschylus, still in the sense of ‘suffering.’<sup>311</sup> Herodotus makes extensive use of πάθος in three distinct senses: for conventional suffering (κακὰ etc. πάσχειν), for a somewhat stronger personal calamity (δεινότατα etc. πάσχειν) and, most commonly, for a national or military disaster.<sup>312</sup> In Plato, πάθος newly denotes an idea or notion:

τὰ δύο μέντοι πάθη περί θεοῦς μέινει

but the other two false notions about the gods do remain.<sup>313</sup>

Another development is the disappearance of the earlier Ionic feminine noun ἡ πάθη that is again supplanted by the neuter πάθος. ἡ πάθη never became common in Attic, and, of the tragedians, only Sophocles uses it – for example:

κατὰ δὲ τακόμενοι μέλαιοι μελέαν πάθαν / κλαῖον, ματρὸς ἔχοντες ἀνυμφεύτου γονάν

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<sup>308</sup> Boreham, *Study*.

<sup>309</sup> e.g. Plato, *Republic*, 605D; Aristotle, *Rhetoric*, 1370b25.

<sup>310</sup> See DL Page, *Poetae*, Fragmenta Adespota Fr. 15 (no. 791) l. 172.

<sup>311</sup> Aeschylus, *Suppliants*, 112; *Persians* 254.

<sup>312</sup> Herodotus, *Wars*, e.g. (respectively): V.4.2; V.95.2; VIII.97.1.

<sup>313</sup> Plato, *Laws*, X.888c.

Wasting away in their misery, they bewailed their miserable suffering, the children of a mother unhappy in her marriage.<sup>314</sup>

One difference between the nouns τὸ πάθος and ἡ πάθη is a general difference in Ancient Greek between -ς / -εος / -ος- nouns and -α feminine nouns.<sup>315</sup> The former relate mainly to inanimate or abstract objects which express the idea not so much of an 'active' force as a 'passive' state. For example, βράδος is that which goes slowly, κάλλος the quality of that which is beautiful. Additionally, when the 'animate' sense of the -α suffix is placed alongside the inanimate, the passive state is often interpreted as the result or effect of the 'animate' noun. For example, ἡ εὐχή, 'prayer,' as active force against εὖχος, 'a prayer answered.' Thus ἡ πάθη could be understood as the cause of the πάθος. It is worth noting that the feminine is here linked to the active, not passive and we may ask why this active feminine state disappeared in Attic Greek.

τὸ πάθημα, which occurs in prose authors from Herodotus onwards, tends to supersede πάθος and becomes important especially in the moral works of Aristotle. Herodotus uses πάθημα rarely but one of its instances shows the proverbial παθήματα / μαθήματα, perhaps its first recorded use in rhyming form:

τὰ δὲ μοι παθήματα ἔόντα ἀχάρिता μαθήματα γέγονε.

And disaster has been my teacher.<sup>316</sup>

In Sophocles's *Oedipus at Colonus* its plural is used internally with πάσχειν in the same way as πάθος, 'to suffer a suffering' which perhaps marks a kind of auto-affection:

ἐγὼ τὰ μὲν παθήμαθ' ἄπαθον, πάτερ, / παρεῖσ' ἐάσω:

The sufferings that I bore, father, in seeking where you dwelt, I will pass by;<sup>317</sup>

Nouns with suffix of -μα tended to come from Ionian authors again to indicate the result of an action and any verb could produce a derivative of this type, sometimes forming a doublet with nouns in -ος, though not always synonymously. Philosophers found these forms useful to describe a state rather than an action, for example, τὸ δίδαγμα to indicate what has been learnt, in contrast to ἡ δίδαξις, 'teaching' or 'instruction'; ἡ μάθησις 'the process of learning' to τὸ μάθημα 'the thing learnt.' In *Physics*, Aristotle uses this distinction to introduce the

<sup>314</sup> Sophocles, *Antigone*, 979-980.

<sup>315</sup> See Chantraine, *Noms Grecs Ancien* §43.

<sup>316</sup> Herodotus, *Wars*, I.207.1.

<sup>317</sup> Sophocles, *Colonus*, 361.

term ἡ πάθησις, translated as ‘a suffering,’ to denote the ἐνέργεια of the ‘passive’ side alongside ποίησις, ‘a doing.’ So, πάθησις is the process of passivity, πάθημα the passive state produced. Yet the actuality [ἔργον] and goal [τέλος] of activity, Aristotle states, is, of activity, ποίημα, and, of passivity, πάθος, not πάθημα.<sup>318</sup> Indeed, Aristotle never uses singular πάθημα only plural πάθηματα.<sup>319</sup> Whereas, in Plato, ποίημα is joined with πάθημα.<sup>320</sup>

A common use of πάθος and πάθημα from Pre-Socratics onwards was to act as pronouns in the same way πάσχειν will act as pro-verb. Each new opposition demonstrates the expansion in noun’s senses. For example, in Aristophanes, πάθημα gains a positive sense akin to ‘fortitude’ through its opposition to τέχνασμα, ‘guile’ or ‘evasion’:

τὰς συμφορὰς γὰρ οὐχὶ τοῖς τεχνάσμασιν / φέρειν δίκαιον ἀλλὰ τοῖς παθήμασιν.

one must not try to trick misfortune, but resign oneself to it with good grace.<sup>321</sup>

In the same passage two lines later, the πάθημα gains a sexual sense in the violent (or comic) alignment of the male homosexual as ‘passive’ (i.e. receptive) sexual partner in its opposition to the privileged λόγος:

καὶ μὴν σύ γ’, ὦ κατάπυγον, εὐρύπρωκτος εἶ οὐ τοῖς λόγοισιν ἀλλὰ τοῖς παθήμασιν.

You certainly got your wide asshole, you faggot, not with words but in the spirit of submission!<sup>322</sup>

An early association of πάθος with language arose in Aristotle’s *Poetics* who identifies πάθος as one of the three components of plot alongside reversal and recognition. πάθος is defined as ‘a destructive or painful action [ἡ πρᾶξις], such as public deaths, physical agony, woundings, etc.’<sup>323</sup>. Aristotle also uses πάθος to describe an alteration of words: poets, being imitators, must represent things in language which includes strange words, metaphors and ‘various modified forms of words [πάθη τῆς λέξεώς].’<sup>324</sup>

Aristotle also makes an interesting remark on the difference between tragedy and epic: epic is more able to create wonder [τὸ θαυμαστόν] because it has ‘more scope for the irrational [τὸ ἄλογον]’ which is the chief cause of wonder. The ‘irrational’ gives more scope

<sup>318</sup> Aristotle, *Physics*, III.III.23-25.

<sup>319</sup> Aristotle, e.g. *Generation of Animals*, V.V.

<sup>320</sup> Plato, *Sophist*, 248b.

<sup>321</sup> Aristophanes, *Thesmophoria*, 199.

<sup>322</sup> *Ibid.*, 200-1.

<sup>323</sup> Aristotle, *Poetics*, 1452b11-13.

<sup>324</sup> *Ibid.*, 1460b12.

for wonder because 'we do not actually see the agent [τὸν πράττοντα]' and, presumably, are left to wonder who or what caused the actions. But although a source of wonder, this can also be a source of falsehoods if, for example, we assume the absent agent to be the same as the one involved in similar, previously witnessed events.<sup>325</sup> If, as Plato affirms, wonder is the beginning of philosophy and this wonder is a πάθος, we should link πάθος to the 'irrational' and absence of agent that gives the possibility of philosophy and error. And perhaps not translate ἄλογον as irrational but, if its root verb λέγειν means also to gather, or collect, then perhaps a disorganization where action and agent are not yet gathered together?<sup>326</sup>

#### ΠΑΘΟΣ AS GRAMMATICAL VOICE: MIDDLE OR PASSIVE?

The connection between πάσχειν and τίθημι in the Greek metaphysical system that persists in the choice of *afficio* to translate πάθος as well as its use by Aristotle to describe word changes is perhaps one reason why πάθος was chosen by Stoics and Alexandrine Grammarians to define one of the two grammatical 'voices' [διάθεσις from δια + τίθημι]: ἐνέργεια and πάθος. Whilst this division seems to suggest the division between 'active' and 'passive' voice, we must be wary of projecting existing linguistic structures onto earlier systems. Contemporary linguistic understanding, as Benveniste makes clear, recognises that originally there was the active [ἐνέργεια] and middle [μεσότης] voice with the passive emerging from the middle:

In the general development of the Indo-European languages, comparatists long ago established that the passive is a modality of the middle, from which it proceeds and with which it keeps close ties even when it has reached the state of a distinct category. The Indo-European stage of the verb is thus characterised by an opposition of only two *diatheses*, active and middle, to use the traditional terms.<sup>327</sup>

But in a study of the difference between ancient grammars and modern grammars of Classical Greek, Codoñer makes the point that modern understandings of Greek grammar differed from that of ancient grammarians: 'for ancient grammarians the middle voice [μεσότης] was never a regular diathesis in itself on the same level as the active and passive voices [ἐνέργεια / πάθος], but rather a formal anomaly only present in specific verbal paradigms.'<sup>328</sup> Indeed, the middle voice was not considered a separate voice until the Renaissance. So how are we to map Benveniste's claim that first there was active and middle

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<sup>325</sup> Ibid., 1460a12-15.

<sup>326</sup> See Heidegger, *Aristotle's Metaphysics*, 2-3 for discussion of λόγος.

<sup>327</sup> Benveniste, *Problems*, 145.

<sup>328</sup> Codoñer, *Grammars*, 73.

with passive emerging out of middle onto the Greek terms ἐνέργεια, μεσότης and πάθος? We will see that the modern active/middle/passive was distributed differently across ἐνέργεια/μεσότης/πάθος and what the ancients considered under πάθος actually bore some senses of what we today call middle voice. This can therefore help us understand further πάθος in senses other than mere passivity.

One immediate difficulty in studying the middle voice is that morphologically middle and passive are the same in the present, perfect and imperfect. In the aorist, middle forms are middle only and a new aorist passive was formed from an older intransitive formation which had active endings while the future passive is formed by adding future middle endings to aorist passive stems. The context is supposed to make it clear which voice is intended. For example, passive voice is typically indicated by the presence of prepositions like ὑπο (in the case of human agents) or the dative (in the case of things) to indicate the cause or source of the suffering (‘suffering ill *through* the battle din of the Trojans’).<sup>329</sup>

Let us take a chronological look at the development of voice in Greek grammar to clarify.

#### *Stoic Grammar*

The earliest treatment of grammar came with the Stoics. Diogenes discusses Chrysippus’s view of dialectic as a ‘doctrine of expressions, including those which are complete in themselves, as well as judgements and syllogisms and that of defective expressions comprising predicates.’<sup>330</sup> A predicate [κατηγορημα] is what is said of something and can be ‘direct’ [ὀρθός], ‘reversed’ [ὑπτια]<sup>331</sup> or neither [οὐδέτερα]. Direct predicates are constructed using ‘oblique cases’ (i.e. dative, genitive and accusative), reversed predicates with the ‘passive part’ [τῷ παθητικῷ μορίῳ] and the ‘neither’ with neither of these. Examples of direct include ἀκούει (he/she/it hears, active voiced), ὁρᾷ (he/she/it sees, active) and διαλέγεται (he/she/it discusses, middle-passive). Examples of the ‘reversed’ are ἀκούομαι (I am heard, middle-passive) and ὁρῶμαι (I am seen, middle-passive). Neutral are those that correspond to neither, such as Φρονεῖ (he/she/it thinks, active) and Περιπατεῖ. (he/she/it walks, active).<sup>332</sup>

Diogenes also discusses other predicates which are among the passive part of speech called ἀντιπεπονθότα typically translated as ‘reflexive.’ The Greek is from ἀντι + πάσχειν meaning to suffer in turn (as suffering good for good or evil for evil done). But Diogenes

<sup>329</sup> Homer, *Iliad*, 10.

<sup>330</sup> Laertius, *Lives*, 7.1.64.

<sup>331</sup> from ὑπό lit. laid on one’s back, with the underside uppermost as Latin *supinus* from *sub*.

<sup>332</sup> Laertius, *Lives*, 7.1.64.

adds, 'although in form passive, they are yet active operations.' He gives the example of 'he gets his hair cut' [κείρεται, middle-passive – note there is no agent specified here using ὑπο or dative]. Diogenes explains this is reflexive because 'he surrounds himself in the sphere of his action' [ἐμπεριέχει γὰρ ἑαυτὸν ὁ κειρόμενος].<sup>333</sup> For the 'action,' Diogenes uses the middle-voiced articular present participle, ὁ κειρόμενος, literally 'the hair-cutting': the event itself within which he in-surrounds himself [ἑαυτόν]. This is therefore reflexive as he 'suffers' the effect of the action he causes, he suffers his hair cutting in the hair cutting done. Thus in Stoic logic, 'reflexivity' was characterised using πάσχειν suggesting it signified not only passivity but reflexivity too.

#### *Dionysius Thrax*

Let us turn next to the τέχνη γραμματική of Pseudo-Dionysius Thrax, considered to be the first surviving grammar of the Greek language dating from around 2nd-1st century BC and one of the first to mention an active [ἐνέργεια], passive [πάθος] and 'middle voice' [μεσότης].<sup>334</sup> Thrax exemplifies ἐνέργεια by τύπτω 'I strike' (modern active) and passive by τύπτομαι 'I am struck' (modern middle-passive). He then defines the middle voice as *sometimes* signifying ἐνέργεια, *sometimes* πάθος giving the examples πέπηγα 'I am fixed to the spot' (modern active voiced), διέφθορα 'I am ruined' (modern active voiced), ἐποίησάμην 'I made for myself' (modern middle aorist), and ἐγραψάμην 'I wrote down for my own benefit' (modern middle aorist).<sup>335</sup> Dionysius therefore includes what we now consider active voiced verbs as examples of μεσότης confirming this different distribution of active/middle/passive.

#### *Renaissance Grammars*

To complicate things further, active voiced verbs were also treated as 'reflexive.' In the Byzantine grammar of Planudes (c. 1260 – c. 1305), Planudes discusses reflexive verbs using the example λούομαι which signifies in the active to wash another, in the passive to be washed and in the middle, to wash oneself. Planudes renders the construction ὁ ἑαυτὸν λούων (literally, the washing himself) as a 'reflexive' but then labels it active (ἐνέργεια): "because it does not happen that the person suffers this action by another."<sup>336</sup> Codoñer therefore

<sup>333</sup> Ibid., 7.1.65.

<sup>334</sup> For translation see Kemp, *Tekhnē Grammatikē of Dionysius Thrax*.

<sup>335</sup> Ibid., 354-55.

<sup>336</sup> Cited in Codoñer, *Grammars*, 81.

argues that the ‘active’ voice is interpreted as ‘the absence of an agent other than the subject.’<sup>337</sup>

In the grammar books of this time, middle forms were not listed as a third column alongside ἐνέργεια and πάθος. It was only with Theodore Gaza in 1495 that a third column in grammar books, *between* ἐνέργεια and πάθος was introduced and labelled the middle voice mostly out of convenience although he gave no definition of this middle column.<sup>338</sup> Then, Ludolf Küstler (1670-1716) gave a definition of this third column and the middle voice as expressing active and passive *at the same time*. Codoñer argues this definition arose because Küstler probably misunderstood the ancient definitions of middle voice who defined it as ‘*alternatively* sharing the active and passive diathetical meanings’ not active and passive *at the same time*.<sup>339</sup> This definition then became incorporated into standard Greek grammars and a standard concept in modern Greek grammars after the 18th century.

#### *Modern interpretations*

For Codoñer, the real problem of comparing Ancient and Modern grammars arises from a difference in the treatment of direct and indirect reflexive values, which he defines as:

Direct reflexive applies when the subject of the reflexive verb is perceived at the same time, either syntactically or semantically, as the direct object of the action: λούεται / λούεται ἑαυτόν / λούεται τὸ σῶμα: He washed himself.

Indirect reflexive refers to a reflexive verb that has a direct object different from the subject or, to put it in other terms, where the agent and the beneficiary of the action are identical but other than the goal or direct object: ἐποίησατο ἄδειαν: He obtained immunity for himself.<sup>340</sup>

Modern understanding of Greek middle voice incorporates all reflexive usages, both direct and indirect, whereas these were distributed differently in Ancient grammars so that ἐνέργεια voice included both active and indirect reflexive values and πάθος both passive and direct reflexive values; μεσότης then included both ἐνέργεια and πάθος voiced verbs depending on paradigms or verbal tenses. In many examples from ancient Grammarians, Codoñer shows how, barring one exception, middle forms characterised as ἐνέργεια had an indirect reflexive value and middle forms characterised as πάθος a direct reflexive value. Codoñer therefore

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<sup>337</sup> Ibid., 81.

<sup>338</sup> Gaza, *Grammaticae*.

<sup>339</sup> Codoñer, *Grammars*, 80.

<sup>340</sup> Codoñer, *Grammars*, 83.

concludes that 'under πάθος, the Greek grammarians likely included some reflexive values, for in both passive and reflexive verbs the subject is affected by the action' and that πάθος 'is wholly compatible with the reflexive values we attribute to the middle voice today.'<sup>341</sup> Thus the term πάθος in relation to grammatical voice not only had a passive meaning of suffering an action by something external but a direct reflexive value *as well*.<sup>342</sup>

But we should be wary of characterisations of the modern middle voice as reflexivity as this can reintroduce the active and passive by positing an active subject and passive subject-as-object or splitting entities like the self into an active soul and passive body. This simultaneity of active and passive is a problem for Greek metaphysics: Codoñer shows how Planudes had compared activity and passivity with hot and cold to argue there is no possibility of 'a compromise between two incompatible concepts.'<sup>343</sup> Codoñer expands on this argument:

no grammarian ever conceived of the idea of explaining the meanings of some forms, especially aorists like ἐποιησάμην and ἐτυψάμην, in terms of reflexivity, as this implied in a certain way the simultaneity of activity and passivity within one single verbal form. Such simultaneity was considered an oxymoron by Greek grammarians, which followed old philosophical concepts that excluded the coexistence of opposites.<sup>344</sup>

Yet, describing it as reflexivity using a subject/object distinction raises the problem that the Greeks did not know this distinction between subject and object. How are we then to understand the sense of πάθος as a simultaneity other than as a simultaneity of active and passive or subject and object?

Let us consider this question further by focusing on the link of πάθος to 'affect.' The connection of affect with πάθος through translation is reinforced by modern linguists' characterization of the middle voice as depending on the 'affectedness' of the subject. For example, Benveniste characterises the middle voice as finally coming down to 'situating positions of the subject with respect to the process, according to whether it is exterior or interior to it, and to qualifying it as agent, depending on whether it effects, in the active, or whether it effects while being affected, in the middle.'<sup>345</sup> Codoñer translates παθητική

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<sup>341</sup> Codoñer, *Grammars*, 81.

<sup>342</sup> See also, Andersen, *Remarks*.

<sup>343</sup> Codoñer, *Grammars*, 81.

<sup>344</sup> Codoñer, *Definitions*, 5.

<sup>345</sup> Benveniste, *Problems of Linguistics*, 149-150. 'selon qu'il effectue, dans l'actif, où qu'il effectue en s'affectant, dans le moyen.'

διάθεσις as ‘affective voice’ and argues ‘in both passive and reflexive values the subject is *affected* by the action.’<sup>346</sup> Bakker says the specific feature of the middle voice is ‘the *affectedness* of the subject of the verb in, or by, the event denoted by the verb’<sup>347</sup>. Lyons defines the middle voice as expressing events in which the ‘action or state affects the subject of the verb or his interests.’<sup>348</sup> Meanwhile, Allan argues the middle voice shows that ‘the subject is affected by the event’ or, in other words, ‘the subject, in some way or other, undergoes an effect of the event.’

Does affect then describe this simultaneity of ‘subject’ and ‘object’ of the verb’s action? And with ‘effects while being affected,’ is this not an auto-affection? Does πάθος as describing direct reflexive values of the middle voice contain an originary sense of auto-affection or, indeed, auto-hetero-affection? Furthermore, Allan is quick to point out that his use of affect is not in ‘a narrower, emotional meaning.’ What is required, he says, is a *broader* definition of affect and affectedness because

if we are tempted to interpret *affect* and *affectedness* in a narrower sense, that is, as an equivalent of the ancient term πάθος, we inevitably run into trouble, since the notion πάθος pertains to passivity, as opposed to ἐνέργεια which pertains to *activity*. The ancient grammarians, however, are clear in that they consider indirect reflexive *middle* verbs such as ἐποιησάμην, ἐγραψάμην as having an ἐνέργεια-meaning.<sup>349</sup>

But perhaps the problem here is that πάθος has been understood in a ‘narrower sense,’ reduced to passivity understood as not being ἐνέργεια, activity. Codoñer affirms this misunderstanding of πάθος as passivity: he argues this narrowing arose in part because ‘it was generally assumed that the ancient πάθος was to be translated as “passivity” in a parallel meaning to the meaning the terms “*passivitas*” or “*passivus*” acquired in Latin grammars.’<sup>350</sup> This sense of passivity was further solidified by the three column approach to the voices which expelled the ‘middle forms’ of πάθος (i.e. the direct reflexive values). Is there another, broader sense of πάθος that can give us the sense of affect Allan seeks? In the same way as the passive voice emerged from the middle voice, did the sense of πάθος as passivity emerge from an earlier, broader sense of πάθος that would better explain why the Ancient Grammarians chose this term to describe passive constructions *and* direct reflexives?

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<sup>346</sup> Codoñer, *Grammars*, 83, 81. Emphasis added.

<sup>347</sup> Bakker, *Voice*, 24.

<sup>348</sup> Lyons, *Introduction*, 373.

<sup>349</sup> Allan, *Polysemy*, 17-18.

<sup>350</sup> Codoñer, ‘Grammars,’ 81.

Perhaps we can venture here the wider sense of πάθος as signifying an experience or event in which there is no explicit separation between the actor and action or between affect and effect. There must of course be implicit differences in this action for the action to take place (as in the hair-cutting or Aristotle's wondrous epics) but we must insist these have not been made explicit: there is merely hair-cutting, I have not yet made the distinction that *I cut my hair*. A making explicit would then manifest the split as inside/outside, subject/object or active/passive. As Benveniste argues, in the move from middle to active voice, transitivity is added, there is a separation between subject and object. When a verb is endowed with an active form, the subject moves from being interior to the process to being the agent of it and so the middle gets converted into a transitive. We can add that the move to the passive is made through the addition of ὑπο or dative constructions. Yet Benveniste also adds that middle voice as interior to the process can still include transitivity, for example, λύεται τὸν ἵππον, 'he untethers the horse, thereby affecting himself' whereby it emerges that the horse is his.<sup>351</sup> We are reminded of Derrida's statement on the middle voice in relation to *différance*: 'for the middle voice, a certain nontransitivity, may be what philosophy, at its outset, distributed into an active and a passive voice, thereby constituting itself by means of this repression.'<sup>352</sup>

Codoñer's conclusion is that 'the term πάθος most probably simply meant 'affection' in accordance with the primary meaning of the Greek term related to the verb πάσχειν.'<sup>353</sup> But understanding πάθος as affection does not help us if we are trying to understand affect as πάθος! Let us then turn to the verb πάσχειν to understand πάθος and 'affect' further.

#### ROOT VERB: ΠΑΣΧΕΙΝ

Liddell-Scott identify four main senses of the verb. First is to 'have something done to one, suffer' that is often opposed to verbs of doing like ποιεῖν or with prepositions, typically ὑπό, 'to be treated so and so by another, suffer at its hands.' Second, 'to be affected in a certain way, be (or come to be) in a certain state of mind' or 'entertain certain feelings' which can also be applied to things 'this is the case with...' and of words 'to be subject to certain changes' or 'to be passive in meaning.' Third, with adverbs like κακῶς ('bad') in a negative sense, to be in evil plight or unlucky or with the preposition ὑπό, 'to be ill-used, ill-treated by' or with εὖ to be well off, in a good case, with genitive, to have the good of, enjoy one's

<sup>351</sup> Benveniste, *Problems in General Linguistics*, 149.

<sup>352</sup> Derrida, *Différance*, 9.

<sup>353</sup> Codoñer, 'Grammars,' 81.

own, receive benefits. Without adverbs, it is used with reference to evil, to suffer anything whatever, including death or to suffer punishment in law, pay the penalty. In idiomatic expressions τί πάθω; to express perplexity ('what is to become of me?' or 'what can I do?') or τί πάσχεις; 'what's the matter with you?' 'or what are you about?' Or just to be ill or suffer with accusative of the part affected. Finally, in later Stoic Philosophy, πάσχειν is 'to be acted upon by outward objects, take impressions from or have experience of them.'<sup>354</sup>

Whilst the sense of receiving an action by something external is common, this is typically only when the verb is used with prepositions like ὑπό or the dative to indicate the agent or cause. Indeed, Boreham argues this sense of πάσχειν as 'passivity' understood as to have something done to one imposed from outside should not be assumed to be any 'radical' or primary sense of the verb. Instead, Boreham identifies four main functions of the verb: to denote physical hardship or mental distress; as 'passive' or pro-verb to verbs of activity; as synonym for πράσσω ('to effect or bring about') and ἔχω ('to have') when used intransitively; and in idioms such as 'τί πάθω;' to express perplexity. The sense of passivity that comes to dominate perhaps most arises with its use as pro-verb or 'passive,' although, after our discussion of grammar, we should be careful again in deciding what this 'passive' means. Let us examine its changing uses to attempt an answer. This dominance neglects the senses of physical or mental distress, perplexity and intransitive senses of effecting or having, effecting or having without any direct object specified.

*Homer (c. 800BC)*

Boreham identifies four restrictions on Homer's use of πάσχειν: it is never used with a non-personal subject only in relation to Gods or humans, never animals or inanimate objects; it is never employed with a plural subject used collectively other than proper nouns; it carries a sense of suffering mainly mental, sometimes physical, but is always valenced negatively.<sup>355</sup> Finally, it is associated with a limited number of neuter nouns, to indicate *what* is being suffered, including ἄλγος 'pain,' πῆμα 'misery or calamity,' ἔργα 'work or deeds wrought.'

Only four other words fulfil these restrictions: ἄχθομαι, 'to be loaded,' carries a sense of burden, a heavy heart; μογέω, used for both physical and mental distress; οἰζύω, used mainly of persons but sometimes of conditions and inclines toward physical effort and toil; and

<sup>354</sup> Liddell and Scott, *Latin*, s.v. 'πάσχειν'.

<sup>355</sup> e.g. In Homer, *Odyssey*: Mental: 'many the woes he *suffered* in his heart upon the sea' (I.4); physical: 'How now, if the stranger, while sitting thus in our house, should come to some harm through grievous mishandling?' (XVIII.224).

words deriving from the <sup>x</sup>τλα- root such as τλάω, to suffer or undergo. But these are not exactly synonyms and their differences are informative: ἄχθομαι as burden relates to a specific occurrence whereas πάσχειν is used in more general situations of indefinite duration; μογέω implies an effort or struggle not present in πάσχειν; οἰζύω inclines only toward physical effort and toil, not mental; and τλάω has a connotation of enduring steadfastly or bearing a misfortune that πάσχειν does not have. In short, πάσχειν seems to be broader and vaguer without explicitly indicating effort or enduring, any response to the indefinite event.

Homer uses πάσχειν in two specialised, idiomatic uses that will continue throughout classical Greek literature to give a sense of circumstances beyond one's control that is no doubt developed from its use as passive to verbs of 'action': one in the subjunctive aorist, πάθω, with τί to mean 'what will happen' or 'what is being to us that...' usually with negative implications:

ὦ μοι ἐγὼ τί πάθω;

Ah me, what will become of me?<sup>356</sup>

And one in aorist participle with τί to mean 'why?'

Ἀμφίμεδον, τί παθόντες ἐρεμνὴν γαῖαν ἔδυτε

Amphimedon, what has befallen you that you have come down beneath the dark earth...<sup>357</sup>

The sense of being unwitting recipient of an action whose agent or instrument has been identified is conveyed using prepositions (most often ὑπο, 'under,' but also ἐκ, 'out of,' and, later πρὸς, 'toward'):

ἀλλ' αἰνῶς δεῖδοικα κατὰ φρένα μή τι πάθωσιν

Ἀργείων οἱ ἄριστοι ὑπὸ Τρώων ὀρυμαγδοῦ.

...dreadfully do I fear in my heart that those best of the Argives have suffered some harm *through* the battle din of the Trojans.<sup>358</sup>

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<sup>356</sup> Ibid., V.465.

<sup>357</sup> Ibid., XXIV.106.

<sup>358</sup> Ibid., *Iliad*, 10.

The sense that suffering an action at the hands of something is opposed to or different from one's own actions is demonstrated by an early example of opposing *πάσχειν* to the verb *ἔρδω*, 'to do' or 'to make':

ὅσσ' ἔρξαν τ' ἔπαθόν τε καὶ ὅσσ' ἐμόγησαν Ἀχαιοί,

all that [the Achaeans] did and suffered, and all the toils they endured.<sup>359</sup>

*Πάσχειν* in Homer therefore most generally indicates adverse changes in mental or physical circumstances of Gods or humans beyond their control, understanding or expectation of indefinite duration that are neutral as to effort or struggle nor signifies any enduring or bearing steadfastly. Only with the identification of the agent or instrument does the verb gain the sense of being caused by something external or other.

#### *Post-Homer*

In the Pre-Socratic philosophers (600—440BC), *πάσχειν* is no longer confined to human or divine subjects, but is used with the inanimate and abstract. Whilst Herodotus also expanded the application of *πάσχειν* to inanimate objects like rivers and statues as well as animals, e.g. fish, its abstract usage was specific to these philosophers and is not found in any non-technical authors of prose or verse with the exception of Xenophon. It continues to denote physical hardship or mental distress and its function as 'passive' of verbs of 'doing' is considerably extended. Its pairing with *ποιεῖν* becomes established as central to Greek philosophy. Here is Antiphon (c. 480-411BC):

ἐλπίδες δ' οὐ πανταχοῦ ἀγαθόν· πολλοὺς γὰρ τοιαῦται ἐλπίδες κατέβαλον εἰς ἀνηκέστους συμφοράς, ἃ δ' ἐδόκουν τοὺς πέλας ποιήσειν, παθόντες ταῦτα ἀνεφάνησαν αὐτοί.

Hopes are not always a good thing: for hopes of this sort have cast many men into incurable misfortunes, and the evil they expected to *inflict on others* they turned out to *suffer themselves*.<sup>360</sup>

In the tragedians, the four restrictions to the usage of *πάσχειν* in Homer get relaxed further such that it is no longer used only with personal subjects, it is no longer confined to a limited number of internal nouns and adjectives and is used with a collective plural subject in Thrasymachus. It continues to be used of both physical and mental distress and to act as passive and pro-verb to an expanding range of verbs, many outside the semantic field of

<sup>359</sup> Homer, *Odyssey*, VIII.490.

<sup>360</sup> Antiphon, Fragment D55 (B58) Stob, 3.20.66 in Laks and Most, *Sophists*, 74-75.

suffering. For example, in Sophocles's *Electra* it is used as pro-verb to κλύειν, 'to hear' when Chrysothemis says he would put up with hearing Electra's criticism as well as when she praised him, Electra replies 'You will never suffer that from me!'<sup>361</sup> Or in *Oedipus at Colonna* as reciprocal passive to δικαίαν χάριν παρασχεῖν, i.e. 'to give a fair requital for his treatment.'<sup>362</sup>

As the comic poets utilise more of the vernacular language, Boreham thought it probable conventional literary usages of πάσχειν would be relaxed despite, as expected, fewer uses of the 'tragic' sense of 'to suffer.' Indeed, it is more commonly used in a good sense, for example:

ὦ μακάριε τῆς τύχης / ὅσον πέπονθας ἀγαθὸν ἐς τὰ πράγματα.

Spoilt child of fortune, everything fits together to ensure your greatness.<sup>363</sup>

The use with the preposition ὑπό to indicate the instrument continues as well as the idiom τί πάθω although it gains a new sense of indifference rather than mere perplexity<sup>364</sup>.

The use of πάσχειν as pro-verb continues in Aristophanes's *Clouds*, as pro-verb for 'being fined':

καὶ προσαπολεῖς ἄρ' αὐτὰ πρὸς ταῖς δώδεκα.

καίτοι σε τοῦτό γ' οὐχὶ βούλομαι παθεῖν,

Then you will lose it besides, in addition to your twelve minae. And yet I do not wish you to suffer this.<sup>365</sup>

A discussion of Plato and Aristotle's use of this word was given in Chapter 3 in the senses of experience, emotion, attribute or state and as binding (in its opposition to ποιεῖν). Boreham argues this wide usage may have arisen partly because the freedom of choice for expressions of 'experience, reaction, feeling, behaviour and sensation' was limited so they found πάσχειν appropriate for the expression of many abstract processes of thought and their 'passive':

Greek lacked other words to denote the passive of αισθάνομαι ('to perceive, feel') (apart from the awkward periphrasis αἴσθησιν παρέχειν), οἶδα, μανθάνω and

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<sup>361</sup> Sophocles, *Electra*, 1029.

<sup>362</sup> Sophocles, *Oedipus*, 1498.

<sup>363</sup> Aristophanes, *Knights*, 187.

<sup>364</sup> Aristophanes, *Birds*, 1432.

<sup>365</sup> Aristophanes, *Clouds*, 1257.

ἐπιστῆμαι, for example and πάσχειν was admirably suited to fill this gap in the semantic mechanics of the language.<sup>366</sup>

The use with abstract entities continues, for example to denote the effect of the action of an abstract entity (λόγος) again using ὑπό:

ἐάν τι πάθωμεν πλημμελές ὑπὸ τοῦ λόγου

if any false note in the argument does us any harm.<sup>367</sup>

It continues to be used in a good sense (four instances in Plato with εἶ, one with ἀγαυά and one with ἄλλο ἡδύ).<sup>368</sup> But, in both philosophers, Boreham claims πάσχειν is little used in the sense of physical or mental distress for which they instead used ἀλγέω, to feel bodily pain, ἀνιασμαι to grieve, distress, or κάμνω, to work or labour.

Thus πάσχειν develops after Homer by becoming both good and bad, applicable to animals, inanimate and abstract not just Gods and humans, and by its expanding use as pro-verb particularly in the analysis of experience by Plato and Aristotle.

Boreham ultimately describes πάσχειν as a ‘philological paradox’ because of its ability to fill specific semantic lacunae as passive or pro-verb to an expanding list of verbs and nouns whilst at the same time being marked by syntactic limitations in the words it is compatible with.<sup>369</sup> Boreham suggests the key to understanding πάσχειν is as metaphor, if metaphor is understood as ‘something that is more remote, less concrete, less vivid, is referred to in terms of something similar.’ He writes: ‘here perhaps lies the key to the adoption of πάσχειν by the Philosophers for metaphysical purposes beyond its simple sense of “suffering.”’<sup>370</sup> Is πάσχειν as metaphor a neat symbol of a making manifest, of a ‘carrying across,’ a making known by separation of the unmanifest in the adding of transitivity that ‘activity’ adds? Πάθος as the perplexing (or indifferent) bindings of implicit differences beyond one’s control that precede any separation of action and agent, subject/object, active/passive; πάθος, through its use as pro-verb, signifies the vast unmanifest, intransitive realm of that which is metaphorized through reference to something known.

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<sup>366</sup> Boreham, *Study*, 128-9.

<sup>367</sup> Plato, *Republic*, V.451b.

<sup>368</sup> e.g. Plato, *Protagoras*, 337c.

<sup>369</sup> Boreham, *Study*, 212-13.

<sup>370</sup> *Ibid.*, 214.

Boreham suggests that one reason for this paradoxical nature is that, despite its importance to Greek, it has few affinities with other languages.<sup>371</sup> Let us then examine these affinities through discussion of its Proto-Indo-European roots.

#### PROTO-INDO EUROPEAN ROOTS OF ΠΑΣΧΕΙΝ: BINDING

Despite the antiquity and importance of the verb, *πάσχειν* cannot be definitively identified with words in other languages but its origins probably lies in the Indo-European root *\*bhendh-* which Pokorny and Boisacq identify with roots meaning 'to bind' (*bindet*), 'captivate,' 'fascinate' (*fesselt*), 'capture' (*nimmt gefangen*), 'add' (*fügt zus*) or 'entangled' (*verstrickt*).<sup>372</sup> Other derivatives can then be understood through this sense of binding connections: *πῆγμα* 'ship's cable' or 'rope,' *πενθερός* 'father-in-law' or, more generally, any connection by marriage. It is from this root we get the English range of 'band,' 'bend,' 'bind,' 'bond,' 'bundle.' Beekes in his more recent etymological dictionary of Greek echoes this probable etymology and adds that there may have been a semantic shift in the intransitive usage from 'bound' to 'suffer.'<sup>373</sup> Janda, in a work on the Eleusinian Mysteries, notes that words related to 'to suffer' or 'to be ill' or physical or mental states of stress as well as words related to 'magic' and 'spell' both share an older meaning 'to bind.'<sup>374</sup> Meanwhile, Leumann argues that this idea of being bound led to two metaphorical uses even in ancient Indo-European times: first 'to the idea of being bound by illness' and second to 'the idea of being bound by guilt.'<sup>375</sup>

#### *Binding in the Rig Veda*

The Proto-Indo-European *bhendh-* is also the root of the Sanskrit: *bandhá* or *bandhu* (bond) which is a key term in the Upanishads. Roberto Calasso writes of a notable example of its use in the 'creation hymn' of the Rig Veda:

Desire came upon that one in the beginning; that was the first seed of mind. Poets seeking in their heart with wisdom found the bond [*bandhu*] of existence in non-existence.

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<sup>371</sup> Ibid., 213.

<sup>372</sup> Pokorny, *Wörterburch*; Boisacq, *Dictionnaire*.

<sup>373</sup> Beekes, s.v. *πάσχειν*, 1156.

<sup>374</sup> Janda, 128-29.

<sup>375</sup> Leumann, 10.

Their cord was extended across. Was there below? Was there above? There were seed-placers; there were powers. There was impulse beneath; there was giving-forth above.<sup>376</sup>

Calasso argues this ‘bond’ challenges

the Parmenidean prohibition on conceiving a passage from nonbeing to being. And they do so using the most precious word: *bandhu*, ‘nexus, ‘bond,’ ‘tie.’ Thought, for the *rsis*, was itself none other than a way of ascertaining and establishing *bandhus*. This was the beginning, and the culmination. Thought could offer nothing else. And it was clear that the first of these *bandhus* had to be the one between *asat* and *sat*. Here, once again, if the two words *asat* and *sat* mean ‘unmanifest’ and ‘manifest’ – and not ‘nonbeing’ and ‘being,’ which are too Greek – then the formula seems far clearer: because the manifest must continually draw upon the unmanifest.<sup>377</sup>

Calasso discusses the perplexing next verse: ‘the bandhu found by the poets inquiring into their heart was a “rope stretched across.” Across what, we are not told. In fact, it is followed by the questions “What was below? What was above?”’<sup>378</sup> Prasad, in his reading, lingers over the meaning of this ‘rope’ (*raśmih*) and proposes it be interpreted in line with many other verses in the Rig Veda where the universe is described as sacrifice or as warp and woof in the metaphor of the loom.<sup>379</sup> The common idea is of preparing a ground for work, outlines, of both a sacrificial area and the warp and woof which is formed by the ‘stretching of cord or thread, which are to be filled up as the work progresses and also because of the similar physical movements, forward and backward, both in the performance of a sacrifice and the working of a loom.’ This ‘rope stretched across’ therefore represents ‘the warp and woof of the universe, and this, in its turn, signifies the divisions of time and space, in which all the beings live, move and have their being.’<sup>380</sup>

Whilst space does not permit a more detailed comparison of Indian and Greek philosophy, it is striking to note here the mention of bonds as ropes stretched that bind manifest to unmanifest that precede and prompt questions of what is above and what below. If above and below are linked to the Greek ὑπο/ὑπερ as active/passive then we have again a binding prior to or producing the active and passive. Furthermore, this rope as ‘stretched’ would link to the Greek τείνω root also of Latin *tendo* and our modern-day intention. Or the Greek ὀρέγειν

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<sup>376</sup> Doniger (trans.), *Rig Veda*. 10.129.4-5 (25).

<sup>377</sup> Calasso, 131.

<sup>378</sup> Ibid.

<sup>379</sup> Prasad, 587.

<sup>380</sup> Prasad, 596.

source also of ὄρεξις, desire or conation. This sense of stretching or reaching out is mentioned in Plato's *Phaedo* and links us to the sense of *affecto* as yearning or desire. In question is if this binding is prior to or produces the (desire for) active/passive then this binding would need to be conceived without the active/passive and cannot therefore be a binding and a being-bound, this would merely raise the question of who or what binds.

*Binding in Ancient Greece: μῆτις*

Let us return to Ancient Greece to consider bindings and their relation to πάσχειν. One notable discussion of binding is in Détienne and Vernant's discussion of 'cunning intelligence' (μῆτις) in Greek culture which, they argue, is expressed by the images of 'the reversal, the bond and the circle.'<sup>381</sup>

Relatively little has been written on μῆτις in comparison to philosophical intelligence mainly, they argue, because 'Platonic Truth, which has overshadowed a whole area of intelligence with its own kinds of understanding, has never really ceased to haunt Western metaphysical thought.'<sup>382</sup> The authors hold Aristotle and Plato most responsible for this neglect as they rejected μῆτις as unsure, unstable, aligned with the contingent and subordinate to true philosophical wisdom. But, through their rejection, they actually help identify two major qualities of μῆτις: ἀγχίνοια (alertness, quick-wittedness) and εὐστοχία (a steady eye to hit the target). These skills are demonstrated in, for example, sophistry, medicine and politics, skills Plato condemns. For example, in *Philebus*, Plato 'makes a distinction between human achievements which are dependent upon uncertain knowledge and those which are based upon exactitude.' Only the latter can belong to science, ἐπιστήμη. Aristotle, however, is perhaps less severe in his condemnation. The *Nicomachean Ethics*, for example, could be seen to be embracing again 'the traditions of the orators and sophists and the types of knowledge which are subject to contingency and directed towards beings affected by change.' Aristotle also admits that 'there can be a type of knowledge bearing upon what is inexact even if, like its subject, this knowledge can itself only be inexact.'<sup>383</sup>

To further understand μῆτις, the authors discuss Hephaestus's μῆτις and his magical power of binding that reveals the fundamental features which ensure victory and success for μῆτις.<sup>384</sup> In a passage from *Odyssey*, Hephaestus discovers his wife, Aphrodite, is having an

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<sup>381</sup> Détienne and Vernant, *Cunning Intelligence*, 7.

<sup>382</sup> Ibid., 317–8.

<sup>383</sup> Ibid., 316–7.

<sup>384</sup> Homer, *Odyssey*, 8.266–366.

affair with Ares. In response, Hephaestus forges a network of fine, invisible chains to bind them *in flagrante* in his wedding bed. Hephaestus's bonds are described as 'inextricable,' δεσμοὶ ἀπείρονες.<sup>385</sup> Détienne and Vernant ask after the meaning of *apeiron* here. A key concept for Greek philosophy, it is typically interpreted as the unbounded or limitless. A linguistic analysis of *apeiron*, composed of the privative *a-* and *peiron*, identifies two main interpretations: first, where *peiron* is understood either as limit, end extremity and bond (it can refer to the ends of rope for example). As bond, it is notably used in the *Odyssey* when Odysseus lashes himself to the ship's mast to evade the sirens.<sup>386</sup> These bonds are sometimes called *peirata*, sometimes *desmoi*. Second, through reference to *peiron*'s Proto-Indo-European root, *\*per*, to mean passage or crossing. This sense of path links the *apeiron* to signals, to nautical navigation, to that which constructs a bridge between the visible and invisible:

Greeks call *apeiros* or *apeiritos* not because it is without limits or boundaries but because it is the expanse that cannot be crossed (*perao*) from one side to the other, an impassable expanse where a path is obliterated as soon as it is made and disappears from the everchanging, smooth surface of the waters.<sup>387</sup>

These two senses complicate the semantic field of *peirar*:

The first depended entirely upon the antithetical complementarity of *peirar-apeiron*: *peirar* denoted a type of path opened up in a defined area while *apeiron* meant, by contrast, that which cannot be crossed and to which there is no ultimate limit. On the other hand the second trend was for the same terms *peirar* and *apeiron* to mean 'bond' and to form, not a contrasting pair, but rather a new complementary combination conveying the paradoxical image of a *peirar apeiron*: an impassable bond and an inextricable path.<sup>388</sup>

To resolve the question, the authors argue for a method similar to that of Benveniste's analysis of τρέφω:

the 'meaning' of a linguistic form is to be determined by the sum total of the ways in which it is used. Thus the problem is not to deduce one meaning from another but rather to understand what kind of relationship the Greeks may have established between a path and a bond and how it is that the sense of 'binding' of the word *peirar*, – a meaning which appears quite different from that of 'journeying' which is

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<sup>385</sup> Ibid., 8.340–342.

<sup>386</sup> Homer, *Odyssey*, 12.36–51.

<sup>387</sup> Détienne and Vernant, 290.

<sup>388</sup> Ibid., 293.

suggested in other contexts – may in fact simply be a variation of the latter meaning.<sup>389</sup>

In answer, they cite Porphyry as the authority who says that ‘the idea of *apeiron* refers to the power of these bonds which [...] extend on every side, having neither end nor beginning, neither *péras* nor *archē*.’<sup>390</sup> Vernant argues that Homer therefore chooses *apeiron* to describe Hephaestus’s bonds because the bonds are *circular*, in the form of rings, as circles are without beginning or end. *Metis* is therefore related to *apeiron* as binding and circularity because circular bonds express one of the fundamental characteristics of *metis*: ‘To exercise all its powers the intelligence of cunning needs the circular reciprocity between what is bound and what is binding.’<sup>391</sup> Key words in this binding are to weave (*πλέκειν*) and twist (*στρέφειν*): for example, ‘Strophaios is also the name given by the Greeks to the sophist who knows how to interweave (*sumplekein*) and twist together (*strephein*) speeches (*logoi*) and artifices (*mechanai*).’<sup>392</sup>

But how does this link to πάθος? If μῆτις is expressed by the image of binding, of placing someone in circular bonds that entrap them, could we venture it is the skill of μῆτις that binds and creates a πάθος? However, there is little evidence of a direct relation between μῆτις and πάθος in textual evidence. Two suggestions occur in *Odyssey*: Odysseus has to endure [*πάσχειν*] his many griefs and submit to the violence of his house guests as part of Athena’s cunning plan [*μῆτις*],<sup>393</sup> and μῆτις is twice referred to as a means of ending suffering [*πάσχειν*].<sup>394</sup> Furthermore, if μῆτις is opposed to true philosophical knowledge is might also then be aligned with the ‘irrational’ of πάθος as absence of agent, or at least ‘ungathered’ action and agent. If philosophy busied itself with understanding the coupled opposites as separated bindings, is there another knowledge concerned with the bindings themselves prior to any separation? If πάθος also describes a direct reflexive where action and agent are not separated, where the action is perhaps circular in the binding of action and agent, is this not akin to the circular bindings of μῆτις? But we must again be careful of bindings that *precede* the active and passive: if they do, it cannot be said that something can *make* a binding as this would imply a passivity. Bindings simply are? Or, μῆτις ‘creates’ bonds as circular

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<sup>389</sup> Ibid., 291.

<sup>390</sup> Ibid., 286.

<sup>391</sup> Ibid., 305.

<sup>392</sup> Ibid., 41.

<sup>393</sup> *Odyssey*, 13.304–310.

<sup>394</sup> Ibid., 3.114–121; 10.189–191.

reciprocities between active and passive that entrap and ensnare. And μητις is required to extricate from such bonds. Perhaps μητις as creating or releasing active/passive binds is therefore somehow 'outside' the active/passive?

#### PASSIONS BEFORE PASSIVITY: BINDINGS OF IMPLICIT DIFFERENCES

To summarise, this section attempted to show how affect, as translation of πάθος, is implicated in past metaphysics of coupled opposites, particularly the active/passive, mainly by how πάθος came to be dominated by senses of passivity in its opposition to activity, as a change arising from an external imposition. But the senses of πάθος were shown to have a broader significance of bindings of implicit differences prior to any separation between agent and action, active and passive. This broader usage is evident in its idiomatic expressions of perplexity or uncertainty, as the wonder-making absence of agent in Epic poetry, its choice to describe a *diathesis* that incorporated passive *and* direct reflexives where the subject is the same (and yet not the same) as the object. The argument therefore is that just as the passive and middle separated out of a πάθος voice that incorporated both, a similar move happened with πάθος where its sense of passivity emerged out of a broader sense of direct reflexive bindings, binds which bind across the ἄπειρον in the warp and weft that binds manifest to unmanifest. It is in this sense akin to the middle voice which both Derrida and Irigaray evoke as a means of overcoming the active/passive. Finally, etymological roots link it to senses of binding invoked in physical (ropes and their end as ἄπειρον), empirical emotions and familial ties that perhaps explains its extension to ontological and metaphysical bindings. Through a discussion of μητις we see how these bindings when circular are ensnaring and inextricable, requiring μητις to free oneself. And in this we are reminded of Berlant's 'cruel optimism' or Sedgwick and Frank's conceptual impasses where 'it is possible to recognise the mechanism of a problem, but trying to remedy it, or even in fact articulate it, simply adds propulsive energy to that very mechanism.'<sup>395</sup>

Viewed diachronically, we can note both a narrowing and enlarging in who suffers, what is suffered (from only negative to positive and negative) and the verbs it is opposed or passive to. In Homer, only Gods and humans suffer pain which expands to the positive or negative suffering of inanimate and animals and then, in philosophy, to the abstract. Is there generally a flattening of agency and diversification of causation? No doubt with the intention of reducing error but can we also witness a spreading attempt at mastery? What enables such

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<sup>395</sup> Sedgwick and Frank, 'Shame,' 635.

a broad and expanding application of πάσχειν is its sense of the unmanifest or unknown or, at least, the implicit, the hidden or non-present, surely the broadest sense there is. In the expression *pathemata mathemata*, it is this unknown that teaches, not the known. And as the known expands — in the form of the changing verbs πάσχειν is opposed to — the unknown or implicit (πάσχειν) remains the same.

We could interpret these changes using Irigaray's identification of conceptions of affect arising from masculine auto-affectation for the affordances are striking. Originating with grief and sorrow, mourning for a lost other, πάσχειν applies only to humans and their Gods. A feminine state ἡ πάθη that grammatically is yet active, productive, is neglected with the turn to the neuter πάθος. This becomes densely implicated in a metaphysics of coupled opposites such that affects can only be viewed as disturbing impositions from an outside and possibilities for growth are conceived only in terms of reversals of actions and passions (ἀντιπεπονθότα) rather than any mutual differentiation toward other affects. Why does πάθος replace πένθος, grief, loss, separation? A grief that is the impetus to the move to a mastery of affects through reducing them to coupled opposites, as perturbing impositions that must be mastered, diluted, applied to everything (and so nothing) rather than any differentiation of a masculine subjectivity from the work of mourning, of separation from the original active feminine being that produced him? And is it notable that μητις, the goddess, is outside active/passive bindings?



# II NEUROSCIENCE



## 5

**ANCIENT NEUROLOGY: MEDICINE AND PHILOSOPHY**

In order to show the conceptual basis of the turn *to* affect in the neurosciences, we first need to understand what this was a turn *from*. At its most radical, this requires an investigation into the roots of contemporary neuroscience in the conflictual relation between ancient Greek medicine and ancient Greek philosophy to show how modern concepts of neuroscience continue this conflict through a dependence on and differentiation of conceptual schemas of past metaphysics, explicitly through the naming of key terms, implicitly through conceptual relations. The main source of its dependence perhaps arises from a concept that is common to both philosophy and medicine: πάθος meaning, most generally, that which happens to a person or thing (and thus senses of passivity) and, in medicine, any ailment or disease. This links medicine with a Greek metaphysics of coupled opposites and the concept of δύναμις or powers, active and passive capacities of affecting or being affected by something other. This chapter demonstrates how these concepts influence early conceptualisations and perceptions of the neurological organism as a sensory and moving organism so that causation is understood by the brain being source and agent.

The conflictual relation between medicine and philosophy can already be evidenced in early Greek writers with some seeking unity, others strict separation. This separation or identity will inform later chapters in the idea of ‘two neurosciences’ that will be exemplified by the difference between Hippocrates and Galen: where one rejects philosophy and its method as concerned with the super-sensible and seeks a method that is more akin to the helmsman and politician (Hippocrates), the other will seek out medicine using Platonic philosophy (Galen). In this dispute, we should consider did one emerge out of the other or was there a separation from a common ancestor? Which is more originary? The former view is supported by Celsus (2nd century CE) in his *De Medicina*:

At first the science of healing was held to be part of philosophy, so that treatment of disease and contemplation of the nature of things began through the same authorities; clearly because healing was needed especially by those whose bodily strength had been weakened by restless thinking and night-watching. Hence we find that many who professed philosophy became expert in medicine, the most celebrated being Pythagoras, Empedocles and Democritus.<sup>396</sup>

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<sup>396</sup> Celsus, *On Medicine*, Pr., 6-8 (4-5).

Celsus argues it was Hippocrates who was the first to separate medicine from philosophy and so we begin with him (i.e. the corpus of writings ascribed to him) before moving to Galen and his attempt to combine medicine and philosophy. Galen will therefore require some discussion of the Greek philosophy he tries to incorporate.

### THE BRAIN AND NEURON IN ANCIENT GREECE

The claim to a proto-neuroscience in ancient Greece can be tracked through the Greek derivation of the term neuron, νεῦρον, which originally meant sinew or rope. In combination it also described a shoe-mender as they who work with *laces* (νευρορράφος) or a puppet controlled by *strings* (νευρόσπαστον). This sense of strings is then transferred to the nerve and tendon of the living organism. In Latin, this became *nervus*, which again had the sense of strings, cords or wires alongside sinews, tendons nerves.<sup>397</sup> The specific term neurology for the science of the nerves came into English via Willis's use of νευρολογία in the Latin *Cerebri Anatome* (1664) which Pordage would translate into English as neurology: 'our Method demands of us, that...by the cense or numbering of the Nerves, being particularly made, we should deliver an exact Neurology or Doctrine of the Nerves.'<sup>398</sup>

Pythagoras saw nerves, together with veins and sinews, as the 'bonds of the soul':

The soul of man, he says, is divided into three parts, intelligence, reason, and passion. Intelligence and passion are possessed by other animals as well, but reason by man alone. The seat of the soul extends from the heart to the brain; the part of it which is in the heart is passion, while the parts located in the brain are reason and intelligence. The senses are distillations from these. Reason is immortal, all else mortal. The soul draws nourishment from the blood; the faculties of the soul are winds, for they as well as the soul are invisible, just as the aether is invisible. The veins, arteries, and sinews [τὰ νεῦρα] are the bonds of the soul [δεσμά τῆς ψυχῆς].<sup>399</sup>

These 'nerves' became central to the early importance accorded to the brain. Hippocratic writings offers a proto-neuroscience in their understanding of the brain and nervous system through these 'strings' and were among the early physicians who affirmed the centrality of the brain (ὁ ἐγκέφαλος, literally, that which is inside the head). Hippocrates writes: 'Men ought to know that from nothing else but the brain [ἐγκέφαλος] come joys, delights, laughter and sports, and sorrows, griefs, despondency and lamentations' and that 'the brain is the most

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<sup>397</sup> Celsus uses *nervus* to translate the Greek τένων in the context of the 'straight and powerful sinews' that hold up the head. *Medicine*, 8.13.

<sup>398</sup> Willis, *Cerebri Anatome*, xix. 230; Willis, *Anatomy*, xix. 130.

<sup>399</sup> Laertius, *Lives*, 8.1 30-31.

powerful [δύναμιν πλείστην] organ of the human body.<sup>400</sup> Before him, Alcmaeon of Croton (5th Century BC) had performed dissections, described the optic nerve, and similarly argued the brain was the central organ of thought.

Systematic human (mainly in Alexandria) and animal dissections (in Greece) yielded anatomical knowledge, some of which is still accurate to this day. A follower of Hippocrates, for example, wrote about parts of the brain including the cerebellum, cerebrum and ventricles and distinguished between tendons and nerves and between sensory and motor nerves. Hippocrates gave the name ‘tenon’ [τένων] to the nerves as a whole, root of our ‘tendon,’ the band of dense fibrous tissue forming the termination of a muscle by which it is attached to a bone or other part. Τένων is from τείνω which means ‘to stretch.’

If Pythagoras saw neurons as bonds of the soul, others rejected its relation to the soul and to true knowledge, perhaps most notably in Plato’s *Phaedo* where Socrates describes his intellectual training under Anaxagoras. Initially drawn to Anaxagoras’s theory that νοῦς was the cause of all things, Socrates believed this meant one should understand ‘in whatever way it is better for each one to act and be acted [πάσχειν ἢ ποιεῖν] upon by these motions that they undergo.’<sup>401</sup> Anaxagoras would demonstrate, for example, that the earth was flat and round because that was the best way for it to be. Socrates hoped Anaxagoras would go on to teach the common good for all but his hope was dashed as, actually, Anaxagoras made no use of νοῦς but listed causes like air, ether, water and many other ‘strange things’ which

seemed to me much like saying that Socrates’s actions are all due to his mind, and then in trying to tell the causes of everything I do, to say that the reason that I am sitting here is because my body consists of bones and sinews [ἐξ ὀστέων καὶ νεύρων], because the bones are hard and are separated by joints, that the sinews are such as to contract and relax, that they surround the bones along with flesh and skin which hold them together, then as the bones are hanging in their sockets, the relaxation and contraction of the sinews enable me to bend my limbs, and that is the cause of my sitting here with my limbs bent.<sup>402</sup>

But the problem with positing bones and sinews as the true cause is that it confuses the ‘real cause’ with ‘the thing without which the cause could never be a cause.’<sup>403</sup> For it is right to say I could not do what I decided to do without them but it is incorrect to say they are the

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<sup>400</sup> Hippocrates, *Sacred Disease*, XVII. 1 (174-5); XIX. 1 (178-79).

<sup>401</sup> Plato, *Phaedo*, 98a.

<sup>402</sup> Plato, *Phaedo*, 99a-b.

<sup>403</sup> *Ibid.*, 99b.

cause of what I do. Socrates's 'true cause,' however, must be external to the things which enable the cause to be the cause and will be found by investigating the truth of things by words and the assumption of the existence of the Forms, of things-in-themselves like the Good. Already the problem of agency and causation, whether bindings of the soul or bindings of the Good, who or what causes neurons to relax and contract? In answer, a method is required to extract an agent from this 'binding-without-agent.' This agent will then need to be purely active (as Plato's forms or Aristotle's unmoved mover) to avoid infinite regress. The underlying problem is that any binding, such as those of bones and sinews, can only be conceived using active and passive.

### **HIPPOCRATES'S SEPARATION OF PHILOSOPHY AND MEDICINE**

Hippocrates rejects the intrusion of philosophy into medicine:

Certain physicians and philosophers assert that nobody can know medicine who is ignorant what a man is; he who would treat patients properly must, they say, learn this. But the question they raise is one for philosophy; it is the province of those who, like Empedocles, have written on natural science, what man is from the beginning, how he came into being at the first, and from what elements he was originally constructed. But my view is, first, that all that philosophers or physicians have said or written on natural science no more pertains to medicine than to painting.<sup>404</sup>

Hippocrates considered medicine more similar to other fields like politics and navigation. The art of the doctor (ὁ ἰατρός) avoiding disease was compared with the art of the navigator (ὁ κυβερνήτης) avoiding shipwreck:

most physicians seem to me to be in the same case as bad pilots; the mistakes of the latter are unnoticed so long as they are, steering in a calm, but, when a great storm overtakes them with a violent gale, all men realise clearly then that it is their ignorance and blundering which have lost the ship. So also when bad physicians, who comprise the great majority, treat men who are suffering from no serious complaint, so that the greatest blunders would not affect them seriously [...] they are not shown up in their true colours to laymen if their errors are confined to such cases; but when they meet with a severe, violent and dangerous illness, then it is that their errors and want of skill are manifest to all.<sup>405</sup>

Like the sea, disease was said to be ποικίλος, changeable and unstable, and so the doctor must consider all the circumstances attending the disease to inform their judgements:

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<sup>404</sup> Hippocrates, *Ancient Medicine*, XX.1 (52-53).

<sup>405</sup> Hippocrates, *Ancient Medicine*, IX.22 (28-29).

from the common nature of all and the particular nature of the individual, from the disease, the patient, the regimen prescribed and the prescriber [...]; from the constitution, both as a whole and with respect to the parts, of the weather and of each region; from the custom, mode of life, practices and ages of each patient; from talk, manner, silence, thoughts, sleep or absence of sleep, the nature and time of dreams, pluckings, scratchings, tears; from the exacerbations, stools, urine, sputa, vomit, the antecedents and consequents of each member in the successions of diseases, and the abscessions to a fatal issue or a crisis, sweat, rigor, chill, cough, sneezes, hiccoughs, breathing, belchings, flatulence, silent or noisy, hemorrhages, and hemorrhoids.<sup>406</sup>

He is therefore keen to demolish the ascription of any ‘divine’ or origin to diseases instead trying to understand their natural causes through careful examination of their patients. He writes that people ascribe a divine cause because of inexperience or their ‘wonder at its peculiar character.’<sup>407</sup> Wonder [θαυμάζω] as absence of agent which leads people to posit a divine cause but which Hippocrates, through experience and absence of wonder, is keen to shift to the non-divine.

Hippocrates insists on the importance of the opportune moment in treating patients: ‘if diseases that should be treated early in the day are handled at midday’ then they take ‘a turn for the worse because their treatment was not opportune.’ This ‘turn’ is also central to Hippocrates: the turn, ῥοπή from ῥέπω to incline downwards, sink or fall, is the critical moment, the turning point in the course of a disease when a decisive change, a *crisis* (κρίνω, a separating or discriminating, a judgement or decision) occurs and events are turned and reversed so that the powers of the doctor can win against those of the disease.

Hippocrates’s discourse is a discourse of powers (δύναμις) and we would do well to consider in the question of whether medicine or philosophy was ‘more originary’ whether this concept originally belonged to medicine or philosophy. The discussion of δύναμις is framed in terms of mastery and domination: ‘in cases where we may have the mastery [ἐπικρατεῖν] through the means afforded by a natural constitution or by an art, there we may be craftsmen, but nowhere else.’<sup>408</sup> *Dynamis* was a key concept in Greek philosophy and derives from the verb δύναμαι, to be able to, to be strong enough. In its noun form it comes to mean force or strength, the capacity or ability to do something. This power framed in terms of coupled opposites of a power of ποιεῖν or πάσχειν which will be often translated as a capacity to affect something or to be affected by something. It is from the verb πάσχειν we get the

<sup>406</sup> Ibid., *Epidemics I*, XXIII.20 (180-1).

<sup>407</sup> Ibid., *Sacred Disease*, I.6-7 (138-39).

<sup>408</sup> Ibid., *The Art*, VIII.13 (202-3).

noun πάθος or πάθημα (plural πάθη / πάθηματα) that describe that from which the patient ‘suffers’ or undergoes. The subject of medicine is therefore ‘simply and solely the sufferings [τῶν παθημάτων] of these same ordinary folk when they are sick or in pain.’<sup>409</sup> And a πάθος must be overcome by something stronger but ‘whenever therefore a man suffers [πάθη] from an ill which is too strong for the means at the disposal of medicine, he surely must not even expect that it can be overcome by medicine.’<sup>410</sup>

One way Hippocrates tries to separate medicine from philosophy is by firmly rejecting the method of ὑπόθεσις that Plato expounds in the *Phaedo*. Hippocrates argues this method belongs to those regions where sense-perception fails us, to the celestial and subterranean regions.<sup>411</sup> We thus see again the separation of the sensible and super-sensible, metaphysical and empirical. For Hippocrates, medicine only has ‘bodily sensation’ as measure and its method must concern itself with sense-perception and not the method of ὑπόθεσις that properly belongs to the super-sensible. If πάθος is common to both discourses, sensation [αἴσθησις] is perhaps what separates them.

Medicine therefore needs its own method which, for Hippocrates, will be *prognosis*, literally a ‘knowing before,’ a foreknowledge or prediction which comprises three operations: reflection on the current situation, comparison with similar past cases and concluding from these to predict the development of the diseases. Anticipation, the meeting of dangers in advance, seems not have played as central a part in Hippocrates’s therapy perhaps because the range of treatments available was limited; it was more about implementing regimens to make the patient comfortable and reduce pain as well as removing that part of suffering related to the uncertainty of how the disease will unfold.

But it is insufficient to merely predict the future based on the past, he must also conjecture (τεκμαίρεσθαι), ‘infer from a combination of all the symptoms’<sup>412</sup>. This τεκμαίρεσθαι means to fix by a mark or boundary as well as to judge from signs, to conjecture, hence the similarity to helmsmen navigating, predicting the future of a safe passage, through reading the signs of the stars and the sea, marks or points as pathmarks on a journey. Also required in this conjecture is ‘some kind of measure’ which will be bodily sensation:

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<sup>409</sup> Ibid., *Ancient Medicine*, II.15 (14-15).

<sup>410</sup> Ibid., VIII.16 (202-5).

<sup>411</sup> Ibid., *Ancient Medicine*, I.

<sup>412</sup> Ibid., *Prognostic*, XXIV (52-53).

no measure, neither number nor weight, by reference to which knowledge can be made exact [ἀκριβές], can be found except bodily feeling [τοῦ σώματος τὴν αἴσθησιν]. Wherefore it is laborious to make knowledge so exact that only small mistakes are made here and there. And that physician who makes only small mistakes would win my hearty praise. Perfectly exact truth is but rarely to be seen.<sup>413</sup>

Reinforcing the separation between philosophy and medicine, Plato condemns this inexact form of knowledge. In the *Philebus* Plato distinguishes between achievements based on uncertain and certain knowledge: key to true wisdom (*sophia*) is the very counting, measuring and weighing medicine lacks; if we were to remove these from the arts and crafts all that remains would be

to conjecture and to drill the perceptions [αἴσθησις] by practice and experience, with the additional use of the powers of guessing [στοχαστικός], which are commonly called arts and acquire their efficacy by practice and toil.<sup>414</sup>

Yet Aristotle will occupy a place between Plato and Hippocrates, showing how medicine and philosophy overlap but how one must be attentive to the differences in method. At the conclusion of *On Respiration*, Aristotle writes:

As for health and disease it is the business not only of the physician but also of the natural philosopher to discuss their causes up to a point. But the way in which these two classes of inquirers differ and consider different problems must not escape us, since the facts prove that up to a point their activities have the same scope; for those physicians who have subtle and inquiring minds have something to say about natural science, and claim to derive their principles therefrom, and the most accomplished of those who deal with natural science tend to conclude with medical principles.<sup>415</sup>

#### GALEN'S RECONCILIATION

The next major figure in our roots of neuroscience is Galen (129 AD – c. 200/c. 216) who sought not to separate but reconcile medicine and philosophy by demonstrating how empirical anatomical evidence could inform philosophy and vice versa. It is also with Galen that the centrality of the brain and the nerves which emerge from it becomes further consolidated. Galen would, through anatomical dissections of animals trace all nerves back to their source in the brain. In this he disagreed with his otherwise beloved Aristotle who

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<sup>413</sup> Ibid., *Ancient Medicine*, IX.16 (26-27).

<sup>414</sup> Plato, *Philebus*, 55e-56a.

<sup>415</sup> Aristotle, *Respiration*, 480b23-32.

believed it was the heart because, ‘not all the instruments of the senses extend to the ear.’

Galen responds incredulously:

Aristotle! What a thing for you to say! Does not a nerve of considerable size along with the membranes themselves enter each ear? Does not a portion of the encephalon much larger than that proceeding to the ears come to each side of the nose?<sup>416</sup>

Anatomy falsifies Aristotle’s claims: Galen also observed that when the beating heart of an animal was held with tongs, the animal is observed to suffer no impairment of sensory or voluntary movement: ‘when the heart is thus separated off, only the movement of the arteries is impaired, and the animal is not otherwise affected.’<sup>417</sup> The heart cannot therefore be the source of agency. The evidence of anatomy, Galen thought, could enable medicine and philosophy to interact with each other to mutual benefit.

Whilst visible evidence refuted Aristotle, it could also support arguments like Plato’s claim for the tripartite division of the soul.<sup>418</sup> In his work *On the Doctrines of Hippocrates and Plato*, Galen argues that Plato and Hippocrates agreed in their views on the powers (δύναμις) which govern us and whether they have their source in the heart alone as Aristotle and Theophrastus believed, or whether it is better to posit three sources for them as Hippocrates and Plato proposed. Galen’s answer will be that the brain, heart and liver are the sources of the powers and that ‘the seat of the soul’s governing part is enclosed in the brain, that of its spirited part in the heart, and that of its desiderative part in the liver.’<sup>419</sup>

But there is a mutual influence because it is not purely through empirical observation that Galen decides on the rightness of a philosophical view, what he observes is heavily influenced by philosophical categories. As we will see, perception is not a passive reception of sense-data, but an active interpretation influenced by the conceptual apparatus held. The main conceptual schema seems to be that of powers of active/passive, of acting and being acted on. Galen makes numerous references to this opposition, favouring ἔργα for the ‘active’ side whilst consistently using πάθη for the ‘passive’:

And by the verses he [Chrysippus] quoted he also indicated adequately the actions and affections of the powers [τὰ τῶν δυνάμεων ἔργα τε καὶ πάθη].<sup>420</sup>

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<sup>416</sup> Galen, *Usefulness*, 1: 391.

<sup>417</sup> Ibid., *Hippocrates and Plato*, 1: 81.

<sup>418</sup> Ibid., *Usefulness*, 1: 398.

<sup>419</sup> Ibid. *Hippocrates and Plato*, 1: 115.

<sup>420</sup> Ibid., 1: 237.

This pairing establishes the brain as source:

In Substance the encephalon is very like the nerves, of which it was meant to be the source, except that it is softer, and this was proper for a part that was to receive all sensations, form all images, and apprehend all ideas. For a substance easily altered is most suitable for such actions and affections [εργοις τε και παθημασιν] and a soft substance is always more easily altered than one that is harder.<sup>421</sup>

Galen will also link the active/passive to the master/slave: ‘for the liver appears not as servant [ύπηρέτης] who prepares suitable material for his master [ήγουμένω], but as the master himself, who has the authority to distribute the material (as he pleases).’<sup>422</sup>

The influence of philosophy on observation is also evident from Galen’s method. He writes that we must first state the definition of the essence of each thing under investigation to use as guide for the particulars and so ‘only one argument was formulated scientifically’: ‘where the beginning of the nerves is, there is also the governing part of the soul.’<sup>423</sup> This method is based on Aristotle’s teaching that we should look to ‘the action and use [την ενέργειαν και χρείαν] of every organ [όργανον], not to its structure, when we investigate its “being.”’ So, if we were to ask what is ‘being’ for the eye, we would say it is an organ of sight instead of describing its structure as ‘moist bodies and tunics and membranes and muscles, so many in number, of such and such kinds, and arranged in such and such a way.’ What distinguishes each part of the human body is the ‘actions and uses’ of each part.<sup>424</sup> Galen therefore identifies the beginning, the origin, with the governing and active already implying a strict linear cause/effect paradigm that is aligned with the master/slave, active/passive:

If, therefore, we are to investigate methodically the number and kinds of faculties, we must begin with the effects [των έργων]; for each of these effects comes from a certain activity [ύπό τινος ενεργείας], and each of these again is preceded by a cause.<sup>425</sup>

Galen provides a helpful definition of the term action:

Now, of course, I mean by an effect [έργον] that which has already come into existence and has been completed by the activity [ύπό τής ενεργείας] of these faculties—for example, blood, flesh, or nerve. And activity [ενέργειαν] is the name I

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<sup>421</sup> Ibid., *Usefulness*, 398.

<sup>422</sup> Ibid., *Hippocrates and Plato*, 2: 385.

<sup>423</sup> Ibid., 1: 67.

<sup>424</sup> Ibid. 1: 93.

<sup>425</sup> Galen, *Natural Faculties*, I.iv.12, 16-17.

give to the active change or motion [τὴν δραστικὴν κίνησιν], and the cause of this I call a faculty [δύναμιν].<sup>426</sup>

Passion (for which Galen uses πάθημα or πάθος) is then defined as that which prevents activity, differentiated from the ‘active’ by the difference between voluntary and involuntary, passions as circumstances beyond one’s control. For example, ‘I call unforced the inhalation of animals in good health and engaged in no violent movement, and I call forced that which occurs in certain affections (πάθεισι) and in violent exercises.’<sup>427</sup>

But Galen goes on to differentiate *two* senses of activity and passivity in answering the question are desire, anger and the like activities (ἐνεργείας) or affections (πάθη). The first sense is that ἐνέργεια is an active motion (κίνησις δραστική) coming from the object itself and πάθος is a motion in one thing that comes from some other thing. The second sense is that ἐνέργεια is motion according to nature (κατὰ φύσιν) and πάθος a motion contrary to nature (παρὰ φύσιν). This ‘according to nature’ means ‘that which occurs through the agency of nature in the first instance’ which in turn means ‘that which nature seeks as an end, and not that which necessarily follows on something else.’ An ‘active’ motion is therefore a motion that ‘has its beginning within the thing moved’ whereas a πάθος is a motion ‘imparted by something else.’<sup>428</sup> This means a single thing may be called both an ἐνέργεια and a πάθος such as an irregular or excessive pulse of the heart for it is active in the sense of it moves of itself but is passive in that it is not in accordance with nature, it being excessive. Or, the case of anger: it is an activity in the first sense but insofar as it is immoderate it is a πάθος in the second sense.

Galen also drew on the active/passive and voluntary/involuntary distinction in relation to movement by the muscles describing those movements not under our will as ‘natural.’ For all voluntary movements, ‘nature has prepared muscles which move the parts by means of tendons inserted into them’ and every part that can be moved voluntarily,

needs at least two muscles set to oppose one another [ἀντιτεταγμένων ἀλλήλοις] and capable the one of extending, the other of flexing it [τοῦ μὲν ἐχτείνειν, τοῦ δὲ κάμπτειν δυναμένου], and I have also shown that no muscle can perform both movements, because it always draws toward it the part to be moved and, being but single itself, has only one position.<sup>429</sup>

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<sup>426</sup> Ibid. I.ii.7, 12-13.

<sup>427</sup> *Hippocrates and Plato*, 1: 122.

<sup>428</sup> Ibid., 2: 363.

<sup>429</sup> Galen, *Usefulness*, 484.

This opposition of stretching and contraction is again aligned with the active/passive:

For, since, each limb, set in motion by muscles – as though by reins – has to divide its activity between two sides, has one muscle tense and relaxed alternately. The contracted muscle pulls toward itself, while the relaxed muscle is pulled along with its part; therefore both muscles move during the performance of each of the two movements for activity consists in tension of the part which moves and not in the action of obeying; and a muscle obeys when it is pulled in a passive state, just like any other part of the limb.<sup>430</sup>

Thus the tensing is that which the relaxing muscle obeys and so tensing is the activity and the obeying the passive state. It is no surprise that the ‘master’ is therefore aligned with the active and the passive with the slave that obeys. This passage is highly illustrative of the general argument that a metaphysics of coupled opposites, governed by the active and passive, has influenced early conceptualisations of the neurological organism. In later chapters, we will see how this conceptualisation is replaced or continues to pervade neurobiology.

Another metaphysical claim that Galen believes can be confirmed through anatomical knowledge is the theory of the soul’s divisions. The difference between Plato and Aristotle, Galen claims, is that while Plato maintains a tripartite division in the soul Aristotle maintains ‘there are powers of a single substance [μᾶς οὐσίας] which stems from the heart.’<sup>431</sup> Division, whether of parts of powers, is necessary again because of an axiom of the active/passive distinction on which he undertakes to build his demonstration:

It is evident that the same thing will not consent to do or undergo [ποιεῖν ἢ πάσχειν] opposite things at the same time [ἄμα] in the same respect, and in relation to the same object.<sup>432</sup>

Similarly, the same thing cannot be at rest and in motion at the same time so if a man was standing in one place but moving his hands, we should not say he is both at rest and in motion but say that one part of him is at rest, another is in motion. So if the soul is to experience actions and passions at the same time, as in the example of anger, then it must also be divided into parts. To be, one needs to be split.

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<sup>430</sup> Galen, *Muscles*, 184.

<sup>431</sup> *Ibid.*, *Hippocrates and Plato*, 2: 501.

<sup>432</sup> *Ibid.*, 2: 603.

### GALEN'S CRITICISM OF THE STOICS

But whilst Galen's book began with the aim of defending Plato's position on the tripartite soul against Aristotle and his cardiocentrism, it is thought that when the first books of the work were published, an 'eminent sophist' accused Galen of not responding sufficiently to the Stoic Chrysippus's argument that the rational part of the soul is in the heart. So Galen added a long refutation of Chrysippus (and Stoicism in general).

Amongst the critiques, Galen criticises Zeno's statement that 'speech passes through the windpipe.' Galen thought this 'passes' meant 'goes out' or 'is sent out' but Zeno denied this meaning. 'Pass' is χωρεῖν, to make room for another, give way or withdraw. When pressed as to what it did mean, however, Zeno was unable to give a definitive answer. Galen then substitutes the less obscure phrasing 'speech *is sent out* through the windpipe.' This should not be interpreted to mean 'if it were passing *from* the brain, it would not pass through the windpipe' because it sophistically hides behind an ambiguity (ἀμφιβολία) of the verbal form in the hope of escaping refutation: it is unsound because it contains 'from' (ἀπό). Chrysippus should have used 'by' or 'out of' (ὑπό or ἔξ) for these are unambiguous unlike 'from' which could mean either 'by' or 'out of.' Speech through the windpipe is sent *by* and *out of* something, 'by the power which sets the container in motion' [ὑπό τινος δ' ὡς δυνάμεως κινούσης τὸ περιέχον]. The choice of this ὑπό is instructive: ὑπό commonly denotes the instrument by which something undergoes something in 'passive' constructions using the verb πάσχειν, to undergo. Galen gives the example of urinating:

it goes out *through* the genitals (τὸ οὖρον ἐξέρχεται μὲν διὰ τοῦ αἰδοίου), and it is sent *out* of a vessel (ἐκπέμπεται δ' ἔξ ἀγγείου) which is the bladder that lies above them (μὲν τῆς ὑπερκειμένης κύστεως) but *by* a power (ὑπό δυνάμεως) that causes the bladder to contract in order to press out the urine.<sup>433</sup>

'From' would be unclear here because it could mean 'out of' or 'by' and so these latter two are substituted. The agent and source must be unambiguous and exact, an insistence no doubt related to Galen's search for the ἀρχή, for the *source* of nerves, blood, etc.

Galen takes issue with Chrysippus for his ambiguity in choice of words: it is as if he were saying 'descending up' or 'talking with a stone' and then justifying it with sophistical reasons<sup>434</sup>. Chrysippus's liking of ambiguity was manifested in his paradoxes and play on

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<sup>433</sup> Ibid., 1: 133.

<sup>434</sup> Ibid., 1: 250.

words. For example, Diogenes Laertius begins his account of Chrysippus with one of his many paradoxes or amphibolies such as:

If you say something, it passes through your lips: now you say wagon, consequently a wagon passes through your lips.<sup>435</sup>

Galen refuses ambiguity: ‘we shouldn’t use words with a meaning other than the usual one.’<sup>436</sup> For all Galen’s quest to rid medicine of ambiguity, later authors would nevertheless judge his writings as tedious, uncongenial, pettifogging, convoluted or full of fanciful metaphors.<sup>437</sup> This quest for clarity and ridding of ambiguity has always been haunted by another intelligence that exploits the ambiguities of language and the inescapability of metaphor particularly in describing the mental realm.

Galen then discusses *what* is sent out: with the heart, blood, with the brain, *pneuma*:

just as the body of the heart, as it alternately dilates and contracts of itself, draws matter in and sends it out again, in the same way the brain, when it chooses to send to some member a portion of the *pneuma* contained in its own ventricles, which we call psychic, executes the motion suitable to this end and thus sends the *pneuma*.<sup>438</sup>

This introduction of *pneuma* is worth remark for it represents another change from Hippocrates. For Hippocrates, *pneuma* meant the wind, the external wind of southerlies, northerlies, etc. (another factor that the doctor has to consider in the identification and prognosis of diseases) whereas *pneuma* internal to the body was considered as breath (φῦσα). Hippocrates nevertheless insisted on the unity of the internal and external *pneuma*, disruptions of which are a cause of disease. But with Galen, the focus and concern will move to the internal movement of this *pneuma* to the neglect of the contingent and unrelated movements of the external winds and severs the unity with them. Galen metaphorizes the search for the origin by describing the distribution of water in a city: ‘you would not pass over its first entrance and find some other point from which to begin the account’<sup>439</sup>. The problem with this metaphor, however, is that this water is lost either in consumption or in flowing out of the city whereas *pneuma* as purely internal, like blood, would *circulate* in a closed circuit.

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<sup>435</sup> Laertius, 7.1.7. Deleuze discusses these paradoxes in *Logic of Sense*.

<sup>436</sup> Galen, *Hippocrates and Plato*, 2: 250.4.

<sup>437</sup> See Kuriyama, *Expressiveness of the Body*, 68-69.

<sup>438</sup> *Ibid.*, *Hippocrates and Plato*, 1: 231.

<sup>439</sup> *Ibid.*, *Hippocrates and Plato*, 2: 395.

Perhaps something is lost in Galen's substitution of ἐξέρχομαι for χωρέω that also reflects this problem of metaphor. Let us examine χωρέω in Stoic usage. It does not appear in Diogenes's section on Chrysippus but does feature in the Zeno chapter and we can note several relevant uses. First, in the sense of becoming:

By this time he had almost become [ἐχώρησεν] a proverb. At all events, 'More temperate than Zeno the philosopher' was a current saying about him.<sup>440</sup>

Second, in the sense of 'pervading all' which links διά ('through') to the name for God:

They give the name Dia (Δία) because all things are due to (διά) him ; Zeus (Ζῆνα) in so far as he is the cause of life (ζῆν) or pervades all life [κεχώρηκεν].<sup>441</sup>

But, most notably, in relation to 'a passing through' that is exemplified by bones and sinews:

The world, in their view, is ordered by reason and providence: so says Chrysippus [...] inasmuch as reason pervades every part of it, just as does the soul in us. Only there is a difference of degree; in some parts there is more of it, in others less. For through some parts it passes [κεχώρηκεν active perfect infinitive of χωρέω] as a 'hold' or containing force [ἔξις], as is the case with our bones and sinews [τῶν ὀστέων καὶ τῶν νεύρων]; while through others it passes as intelligence, as in the ruling part of the soul [ἡγεμονικοῦ].<sup>442</sup>

What passes through or pervades is held to be the ruling principle or power of the world and acts as a principle of cohesion, a 'stable state' [καθ' ἑξιν]. Galen's 'sending out' requires an ἀρχή, a master and a slave, active and passive whereas there could be some alternative to this model in the idea of χωρέω for example as omnipresent circulating *pneuma* differing in relative intensities, in different parts (like blood oxygen levels differentiation (BOLD) in modern day fMRI measures of brain activity – you are using 100% of your brain 100% of the time, just that you are using some parts more than others).

One final point Galen attacks Chrysippus for is his invocation of myth to confirm his theory of cardiocentrism. Chrysippus brings up and dismisses the argument of those who would say the governing part of the soul is in the head through reference to the story of the birth of Athena (who is wisdom and thought) from the head of Zeus. This for Chrysippus 'signifies that the governing part is there.'<sup>443</sup> Whilst versions of the myth differ, the common

<sup>440</sup> Laertius, 7.1.27.

<sup>441</sup> Ibid., 7.1.147.

<sup>442</sup> Ibid., 7.1.139.

<sup>443</sup> Galen, *Hippocrates and Plato*, 1: 225.

important element is that Zeus swallowed Metis who then gave birth to Athena inside Zeus. Chrysippus interprets this as showing if Metis is a kind of ‘wisdom and art in practical matters’ then these arts must be ‘swallowed and stored up within us’ which then gives birth to a daughter similar to its mother.<sup>444</sup> This art would emerge most readily, Chrysippus argues, through the mouth in speech by way of the head and it is in this way that we are to understand this emerging from the head in the myth – wisdom is spoken out of the mouth.

Galen’s alternative interpretation of the myth, using his concept of sent out *pneuma*, is that

wisdom, that is, psychic *pneuma*, after being conceived in the lower parts, reaches full development in the head, especially the top of the head, because that is the location of the brain’s middle and most important ventricle.<sup>445</sup>

Ultimately, however, Galen believes Chrysippus should have abandoned this myth and not wasted his time on explaining their hidden meanings.

#### **SEPARATION OR UNIFICATION: WHAT REMAINS THE SAME**

Early medicine in its development from Hippocrates to Galen thus already attests to the conflictual relation between philosophy and medicine: the Hippocratic writers sought to separate themselves from philosophy whilst with Galen and Aristotle this separation seemed to have softened. Despite this alternation of separation and combination, we can note several fixations that remain relatively constant throughout the alternations over the next two centuries.

First, the move from a concern with external wind and its unification with internal wind to the internalisation of this wind as breath, the spiritualization of *pneuma* from a material external phenomenon to an internal, individual breath that will become the immaterial *spiritus* of Christianity.

Second, the preoccupation with muscle conceived through the opposition of active extension and passive contraction that was introduced sometime between Hippocrates and Galen. The Greek word for muscle, *μύς*, is used only once by Homer and does not appear in Herodotus, Thucydides or Plato. Plato’s *Timaeus*, for example, speaks only of flesh [*σάρξ*] and sinew [*νεῦρον*]. Hippocrates makes sparing reference to muscles for example in defining the heart as a ‘muscle’ where muscle is only defined as ‘of flesh which is not cordlike

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<sup>444</sup> Ibid., 1: 227.

<sup>445</sup> Ibid., 1: 231.

[νεῦρον], but compressed [πλήματι σαρκός].<sup>446</sup> This focus on muscle, whilst seemingly obvious, is actually historically and culturally specific. In his comparative study of Greek and Chinese medicine, Kuriyama notes that the preoccupation with muscle is not apparent in Chinese medicine. He presents two figures of the human body: one from Vesalius's *Fabrica* (1543) and one from Hua Shou's *Shisijing fahui* (1341) and notes also that the Chinese doctors lacked a specific word for muscle.<sup>447</sup> The preoccupation in the West arose in part through the influence of Plato's teleology in the *Timaeus* but also Aristotle's nature as an immanent force shaping biological beings. Whereas flesh was therefore concerned more with how the body *looked*, muscles foreground how the body *worked*.

Third, is the theory of organs which matured after Hippocrates. Body *parts* can be identified in many ways but what makes a part an *organ* is its role in some activity like seeing, talking, walking. Here is Galen:

I call an organ a part of an animal which performs a complete function: for example, the eye [effects] sight, the tongue speech, the legs walking, and in like manner, an artery, a vein and a nerve are both organs and also parts of animals.<sup>448</sup>

Underlying all three is an implicit dependence on a δύναμις of active and passive. This δύναμις is interdependent with the conception of an autonomous will – muscles are therefore required for the active movements of this autonomous agent. This autonomy also marks a shift from Aristotle to Galen as Canguilhem has noted: for Aristotle, 'all movement depends on a primal unmoved mover,' a supernatural act derived from the divine ether that enters the human embryo as soul. Whereas for Galen, movement is 'the expression of an internal spontaneity ... the effect of a force immanent in the organism.'<sup>449</sup> If anatomy and dissection, and the focus on organs arose from a Platonic view of teleology, the shift to Galen's spontaneity marks also a shift from divine agency or origin to those of autonomous agents and their spontaneous movements. The 'passive' is evident with the centrality of πάθος: illness is seen as a πάθος, a hidden or obscure disease whose *symptoms* (from the Greek σύμπτωμα a chance occurrence, literally, a falling together used by Galen)<sup>450</sup> must be read and interpreted by the doctor to establish a path from the external manifestations of the

<sup>446</sup> Hippocrates, *Heart*, IV, 60-61.

<sup>447</sup> Kuriyama, *Expressiveness of the Body*, 8.

<sup>448</sup> Galen, *Method of Medicine*, 47. Translation modified.

<sup>449</sup> Canguilhem, *La Formation*, 16.

<sup>450</sup> e.g. See Galen, *On the Natural Faculties*, I.III where Galen equates symptom with affection [σύμπτωμα καὶ πάθημα], III.IV, III.VIII.

expressive body to its hidden ailment and to effect an alteration in this binding through the active δύνάμις of the doctor and their medications.

This is not to criticise this model of medicine. Perhaps the active/passive is necessary for the effecting of medical therapies and cures and medicine of course has made great advances in the treatment and understanding of the body and its ailments through it. It aims instead to manifest the conceptual basis underpinning much of the science from Galen to at least the nineteenth century (the subject of the next chapter) and to discuss alternatives through East-West comparisons to demonstrate whilst the body may or may not be a universal structure, everywhere the same, its understanding and therapy is nevertheless strongly enmeshed with the way in which it is conceptualised. And if concepts are strongly based on the necessity of ‘scientific’ language, the removal of ambiguity and rejection of the metaphorical for the literal, then science as long as it uses language will be haunted by something other, another intelligence, as manifested in the ambiguities and amphibolies of Chrysippus. But also, affirming Galen, that through empirical observation, biology itself can affect those conceptions. In short, it is to manifest a reciprocity between philosophy and biology where neither is master nor slave to the other. Furthermore, that there might be an ‘other’ science demonstrated in the different attitudes toward philosophy of Hippocrates and Galen. Whilst Hippocrates seems to affirm a practice of uncertain knowledge, more akin to the helmsman and sophist, separate from philosophy, Galen, through Plato, condemns these forms of knowledge replacing it with the Platonic truth and search for unambiguous language that would dominate philosophy as much as neuroscience for the next two millennia. We will see in the next chapters how this ‘other neurosciences’ continues to haunt the Galenic model.



## 6

## 19TH CENTURY NEUROSCIENCE

Galen's influence on medicine was extensive and medical models in the West typically continued with similar ideas until the eighteenth and nineteenth centuries. This chapter will therefore continue the investigation into the roots of contemporary neuroscience by examining this period when the new discipline of neurology overturned Galenic models, emerged from a more general 'medicine' and attempted to separate itself from overtly philosophical foundations to ones from the newly emerging fields of physics. I discuss four main aspects to this: first, how the discovery of reflex actions through the spinal cord that did not pass through the brain challenged Galen's notion of the hegemonic brain sending and receiving all nerve impulses; second, cell theory and its application to the nervous system that gave a new understanding of 'neuron' not as sinews or tendons but as a 'nerve-cell' of axons, cell body and dendrites; third, the transference of the problem of what flows between neurons from a spiritualised *pneuma* to physical principles of energy; finally, how πάθος as linking the medical and philosophical is replaced by the concept affect (from the German *Affekt* and its translation as emotion) to link the physical and the physiological.

Despite the attempt to extricate themselves from philosophy, philosophy continued to influence this emerging science via the intellectual climate of 19th century philosophy. Specifically, in Germany the influence of a Romantic philosophy of nature (mainly Schelling) produced a belief in and search for the synthesis and unity of general laws which believed the human organism 'could not be understood in isolation, but that its relations to the rest of the organic world and even with inorganic nature must be discovered if knowledge was to advance.'<sup>451</sup> In France, a transcendental anatomy dominated led by Étienne Hilaire which privileged *a priori* reasoning that transcended sense experience. Meanwhile, Britain saw an eclectic mix of both. The main differences were in how much pure speculation there was.

Yet these philosophies were of course derived from the metaphysics of Greek philosophy that had influenced Galen but any δύνάμις of active/passive now gets transferred onto the physical notion of energy, its constancy and transformations. But the aim of this chapter will

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<sup>451</sup> Clarke and Jacyna, *Origins of Neuroscientific Concepts*, 1-2.

also be to demonstrate how early neurobiology yielded an implicit challenge to its inherited conceptual system through the resistance of the biological to fit the system imposed on it.

#### **CEREBROSPINAL AXIS DISPLACES CENTRALITY OF THE BRAIN**

First is the challenge to the Galenic model of the brain as sole origin and centre of the nervous system that discoveries of the functions of the spinal cord presented. Microscopic studies of this axis, revealed accumulations of grey matter, named ‘ganglions,’ thought to be particular centres of action. This led the French physician and neurologist Vulpian, for example, to write in 1866:

we believe that the spinal cord is not only, as Galen believed, and as has been reiterated for a great many ages since him, a large nerve gathering together all the nerves of the body in order to conduct them to the brain but that it is at the same time a true nervous centre endowed with very remarkable functions.<sup>452</sup>

The modern nervous system then became viewed more as a unity of multiple centres of autonomous activity rather than a hegemonic brain as source and agent of all action, a view strengthened by the discovery of the autonomy of the spinal cord in reflex actions (actions performed without conscious intention, automatic responses to stimuli like the knee reflex). These reflex actions related to the earlier concept of ‘sympathy’ (Latin *consensus*), an ‘undergoing together’ (συμπάθεια or συμπαθής) invoked in Galen amongst others, which posited a rapport between parts of body to explain involuntary movements such as sneezing or yawning, and especially in organs that were not anatomically connected.<sup>453</sup> This rapport was said to be effected through nerve or blood vessels by, for example, the movement of *pneuma* through what were thought to be hollow fibres (νεῦρον). Many of these would turn out to be reflex actions.

Hall was the first to use the substantive ‘reflex’ in a biological context in a paper of 1833.<sup>454</sup> Reflex was no doubt chosen as it describes a turning point, a turning back on oneself or a reversal. Hall first described the three types of motion well known to physiologists: spontaneous voluntary movements that move in a direct line from cerebrum along spinal marrow and motor nerves to voluntary muscles and do not require the agency of a stimulus; respiration: a spontaneous movement but one which originates in the medulla oblongata (part of the brain stem); finally, involuntary movements which depend on the irritability principle

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<sup>452</sup> Vulpian, *Leçons* (1866), 12. Cited in Clarke and Jacyna, 51.

<sup>453</sup> See Galen, *On the Natural Faculties*, 1.13.39ff.

<sup>454</sup> Hall, ‘On the Reflex Function.’

that requires immediate application of stimulus to neuro-muscular fibre itself. To these, Hall added a fourth: those of reflex actions which are not spontaneous, do not originate in any central part and are not direct in their course. Evidence through anatomy and dissections provided evidence that the impression travels toward and is reflected back by the spinal cord without travelling to the brain.

This therefore challenged the idea of the brain as origin that actively sends out messages. Actions and reactions do not always pass through the brain and parts such as the spinal cord, thought to be mere passive conductors of animal spirits, gained a form of agency. But, in a move that will be observed throughout history, when the agency of one entity is challenged, agency is recuperated by enlarging or transferring the agent rather than challenging the active/passive dichotomy itself. Many, including Hall, still relied on an implicit dualist assumption of an active immaterial mind affecting a passive nervous system so to reconcile this dualism with a decentred brain, people tended to adopt one of two strategies: either they posited the existence of a ‘spinal soul’ or they ascribed ‘mind’ to all organic structures thereby distributing the soul through the whole organism.<sup>455</sup>

#### CELL THEORY AND THE NEW NEURON

The establishment of modern cell theory was driven in part by the influence of Romantic philosophy that sought a unity in nature through seeking an *Urtypus*, or *Urphänomen*. Valentin, for example, proposed that the *Urform* of all tissues was the cell, a theory taken up by Schwann and incorporated into his cell theory of animal life in 1839.<sup>456</sup> With this, biology established a new foundation for itself whereby the unity of living organisms was based, not on essences, but on the common composition of cells.

Cell theory led to the search for cells specific to the nervous system, cells that would, in 1891, be termed ‘neuron’ by Waldeyer (in an article summarising results of existing research, particularly that of Ramón y Cajal). Waldeyer, in choosing ‘neuron’ transformed the Greek νεῦρον meaning sinew or rope (as in Galen’s visible ‘ropes’ extending from the brain to all parts of the body) to the nerve cell itself, visible under microscopy. Waldeyer described the new ‘neuron’ thus:

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<sup>455</sup> For instance, Eduard Pfluger argued the spinal cord was possessed conscious and was sentient or Friedrich Goltz in 1869 argued that a decerebrated frog could still possess ‘soul faculties.’ Cited in Bennett and Hacker, ‘The motor system in neuroscience,’ 25.

<sup>456</sup> Schwann, *Mikroskopische Untersuchungen*.

a nerve element, a nerve entity, or ‘neuron,’ as I propose to call it, consists of the following pieces: – (a) a nerve cell, (b) the nerve process, (c) its collaterals, and (d) the end-branching.<sup>457</sup>

Nervous influence continued to take the form of a kind of movement along ‘ropes’: something flowed from sensory input to neuron and from neuron to motor fibres, centrifugal and centripetal flows. Centrifugal fibres would be called axons and centripetal dendrites. But cells were not conceived as merely passive conductors of the nervous system, they had an agency of their own in the form of an ‘action potential.’ Gratiolet thus conceived neurons as so many:

intermediaries completing the nervous arcs; but they [cells] are not mere conductors of stimulations: each of them is a centre for the generation of impulses. In effect, the sensory fibre acts upon the central cell and modifies it in such a manner as to provide in the cell a particular activity – a hidden property that sleeps but which a stimulation renders manifest.<sup>458</sup>

The question then arose of how nerve cells made contact with each other for communication and transmission. Disagreement over this led to a significant debate in the history of neuroscience: between those who felt the cell formed a network connecting all cells (the ‘reticular’ theory proposed by, among others, Gerlach and Golgi) and those who believed contiguous but not continuous (the ‘neuronists’).<sup>459</sup> It was only after the development of electron microscopy post-1945 that the neuron was finally confirmed to be a distinct and separate entity and that there was no network.

One of the difficulties the doctrine posed was how flows happen from cell to cell if cells merely touch but do not connect, i.e. if there are gaps between cells. The impulses through the axon must somehow bear on the dendrites of another cell. How did energy flow across these gaps? And did this lack of continuity between the axon of one cell and dendrite of another offer ‘an opportunity for some change in the nature of the nervous influence as it passes from the one cell to the other’?<sup>460</sup>

A major advance in answering this question was provided when C.S. Sherrington named this gapped contact a ‘synapse’ in Foster’s *A Textbook of Physiology* (1897):

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<sup>457</sup> Waldeyer, ‘Über einige neuere Forschungen,’ 569.

<sup>458</sup> Leuret and Gratiolet, *Anatomie Comparée*, Volume 2 (1857): 3-4 (by Gratiolet). Cited in Clarke and Jacyna, 96.

<sup>459</sup> Clarke and Jacyna, *Origins of Neuroscientific Concepts*, 99.

<sup>460</sup> *Ibid.*, 930.

So far as our present knowledge goes we are led to think that the tip of a twig of the [axon's] arborescence is not continuous with but merely in contact with the substance of the dendrite or cell body on which it impinges. Such a special connection of one nerve cell with another might be called a synapsis.<sup>461</sup>

Sherrington revealed his reasons for choosing 'synapse' in correspondence with Edward Sharpey-Schäfer about Sherrington's contribution to Sharpey-Schäfer's *Textbook of Physiology* (1900). In these letters, Sherrington expresses the care required when naming new discoveries: they should be clear, brief and avoid periphrasis; in short we should avoid 'committing barbarisms' such as impossible adjectival forms or prefixes and affixes with false signification.<sup>462</sup>

They considered 'junction' from the Latin root *jungere*, 'to join or unite together, connect, attach' but this presented three difficulties: it implied a union of two into one which suggested a continuum rather than a contiguity, it could not suggest making one thing out of more than two, and implied 'the things joined are *passive* agents in the act of union, i.e. that the combination is made of them but not at all by them.'<sup>463</sup> Sherrington then considered the Greek σύνδεσμος, meaning a co-binding or binding together, but eventually settled on synapse after advice a Cambridge Euripidean scholar and Metaphysician.<sup>464</sup> Synapse is from the Greek συνάπτω, a composition of σύν- 'with' or 'together' and ἄπτω, to fasten or bind, to lay hold of or touch.

Sherrington provides three main justifications for his choice. First, that it offers a 'better adjectival form.' Second, that it 'remotely' suggests (Sherrington does not specify how) James's 'law of forward direction.' This law proposed all paths through the nervous system are paths of motor or sensory discharge, through paths of least resistance, that '*all run one way, that is from 'sensory' cells into 'motor' cells and from motor cells into muscles, without ever taking the reverse direction.*'<sup>465</sup> But the main advantage was the connotation of activity inherent in the term. Sherrington was keen to select a word that would not suggest a mere passive union – such as 'the neurons *are combined*' (presumably by some other *active* process of binding or joining) – but rather that the neurons themselves *combine* through an

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<sup>461</sup> Foster, M. and C.S. Sherrington, *Textbook of Physiology*, 929.

<sup>462</sup> Sherrington to Schäfer, 27 Nov 1897 (ESS/B.21/8). Sharpey-Schäfer Papers.

<sup>463</sup> Ibid., Nov 27th, 1897 (ESS/B.21/8), emphasis in original.

<sup>464</sup> Sherrington to Fulton, 25th December 1937. In: Swazey, *Reflexes*, 76.

<sup>465</sup> James, *Principles*, 2: 581.

active process of touching together: ‘Synapse, which implies a catching on, as e.g., by one wrestler of another—is really much closer to the mark.’<sup>466</sup>

Sherrington was perhaps led to this insistence on an *active* touching-together by the contemporary idea that nerve endings were capable of movement, of extension or retraction. This view arose partly from the dominance of comparative anatomy and analogies between organisms, a post-Darwinian craze which sought to explain structures higher on the evolutionary scale through analogy to those lower down. In the case of neurons, analogies were drawn with unicellular organisms’ movements, particularly the pseudopods of amoebas, which suggested contact between neurons could be increased or decreased by movements of retraction or extension because of ‘a veritable amoeboid property of their protoplasm.’<sup>467</sup> But this view largely faded into oblivion around 1900 due to lack of any experimental evidence.

Sherrington would have been aware of this theory’s decline and it is interesting to speculate its influence on the different reasons he later gave for his choice of ‘synapse’ in correspondence with John Fulton in 1937. Sherrington now seems to suggest *syndesmos* would have been a better choice after all:

‘Synapsis’ strictly means a *process* of contact—i.e. a proceeding or *act* of contact, rather than a *thing* which enables contact i.e. an *instrument* of contact. ‘Syndesm’ would not have had that defect, i.e. it would have meant a ‘bond.’<sup>468</sup>

The criticism that *junction* implies the neurons joined are passive agents in an act of union also no longer seems to trouble Sherrington. Both terms seem to convey the sense of an *instrument* of contact, something which enables contact and the task is to describe this something which *enables* contact rather than two things which make contact. Perhaps the search is for a concept that would describe a process or entity simultaneously active and passive or a binding that is apart from activity or passivity. But the name synapse held: biology resists the concept science imposes on it yet it proves too difficult to change scientific terminology.

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<sup>466</sup> Sherrington to Schäfer., 1st Dec. 1897 (PP/ESS/B21/9).

<sup>467</sup> Duval, ‘Hypothèse,’ 75.

<sup>468</sup> Sherrington to Fulton, 25th December 1937. In Swazey, *Reflexes* 76.

**FROM PNEUMA TO ENERGY***Conservation of force*

Not only *how* flows occur, the question also arises of *what* flowed through these neuronal gapped contacts and the answer of ‘nervous energy’ will be another key foundation of modern neuroscience. This concept again arose from a philosophical underpinning, mainly Schelling’s *Naturphilosophie* which argued for a *potentia* inherent in all matter, a *potentia* as potentiality, a capacity or ability, we can link back to Greek philosophy due to its choice to translate δύναμις in the Aristotelian distinction of δύναμις/ἐνέργεια. But δύναμις will also be translated as *potestas* to separate the two meanings of δύναμις: potentiality as the ‘not yet,’ the action potential inherent in things (*potentia*) and the power that results from the activated action (*potestas*). Again, the search is for a unifying principle and an *Urkraft* was therefore sought in nature, a force or energy that manifested itself in different forms and to which all its phenomena could ultimately be attributed.

Key to understanding this development was the 19th century attempt to extend principles from physics to physiology. The pursuit of this experimental science had produced a conflict with vitalism that, in response to a mechanistic view of organisms, had proposed some extra ‘vital force’ that differentiated the animate from the inanimate. This vital force had its roots, at least terminologically, in the *vis viva*, the ‘living force,’ a key concept in the philosophy of Leibniz who proposed it as the active source of movement. Whilst the physical viewpoint could focus on the *vis*, the vitalist tended to emphasise the *vita*, the living. But in the early 19th century, some argued these ‘vital forces’ were purely physical forces. The challenge for science was then to account for this force in physical terms and, in so doing, banish vitalism.

A milestone in this attempt was Helmholtz’s law of the conservation of force proposed in a paper of 1847.<sup>469</sup> While such a principle had already been expounded in mechanics and thermodynamics, Helmholtz sought to extend this ‘to all branches of physics,’ to chemical forces, electricity and magnetism.<sup>470</sup> Helmholtz began from two principles (that will ultimately be shown to be the same): that ‘it is impossible to obtain an unlimited amount of force capable of doing work as the result of any combination whatsoever of natural objects’ and that ‘actions in nature are reducible to forces of attraction and repulsion, the intensity of the forces depending solely upon the distances between the points involved.’ Helmholtz

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<sup>469</sup> Helmholtz, ‘The Conservation of Force’ in *Selected Writings*.

<sup>470</sup> *Ibid.*, 7.

demonstrated their identity and, in so doing, proposed the principle of the conservation of force defined as:

In all cases of the motion of free material points under the influence of their attracting and repelling forces, the intensity of which depends solely upon distance, the loss in tensional force is always equal to the gain in *vis viva*, and the gain in the former is always equal to the loss in the latter. Hence, the sum of the tensional forces and *vires virae* is always constant.<sup>471</sup>

Helmholtz here differentiated between *vis viva*, the mass times velocity squared ( $mv^2$ ) (now called kinetic energy), and the sum of the forces of tension expressed differentially (as Helmholtz deals not with magnitudes *per se*, but with differences between initial and final states such as the raising of a weight to a certain height and its falling from that height). In this example, the work expended in raising the weight is equal to (in opposite sign) the energy produced in its falling. As equal but opposite signs resolve to zero, their sum does not vary but remains constant. Helmholtz calls this sum force (*Kraft*).

Helmholtz also reflects in this essay on the purpose of science and its relation to philosophy. He argues the task of physical sciences is to discover laws according to the law of causality, i.e. that every change has a sufficient cause:

the principle of causality is, indeed, nothing but the presupposition of the lawful regularity or uniformity of all natural phenomena. A law considered as an objective power, we call *force*. *Cause*, according to its original meaning, is the unchanging existent (that is, matter) which lies behind the changes of phenomena; the law of its effects is force.<sup>472</sup>

To find these laws, science makes two abstractions. First the abstraction that matter is inert. Only quantitative (mass) and spatial distinctions are made of matter, not qualitative, and when we speak of different kinds of matter, we really mean quantitative differences in the *forces* of matter as ‘matter in itself can undergo no change other than spatial one, that is, a movement.’<sup>473</sup> This sense of ‘inertia’ from the Latin meaning ‘want of art or skill’ or ‘inactivity’ was introduced into physics by Kepler and taken up by Newton. Whilst Newton tried to avoid metaphysical arguments, his explanation of causality led to a dualistic ontology of matter and force and where an essential passivity was ascribed to matter. This essential passivity would be termed ‘force of inertia’ [*vis inertiae*] which Newton describes as a

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<sup>471</sup> Ibid., 14.

<sup>472</sup> Ibid., 49.

<sup>473</sup> Ibid., 4.

‘passive principle by which bodies persist in their motion or rest, receive Motion in proportion to the Force impressing it, and resist as much as they are resisted.’<sup>474</sup> Passive principles are opposed to active principles such as gravity and ‘passive’ thus gains its sense of ‘Not acting, working, or operating on anything else; not exerting force or influence; inert, quiescent.’<sup>475</sup> But also, through its tendency to persist in motion, it acquires a kind of moving passivity: passivity is not always static. We will see this moving passivity in modern neurobiology in their concept of ‘passive transports.’

The second abstraction is ‘*the capacity to produce effects*’ that derives from the fact we only know objects through their effect on our sense organs. In this, Helmholtz seems to be suggesting that it is objects acted on, the ‘passions,’ that can be productively analysed to deduce the actions but not the reverse, i.e. we cannot deduce passions from actions, we cannot know the effect of an action in advance of that action unless we have first experienced it as a passion:

The necessity for analysing the forces of bodies into forces of material points can, for the masses *upon* which forces act, be derived from the principle of the complete comprehensibility of nature, since complete knowledge of movement is lacking if the motion of each individual material point cannot be given. There does not seem to me, however, to be an equal necessity for such analysis for the masses *from* which the forces arise.<sup>476</sup>

#### *Shift from vital force to energy*

Helmholtz would later change the wording of this principle: *Kraft* was changed to *Energie* and *Erhaltung* to *Konstanz*. ‘Energy’ was first used in physics by William Thomson (later Lord Kelvin) in 1849 stating ‘nothing can be lost in the operations of nature – no energy can be destroyed.’<sup>477</sup> He divided energy into statical (weights at height, an electrified body, quantity of fuel, etc.) and dynamical (masses of matter in motion). The term was then further developed by Rankine in a paper of 1853:

the term *energy* is used to comprehend every affection of substances which constitutes or is commensurable with a power of producing change in opposition to resistance, and includes ordinary motion and mechanical power, chemical action, heat, light,

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<sup>474</sup> Newton, *Opticks*, 397-399

<sup>475</sup> OED, s.v. ‘passive (v)’.

<sup>476</sup> Helmholtz, ‘The Conservation of Force,’ 50.

<sup>477</sup> Thomson, ‘Account of Carnot’s Theory,’ 118.

electricity, magnetism, and all other powers, known or unknown, which are convertible or commensurable with these.<sup>478</sup>

Rankine replaced Thomson's statical/dynamical with potential/actual energy and defined the 'law of the conservation of energy' as stating 'the sum of the actual [kinetic] and potential energies in the universe is unchangeable.' (In turn, the potential/actual would be replaced by the modern terms potential/kinetic beginning with Thomson and Tait's *Treatise on Natural Philosophy* (1867)). Helmholtz reviewed Rankine's paper and stated his terms 'living force' [*lebendige Kraft*] and 'tensional force' [*Spannkraft*] were synonymous with Rankine's terms 'actual [kinetic]' and 'potential energy.'<sup>479</sup>

In 1861, Helmholtz argued we should adopt the expression 'constancy of energy' rather than 'conservation of force' because the law:

does not mean that the intensity of the natural forces is constant; but it relates more to the whole amount of power which can be gained by a natural process, and by which a certain amount of work can be done.<sup>480</sup>

Thus we see how the active and passive continues to structure the conceptions proposed where *potentia* then force then energy takes the place of δύναμις still split into that which undergoes changes (passive) with active force, or actual (kinetic) and potential energy which, in their togetherness, must sum to zero so that there is a togetherness of equal but opposite quantities.

#### *Extension of theory to the physiological*

In 1861, Helmholtz tried to extend this physical law to the physiological. Helmholtz noted that Mayer, mainly a physician, gave the first exposition of the general principle in 1842 and Helmholtz wonders why physiology could give rise to such a law speculating that it may be because some had thought the body of every living animal was a perpetual motion machine wherein motive power was produced without any external mechanical force. But this neglected the fact that any force of nature is capable of being transformed, or of bringing into action, every other force. They did not consider that nutrition could be such a force that could be transformed into motion. If you do, however, 'if you compare the living body with a steam engine, then you have the completest analogy.'<sup>481</sup> Animals take in food (flammable

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<sup>478</sup> Rankine, 'Transformation of energy,' 106.

<sup>479</sup> Helmholtz (1853), cited in Harman *Metaphysics and Natural History*, 113.

<sup>480</sup> Helmholtz, 'Application of Conservation of Force,' in *Selected Writings* 109.

<sup>481</sup> *Ibid.*, 116.

substances of fat, starch and sugar) and air just as steam engines take in coal and air and both convert this to motion. Further experimentation was required to understand the conservation of force in living bodies but the principle of conservation of force, Helmholtz believed, would ‘probably’ hold good for living bodies as for inanimate ones.<sup>482</sup>

Helmholtz drew the main implication of this extension: it rang the death knell for vitalism. For if vitalism held there was a ‘vital principle,’ one principal agent which either initiates or suspends the physical forces in the living body, the conservation of force only holds in cases where the same direction and intensity of forces in action if the circumstances under which they act are the same, so this cannot mean any principle, vital or otherwise, can apply or suspend the forces of the body.

With this extension, biology draws nearer to physics and chemistry, ostensibly away from philosophy, and the radical separation between the animate and inanimate diminishes as all are composed of molecules and subject to physical forces. This means the search for the causes of processes in the living body will be equated with the search for causes in the inanimate physical or chemical world – the idea of a soul or vital principle, of hollow fibres would be discarded and the processes between neurons and the transmission of energy instead sought in electrical and chemical processes.

### ΠΑΘΟΣ TO AFFECT: LINKING THE PHYSICAL AND PHYSIOLOGICAL

Where does affect fit into this understanding of the nervous organism as flows of a constant energy between neurons and synapses? And, if the Greek term *πάθος* served to connect the philosophy and medicine of Galen’s time, what has become of this concept?

I argue that *πάθος*, through its translation into the Latin *affectus* and on into the German *Affekt* and English *affect*, continues to offer a unifying concept but this time to unify the physical and the physiological and/or psychological. For this I will discuss two main authors who represent different approaches to the problem: Freud who, in his early training as a neurologist, wrote but did not publish *Project for a Scientific Psychology* (1895) that sought to unite his early research on neuroses with a quantitative approach to nervous force and, secondly, William James who in *What is an Emotion?* (1884) questioned why the physiological advances of recent years had ignored the question of the emotions and strove for a theory that would unite the physiological and psychological. Each in their different ways would also represent a split in the study of emotion: whilst one led to psychoanalysis,

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<sup>482</sup> Ibid., 119-120.

the other led to (American) psychology. Yet in both authors, the concepts of affect plays a central role: in Freud *Affekt*, in James ‘emotion’ as translation of *Affekt*.

The term *Affekt* was borrowed from German psychology. For example, Wundt dedicates a section of his *Grundriss der Psychologie* of 1896 to *Die Affecte* (translated as ‘Emotions’ in Judd’s English translation of 1896). Wundt distinguishes affect from feeling (*Gefühl*): feeling refers to slower processes of medium intensity whereas affect is a succession of feelings in interconnected processes that has a more intense effect on the subject. But there is no sharp line of demarcation and ‘every feeling [*Gefühl*] of greater intensity passes into an emotion [*Affect*].’<sup>483</sup> Wundt links the processes occurring in an affect not just to the psychical but also to the physical, in the innervation of the heart, blood-vessels, respiratory organs and muscles. In this experimental psychology, its psychophysical measurements thus already conceptualise affect in its difference from feeling by quantitative intensities and affect as a connection of processes that have greater *effect* on the subject. For this sense of affect, James used the term ‘emotion’: ‘we may also feel a general seizure of excitement, which Wundt, Lehmann, and other German writers call an Affect, and which is what I have all along meant by an emotion.’<sup>484</sup>

### *James*

James begins by questioning why the advances in the physiological understanding of the brain limited their explanations to cognitive and volitional aspects and neglected ‘the *aesthetic* sphere of the mind, its longings, its pleasures and pains, and its emotions.’<sup>485</sup> He also asks whether there are separate centres for emotion in the brain or whether emotion results from sensory and motor centres. James will argue for the latter, that emotion is nothing but various combinations of ordinary motor and sensory processes. This derived from his theory of emotion: ‘*bodily changes follow directly the perception of the exciting fact, and that our feeling of the same changes as they occur is the emotion.*’ This reversed the common-sense view that ‘the mental perception of some fact excites the mental affection called the emotion, and that this latter state of mind gives rise to the bodily expression.’<sup>486</sup> For James, reflex circuits are crucial to these bodily changes because emotions have an autonomy:

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<sup>483</sup> Wundt, *Outlines of Psychology*, §13, 186.

<sup>484</sup> James, *Collected Essays*, 358.

<sup>485</sup> James, ‘What is an Emotion?’ 188.

<sup>486</sup> *Ibid.*, 189-90, emphasis in original.

An object falls on a sense-organ and is apperceived by the appropriate cortical centre; or else the latter, excited in some other way, gives rise to an idea of the same object. Quick as a flash, the reflex currents pass down through their pre-ordained channels, alter the condition of muscle, skin and viscus; and these alterations, apperceived like the original object, in as many specific portions of the cortex, combine with it in consciousness and transform it from an object-simply-apprehended into an object-emotionally-felt.<sup>487</sup>

To defend this thesis, James characterises the nervous system as predisposed to react on contact with its environment: ‘the neural machinery is but a hyphen between determinate arrangements of matter outside the body and determinate impulses to inhibition or discharge within its organs.’<sup>488</sup> Emotions, then, are nervous anticipations such as a child being frightened of an elephant or a woman’s delight in seeing a baby in advance of any experience of either.

But what of cultural influences? Most of the objects we feel emotion with are not objects the nervous system could be innately adapted to, they are too new, and many objects are culturally specific. Such an objection, James argues, fails to distinguish the idea of an emotion from the emotion itself and, moreover, once a nervous tendency to ‘discharge’ is established, it may prove useful in many other situations in an environment that originally had little to do with it. This idea of discharge will echo Freud’s view on discharge and its blockage. James writes:

Every perception must lead to *some* nervous result. If this be the normal emotional expression, it soon expends itself, and in the natural course of things a calm succeeds. But if the normal issue be blocked from any cause, the currents may under certain circumstances invade other tracts, and there work different and worse effects.<sup>489</sup>

But for James, examples of such worsening are indignation that is not expressed becoming vengeful brooding or a turning to stone by those who resist crying. Without a concept of the unconscious, James does not go into as much detail on the effect of these blockages that Freud will do with their link to neurosis.

Bodily expression is thus crucial to this view of emotion, but their varieties and combination have not been exhausted even by Darwin’s extensive study which characterised only what James calls the ‘standard emotions’<sup>490</sup>. Each emotion would be as varied as all the

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<sup>487</sup> Ibid., 203.

<sup>488</sup> Ibid., 190.

<sup>489</sup> Ibid., 198.

<sup>490</sup> Ibid., 191. Reference is to Darwin’s *Expression of Emotions*.

possible combinations of differences in bodily parts: the heart, the dilation and constriction of the arteries, the bladder and bowels, mouth glands, throat and liver, all these are affected in emotions and, even in the absence of outward expression, inner changes are ‘felt as a difference of tone or of strain.’<sup>491</sup> All these changes must be *felt* and the sheer number of parts involved thus makes it difficult to reproduce the integral expression of them all. Feeling is also therefore central to James’s conception, this term conveying a sense of indeterminacy and vagueness that is flexible enough to describe the binding of emotion with the idea of the emotion without innate or determined fixity.

James goes on to discuss non-standard emotions, ‘moral, intellectual and aesthetic feelings’ such as a ‘neat’ act of justice or a ‘pretty’ geometrical demonstration. Whilst some argue these are purely cerebral forms of pleasure or displeasure that do not involve the body, James argues only rarely do such cognitive acts not involve the body and, even in such cases, the *absence* of bodily changes are felt that gives the experience a ‘dryness ... paleness, the absence of all glow.’<sup>492</sup> Feeling occurs in the absence of emotion because ‘the bodily sounding-board, vibrating in the one case, is in the other mute.’<sup>493</sup>

### *Freud*

By 1895, Freud had been in private practice for nine years but had earlier trained in neurology and contributed scientific papers on the nervous structure of various organisms. Some authors have even claimed either that his neurological works contributed to the establishment of the neuron doctrine or that he was himself on the verge of discovering it.<sup>494</sup> Freud’s *Project for a Scientific Psychology* written in 1895 was described in a letter to Fliess as a ‘psychology for neurologists,’ an attempt at binding the neurological and the psychological that has also been read as a ‘moment of transition’<sup>495</sup> from one to the other. Freud writes:

I am vexed by two intentions: to discover what form the theory of psychical functioning will take if a quantitative line of approach, a kind of economics of

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<sup>491</sup> Ibid., 192.

<sup>492</sup> Ibid., 202.

<sup>493</sup> Ibid., 202.

<sup>494</sup> See Shepherd, *Foundations of the Neuron Doctrine*, 73-75 for discussion of these claims.

<sup>495</sup> As Solms and Saling call it in their discussion of two neuroscientific articles by Freud: Solms and Saling, *A Moment of Transition*.

nervous force, is introduced into it, and, secondly, to extract from psychopathology a yield for normal psychology.<sup>496</sup>

Freud abandoned the project in 1896 in part because the neurological view could not explain consciousness nor the unconscious and it would remain unpublished in his lifetime (it was only published in German in 1950 and in English in 1954). But certain neurological concepts from this time remain consistent throughout Freud's work and often become transferred onto the psychical. Notably, a principle of constancy (influenced by, but not identical with, Fechner's principle of a tendency to stability derived in turn from Helmholtz's law of conservation of energy), the principle of neuronal inertia (the discharge of excitation by output to the motor systems), the idea of neurons as pseudopods capable of retraction and extension and the idea of a free and bound energy.

Affect (*Affekt*) again plays a central role in the *Project* and takes on many evolving meanings but generally denotes any state, painful or pleasant used mainly in two contexts: as a release or discharge and in the separation of affect and idea.<sup>497</sup> Affect as discharge is linked to the theory of abreaction in early Freud. Every psychical impression, he argued, comes with a certain quota of affect (*Affektbetrag*) which is discharged through associated motoric and psychical activity. In the case of hysterical symptoms, neither of these happen and the affect remains blocked and unconscious manifesting itself in hysterical symptoms. Freud's early view of therapy then involved 'abreacting' this blocked affect by bringing to conscious recall the original event and its accompanying affect and putting this affect into words. The importance of discharge is explained in the *Project* by the principle of neuronal inertia that states 'neurons tend to divest themselves of Q [quantity]' and is based on the concept of reflex action whereby a quantity of excitation received by sensory neurone is discharged through motoric output. Freud defines this constancy in *Beyond the Pleasure Principle* as 'the mental apparatus endeavours to keep the quantity of excitation present in it as low as possible or at least to keep it constant.'<sup>498</sup> This has been read as merely a transferring of the free circulation of energy in neurones onto clinical observations of how the free circulation of meaning occurs in the primary process.<sup>499</sup>

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<sup>496</sup> Freud, Letter to Fliess, May 25, 1895, quoted in 'Project,' Editor's Introduction, 283.

<sup>497</sup> Laplanche and Pontalis, *Language of Psychoanalysis*, s.v. 'affect'.

<sup>498</sup> Freud, 'Beyond the Pleasure Principle,' 9.

<sup>499</sup> Laplanche and Pontalis, *Language of Psychoanalysis*, s.v. 'Principle of Neuronal Inertia.'

The second context of affect describes how instincts express themselves in affect and ideas (*Vorstellungen*). But an affect is not necessarily bound to an idea, it can follow different paths that give rise to the neuroses. Freud often refers to a ‘quota of affect’ to emphasise the economic aspect which ‘corresponds to the instinct in so far as the latter has become detached from the idea and finds expression, proportionate to its quantity, in processes which are sensed as affects.’<sup>500</sup> This separation allows affect to become the qualitative expression of the quantity of instinctual energy and its fluctuations, ‘the subjective transposition of the quantity of instinctual energy.’<sup>501</sup>

Instinctual energy can be either free or bound which again derives from the neurological idea that in the passage of energy through the nervous pathways, there is a potential energy in the neurone and a kinetic energy that moves through it toward motoric discharge. Free energy is characteristic of the primary process evident in free association and dreaming and the binding of free energy becomes, in *Beyond the Pleasure Principle*, ‘the task of mastering or binding excitations.’<sup>502</sup> Freud then shows how the preconscious system binds this free energy: ‘The processes of the system *Pcs.* display [...] an inhibition of the tendency of cathected ideas towards discharge. When a process passes from one idea to another, the first idea retains a part of its cathexis and only a small portion undergoes displacement.’<sup>503</sup> In *The Ego and the Id*, life instincts bind, the death instinct unbinds:

The aim of [Eros] is to establish even greater unities and to preserve them thus – in short, to bind together; the aim of [the destructive instinct] is, on the contrary, to undo connections and so to destroy things.<sup>504</sup>

#### **PERSISTENCE OF ACTIVE/PASSIVE ΔΥΝΑΜΙΣ: A CLOSED SYSTEM?**

This chapter has therefore tried to demonstrate the implicit dependence on conceptual schemas inherited from Greek metaphysics, notably the active and passive δύναμις, even as these were extended to physics. This δύναμις, through ‘free energy,’ then gets transferred onto the physiological and on to psychological or psychoanalytic views of affective or emotional theories. This leads to several problems in the application of the physical to the mental, mainly that a metaphysics of coupled opposites and a law of the conservation of energy serves to reduce otherness to the same in closed systems. Helmholtz’s variations

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<sup>500</sup> Freud, ‘Repression,’ 152.

<sup>501</sup> Laplanche and Pontalis, *Language of Psychoanalysis*, s.v. ‘affect.’

<sup>502</sup> Freud, ‘Beyond the Pleasure Principle,’ 34-35.

<sup>503</sup> Freud, ‘The Unconscious,’ 188.

<sup>504</sup> Freud, ‘The Ego and the Id,’ 274.

between a certain initial state and a certain final state, variations having equal but opposite signs, means that, if two magnitudes undergo equal changes of opposite sign, their sum does not vary, it remains constant. In the extension of the constancy of energy to the neurological and onto the psychical, the brain or psyche is portrayed as a closed system which is no doubt derived from Helmholtz's characterisation of the universe as a closed system:

the whole universe represents such a system of bodies endowed with different sorts of forces and of energy, and therefore we conclude from the facts I have brought before you that the amount of working power, or the amount of energy in the whole system of the universe, must remain the same, quite steady and unalterable, whatever changes may go on in the universe.<sup>505</sup>

But the brain is not the universe, it is one part in it and so the principle of the constancy of energy must hold that the increase in energy of one nervous system must be at the expense of another system.

In Freud, this therapeutic balance is achieved by understanding the unbalanced alignment of opposites through the releasing of repression that allows a better alignment and balance to zero or at least reduced tension. Reversals from masculine to feminine, active to passive via a manifesting of what was unconscious ensure the flow is no longer blocked. An example is provided by the interpretation of Hoffmann's tale 'The Sandman' in Freud's *The Uncanny* (1919). There, Freud draws on many opposites to counter the seemingly 'arbitrary and meaningless' details of Hoffman's story. They become intelligible within a system of coupled opposites that alternate under the direction of a pre-existing underlying principle, in this case the castration complex. In the story, Nathaniel's father and the figure of Coppélius come to represent the opposites into which Nathaniel's father figure has split: his own father as 'good' and Coppélius as the 'bad' father. These pair are then transferred onto Professor Spalanzani and Coppola the optician. Then, the Professor is called the father of the doll Olympia. Now, in a strict concordance, this doll should represent Nathaniel, the son of the father. But Olympia is female. A problem? Not if one combines the male/female split with a physical/psychical difference: Olympia can then become a representation of Nathaniel's *psychic* femininity so that Olympia is 'nothing else than a materialization of Nathaniel's feminine attitude towards his father, in his infancy.'<sup>506</sup> The goal of psychoanalytic therapy becomes the switching of this vast bank of switches until the flow of energy is released or

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<sup>505</sup> Helmholtz, 'Application of Conservation of Force,' 113.

<sup>506</sup> Freud, 'The Uncanny,' 232.

bound to the correct idea. Releasing the blockage is not with the aim of moving to an unknown potential but of confirming a pre-existing hypothesis, in this case, of the castration complex. It is to reduce difference (the arbitrary and meaningless) to the same (pre-existing theory).

It is of course a question of what remains the same across change and whether we need some pre-existing underlying theory to understand change or whether theory should come anew with each change. It is a question of attachment and flexibility to change and the relative balance of concept to empirical evidence that will also draw in community cohesion and disciplinary boundary policing. Such an 'attachment' to a theory or concept in the face of biological discrepancies to the theories imposed on it (as with the concept synapse) is displayed in the development of Helmholtz's constancy of energy theory. In Harman's work on the metaphysical underpinnings of 19th century physics, Harman notes that Helmholtz refused to entertain any deviations from his constancy principle, even when evidence from electrical forces seemed to suggest that Newton's laws of action/reaction need not hold, evidence which might have necessitated a modification of its application to electrical forces. Citing Helmholtz's 1881 notes added to the original conservation of energy essay, Harman argues

Helmholtz emphasised that any abrogation of the central force principle by denying 'the established mechanical principles of the equality of action and reaction and of the constancy of energy' would be an abandonment of any prospect of 'the complete solution of scientific problems.' The acceptance of such theories threatened a violation of the principles which were a necessary condition of the intelligibility of nature.<sup>507</sup>

The stakes for science are high: the unknown, the other, difference that challenges theories and concepts might come at the expense of the project of explaining nature.

#### **IMPLICIT CHALLENGES TO ACTIVE/PASSIVE *ΔYNAMIS*?**

But, within neurological studies, there lies an implicit challenge to this metaphysics, particularly in the evidence of reflex actions and in the doctrine of the neuron that emphasises touch rather than immediate connectivity.

One author who recognised the challenge reflex actions presented to orthodox conceptualisations was John Dewey. In 1896, Dewey argued that the concepts which the

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<sup>507</sup> Harman, 124.

discovery of the reflex arc claimed to have displaced were not sufficiently displaced and so, for example, the dualism between bodily sensation and mental idea merely shifted to a dualism between periphery (spinal cord) and central structures (brain) or an active stimulus and passive response.<sup>508</sup> The traditional way of interpreting the stimulus-response model was that a stimulus provoked an activity in the form of an idea which generated the response. The response is therefore understood as a response *to* a stimulus. This relied on pre-conceived distinctions between sensation, thought and act and assumed the replacement of one by another. To this extent, it conceives stimulus and motor response as distinct psychical existences, disconnected experiences adjusted through the intervention of an extra-experimental soul or a mechanical push and pull, the origin of which is placed in external pressure or internal spontaneous variation. One problem with this conception of stimulus is that it ignored the status prior to or concurrent with the stimulus and required a superior force or agency in the stimulus which served to create the problem of a super-agency in a mechanical system.

Instead, Dewey proposed an alternative economy: the response is not a response *to* the stimulus but a response *into* the stimulus, a transformation or mediation of that experience, the response as a reconstituted stimulus. There is no replacement of one by the other, just a change in the system of tensions. A stimulus, sensation/response and movement are not fixed existences but distinctions of flexible function only. One and the same occurrence plays either or both parts according to shifts of interest and stimulus and response become functional not existential distinctions. The identification of the stimulus establishes the problem, the constitution of the response marks its solution.

Dewey discusses an example in the case of a child seeing and reaching for a candle and being burnt by it (as given by James in *Principles of Psychology*<sup>509</sup>). The traditional interpretation would say the sensation of the candlelight is the stimulus which generates the response of grasping and the burning a stimulus with the response of withdrawing the hand. But Dewey rejects sensation as pure passive receptivity: sensation is also an activity because movement is required for the ‘reception’ of the sight so motoric activity must have already taken place for it to be seen. So, the real beginning is the seeing, not the sensation of light, a

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<sup>508</sup> Dewey, ‘The Reflex Arc,’ 357-58.

<sup>509</sup> James, *Principles*, 1: 25.

seeing in which 'seeing and grasping have been bound together.' Thus an original act of seeing gets transformed into a 'seeing-of-a-light-that-means-pain-when-contact occurs.'<sup>510</sup>

But if this interpretation seeks to bind existential distinctions into some whole of separate yet bound concepts that get transformed, is the question of agency not merely shifted on to who or what transforms? Perhaps Dewey's answer to this would lie in the distinction he makes between whether our experience runs according to expectation or whether we are jolted out of our comfort zone by the discrepancy between expectation and result, a difference that separates and unsettles. Dewey writes, 'so long as our experience runs smoothly we are no more conscious of motion as motion than we are of this or that colour or sound by itself.'<sup>511</sup> What decides, then, is not some supernatural agency or spontaneous soul but the differences in the matters themselves, the differences inherent in the bindings of us and world, a binding that is only manifested in the difference of self and world.

Secondly, the doctrine of the neuron posed a challenge to simplistic conceptions of active and passive flows of energy from start to finish as the lack of continuity between the axon of one cell and dendrite of another demonstrated the possibility of changes in the nature of nervous influence between cells via properties of the membrane and of the synapse or 'gap.' Further evidence of these properties was provided later which will be discussed in the next chapter. The synapse did not therefore describe an active or passive touching but a 'process of contact' that seemed to evade simple active/passive conceptions of binding/bound.

It seems then that at work in neuroscience is both an implicit reliance on past metaphysics and an undermining of them that arises from both changes in conceptual frameworks *and* empirical evidence of the senses in the operation of biological organisms. Two neurosciences: a more traditional, explicit neuroscience of a unidirectional flowing out, of discharge, of the active and passive, beginning and end and another, implicit or marginalised neuroscience of an 'integrative' nervous system, bindings that seem to undermine the active or passive by not positing an active binding and passive being bound, but merely a '*process of binding*,' that precedes, produces or accompanies the active/passive split such that there is a binding and there is its split into active and passive, beginning and end, stimulus and response, cause and effect, at the same time.

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<sup>510</sup> Dewey, 'The Reflex Arc,' 359.

<sup>511</sup> *Ibid.*, 369.

Furthermore, if the traditional active is seen as an act of a self-present entity, acting in full awareness, Dewey's recognition of the challenge reflex actions posed to traditional conceptions redefined an act as the surprise or the mismatch of anticipations and matter, the shock at the failure at the act's expected result through which the bindings are transformed. Not merely a pure movement of an entity, a subject that acts on an object, the active on the passive, the active is instead this acting in its entanglement with the environment that frustrates or smooths its acting manifesting its intended purpose in its failure. To the extent one acts, acting differs with itself in its differing with the world and its (in)difference to this difference. Yet agents are nevertheless identified and separated from entanglements but now, no longer as a pure entity that precedes this entanglement but as the error, as the malfunction in this entanglement. An entanglement in which no entity is purely passive or purely active but some admixture of the two. What is agential is therefore *difference*, a difference that is, at least initially, felt rather than cognised. The next chapter will examine the extent to which this challenge to traditional, Galenic neuroscience, this 'second neuroscience,' continues in modern neuroscience through the revolutions wrought by the discovery of the plasticity of the brain.



## 7

**CONTEMPORARY NEUROSCIENCE**

The previous chapter identified the continued implication of past metaphysics in the nineteenth century foundations of neuroscience mainly through the equal but opposite active and passive δύναμις in its transference onto physics. This chapter discusses how this constancy of energy principle continues to influence contemporary neuroscience via the dominant theory of the ‘free-energy principle’ in contemporary computational neuroscience. But also how a ‘second neuroscience’ implicitly challenges this through the discoveries of plasticity and the challenge it presents to active and passive flows of constant energy. Passivity is now applied to ‘passive transports’ that affects the organism without energetic requirement. Activity, extending Dewey’s challenge, is now explicitly conceived as error-making: the difference between expectation and actuality that manifest implicit bindings. Yet the neglect of this ‘other’ neuroscience continues in theories of affect that remain understood as quantitative discharges of energy that privilege the mechanistic succession and causality of computational models to the neglect of its simultaneity with an essential contingency at the heart of the nervous system. In short, the argument will be how the discoveries of plasticity demonstrates a radical binding of succession and contingency in the organism that the transformed concepts of affect and passive can actually describe in their togetherness.

**PLASTICITY’S CHALLENGE TO THE FIXED BRAIN**

The major paradigm shift in the neuroscience of the twentieth century occurred mainly with the discovery of the plasticity of the nervous system. This undermined the view that the brain is fixed from birth. Learning through synaptic change was acknowledged and the term plasticity was used to describe this. It was first proposed by Jerzy Konorski in his development of the work of Pavlov to describe

a change in response of an organism or its parts (perhaps just nerve impulses and not necessarily any overt response) to a stimulus, the change being due only to repeated presentation of that stimulus (the *n* may be as few as one), in combination with other stimuli (combination may include a stimulus combined with nothing).<sup>512</sup>

But, more radically, plasticity also challenged the idea that localisation of functions of the brain were fixed. More specifically, that cortical mapping, as the link between the activities

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<sup>512</sup> Livingston ‘Brain mechanisms in conditioning and learning’ 350.

of the organism and the activities of the nervous system, or the interaction of the peripheral nervous system (which sends messages from sensory receptors to the brain) and the central nervous system (the ‘command-and-control’ centre), were fixed from birth.

The neuroscientist Merzenich discovered these maps were not universal but varied from individual to individual and seemed to be dependent on experience. Mappings were also dynamic and could change and rewire in response to changes in the body or even without bodily changes. For example, with the removal of a monkey’s finger, the map for that finger was lost, and the map for the adjacent fingers enlarged to take its place.<sup>513</sup> This challenged localizationists like Torsten Wiesel who, through studying the visual cortex, had claimed ‘once cortical connections were established in their mature form, they stayed in place permanently.’ Wiesel later admitted he was wrong:

the pioneering work by Michael Merzenich and colleagues, showing dramatic reorganization in the adult somatosensory cortex through specific patterns of sensory deprivation and stimulation, led Charles Gilbert and me to re-examine our views on this issue.<sup>514</sup>

Neural plasticity as understood today operates in at least three ways: first is the developmental plasticity in the embryo and child where the brain forms according to genetic instructions. Soon after birth, segregation of neurons takes place under the control of homeotic genes to form areas that will become fore-, mid- and hind-brain in the neural tube.<sup>515</sup> But plasticity is also present here evidenced by the fact that cells transplanted to different regions do not always develop according to the genetic program of the homeotic genes but sometimes develop according to the properties of the new region rather than the old.<sup>516</sup>

After early years this genetic plan recedes and plasticity then refers to changes in neuronal connections, the ‘activity dependent plasticity’ identified by Merzenich and Konorski and others. This change occurs most often through synaptic modulation, epigenetic mechanisms or, less frequently, through the development of new neurons in neurogenesis from neural stem cells. This plasticity continues, although does decline, throughout life but is always challenged by the third kind of plasticity involved in both damage to the brain (through

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<sup>513</sup> Merzenich, et al. ‘Somatosensory cortical map changes.’

<sup>514</sup> Wiesel, ‘Plasticity of the visual cortex,’ 9.

<sup>515</sup> LeDoux, *Synaptic Self*, 68.

<sup>516</sup> Schlaggar and O’Leary, ‘Potential of visual cortex.’

lesions, traumas or strokes or other deficiencies) and its capacity to heal itself after such damage through cortical remapping.

This implies that brains are relatively undifferentiated at birth and experience then serves to differentiate them. As LeDoux summarises, the interplay of these three different senses of plasticity is the contingent interplay between species and individual, gene and experience:

Genes thus dictate that we will all have a human kind of brain with roughly the same kinds of circuits, but random individual differences will exist, and the connectivity of the circuits, selected by synaptic activity, will shape the individual brain.<sup>517</sup>

*Activity dependent / Hebbian plasticity*

First let us focus on activity dependent plasticity. To understand this requires an overview of contemporary understandings of the nervous system. A neuron typically receives inputs through its dendrites that moves centripetally to cell body and outputs, centrifugally, through its axons. A neuron typically has more than one dendrite which receive inputs from multiple other cells, a process called convergence. Most neurons have only one axon but a single axon can have many branches allowing the signal to affect many other cells through its multiple terminals, termed divergence. Faced with a fork in an axon, a nerve impulse does not have to choose but can duplicate itself ‘giving rise to two spikes that can take both branches. By doubling this repeatedly, a single spike starting near the cell body becomes many spikes that reach every branch of the axon, amplitude undiminished.’<sup>518</sup> Paths can mostly be traced from origin in sensory receptors through to motor outputs as the final destination of all neural pathways is the muscles. They allow the flow of excitatory or inhibitory impulses known as action potentials.

But there is not complete sensory control. Transmission of impulses do not always begin with sensory ‘input’ but can also arise by spontaneous firings of the nerve cells. This is evidenced partly by the fact there is almost incessant motor activity, an activity essential to the regulation of the nervous system. This spontaneity of firings need not be read as evidence of some autonomous agency of a nerve cell as firings do not occur at random but seem to follow some rhythmic pattern and are also dependent on intrinsic membrane properties. There is also reverberatory activity, a term coined by Rafael Lorente de Nó to describe how cell assemblies self-sustain an impulse even after its stimulus is gone.

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<sup>517</sup> LeDoux, *Synaptic Self*, 74.

<sup>518</sup> Seung, *Connectome*, 53.

Within the neuron, flow occurs as changes in ion balance which spreads rapidly as electrical ‘blips’ rather than electrical currents. From neuron to neuron the impulse has to cross the synapse which has a high electrical resistance that prevents easy jumping from one neuron to another. So an action potential has to cross the gap by chemical diffusion through the release of neurotransmitters of which there are four types acetylcholine, amino acids (such as GABA, glycine and glutamate), monoamines (such as noradrenaline, dopamine and serotonin and neuropeptides (such as endorphins).

Neurotransmitters are often the target of pharmaceutical interventions. Glutamate and GABA are the two main chemicals responsible for most neurotransmission. The over-activity of glutamate and the resulting injury to neurons actually plays an important role in stroke and other vascular disorders of the brain as well as in epilepsy and possibly Alzheimer’s Disease. GABA are thought to play a significant role in the amygdala’s sensing of danger: the amygdala receives input from the sensory world constantly but tends to ignore the majority of it. GABA is required for this as it prevents projection cells in the amygdala from firing in response to meaningless stimuli. Valium is then hypothesised to work by reducing the sensitivity of amygdala to fire as it works on facilitating these GABA transmissions. Many drugs also alter monoamines. Prozac, for example, prevents the removal of serotonin from the synaptic space but the exact means by which the increase in serotonin levels relieves anxiety or depression is not known.

In detail, the flow occurs as follows: the action potential arrives at the end of the axon, at a ‘synaptic bulb’ where calcium channels open in the presynaptic membrane to allow calcium ions in. As they enter, concentration increases and synaptic vesicles containing the neurotransmitters move toward the membrane. These vesicles then fuse with the membrane releasing the neurotransmitter into the synaptic cleft, a process taking around one millisecond, longer than the time it would take for an electrical signal to pass, a delay known as the synaptic delay. At the post-synaptic cell, the neurotransmitter binds to receptors at its surface membrane and the neurotransmitter is then released. The action potential is then set up in the postsynaptic cell. When a motor neurone ends on a muscle, it branches into many specialised synapses called neuromuscular junctions that send excitatory or inhibitory signals to the muscle to flex or contract. This is the process Sherrington had tried to name. The mention of fusing and binding acknowledges the difficulty in whether a reciprocally active ‘co-fastening’ (*synapse*) is appropriate or a process of co-binding (*syndesmos*). As most

muscles are made up of opposite pairs, the corresponding pairs receive inhibitory or excitatory signals to effect the corresponding movement.

The transmission from neuron to neuron can occur by the summation of more than one pre-synapse releasing their transmitters at the same time. Two types of summation occur: temporal and spatial. Temporal requires the summation of two or more impulses that arrive in rapid succession down the same neuron. Spatial summation requires two or more impulses arriving down different neurons. A neuron can therefore receive input from many others, termed synaptic convergence. Spatial summation of excitatory impulses leaves the neuron more responsive to the next impulse, a process called facilitation.

The speed of an action potential varies from 1–3m/s<sup>2</sup> in unmyelinated fibres and from 3–120 m/s<sup>2</sup> in myelinated fibres. But the speed also depends on the number of synapses involved: the greater the number of synapses in a series of neurons, the slower the conduction velocity and so the direction an entering impulse takes may be completely dependent on the timing of other excitations.

This understanding of flow through the nervous system enables a more detailed understanding of activity dependent plasticity. The most studied form of plasticity is Hebbian plasticity, so named because of its basis on Hebb's proposition:

when an axon of cell A is near enough to excite a cell B and repeatedly or persistently takes part in firing it, some growth process or metabolic change takes place in one or both cells such that A's efficiency, as one of the cells firing B, is increased.<sup>519</sup>

This is more commonly summarised as 'neurons that fire together wire together' and, conversely, 'neurons that fire apart wire apart' or 'neurons out of sync fail to link.' This firing together refers to the firing of the pre- and postsynaptic cells which strictly requires a temporal delay for the pre- cell to cause the post-cell to fire. But it has also been invoked in summation of firings such that if stimuli W weakly triggers response A, and stimuli S strongly triggers response A, if a stimulus triggered both W and S, A will more likely fire and the connection between W and A will also be strengthened.<sup>520</sup> Repeated firing of synapses strengthen and facilitate synaptic transmission, a term called Long Term Potentiation (LTP) and, conversely, the weakening of synaptic strength Long Term Depression (LTD).

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<sup>519</sup> Hebb, *Organization of Behaviour*, 62.

<sup>520</sup> LeDoux, *Synaptic Self*, 136.

For neurons that fire together to wire together there must be a convergence zone, a place where synaptic connections meet. Convergence zones integrate parallel plasticity by receiving and integrating inputs from many other brain regions. One site of rich convergence is known to be the hippocampus which is key to the formation of memories as it receives multi-sensory input from many associative areas of the neocortex.<sup>521</sup> Some neurobiologists, such as LeDoux, speculate that the cognitive sophistication of a species can be predicted by the extent of convergence zones in its cortex.

But the brain is not connected all to all, a fact which places a limit on the possibilities of Hebbian plasticity. This is why remarkable possibilities of therapy enabled by plasticity nevertheless have a limit. Remarkable stories like Cheryl Schiltz whose vestibular apparatus (the sensory organ for the balance system) was nearly completely destroyed by side effects of medication with the result she felt like she was perpetually falling. In response, the neuroscientist Bach-y-Rita developed a device that would replace Cheryl's vestibular apparatus by sending balance signals to her brain from her tongue. After she removed it, there was a 'residual effect' that lasted about 20 seconds, but this residual effect kept increasing. Now she does not use the device at all and no longer suffers. Her brain had rewired itself to receive these signals from another functional part, her tongue.<sup>522</sup> Plasticity is invoked here as sensory substitution, 'cross-modal plasticity' that means if one sense is damaged, another can take over like touch incorporated lost vestibular function. But this can only occur because there is a convergence zone that connects the vestibular areas to those of touch.

Possibilities for Hebbian plasticity are also limited by metabolic sustainability:

If every area in the cortex were wired to every other area (and to all other regions outside the cortex), then equipotentiality might hold without any provisos. Wouldn't the brain be far more versatile and resilient if its wiring were 'all to all'? Maybe so, but it would also swell to gigantic proportions. All those wires take up space, as well as consume energy. The brain has evidently evolved to economise, which is why the wiring between regions is selective.<sup>523</sup>

These limits undermine Lashley's theory of equipotentiality which assumed 'every cortical area is dedicated to a specific function, but every area also has the *potential* to

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<sup>521</sup> Bratislav Mišić, 1, 2, 3, \* Joaquín Goñi, 3 Richard F. Betzel, 3 Olaf Sporns, 3 and Anthony R. McIntosh, A Network Convergence Zone in the Hippocampus.

<sup>522</sup> Doidge, *Brain that Changes Itself*, Chapter 1.

<sup>523</sup> Seung, *Connectome*, 34 and 120-1.

assume some other function.’<sup>524</sup> Lashley's claim was too sweeping, cortical areas have the potential to adopt any other function but only with the necessary connectivity to other brain regions. Furthermore, the idea of a convergence zone where all regions would connect to all other regions gives rise to what Dennett calls a ‘Cartesian theatre,’ a single site where all experience converges:

While everyone agrees that there is no such single point in the brain, reminiscent of Descartes’s pineal gland, the implications of this have not been recognised, and are occasionally egregiously overlooked. For instance, incautious formulations of ‘the binding problem’ in current neuroscientific research often presuppose that there must be some single representational space in the brain (smaller than the whole brain) where the results of all the various discriminations are put into registration with each other — marrying the soundtrack to the film, colouring in the shapes, filling in the blank parts.<sup>525</sup>

Rather than any central convergence zone, where everything comes together, Dennett proposed a ‘multiple drafts’ model of consciousness, that there are at any one time multiple flows or drafts of sensori-motor activities that do not come together in one coherent whole.

#### *Non-Hebbian plasticity and passive transports*

Hebbian plasticity typically refers to synapses between excitatory neurons that require a pre- and postsynaptic connection. But there are also forms of non-Hebbian plasticity that do not require this connection. For example, plasticity occurring solely through presynaptic facilitation or post-synaptic potentiation;<sup>526</sup> or the plasticity localised to one synapse occurring through modification of the biophysical properties of a membrane. There is also evidence for a cell-wide homeostatic synaptic plasticity which, because of the limit on the continued strengthening of synapses in terms of the energy required (the metabolic capacity of the neuron), maintains and regulates metabolic balance across many cells whilst retaining the relative difference in strengths of individual synapses within that population. There is also the rarer case of neurogenesis which introduces structural changes into the nervous system through the creation of new neurons. Finally, there are thought to be epigenetic mechanisms which derive from Francis Crick’s proposal that ‘a self-perpetuating biochemical autoconversion of methylated DNA might serve as a memory mechanism at the molecular level, as a specific mechanism that might defeat molecular turnover and stabilise acquired

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<sup>524</sup> Ibid., 35.

<sup>525</sup> Dennett, *Consciousness Explained*, 257-8.

<sup>526</sup> Kato et al. ‘Non-Hebbian Synaptic Plasticity.’

behavioural change.<sup>527</sup> It was thought epigenetic marks like DNA methylation were fixed over an organism's lifetime but it is now clear they are dynamically regulated in the central nervous system and can self-regenerate and self-perpetuate.

One advantage of non-Hebbian plasticity is the possibility of more global state changes through membrane properties, neurogenesis, or homeostatic or epigenetic processes which depend less on the connectivity of neurons. These more global state changes have often been linked to 'emotional' states. LeDoux, for example, argues that emotional states monopolise brain resources and penetrates the brain widely by perpetuating itself. So, 'by coordinating parallel plasticity throughout the brain, emotional states promote the development and unification of the self.'<sup>528</sup> Such widespread changes are often achieved through the diffusion of neurotransmitters such as monoamines:

Monoamines produce global state changes in many brain areas simultaneously, such as the high degree of arousal occurring through the brain when we encounter a sudden danger or the low degree of arousal when we are going to sleep.<sup>529</sup>

Diffusion occurs as follows: as mentioned, neurons have resting potentials when not being 'fired.' They must always be ready to transmit impulses and do so by the always polarised nature of their membrane. The fluid inside is negatively charged in relation to its outside, an unequal distribution of ions termed the electrochemical gradient. Movement between these two areas of unequal concentration then occurs through diffusion, one example of 'passive transport' (the others being facilitated diffusion, filtration and osmosis) that describe molecular movement across cell membranes. Unlike active transports, passive transports do not require cellular energy; they are driven instead by the entropy of the system.

Concepts of active and passive thus continue to structure the conception of the nervous system but in subtly different formulations. For, whilst passive is still aligned with potential energy in distinction to active kinetic energy, 'passive' transports can occur through the entropy of the system, that effects movement and change that affect the plasticity of the nervous system, without the input of energy, without actually 'acting.' Are they strictly 'passive' in this case? Perhaps in the sense that Newton's passivity as inertia persists in movement? But inertial movement was originally initiated by something other. Whereas in

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<sup>527</sup> Sweatt, 'Neural plasticity and behaviour.'

<sup>528</sup> LeDoux, *Synaptic Self*, 320, 322.

<sup>529</sup> LeDoux, *Synaptic Self*, 58.

passive transports this is less the case, change arises from properties inherent to the system and its entropy. Or was there a prime mover? Others state they should more properly be called ‘facilitated transports’ as they are facilitated by something ‘other’ like gravity or the difference of electrochemical gradients. Yet, this passivity is traditionally metaphysical in that it echoes the historic privileging of activity over passivity. As passive transports are linked to entropy, they continue to be aligned with disorder if entropy is understood as the measure of disorder in a system. Perhaps the split between active and passive transports evidences a more profound split between an orderly, computational, successive process of Hebbian plasticity and a more complex, contingent and disorderly, emotional global state changes, a split that continues the suggestion of ‘two neurosciences’ of the previous chapter and the difference between a Hippocratic method, its inexact truths, and a Galenic method with its Platonic truth. The transformed understandings of active and passive could, in their coupling, therefore conceptualise the togetherness of these two neurosciences and the contingency and successive.

#### **PLASTICITY’S CHALLENGE TO CLASSIC CELL THEORY**

Yet this challenge has yet to be drawn out explicitly. One challenge that has, however, is the challenge non-Hebbian plasticity and passive transports present to the doctrine of the neuron and, by extension, classical cell theory. Specifically, they undermine the view of neurons as independent anatomical entities that are always contiguous and not continuous, as well as the ‘law of dynamic polarization’ that claims a singular direction of transmission of nerve impulses from cell to cell and, within cells, from dendrites to cell body to axon.

The challenge is presented, first, by the discovery of ‘gap junctions’ between membranes of cells, specialised intercellular connections considered small enough to allow the diffusion of molecules directly from the interior of one cell to another. If there can be fusions of two or more cells, neurons cannot strictly be considered completely separate anatomical entities: fusions producing syncytial structures mean these cells would be continuous not contiguous. Experiments demonstrated dye molecules dye adjacent nerve cells through small holes in these gap junctions. Gap junctions are particularly significant for the function of the heart as they allow the electrical signal to contract to rapidly spread between the muscles of the heart as ions pass through gap junctions enabling the cells to contract together. Functional links

across synapses thereby produce 'reticular' structures denied by the neuron doctrine.<sup>530</sup> As Loewenstein argues:

The discovery of this form of intercellular communication has meant a sharp departure from classic cell theory. It is the coupled cell ensemble and not the single cell that is the functional compartmental unit for the smallest cytoplasmic molecules; the ensemble inside constitutes a largely uninterrupted interior milieu for somatic and genetic processes.<sup>531</sup>

Meanwhile, the law of dynamic polarization and James's law of forward direction are challenged by discoveries that a neuron displays two directions, not one, and types of movement: simultaneous movements of Na and/or K ions in opposite directions together with the transmission of impulses as sequential movements of these ions. Whilst the latter are an 'all-or-nothing' fire rate, the former are relative to the strength of the input. Furthermore, impulses have been discovered to begin on axons. Cells like the dorsal root ganglion cell have 'no synaptically activated dendrites associated with the cell body'<sup>532</sup>. There are also cells which lack axons<sup>533</sup>. If dendrites are postsynaptic and axons presynaptic, serial synapses where one synaptic terminal synapses on another, should not occur. These serial synapses can yield axo-axonal contacts and also prove a problem because they suggest parts of the nerve cell can be independently active<sup>534</sup>.

Others, however, have argued that, although these exceptions challenge any strict generalization of the neuron doctrine to the entire nervous system, the law of forward direction continues to express the overall flow of activity in the majority of neurons. As Shepherd argues, it is just that 'within a region, and within a neuron, this overall constraint no longer applies, and synaptic inputs and outputs can occur at any point on a neuron'<sup>535</sup>. Furthermore, whilst such discoveries may pose a challenge to the doctrine of the neuron, it need not challenge cell theory because the neuron doctrine did not just apply cell theory to nerve cells, it was more restrictive. Neuron doctrine exceeded cell theory because cell theory accommodates multinucleate cells and fusions between cells to form syncytial structures and

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<sup>530</sup> Guillery, 'Relating neuron doctrine to cell theory.'

<sup>531</sup> Loewenstein, 'Junctional intercellular communication.' Cited in Shepherd, *Neuron Doctrine*, 277.

<sup>532</sup> Bodian, 'The Generalised vertebrate neuron.'

<sup>533</sup> See Shepherd, *Neuron Doctrine*, 283.

<sup>534</sup> Guillery, 'Relating the neuron doctrine to the cell theory.'

<sup>535</sup> Shepherd, *Neuron Doctrine*, 285.

does not posit any ‘law of dynamic polarization.’ These discoveries therefore challenge the neuron doctrine without challenging cell theory.

It is interesting to note how the discoveries of non-Hebbian plasticity, passive transports and challenges to the neuron doctrine also seem to affect strict connectionist theories of consciousness. For example, Seung, who argues ‘you are your Connectome,’ discusses neural phenomena that would be incompatible with this statement. One is that neurons can interact without the need for synapses, for example, extrasynaptic interactions where a neurotransmitter escapes from one synapse and diffuses away to be sensed by a more distant neuron, or between neurons that do not even touch each other. Seung’s response is that to model this one would have to move to the atomic level and whilst the laws of physics (not to mention quantum physics) could generate a simulation of every atom in the brain, this would be impossibly complex requiring enormous computational power and require measurement of position *and* velocity.<sup>536</sup> So Seung does not strictly exclude the possibility, just that as its modelling is (currently) impossible it would not be of any explicatory use.<sup>537</sup> Do we see here a limit to science in the scientists attachment to explicatory models that would explain nature as with Helmholtz’s refusal to entertain challenges of the law of constancy of energy? And where the ‘passive’ as disorderly and contingent presents that challenge? Yet to say computation is too complex does not mean there is not computation, it has merely yet to be made explicit.

#### **MANAGING INTERACTION: TIME AND SPACE IN THE NERVOUS ORGANISM**

Within such a complex nervous system of leaky and differential spatial and temporal flows, and the difference between these flows and the flows of the external environment, the problem arises of just how, given this differential simultaneity, the organism can successfully interact with its environment and itself. If the course through the nervous pathways, from stimulus to motoric response, is largely dependent on the different lengths and properties of the nerves involved (the number of synapses involved and whether myelinated or not) and the action of plasticity is to bind or separate synapses thus slowing or speeding progress through the organism, managing the difference and separation between organism and world and organism and itself seems to be a function of plasticity.

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<sup>536</sup> Seung, *Connectome*, 269.

<sup>537</sup> *Ibid.*, 269.

The coordination of successive events within a differential simultaneity is often referred to as the binding problem which has two senses: first, how complex sensory stimuli are separated into discrete objects, known as the segregation problem, and secondly, the combination problem, how separate experiences and stimuli are combined into a single, interactive experience. One solution, neural synchrony, proposes synchronous (simultaneous) firing as an explanation of consciousness and plasticity as integrative, bindings of organism with world that ultimately has its roots in a brand of associationism or, as it developed into in the 1950s, connectionism.

But criticisms of connectionism were there from its inception. Lashley, for example, criticised naive connectionisms such as the stimulus-response model. Lashley's objection was that the brain was omitted from this stimulus-response formula and, when it was introduced, was based on a telephone switchboard which implied a 'linear reflex activity in the spinal cord' that left no room 'for the psychological categories that require sustained activity such as thought, memory, emotion, motivation, selective attention, and the like.'<sup>538</sup> Lashley's alternative was to argue for a sustained mechanism that continued after stimuli termination which led him to N6's reverberatory circuit. Lashley therefore argued not for a S-R model, but a S-O-R (Stimulus-Organism-Response), which suggested the stimulus excites the organism and the organism incites the response.

Hebb also criticised naive connectionism. In his work *The Organization of Behaviour*, Hebb argued the main problem with connectionism is how to explain 'thought.' It cannot simply be behaviour as an interaction between sensory and motor processes, 'something like *thinking* intervenes.'<sup>539</sup> Hebb's aim is to develop a theory to 'show how "expectancy" or the like can be a physiologically intelligible process,' how the problem of 'attention' can be understood not as some supra-neural, mystical process but in terms of neural mechanisms.<sup>540</sup> He proposed a form of 'connectionism' but 'not an S-R psychology if R means a muscular response' and also invoked N6's reverberatory circuit in 1949 as a basis for his 'autonomous central process.'<sup>541</sup>

The task, as modern neuroscientists seem to see it, is not to fall into a naive connectionism that would focus only on simultaneity and connection, but of how succession and

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<sup>538</sup> Lashley quoted in Orbach, *Neuropsychological theories of Lashley and Hebb*, 4.

<sup>539</sup> Hebb, *Organisation of Behaviour*, xvi.

<sup>540</sup> *Ibid.*, xviii.

<sup>541</sup> *Ibid.*, xix.

simultaneity bind together through connections that facilitate or impede flows and how psychological categories such as agency, attention and thought emerge out of this binding. With the ever-present caricature of ‘Cartesian dualism’ as the enemy, modern neuroscience seeks to explain this binding of simultaneity and succession seemingly without recourse to a sequential active and passive for if there is something that binds and something that is bound, this merely requires a search for what performs this binding in a super-neural realm and leads to infinite regress.

### **PREDICTIVE PROCESSING AND FREE ENERGY**

Let us turn now to the dominant and most popular theory of contemporary computational neuroscience that seeks to provide answers to many of these problems. The current theory enjoying most attention today revolves around a few theories intimately linked: that of the brain as a ‘prediction processor,’ the ‘Bayesian brain’ and the free-energy principle.

The idea of the brain as a prediction processing computer has a long history and dates at least as far back as Helmholtz who conceived perception as involving probabilistic inference of sensory causes given bodily effects.<sup>542</sup> This inference is not so much a conscious, deliberative prediction but an unconscious, automatic prediction based on previous experience of the world. This theory then went through several developments within computational neuroscience and today yields theories of perception and action as hierarchical systems of top-down and bottom-up probabilistic processes that try to match sensation with predicted results of manipulations of the organism’s environment.

Key to this predictive action are ‘prediction errors’ defined as the difference between the expected and actual sensory effects of enacted motoric manipulations which propagate forward in the system to determine action. These hierarchical active inference loops and their waves of error are multiple, there is not simply one organismal problem to resolve, it is constantly in multiple processes of interoceptive and exteroceptive origin. Multiple motor responses are therefore prepared simultaneously which all mutually affect each other. The actual action depends on the weight given to each error and may be an awkward movement of more than one intended action. As Clark summarises, prediction-error weighting,

is essentially a means of sculpting patterns of inference and action, and as such it is strangely neutral concerning the intuitive difference between increasing the precision upon (say) a prior belief or decreasing the precision upon the sensory evidence. What

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<sup>542</sup> Helmholtz, *Physiological Optics*, cited in Clark, *Surfing Uncertainty*, 170.

matters is just the relative balance of influence, however that is achieved. For it is that relative balance that determines agentic response.<sup>543</sup>

Clark calls this theory ‘action-oriented predictive processing’ which involves finding predictions that match sensory input and, at the same time, performing actions that make those predictions come true.<sup>544</sup> The brain so conceived is not then a mere computational device, an ‘an insulated inner “inference engine” ’ but ‘an action-oriented engagement machine – an enabling [...] node in patterns of dense reciprocal exchange binding brain, body and world.’<sup>545</sup>

These prediction errors are computationally defined using Bayesian probability theory which infers posterior probabilities as a function of prior probability and ‘likelihood functions’ derived from statistical models of observed data. It was definitively introduced by Friston by computationally defining the cascade of inference loops using hierarchical predictive coding. This introduction of computational algorithms was an important addition as it allowed experimental testing of hypotheses.<sup>546</sup>

Helmholtz remains central to the theory because of its assumption of the constancy of energy principle. Clark, for example, argues the aim of the organism is to minimise these prediction errors, an aim which is in turn ‘a manifestation of a more fundamental mandate to minimise an information-theoretic isomorph of thermodynamic free energy in a system’s exchanges with the environment.’<sup>547</sup> Meanwhile, Friston argued he ‘advances Helmholtz’s agenda to find principles of brain function based on conservation laws and neuronal energy.’<sup>548</sup>

In this model, the difference between the expected and actual sensation after an action is called ‘surprise.’ But surprise cannot be evaluated as it would require knowledge of all the hidden states of the environment that cause sensory input. So the concept of free-energy was introduced which functions to place an upper-bound on this surprise, a bound which can be evaluated because it is a function of sensory data and brain states. Free-energy is therefore

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<sup>543</sup> Clark, *Surfing Uncertainty*, 206.

<sup>544</sup> Clark, Andy. ‘Whatever next? Predictive brains, situated agents, and the future of cognitive science.’ *Behavioural and brain sciences* 36.3 (2013): 181-204.

<sup>545</sup> Clark, *Surfing uncertainty*, xvi.

<sup>546</sup> Friston, ‘Learning and Inference.’

<sup>547</sup> Clark, *Surfing uncertainty*, 305.

<sup>548</sup> Friston, ‘Free-Energy Principle,’ 293.

defined as ‘an information theory quantity that bounds the evidence for a model of data.’<sup>549</sup> The principle underlying perception as active inference is therefore that any adaptive change in the brain minimises free-energy. In the case of a biological organism, its data are its sensory inputs and its model is the model of the world and organism encoded by the brain. The theory, Friston adds, ‘applies to any biological system that resists a tendency to disorder,’ that is, that aims to minimise the entropy of its sensory states.<sup>550</sup> This entropy is, for Friston, a measure of uncertainty as ‘a density with low entropy means that, on average, the outcome is relatively predictable.’<sup>551</sup>

Meanwhile, Clark states that free-energy ‘emerges as the difference between the way the world is represented (modelled) as being and the way it actually is.’ This representation of the world should not be understood as some kind of passive ‘mirror of nature’ story about the fit between model and world, a correlationist-truth view of concordance of model and world, but as an optimal *difference* which ‘enables the organism to engage the world in a rolling cycle of actions that maintain it within a window of viability.’<sup>552</sup>

Such an account aims to answer one problem of traditional stimulus-response models: given the discussed delay in neural pathways, the nervous system would effectively always be living in the past. By the time stimuli pass from sensation to action, the source of the stimuli may have radically changed rendering any responsive movement possibly ineffective. Perception and action as forward propagating predictions and errors provides an answer to this problem by arguing the nervous system partly lives in the past but also in the future. For example, in ball sports, experiments show that eye saccades occur not only to where the ball is but to where the ball is predicted to be, areas that lack salience. In traditional accounts of what stimuli captures attention in an environment, the concept of salience is invoked to suggest those features most salient to the organism capture attention. But this account is not consistent with such eye tracking evidence that show where and when eye gaze roams across a scene. Instead, predictive processing explains salience as expectation-driven: the fact that the eye looks at relatively non-salient areas of a scene is explained by the fact it is looking into the future in the form of the expected place of where the ball will be.

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<sup>549</sup> Ibid., 293.

<sup>550</sup> Ibid., 293.

<sup>551</sup> Ibid., 127.

<sup>552</sup> Clark, *Surfing Uncertainty*, 305.

*Binding the physiological and neural*

For Clark and Friston, this free-energy principle underlies the computational, the neuroscientific and the psychological. Friston, in particular, is explicit in calling this theory a ‘unified brain theory’: ‘several global brain theories might be unified within a free-energy framework.’<sup>553</sup> Whilst some might balk at this reduction of the phenomenological to the computational and onto the neural, it is more accurate to say Friston and Clark seek not a reduction but a reciprocation, the reciprocal causality of each ‘level’ all dependent, nonetheless, on this foundation of free-energy.

The neural level seeks to understand how a computational hierarchical model of predictive processing might be implemented in the nervous system. Plasticity plays a central role. Friston mentions three such possible mechanisms whereby this theory could be neurally implemented. First is the synchronisation of pre-synaptic inputs that result in increased post-synaptic gain. Thus a psychological concept like attention can be defined by Friston, as ‘the process of optimizing synaptic gain to represent the precision of sensory information (prediction error) during hierarchical inference.’<sup>554</sup> Physiologically, this ‘precision,’

corresponds to the postsynaptic gain or sensitivity of cells reporting prediction errors (currently thought to be large principal cells that send extrinsic efferents of a forward type, such as superficial pyramidal cells in cortex).<sup>555</sup>

Secondly, the precision-weighting of prediction errors, which is this control of post-synaptic gain, can be explained through the activity of neurotransmitters like acetylcholine or dopamine<sup>556</sup> Or, finally, synchronous interactions by adjacent neuronal populations such as may be achieved through frequencies of oscillation:

it seems possible that bottom-up signalling (which in predictive processing encodes prediction error and is hypothesised to originate in superficial pyramidal cells) may be communicated using gamma-range frequencies while top-down influence may be conveyed by beta frequencies.<sup>557</sup>

In one of the many applications of the theory at the psychological level, Clark discusses how such a theory might explain pathologies like schizophrenia. Clark notes how a misattribution of agency is often invoked in accounts of some schizophrenic symptoms. For

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<sup>553</sup> Friston, ‘Free-Energy Principle,’ 127.

<sup>554</sup> Feldman and Friston, ‘Attention, Uncertainty and Free-Energy,’ 2.

<sup>555</sup> Friston, Bastos, et al., 2015, p.1.

<sup>556</sup> Friston, 2009.

<sup>557</sup> Clark, *Surfing Uncertainty*, 149.

example, Edwards et al. describe how eye-tracking dysfunction, one of the most often reported deficits in schizophrenia, a usually autonomous and nonconscious action that is felt to be generated voluntarily, is felt as involuntary with the result that a ‘misattribution of agency’ occurs that shifts this agency from self to something other with the concomitant feeling of being controlled or manipulated.<sup>558</sup> This misattribution is hypothesised to arise from malfunctions within this complex hierarchical model, perhaps rooted in abnormal dopaminergic functioning, that

yield wave upon wave of persistent and highly weighted ‘false errors’ that then propagate all the way up the hierarchy forcing, in severe cases (via the ensuing waves of neural plasticity) extremely deep revisions in our model of the world. The improbable (telepathy, conspiracy, persecution, etc.) then becomes the least surprising, and—because perception is itself conditioned by the top-down flow of prior expectations—the cascade of misinformation reaches back down, allowing false perceptions and bizarre beliefs to solidify into a coherent and mutually supportive cycle.<sup>559</sup>

Evidence from the phenomenological affects the neural affects the computational in a rich literature of psychological, neural, mathematical, psychiatric and even psychoanalytic or neuropsychanalytic. It is not so much a reduction of one to the other as the transformation of a single principle into different modes of explanation. We might therefore ask, is free-energy now the unifier that affect was in previous years?

#### *Affects in predictive processing theories*

If so, what is the role of emotion within this framework? Several relevant mentions of emotional concepts suggest themselves. First is the use of the apparently emotive term ‘surprise’ to describe the mismatch between prediction and actuality. But apparently this is not to be taken as surprise in the ordinary sense, surprise as an affect. To avoid this confusion, Clark argues it would be better to use Tribus’s concept of ‘surprisal.’<sup>560</sup>

there seems to be an initial disconnect between neural-surprise (‘surprisal’: the implausibility of some sensory state given a model of the world) and agent surprise. This is evident from the simple fact that the percept that, overall, best minimises surprisal (hence minimises prediction errors) ‘for’ the brain may well be, for me the agent, some highly surprising and unexpected state of affairs.<sup>561</sup>

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<sup>558</sup> Edwards et al., ‘A Bayesian account of “hysteria” ’; Clark, *Surfing Uncertainty*, 222, 209.

<sup>559</sup> Clark, *Surfing Uncertainty*, 80.

<sup>560</sup> Tribus, *Thermodynamics and thermostatics*.

<sup>561</sup> Clark, *Surfing Uncertainty*, 78.

Yet Clark goes on to say ‘the appearance of a radical disconnect here is, however, illusory’ and suggests the ‘*feeling of surprise*’ [...] might be a way of preserving useful information that would otherwise be thrown away—the information that, prior to the present evidence-led bout of inference, the perceived state of affairs was estimated as highly improbable.<sup>562</sup> Friston also echoes this ambiguous status of surprise when he says ‘a “fish out of water” would be in a surprising state (both emotionally and mathematically).’<sup>563</sup> Feeling or emotion then becomes a difference, a difference between previous expectations and modified expectations in the light of predictions made and acted on. For Clark, the purpose of these ‘felt emotions’ may be to ‘integrate basic information (e.g., about bodily arousal) with higher-level predictions of probable causes and preparations for possible actions.’<sup>564</sup>

Second, is the concept of ‘affective gist,’ rapidly retrieved, initial predictions about the ‘gist’ elements of a scene or event that are based on previous experiences of how external sensations affected internal sensations in similar circumstances and which determine whether we like or dislike the scene or event.<sup>565</sup> These global impressions of attitude toward a scene can occur in the relative absence of conscious recognition of objects in peripheral vision and suggest an implicit, yet to be unfolded, binding of self and world that affects.

Most importantly, however, Clark provides a brief outline of how a theory of emotion would look in a PP model. He extends the James-Lange model by adding a necessary ‘predictive twist’ because their theory ‘seems to require a one-to-one mapping between distinct emotional states and distinctive ‘brute-physiological’ signatures, and it seems to suggest that whenever the physiological state is induced and detected, the same emotional feeling should arise.’<sup>566</sup> Clark instead draws on recent work which adds a match or mismatch between top-down predictions of interoceptive states and forward-flowing information contained in sensory prediction error. Whilst this seems to subsume emotion under prediction processing and suggest emotion is not the unifier it once was, what Clark identifies as missing from James-Lange ultimately is feeling as the feeling of *difference*, a difference that must affect the organism. Perhaps affect still has a place as unifier.

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<sup>562</sup> Clark, *Surfing Uncertainty*, 79. Emphasis added.

<sup>563</sup> Friston, ‘The Free-Energy Principle,’ 127.

<sup>564</sup> Clark, *Surfing Uncertainty*, 234.

<sup>565</sup> Barrett and Bar, ‘See it with Feeling,’ 2009.

<sup>566</sup> Clark, *Surfing Uncertainty*, 233.

### *Critique*

This theory has been criticised from a number of angles. First for its reliance on Bayesian accounts of probabilistic inference, specifically the requirement of prior probabilities for its computation of risk. These ‘priors’ are an expression of a current state of belief pertaining to a situation prior to any evidence. The question then arises where these priors come from? Are they innate? Or transcendental: Clark suggests that there may be ‘hyperpriors,’ ‘priors upon priors’ that embody ‘systemic expectations concerning very abstract (at times almost ‘Kantian’) features of the world.’<sup>567</sup> Biological systems, he adds, ‘may be informed by a variety of learned or innate ‘hyperpriors’ concerning the general nature of the world. One such hyperprior might be that the world is usually in one determinate state or another.’<sup>568</sup>

In answer, Clark and Friston respond with an ‘empirical Bayes’ (Robbins, 1956) which suggests that, within a hierarchical scheme such as predictive processing, priors can be provided from the estimates of one level to the level above; again, a succession of prior-posterior is collapsed into a simultaneity of hierarchical prior with posterior:

In predictive processing architectures, the presence of multilevel structure induces such ‘empirical priors’ in the form of the constraints that one level in the hierarchy places on the level below. These constraints can be progressively tuned, using standard gradient descent methods, by the sensory input itself.<sup>569</sup>

The neurological level might confirm this: ‘such multilevel learning procedures look neurally implementable courtesy of the hierarchical and reciprocally connected structure and wiring of cortex.’<sup>570</sup> Again, it is a question not of cause and effect, a succession whereby past priors would affect present probabilistic inference but their simultaneity in a reciprocal causality.

A related question is what accounts for the bindings of organism with itself and its environment, i.e. why does one thing affect one organism more than another? Given the vast diversity in possibilities of reciprocal affections in the organism and its environment, what aspects does it focus on its perceptual predictions? And how can this be explained without recourse to a supra-neural agency? Previous attempts, as previously discussed, tried to explain perceptual attention through ‘salience,’ that the organism turns toward the most

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<sup>567</sup> Clark, *Surfing Uncertainty*, 174.

<sup>568</sup> *Ibid.*, 188.

<sup>569</sup> *Ibid.*, 303.

<sup>570</sup> *Ibid.*, 303.

salient aspects. But, as we saw with the ball game example, attention is often given to non-salient parts of a scene which are actually the predicted future path of an object. So, predictive processing appeals instead to ‘affordance,’ ‘the possibilities for action and intervention that the environment makes available to a given agent.’<sup>571</sup> This concept was introduced by Gibson who defined it as ‘the affordance of anything is a specific combination of the properties of its substance and its surfaces taken with reference to an animal.’<sup>572</sup> Affordances of the environment are ‘what it offers animals, what it provides or furnishes, for good or ill.’<sup>573</sup> Thus what binds is largely conceived as some reciprocal causal relation between what an organism seeks to enact and the perceived match an aspect of the environment affords. Just as there are multiple predictions and planned motoric responses, so too will there be multiple affordances and so an ‘affordance competition hypothesis’ applies that gives ‘multiple possibilities for organism-salient action and intervention.’ With prediction-error weighting, the requisite affordance is then selected.

The opportunities the environment presents deeply influence organismal behaviour to the extent an organism’s intentionality is part world, part itself, ‘extended’ throughout the flattened inanimate and animate it finds around it, opportunities themselves influenced by the sensory predictions it makes so that it only sees, in a way, what it expects to see. Indeed, the focus on expectations and avoidance of surprise means that

Our expectations here ‘cause the sampled environment,’ as Friston and Ao put it, but only in the metaphysically innocent sense of driving actions that selectively disclose predicted sensory stimulations. It is in this way that the agent by action calls forth the very world that she knows.<sup>574</sup>

This causing the environment arises from an avoidance of difference. But whilst this may resemble an active organism *causing* or shaping its passive outside, the key difference is that this ‘outside’ is already an implicit binding of inside and outside, part organism, part world, a model of the outside that will be confirmed or rebutted in enacted movements, a model only manifested in its error.

Furthermore, if an organism merely sought out in its environment what it already knows or needs, the problem arises of explaining novelty, learning, development and growth. Does the organism aim at perfect prediction of motoric responses, of perfect attunement between its

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<sup>571</sup> Ibid., 133.

<sup>572</sup> Gibson, ‘Theory of Affordances,’ 66.

<sup>573</sup> Ibid., 67.

<sup>574</sup> Clark, *Surfing Uncertainty*, 125.

priors and those of the environment? This might suggest, as Clark highlights, that the best predictive coding strategy would be of ‘finding a dark corner and staying there, correctly predicting immobility and darkness until all bodily functions cease.’<sup>575</sup>

Not so, Clark and others argue, because this would neglect the biological or evolutionary level required for the integrity and persistence of the organism (the most error inducing states are ones where activity ceases and hunger and thirst come to dominate) as well as the cultural levels which encourage what Clark calls ‘human flourishing’ against which the multiple processes of prediction error minimization resolve themselves, ‘an equally transformative backdrop of slowly accumulated material structure and cultural practices: the socio-technological legacy of generation upon generation of human learning and experience.’<sup>576</sup> Active-infering agents are not trying simply to correspond with world but producing choreographies as sensed-errors to act appropriately with its environment. And the world is changing independently of the organism’s attempts to match it; the world is thus accorded agency too. As Feldman argues, ‘one would be unwise to fit one’s prior too closely to any finite set of observations about how the world behaves, because inevitably the observations are a mixture of reliable and ephemeral factors.’<sup>577</sup>

#### **ERROR AND IMPLICIT MODELS REPLACES ACTIVE AND PASSIVE?**

We can summarise the developments computational neuroscience approach brings to the question of affect and the challenge to active and passive δύναμις. Notable is the challenge it presents to the traditional understandings of stimulus-response, action-consequence and the active-passive. Perception, for example, is now conceived as incessantly active, not merely passive; perception is collapsed into action such that they are both ‘locked in a kind of endless circular embrace.’<sup>578</sup> The brain, as Clark and Friston and others now conceive it, is incessantly active or pro-active:

The image of the brain as a probabilistic prediction machine places context and action centre stage. It requires us to abandon the last vestiges of the ‘input-output’ model according to which environmental stimuli repeatedly impinge upon a richly organised but essentially passive system. In its place we find a system that is constantly active,

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<sup>575</sup> Ibid., 47. Referred to as ‘the darkened room argument’: see Friston, Thornton & Clark, 2012.

<sup>576</sup> Ibid., 263.

<sup>577</sup> Feldman, ‘Tuning your priors to the world.’

<sup>578</sup> Ibid., 7.

moving restlessly from one state of expectation to another, matching sensory states with predictions that harvest new sensory states in a rolling cycle.<sup>579</sup>

Indeed, activity seems to be so privileged that there is little mention of passivity which seems to no longer have a place in the organism. Passivity is only mentioned by Clark in terms of ‘passive dynamics’: ‘the kinematics and organization inhering in the physical device alone.’<sup>580</sup> One such passive dynamic is gravity which, in its co-occurring with *active* energetic movements, produces a more efficient and complex movement to achieve broader aims such as when walking is conceived as ‘controlled falling.’<sup>581</sup> Or the diver who, whilst gravitationally falling, activates muscles to enact the dives. But the predictive brain is nevertheless also a lazy brain: ‘a brain vigilant for any opportunity to achieve more by doing less.’<sup>582</sup> This economy is achieved precisely through its active exploitation of its own ever-present passive dynamics. Thus it is perhaps more correct to say that the predictive organism is always active and passive at the same time although most attention is given to the active side, repeating the historical neglect of the passive. With the earlier mention of passive transports arising from the entropy of the system, should we not add these to the list of passive dynamics, like gravity, with which activity cooperates? Does Hebbian plasticity exploit its non-Hebbian passive transports or do the two work with each other? The active works with its implicit bindings.

But, more significantly, we should also note that the understanding of action and agency within this model has been radically redefined. Even though, in Friston’s account, various entities are grammatically afforded agency, it is again mainly the brain as agent: ‘the brain will minimise free-energy,’ ‘model is encoded by the brain’ or ‘the brain is suppressing free energy.’<sup>583</sup> Now this may be merely a limitation of a grammar that requires subject-object but Friston also refers to the agent thus: ‘an agent can avoid surprising exchanges with the world if it minimises its free-energy because free-energy is always bigger than surprise.’<sup>584</sup> If action minimises free-energy and action depends on the difference between prediction and error, surely it is better to understand *difference* as the agential component here rather than any entity or being? If free-energy is the difference between expectation and actuality, it is this

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<sup>579</sup> Clark, *Surfing Uncertainty*, 139.

<sup>580</sup> *Ibid.*, 246.

<sup>581</sup> See McGeer, *Passive Dynamic Walking*.

<sup>582</sup> Clark, *Surfing Uncertainty*, 268.

<sup>583</sup> *Ibid.*, 300.

<sup>584</sup> *Ibid.*, 293.

difference which motivates action not a brain or subject. The notable change from previous accounts of action is thus that agency need not be ascribed to some supra-neural, external or transcendental pure activity, an ego or soul but an effect of the difference between error and prediction, complexity and uncertainty that is located firmly in the difference between neuronal flows and the difference between these differences and the organism's world.

Yet this is not to deny that agents are posited nor that events are not split into active and passive, cause and effect. Such a move would merely place us back in a naive connectionism. Clark writes, perception as an inferential process 'cannot help but interpose something (the inference) between causes (such as sensory stimulations or distal objects) and effects (percepts, experiences).'<sup>585</sup> But such splits arise again not through the agency of any entity but from the difference between predicted sensation/movement and the error-generating actual sensation/movement. We should therefore be attentive to the different agencies different bindings effect.

This transformation in active/passive is mirrored in the changes it effects in conceptions of causality. For example, Pezzulo noted how, in the ideomotor view of action, a theory which is extended by Predictive Processing:

causality, as present in the real world, is reversed in the inner world. A mental representation of the intended effect of an action is the cause of the action: here it is not the action that produces the effect, but the (internal representation of the) effect that produces the action.<sup>586</sup>

Predictive Processing takes this one step further: cause and effect are not merely reversed but are made simultaneous and reciprocal. A response does not merely follow a stimulus as output follows input but is 'a neat and efficient way of selecting the *next* input, driving a rolling cycle.'<sup>587</sup>

The predictive brain also seems to challenge the law of direction of thought through its implicit reliance on a simultaneity of forward and backward movement, where connections carry predictions of expected activity 'backward' to explain current sensation at the same time as predictions carry and shape future motoric action. There must then be a bidirectional network and Clark will give some theories as to how this could be neurally implemented in vision:

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<sup>585</sup> Clark, *Surfing Uncertainty*, 170.

<sup>586</sup> Pezzulo, 'Anticipation and future-oriented capabilities,' 75.

<sup>587</sup> Clark, *Surfing Uncertainty*, 52.

In the visual cortex, such a scheme suggests that backward connections from V2 to V1 would carry a prediction of expected activity in V1, while forward connections from V1 to V2 would carry forward the error signal indicating residual (unpredicted) activity.<sup>588</sup>

Although passivity continues to be aligned with disorder, entropy and contingency this actually has positive effects in its challenge to over-deterministic computational models as that which evades computation, being too complex and uncertain. Activity is reconceived as error, the difference between sensation, model and movement, an error arising from uncertainty from an ever-changing world and self. Activity thus manifests world and model in the model's errors. Moreover, agency is now not substantial or identity-based but differential. Agency as error manifests a passive, implicit model at the same time as active kinetics work with passive dynamics in rolling, reciprocal transformations. This is how an active and passive δύνναμις is being challenged by contemporary computational neuroscience by reconceiving the very notion of active and passive: not as a coupled opposite of acting on / being acted on but as a simultaneous action as error with implicit models that together motivate can compel as the evolving difference between organism and world.

But the extent to which affect and emotion remains within a computational model depending on traditionally conceived active and passive (fear causes me to do something / something causes fear in me) is the extent to which this past metaphysics has not yet been fully overturned.<sup>589</sup> For if it is the *feeling* of surprise, the *feeling* of prediction error that binds the active manifesting of passive models, this vague experience of feeling is itself the difference and as such does not strictly belong in a computational, mechanistic account that would reduce it to succession. Instead, an affect *is* this binding, a non-causal co-touching that is neither active nor passive (one does not bind, the other bound) but precedes, accompanies or produces the successive active-passive, cause-effect, etc and begins as a vague feeling of the difference between expectation and actuality that can manifest the implicit model we used to predict our actions. Thus this feeling of difference is a route to novelty, learning and change, disturbing no doubt but necessary to avoid the quiet, dark room. Let us turn now to affective neurobiology and its challenge to a more computational neuroscience to see if this affect as difference, as binding can be further manifested.

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<sup>588</sup> Clark, *Surfing Uncertainty*, 31.

<sup>589</sup> There is even a horrendous project of 'Affective Computing' that seeks to computationally model affects! See Picard, 'Affective Computing.'

## 8

**AFFECTIVE NEUROBIOLOGY**

This final chapter turns to affective neuroscience for the difference it produces to the more computational theories of the previous chapter. We will see a similar focus on plasticity but this time with a specific focus on ‘emotional circuits’ and their possibilities for change through interaction with evolutionary newer parts. Affective neuroscience continues to affirm a contingency in the organism but this is now explicitly conceived using concepts of emotion, feeling and affect as discrete, finite, qualitative states. Feeling describes the experience of differences between emotional and other more ‘cognitive’ circuits whilst affect describes this differential binding of organism with its environment and itself in its affecting of the organism. The specificity of affect manifested in affective neurobiology is thus that affect is implicitly auto-affectation: affects are only affects to the extent they affect the organism in its interaction with its environment.

**ORIGINS OF ‘AFFECTIVE NEUROSCIENCE’**

The term ‘affective neuroscience’ was coined by Jaak Panksepp in 1992.<sup>590</sup> The need to create and name a separate discipline arose from Panksepp’s felt need for something that would synthesise behavioural, psychological and neurological perspectives. Ethology had come close but had not taken into consideration brain mechanisms whilst behaviourism did not deal with the innate sources of behavioural variation susceptible to modification via contingencies in the environment.<sup>591</sup> Meanwhile, cognitive science tended to ignore the emotions. What was missing in all these disciplines, and what affective neuroscience sought to combine, was:

a neurological understanding of the basic emotional operating systems of the mammalian brain and the various conscious and unconscious internal states they generate.<sup>592</sup>

This perceived neglect of emotion was of course specific to Panksepp’s time. Emotions had been a topic during the period 1890s to 1930s during which science tended to view the emotions as physiological, non-intentional or non-cognitive processes such as William

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<sup>590</sup> Panksepp, ‘Critical role for “affective neuroscience.” ’

<sup>591</sup> Panksepp, *Affective Neuroscience*.

<sup>592</sup> *Ibid.*, 5.

James's essay *What is an Emotion?* although not all agreed with this view.<sup>593</sup> Scientific study of the emotions then diminished in the period post 1930s, a marginalization some link to a post war rationalization that associated Nazism with 'excessive emotionalism' such that emotions 'appeared largely as symptoms or causes of political and social pathologies.'<sup>594</sup> For example, Wehler, writing in 1980, argued, 'for those generations who had experienced the Second World War, flight, and the postwar period, the control of affects was an indispensable precondition of physical and psychological survival.'<sup>595</sup>

Behaviourism then arrived in the 1960s which many saw as dealing the death blow for the scientific study of emotions. Skinner, for example, described emotions as 'excellent examples of the fictional causes to which we commonly attribute behaviour' and 'as a particular state of strength or weakness in one or more responses induced by any one of a class of operations.'<sup>596</sup> It tended to treat emotions as conditioned responses to external stimuli, not as causes: it is not helpful, Skinner argues, to say someone's behaviour is due to frustration or anxiety, 'we also need to be told how the frustration or anxiety has been induced and how it may be altered.'<sup>597</sup>

There were exceptions to this narrative of course. Hebb, for example, discussed emotions in his 1949 work *The Organisation of Behaviour*. Hebb argued emotion, in its traditional significance, is not a particularly useful term as 'it does not refer to a special kind of event in consciousness,' 'an immaterial awareness' that should not be attributed causal agency.<sup>598</sup> Instead, Hebb sought a materialist account of emotion as 'the neural process that is inferred from and causes emotional behaviour, with no reference to consciousness.'<sup>599</sup> Hebb paid particular attention to the inherent organizing and motivating nature of emotions and their capacity to integrate or disintegrate, a difference mostly determined again by quantity of emotion. Moderate emotion generally integrates, extreme emotion disorganises and disrupts: 'strong emotional disturbance tends to prevent the repetition of any line of thought that leads up to it, and to eliminate the corresponding behaviour.'<sup>600</sup> Hebb therefore believed we should separate those emotions which tend to maintain or increase the original stimulating conditions

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<sup>593</sup> See Dixon, *Passions to Emotions*, 212-23.

<sup>594</sup> Biess and Gross, *Science and Emotions*, 1-2.

<sup>595</sup> Cited in Biess and Gross, *Science and Emotions*, 4.

<sup>596</sup> Skinner, *Science and Human Behaviour*, 160; 166.

<sup>597</sup> *Ibid.*, 167.

<sup>598</sup> Hebb, *Organization of Behaviour*, 237-8.

<sup>599</sup> *Ibid.*, 148.

<sup>600</sup> *Ibid.*, 255.

(‘pleasurable or integrative emotions’) and those which tend to abolish or decrease the stimulus (‘rage, fear, disgust,’ disintegrative).<sup>601</sup>

The study of emotions returned notably with Silvan Tomkins and the publication of his series *Affect Imagery Consciousness* beginning in 1961. Tomkins argued that both behaviourism and psychoanalysis had neglected the study of consciousness as well as grossly underestimated the role of affect:

we might speculate that the phenomena of consciousness might possibly never have been so neglected had the problem been restricted to determining what another human being thinks. It is rather knowing how he *feels* that has been most strikingly avoided.<sup>602</sup>

Tomkins sought to build on Darwin’s theory that there were evolutionary, basic emotions with their expression which could be scientifically studied. He splits the organism into two systems: a primary affect system, ‘the primary provider of blueprints for cognition, decision and action,’ and a secondary drive system. Tomkins sees duplication as the primary characteristic of living systems, ‘a transformation process in the service of a specific aim, the rebuilding of an identity’ giving examples of the replacing of old information about the ever-changing environment, injured cells or tissues which must be regenerated.<sup>603</sup> This ability to duplicate and reproduce itself is then guaranteed ‘not only by a responsiveness to drive signals but by a responsiveness to whatever circumstances activate positive and negative affect.’<sup>604</sup>

Tomkins influenced another researcher, Paul Ekman who similarly claimed a set of discrete, ‘basic’ emotions universally expressed in similar facial expressions which was also a reaction against anthropologists like Margaret Mead and Gregory Bateson who argued for a more relativist position that emotions and their expressions varied from society to society.<sup>605</sup> This debate, arising within different disciplines with different approaches, will doggedly haunt the field as a claimed difference between essentialism and constructionism. This chapter, however, will focus on the turn to affect in the 1990s in the specifically neurobiological sciences focusing on the neurobiologists Damasio, LeDoux and Panksepp.

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<sup>601</sup> Ibid., 240.

<sup>602</sup> Tomkins, *Affect Imagery Consciousness*, 1: 4.

<sup>603</sup> Ibid., 5.

<sup>604</sup> Ibid., 13.

<sup>605</sup> See Ekman, ‘Afterword’ in Darwin, *Expression of Emotions*, 363-396.

## AFFECTIVE NEUROSCIENCE'S CLAIMS

### *Defining terms: emotion, feeling and affect*

We begin first with the problem of how the key concepts affect, emotion and feeling are understood in each thinker. Damasio expends most effort on repeatedly and consistently defining his terms. Throughout his work the key distinction is between emotion and feeling where feeling is the experience or perception of emotional changes. These emotional changes are complex collections of chemical and neural responses forming distinctive patterns; automatic responses to 'emotionally competent stimuli' that can be objects or events in actual or mental recall. The result of these changes are a change in the state of the body and in the state of the brain structures that map the body: 'a feeling is the perception of a certain state of the body along with the perception of a certain mode of thinking and of thoughts with certain themes.'<sup>606</sup> In essence, feeling is an idea of the body: 'a feeling of emotion is an idea of the body when it is perturbed by the emoting process.'<sup>607</sup> One difficulty of understanding Damasio's distinction between emotion and feeling is that names for emotions typically refer to both the emotion and the *felt* emotion:

the felt experiences of emotions are unfortunately known by exactly the same name as the emotions themselves. This has helped perpetuate the false notion that emotions and feelings are one and the same phenomenon, although they are quite distinct.<sup>608</sup>

Affect for Damasio, drawing on Spinoza, is also differentiated from feeling and emotion: 'Spinoza saw drives, motivations, emotions, and feelings—an ensemble Spinoza called affects—as a central aspect of humanity.'<sup>609</sup> Emotion and feeling therefore describe different events in the process of 'being affected' and, once studied separately, can be re-joined as affect. Damasio's definition of terms is therefore, in part, to enable a research intention: 'in order to understand the entire set of affective phenomena, it is helpful to break components apart, study their operations, and discern how those components articulate in time.'<sup>610</sup> And so, 'the unified and apparently singular process of affect, which we often designate casually and indifferently as emotion or feeling, can be analysed in parts.'<sup>611</sup>

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<sup>606</sup> Damasio, *Looking for Spinoza*, 86.

<sup>607</sup> *Ibid.*, 88.

<sup>608</sup> Damasio, *Strange Order of Things*, 100.

<sup>609</sup> Damasio, *Looking for Spinoza*, 8.

<sup>610</sup> *Ibid.*, 133.

<sup>611</sup> *Ibid.*, 27.

Panksepp does not discuss definitions at great length but they can be interpreted from his use of the terms. Similar to Damasio, affect for Panksepp is differentiated from emotion and feeling. Panksepp clarifies the difference between emotion and feeling in functional terms:

The core function of emotional systems is to coordinate many types of behavioural and physiological processes in the brain and body. In addition, arousals of these brain systems are accompanied by subjectively experienced feeling states that may provide efficient ways to guide and sustain behaviour patterns, as well as to mediate certain types of learning.<sup>612</sup>

Panksepp's problem with behaviourism becomes apparent in his concept of affect in its difference to emotion and feeling. He emphasises that the brain affects itself and argues that behaviourism would have treated this auto-affection as a black box. Instead, he insists, we must find evidence of this self-affection for this is key to emotional behaviour. For Panksepp, there are emotional affects, homeostatic affects (like hunger and thirst) and sensory affects (like sweetness and bitterness).<sup>613</sup> We can therefore say an affect is an affect to the extent emotion, homeostasis or sensation *affects* the organism.

LeDoux defines emotions as 'biological functions of the nervous system,' brain processes that determines the value of a stimulus.<sup>614</sup> A feeling then follows as we become aware that we are in an emotionally arousing situation and have taken action: 'emotional actions, in other words, occur when emotions motivate us to do things.'<sup>615</sup> LeDoux gives a recent summary of his view on the difference between emotion and feeling:

emotions are feelings, and feelings are cognitively created conscious experiences. The other factors that contribute to feelings, such as arousal, body feedback, and so forth, are non-emotional ingredients that are neither necessary nor sufficient for an emotional experience.<sup>616</sup>

One of these 'emotions' (which LeDoux will later rename 'survival circuits') is the fear system, understanding of which is perhaps what LeDoux is most known for. He had traced the fear response from sensory inputs through to motor outputs, the contribution it makes to the construction of conscious experience and, through seeking the essential plasticity in this circuit, the extent to which it can be moderated.

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<sup>612</sup> Panksepp, *Affective Neuroscience*, 15.

<sup>613</sup> Panksepp and Biven, *Archaeology of Mind*, 18.

<sup>614</sup> LeDoux, *Emotional Brain*, 12.

<sup>615</sup> LeDoux, *Synaptic Self*, 206.

<sup>616</sup> LeDoux, 'Afterword' in Barrett and Russell, *Psychological Construction of Emotion*, 462.

LeDoux does not seem to differentiate affect and emotion, often using the terms interchangeably.<sup>617</sup> But he does, like Panksepp, use the verb affect to describe the brain affecting itself, for example: ‘there are many subtle ways in which disruptions in electrical and chemical functions can adversely affect a brain region, with lesions being just an extreme example of this.’<sup>618</sup>

It seems that all three authors share a common conceptual apparatus that is perhaps radically different to prior scientific understanding. Emotion is conceived as discrete circuitry in the brain, relatively hardwired and innate although the plasticity in these circuits is sought through their coexistence (and not absolute separation) with the rest of the brain. Feeling is then the experience of these (and other) changes, the experience of self-difference. Affect itself, whilst often seemingly synonymous with emotion, feeling, sensation or homeostasis differentiates itself through its capacity to act as both noun and verb enabling the authors to draw out their critique of previous theories by insisting affect is only affect to the extent it affects the organism. The conflation of affect with emotion thus arises from affect’s capacity as noun and verb, and the rarity of emotion’s verb ‘to emove,’ to construct such phrases as ‘emotion affects the organism.’ This contributes to the understanding that emotion *is* an affect which it is, but so is sensation and homeostatic functions. Likewise, feeling as noun and verb describes the organism’s feeling this affecting itself prior to any more explicit, conceptual understanding of these affections. Damasio makes repeated use of the verbs: ‘the representations known as feelings are *felt*, and we are *affected* by them’;<sup>619</sup> and:

Objects and events do ‘play,’ in the sense that they, as distinct entities within the organism’s mind, can act on certain neural structures of the organism, ‘affect’ their state, and change those other structures for a passing moment.<sup>620</sup>

Similarly, Panksepp insists that emotional processes affect the processes they participate in:

A central, and no doubt controversial, tenet of affective neuroscience is that emotional processes, including subjectively experienced feelings, do, in fact, play a key role in the causal chain of events that control the actions of both humans and animals.<sup>621</sup>

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<sup>617</sup> LeDoux, *Emotional Brain*, 54.

<sup>618</sup> LeDoux, *Emotional Brain*, 250.

<sup>619</sup> Damasio, *Strange Order of Things*, 180.

<sup>620</sup> *Ibid.*, 147.

<sup>621</sup> Panksepp, *Affective Neuroscience*, 14.

If affect describes this affecting, their concept of affect is therefore implicitly auto-affectation. As we will see, this implicit auto-affective sense will often be neglected in other psychological, constructionist or anthropological critiques.

*Basic emotions and their circuits: are basic emotions plastic?*

The conception of emotions as circuits that affect the organism required first naming the phenomena of emotions then seeking evidence for their existence through experimentation utilising the neurobiologist's specific understanding of brain anatomy and, more importantly, the connectivity and plasticity between regions. This also required a conceptual view of the brain mainly derived from evolutionary principles. Panksepp, for instance, argues for the 'triune brain' model that sees the brain as three in one, a trinity in unity: the neomammalian, old mammalian, and reptilian brains which are hierarchically organised: higher functions can only operate on the basis of lower functions but these lower functions can operate independently of higher functions.<sup>622</sup> This split is necessary for the study of how the brain differs from itself, how evolutionary or instinctual processes in the brain interact with the tertiary, higher, cultural parts of the brain that are more adaptable and mostly learned. Panksepp believes there are primitive emotional affects below neocortical areas, the cultural centre where all is learned. But the naming of these emotions that they seek in the brain will be much criticised with accusations of conflating cultural and biological categories.

Panksepp, for example, insisted on evidence that there exists in ancient subcortical regions of mammalian brains *at least* seven basic affective systems – 'at least' because more will be discovered, or existing ones qualified. Panksepp names these: SEEKING, FEAR (anxiety), RAGE (anger), LUST (sexual excitement), CARE, PANIC/GRIEF and PLAY. He uses the upper case to signify he is using the terms 'in a scientific rather than simply a vernacular way.'<sup>623</sup> Yet they nevertheless bear a relation to the vernacular usage and Panksepp defends his choice of cultural terms: 'the common emotional words we learned as children—being angry, scared, sad, and happy—can serve the purpose better than many psychologists are inclined to believe.'<sup>624</sup> This leads Panksepp to claim:

At the empirical level, we can presently defend the existence of various neural systems that lead to the limited set of discrete emotional tendencies [...] I will argue that a series of basic emotional processes arises from distinct neurobiological systems

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<sup>622</sup> Ibid., 70.

<sup>623</sup> Ibid., 51.

<sup>624</sup> Ibid., 82.

and that everyday emotional concepts such as anger, fear, joy, and loneliness are not merely the arbitrary taxonomic inventions of noncritical thinkers.<sup>625</sup>

Panksepp defined six criteria for defining a circuit as emotional:

The underlying circuits are genetically predetermined and designed to respond unconditionally to stimuli arising from major life-challenging circumstances.

These circuits organise diverse behaviours by activating or inhibiting motor subroutines and concurrent autonomic-hormonal changes that have proved adaptive in the face of such life-challenging circumstances during the evolutionary history of the species.

Emotive circuits change the sensitivities of sensory systems that are relevant for the behavioural sequences that have been aroused.

Neural activity of emotive systems outlasts the precipitating circumstances.

Emotive circuits can come under the conditional control of emotionally neutral environmental stimuli.

Emotive circuits have reciprocal interactions with the brain mechanisms that elaborate higher decision-making processes and consciousness.<sup>626</sup>

These neatly convey the main tenets held by all three neurobiologists: that emotion circuits are the more evolutionary determined and genetically programmed parts of an organism that dictates innate responses to its environment but which, due to their co-existence with newer, more adaptive systems, create the conditions for cultural change and moderation of these circuits through a plastic auto-affection that is reciprocal and ongoing.

But evidence for the triune brain is controversial. LeDoux, for example, considers the emotional brain from an evolutionary perspective but disagrees with the triune model because so-called primitive creatures *do* have areas which meet functional and structural criteria for a neocortex:

it is no longer possible to say that some parts of the mammalian cortex were older than other parts. And once the distinction between old and new cortex breaks down, the whole concept of mammalian brain evolution is turned on its head. As a result, the evolutionary basis of the limbic lode, rhinencephalon, visceral brain, and limbic system has become suspect.<sup>627</sup>

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<sup>625</sup> Ibid., 93-4.

<sup>626</sup> Ibid., 49.

<sup>627</sup> LeDoux, *Emotional Brain*, 100.

LeDoux does, however, maintain an internal difference in brain systems that underlie certain emotional behaviours which have been preserved through many levels of brain evolution. Circuits in the brain may also have been conserved across species. Each neural emotional system evolved to face an ancestral survival behaviour. Despite the trillions of possibilities of connection, very systematic patterns of interaction exist between neurons which can determine which areas receive inputs and which give outputs. For example, LeDoux concentrated on a ‘fear system.’ He tested things like damage to the auditory cortex which, if it prevented the flow of fear, was deemed to be essential to that system. His study of the pathways in fear revealed a ‘low,’ ‘quick and dirty’ path from the sensory thalamus to the amygdala that can trigger rapid action in the face of a threat, and a second ‘high’ road through the sensory cortex that allows more considered reactions. It is important to note that these two happen *at the same time* yet are of different speeds, one faster, the other slower.

In regard to the problem of naming these phenomena, LeDoux prefers to name special adaptive behaviours that would mirror the basic emotions. He is not, however, interested in coming up with a list but is concerned with drawing a line between biologically derived and socially constructed behaviours with this distinction between social and biological stemming from differences in relative plasticity, i.e. activity dependent (social) or homeostatically determined (biological), differences ultimately in speed, adaptability and capacity for change.

Despite their hardwired, evolutionary intact systems, each author admits these circuits are *part* of the organism, not a whole, with the whole arising from interaction between these systems and more adaptive parts through the plasticity of the brain. This will be something their many critics in the humanities neglect: a *pars pro toto* error. The question is providing evidence for interaction and the extent of their plasticity, something that can only be done by first naming and studying these circuits, a possibility because brains develop initially from homeostatic genes that dictate similar brain structures and connectivity. Here is Panksepp:

Although emotional circuits, as many other brain systems, exhibit considerable plasticity during the life span of organisms, the initial issue is identification of the genetically dictated emotional operating systems that actually exist in the brain.<sup>628</sup>

Similarly, LeDoux argues:

Genes give us the raw materials out of which to build our emotions. They specify the kind of nervous system we will have, the kinds of mental processes in which it can

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<sup>628</sup> Panksepp, *Affective Neuroscience*, 3.

engage, and the kinds of bodily functions it can control. But the exact way we act, think, and feel in a particular situation is determined by many other factors and is not predestined in our genes. Some, if not many, emotions do have a biological basis, but social, which is to say cognitive, factors are also crucially important. Nature and nurture are partners in our emotional life. The trick is to figure what their unique contributions are.<sup>629</sup>

Finally, Damasio:

the idea of a 'brain module' that would cause the emotive responses that lead to the feeling of delight, while another module would produce disgust, is no more correct than the idea that there is an emotive control panel with buttons for every emotion. The idea that the delight or the disgust would be a replica of each other at every new instantiation is also incorrect. On the other hand, the nature of the delight and the machinery that underlies its appearance are sufficiently comparable from instance to instance that the phenomena are easily recognizable in everyday experience and are traceable, albeit not rigidly, to certain brain systems, planted there by the grace of natural selection with the help of our genes and with more or fewer jitters from the environments of the womb and infancy. To say that emotivity is fixed, however, would be an exaggeration. All manner of environmental factors can modify the emotive deployment as we develop.<sup>630</sup>

Again it is a question of what remains the same across change, what relatively fixed standpoint to choose from which to observe difference. Where some focus on time or space as the unchanging, here it is emotion as the more hardwired or slow to change parts of the nervous organism. Its relation to change is then affect. Affect thus conceptualizes possibilities of bindings to effect change, of what can affect what to what effect. Panksepp believes there is little evidence about these interactions as the newer levels are hard to study in animals and because 'specific cognitions do not have the clear-cut neural pathways that primal emotions have.'

*Synthesis: integrating emotion, reason and the 'self'*

This question of interaction between emotional circuits and their other is often described as the question of the relation of emotion to cognition or reason. Damasio will notably challenge the idea that reason is clouded by emotion although such a view is not necessarily new to him; the cognitive function of emotions had been argued already by many others.<sup>631</sup>

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<sup>629</sup> LeDoux, *Emotional Brain*, 137.

<sup>630</sup> Damasio, *Strange Order of Things*, 113.

<sup>631</sup> For example, De Sousa, Lazarus, Nussbaum, Solomon, and Pinch.

But what was new was the attempt to provide specifically neurobiological evidence for this view.

Damasio's argument is that reason is not purified of emotions: 'emotions and feelings are not intruders to reason but enmeshed with it.'<sup>632</sup> His view arises from his theory that 'the essence of a feeling may not be an elusive mental quality attached to an object, but rather the direct perception of a specific landscape: that of the body.'<sup>633</sup> It is therefore the state of the entire body, its tensions, relaxations, stresses, in being affected by an object that influences decision-making not some impartial reason evaluating the object in separation from the body:

That the body, as represented in the brain, may constitute the indispensable frame of reference for the neural processes that we experience as the mind; that our very organism rather than some absolute external reality is used as the ground reference for the constructions we make of the world around us and for the construction of the ever-present sense of subjectivity that is part and parcel of our experiences.<sup>634</sup>

The 'implicit model' of Prediction Processing theory is echoed here in the idea that an organism's representation of reality rather than reality itself drives action. Damasio's terms his theory the 'somatic marker hypothesis,' evidence for which comes mainly from an experiment in which six patients with prefrontal brain damage and ten 'normals' performed a gambling task during which behavioural, psychophysiological, and self-report measures were recorded.<sup>635</sup> The gambling task, called the Iowa Gambling Task (IGT), involved giving participants a loan of \$2000 and asking them to select a card from one of four decks differently advantageous, some incurring large rewards and large losses, some small wins, small losses. Only two packs resulted in an overall gain. Participants were required to realise that, despite large gains in two decks, their larger penalties would eventually lead to an overall loss. Participants had no way of predicting when a penalty card would come, no means of calculating the overall net gain or loss, and no advance knowledge of how many cards they would turn over (play was eventually stopped after 100 cards).

Performance on the game in terms of how many cards taken from the good and bad decks was monitored, skin conductance responses (SCRs, theorised to be a measure of autonomic and emotional arousal) were recorded and, after 20 successive card turns, subjects were asked to report the basis for their decisions and how they conceptualised the game. The aim of the

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<sup>632</sup> Damasio, *Descartes' Error*, xii.

<sup>633</sup> *Ibid.*, xiv.

<sup>634</sup> *Ibid.*, xvi.

<sup>635</sup> Bechara et al., *Deciding Advantageously*.

experiment was to determine whether subjects were choosing from the advantageous decks before or after they had conceptualised the nature of the game.

Progress in the game was then split into four phases based on the results of these tests. The first, termed pre-punishment, was before subjects had sampled from each of the four decks but had not suffered any loss. No anticipatory SCRs were found. After experiencing a few losses, normal subjects started to generate anticipatory SCRs to the riskier decks. This phase was called the pre-hunch. Third, came the hunch phase – arriving at around card 50 for non-patients – where they expressed a hunch which decks were riskier. By around card 80, 7 non-patients expressed knowledge of why two decks were good or bad, termed the conceptual phase. No brain-damaged patient generated SCRs at any point during the game. The most surprising finding, though, is that the three patients who reached the conceptual level and correctly identified the good from the bad decks nevertheless continued to choose from the disadvantageous deck. The patients' behaviour failed to reflect their correct conceptual knowledge.

The authors interpret these results by proposing a theory of decision-making that involves two parallel but interacting events. Firstly, sensory representation of the situation triggers nondeclarative knowledge arising from an individual's prior emotional experience in similar situations. Memory of the losses sustained when sampling from bad decks is recalled each time the individual goes to sample from the bad deck. These memories activate autonomic and nonconscious signals which act as covert biases on the parallel process of cognitive evaluation of relevant, conscious facts and the application of decision-making strategies based again on prior experience of similar situations. The experiment, particularly the SCR results, showed that in non-patients, this covert bias operated before overt reasoning took place (measured by the subjects' reporting of their conscious awareness of the best strategy) and influences the decision that is taken. As the patients with lesions did not generate SCRs their behaviour on the task failed to operate in accord with their cognitive evaluation. It theorises the manifesting of implicit 'hunches' that are somatic and *felt* into consciously conceived understanding. Whilst this feeling precedes cognition, it nevertheless accompanies it as parallel but interacting events in the move of manifesting implicit bodily knowledge.

LeDoux similarly stresses the importance of emotion to decision making and to protect emotion from being 'consumed by the cognitive monster.' He again treats emotion and cognition as 'separate but interacting mental functions mediated by separate but interacting

brain systems.’<sup>636</sup> He draws this conclusion from several key findings: that brain damage to animals or humans prevents their ability to appraise the emotional significance of a stimuli whilst leaving the perceptual capacity to recognise the object intact; that an emotional meaning of a stimulus can be appraised before the perceptual systems – we can know something is good or bad for us before we know exactly what it is; and that ‘emotional memory’ is stored differently to cognitive memories and damage to the former prevents previous, emotionally experienced stimuli triggering present emotional reactions whilst damage to the latter reduces the ability to locate where and when and how we last saw the stimulus.<sup>637</sup>

Meanwhile Panksepp asked whether affects and cognitions are totally conflated. In response he insists on looking not just from the ‘top-down’ perspective of most philosophers and psychologists who believe they are totally conflated but from the perspective of an evolutionary ‘bottom-up’ view that insists on the possibility that ‘primary-process affects have an independent existence that goes back much further in MindBrain evolution than the brain processes typically subsumed by the concept of cognition.’<sup>638</sup> Panksepp’s view arises from his insistence on the necessity of studying these primary-process affects.

It is a question of the simultaneous distinction and union of emotion and cognition. Some critics (often in the humanities) will claim the three neurobiologists make an absolute separation between emotion and cognition, clearly a misreading of a more nuanced position given their conception of an organism as a unity of differential, affective bindings of emotion and cognition that are felt. This no doubt arises from the biological requirement of separating the organism into parts for research purposes. But, given the neurobiological understanding of brain anatomy and plasticity, how could they legitimately claim any absolute separation in a nervous organism, any analysis without synthesis?

Indeed, this analysis of parts is brought together in various theories of synthesis of emotional circuits with the rest of the organism. The question of synthesis asks how a coherent, agentive, conscious self arises from such a fragmentary and differential structure and emotions play a key role in this integration. LeDoux writes, emotional states monopolise brain resources and emotional arousal penetrates the brain widely, and perpetuates itself.’<sup>639</sup>

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<sup>636</sup> LeDoux, *Emotional Brain*, 68-70.

<sup>637</sup> Ibid.

<sup>638</sup> Panksepp, *Archaeology of Mind*, 490.

<sup>639</sup> LeDoux, *Synaptic Self*, 320.

This integration is achieved first through the plasticity inherent in the connectivity of these emotional circuits with memory formation but also in the form of bodily sensations from responses that give the ‘felt’ aspect of the emotion that further affects synaptic activity via the hormones released over a larger time scale than mere neuromodulators. So, ‘by coordinating plasticity throughout the brain, emotional states promote the development and unification of the self.’<sup>640</sup> For example,

monoamines produce global state changes in many brain areas simultaneously, such as the high degree of arousal occurring through the brain when we encounter a sudden danger or the low degree of arousal when we are going to sleep.<sup>641</sup>

Panksepp similarly views the core function of emotional systems to ‘coordinate many types of behavioural and physiological processes in the brain and body.’ Arousals of these systems are ‘accompanied by subjectively experienced feeling states that may provide efficient ways to guide and sustain behaviour patterns, as well as to mediate certain types of learning.’<sup>642</sup> Emotional systems, he adds, are ‘evolutionary tools to promote psychobehavioural coherence.’<sup>643</sup>

This integration also plays a key role in the creation of an autobiographical self. LeDoux states ‘you are your synapses’ – ‘your “self”, the essence of who you are, reflects patterns of inter connectivity between neurons in your brain.’<sup>644</sup> For Panksepp, primary-process consciousness will be defined as ‘that ineffable feeling of experiencing oneself as an active agent in the perceived events of the world.’<sup>645</sup> This feeling arises from ancient foundational emotional circuits that give neurosymbolic affective representations of a self critically linked to primitive motor representations in the brain stem. These ‘ancient and stable motor coordinates’ may provide a ‘self-referential coherence’ that is ‘the very foundation for the unity of all higher forms of consciousness.’<sup>646</sup> Similarly, in *The Feeling of What Happens*, Damasio argues for a nonconscious or automatic processing level, a ‘proto-self’ consisting of the nonconscious, homeostatic processes of the organism, ‘the ensemble of brain devices which continuously and nonconsciously maintain the body state within the narrow range and

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<sup>640</sup> Ibid., 322.

<sup>641</sup> Ibid., 58.

<sup>642</sup> Panksepp, *Affective Neuroscience*, 15.

<sup>643</sup> Ibid., 55.

<sup>644</sup> LeDoux, *Synaptic Self*, 2.

<sup>645</sup> Panksepp, *Affective Neuroscience*, 310.

<sup>646</sup> Ibid., 313.

relative stability required for survival.’ These processes ‘continually represent, nonconsciously, the state of the living body, along its many dimensions.’<sup>647</sup> Damage to these simple biological phenomena demolish the entire edifice of consciousness. The next level of consciousness, the core self, arises ‘when the brain’s representation devices generate an imagistic, nonverbal account of how the organism’s own state is affected by the organism’s processing of an object’ in the form of a feeling. The final, autobiographical self, the conscious ‘you’ then develops as a feeling of ‘the re-representation of the nonconscious proto-self in the process of being modified within an account which establishes the cause of the modification.’<sup>648</sup> This self is therefore ‘a feeling of a feeling.’<sup>649</sup>

But we are not conscious of all our feelings: many remain non-conscious, never to be conscious, such as homeostatic affects. Nor are feelings unequivocally correlated with conscious experience – feelings of anxiety or uncomfortableness, for example, may not have begun at the moment of knowing but sometime before. Feeling itself is a vague, uncertain experience that becomes autobiographical in its establishment of a cause of the modification, by an imposition or extraction of agent, notably the ‘I,’ but one which is always liable to error.

*Differential auto-affection qualifies the computational*

As we have seen, key to these thinkers is the differences in the nervous organism of relative evolutionary age of systems, connectivity and plasticity, differences in durations and speed of flow of energy through the system. For example, Panksepp argues ‘in terms of firing rates of neurons, cognitive-somatic territories are enriched in very highly firing neurons (e.g., hundreds of action potentials per second), while the affective-visceral ones abound in very slowly firing neurons (e.g., it is hard to find many that fire more than ten times a second).’<sup>650</sup> Damasio discusses the difference between fast myelinated and slow unmyelinated axons:

perception of the world external to our bodies—what we see, hear, and touch—is now in the well-insulated, fast, and secure hands of myelinated axons. So are the skilled and rapid movements we make out in the world, by the way, and so are the high-altitude flights of our thinking, reasoning, and creativity. Myelin-dependent axon firings are modern, fast, efficient, Silicon Valley like.<sup>651</sup>

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<sup>647</sup> Damasio, *Feeling of What Happens*, 22.

<sup>648</sup> *Ibid.*, 169.

<sup>649</sup> *Ibid.*, 29.

<sup>650</sup> Panksepp, *Archaeology of Mind*, 383.

<sup>651</sup> Damasio, *Strange Order of Things*, 132.

Yet homeostasis is ‘in the hands of the electrically leaky, slow, and ancient unmyelinated fibres’ such as fibres in the vagus nerve, ‘the main conduit of neural signalling from the entire thorax and abdomen to the brain’ which are almost all unmyelinated.<sup>652</sup> Damasio ventures to explain why this might be. First, unmyelinated fibres are more open to their surrounding chemical environments whereas modern, myelinated fibres ‘can only be acted on by a molecule at a few points along the axon.’<sup>653</sup> Secondly, there is an older form of communication in the nervous system, different to synaptic communication, called *ephapsis* which may ‘alter the recruitment of axons, for example, by amplifying the responses transmitted along nerve trunks.’<sup>654</sup> Damasio notes how attention to ephapsis is neglected for the focus on synapsis yet notes that the in the vagus nerve, the conduit from the thorax and abdomen to the brain are almost all unmyelinated. Lack of study of these mechanisms has meant aspects of the organism such as the gut and heart have been neglected as peripheral to the nervous system but it is actually central and more work needs to be done on this – this neglect arises for the same reasons as the neglect of feelings and emotions and the neglect of non-Hebbian plasticity mechanism for the safe and secure flows of Hebbian.

This introduces a spacing between two parallel systems: not only a difference in duration such that an emotional circuit continues processing an event beyond the cognitive system but also that different forms of communication and firing rates affect the interaction of computational synaptic Hebbian plasticity with the more complex *ephaptic*, diffusional (passive) processes of non-Hebbian plasticity. This necessary co-existence of the overtly computational aspects with its other is manifested by authors in their discussion of non-Hebbian *with* Hebbian plasticity, molecular passive transports *with* active neural transmissions. Or the digital with its other (the analogue?). Damasio writes:

because neurons can be described as active or not, their operation lends itself to a description in terms of Boolean algebra, zeros or ones. This is a core belief behind the idea of brains as computers. But microcircuit neural operations reveal unexpected complexities that undermine that simple view. For example, under certain circumstances, neurons can communicate to other neurons directly without using synapses, and neurons and the supporting glia also interact abundantly.<sup>655</sup>

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<sup>652</sup> Ibid., 225.

<sup>653</sup> Ibid., 226.

<sup>654</sup> Ibid., 227.

<sup>655</sup> Ibid., 64.

The body also has a say via the chemical molecules circulating in the blood which can achieve rapid, widespread modification of the organism and exert an influence at the level of the brainstem and cerebral cortices. Damasio recognises that a focus on these aspects undermines the dominance of the active-passive:

If there is no distance between body and brain, if body and brain interact and form an organismic single unit, then feeling is not a perception of the body state in the conventional sense of the term. Here the duality of subject-object, of perceiver-perceived, breaks down. Relative to this part of the process, there is unity instead. Feeling is the mental aspect of that unity.<sup>656</sup>

Yet Damasio recognises the necessity of the co-existence of unity with a split in that unity:

Duality does come back in, however, at a different point of the complex process of brain-body interaction. When images of the body frame and its sensory portals are formed, and when images of the spatial positions occupied by viscera are referred to that overall frame and placement within it, it becomes possible to generate a mental perspective of the organism, a set of separate images that is distinct from sensory images of the exterior (visual, auditory, tactile) and from the emotions and feelings they provoke. A duality sets in then, images of the ‘body frame and sensory-portal activity’ to one side and, to the other, the rest of the images, those of the exterior and of the interior.<sup>657</sup>

It is again a question of a simultaneous distinction and union, of transmission and blending *at the same time*:

Does the body really transmit information about its condition to the nervous system, or does the body blend in with the nervous system so that the latter can be continuously apprised of its status? ... each of these two accounts corresponds to a different age in the evolution of body-brain relationships and to different levels of neural processing. The blending-in account is the only way of describing how the old interior, using old functional arrangements, interweaves body and brain. The transmission account fits well the more modern aspects of brain anatomy and function and how they capture both the old and the not so old interior.<sup>658</sup>

These factors, Damasio insists, need to be factored into the scholarship on affect as a reciprocity between vague, blended areas of nervous activity co-existing with secure, causal, sequential flows.

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<sup>656</sup> Ibid., 126.

<sup>657</sup> Ibid., 126.

<sup>658</sup> Ibid., 128.

### CRITIQUE: ESSENTIALISM VERSUS CONSTRUCTIONISM AGAIN?

These three affective neuroscientists have been subjected to various critiques from within science and, perhaps most stridently, the humanities although the critiques from within science seem to have the most effect. Within psychology, Barrett criticises Damasio, LeDoux and Panksepp for holding a ‘basic emotions’ view that assumes a discrete set of emotions that can be referred to by their cultural names, located in neural circuitry. The problem with this, she claims, is they assume fear, anger and the like are ‘natural kinds’:

Scientists begin with emotion concepts that are most recognizably English, such as anger, sadness, fear, and disgust, and search for their elusive biological essences (i.e. their neural signatures or fingerprints), usually in subcortical regions. This inductive approach assumes that the emotion categories we experience and perceive as distinct must also be distinct in nature.<sup>659</sup>

Her response is that mental categories rarely reveal the way the natural world works and so she claims to ‘turn the typical inductive approach on its head’ and begin not with such mental categories but ‘with the structure and function of the brain’ and from there, ‘deduce what the biological basis of emotions might be.’ Her alternative will be a theory of ‘constructed emotion’ based on her division of the entire history of theories of human mind into two neat categories: ‘faculty psychology’ and ‘psychological construction.’<sup>660</sup> The first understands the mind as ‘a collection of separate and independent abilities, or faculties, that reflect separate processes, each with its own distinct physical properties that are innate (neurons in a brain region, a modular brain circuit, or bodily correlate).’<sup>661</sup> It is a form of ‘psychological essentialism’ whereby categories human name are expected to have a metaphysical or biological essence that makes them what they are. This theory has driven neuroscience too: ‘for much of its history, neuroscience has used faculty psychology assumptions to understand the functional architecture of the human brain.’<sup>662</sup> The problems of defining emotion and agreeing a list of basic emotions then arose because this approach assumed ‘the components (nonverbal expressions, physiological changes, etc.) in an emotional episode are caused by and therefore explained by a common agent behind them, the essence of each emotion.’<sup>663</sup>

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<sup>659</sup> Barrett, ‘Theory of Constructed Emotion,’ 1.

<sup>660</sup> *Ibid.*, 1.

<sup>661</sup> *Ibid.*, 2.

<sup>662</sup> *Ibid.*, 2.

<sup>663</sup> *Ibid.*, 4.

Whereas ‘psychological construction’ eschews essentialism and understands the mind as ‘an ongoing stream of mental activity, or sequences of *mental states*, that are caused by a set of *common or domain-general processes* (with physical properties left unspecified).’<sup>664</sup> In this account, emotional events emerge from more basic processes. She acknowledges James as an early constructionist who rejected the ‘common-sense presupposition that each emotion word names a physical category, with a physical essence, and a power specifically and mechanistically to cause certain predetermined changes in behaviour.’<sup>665</sup> James instead proposed emotions are ‘like rapids and eddies in a river, to be understood as disturbances and agitations in an unbroken stream of thought, which one studies by examining the forces and conditions that produce such changes in the flow.’<sup>666</sup> Barrett’s core assumption is ‘each emotional episode is constructed rather than triggered.’<sup>667</sup>

Within humanities, perhaps the most notable critic is Ruth Leys in three much cited articles and recent book.<sup>668</sup> Hers is mainly a critique of the experimental contributions of psychology to affect theory. Leys similarly makes a binary, this time between Ekman (and his predecessor Tomkins) as the arch-villain with his proposal of a set of basic emotions such as fear, anger, disgust, etc. which are manifested in distinct physiological expressions of authentic emotional experience, localised in specific brain areas and seemingly independent of or unmediated by cognitive or other intentional states (faculty psychology in Barrett’s terms). The hero of the book is Fridlund who had studied under Ekman but eventually opposed Ekman’s conclusions. Fridlund instead offered a ‘behavioural ecology view’ that portrays emotions as ‘meaningful behaviours that have evolved in order to communicate motives in an ongoing interpersonal or interindividual context or transaction.’<sup>669</sup> Emotional displays cannot then be regarded as ‘readouts of internal states but as intentional movements serving various social motives.’<sup>670</sup> Instead, Fridlund replaces sets of basic emotions like anger, etc:

there may be one dozen or one hundred ‘about to aggress’ displays appropriate to the identities and relationships of the interactants, and the context in which the interaction

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<sup>664</sup> *Ibid.*, 1.

<sup>665</sup> *Ibid.*, 5.

<sup>666</sup> *Ibid.*, 5.

<sup>667</sup> *Ibid.*, 5.

<sup>668</sup> Leys, ‘Turn to Affect,’ ‘You and Me both disgusted,’ ‘How did Fear become a Scientific Object’ and *Ascent of Affect*.

<sup>669</sup> Leys, *Ascent of Affect*, 470-1.

<sup>670</sup> *Ibid.*, 233.

occurs. The topography of an ‘about to aggress’ display may depend on whether the interactant is dominant or nondominant, conspecific or extraspecific, and whether one is defending territory or young, contesting for access to a female, or retrieving stolen food or property.<sup>671</sup>

Leys’s binary of Ekman and Fridlund is then used to divide the whole of affect theory into two camps: noncognitivists (Tomkins, Ekman and anyone who uses their methodology or stress the importance of bodily changes and subpersonal processes) and cognitivists (appraisal psychologists, social constructionists, best typified by Fridlund who stress the intentionality of emotions). Leys also describes this as a choice between intentionalism (Fridlund) and anti-intentionalism (everyone else) and claims anti-intentionalists see affect as ‘independent of signification and meaning.’<sup>672</sup> This view derives from her reading of Deleuzian inspired affect theorists like Massumi who, she claims, define affect as ‘noncognitive, subpersonal, or corporeal processes or states.’<sup>673</sup> Although this definition might seem to place them at odds with the work of Tomkins, Ekman and Damasio, Leys argues ‘there is in fact a deep coherence between the ideas of both groups’:

That coherence concerns precisely the separation presumed to obtain between the affect system on the one hand and intention or meaning or cognition on the other. For both the new affect theorists and the neuroscientists from whom they variously borrow— and transcending differences of philosophical background, approach, and orientation— affect is a matter of subpersonal, autonomic responses that are held to occur below the threshold of consciousness and cognition and to be rooted in the body.<sup>674</sup>

Both Leys and Barrett’s critique make reductive characterisations of the ‘enemy’ in order to separate themselves from this other yet actually risk falling prey to the very critique they identify. With both, the characterisation of the other is that they claim an absolute separation between two entities without any attention to their interaction. With Barrett, ‘faculty psychology’ is seemingly only interested in separating out faculties with no attention to their integration. With Leys, non-cognitivists absolutely separate affect and cognition. But these critiques risk becoming merely another example of the absolute separation they claim to abhor: both Leys and Barrett make an absolute separation between two camps without due

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<sup>671</sup> Fridlund, *Human Facial Expression*, 128-29.

<sup>672</sup> Leys, *Ascent of Affect*, 315.

<sup>673</sup> *Ibid.*, 310.

<sup>674</sup> *Ibid.*, 315.

attention to their interrelation and then attack one side for making absolute separations without attending to their interrelation.

This reductive digitalisation is exacerbated by lack of attention to the differing definitions and distributions of the key concepts affect, emotion and feeling. Barrett, for example, treats affect as *part* of the organism, in its influence on a person's body state. The affective reaction is then 'one component of the prediction that helps a person see the object.'<sup>675</sup> And Leys claims neurobiologists effect an absolute separation between affect and cognition. Yet, the neurobiologists studied here posit *emotion*, not affect, as opposed to cognition and affect as their affective integration; for example, Damasio's repeated and consistent understanding of affect as *ensembles* of drives, motivations, emotions and feelings, and the 'unified and apparently singular process of affect.'<sup>676</sup> Leys seems to ignore this definition and even refers to Damasio's distinction between emotion and feeling as 'idiosyncratic.'<sup>677</sup> Finally, affect and feeling in verb form and the sense of affect as auto-affection is neglected.

Their critiques then proceed to a near exclusion of the other discipline, neurobiology. Barrett acknowledges this criticism when she states in a co-edited collection that the aim of the collection is to 'bridge psychological construction to other levels of analysis (and countering the mistaken assumption that any biological evidence on the nature of emotion is support for a faculty psychology view).'<sup>678</sup> The first essay in this collection apparently then counters the 'misunderstanding' that the goal of psychological construction 'is to deny emotions any biological reality or to define them out of existence.'<sup>679</sup> Barrett claims a 'construction' in which physical properties of the mind as stream of activity are left unspecified but seemingly leaves little possibility that that construction might be constructed out of these physical properties and, at a higher composite level, the faculties, evidence for which could be provided by neurobiology.

Leys is more explicit in her exclusion of neurobiology:

the answer to the question of how people and nonhuman animals behave is to be found by studying their interactions in their natural-social settings without recourse to

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<sup>675</sup> Barrett and Bar, 'See it with feeling,' 1331.

<sup>676</sup> Damasio, *Looking for Spinoza*, 8.

<sup>677</sup> Leys, *Ascent of Affect*, 126.

<sup>678</sup> Barrett and Russell, *Psychological Construction of Emotion*, 5-6.

<sup>679</sup> *Ibid.*, 8.

explanations based on the existence of hypothetical internal causal entities, processes, or mechanisms.<sup>680</sup>

And further, that

in the field of emotion research there is no intellectually viable alternative to Fridlund's position, whatever the cost may turn out to be to many of the existing 'scientific' studies of emotion.<sup>681</sup>

This exclusion means Leys cannot appreciate that any absolute separation between 'affect and cognition' would be neurobiologically unsustainable, something a more careful consideration of the concepts of plasticity, Hebbian and non-Hebbian, within an organismal *unity*, would show. Indeed, plasticity is mentioned only four times in Leys' book – twice in relation to Fridlund's cultural expression of emotions as 'highly plastic social and communicative signals' and twice in relation to neural mechanisms. One mention is in a quote from Tomkins that links plasticity of the affective system with "ambiguity and error" arising from Tomkins's "radical dichotomy between the 'real' causes of affect and the individuals' own interpretations of these causes."<sup>682</sup> This possibility of error will be interpreted as anti-intentionalist: 'the idea of life's essential errancy informed an explicitly anti-intentionalist account of the affects.'<sup>683</sup> The second mention of plasticity is in a critique of Smail's *On Deep History and the Brain* which emphasises plasticity in the interaction between LeDoux's and Damasio's theory of emotional circuits and cultural norms and conventions. But, again, Leys reduces this to anti-intentionalism as it uses terms 'not unlike Ekman's neurocultural theory of the emotions': cultural plasticity good, neural plasticity bad (anti-intentional).<sup>684</sup>

Finally, perhaps the main objection of Leys and Barrett is a perceived essentialism in the neurobiologists' 'faculty psychology' with Barrett claiming psychological construction eschews essentialism because it does not treat cultural terms as 'natural kinds.' But Leys ultimately treats even Barrett's constructionism as Ekman-esque as they end up with the same 'confusions and uncertainties regarding what it is they think they are studying when they adopt a multicomponential approach.'<sup>685</sup> She at least recognises that shifting the focus from

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<sup>680</sup> Leys, *The Ascent of Affect*, 365-66.

<sup>681</sup> *Ibid.*, 368.

<sup>682</sup> *Ibid.*, 34.

<sup>683</sup> *Ibid.*, 27.

<sup>684</sup> *Ibid.*, 337.

<sup>685</sup> *Ibid.*, 368.

‘emotions’ to a set of ‘*common or domain-general processes*’ merely shifts the same problems addressed to emotions to these processes: what is a process, how many are there, are there ‘basic’ processes, what do we call them and are these then natural kinds? There will always be some admixture of cultural categories binding biological investigations with cultural phenomena whether you call that ‘fear’ or a combination of arousal, movement and memory. Unless of course you take Leys’s approach and exclude the biological and remain purely with the cultural. But, arguably, the same problem would arise with the cultural components: how many are there, are there ‘basic’ components, etc.

Rejecting any discrete set of ‘basic’ processes or cultural phenomena has two problems: first it risks a trivializing infinitization. Whilst the fear of this finitely more than two is no doubt a fear of biological essentialism, to say there are  $2 < n < \infty$  biological systems of different evolutionary age and modifiability and that we must study their interaction with newer and more quickly changing systems is not to claim an essence as fixed or deterministic. It is to locate the slower to change within the quicker to change, not to posit an eternally fixed essence. It neglects also that Panksepp admitted that more systems may be discovered, or existing ones qualified. Is not taxonomizing merely a ground for disconfirmation and surprise? Secondly, it does not overcome the claimed essentialism it sees in the other, it merely essentialises different aspects and is perhaps more dangerous as it is not recognised as an essentialism.<sup>686</sup> One wonders if Leys and Barrett’s critiques have more to do with boundary policing and disciplinary cohesion through exclusion rather than any sustained and respectful engagement with another discipline or an acknowledgement of the contribution other disciplines and other methodologies can make.

#### **PROBLEMS UNDERLYING DISPUTES: PAST METAPHYSICS**

Ultimately, these disputes arise from the difference between, on the one hand, an insufficient manifestation of an implicit dependence on past metaphysics and, on the other, the implicit challenge to this metaphysics. Firstly, the question of agency, so crucial to the difference in positions often relies on a δύνναμις of the coupled opposites active and passive. For instance, Barrett portrays ‘faculty psychology’ as granting agency to an emotion, that emotion *causes* a behaviour; or in her characterisation of basic emotions theorists as maintaining all instances of fear are ‘*caused* by a hidden common agent unique to fear (e.g. an “affect program” or a neural circuit).’ A continuing reliance on this form of agency means

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<sup>686</sup> See the critiques of Sedgwick and Frank in Chapter 1.

that even the alternative of processual constructions still necessitates the positing of *what* constructs: for Barrett it will often be the brain or a grammatical ‘I’ as agent: ‘my brain constructed my experience of emotion’<sup>687</sup>; for Leys, it is the intentional cognitivist ego. But this merely shifts the problem: what is ‘the brain,’ the ‘I,’ intentionality? And are these not as much cultural categories with their own history? To Leys’s distinction of intentionalist or anti-intentionalist thinkers, the latter’s diffusion of agency throughout the organism and its environment need not be *anti-* but a differently conceived, differently distributed agency, an intentionality not dependent on a traditional, substantial, ego pure to itself. Furthermore, the critique itself may arise from a metaphysics of coupled opposites such that one can only define one’s own position by what an other is not.

Yet, for affective neurobiologists, causality in the nervous organism is far more complex and contains an implicit challenge to this active/passive. Causality arises from the contingent togetherness of the organism with itself and its environment and Damasio in particular challenges the primacy of the active/passive for a unity of duality and non-duality, of transmission and blending within the organismal unity. Possibilities of combinations, flows and change arising from the organismal ensemble is thus less a togetherness of active/passive in continuous reciprocation with the contingent, but that the transformed active and passive actually convey the togetherness of succession and contingency.

Secondly is an implicit difference between a dependence on ontologies of identity rather than difference. For both Leys and Barrett struggle to acknowledge the radical redefinition of affect in Damasio, LeDoux and Panksepp whereby affect is now the binding of differential, reciprocally affecting elements and not just one part of the organism. Affect is auto-affection, the organism is because of its difference to itself rather than any identity with itself. Feeling is the feeling of the unity of this difference. Leys, with her privileging of the cognitive and rejection of any attempt to introduce error, uncertainty or a difference within the organism seems to wilfully neglect this *felt* aspect of the organism’s behaviour and any effect on the organism of this feeling, any auto-affection, any self-difference, arising from her ontology of identity.

#### **AFFECTIVE NEUROSCIENCE’S RESPONSE: DISCARD EMOTION?**

But the critiques (mostly from the sciences it must be said given the lack of citations of Leys or other cultural humanities scholars in the neurobiologists’ work), have led to recent

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<sup>687</sup> Barrett, *How Emotions are Made*, xiii.

shifts in focus for both Damasio and LeDoux (Panksepp tragically died in 2017). In Damasio’s latest work, there is a shift in focus away from discussion of emotions and more toward feelings as the mental expressions of homeostasis defined as ‘the collection of coordinated processes required to execute life’s unthought and unwilled desire to persist and advance into the future, through thick and thin.’<sup>688</sup> Damasio’s homeostasis bridges the cultural/biological divide by including application to systems in which:

conscious and deliberative minds, individually and in social groups, can both interfere with automatic regulatory mechanisms and create new forms of life regulation that have the very same goal of basic automated homeostasis, that is, achieving viable, upregulated life states that tend to produce flourishing. I see the effort of constructing human cultures as a manifestation of this variety of homeostasis.<sup>689</sup>

Feelings are related to homeostasis as ‘the subjective experiences of the momentary state of homeostasis within a living body.’<sup>690</sup> The relative goodness or badness of a given state is the basis for the good or bad feelings. This homeostasis acting through feeling is ‘the functional thread that links early life-forms to the extraordinary partnership of bodies and nervous systems.’<sup>691</sup>

Panksepp had also posited a link between his emotional systems and homeostasis – for example, his SEEKING system relates to homeostasis through management of food. Or Separation distress is related to a homeostatic thermal response: when we are lost, we feel cold, when together, warm: ‘the roots of the social motivational system may be strongly linked to thermoregulatory systems of the brain.’<sup>692</sup>

But the more dramatic shift or, strictly, clarification, comes in LeDoux. In 2018, LeDoux clarified his position by stating he has not actually been studying emotion at all. Instead, LeDoux claims he has been studying ‘survival circuits’ because,

If you think about what an animal does in a situation of danger, it does something to protect itself, either by remaining motionless or moving away from the harm. When a person is in that state, they do the same sorts of things. But they also feel afraid. So it’s natural to assume that when a rat is doing those things, it’s probably feeling some sort of fear as well. But if you follow the logical conclusion of all of this, you will see

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<sup>688</sup> Damasio, *The Strange Order of Things*, 64, 84.

<sup>689</sup> *Ibid.*, 46.

<sup>690</sup> *Ibid.*, 51.

<sup>691</sup> *Ibid.*, 51.

<sup>692</sup> Panksepp, *Affective Neuroscience*, 278.

that even bacteria do these things. They're in their little petri dish in a lab. If you put some acid on one side, they all move to the other side.<sup>693</sup>

There remains, however, a link from these survival circuits to emotions:

emotions are conscious experiences that occur when we find our self in a situation where a challenge or opportunity exist. Some occur when a survival circuit is active — like fear — while others don't involve survival circuits — like pride. What defines the emotion is not whether there's a survival circuit that's active but whether we interpret the situation we're in as either challenging or potentially beneficial.<sup>694</sup>

This leads LeDoux to claim:

I'm putting all the emotions on a level playing field, but I am playing on a different field. I'm not studying emotion. I'm studying the function of survival circuits. Survival circuits contribute to emotions but are not emotion circuits.<sup>695</sup>

Re-conceptualise emotion as basic survival movements and the possibility of cross-species comparison is hoped to be less controversial. Any human distinction then is to be found in its greater capacity for self-reflection:

I don't think these systems are in the brain to create emotions. They're in there to deal with the environment. But when you put one of those systems in a brain that has other capacities such as self-reflection and an awareness of its other activities, then you get emotions.<sup>696</sup>

Whilst these biologists conceive homeostasis, emotions and survival as affects, one wonders if the hostile reaction of humanities to their study of emotion is due to a perceived ownership of these phenomena in the humanities. It will be interesting to see if the same hostile critiques are levelled against homeostatic or survival affects.

#### **BINDINGS OF THE NERVOUS ORGANISM**

The difference affective neuroscience produces in comparison to a more computational neuroscience is the organism as a differential auto-affection, a mutually affective, reciprocal togetherness of systems of different speeds, age and adaptability. If mainstream neuroscience affirms a contingency within the organism but tends to privilege the successive and computational, the co-existence of succession with contingency is affirmed by affective

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<sup>693</sup> LeDoux and Emory, 'On Fear, Emotions and Memory.' See also LeDoux, 'Afterword' in Barrett and Bennett; LeDoux, 'Rethinking the Emotional Brain.'

<sup>694</sup> Ibid.

<sup>695</sup> Ibid.

<sup>696</sup> Ibid.

neuroscience precisely through attention to the emotional circuits that utilise more non-Hebbian plasticity. In the difference between Hebbian and non-Hebbian plasticity, the terms active and passive are radically rethought. Passive no longer means merely imposition from outside but, with ‘passive transports,’ changes in the organism without requirement of energy. Activity then works *with* this passivity, not against it or coupled to as its opposite, but to manifest the implicit bindings of transports within through failed actions. Affective neurobiology’s privileging of difference yields a view of affect not as some external disturbance that would need to be resisted or returned to homeostatic sameness but as ensuring the difference that is vital to feeling, agency and life itself.



## CONCLUSION: A PRE-PRE-SOCRATIC NEUROLOGY?

Two turns, two different disciplines. Each, independently, reacting against perceived neglects. Whilst Sedgwick, Frank and Massumi did refer to science, this was not originally the work of the neurobiologists LeDoux, Damasio, and Panksepp, nor did neurobiology engage with Sedgwick, Frank and Massumi. Instead, reacting against the privileged accorded to language and essentialised anti-essentialisms, humanities sought to continue the critique of philosophies of the subject as self-present, self-certain or purely human whilst seeking a way out of conceptual impasses by exploring affects as real-world anchors of signs. While affective neurobiology sought to extend ethology's synthesis of behavioural and psychological perspectives on emotions by adding neural evidence after the perceived neglect of emotions by behaviourism and cognitive science. Yet, different causes, similar effects in the shared themes of a return to the emotional body, the renewal of relations between natural sciences and humanities and renewed conceptions of organisms and their immanence in the world and thus causality, contingency, agency and identity.

These turns arose within a traditional, sedimented conception of affects conceived under a 'masculine auto-affection' of quantitative differentiation that produced therapies of defence through reversals in coupled opposites to return to homeostasis by the balancing of some underlying thing like energy, which must remain constant so that an increase of affect in one requires a decrease in another. Affect, through its root in πάθος, became dominated by the coupled opposite of activity and passivity where passivity is mainly understood as something imposed from without and narrowed to human feeling to the neglect of its wider senses. The choice of affect (*afficio*), given it was cognate with τίθημι (to set or lay down), reinforced this neglect of a wider sense of πάθος by privileging its sense of states or a 'being set.' *Afficio* and affect, as either active or passive voiced, could then convey both activity and passivity: to affect or be affected, whereas πάσχειν had only been active voiced. Later, with the disappearance of the verb 'to emove' or 'to passion,' affect stepped in to fulfil this gap ('to affect with emotion' rather than 'to emove' or 'to passion') further reinforcing its narrowing to and conflation with passion and emotion as human feeling.

Both turns challenged this understanding. Most explicitly in philosophy, where a 'before' or 'other' to coupled opposites was proposed that was likened to the middle voice. In neurobiology, the sense of affects as ensembles, in which affects are only affects to the extent they affect the organism – affect as implicit auto-affection –challenged any binding of

organism and world as simply active and passive. As this ensemble comprised bindings of conscious, unconscious and nonconscious. animate and inanimate, these bindings often remain implicit.<sup>697</sup>

The thesis pursued here, however, was not to posit a ‘before’ or ‘other’ to the active/passive but to suggest that ‘active/passive’ never really translated the Greek coupling of πάσχειν with ποιεῖν (but also δρᾶν, ἐνέργεια, and then *ago, facio*, etc.) that is its root. A broader sense of πάσχειν was thus manifested as actually signifying this ‘before,’ as a binding in which no explicit separation between actor and action, agent and patient, had yet been made, akin to the middle-voiced senses of πάθος. This sense of binding then gives πάσχειν and affect a broader sense of bindings of implicit differences, bindings before transitivity is added in the move to active and passive. As Derrida notes, the repression of this nontransitivity and the narrowing of πάσχειν to passivity has significant implications: ‘a certain nontransitivity, may be what philosophy, at its outset, distributed into an active and a passive voice, thereby constituting itself by means of this repression.’<sup>698</sup> The affect of the affective turn can then be read as a return to this sense of πάσχειν ‘before’ passivity. The so-called ‘expansion’ of affect and agency to include the inanimate is actually a ‘return’ to the πάσχειν of ancient Greek philosophy before its narrowing by Latin translators and the philosophy of nontransitivity.

What then of ‘activity’? The dominant prediction processing theories of computational neuroscience place action centre stage by collapsing perception and action so that perception is no longer the passive reception of sense-data but the active turning-toward and sampling by the organism of itself and its environment. These actions then become ‘predictive,’ future oriented, seeking out confirmation or disconfirmation of predictions based on implicit models of organism and world, action as differential. Key to determining actions are ‘prediction errors,’ the affecting difference between expected and actual sensory effects of enacted motoric manipulations of the environment that propagate forward. Activity is then no longer the active ‘making’ or ‘doing’ of a purely self-present ego but confirmation-seeking explorations and correctives to implicit models: error, uncertainty and implicit difference thus replace the self-certainty. As motivation for action depends on the difference between prediction and error, *difference* is agential rather than any entity or being. Agency need not

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<sup>697</sup> We should hear in this implicit its etymological roots in the Latin *implico* and Greek πλέκειν, to (in)fold or intertwine. Explicit then is the unfolding.

<sup>698</sup> Derrida, *Différance*, 9.

then be ascribed to some supra-neural, external or transcendental pure activity, nor an ego or soul but an effect of the difference between actuality and prediction, between organism and world. Differences are manifested with the establishment of a cause of the modification, in the separation of agent and patient, which yields a self in the extraction of 'I' as agent, an extraction always liable to error.

But, to the extent computational neuroscience assumes the aim of the organism is to minimise free-energy, conceived as the difference between these models and the way the world actually is, it risks remaining in past conceptions of affect where the goal is defence against difference through therapies that re-enable flows by removing 'blockages' by aligning coupled opposites to return to homeostasis by conforming world to the implicit models of hegemonic norms.

Within affective neurobiology, these theories are conceptualised with affect, emotion and feeling. Emotion as the slower to change, older parts of an organism's self-difference. Feeling as the feeling of unity of that self-difference, a vague, uncertain experience. Affect as implicitly auto-affection, the organism is only to the extent it differs from itself thus better opening to the possibility of change and difference. Because the organism feels itself only to the extent it is affected and different to itself, error and self-difference thus become foundational to the organism's feeling of agency and animacy within the inanimate.

But we need to think the transformed activity and passivity together, we need to bind the discoveries of the turn to affect in both disciplines. For it cannot be the case of a pure activity or pure passivity: if agency is manifested with the difference of implicit models to actuality, bindings of implicit models are equally only manifested with activity; their separate existence is difficult to conceive. The world 'as it is' is only manifested in its difference and error to how we expect it to be. How the world *is* will therefore always evade capture as error is always required. And this is perhaps a criticism of much of today's affect-inspired theory that recognises entanglements and bindings but do little with this. They do not go the extra step of manifesting these bindings as Sedgwick and Frank tried to do. If their separate existence is difficult to conceive, each action (as manifestation through separation in bindings) remains an implicit binding of manifest and unmanifest. In the example of *πάθος* as attribute, the active association (an active voiced *λέγειν*) of Plato's 'being is one,' avoids the tautological 'being is being' by binding it with another concept which brings with it its own implicit differences which need to be unfolded in their difference with that which it is now bound with. These differences are not immediately apparent. Such a manifesting reveals a circular binding of its

own: one cannot rest with the implicit – the unknown gnaws – yet to manifest it creates other implicit bindings. The dream of manifesting without the implicit, a pure making explicit, is the dream of pure separation, the purely present ego or the purely active entity. Actions merely create two new implicit bindings: perhaps this is the meaning of activity in all its various forms of separation, but each ‘active’ verb would need to be analysed for the different separations they make – what is the difference between opposing *πάσχειν* to *ποιεῖν* or *δρᾶν*? And is this where the difference between inanimate and animate lies? The animate as that which is capable of this auto-affection as the manifesting of implicit bindings?

Binding the two turns could then better overcome past conceptions of affect. Through their emphasis on qualitative bindings not quantitative differences, qualitatively differentiated ‘emotional circuits’ that bind with differently organised, differently adaptive systems displaces the idea of affects emerging out of quantitative movements between foundational coupled opposites such as joy/sorrow, pleasure/unpleasure and where different affects can then only be conceived as combinations with other contraries (self/other, present/absent, etc.)<sup>699</sup>. To be affected is then re-bindings, re-pairings, not some increase or decrease in oppositional quantities like pain/pleasure. One can only hope that something remains the same across different affects – evidence of brain damage today shows sometimes there is not.<sup>700</sup>

These bindings allow access to the discrete, limited realm of  $2 < n < \infty$ . It resists  $n = \infty$  through the understanding of the early brain structural similarities and limits to connectivity through homeostatic genes. It resists  $n = 2$  through non-Hebbian plasticity with its older, ephapsis that is more complex than a digital fire/don’t fire. The necessary co-existence of the two in a nervous organism thus offers a  $2 < n < \infty$  without a violent biologism. And each of its taxonomies is ground for disconfirmation, as Sedgwick, Frank and Panksepp affirmed. Furthermore, the focus is less on a reified Affect that could get transferred to energy and its constancy, no Affect as energy that could be turned on or off, bound or unbound, balancing to zero, but *affects*. Qualitative bindings ensure the homeostasis necessary for survival cooperates with cultural bindings that promote flourishing and growth, a positive binding of biological with cultural. The contingency and uncertainty of Hippocratic, second

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<sup>699</sup> As in Spinoza’s definitions of the affects, *Ethics*.

<sup>700</sup> See the debate between Malabou and Zizek on this question in Malabou, ‘Post-Trauma: Toward a New Definition.’

neuroscience meets Galenic philosophical neuroscience meets nontransitive philosophy in an organism of essentialized differential plasticities.

But, as we saw, the field is subject to many critiques and misunderstandings. What resists this alternative understanding?

First, there is the continued privilege accorded to the computational and mechanism in opposition to contingency, a contingency exemplified by the co-touching of neurons and passive transports as the contingency inherent to the organism as movements without energy too complex to be computed. Contingency thus remains bound to disorder, disruption, and with the historical neglect of accidents as errors that disrupt philosophies of substance and essence or are too complex to be computed.<sup>701</sup>

Second, the privileging of successive flow over the co-touching of contingency, of active transports over passive, no doubt stems from the implicit and unchallenged metaphor of movement that underlies so much discourse in both philosophy and neuroscience. Whilst many have a problem with metaphors of organism as steam engine or brain as computer, few question the metaphor of movement that can only conceptualise change in terms of flows of something through pathways, beginning to end, agent initiating, patient receiving; movements that privilege free flow, discharge and the avoidance of blockages. This metaphor is deeply embedded, not only explicitly in concepts like emotion, perturbation but also implicitly through etymology in concepts like method, aporia etc.<sup>702</sup> No surprise then that affect became implicated with physics. What alternative metaphor of binding could be conceived that conveys not ‘blocked discharges’ but resistances to separations?<sup>703</sup>

Third, some might counter that we cannot escape the active and passive because we require language and English, at least, lacks something like a middle/πάθος voice that would enable us to express bindings of implicit differences: we have no alternative to speaking in active or passive voice institutes the subject as agent and object as patient – for example, ‘the brain constructs emotions’ or ‘emotions cause our behaviour.’ But grammatical constructions that allow the broader sense of πάθος as bindings without separation are possible without a middle voice. Indeed, it may be a distinguishing feature of English that passive constructions

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<sup>701</sup> For example, Aristotle says that, in creating a house, a builder does not create its accidents as they are infinite. The study of accidents therefore belongs to the sophist. *Metaphysics*, 1026b.

<sup>702</sup> Method comes from the Greek literally meaning a pursuit or following after a track or path; aporia meaning blockage to a path.

<sup>703</sup> See D tienne and Vernant’s work on μίτης for some examples like the nets of fishermen or Hephaestus’s bonds.

without agent are possible and frequently used. And, interestingly, such constructions lend themselves to constructions with ‘feeling.’

In *Syntactical Structures*, Chomsky showed how certain models for linguistic structure could not account for relations between sentences like the active-passive relation.<sup>704</sup> Chomsky points out that the active/passive voice of grammar is not such that a passive construction is always a reversal of the active: the assumption that an active sentence and corresponding passive are synonymous is often false. For example, quantificational sentences like ‘everyone in the room knows at least two languages’ cannot be reversed in the passive as ‘at least two languages are known by everyone in the room’ because one person might know only French and German and another only Spanish and Italian so the former holds but the latter doesn’t: no language is known by everyone in the room. Chomsky therefore argues, ‘this indicates not even the weakest semantic relation (factual equivalence) holds in general between active and passive.’<sup>705</sup> Nor does the passive always suggest an ‘undergoing’ – for example, ‘she was offered a bunch of flowers.’

Chomsky also discusses the elliptical transformation that removes the agent that is often used with the passive transformation – ‘the boy was seen by John’ / ‘the boy was seen.’<sup>706</sup> Cléro, in his entry on English in *Dictionary of Untranslatables*, draws out a specific use of this loss of the agent (also called recessive diathesis) in relation to a key term for us, ‘feeling,’ in a discussion of its difference to ‘sensing’ and thus the difficulty of translating it into French with *sentir*:

‘To feel’ marks a collaboration in a process; it plays along either in an immanent or an adherent way, unlike sensation, which is more instantaneous and event-like—so much so that ‘to feel’ is often expressed in the passive, without indicating what is doing the feeling. ‘Something felt’ is said in English, instead of *quelque chose de senti*, as it must be said in French.<sup>707</sup>

Cléro argues feeling’s ability to be used in the absence of *what* is feeling, the ‘ellipsis of the agent,’ means that for English language philosophers, the passive in general becomes ‘the privileged form of an action when its agent is unknown, indeterminate, unimportant, or, inversely, too obvious.’ This loss of the agent, he adds, has ‘become a characteristic of the English language itself’ and he therefore claims the word ‘feeling’ allows an articulation of

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<sup>704</sup> Chomsky, *Syntactic Structures*, 6.

<sup>705</sup> *Ibid.*, 100-101.

<sup>706</sup> *Ibid.*, 90.

<sup>707</sup> Cléro in Cassin et al., *Dictionary of Untranslatables*, s.v. feeling, 340.

the realm of affectivity in English which is difficult to translate into French.<sup>708</sup> An excellent example of such a use is in Damasio's book title *The Feeling of What Happens* on emotion's role in the making of consciousness. This has been translated into French as *Le Sentiment Môme de Soi*. But this introduces a 'self' that is absent in the English. It is also interesting to note here that the neuroscientist Sherrington, with his concern for the correct name for the gap between neurons overburdened by the active/passive, admired Virginia Woolf's *The Waves* and *To the Lighthouse* for its frequent style of passive constructions with absence of agent: a friend recalled, "I can remember Sherrington praising Virginia Woolf's two masterpieces, *The Waves* and *To the Lighthouse*, both extreme specimens of life without will and action"<sup>709</sup> (50).

What this suggests is that passive constructions without agent, particularly those using 'feeling,' can convey some of the senses of the *πάθος* middle-voice – a vague or indeterminate experience that is the beginning of more secure knowledge through added transitivity – and so do not always need to grammatically construct agent and patient. This is not to suggest we should not use active and passive voice at all: that would be to neglect that passivity does not *solely* mean bindings of implicit difference: this is only its broadest sense. There is still room for constructions with an agent to convey the necessary separations, just as Greek did using prepositions like *ὑπο* or dative constructions.

Furthermore, the challenge to agency and 'activity' has also come right from the very heart of language. For example, Davidson argued that

Philosophers often seem to think that there must be some simple grammatical litmus of agency, but none has been discovered. I drugged the sentry, I contracted malaria, I danced, I swooned, Jones was kicked by me, Smith was outlived by me: this is a series of examples designed to show that a person named as subject in sentences in the active or as object in sentences in the passive, may or may not be the agent of the event recorded.<sup>710</sup>

Or in the 'ordinary language' philosophy of Austin. In *A Plea for Excuses*, Austin discusses the problem of defining 'action':

There is indeed a vague and comforting idea in the background that, after all, in the last analysis, doing an action must come down to the making of physical movements

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<sup>708</sup> Ibid., 258.

<sup>709</sup> The friend is Granit, quoted in Swazey, *Reflexes and Motor Integration*, 76

<sup>710</sup> Davidson, 'Action,' 44.

with parts of the body; but this is about as true as that saying something must, in the last analysis, come down to making movements of the tongue.<sup>711</sup>

An action, he says, is a highly abstract thing that stands in for any almost any verb with a personal subject just like ‘thing’ stands in for any noun substantive and ‘quality’ for any adjective. The problem arises when we fall for ‘the myth of the verb,’ that is, when we treat ‘doing an action’ not just as a stand-in for verb with subject but as a ‘self-explanatory, ground-level description, one which brings adequately into the open the essential features of everything that comes by simple inspection under it.’<sup>712</sup> This overlooks exceptions and difficulties (is thinking or saying something an action?) and relegates all actions as equal – from sneezing to winning a war; we might add: ποιεῖν, δρᾶν, ἐνέργεια, *ago, facio*, etc.

Austin argues studying excuses can help classify the vast list of verbs of actions and shed light on what an action is because not every excuse can be used with every verb and excuses tend to indicate some abnormality in the action that throws light on the normal, successful performance of the act. Austin, like prediction processing, therefore introduces error so that actions become known in their excused failure. Excuses and error thus do not come after the fact but are an essential component of the action. Excuses (and errors) qualify agency and reveal in their plurality and appropriateness that and how I am not always the master of my actions, nor its subject or author.

This question of agency is precisely the locus of much criticism of the field, particularly between Leys against ‘anti-intentionalists’ or between Barrett and her constructionism versus faculty psychology: who or what can be ascribed agency in these bindings of implicit differences? And to what extent should an intentional subject and its capacities for binding or acting be taken into consideration? But a fourth resistance appears here: the neglect or lack of attention to the unknown and unmanifest that arises from the attachment to the anthropomorphic, self-present subject that also resists the spreading agency to the inanimate.

Yet this challenge to agency is not new. The idea of a flattened, diffused agency is actually a return to the origins of πάσχειν and its diffusing use in Greek thought. For πάσχειν became applied to almost everything – anything could suffer the actions of Gods, humans, animals, the inanimate and abstract ideas, an expansion in who or what can act as agent and patient. Today, it continues. Why limit agency to the intentional human subject?

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<sup>711</sup> Austin, ‘Plea for Excuses,’ 126.

<sup>712</sup> Ibid. 126-7.

Finally, with the identification of ‘two neurosciences’ in the difference between Galen’s Platonic medicine and Hippocrates’s medicine as μῆτις that resembles the art of the sophist, helmsman and politician, we can see how the resistances can be aligned with a Galenic model that privileges secure truths and intentional, human agency. Yet the link between μῆτις and bindings suggests there is another knowledge that is precisely the knowledge of circular bindings, of conceptual impasses, a knowledge of how to create and escape from them. As Sedgwick and Frank’s description of conceptual impasses as where ‘it is possible to recognise the mechanism of a problem, but trying to remedy it, or even in fact articulate it, simply adds propulsive energy to that very mechanism’ evoked the image of the person bound in a net where every movement merely ensnares them further.<sup>713</sup> Such a knowledge privileges an auto-affectation of making explicit implicit bonds: it is not enough to identify a critique of another’s position, one must also manifest the extent to which that critique remains implicitly bound to its object of critique, as critiques of essentialism that remained essentialist or claims to overcome ‘Cartesian dualism’ remain dualist demonstrated. The task is to differentiate these circular bonds by identifying the circularity, the internality to the action, the way in which action to extricate oneself merely binds oneself further. Only when one knows what is the same and how the same sustains itself can difference manifest itself and the difficult process of separating to new bindings begin. Help perhaps comes from awareness of why one position sounds obvious and the other ‘cockamamie.’

Difficult re-bindings because affects are key to this process. We might ask why, for instance, grief and depression feature so often in discourses on affect. For example, Panksepp’s major volume *Affective Neuroscience* was written after a period of grief and depression after the tragic death of his daughter;<sup>714</sup> or Cicero’s *Tusculan Disputations* written also after the death of his daughter; or Sedgwick who has written about her own depression;<sup>715</sup> or Irigaray on the necessity of separation from mother that would require mourning the loss. Why does grief drive so many positions on affect? Or what is it about the depressive position? Is depression, linked to separation, the affect of the separation of bindings? The release of the binding that sustained? As death was the release of the binding of soul and body (Plato’s *Phaedo*)? But the goal is not to aim for or remain with depression or death: philosophy does not have to be a practice for dying. One could instead aim for

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<sup>713</sup> Sedgwick and Frank, ‘Shame,’ 635.

<sup>714</sup> See preface to Panksepp, *Affective Neuroscience*.

<sup>715</sup> Sedgwick, ‘Teaching/Depression.’ And on Klein’s ‘depressive position’ in ‘Klein and the Difference Affect Makes.’

circular bindings that are positive in their sustaining. We could mention here Irigaray's work on meditative practices that bind one to oneself through breath and re-touch.<sup>716</sup> One always writes from where one is. The goal is not only to write the affect but to understand how the writing is itself a manifestation of the affect if theory is to offer more than just distraction.

The necessity of affirming 'two neurosciences' would better open the question of possible bindings of organism with itself and environment rather than solely computational models of flow and difference in a Bayesian framework. Just as attention to passive transports and their use by pharmaceutical therapies enlarged the limits of a purely activity-dependent Hebbian plasticity of flow, by facilitating or impeding connectivity and binding, perhaps the combination of the two would permit the most radical transformations. But as contingent bindings of indeterminate effect and ambiguous language, such knowledge will always be insecure in relation to Platonic truth.

With the possibility of affects understood through a binding of the two turns to affect with two neurosciences, radical new therapies could be posited in the conjunctions afforded by such combinations as neuropsychanalysis. One example of this is provided by the neurobiologist and psychoanalyst Ariane Bazan in a case study of a patient with psychosis, 'Hervé' who had suffered profound trauma.<sup>717</sup> Bazan listens to Hervé intently and his descriptions of his 'psychotic' actions not merely to place them within a pre-existing psychoanalytic interpretation of psychosis as an 'absence of repression' but that this failing repression may, in part, also be due to the effects of trauma on the developing brain: 'the proposition therefore is that the failing repression in psychosis then is instantiated as this failing sensorimotor inhibition.'<sup>718</sup> Bazan demonstrates that trauma does not merely affect a psyche but also the physical – in all its forms including homeostatic and autonomous functions – as well as the binding of the physical and psychical to suggest a limit to psychotherapeutic cures and possible alternatives in the form of physical interventions. Just as few would disagree that hysterical blindness can be most affected by psychotherapy, physical blindness by neuroscience.

But perhaps it is not so much a question of what can affect what, perhaps this must remain unknowable in advance. A better emphasis might be on the question of what agents can be assigned in active separations of implicit bonds: animate, inanimate, abstract, biological,

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<sup>716</sup> See Irigaray, *To Be Born*.

<sup>717</sup> Bazan, 'Sensorimotor Inhibition to Freudian Repression,' 1–2.

<sup>718</sup> *Ibid.*, 7.

cultural. The question then becomes not a tendentious dispute between disciplines policing boundaries but how to affect phenomena for the better where this affecting is understood as separating-bindings through establishment of cause. Why can this question of agency not be extended unaffected by a boundary policing that can only conceive engagement and critique as active and passive, as imposing on or being imposed on that only leads to a struggle for dominance and mastery?

But a major question still remains: are bindings active and passive? Is there a togetherness of a binding and being bound? Does something bind something other? Who or what binds? Is it the work of an agent? A human ego? But if it is a case of binding or being bound, how could bindings 'precede' the separation of active and passive?

Perhaps such a non-causal, contingent binding has been evidenced in the very turns we have been studying; manifested, for example, in the biological observation of the function of the neurons where Sherrington experienced great difficulty in naming the gap where two cells touched, a difficulty no doubt because he was overburdened by the alternative between the active/passive. What he sought was a name for a 'process of contact,' a middle voiced binding if you like. In question is a binding that results from flows developing independently that, at a certain indeterminate point, touch, to combine and collapse flows of independent successions although one did not make the other touch nor was made to touch. Two things developing in isolation from each other, unaffected by each other, but develop in such ways that they can then touch and bind. Is this not also the situation of the turn to affect in both philosophy and neurobiology? Each were reacting against different with different methods, different disciplines. Did one make the other turn? Or did they turn independently and yet combine with their common concept of 'affect' and common themes? Their binding is revealed not only in their common concept of affect but their remarkable parallels. All this thesis tried to manifest were the dependencies and overcomings of an implicit enmeshment of medicine, metaphysics and language. Such a binding might also exemplify a different relation of culture and biology to active concept / passive biological and critiques other than those arising from affects of shame or depression.

What then binds two turns, two flows? A concept? An orientation? Shared implicit roots? A mutual turn toward a transformation in activity and passivity: to a time before passivity's domination by metaphysics of coupled opposites and activity after the critique of the self-certain subject. Manifestation of such bindings might effect dramatically new bindings like that of a strange time and place: that of a pre-pre-Socratic Neurology.



## BIBLIOGRAPHY

- Aeschylus. *Persians. Seven against Thebes. Suppliants. Prometheus Bound*. Edited and translated by Alan H. Sommerstein. Loeb Classical Library 145. Cambridge, MA: Harvard University Press, 2009.
- Allan, R.J.. *The Middle Voice in Ancient Greek: A Study in Polysemy*. Amsterdam: JC Gieben, 2003.
- Andersen, P.K.. ‘Remarks on Dionysius Thrax's Concept of “Diathesis.” ’ *Historiographia Linguistica*, 21.1 (1994), pp.1-37.
- Appadurai, Arjun (Ed.). *The Social Life of Things: Commodities in Cultural Perspective*. Cambridge: Cambridge University Press, 1986.
- Apuleius. *Apologia. Florida. De Deo Socratis*. Edited and translated by Christopher P. Jones. Loeb Classical Library 534. Cambridge, MA: Harvard University Press, 2017.
- Aquinas, Thomas. *Summa Theologica*. Translated by Fathers of the English Dominican Province. Ave Maria Press, 2000.
- Aristophanes. *Acharnians. Knights*. Edited and translated by Jeffrey Henderson. Loeb Classical Library 178. Cambridge, MA: Harvard University Press, 1998.
- Aristophanes. *Birds. Lysistrata. Women at the Thesmophoria*. Edited and translated by Jeffrey Henderson. Loeb Classical Library 179. Cambridge, MA: Harvard University Press, 2000.
- Aristophanes. *Clouds. Wasps. Peace*. Edited and translated by Jeffrey Henderson. Loeb Classical Library 488. Cambridge, MA: Harvard University Press, 1998.
- Aristotle. *Art of Rhetoric*. Translated by J. H. Freese. Loeb Classical Library 193. Cambridge, MA: Harvard University Press, 1926.
- Aristotle. *Metaphysics*, Volume I and II. Translated by Hugh Tredennick. Loeb Classical Library 271 and 287. Cambridge, MA: Harvard University Press, 1933.
- Aristotle. *Categories*. Translated by H. P. Cooke, Hugh Tredennick. Loeb Classical Library 325. Cambridge, MA: Harvard University Press, 1938.
- Aristotle. *On Coming-to-be and Passing Away*. Translated by E. S. Forster, D. J. Furley. Loeb Classical Library 400. Cambridge, MA: Harvard University Press, 1955.

- Aristotle. 'On Respiration,' in *On the Soul. Parva Naturalia. On Breath*. Translated by W. S. Hett. Loeb Classical Library 288. Cambridge, MA: Harvard University Press, 1957.
- Aristotle. *On the Soul. Parva Naturalia. On Breath*. Translated by W. S. Hett. Loeb Classical Library 288. Cambridge, MA: Harvard University Press, 1957.
- Aristotle, Longinus, Demetrius. *Poetics*. Longinus: *On the Sublime*. Demetrius: *On Style*. Translated by Stephen Halliwell, W. Hamilton Fyfe, Doreen C. Innes, W. Rhys Roberts. Revised by Donald A. Russell. Loeb Classical Library 199. Cambridge, MA: Harvard University Press, 1995.
- Aristotle. *Physics*, Volume I-II. Translated by P. H. Wicksteed, F. M. Cornford. Loeb Classical Library 228, 255. Cambridge, MA: Harvard University Press, 1957, 1934.
- Augustine. *City of God*, Volumes I-VII. Translated by George E. McCracken. Loeb Classical Library 411-417. Cambridge, MA: Harvard University Press, 1957.
- Augustine. *Confessions*, Volume I: Books 1-8. Translated by Carolyn J.-B. Hammond. Loeb Classical Library 26. Cambridge, MA: Harvard University Press, 2014.
- Austin, J.L. 'A Plea for Excuses' in *Philosophical Papers*. Edited by J.O. Urmson and G.J. Warnock. Oxford: Clarendon Press, 1961.
- Bakker, Egbert. 'Voice, Aspect and Aktionsart.' In *Voice: Form and Function*. Edited by Barbara Fox and Paul J. Hopper. Amsterdam: John Benjamins, 1994.
- Baldwin, J.M.. *Dictionary of Philosophy and Psychology*. Volumes 1-3. New York: Macmillan, 1905.
- Balibar, Etienne. *Citizen Subject: Foundations for Philosophical Anthropology*. New York: Fordham University Press, 2016.
- Barrett, Lisa Feldman and Moshe Bar. 'See it with feeling: Affective predictions in the human brain.' *Royal Society Phil. Trans. B*, 364 (2009): 1325–1334.
- Barrett, Lisa Feldman. 'The Theory of Constructed Emotion: An Active Inference Account of Interoception and Categorization.' *Social Cognitive and Affective Neuroscience* 12.1 (January 2017): 1-23.
- Barrett, Lisa Feldman. *How Emotions are Made: The Secret Life of the Brain*. New York: Macmillan, 2017.

- Barrett, Lisa Feldman and James A. Russell (Editors). *The Psychological Construction of Emotion*. New York: Guilford Press, 2015.
- Bazan, Ariane. 'From Sensorimotor Inhibition to Freudian Repression: Insights from Psychosis Applied to Neurosis.' *Frontiers in Psychology* 3: 452 (2012).  
<https://doi.org/10.3389/fpsyg.2012.00452> . Accessed March 6<sup>th</sup> 2019.
- Bechara Antoine, Hanna Damasio, Daniel Tranel, Antonio Damasio. 'Deciding advantageously before knowing the advantageous strategy.' *Science* 275. 5304 (1997): 1293–5.
- Beekes, Robert. *Etymological Dictionary of Greek*. 2 Volumes. Leiden: Brill, 2010.
- Bell, J. 'On capturing agency in theories about prehistory.' In *Representations in Archaeology*. Edited by J. Gardin and C. Peedles. Indiana University Press, 1992.
- Bennett, Jane. *Vibrant Matter: A Political Ecology of Things*. Durham, NC: Duke University Press, 2010.
- Bennett, M.R. and P.M. Hacker. 'The Motor System in Neuroscience: A History and Analysis of Conceptual Developments.' *Progress in Neurobiology* 67 (2002), 1-52.
- Benveniste, Émile. *Problems in General Linguistics*. Translated by Mary Elizabeth Meek. Miami: Miami University Press, 1971.
- Berlant, Lauren. 2011. *Cruel Optimism*. Durham, NC: Duke University Press.
- Biess, Frank and Daniel M. Gross. *Science and Emotions after 1945: A Transatlantic Perspective*. Chicago: Chicago University Press, 2014.
- Bodian, David. 'The Generalised vertebrate neuron.' *Science* 137 3527 (August 1962): 323-6.
- Boethius. *De Consolatione Philosophiae*. Translated by Geoffrey Chaucer. Edited by Richard Morris. EETS edition, 1868; 1895 reprint.
- Boethius. *Theological Tractates. The Consolation of Philosophy*. Translated by H. F. Stewart, E. K. Rand, S. J. Tester. Loeb Classical Library 74. Cambridge, MA: Harvard University Press, 1973.
- Boisacq, Emile. *Dictionnaire Étymologique de la Langue Grecque*, 1950.

- Boreham, Leonard. 'A Study of Πάσχω in Greek Literature from Homer to 300 B.C.' PhD diss., University of London, 1969.
- Brown, Thomas. *Lectures on the Philosophy of the Human Mind*. Edinburgh: Ballantyne, 1820.
- Butler, Judith. *Bodies that Matter: On the Discursive Limits of Sex*. New York: Routledge, 2011.
- Calasso, Robert. *Ardor*. Macmillan, 2014.
- Canguilhem, Georges. *La Formation du Concept de Reflexe aux XVIIe et XVIIIe Siecles*. Paris: Vrin, 1977.
- Cassin, Barbara, Emily Apter, Jacques Lezra, and Michael Wood, (eds). *Dictionary of Untranslatables: A Philosophical Lexicon*. Princeton: Princeton University Press, 2014.
- Celsus. *On Medicine*, Volume I: Books 1-4. Translated by W. G. Spencer. Loeb Classical Library 292. Cambridge, MA: Harvard University Press, 1935.
- Chantraine, Pierre. *La Formation des Noms en Grec Ancien*. Paris: Librairie C. Klincksieck, 1979.
- Chomsky, Noam. *Syntactic Structures*. The Hague: Mouton Publishers, 1957.
- Cicero. *On the Nature of the Gods. Academics*. Translated by H. Rackham. Loeb Classical Library 268. Cambridge, MA: Harvard University Press, 1933.
- Cicero. *Quartus Tomus in quo Marci Tullii Ciceronis Opera Philosophica*. Venice: Ex Officina Lucae Antonii Iuntae, 1536.
- Cicero. *On Ends*. Translated by H. Rackham. Loeb Classical Library 40. Cambridge, MA: Harvard University Press, 1914.
- Cicero. *Tusculan Disputations*. Translated by J. E. King. Loeb Classical Library 141. Cambridge, MA: Harvard University Press, 1927.
- Cicero. *Letters to Atticus*, Volume I. Edited and translated by D. R. Shackleton Bailey. Loeb Classical Library 7. Cambridge, MA: Harvard University Press, 1999.
- Clark, Andy. 'Whatever next? Predictive brains, situated agents, and the future of cognitive science.' *Behavioural and Brain Sciences* 36.3 (2013): 181-204.
- Clark, Andy. *Surfing Uncertainty: Prediction, Action and the Embodied Mind*. Oxford: Oxford University Press, 2016.

- Clarke, Edwin and L.S. Jacyna. *Nineteenth Century Origins of Neuroscientific Concepts*. Los Angeles: University of California Press, 1987.
- Codoñer, Juan Signes. 'The Definition of the Middle Voice in Ancient and Byzantine Grammars: A Guide for Understanding the Use of the Verb in Byzantine Texts Written in Classical Greek.' In *The Language of Byzantine Learned Literature* edited by Martin Hinterberger, (Turnhout, 2014), pp. 72-95.
- Codoñer, Juan Signes. 'The definitions of the Greek middle voice between Apollonius Dyscolus and Constantinus Lascaris.' *Historiographia Linguistica*, 32.1 (2005), pp.1-33.
- Connolly, William E. *Neuropolitics: Thinking, culture, speed*. Minnesota: University of Minnesota Press, 2007.
- Connolly, William E. *A World of Becoming*. Durham, NC: Duke University Press, 2011.
- Coole, Diana and Samantha Frost. *New Materialisms: Ontology, Agency, and Politics*. Duke University Press, 2010.
- Damasio, Antonio. *Descartes' Error: Emotion, Reason and the Human Brain*. New York: Avon Books, 1994.
- Damasio, Antonio. *The Feeling of What Happens: Body, Emotion and the Making of Consciousness*. London: Vintage, 2000.
- Damasio, Antonio. *Looking for Spinoza: Joy, Sorrow and the Feeling Brain*. London: Heinemann, 2003.
- Damasio, Antonio. *The Strange Order of Things: Life, Feeling and the Making of Cultures*. Pantheon Books: New York, 2018.
- Darwin, Charles. *The Expression of the Emotions in Man and Animals*. Introduction, Afterword and Commentaries by Paul Ekman. London: Harper, 2009.
- Davidson, Donald. 'Agency' in *Essays on Actions and Events*. Oxford: Clarendon Press, 2001.
- De Sousa, Ronald. *The Rationality of Emotion*. Cambridge, MA: MIT Press, 1987.
- Deleuze, Gilles. *Spinoza: Practical Philosophy*. Translated by Robert Hurley. San Francisco: City Lights Books, 1988.
- Deleuze, Gilles. *Logic of Sense*. Translated by Constantin V. Boundas, Mark Lester and Charles J. Stivale. London: Bloomsbury Publishing, 2004.

- Deleuze, Gilles and Felix Guattari. *A Thousand Plateaus: Capitalism and Schizophrenia*. Translated by Brian Massumi. London: Bloomsbury Publishing, 1988.
- Deleuze, Gilles and Felix Guattari. *What is Philosophy?* Translated by Hugh Tomlinson and Graham Burchell. New York: Columbia University Press, 1994.
- Dennett, Daniel. *Consciousness Explained*. London: Penguin, 1991.
- Derrida, Jacques. 'Plato's Pharmacy,' in *Dissemination*. Translated by Barbara Johnson. London, Continuum, 1981.
- Derrida, Jacques. 'Ousia and Gramme', in *Margins of Philosophy*. Translated by Alan Bass. Chicago: University of Chicago Press, 1982a.
- Derrida, Jacques. 'Différance', in *Margins of Philosophy*. Translated by Alan Bass. Chicago: University of Chicago Press, 1982b.
- Derrida, Jacques. 'Eating Well: An Interview' in *Who Comes After the Subject?* Edited by Eduardo Cadava, Peter Connor and Jean-Luc Nancy. New York: Routledge, 1991.
- Derrida, Jacques. *Of Grammatology*. Translated by Gayatri Spivak. Baltimore: John Hopkins Press, 1997.
- Derrida, Jacques. *On Touching, Jean-Luc Nancy*. Translated by Christine Irizarry. Stanford University Press, 2005.
- Derrida, Jacques. *Voice and Phenomenon: Introduction to the Problem of the Sign in Husserl's Phenomenology*. Translated by Leonard Lawlor. Northwestern University Press, 2011.
- Detienne, Marcel and Jean-Pierre Vernant. *Cunning Intelligence in Greek Culture and Society*. Translated by Janet Lloyd. Chicago: University of Chicago Press, 1991.
- Dewey, John. 'The Psychological Arc Concept in Psychology.' *Psychological Review* Volume III No. 4 (July, 1892): 357-370.
- Dixon, Thomas. *From Passions to Emotions: The Creation of a Secular Psychological Category*. Cambridge University Press, 2003.
- Doidge, Norman. *The Brain That Changes Itself: Stories of Personal Triumph from the Frontiers of Brain Science*. London: Penguin, 2007.
- Doniger, W. ed. *The Rig Veda: An Anthology: One Hundred and Eight Hymns, Selected, Translated and Annotated*. London: Penguin, 1981.

- Duval, M. 'Hypothèse sur la physiologie des centres nerveux; théorie histologique du sommeil.' *Compte Rendus de la Société de Biologique*. 2 Feb 1895: 75.
- Edwards, M. J., R.A. Adams, H. Brown, I. Pareés and Karl Friston. 'A Bayesian account of "hysteria"' *Brain*, 135.11 (2012): 3495–3512.
- Feldman, H., & Karl Friston. 'Attention, uncertainty, and free-energy.' *Frontiers in Human Neuroscience* 2.4 (2010): 215.
- Feldman, J. 'Tuning your priors to the world.' *Topics in Cognitive Science*, 5.1 (2013), 13–34.
- Ficino, Marsilio. *Platonis Opera Omnia*. Lugduni: Apud Franciscum Le Preux, 1590.
- Foster, M. and C.S. Sherrington. *A Textbook of Physiology, Part Three: The Central Nervous System*, 7th ed. London: MacMillan & Co Ltd; 1897.
- Freud, Sigmund. 'Project for a Scientific Psychology,' in *Standard Edition of the Complete Psychological Works of Sigmund Freud: Volume 1*. London: Vintage, 2001.
- Freud, Sigmund. 'Repression,' in *Standard Edition of the Complete Psychological Works of Sigmund Freud: Volume 14*. London: Vintage, 2001.
- Freud, Sigmund. 'The Unconscious,' in *Standard Edition of the Complete Psychological Works of Sigmund Freud: Volume 14*. London: Vintage, 2001.
- Freud, Sigmund. 'The Uncanny,' in *Standard Edition of the Complete Psychological Works of Sigmund Freud: Volume 17*. London: Vintage, 2001.
- Freud, Sigmund. 'Beyond the Pleasure Principle,' in *Standard Edition of the Complete Psychological Works of Sigmund Freud: Volume 18*. London: Vintage, 2001.
- Freud, Sigmund. 'The Ego and the Id,' in *Standard Edition of the Complete Psychological Works of Sigmund Freud: Volume 19*. London: Vintage, 2001.
- Fridlund, Alan J. *Human Facial Expression: An Evolutionary View*. San Diego: Academic Press, 1994.
- Friston, Karl. 'The Free-Energy Principle: a rough guide to the brain?' *Trends in Cognitive Science* 13.7 (July 2009): 293-301.
- Friston, Karl. 'Learning and inference in the brain.' *Neural Networks*, 16(9) 2003: 1325-1352.

- Friston, K., C. Thornton and A. Clark. 'Free-energy minimization and the dark-room problem.' *Frontiers in Psychology* 3 (2012): 1–7.
- Gaza, Theodore. *Institutionis Grammaticae Libri IV*. 1529.
- Galen. *On the Doctrines of Hippocrates and Plato*. Three Volumes. Translated by Phillip de Lacy. Berlin: Akademie-Verlag, 1984.
- Galen, 'Method of Medicine,' in *Medicorum Graecorum Opera*, Volume 10, edited by Charles Gottlieb Kühn. Lipsiae: 1825.
- Galen. 'De Motu Musculorum [Περὶ Μυῶν Κινήσεως],' in *Selected Readings in the History of Physiology*, ed. J.F. Fulton J.F., p. 184. Classics of Medicine Library, 2006.
- Galen. *On the Natural Faculties*. Translated by A. J. Brock. Loeb Classical Library 71. Cambridge, MA: Harvard University Press, 1916.
- Galen. *On the Usefulness of Parts [Περὶ χρείας μορίων / De usu partium]*. Two volumes. Translated by Margaret Tallmadge May. New York: Cornell University Press, 1968.
- Galen. *Method of Medicine, Volume I: Books 1-4*. Edited and translated by Ian Johnston, G. H. R. Horsley. Loeb Classical Library 516. Cambridge, MA: Harvard University Press, 2011.
- Gellius. *Attic Nights*, Volumes I-III. Translated by J. C. Rolfe. Loeb Classical Library 195, 200 and 212. Cambridge, MA: Harvard University Press, 1927.
- Gosden, Chris. *Social Being and Time*. London: Blackwell, 1994.
- Gosden, Chris. 'Aesthetic, Intelligence and Emotions: Implications for Archaeology' in *Rethinking Materiality: The Engagement of Mind with the Material World*, Edited by Elizabeth DeMarrais, Chris Gosden and Colin Renfrew. Cambridge: McDonald Institute, 2005.
- Gregg, Melissa, and Gregory J. Seigworth. eds.. *The Affect Theory Reader*. Duke University Press, 2010.
- Gregory, Richard L. and O.L. Zangwill (eds). *The Oxford Companion to the Mind*. Oxford: Oxford University Press, 1987.
- Grossberg, Lawrence. 'Affect's Future: Rediscovering the Virtual in the Actual', in *The Affect Theory Reader*, eds Gregg and Seigworth. Duke University Press, 2010.

- Guillery, R.W. 'Relating the neuron doctrine to the cell theory. Should contemporary knowledge change our view of the neuron doctrine?' *Brain Res* 55.2 (October 2007): 411-21.
- Hall, Marshall. 'On the reflex function of the Medulla Oblongata and Medulla Spinalis.' *Philosophical Transactions of the Royal Society of London* 123 (1833): 635-665.
- Harman, P.M., *Metaphysics and Natural History: The Problem of Substance in Classical Physics*. Brighton: Harvester, 1982.
- Hebb, Donald O. *The Organization of Behaviour*. New York: John Wiley & Sons, 1949.
- Heidegger, Martin. *Being and Time*. Translated by John Macquarrie and Edward Robinson. Oxford: Blackwell Publishing, 1962.
- Heidegger, Martin. *Poetry, Language, Thought*. Translated by A. Hofstadter. London: Harper, 1971.
- Heidegger, Martin. *Aristotle's Metaphysics  $\Theta$  1-3: On the Essence and Actuality of Force*. Translated by Walter Brogan and Peter Warnek. Indiana University Press, 1995.
- Heidegger, Martin. *Kant and the Problem of Metaphysics*. Translated by Richard Taft. Indiana University Press, 1997.
- Heidegger, Martin. *Basic Concepts of Aristotelian Philosophy*. Translated by Richard Rojcewicz. Indiana University Press, 2009.
- Helmholtz, Hermann von. *Treatise on Physiological Optics*. Edited and Translated by J. P. C. Southall, Vol. 3. New York: Dover, 1860/1962.
- Helmholtz, Hermann von. *Selected Writings*. Edited by Russell Kahl. Middletown, Conn: Wesleyan University Press, 1971.
- Herodotus. *The Persian Wars*, Volume I-III. Translated by A. D. Godley. Loeb Classical Library 117-120. Cambridge, MA: Harvard University Press, 1921-1925.
- Hippocrates. *Ancient Medicine. Airs, Waters, Places. Epidemics 1 and 3. The Oath. Precepts. Nutriment*. Translated by W. H. S. Jones. Loeb Classical Library 147. Cambridge, MA: Harvard University Press, 1923.
- Hippocrates. 'Heart,' in *Coan Prenotions. Anatomical and Minor Clinical Writings*. Edited and translated by Paul Potter. Loeb Classical Library 509. Cambridge, MA: Harvard University Press, 2010.

- Hippocrates. *Prognostic. Regimen in Acute Diseases. The Sacred Disease. The Art. Breaths. Law. Decorum. Physician (Ch. 1). Dentition*. Translated by W. H. S. Jones. Loeb Classical Library 148. Cambridge, MA: Harvard University Press, 1923.
- Hodder, Ian. *Entangled: An Archaeology of the Relationships between Humans and Things*. Chichester: John Wiley & Sons, 2012.
- Homer. *Iliad*, Volume I-II. Translated by A. T. Murray. Revised by William F. Wyatt. Loeb Classical Library 170-1. Cambridge, MA: Harvard University Press, 1924, 1925.
- Homer. *Odyssey*, Volume I-II. Translated by A. T. Murray. Revised by George E. Dimock. Loeb Classical Library 104-5. Cambridge, MA: Harvard University Press, 1919.
- Hume, David. *A Treatise of Human Nature*. London: Penguin, 1985.
- Husserl, Edmund. *Cartesian Meditations: An Introduction to Phenomenology*. Translated by Dorion Cairns. The Hague: Martinus Nijhoff, 1960.
- Ingold, Tim. 'The Textility of Making' in *Being Alive: Essays on Movement, Knowledge and Description*. Oxford: Routledge, 2011.
- Ingold, Tim. *Making: Anthropology, Archaeology, Art and Architecture*. Abingdon: Routledge, 2013.
- Irigaray, Luce. *This Sex which is Not One*. Translated by Catherine Porter with Carolyn Burke. New York: Cornell University Press, 1985.
- Irigaray, Luce. *Marine Lover of Friedrich Nietzsche*. Translated by Gillian C. Gill. New York: Columbia University Press, 1991.
- Irigaray, Luce. *Elemental Passions*. Translated by Joanne Collie and Judith Still. New York: Routledge, 1992.
- Irigaray, Luce. *In the Beginning, She Was*. London: Bloomsbury, 2013.
- Irigaray, L. *To Be Born: Genesis of a New Human Being*. London: Springer, 2017.
- Janda, Michael. *Eleusis: Das Indogermanische Erbe Der Mysterien*. Innsbruck: Institut für Sprachwissenschaft der Universität, 2000.
- James, Susan. *Passion and Action – The Emotions in Seventeenth Century Philosophy*. Oxford: Clarendon Press, 1997.
- James, William. 'What is an Emotion?' *Mind* 9, no. 34 (Apr 1884), pp. 188-205.
- James, William. *Collected Essays and Reviews*. London: Longmans, Green and Co., 1920.

- James, William. *Principles of Psychology*. Two Volumes. New York: Holt, 1890.
- Kant, Immanuel. *Critique of Pure Reason*. Translated and edited by Paul Guyer and Allen W. Wood. Cambridge University Press, 1988.
- Kato, Hiroyuki K., Ayako M. Watabe and Toshiya Manabe. 'Non-Hebbian Synaptic Plasticity Induced by Repetitive Postsynaptic Action Potentials.' *Journal of Neuroscience* 29.36 (9 September 2009): 11153-11160.
- Kemp, Alan. 'The Tekhnē Grammatikē of Dionysius Thrax: Translated into English.' *Historiographia Linguistica*, 13.2 (1986), pp.343-363.
- Kuriyama, Shigehisa. *The Expressiveness of the Body and the Divergence of Greek and Chinese Medicine*. New York: Zone Books, 1999.
- Laertius, Diogenes. *Lives of Eminent Philosophers*, Volume II: Books 6-10. Translated by R. D. Hicks. Loeb Classical Library 185. Cambridge, MA: Harvard University Press, 1925.
- Laks, André and Glenn W. Most. *Early Greek Philosophy, Volume IX: Sophists, Part 2*. Edited and translated by André Laks, Glenn W. Most. Loeb Classical Library 532. Cambridge, MA: Harvard University Press, 2016.
- Laplanche, Jean and Pontalis, Jean-Bertrand. *The Language of Psychoanalysis*. Translated by Donald Nicholson-Smith. London: Karnac Books, 1988.
- Lazarus, Richard. *Emotion and Adaptation*. Oxford: Oxford University Press, 1991.
- LeDoux, Joseph E. *The Emotional Brain: The Mysterious Underpinnings of Emotional Life*. New York: Simon and Schuster, 1996.
- LeDoux, Joseph E. *The Synaptic Self*. New York: Viking, 2002.
- LeDoux, Joseph E. and Margaret Emory. 'On Fear, Emotions, and Memory: An Interview with Dr. Joseph LeDoux.' *BrainWorld* June 6, 2018. Accessed 14 February 2018.
- LeDoux, Joseph E. 'Rethinking the Emotional Brain.' *Neuron* 73.4 (2012): 653-676.
- Leumann, Ernst. 'Die Göttin Aditi und die vedische Astronomie.' In *Zeitschrift für Indologie und Iranistik*, 6 (1928) pp. 1-10.
- Leys, Ruth. 'How did fear become a scientific object and what kind of object is it?' *Representations* 110 (2010): 66-104.
- Leys, Ruth. 'The turn to affect: A critique', *Critical Inquiry*, 37.3 (2011): 434-472.

- Leys, Ruth. “‘Both of us disgusted in my insula’: Mirror neuron theory and emotional empathy.’ *Nonsite.org* 5 (2012): 1-25.
- Leys, Ruth. *The Ascent of Affect: Genealogy and Critique*. University of Chicago Press, 2017.
- Livingston R.B. ‘Brain mechanisms in conditioning and learning. *Neurosciences Research Program Bulletin*. 4.3 (1966): 349–354.
- Livy. *History of Rome*, Volume VI: Books 23-25. Translated by Frank Gardner Moore. Loeb Classical Library 355. Cambridge, MA: Harvard University Press, 1940.
- Loewenstein, W.R. ‘Junctional intercellular communication: the cell-to-cell membrane channel.’ *Physiological Reviews* 61.4 (October 1981): 829-913.
- Lucretius. *On the Nature of Things*. Translated by W.H.D. Rouse. Cambridge, MA: Harvard University Press (Loeb Classical Library), 1992.
- Lyons, John. *Introduction to Theoretical Linguistics*. Cambridge: Cambridge University Press, 2012.
- Malabou, Catherine and Adrian Johnston. *Self and Emotional Life: Philosophy, Psychoanalysis and Neuroscience*. New York: Columbia University Press, 2013.
- Malabou, Catherine. *The Future of Hegel: Plasticity, Temporality and Dialectic*. Translated by Lisabeth During. London: Routledge, 2004.
- Malabou, Catherine. *What Should We Do with Our Brain?* Translated by Sebastian Rand. New York: Fordham University Press, 2008.
- Malabou, Catherine. ‘Post-Trauma: Towards a New Theory?’ In *Telemorphosis: Theory in the Era of Climate Change*. Volume 1. Edited by Tom Cohen. Ann Arbor: Open Humanities Press, 2012.
- Malafouris, Lambros. *How Things Shape the Mind: A Theory of Material Engagement*. Cambridge, MA: MIT Press, 2013.
- Massumi, Brian. ‘The Autonomy of Affect’, *Cultural Critique*, 31 (1995): 83-109.
- Massumi, Brian (Ed.). *A Shock to Thought: Expression after Deleuze and Guattari*. Psychology Press, 2002a.
- Massumi, Brian. *Parables for the virtual: Movement, affect, sensation*. Duke University Press, 2002b.

- Massumi, Brian. *Politics of Affect*. Cambridge, MA: Polity Press, 2015.
- McGeer, T. 'Passive dynamic walking.' *International Journal of Robotics Research* 9.2 (1990): 68–82.
- Meillassoux, Quentin. *After Finitude*. London: Bloomsbury, 2013.
- Merzenich, Nelson, Stryker, Cynader. Schoppmann, Zook. 'Somatosensory cortical map changes following digit amputation in adult monkeys.' *Journal of Comparative Neurology*, 224.4 (1984): 591-605.
- de Montaigne, Michel. *The Essayes, or Morall, Politike, and Millitarie Discourses of Lord Michaell de Montaigne*. Translated by John Florio. 1st edition, 1603.
- Newton, Isaac. *Opticks*. London: Innys, 1730.
- Nietzsche, Friedrich. 1990 [1889]. *The Twilight of the Idols*. Translated by R. J. Hollingdale. Harmondsworth: Penguin Books, 1990.
- Nussbaum, Martha. *Upheavals of Thought: The Intelligence of Emotions*. Cambridge: Cambridge University Press, 2001.
- Orbach, Jack. *The Neuropsychological Theories of Lashley and Hebb: Contemporary Perspectives Fifty Years After Hebb's The Organization of Behaviour: (Vanuxem Lectures and Selected Theoretical Papers of Lashley)*. University Press of America, 1988.
- Page, D.L. *Poetae Melici Graeci*. Oxford: Oxford University Press, 1962.
- Panksepp, Jaak and Lucy Biven. *The Archaeology of Mind: Neuroevolutionary Origins of Human Emotion*. New York: Norton, 2012.
- Panksepp, Jaak. 'A critical role for "affective neuroscience" in resolving what is basic about basic emotions.' *Psychological Review* 99.3 (July 1992): 554-560.
- Panksepp, Jaak. *Affective Neuroscience: The Foundations of Human and Animal Emotions*. Oxford: Oxford University Press, 1998.
- Pezzulo, G. 'Anticipation and future-oriented capabilities in natural and artificial cognition.' In *50 Years of AI, Festschrift, LNAI*. Berlin: Springer, 2007: 258–271.
- Picard, Rosalind W. *Affective Computing*. Cambridge, MA: MIT Press, 1997.
- Pinch, Adela. *Strange Fits of Passion: Epistemologies of Emotion, Hume to Austen*. Stanford: Stanford University Press, 1996.

- Plamper, Jan. 'The history of emotions: an interview with William Reddy, Barbara Rosenwein, and Peter Stearns', *History and Theory*, 49.2 (2010): 237-265.
- Plamper, Jan. *The History of Emotions: An Introduction*. Oxford: Oxford University Press, 2015.
- Plato. *Laches. Protagoras. Meno. Euthydemus*. Translated by W. R. M. Lamb. Loeb Classical Library 165. Cambridge, MA: Harvard University Press, 1924.
- Plato. *Laws*, Volume II: Books 7-12. Translated by R. G. Bury. Loeb Classical Library 192. Cambridge, MA: Harvard University Press, 1926.
- Plato. *Republic*, Volume I: Books 1-5. Edited and translated by Christopher Emlyn-Jones, William Preddy. Loeb Classical Library 237. Cambridge, MA: Harvard University Press, 2013.
- Plato. *Statesman. Philebus. Ion*. Translated by Harold North Fowler, W. R. M. Lamb. Loeb Classical Library 164. Cambridge, MA: Harvard University Press, 1925.
- Plato. *Theaetetus. Sophist*. Translated by Harold North Fowler. Loeb Classical Library 123. Cambridge, MA: Harvard University Press, 1921.
- Plato. *Timaeus*. Translated by R. G. Bury. Loeb Classical Library 234. Cambridge, MA: Harvard University Press, 1929.
- Plato. *Euthyphro. Apology. Crito. Phaedo*. Edited and translated by Christopher Emlyn-Jones, William Preddy. Loeb Classical Library 36. Cambridge, MA: Harvard University Press, 2017.
- Pokorny, J. *Indo Germanisches Wörterburch*, 1959.
- Prasad, J. 'The Philosophical Significance of Rgveda X, 129, 5, and Verses of an Allied Nature.' *Journal of the Royal Asiatic Society*, 61.3 (1929), pp.586-599.
- Probyn, Elspeth. 'Writing Shame', in *The Affect Theory Reader*, eds Gregg and Seigworth. Duke University Press, 2010.
- Quintilian. *The Orator's Education* (Books 6-8). Edited and Translated by Donald A. Russell. Cambridge, MA: Harvard University Press (Loeb Classical Library), 2001.
- Rankine, William John Macquorn. 'On the general law of the transformation of energy', *The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science*, 5 (1853): 106-117.

- Reddy, William M. 1997. 'Against constructionism: the historical ethnography of emotions', *Current Anthropology*, 38(3): 327-351.
- Reddy, William M. *The Navigation of Feeling: A Framework for the History of Emotions*. Cambridge: Cambridge University Press, 2001.
- Robinson, Richard. *Plato's Earlier Dialectic*. Oxford : Clarendon Press, 1953.
- Rousseau, Jean-Jacques. 'Essay on the Origin of Languages' in *Two Essays on the Origin of Language*. Translated by John H. Moran and Alexander Gode. Chicago: Chicago University Press, 1986.
- Scheer, Monique. 'Are emotions a kind of practice. and is that what makes them have a history? A Bourdieuan approach to understanding emotion', *History and Theory*, 51.2 (2012), pp. 193-220.
- Schlaggar, B.L. and D.D. O'Leary. 'Potential of visual cortex to develop an array of functional units unique to somatosensory cortex.' *Science* 252 (1991): 1556-1560.
- Schwann, Theodor. *Mikroskopische Untersuchungen über die Uebereinstimmung in der Struktur und dem Wachsthum der Thiere und Pflanzen*. Berlin, 1839.
- Sedgwick, Eve Kosofsky, and Adam Frank. 'Shame in the cybernetic fold: Reading Silvan Tomkins', *Critical Inquiry* 21.2 (1995): 496-522.
- Sedgwick, Eve Kosofsky. *The Epistemology of the Closet*. Los Angeles: University of California Press, 1990.
- Sedgwick, Eve Kosofsky. 'Paranoid Reading and Reparative Reading, or, You're So Paranoid, You Probably Think This Essay is About You.' In *Touching Feeling*. New York: Duke University Press, 2003.
- Sedgwick, Eve Kosofsky. 'Teaching/Depression.' In *The Scholar and Feminist Online* (Spring, 2006). <http://evekosofskysedgwick.net/writing/teaching-depression.html>. Retrieved 3<sup>rd</sup> March 2019.
- Sedgwick, Eve Kosofsky. 'Melanie Klein and the Difference Affect Makes.' *South Atlantic Quarterly* 106:3 (Summer 2007): 625-642.
- Serres, Michel. *The Natural Contract*. Translated by Elizabeth MacArthur and William Paulson. Ann Arbor: University of Michigan Press, 1995.

- Seung, Sebastian. *Connectome: How the Brain's Wiring Makes us Who We Are*. London: Penguin, 2012.
- Sextus Empiricus. *Outlines of Pyrrhonism*. Translated by R. G. Bury. Loeb Classical Library 273. Cambridge, MA: Harvard University Press, 1933.
- Sextus Empiricus. *Against Physicists*. Translated by R. G. Bury. Loeb Classical Library 311. Cambridge, MA: Harvard University Press, 1936.
- Sharpey-Schäfer papers. Contemporary Medical Archives Centre, Wellcome Institute for the History of Medicine.
- Shepherd, Gordon. *Foundations of the Neuron Doctrine*. Oxford: Oxford University Press, 1991.
- Silius Italicus. *Punica*, Volume II: Books 9-17. Translated by J. D. Duff. Loeb Classical Library 278. Cambridge, MA: Harvard University Press, 1934.
- Solms, Mark and Michael Saling. *A Moment of Transition: Two Neuroscientific Articles by Sigmund Freud*. London: Karnac Books, 1990.
- Solomon, Robert C. *True to our Feelings: What our Emotions are Really Telling Us*. Oxford: Oxford University Press, 2008.
- Sophocles. *Ajax. Electra. Oedipus Tyrannus*. Edited and translated by Hugh Lloyd-Jones. Loeb Classical Library 20. Cambridge, MA: Harvard University Press, 1994.
- Sophocles. *Antigone. The Women of Trachis. Philoctetes. Oedipus at Colonus*. Edited and translated by Hugh Lloyd-Jones. Loeb Classical Library 21. Cambridge, MA: Harvard University Press, 1994.
- Sparrow, Tom. *Plastic Bodies: Rebuilding Sensation After Phenomenology*. London: Open Humanities Press, 2014.
- Speigel, Gabrielle M. (Ed.). *Practicing History: New Directions in Historical Writing After the Linguistic Turn*. London: Routledge, 2005.
- Spinoza, Benedict. *Ethics* translated by Edwin Curley. London: Penguin, 1996.
- Stengers, Isabelle. 'Diderot's egg: Divorcing materialism from eliminativism', *Radical Philosophy*, 144: 7-15, 2007.

- Sturm, Hertha and M. Grewe-Partsch. 1987. 'Television—The Emotional Medium: Results from Three Studies' in *Emotional Effects of Media: The Work of Hertha Sturm*. Montreal: McGill University., pp. 25-36.
- Swazey, Judith. *Reflexes and Motor Integration: Sherrington's Concept of Integrative Action*. Cambridge, Mass: Harvard University Press, 1969.
- Sweatt JD. 'Neural plasticity and behaviour – sixty years of conceptual advances.' *Journal of Neurochemistry* 139 (2016): 179–199.
- Terada, Rei. *Feeling in Theory: Emotion after the "Death of the Subject"*. Harvard University Press, 2003.
- Thomson, William and Peter Guthrie Tait. *Treatise on Natural Philosophy*. Oxford: Oxford University Press, 1867.
- Thomson, William. 'An account of Carnot's theory of the motive power of heat,' in *Papers*, Vol 1, 1849.
- Tomkins, Silvan. *Affect Imagery Consciousness: The Complete Edition*. Two Volumes. New York: Springer, 2008.
- Tomkins, Silvan. 'The quest for primary motives: Biography and autobiography of an idea', *Journal of Personality and Social Psychology*, 41.2 (1981): 306-329.
- Tribus, M. *Thermodynamics and Thermostatistics: An Introduction to Energy, Information and States of Matter, with Engineering Applications*. New York: D. Van Nostrand, 1961.
- Villani, Arnaud. *La Guêpe et L'Orchidée: Essai sur Gilles Deleuze*. Paris: Belin, 1999.
- Virgil. *Eclogues. Georgics. Aeneid: Books 1-6*. Translated by H. Rushton Fairclough. Revised by G. P. Goold. Loeb Classical Library 63. Cambridge, MA: Harvard University Press, 1916.
- Waldeyer-Hartz, Wilhelm. 'Ueber einige neuere Forschungen im Gebiete der Anatomie des Centralnervensystems,' *Deutschen Medicinischen Wochenschrift* 44, 44 (1891). Translated as 'Certain Recent Researches into the Anatomy of the Central Nervous System' by Alex Hill. *Brain*, Volume 14, Issue 4, (1 January 1891): 567–588.
- Wiesel, T.N. 'Early explorations of the development and plasticity of the visual cortex: A personal View.' *Journal of Neurobiology*, 41.1 (1999): 7-9.

Wilden, Anthony. *System and Structure: Essays in communication and exchange second edition*. Abingdon: Routledge, 2001.

Williams, Raymond. *Problems in Materialism and Culture*. London and New York: Schocken Books, 1980.

Willis, Thomas. *Cerebri Anatome*. London, 1664.

Willis, Thomas. 'Anatomy of the Brain,' in *Five Treatises*, edited and translated by Samuel Pordage, London, 1681.

Wundt, Wilhelm. *Outlines of Psychology*. Translated by Charles Hubbard Judd. London: Williams & Norgate, 1902.