9 Meditations on silence

The (non-)conveying of the experiential in scientific accounts of Buddhist meditation

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This volume attends to an under-appreciated aspect of science communication: its silences.[1] As discussed in the Introduction, one way of opening up silence as a phenomenon is to note that what counts as silence can vary across situations. Just when the absence of sound becomes treated as 'silence' varies depending on whether one is listening to the radio, working in an open plan office, at home enjoying a cup of tea before bed, or talking with a friend over the phone. Thus, the question 'What is silence?' needs to give way to questions like 'Silent for whom?' 'When?' and 'In what manner?' Silences are *enacted* in specific contexts and also help to define those contexts. Being produced through contingent and situated practices, silences come in many forms: what goes without saying, what is unspeakable, what has been censored, what is known but not sayable, and so on. Accordingly, to be silent can be recognized as a way of demonstrating deference or defiance, understanding or lack of understanding, giving or avoiding offence, as well as displaying or suppressing emotion. In this respect, silences are pregnant with possibilities.

In this chapter we develop these points by exploring the struggle to render present what is considered silent in a specific context: the recent (renewed) attempts to scientifically demonstrate the effects of Buddhist meditation on the human brain and behaviour. Silence and meditation seem natural companions: through stilling the body and quieting the mind, people create the conditions for experiencing what is happening in the present moment. Yet silence, in various guises, also mediates accounts *about* meditation, which must grapple with how best to do it justice as a kind of practice. Efforts to convey what meditation 'is' face a number of tensions deriving from the idea that the best, and ultimately only, way of knowing it is through first-hand experience. By shifting the focus from 'telling' to 'showing', scientific approaches using brain imaging and other physiological methods have expanded the possibilities for conveying meditation experiences. In the process, these approaches invite, necessitate and shape particular forms of silence.

Overall, we are interested in how silences work across and in the collaboration between the varied traditions that speak about meditation. Unlike mere gaps that hinder the development of knowledge, we argue that the interlacing of what is said and what is not said about the experiential helps

cohere different traditions. In doing so, silences are consequential in helping define notions of expertise and producing forms of scientific accounting.

The next section begins by introducing some of the general complications associated with describing lived experience. The third section considers how such complications play out within Buddhist contemplative traditions, indicating how and why accounting (in words) for experiences of meditation is seen as problematic. The fourth section examines scientific and popular-scientific accounts of neuroimaging and other experimental studies on the effects of meditation, in particular by attending to the case of a Tibetan Buddhist meditator who has assumed a high prominence. In this examination, we focus on what is *not* present in write-ups of experiments and on the manner in which the lived experience of meditators is rendered present and absent in such accounts. The final section surveys how accounts of lived experience of meditation have been positioned within the fields of neuroscience and so-called 'neurophenomenology' in the last few years and how this might develop in future.

Putting experience into words

We can begin by noting some of the general curiosities associated with offering accounts of lived experience, or what we will refer to as 'the experiential'. Noting these curiosities sets an overall intellectual backdrop for the discussion in subsequent sections about what resists being said about meditation and how, despite these issues, meditation is spoken about all the same.

From bodily sensations to desires, memories, emotions and thoughts, experiences would seem to be unquestionable and always present. Famously, Descartes reasoned that one thing that cannot be doubted is the reality of our conscious thinking activity. And yet, as subsequent reflections on the nature of experience (developed for example in philosophical phenomenology and psychotherapy) have highlighted, experiences are neither always clearly or fully present, nor always readily available for self-reports. To begin appreciating this point, consider bodily sensations (such as an itch or a headache). At times, these can be overwhelming and take up all our attention; but this is not always so (see Petitmengin, 2009). To see this, take a moment now proprioceptively to 'scan' your body. You might notice stiffness and even pain in your lower back, or tautness associated with your position, slumped shoulders, and so on. Now close your eye lids and direct attention to the muscles at the back of your eyes. Can you locate them? How do they feel? Is this feeling easy to characterize? Try now relaxing those muscles. Could they be relaxed? Was there built up tension that you had not previously noticed?

The point of this exercise is to show that, by directing attention to different parts of one's body, it is possible to become aware of ongoing happenings that are otherwise not noticed. In the philosophical phenomenological tradition, experiences that are generally unheeded, but that can nevertheless be brought to attention, reflected on and reported into words, are said to be *pre-reflective*.

Pre-reflective experiences are generally 'tacit' or implicit, but can become reflective or explicit (see Zahavi, 2005).

In addition, consider that even when one becomes reflectively aware of certain experiences, staying with their unfolding can prove challenging. This is perhaps most apparent in the case of 'difficult experiences', such as intense negative emotions (anxiety, grief, etc.) or acute physical pain. It is challenging to pay close and sustained attention to these experiences over time and our natural tendency is to 'block them out', think of something else or construct narratives about them. Keeping sustained attention even on ordinary and not unpleasant sensations is highly demanding, as anyone who has tried to focus on, for example, the proprioceptive and tactile sensations of the breath (such as the perception of the belly rising and falling or the passage of air through the nostrils) will testify. Very soon judgments (e.g. 'my breath is so shallow') or other thoughts (planning one's dinner, remembering a previous quarrel, etc.) take one's attention away from the bodily sensations.

On top of these complications, even when one can attend closely to one's experiences as they unfold, rendering those experiences into words often amounts to a gross reduction. Commonly used descriptions – say, 'I'm bored' – stand as coarse and generic labels for what are often varying and complex experiences. Arguably, producing different labels to capture as exhaustively as possible different varieties of boredom, fear, concentration, etc. is likely to be inadequate to speak to the diversity, richness and uniqueness of individual experiences. As another exercise, for instance, you could try to list how many different forms of boredom you can name and consider whether this list adequately captures the quality of your experience of boredom.

As we will see in the course of this chapter, there are different ways of responding to and dealing with these complexities. Generally, however, it is acknowledged that becoming aware of pre-reflective experiences and offering verbal accounts of them is a skill that needs to be honed. In psychotherapy, one method for doing this is known as 'focusing' (Gendlin, 1996). This method recognizes that people are often not aware of (at least some of) their emotional experiences and tend to describe their behaviours rather than their feelings, or what 'they are supposed to feel' in a certain situation according to social conventions or personal schemas. To put clients in touch with their lived experience, the focusing psychotherapist explicitly invites them to attend to their bodily sensations and to how a certain situation feels 'in' their body.[2] This psychotherapeutic technique thus recognizes words as limiting: people can get 'stuck' in self-descriptions that prevent them from tapping their lived experience. To be (re)directed toward the latter, people need to move away from a detached descriptive view of their condition. Yet at the same time, the therapist has to use words to facilitate this redirection, and clients need words to communicate how their body feels and how they interpret these bodily feelings.

Reference to an experience that cannot be captured through words is pervasive in works of literature as well. As Timothy Walsh (1998: p. 111) contends, a passing phrase – such as William Faulkner's reference to the 'smell of rotting cucumbers

and something else which had no name' – invites readers to move beyond words through words, but in a manner that has no determinate ending for meaning. In the hands of writers such as Virginia Woolf or D. H. Lawrence, such simple allusions mesh with layers of partial descriptions, absent referents and incomplete storylines to produce sometimes subtle and sometimes overt evocations, through language, of what is and is not expressible about experience.

Perhaps nowhere are the tensions associated with the desire to express while acknowledging inexpressibility more evident than in the case of existential, contemplative and spiritual matters. Here, while much is regarded as too profound for words to capture, considerable effort is directed towards doing just that – indeed volumes and volumes have been written on such limits of expression (Burke, 1961).

The obstacles to expressing experiential understandings, comprehensions, awareness, etc. (what we lump together as 'insight' for short) are many. Foundational religious texts that might provide the basis for deep understanding – such as the Bible or Qur'ān – have been subject to much debate regarding their literalness, who can interpret their meaning, what remains outside of them and the extent to which divine reasoning can be accessed by human thought (e.g. Saeed, 2006). The limits of human concepts impinge upon both what could be written about and what can be read from sacred texts. In other words, how can we know the limitless nature of God through mundane human concepts? To refer to an experience as 'transcendent' is to gesture towards a sense of how it necessarily 'lies beyond'. If experiential insights resist comprehension by those undergoing them, then their expression to others is even more contestable.

Refraining from attempts to express is one way to acknowledge such predicaments, but dynamic questioning and debate has often followed instead. In the tradition of speaking of the ineffable, Franke (2007: p. 2) commented that:

> The irrepressible impulse to 'speak' essential silence is a constant (or close to a constant) of human experience confronted ever anew with what surpasses saying. While what is experienced remains inaccessible to speech, there is no limit to what can be said about – or rather from within and as a testimonial to – this experience which, nevertheless, in itself cannot be described except as experience of … what cannot be said.

The recognition of such tensions has inspired many attempts to exceed the limitations of language by working with language.

Having highlighted some general complications associated with describing lived experience, the remainder of the chapter turns to how experiential insight is accounted for in descriptions of Buddhist meditation. Both first-person accounts of those undergoing experiences and secondary analyses of them by academics, writers, religious authorities and others, are patterned by what is and is not said about experience, and the interrelations between the two.

Moon pointing: 'can nots' and 'should nots' of recounting meditation

Today the label 'Buddhism' is often used to lump together systems of thought and local practices that have varied significantly over time and space. In different periods and places, practitioners and scholars understood and promoted sutras[3] and other discourses central to understanding experience within Buddhism in one of four ways: as literal, as containing hidden messages, as subject to multiple interpretations depending on the proficiency of readers or as simply beyond comprehension (Mair, 2013; Teeuwen, 2006). Moreover, both at the level of philosophical doctrine and cultural practice, such contests over interpretative authority have been shaped by prevailing political and social structures of the day (Rambelli, 2006).

In this section, we invite readers to consider how the experiential has figured as a source of insight – though a complicated one – in many instantiations of Buddhism. The points in this section, and the spirit of 'probing the possible' that accompanies it, will serve as a prefatory basis for examining in the next section recent scientific efforts to document the effects of meditation on the brain.

We begin with the observation that in providing detailed self-accounts of what it is like to meditate, practising meditators themselves often refer to challenges and tensions in speaking about their experiences. The paradoxical contention that words are incapable of obtaining and conveying insight is routine in contemporary written first-person accounts of meditative journeys, notably those written in English for general audiences not necessarily steeped in Buddhist traditions.[4] A common refrain is that, as a practical undertaking, the experience of meditation cannot be reduced to language. This applies particularly to what can be characterized as 'higher' states of awareness that are non-conceptual (Thompson, 2015: p. 94). For instance, whether the experience of 'nirvana' can be described is a matter of debate, not least because of the different ways it is understood across and within Buddhist traditions (Albahari, 2011).

What can be described also depends on who is speaking to whom – some readers may not be able to understand because of where they are in their own meditation progression (Herrigel, 1999: p. 23). Indeed, whatever the possibility of description, the advisability of offering it can be doubted because of the risk of glamorizing meditation practice, setting up unrealistic expectations, fostering misunderstanding and doubt, and divorcing readers from attending to their own experiences in favour of striving to achieve externally inspired states (like someone else's sense of compassion, bliss, or one-ness; see Kornfield, 2001).

By their own acknowledgement, first-person accounts are often said to capture something of importance (an 'experience') and at the same time not to do so (because of the inadequacy of language to describe or the inability of the reader to understand). While such *disavowals* may undermine confidence in authors' descriptions of their lived experience, they do signal an awareness of

being aware of experiences – and thus shore up a particular kind of claim to proficiency.

We can try to make sense of the above-mentioned cautions about first-person accounts by aligning them with foundational doctrine. Consider for example the following passage from one of the best known sutras. In volume 2 of the Shurangama Sutra, the Buddha likened the habitual orientation to his teachings of those working within a non-enlightened mind as one of fixating on the finger that points to the moon, rather than on the moon itself. So rather than following the words of the Buddha toward enlightenment (represented by the moon), the common tendency is to look at the finger pointing at it (the teachings of the Buddha), thus mistaking the finger for the moon.

In the same vein, many traditions of Buddhism express caution about seeking to put experiences into words. Words are potentially dangerous because they are never experiences – either of the dissatisfaction of the world or of the awakenings of enlightenment. Wrapping words and concepts around experience is likely to reinforce habitual intellectual tendencies toward grasping at the world through greed, aversion and delusion. Labels given to experiences – such as 'pain', 'pleasure', 'old', 'ugly', 'beautiful' – become mistaken for the experiences themselves and condition subsequent thought and action; labels are used to produce theories about experience, and these theories become unquestioned doctrines. Speaking to the dangers of doctrine, the Buddha offered another simile in the Alagaddupama Sutra, here likening his teachings to that of a raft. A raft is necessary for crossing a vast expanse of water (i.e. a journey of awakening). Once that journey has been undertaken, though, it would be foolish to continue to carry the raft. Similarly, even the words of the Buddha should be seen as temporary aides, rather than abiding truths.

One recurring danger with the elaboration, explication and evaluation of experience is that the reading of words creates expectations and engenders striving for certain sensations. Another danger is that knowledge of what is written gets mistaken for the experiential understanding obtained through moment-to-moment engagement in the world. Because of the potential for words to reinforce commonplace delusional thinking, the Buddha recommends sticking to experience itself. To use modern terminology, it is not simply that experience is 'ineffable', but also that it is *better* left undescribed.

The points in the previous two paragraphs play out in different ways across different traditions in Buddhism. Consider two extremes. In an exceptionally in-depth analysis of what he labelled 'the phenomenology of meditative experience', Brown (1977: p. 238) argues that 'meditative and mystical states are rarely ineffable. Ineffability is largely a function of inadequate data sources, inadequate methods of analyzing the texts, and lack of verbal skills.' Examining the Tibetan *Muh Gmudru* tradition, he works through extensive language developed for describing meditative experiences. The rendering of this textual language into one understandable to Western researchers is presented as unproblematically accomplished through drawing on the 'semantic field method' in cultural anthropology. And yet, against this literal rendering,

elsewhere Brown also speaks of the difficulty of comprehending, let alone expressing, the notion of 'subtle energy' discussed in the *Muh Gmudru*. Certain higher levels of meditation are regarded as too complex and subtle for this extensive analysis, even if they themselves are merely a 'starting point of meditative insight' (ibid.: p. 261). In addition, Brown's analysis only presents a description of general states meant to be reached in meditative practice rather than trying to recount the first-person lived experience of those who have reached them.

Elsewhere, routine rejections of the possibility of describing insight give way to attempts to do just that. Claims about the inability of words to capture insight are perhaps most pronounced in Zen Buddhist traditions, one of the most written-about forms of Buddhism in the West. Here denials that insights can be communicated typically accompany accounts of Zen. As D. T. Suzuki (1949: p. 267) writes:

> Zen refuses even tentatively to be defined or described in any manner. The best way to understand it will be, of course, to study and practice it at least some years in the meditation Hall. Therefore, even after the reader has carefully gone over the Essay, he will still be at sea as to the real significance of Zen.

In book after book, as part of his influential work in bringing Zen to Western audiences, Suzuki strives to undermine the belief that he is conveying anything substantial (ibid.: p. 235) – or at least that is the way we read his text as relative novices to the meditation hall. Stated disavowals place his accounts in a precarious status, as both pointing to and pointing away from something significant. This is so because these accounts reinforce the established intellectual conditioning instead of developing awareness of one's ongoing lived experiences (Dass, 1988: p. x). In presenting intellectualizing as impeding the cultivation of awareness (Kasulis, 1981), the writing of Suzuki and others could be interpreted as *distracting* readers from obtaining awareness.[5]

In short – as has been said more than once – the more that is said about Zen, the further one is from it. To be open to the contradictions of such a statement is to open to the contradictions of offering accounts of the experiential.

How to see and describe the moon then?

Meditation under trial: what is not being rendered in words

Experimental approaches have provided a way to reorient the complications of speaking what cannot or should not be spoken. To indicate the basic logic that undergirds these experiments: if it can be empirically demonstrated that experienced meditators regulate their cognitive, physical and emotional responses better than 'normal' subjects do (see, e.g., Goleman, 2003; Davidson and Harrington, 2002), this facilitates understanding how meditation slowly but surely *imprints* on behaviour, brain function and even brain structure. In

this section and the next two, we contrast some of the varying ways in which the experiential is expressed, or left in silence, in the encounters between Buddhism (particularly its Tibetan forms) and scientific traditions. Our goal is to consider how the interlacing of what is said and what is not said facilitates the collaboration between varied traditions concerned with meditation. Silences, we will argue, are consequential in helping define notions of expertise and producing forms of scientific accounting.

That science can help elucidate the nature of meditative experience has been a contentious matter in the past.[6] On the one hand, some Buddhist practitioners have welcomed efforts to map and measure bodily and brain activity, for these measures might render meditation intelligible as a distinct form of practice with real consequences. On the other, there have been concerns that the translation of meditation into a phenomenon amenable to scientific study might lead to impoverished understandings or misguided conclusions.[7]

For example, in his autobiography published in 1987, Tibetan monk Lobsang Tenzin[8] wrote with bemusement about the efforts of Western doctors and scientists to measure the *tummo* or 'psychic heat' he generated as part of meditation practice. Reflecting on a visit to the US, he commented:

> With their instruments the scientists could see such things as heat, movement of wind and blood, and my brain waves. There are certain things, however, which cannot be seen by their instruments, such as the non-dual wisdom of great bliss and emptiness, which is the root of all realisation. Therefore the tantric texts say that it is the basic principle of Tantra to generate a subjective blissful wisdom realising emptiness through the withdrawal, abiding and dissolution of the winds in the central psychic channel […] [W]ithout the subjective wisdom of great bliss realizing emptiness, it would be impossible to gain control over the winds and channels.
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> (Tenzin, 1987: p. 111)

Tenzin's article appeared in the periodical *Chö-Yang: The Voice of Tibetan Religion and Culture*, so he could presume his audience to be at least somewhat familiar with the canonical texts, the hermit life and the spiritual journey in the context of which his meditation practice took place. In the piece, he acknowledges the limits of words and 'conceptual thoughts' in conveying actual experience (Tenzin 1987: p. 110), but he also offers rich detail about the trials and tribulations of solitary meditation, using a Buddhist vocabulary of 'bliss', 'winds', 'channels' and 'emptiness'. Western science appears in his account as both alien and alienating. The scientists got what they wanted out of the encounter ('I could tell from the scientists' faces that they were satisfied, and they said so too' [Tenzin, 1987: p. 111]), but, as the earlier quote indicates, their methods and measurements missed what Tenzin considered to be most salient about his practice.

Collaborative research

In the early 1990s, under the auspices of the fourteenth Dalai Lama, collaboration was initiated that sought to place Buddhist monks and Western scientists on more equal terms. A mixed group of scientists and scholars set out to study Tibetan monks who lived in retreat on Bhagsu Mountain in the Himalayas (Houshmand et al., 2002). Senior monks were invited to 'provide insights both from the formal teachings of their own tradition and from their own direct experience of meditative practice to help shape the ultimate design of the experiments' (p. 4). These monks, by virtue of their intensive and long-term meditation practice, were seen as highly advanced in the investigation and training of their own minds. Scientists such as Richard Davidson wanted to test and measure their proficiency in relation to theories of neuroplasticity (the brain's ability to change in structure and functionality in response to training). Such testing and measuring required the monks to share details about what they were doing when meditating, as well as the changes they had experienced with the advancement of their practice. This proposal, however, did not reckon with the various forms of silence that accompany the practice of meditation in the context of the Tibetan monastery.

As Sara Houshmand and colleagues recount in a book chapter on the early days of this cross-cultural collaboration, the designated monks were not readily prepared to provide insight into their meditation practices: 'This is a sensitive area, because many of the practices are traditionally held as secret, to be discussed only with one's teacher or perhaps with others who are similarly initiated' (Houshmand et al., 2002: p. 11). Even more fundamentally, the monks who were approached by the research team 'all denied having achieved any special spiritual progress' (ibid.), despite having had many years of training in Buddhist thought and having devoted much of their lives to intensive meditation. In Tibetan Buddhism, those who are recognized as having achieved spiritual attainment are not at all interested in letting this be known or in convincing others of it; also pretending to have high spiritual attainment is a major breach of monastic rule (for instance, see Revel and Ricard, 1998: p. 51). As a result, 'it is almost unheard of for a monk to speak of his own accomplishment or progress in the practice' (Houshmand et al., 2002: p. 11).

Scientists, however, did not give up on the idea that advanced meditators make especially valuable experimental subjects. Further and later efforts to observe the effects of long-term meditation on the brain went ahead, but compromises were made. For example, the trend in scientific publications became to qualify experimental subjects on the basis of 'total number of hours' they had spent meditating.[9] In this way, the touchy issue of proclaiming advancement could be sidestepped; indeed, beyond the impression conveyed by the large numbers (10,000 hours and upward), the question of who qualifies as an advanced meditator (and why) is routinely not unpacked in scientific reports today.

In 2000, again under the Dalai Lama's influence, another round of experiments was initiated, involving a Buddhist monk who has since become an iconic

experimental subject in accounts of neuroscientific meditation research in popular writings and the international media. The earliest of these accounts, Daniel Goleman's book *Destructive Emotions and How We Can Overcome Them* (2003; hereafter *Destructive Emotions*), presents 'Lama Öser' as a 'European-born convert to Buddhism [who] trained as a Tibetan monk in the Himalayas for more than three decades, including many years at the side of one of Tibet's greatest spiritual masters' (Goleman, 2003: p. 3). He agreed to a series of laboratory tests designed to study his brain activity, emotional response, physiological arousal in situations of disagreement and startle response reflex while variously engaged in different forms of meditation. Goleman provides a lively description of the rationale behind and the setup of these experiments, of Lama Öser's demeanour throughout and of the scientists' rush to analyse their data in time for a laboratory visit by the Dalai Lama. While describing the results as preliminary and not conclusive, the author conveys that Lama Öser performed exceptionally well on all the tests.

Since the publication of *Destructive Emotions*, the story of this particular set of experiments has circulated widely in popular accounts about science and Buddhism.[10] In the process, it became known that 'Lama Öser' was, in fact, Matthieu Ricard, a French monk with a Ph.D. in molecular genetics. Ricard started working with the Dalai Lama as his French interpreter in 1989. For several decades now he has been involved in raising awareness and understanding of Buddhist thought and of meditation among Western audiences. This he does through his photography, translation work and popular writing on subjects such as Buddhism and philosophy (with his father Jean-Francois Revel, 1998), Buddhism and science (with Trinh Xuan Thuan, 2001), Buddhism, neuroscience and economics (co-edited with Tania Singer, 2015), how to meditate (2010) and happiness (2007).

Ricard's complex identity as a Buddhist monk (and part of the Dalai Lama's entourage), a scientist and, increasingly, a celebrity who can connect with Western audiences has made his role as an experimental subject in meditation research especially significant. Here is someone who can skilfully operate within Tibetan Buddhism as well as Western science, someone with the integrity and know-how to make Buddhist insights and experiences available to a wide audience. Unlike the reluctant monks of Bhagsu Mountain, Ricard understands the project and the stakes 'from both sides'. This allows him to provide helpful suggestions to scientists for how to make meditation amenable to experimental study – suggestions that maintain the integrity of Tibetan Buddhist practices while also understanding the parameters of scientific research.

Commentators indeed make much of Ricard's distinctive positioning. Goleman, for example, in his foreword to Ricard's book *Happiness* (2007) credits the latter with 'unparalleled authority' because of his combined Buddhist and scientific attainments (Goleman, 2007: pp. xi–xii). The same book includes Ricard's own account of those early experiments in which he participated as an experimental subject and collaborator. Introducing a reprint of that chapter in a later volume, editors Barry Boyce and colleagues note that:

'[s]ince he [Ricard] himself was a laboratory subject in one of these major scientific studies, he has a unique vantage point from which to describe the historic encounter between science and meditation' (Boyce et al., 2011: p. 127). To what extent are Ricard's experiences of meditation conveyed as part of this unique vantage point?

Blanking

In relation to the themes of this chapter, of particular interest is the interlacing between what is said and not said in these and other descriptions of Ricard as an expert experimental subject. Despite making much of Ricard's unique positioning, the accounts by Goleman in *Destructive Emotions*, Ricard himself in *Happiness*, and others elsewhere do not make mention of Ricard's first-person experience of meditation during the experiments (nor of such experiences on the part of any other monk). While it is reported that Ricard brought about certain mental states – such as concentration and compassion – there is no attempt to describe his lived experience during these states of awareness.[11] Instead, what we find in these texts is disengagement from experience even when it is held up as relevant. We discuss this dynamic as various forms of *indirection*.

The first form of indirection relates to the claim that experienced meditators have greater insight into the nature of the mind, and hence greater discipline over thoughts and emotions, than the average person (e.g. Lutz and Thompson, 2003: p. 37; Lutz et al., 2007: p. 521). Such insight and discipline are expected to allow a person to provide more precise descriptions of what he or she is experiencing at any moment in time. In the literature on meditation research, a subject's ability to furnish such descriptive first-person accounts is highlighted as essential for the design of meaningful experiments (Lutz et al., 2007) and also as a mark of expertise (Fox et al., 2012). Yet for scientists to acknowledge, let alone make space for, such experiential accounts in their writing is not straightforward, as these do not mesh with the wider conventions of scientific publication. On rare occasions, the importance of first-person accounts has been flagged in scientific writing, as an aside. For example, in a recent article on the experiments that focused on Ricard's startle response reflex,[12] authors Robert Levenson and Paul Ekman state:

> We showed Ricard a number of emotionally arousing films, of the sort we typically use in our emotion research […] Our general experience is that, when allowed to give a free response describing their subjective experience, almost all subjects respond quite briefly. Ricard's descriptions, in contrast, were *much more elaborated, rich in detail and recounting the moment-to-moment changes that occurred in his emotional state.*
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> (Levenson et al., 2012; p. 656; italics added)

And yet, even in this exceptional instance of commenting on first-person accounts in a scientific article, not one example is provided that might

illustrate the richness of Ricard's descriptions. Indeed, a negotiated sense of presence and absence is especially vivid here. The authors make a point of highlighting, as something of interest, both the richness of Ricard's experience and his ability to recount such richness, but do not go on to share this richness with the reader. They may well have considered this out of place in a scientific publication,[13] and indeed it would appear that popular writings like *Destructive Emotions* and *Happiness* can do this more easily (though see below). Our point is that indirection occurs in the way the richness of Ricard's moment-to-moment experiential descriptions is rendered present and not.

A second form of indirection relates to how, especially in *Destructive Emotions*, Ricard's experience as a meditator is made salient to the design of the experiments. The scientists rely on Ricard to distinguish in theory, and perform in practice, six different varieties of meditation: visualization, one-pointedness, open state, compassion, devotion and fearlessness. Descriptions of what these mental states entail and how they differ from one another are essential to making sense of the experimental data generated via functional magnetic resonance imaging and other means. However, as detailed in *Destructive Emotions* and also in *Happiness*, this happens in a particular and limited way. The scientists and their experimental subject give general labels to achieved mental states (e.g. compassion), but they provide no account of the lived mental and bodily experiences of those states from the perspective of the meditator. General labels are made to stand in, as a gloss, for lived experience.

A third form of indirection relates to the dislodging of any religious connotations from meditation training. The absence of marks of lived experience from a first-person point of view in *Destructive Emotions* and *Happiness* makes it easy to leave religion out of the account. This also resonates with the expressed intention of Ricard and others to present meditation as a mental technique rather than a Buddhist religious practice. As Ricard states: 'If such meditation techniques are valid and address the deepest mechanisms of the human mind, their value is universal and they don't have to be labelled Buddhist even though they are the fruit of more than twenty centuries of Buddhist contemplatives' investigations of the mind' (Ricard, 2007: p. 201). In the context of experimental testing, the dislodging of religious connotations also makes less relevant concerns about validity that might be raised if accounts of meditation were framed through – indeed as squarely derived from – a Buddhist vocabulary and training (as in the case of Lobsang Tenzin's account above).[14] More generally, the lack of experiential accounting sidesteps questions about whose understanding of religious experiences should count – no explanation needs to be given for *which* introspective accounts of the experiences of meditation by *which* meditators from *which* traditions on *which* occasions need to be taken with what measure of significance.

A fourth and final form of indirection relates to how Ricard as a subject is presented in various written accounts of the experiments. As mentioned

above, the particularities of his background and profile have been heralded as making him the ideal subject-collaborator. It is interesting, then, that even and especially in Ricard's own writing, he comes across as hardly present at the scene of the experiment. In *Happiness*, Ricard acknowledges: 'I happened to be the first "guinea pig"' (Ricard, 2007: p. 190). However, he then proceeds to describe these experiments in highly generalized terms, never once referring to the tests as personally experienced. Passive, scientific language prevails ('A protocol was developed'; 'The meditator alternates thirty-second neutral periods with ninety-second periods in which he generates one of the meditative states' [ibid.: pp. 190, 191]). There is a strong emphasis on results ('Using fMRI, Lutz, Davidson, and their colleagues also found that the brain activity of the practitioners meditating on compassion was especially high in the left prefrontal cortex' [ibid.: p. 195]). Notwithstanding his 'unique vantage point' as an experimental subject and scientific collaborator, Ricard talks about himself mostly in the third person, for example when recounting the responses of 'the first meditator' in the experiment on the startle reflex (ibid.: pp. 197–198).[15] All these examples point away from the tradition and struggles of writing about meditation in the first person; they foreground science as a way to represent what meditation really does. Ricard's subjectivity thereby slips from view – it is as though there is a blank figure at the centre of his account.

Kevin Hetherington and Nick Lee (2000) have defined the 'blank figure' as an entity that helps broker new possibilities because of the way it, itself, remains undefined.[16] They mention the joker in a game of cards and the double-blank domino as examples. The key characteristic of a blank figure is that, as an 'underdetermined element', it helps 'stitch incommensurabilities together' (p. 175). Ricard's 'blankness' as an experiencing subject, similarly, may be a remedy for some of the perceived incommensurabilities or tensions between the experience of meditation within Buddhism and scientific or other forms of secular and rationalist discourse that appeal to Western audiences (see Andresen, 2000).

Taken together, these four forms of indirection keep engagement with the lived experience of meditation at bay by hinting at it without describing it, by glossing it, by stripping away religious connotations, and by both emphasizing and effacing the importance of Ricard as a person. In no instance are we told what Matthieu Ricard feels at any particular moment throughout his meditative practice. This is particularly noteworthy because, based largely on the neuroimaging experiments done on him, Ricard has been repeatedly dubbed by others as 'the happiest man alive' (Barnes, 2007; Simons, 2010). Given the various forms of indirection when it comes to conveying the experiential, it is perhaps no surprise that these accounts do not engage the 'can nots' and 'should nots' of recounting meditation discussed in an earlier section of this paper. Whether Ricard's or other monks' experiences are beyond description ('ineffable') or better left undescribed is beside the point as long as these experiences are not featured in the accounts.[17]

Recent experiences in contemplative neuroscience and neurophenomenology

Since *Destructive Emotions*, the effects of meditation on the brain and body have been the topic of a burgeoning interest and have led to the establishment of what is now called 'contemplative neuroscience'. Much of the initial research in this latest period of scientific interest in mediation was cultivated through the Dalai Lama and the Mind and Life Institute, which he co-founded with entrepreneur Adam Engle and neuroscientist Francisco Varela.[18] In the last several years, scientific studies on meditation also derive from a wider 'semi-secular' attention to the benefits of so-called 'mindfulness' (see, in particular, the Mindfulness-Based Stress Reduction and Mindfulness-Based Cognitive Therapy programmes, e.g. Kabat-Zinn, 2005).

Within this field, we can distinguish different strands and attitudes to experience and self-reports, in which silence takes different forms and accordingly matters in different ways. In this section we first discuss a strand that is in line with the mainstream approach in cognitive neuroscience and that, as such, pays little (if any) attention to the subjective experience of meditating and to related self-reports. We then turn to 'neurophenomenology' – an emerging approach that explicitly calls for the integration of first-person reports into mainstream cognitive neuroscience. Here we point to a different form of silence; in neurophenomenology there is little consideration for what can or should *not* be described about the experience of meditating. Both types of silences are noteworthy for how they are bound up with the production of claims to scientific knowledge. We conclude the section by delineating what we think may be a possible further development of contemplative neuroscience that takes into account the difficulties and caveats discussed earlier in this chapter.

The cognitive neuroscience of meditation

Much of contemplative neuroscience reflects the mainstream approach in cognitive neuroscience, which typically looks at what the brain does in response to various stimuli and at how brain activity correlates with performance on cognitive-behavioural tasks. In this approach, participants' self-reports about their experiences are usually not included, because they are considered 'subjective' and thus uncertain, questionable and unreliable. Likewise, cognitive-neuroscientific studies of meditation side-line participants' experiences of meditating and do not sample any description of these experiences (see, for example, Ahani et al., 2013). Some researchers specifically identify complications with self-reports due to mindfulness topic-specific considerations, such as the potential variability of questionnaire responses due to prior familiarity with mindfulness-based practices (e.g. Keng et al., 2011).

This situation is similar to what one of us has highlighted elsewhere for the field of 'affective neuroscience'. Here, even when self-reports are collected as part of research, reliance on them is 'extremely cautious and minimized'

(Colombetti, 2014: p. 144). We can point to several parallels between the neuroscience of emotion and that of meditation with regard to how self-reports are sidelined even if they are noted:[19]

1 *Lack of incorporation of first-person data into the experimental set-up*: In affective neuroscience, when first-person accounts are obtained, this is often primarily as a form of control for 'more objective' behavioural and neurological measures. In addition, self-reports often do not play a meaningful role in the design of experiments. The same goes for first-person accounts of meditation, which are often collected to validate other measures (e.g. Marzetti et al., 2014; Xu et al., 2014), and whose scientific standing tends to be downplayed (e.g. Levenson et al., 2012). As noted above, in terms of recruitment and categorization of participants, individuals' proficiency is routinely gauged through the quantitative measure of total meditation hours and not informed by first-person evidence.
2 *First-person data collected by questionnaires*: Within the study of emotion, experiences are typically assessed through questionnaires that both transform them into numerical measures, and understand them through assumptions informed by theoretical frameworks. As a result, fine-grained descriptions of what it is like to undergo an experience are removed. The use of generic questionnaires for the purpose of gauging first-person experience is also prevalent in meditation research (e.g. MacCoon et al., 2014). At times, the standard experimental ways of gauging experience appear to neglect basic Buddhist understandings regarding the aims and effects of meditation. For instance, in one experiment participants (experienced meditators and non-meditators) were asked retrospectively to rate their emotional responses to a set of stimuli on a Likert scale, from 'Not at all' to 'Very' angry, sad, happy or disgusted (McCall et al., 2014). Here, emotions are treated simply as categorical experiences one has in degrees. Yet a central consideration in Buddhism is that emotions are complex experiences that arise under certain conditions and can be met with different levels of self-identification and attachment. One aim of meditation is to recognize the appearance of the 'ego' in emotion and the craving or suffering that this involves. From our position as authors with some knowledge of, but not a specialized expertise in, Buddhist philosophy, a more nuanced approach stemming from these considerations would be to consider whether meditators and non-meditators experience the arising of emotion differently and whether emotions come with different levels of self-awareness and attachment across these groups.
3 *The use of standard clinical scales*: In affective neuroscience, the experience of emotion is typically measured via standard scales (such as the Beck Depression Inventory or the PANAS scales). Participants are generally not allowed to describe their experiences in their own words. This also happens in the study of meditation (e.g. Desbordes et al., 2012).

4 *Experience as a static phenomenon*: Because of the considerations raised by points 2 and 3 as well as other simplifications during measurement, experience is often treated as a static phenomenon rather than one that unfolds and changes over time. Likewise, studies of meditation pay little attention to how participants' experiences unfold from moment to moment (e.g. Lutz et al., 2008; Xu et al., 2014) and rather treat them as fixed and uniform. Neuroscientists use specific scales (particularly the Mindful Attention Awareness Scale and the Five Facet Mindfulness Questionnaire) to measure the effects of meditation, but these scales are designed to capture general overall levels of mindfulness ('traits') rather than the qualitative character of experience as it unfolds.

Neurophenomenology

Although first-person accounts have rarely played a significant role within the design, analysis or write-up of contemplative neuroscience studies to date, they are not wholly absent. Recent years have witnessed the emergence of 'neurophenomenology', a research programme aiming to incorporate into the scientific study of brain activity rigorous methods for the generation of rich first-person data. First heralded by Francisco Varela (1996) – one of the cofounders of the Mind and Life Institute – this approach has gradually been making its way into more mainstream cognitive-neuroscientific research (see Lutz and Thompson, 2003). The label 'neurophenomenology' explicitly refers to a combination of methods: standard methods of brain-imaging during the performance of some mental activity (fMRI, EEG, etc.), as well as 'phenomenological' methods aimed at sampling descriptions of experience.[20] Supporters of this approach typically seek ways of producing self-accounts that meet standards of scientific validity, such as being reproducible through established methods and being verifiable or falsifiable (e.g. Varela and Shear, 1999; Hendricks, 2009; Maurel, 2009; Petitmengin, 2009; Vermersch, 2009). Much effort has been directed not only at establishing and refining methodologies to collect first-person accounts, but also at refuting critiques from those sceptical about the scientific validity and reliability of such accounts (e.g. Petitmengin and Bitbol, 2009).

It is possible to distinguish two types of neurophenomenologically inspired contemplative neuroscience. The first one introduces an explicit reliance on 'experiential categories' in cognitive-behavioural neuroscience and uses them to interpret brain activity. For example, an early study by Antoine Lutz and colleagues (2004) compared brain activity in long-term Buddhist meditators and people with only a few hours training while they generated an experience of 'pure compassion'.[21] The experimenters found that in long-term meditators, this experience was associated with unusually high degrees of synchrony in gamma activity (thought to reflect attention and emotional processes). This study can be considered already 'neurophenomenological' because brain activity here is measured not as participants are exposed to specific stimuli, but as they generate specific experiences (as Ricard did during the experiments

described in *Destructive Emotions*). The experimenters relied on participants' self-reports to know when these experiences occurred and their article also mentions (albeit briefly) that self-reports were used to make sense of the temporal profile of brain activity. To borrow Gallagher's (2003) useful term, this study *front-loads* phenomenology in the experimental design – that is, it uses an experiential category identified in long-standing Buddhist meditation practices (e.g. 'pure compassion') to guide interpretation of brain data.

It can be noted that in this approach the phenomenological component is still very limited and cautious, in the sense that subjects are not asked to describe their experience in much detail (if at all). We can compare this 'thin' neurophenomenological approach with a more recent and 'thicker' one, which involves asking meditators freely to report on their experiences in their own words, then using these self-reports to generate specific categories of experience to aid the interpretation of brain activity. A recent study that takes this 'thick' approach is by Yair Dor-Ziderman and colleagues (2013) on the neural activity associated with different states of self-awareness in long-term Vipassana meditators. Here, the experimenters asked meditators to enter three different 'self-related' states, including a 'selfless condition' in which participants had to try to be aware of the present moment without, however, experiencing themselves as subjects of experience. Importantly, in addition to adopting standard measures of experience involving Likert scales, the experimenters also interviewed the participants, asking them to describe their experience while meditating 'freely and in their own words, without reflection or judgment' (Dor-Ziderman et al., 2013: p. 4). For the 'selfless condition', participants gave descriptions that experimenters grouped into three categories – the one labelled 'lack of ownership' turned out to be associated with a distinct neural signature. This study is thus notable in that it does not only use pre-established categories of self-awareness to interpret brain activity, but it also relies on participants' self-reports, produced in the course of the study, to generate new categories that provide further neuroscientifically relevant information.

Another 'thick' neurophenomenological study is by Kathleen Garrison and colleagues (2013a, b), who combined 'real-time fMRI' (an fMRI technique that provides feedback in real time about brain activity via some form of visual representation) with grounded theory (a widespread inductive qualitative approach in the social sciences, that entails starting from data about experience to build conceptual categories and theoretical schema). Long-term meditators, including some non-Buddhists, were asked to describe their experience in their own words via open-ended questions (presumably to keep the data more manageable, they were asked to provide concise descriptions and to focus on the 'highlights' of the meditation experience). They were also asked to pay attention to the real-time feedback – provided in the form of a graph – from their brain activity and to consider whether this feedback corresponded with their experience of meditation. If they found that the graph did not correspond to their experience, they were asked to explain how they knew this. By analysing these self-reports with grounded theory, the experimenters were able

to extrapolate several categories of experience, which they used to identify and interpret specific patterns of brain activation. The researchers then went on to outline hypotheses derived from this neurophenomenological design.

These two studies thus overcome the silences about experience and self-reports we identified earlier in mainstream cognitive-neuroscientific approaches to meditation, and even in the earlier 'thinner' neurophenomenological ones, by making room for moment-to-moment experience to be recounted in meditators' own terms. And yet, on the basis of our earlier considerations about the difficulties of putting experience into words, we can note here a different form of silence that (still) characterizes the thick neurophenomenological approach. The latter is particularly concerned with elucidating, establishing and 'explicitating' lived experience, and with providing means of verbalizing it. This emphasis is accompanied by a lack of attention to, and discussion of, what is, or even needs to be, *absent* from first-person accounts. In other words, this approach generally does not recognize the need for caution about the possibility or advisability of trying to capture through words the experience of meditation.[22] Nor does it treat what participants choose *not* to describe about the experience of meditation as indicating an awareness of their awareness. Instead, the overall orientation of the thick neurophenomenological approach is one of developing scientific means for making pre-reflective aspects of experience explicit and for analysing them in a rigorous way.

A noteworthy feature of the studies just outlined (and of the cognitive-neuroscientific approach more generally) is what they do *not* make reference to. They do not give any consideration to what the meditators might think should be left undescribed or even not be subject to descriptive attempts. They do not mention either whether the meditators examined felt any reluctance in being identified as accomplished meditators. In other ways, too, these studies give primacy to what can be verbalized over what cannot. The use of qualitative methods (such as grounded theory) to extrapolate categories of experience tends to rely on what gets said, rather than on what is not or cannot be said. There is also a point to be made about vocabularies and their indebtedness, or lack thereof, to Buddhist thinking. Dor-Ziderman et al. (2013) used first-person descriptions by experienced meditators to identify three different forms of experience. These experiences are recounted through concepts and descriptors that (largely Western and non-Buddhist) readers of this volume are likely to regard as commonplace. Arguably, this would have been a harder and more question-begging task if it had involved meditators who had interpreted their experience in a language steeped within a Buddhist imaginary (as in the case of Lobsang Tenzin).

This is not to say that the neurophenomenological approach does not show any awareness at all of the difficulties associated with putting experience into words. Echoing some of the Buddhist themes we noted above, Petitmengin and Bitbol (2009: p. 389), for instance, note that 'words […] don't display experience, they only point at it'. Like Gendlin (1996), they warn that, in becoming absorbed in verbal descriptions, individuals may lose sight of their

experiences. And yet, this consideration does not lead Petitmengin and Bitbol to recognize the ineffable or contemplate that practitioners might see a limit to what should be described. Rather, it is for them a reason to strive for the development of ever more refined techniques enabling people to become aware of experiences not ordinarily noted and to describe them in detail whilst remaining 'close' to them. Arguably, language is taken here as a tool for representing and reporting experiences in a direct, mostly non-problematic way.

A similar tendency can be found in Thompson's (2015) recent book *Waking, Dreaming, Being*, which closely examines a variety of Indian yogic and Tibetan Buddhist accounts of several states of consciousness, including 'non-dual' ones such as the 'clear light' said to be experienced by trained meditators in the dying process. These states of consciousness are by definition 'object-less' (that is, they are not about anything in particular) and they are non-conceptual. This makes them very difficult to report, even retrospectively – because as they occur, they cannot, arguably, be described without losing their non-dual and non-conceptual status. Thompson is particularly interested in whether and how neuroscience can find the neural signatures of these states and reviews several studies that have attempted this for various experiential states (as well as giving suggestions for how to do so). Although his account is unquestionably sensitive to the complexities and subtleties of experiential states achievable by meditators, it is primarily oriented to clarifying these experiential states for the purpose of identifying features of experience that lend themselves to neuroscientific investigation. His account does not talk about what can or should *not* be talked about in meditation. As a result, it is not clear whether Thompson thinks that there are experiential states, or aspects thereof, that do not lend themselves to neurophenomenological investigation precisely because of their non-dual and non-conceptual nature.

A possibility for a third-stage neurophenomenology would be to integrate recognition of these difficulties and struggles explicitly into the experimental approach. This approach would neither sideline experiential reports, nor be silent about the risks and paradoxes inherent in the project of describing experience during meditation. Such a neurophenomenology would engage with participants in a yet more thorough way, by assessing their attitude to the tasks of reporting on their experience, by enquiring into their background and conceptual frameworks, by asking explicitly to report on features of experience that are harder to put into words than others, and to explain why this is the case. This project of explicitation and reflection would aim at making more room for the constructive and generative role of silences and absences in the meditation experience – one that, as we saw, has been long pointed out in non-scientific traditions of writing about Buddhist meditation.

Concluding remarks

This chapter has sought to understand how silences contribute to the production of knowledge claims in attempts to subject meditation practices

within Buddhism to scientific scrutiny. In this intersection between scientific and Buddhist traditions much is up for negotiation. We have been struck by a particular recurring dynamic that plays out in different ways in a variety of settings: namely, that examinations of the experiential practice of meditation rarely seek to offer an account of the lived experience of meditation, including the silences and ineffable aspects that characterize this experience.

As has been developed elsewhere in this volume, silences can both frustrate and facilitate inter-subjective agreement, act as a mark of expertise and of ignorance, stifle the exchange of ideas and stimulate the production of knowledge. In this chapter, silence has not been conceived as a state or space, a gap in what has been said, or a kind of social glue that holds science and Buddhism together.

To better characterize silence in the spotted and ambivalent engagements with the lived experience of meditation in the accounts examined in this chapter, we can perhaps turn to music as an analogy. Just as the denoting of sounds in the composition of music brings with it what is in-between the notes, so too the telling or showing of experiences of meditation entails the production of a sense of what is outside. Both what is 'there' and 'not' are constitutive of music scores and meditation accounts. But neither are simply fixed properties. Silences might be structured by composers and musicians in such a way that they take centre-stage, or are pervasive but not intended to be noticed. Then again, '[l]isteners may engage with silences to whatever degree they like, depending on how attentively they feel like listening, how actively they are engaging with the material they are hearing, or not at all' (Losseff and Doctor, 2007: p. 11). What is there and what is not are interrelated in the manner that the interpretation given to either depends on the other. It is, then, through silence as well as explication that experience (and music) is performed and made sense of. As argued in the case of accounts of meditation, within these relations knowledge of the experiential is variously denied, defended, deferred or made subject to deference.

Notes

1 Our thanks to the editors for their helpful corrections and comments on an earlier draft of this chapter.

2 Gendlin (1996, pp. 29–30), for example, illustrates the case of a client initially complaining that she often misses school, does not hand in papers and does not have a romantic relationship even if she would like one. When asked to pay attention to how her body feels when thinking of these situations, she reports feeling 'jittery' and also 'pulling back', and subsequently comes to the realization that she is scared.

3 The term 'sutras' (or 'suttas' in Pali) refers to Buddhist canonical scriptures, many of which are considered records of the Buddha's teachings.

4 For instance, see Lerner (1977: pp. 60, 72, 100, 127), Austin (1998: ch. 13) and Kasulis (1981: p. 41).

5 This theme occupies a particularly prominent place within some traditions of Buddhism, see Burton (2000).

6 In focusing on the different ways in which silence is negotiated at the intersection of Buddhist meditation and neuropsychology, this section cannot do justice to the variegated history of the scientific study of meditation. For more extensive accounts, see Harrington (2008: ch. 6) and Andresen (2000).
7 For a scientist's perspective on this work, see Benson (1991).
8 A different Lobsang Tenzin from the one who was prime minister of the Tibetan government-in-exile in 2001–2011.
9 For example: 'Buddhist practitioners underwent mental training in the same Tibetan Nyingmapa and Kagyupa traditions for 10,000 to 50,000 hours over time periods ranging from 15 to 40 years. The length of the training was estimated based on their daily practice and the time they spent in meditative retreats. Eight hours of sitting meditation was counted per day of retreat' (Lutz et al., 2004: p. 16369).
10 Examples include Geirland (2006), Davidson (2009), and Ricard (2007; 2011). Sometimes accounts of the experiment serve to signpost the beginning of rigorous studies of meditation; at other times they are used to illustrate the notion of neuroplasticity (as in Ricard, 2007, 2011).
11 For a contrasting orientation that attempts to make sense of first-person experience through a scientific language, see Austin (1998: pp. 353, 479).
12 These were described more informally in Goleman (2003).
13 The quote is included in a section of the paper reserved for observations on Ricard's performance in tasks and tests that 'lacked the experimental rigor necessary for scientific publication, [yet] we still feel they may be of interest to others and may help place the startle findings in their larger context' (Levenson et al., 2012: p. 656).
14 For a discussion of these validity concerns, see Lutz et al. (2007). For attempts to mix science with Buddhist philosophy, see Hanson and Mendius (2009) and Austin (1998).
15 Especially curious is that Ricard's writing about the experiments relies heavily on quotes from other published sources. For instance, Ricard brings in the voice of Richard Davidson, the scientist in charge of the experiments, by quoting newspaper articles for which Davidson was interviewed.
16 See also Hetherington (1997), who in turn draws on the work of Michel Serres.
17 The accounts we have read also certainly do not attempt to represent what might be dubbed as the 'higher (non-dualist) states of awareness' that Ricard or other monks participating in these experiments might achieve (such as 'sublime consciousness' or 'pure awareness').
18 As recounted in, for example, Harrington (2008: ch. 6) and Thompson (2015: ch. 3).
19 This section is based on a review of fifty-one articles returned after a PubMed search of the terms 'neuroscience' and 'meditation' in January 2015. Not all returned studies are strictly neuroscientific ones (some are behavioural-physiological). However, to the best of our knowledge all the features we identify below do apply to the neuroscience of meditation (as well as to many behavioural-physiological and other scientific studies).
20 Phenomenology is a philosophical tradition usually traced back to Husserl and associated with works by Heidegger, Merleau-Ponty, Sartre and many others. For present purposes, we can characterize phenomenology as the study of phenomena, i.e. of what 'appears' or 'is given' in first-person experience.
21 Characterized here as 'unrestricted readiness and availability to help living beings' (Lutz et al., 2004: p. 16369).
22 This is particularly noteworthy, we think, given that many supporters of the neurophenomenological approach are themselves experienced meditators.

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