The Neuroscientific Turn

Transdisciplinarity in the Age of the Brain

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Chapter 5

Neuroscience and the Quest for God

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Modern writers such as Will Durant have described the medieval period as an “age of faith” (1950, iii), and despite the danger of gross generalization, in its broad strokes it is difficult for a modern researcher to deny the characterization. In fact, for countless premodern Europeans during the Middle Ages and beyond, belief in God’s divine plan served as an organizing principle through which they understood themselves and their world. Considering the power of the Catholic Church during these centuries, this theistic focus should come as no surprise, nor should it surprise us that many people during this period desired more than simply a chance to pray to God—many wanted to know God immediately and directly. For these impatient souls, mystical union with the divine became the goal. Not only might one hope to reap significant spiritual rewards, but the prestige a recognized mystic held provided considerable authority and power. The sociocultural ethos of the medieval period was thoroughly infused with a hegemonic discourse, that is, a set of cultural and ideological assumptions, encouraging the pursuit of mysticism.

However, while the Christian tradition provides models for this quest—perhaps the most significant being the Apostle Paul’s experience on the road to Damascus and the writings in toto of the sixth-century Christian Neoplatonist Ps. Dionysius the Areopagite—there was no established set of techniques designed to bridge the gap between humanity and God’s divinity. Therefore, aspiring mystics experimented with different sets of what Michel Foucault would call “technologies of the self” (1988) in order to refashion themselves in ways that would make direct contact with God possible. Naturally, different technologies yielded different results. These differences can be understood through the lens of neuroscience. A neu-
rosco scientific analysis of the practices of mystics provides insights into the psychophysiological effects that these technologies of the self might be expected to produce. In conjunction with a historical analysis of the motivations for pursuing contact with the divine, a neurohistorical analysis provides a fuller framework for understanding medieval mystic behavior.

Neurohistory is a young approach, combining the analytical tools of the neuroscientist with those of the historian in order to provide fuller insights into the motivations, desires, and actions of historical actors than either discipline can provide individually. The basis of analysis is the presupposition that psychological factors must be understood within their sociohistorical contexts, but these factors are informed by standardized neurological structures. Rather than remaining limited to the writings of these individuals, or those that were written about them, a neurohistorical approach allows the researcher to make reasonable judgments about how important figures were able to effectively exercise agency in pursuit of mystical contact with the divine. In short, neuroscience provides an added level of analysis to be coupled with postmodern techniques of culturally dependent textual interpretation. Historians have made great strides in gaining an increasingly sophisticated understanding of peoples of the past who lived very different lives from the researcher and explained their own experiences through radically different discursive formations—but were dependent upon the same neurological structures for forming thoughts and approaching the world as we are today.

Neurohistory is hinged upon an understanding of non-culturally specific aspects of our basic humanity that, when considered in conjunction with the societies and cultures that people build slowly over time, allow us to draw closer to an understanding of those people who make history than is otherwise possible. In addition, while it is widely understood in the neurosciences that experiences and behavior unfold from brain activity embedded in and dynamically interacting with multiple contexts (e.g., physical and sociocultural), a deeper understanding of the influences of those contexts is difficult to unpack with the tools of neuroscience alone. This is perhaps most evident in prevailing tendencies to interpret mystical experiences through a lens of pathology (for examples, see Saver and Rabin 1997; Vaitl et al. 2003). While some experiences may indeed issue from neuropsychiatric conditions (e.g., epilepsy), the relatively new field of contemplative neuroscience, which examines brain changes associated with different meditative practices, has revealed just how much meditation can produce profound, and typically desirable, neural and psychological changes in nonpathological populations (for overviews, see Ekman et al.
The study of mystics provides insights into the ways in which these technologies of the self might be understood with a historical analysis of the motivations, the divine, a neurohistorical analysis providing new understanding of medieval mystic behavior.

An approach, combining the analytical tools of the historian in order to provide fuller picture of the lives, and actions of historical actors than was previously possible. The basis of analysis is the perception that the characters must be understood within their context. The factors are informed by standardized narrative, and the basis of the writings that were written about them, a neurohistorical framework to make reasonable judgments about the ways in which to effectively exercise agency in pursuit of religious belief. In short, neuroscience provides an added layer of understanding, with postmodern techniques of cultural analysis. Historians have made great strides in how the understanding of peoples of the past and the researcher and explained their own place in this new understanding of discursive formations—yet were largely ignored. Researchers have been interested in the possibility of forming thoughts and actions today.

Our understanding of non-traditional practices of mystics, when considered in conjunction with the work of those practicing in the present, is that people build slowly over time, allowing the unfolding of those people who may otherwise be constrained, while it is widely understood in the context of behavior unfolding from brain activity—interacting with multiple contexts (e.g., religious, social, cultural) and the influences of the culture and the tools of neuroscience alone. We are beginning to interpret mystical pathology (for example, see Saver and Woodard). While some experiences may indeed issue in neurological disorders (e.g., epilepsy), the reality of new field of neurotheology, which examines brain changes associated with contemplative practice, has revealed just how much meditation is not only desirable, neural and psychological relations (for overviews, see Ekman et al. 2005; Lutz et al. 2008; Shapiro and Wallace 2007). These changes are only meaningful, however, in the larger personal and sociocultural contexts in which they occur. Thus, both neuroscience and history stand to gain from joint neurohistorical analyses.

The current study will focus on two rather different people, Bernard of Clairvaux (1091–1153) and Teresa of Ávila (1515–82). Bernard was the son of a Burgundian nobleman and a deeply pious mother who attempted to live a life as close to the ascetic ideal as possible while acting as a married mother of seven (William of St.-Thierry 1147). Teresa, on the other hand, was the daughter of a minor Spanish knight whose paternal grandfather had converted from Judaism only to later face persecution at the hands of the Spanish Inquisition for allegedly continuing to favor the religion of his birth (Williams 2001). Bernard and Teresa were similar in one important way: both became recognized as successful in their quest for union with God, which in turn brought prestige and power to each of them. Yet even in this fact they were very different, for the techniques they used to gain this union were widely divergent, and if we want to understand not only these two but also the many other mystics who have played such a key role in the history of Christianity then we need to move beyond a historical approach to the level of neurohistorical analysis. For the modern researcher seeking to understand the ways in which those who wrote of their own experience in the study of historical practice, this provides an untapped evidentiary base upon which to build a stronger understanding of the power of meditation. For the historian who wants to understand how mystics were able to (re)make themselves—transcending normal human limitations to such an extent that, in a Christian milieu, the mystic could plausibly claim contact with the divine—research in contemplative neuroscience provides a heuristic for a different understanding of ostensibly similar practices by historical figures. In other words, neurohistory allows the researcher to consider alternate routes into the subjectivities of historical figures. In virtue of both their similarities and differences, Bernard of Clairvaux and Teresa of Ávila function as good case studies to demonstrate the usefulness of neurohistory for bringing fresh insights to the study of historical actors.

Let us begin with Bernard: as a young boy he grew up in a household in which his mother, Aleth, was the most important influence. According to William of St.-Thierry, Bernard's friend and biographer, Aleth ate abominably, spent many long hours in prayer, and "ruled her household in the fear of God . . . and brought up her sons in obedience" (William of St.-Thierry 1147, 237B–238A). Her influence on the household is clear; even-
tually all of her children—and even her husband—would take monastic vows. It is also clear that she saw Bernard as special from an early age, even if we discount the formulaic tale that a holy man predicted great things for him while still in the womb. As a boy his parents sent him alone of all the children to Chatillon-sur-Seine to be educated by the secular canons of the cathedral of Saint-Vorles. Although Bernard had an early interest in classical Latin literature and poetry that would mark his writing for the rest of his life, spending his formative teenage years in such a religious setting would have only reinforced the deeply pious example set by his mother. It is likely that Bernard’s habit of hagiographical reading developed here, as in his adult life many remarked upon the time he spent reading saints’ lives. The most popular work in this genre was the *Life of St. Anthony*, the desert hermit who died in 356/7, portraying a man who lived a life of ascetic heroic self-denial in hopes of getting closer to God. Living in seclusion for much of his life, eating only wild foods—and of that only very little—Anthony nonetheless came to be seen as the founder of monasticism and attained such prestige in his own day that the Roman emperor Constantine (d. 337) and two of his sons corresponded with the eremite in search of advice (Latourette 1953).

All of this—his mother’s early influence, his education at the cathedral school, and his devotional reading—would have created a set of cultural assumptions about sanctity through which Bernard would have been conditioned to see asceticism, complete devotion to God, and striving for divine union as the most praiseworthy life possible, leading to both spiritual rewards and temporal influence. In fact, judging from Bernard’s later writing, he saw it as the essence of the human condition to “always be journeying back, always striving to know God” (Evans 2000, 23). This attitude seems to have begun to express itself soon after the death of his mother when he was nineteen, coming to the fore as the primary motivating influence in his life four years later in 1113 when Bernard and thirty companions, including two of his own brothers, entered the French monastery at Citeaux.

Bernard left us with no shortage of written material from which we may understand his approach to his religious vocation. In his sermon on Psalm 138:8 he asked “Where shall I turn, so that I may turn to thee, my Lord God?” (Evans 2000, 22–23). Proceeding from that point, he deconstructs the concept of “turning,” in the end stating that if he wishes to be one with God—which is his most fervent desire—then he must remake himself, turning into a different person, changing himself into a “little one” so as to learn meekness and humility. When compared to his *Sermones in
her husband—would take monastic Bernard as special from an early age, even that a holy man predicted great things a boy his parents sent him alone of all to be educated by the secular canons although Bernard had an early interest in that would mark his writing for the rest of his life in such a religious setting only pious example set by his mother. It was the Life of St. Anthony, the deserts, a man who lived a life of ascetic living closer to God. Living in seclusion from the world foods—and of that only very little—given as the founder of monasticism and believe that the Roman emperor Constantine corresponded with the hermit in search of influence, his education at the cathedral—would have created a set of cultural norms which Bernard would have been expected to emulate devotion to God, and striving for a holy life possible, leading to both spiritually. In fact, judging from Bernard’s later the human condition to “always be journeying by God” (Evans 5000, 23). This attitude developed itself soon after the death of his mother fore the primary motivating influence 13 when Bernard and thirty companions, entered the French monastery at one of written material from which we can discern his religious vocation. In his sermon on I turn, so that I may turn to thee, my proceeding from that point, he deconstructs the end stating that if he wishes he must remake his desire —then he must remake himself into a “little one” by praying. When compared to his Sermones in

Quadragesima de psalmo “Qui habitant,” his meaning is clear. There he states, “A merely bodily and therefore outward conversion is a form and not the truth. We are told to deny our bodies their sensual pleasures, but that is not enough,” before going on to clarify that neither is it enough to undergo only a spiritual change, for such a change can only occur after a bodily “conversion.” What is the point of this “turning”? No less than ecstatic union with God, which though only momentary in this life is nevertheless the most important goal toward which anyone can ever strive—at least while in this life. Bernard was successful in his pursuit, coming to be seen as a mystic during his own lifetime, and the rewards were indeed great; his contemporaries held his moral authority in such high esteem that kings and popes wrote seeking advice, while he directly intervened in the crisis in the church that left two men vying for the role of pope in 1130. Bernard has been called without exaggeration one of the most powerful men in twelfth-century Europe (Harris 2001).

Similarly, Teresa of Ávila’s psyche developed within an environment in which the concept of self-abnegation and the quest for God was continued to be presented to her not only as the most laudatory but also as the most fully actualized life possible. Sixteenth-century Spain was a culture in which no deviation from Catholic orthodoxy was permitted, as the Spanish Inquisition alertly policed the populace of “New Christians,” Jews who had converted rather than face expulsion in 1492, for any hint of the existence of the Marranos who secretly practiced Judaism (Roth 1992). Teresa’s paternal grandfather was one of these New Christians who knew all too well the suspicious nature of the inquisitors: forced to do public penance in 1485 for alleged Jewish activities, he was lucky to escape with his life (Williams 2001). Even among the larger body of those with no links to Judaism the authorities were extremely vigilant, especially for signs of Erasmianism, which had become popular among members of the intelligentsia, such as the former chancellor of Alcalá University, Pedro de Lerma (d. 1541), imprisoned in 1537 for his Erasmian teachings (Kamen 1997). This humanistic reevaluation of Catholic doctrines based upon the writings of Desiderius Erasmus (d. 1536) was far too liberal for the deeply conservative brand of Catholicism practiced on the Iberian Peninsula in the sixteenth century.

It is important that we have some sense of the extent to which religious orthodoxy informed the time and place of Teresa’s birth, for as with Bernard, the result was the creation of a hegemonic discourse built around cultural assumptions that would have provided her with a view of her relationship to God and her faith that would have been absorbed from the culture
in which she lived. True, there are elements of her writings that indicate a carefully negotiated resistance to the overarching power structures of her society, but negotiation is not rejection. Her religious identity would have been reinforced by the education she received from the Augustinian nuns at Ávila and the letters of St. Jerome (d. 420) that she read assiduously. The impact of these letters on Teresa cannot be underestimated, as they present a form of Christian asceticism and complete devotion to God that clearly influenced Teresa in her own pursuit of union with the divine; in her autobiography she not only regularly refers to Jerome’s letters but also indicates that others compared her to the fifth-century saint (Teresa of Ávila 1565).

Teresa had the potential to gain even more from recognition as a mystic than had Bernard. First of all, as a woman her freedom of action and influence was extremely circumscribed in sixteenth-century Spain. Through recognition as a mystic, though, she was able to carve for herself a sphere of action, becoming a reformer and founder of monasteries. By the time of her death some thirty-four monastic establishments, split equally between those housing monks and those housing nuns, owed either their existence or their reform and reestablishment to her guiding hand. Certainly she faced opposition, as many within the Inquisition suspected her of heresy and diabolical discourse, but ultimately she prevailed through the direct support of King Philip II (d. 1598) and Pope Gregory XIII (d. 1585). It is unthinkable that she would have been able to wield such power had she not been widely seen as regularly engaged in direct discourse with God (Mujica 2003).

We can understand both Bernard and Teresa better if we approach them as people who employed what Michel Foucault would call “technologies of the self,” if we understand these technologies to comprise both inward mental techniques as well as those directed at disciplining the body with the intended goal of changing the inner landscape of the individual (Foucault 1988). This application of the theory is permissible because Foucault’s essential insight was that there is a venerable Western tradition against allowing one’s “self” to represent a passive construct, coming about through an interaction of biological and environmental conditions. Rather, from at least the time of the Greeks there have been many people who have taken a proactive role in the process of self-determination and individualization, using processes such as self-reflection—either carried out through a process of individual meditation or through analytical writing about one’s innermost thoughts and feelings—and confession based on guided self-analysis of what faults a person might have and how the person
are elements of her writings that indicate a reading of the overarching power structures of her time and place. Her religious identity would have amounted to the Augustinian asceticism and devotion to God in her own pursuit of union with the divine, as regularly refers to Jerome’s letters but is perhaps most fully developed by the early twentieth-century theorist Antonio Gramsci (Gramsci 2007; Martin 2002). Hegemonic discourse is one of the key components in the socioculturally constructed self, wherein researchers seeking to understand historical actors should take account of the intersecting elements that inform the construction of the self for each individual. Within high and late medieval society, the biographies of the Desert Fathers (with Anthony being the most prominent), the writings of church fathers (such as Jerome), and the work of Ps. Dionysius all served as constitutive elements of this discourse in which mystical contact with God was widely held to be the most desirable—and profitable—thing one could accomplish in this life, as detailed above. It is within this orienting framework that Bernard and Teresa operated. However, while the ends to which Bernard and Teresa devoted themselves were strongly determined by the prevailing hegemonic discourse, the methods for attaining contact with the divine were not. In the absence of any sort of guiding principles, the technologies applied by would-be mystics were necessarily idiosyncratic and ad hoc.

Turning first to Bernard, while he employed many technologies of the self in an ascetic project of self-fashioning, for the purposes of this study the most important component of this program was a twofold strategy designed to reorder himself as one capable of having direct experience of the divine. First, from the time that Bernard entered into his novitiate at the monastery of Citeaux, he habitually avoided sleep, with his contemporaries noting that he stayed awake in prayer long after the other monks retired for the evening or went back to bed after rising to perform one of the nightly offices (William of St.-Thierry 1147). While research indicates that people can get by on very little sleep—if the sleep received is regular—details of Bernard’s life suggest that he chose random intervals at which to maintain long vigils of prayer, indicating that he would have experienced not only sleep restriction but also sleep fragmentation, a combination that would have caused a destabilization of the waking state (Doran et al. 2001; Durmer 2005).
It is normal that during sleep, activity in the prefrontal cortex of the brain diminishes substantially, most strikingly in an area known as the dorsolateral prefrontal cortex (DLPFC) (Muzur et al. 2002). Typically, this activity recovers quickly upon waking, but in a person enduring sleep deprivation and fragmentation, recovery can be delayed. The DLPFC is central to the so-called executive functions, including working memory, reasoning, temporal ordering of information, directed thought, and “reality monitoring.” Therefore, an individual undergoing extended sleep fragmentation—as was likely the case with Bernard—would experience numerous brief periods in which the likelihood of abnormal perceptions and the inability to properly categorize these experiences as such are greatly increased (Wesensten et al. 1999). It is important to note here that while a neuroscience perspective provides insights into the likely effects of Bernard’s practices, it makes no epistemic or ontological claims about those experiences.

Bernard’s intentional sleep deprivation and fragmentation increased the likelihood of having experiences that might be classified as mystical. To the extent that sleep deprivation and fragmentation were employed as a means for remaking the self—as it appeared to be for Bernard—then there were valuable technologies of the self. In addition, Bernard practiced long periods of intense prayer typically directed toward a single object, often standing for such extended periods as he did so that his feet would swell and his knees would buckle from the effort (William of St.-Thierry 1146). Prayer has not always been fully appreciated as a technology usefully employed by mystics, likely because the vision of prayer in the popular imagination is that of an undirected exercise of limited length requiring little if any concentration, useful perhaps for reducing “mental clutter” but for little else (Kroll and Bachrach 2003). However, the way in which Bernard used prayer—performed for extended periods while concentrating on a single object—means that we should think of what he was doing more as meditation than any simplistic appeal to the divine. Meditation allows one skilled in its use—and we must remember that Bernard practiced intensive prayer for decades—to experience alternate states “by promoting more frequent transitional periods [between sleep and waking], and by training the meditator to remain experientially aware for longer intervals” during transitional periods (Austin 1998, 464). This process of lengthening the periods in which one is experientially aware is consistent with the increase in involuntary microsleeps that follow sleep deprivation, resulting in frequent hypnagogic and hypnopompic perceptual distortions (Durner 2005; Austin 1998). In a phenomenological investigation of intense meditation practice, Jack Kornfield reports experiences from practitioners including
activity in the prefrontal cortex of the brain
(likely in an area known as the dorsolat-
murral cortex, DLPFC) is central to the
context of working memory, reasoning, tem-
pered thought, and "reality monitoring."
Under extended sleep deprivation—as was
the case with several subjects in the study—
individuals could experience numerous brief periods in
perceptions and the inability to properly
interpret the data collected during the study.

With the advent of new technologies and an increased
focus on sleep quality and quantity, researchers are
beginning to explore the role of sleep in cognitive func-
tion, mood regulation, and overall health.

In this context, sleep deprivation and fragmentation
increase the risk of developing various health
problems, including cognitive decline, depression,
and an increased risk of type 2 diabetes.

Evidence suggests that adequate sleep is vital for
overall health and well-being. Sleep deprivation
has been linked to an increased risk of chronic
conditions such as obesity, heart disease, and
mood disorders.

In conclusion, the relationship between sleep
quality and cognitive function is complex and
requires further investigation. While the relationship
between sleep deprivation and cognitive decline
is well-established, the mechanisms underlying this
relationship are not yet fully understood.

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Further research is needed to fully understand
the interplay between sleep and cognition and
how interventions to improve sleep quality may
contribute to overall health and cognitive
functioning.
an inability to perceive the passage of time or even the existence of the self as “the soul is made one with God” (Teresa of Ávila 1577, 132). Such experiences sound so odd and inexplicable to modern readers that modern scholars have struggled to explain and define her mystical experiences. How can one reconcile periods of completely interiorized absorption that remove one from the phenomenological world that is the ordinary field of maneuver and action for grounded modern people? Such confusion has led some to seek explanation in medical conditions such as epilepsy (Barton 1982). Unfortunately such an approach is reductionist, relying too much on modern medical understanding divorced from historical context and the full range of evidence provided not only in Teresa’s copious writings but also in statements her contemporaries made about her. Biological considerations are an important component of understanding mysticism, but this form of analysis must be combined with a close reading of the historical context of the subject under scrutiny. With that in mind, it is important to note that Teresa’s contemporaries perceived her experiences as useful and laudatory—if highly uncommon—rather than aberrant and possibly pathological.

Furthermore, Teresa’s experiences closely mirror those of others wielding similar technologies of the self. For example, in a comparative analysis, Ken Wilber likens Teresa’s attainments to a stage called “conditional nirvikalpa samadhi” in Eastern contemplative traditions (Wilber 2000a, 645). This replicability of the effects of meditative technologies speaks against a pathology-interpretation of Teresa’s experiences.

The question becomes, then, how did she accomplish her goal? What she needed was a system of meditation, allowing her to transcend her self—that essential construct created, in part, by the hegemonic discourse within which she existed, which produced a set of unspoken assumptions that made up how she thought about herself and her world (cf. Bourdieu 1998). In the absence of an established system of meditation within sixteenth-century Catholicism, she invented one. Foucalt’s understanding of the technologies of the self closely mirrors Teresa’s system, beginning as it does with an intense process of self-reflection during which time the individual categorizes and reflects upon the sins weighing down the soul in order to gain entry to the first mansion—in Teresa’s terminology—proceeding through a process of a “gradual letting go of unnecessary things,” thereby allowing one to rise through the higher mansions by way of a process of self-reflective analytical prayer (Ahlgren 1979). The progressively unfolding fruits of her efforts are described in her Interior Castles as seven mansions. Each mansion was phenomenologically unique and, she believed,
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The soul is ‘so completely absorbed and the understanding so completely

spatially that the soul seems incapable of grasping anything that
does not awaken the will to love” (2000a, 305). It is through this internal
 absorption, occurring at mansions four through seven in Teresa’s system,
with longer duration at each higher level, that she comes into contact with

Teresa’s descriptions of her absorptive states are important, as they par-
allel descriptions provided by others in similar states. Indeed, J. H. Aus-
tin has studied internal absorption in relation to Zen practitioners and
notes six regular characteristics of internal absorption: (1) no spontaneous
thought; (2) an intensified, fixed, internalized awareness; (3) an expansion
of especially clear awareness into ambient space; (4) the disappearance
of the bodily self; (5) a distinctive closing off of all sight and sound; (6) a
deep, blissful serenity; and (7) a marked slowing or cessation of respira-

With the possible exception of the final characteristic, this descrip-
tion seems strikingly close to the descriptions Teresa provides of her own
experiences. Use of meditation to alter the effective functionality of the
brain is not unknown. Recent research shows that during the meditations
of long-term practitioners, many parts of the brain experience functional
“deafferentation” (Newberg et al. 2001). That is, they become deprived
of their normal inputs. As a result, the practitioner’s phenomenological
experience shifts dramatically, taking on the characteristics of absorption
distilled by Austin. Austin speculates that during absorption, this functional
deafferentation is effected by excitation of a part of the brain called the
reticular nucleus of the thalamus (2006). The thalamus is considered to
be the “relay station” of the brain, because signals for sight, sound, touch,
and taste synapse onto the thalamus before proceeding to their primary
sensory neocortical areas. Many higher-order brain areas also feed back
into the thalamus. For this reason, one way to significantly impact the sen-
sory processing of the brain is to alter the thalamus, such that outputs are
no longer projected to the cortex (indeed, this is partly what happens in
deep sleep). Excitation of the thalamus’s reticular nucleus results in the
inhibition of other thalamic nuclei, which would normally take in sensory
signals. As a result, Austin notes that several domains would drop out of
consciousness: vision, hearing, proprioception, vestibulation, and somato-
sensation. As a consequence of the loss of these signals, our normal cues to
orient ourselves in space are lost, and so, conceivably, one’s sense of space
would be dramatically altered or even vanish entirely.
The initial excitation of the reticular nucleus would come from projections from the prefrontal cortex (Zikopoulos and Barbas 2007), a key area subserving the practitioner's ability to maintain attention on an object of meditation. Long-term meditation is associated with increases in prefrontal cortical thickness (which may be likened to the increased capacity of a larger muscle; Lazar et al. 2005). Thus, practitioners such as Teresa would be more capable of cutting off the flow of information from the thalamus, thereby producing a state of absorption (see fig. 1). Through intensive meditation, then, Teresa effectively applied a technology of the self, in this case a sophisticated set of meditative techniques of her own devising, in order to remake herself into an individual capable of having experiences that, within her cultural milieu, would have been interpreted as mystical contact with the divine.

Bernard and Teresa represent two very different approaches to pursuing contact with God. Bernard's approach was marked by severe asceticism, while Teresa's by a more classical meditative system. Bernard's asceticism produced visions of the divine, which were likely mediated by the effects of sleep fragmentation on the prefrontal cortex. Teresa's meditations resulted in periods of absorption, which were likely mediated by the inhibition of the thalamus, a gateway for sensory information to reach the rest of the brain. Despite these differences, the end result was the same for both Bernard and Teresa: each attained the status of a mystic—and eventually sainthood—providing immense authority and respect, allowing for a wider field of action than either would have enjoyed otherwise.
Internal Awareness  
Awareness of Bodily Self  

Sensory Nuclei of the Thalamus  
Somatosensation  
Interception

Phenomenological interactions producing a bird represents an excitatory interaction, a phobic interaction, and dashed lines of phenomenal awareness.

The particular nucleus would come from projects (Zikopoulos and Barbas 2007), a key area for maintaining attention on an object of perception is associated with increases in prefrontal cortex. This is likely to the increased capacity of a focus or task. Thus, practitioners such as Teresa would be able to flow of information from the thalamic to sensory cortex (see fig. 1). Through intensive practice, they applied a technology of the self, in this case, Teresa’s techniques of her own devising, in order to be capable of having experiences that could be interpreted as mystical experiences.

The two very different approaches to pursue meditation. Here’s approach was marked by severe asceticism, and the meditative system. Bernard’s asceticism was likely mediated by the effects of the prefrontal cortex. Teresa’s meditations resulted in experiences that were likely mediated by the inhibition of sensory information to reach the rest of the brain. In Teresa’s case, the end result was the same for both Bernard and Teresa: the status of a mystic—and eventually authority and respect, allowing for a wider audience who could enjoy otherwise.

NOTES


2. For a variation on this approach, see Jerome Kroll and Bernard S. Bachrach, The Mystic Mind (New York: Routledge, 2005).

3. There are certainly individual differences between people (accounting for certain personality differences, for example). However, it is generally accepted that Homo sapiens brains have remained architecturally stable for over ten thousand years.

4. Quoted in Evans 2000, 23, from Sermones in Quadragesima de psalmo “Qui habitat,” 2, 1, 2, 4.

5. Not all would agree with my interpretation. See Antonino Perez-Romero, Subversion and Liberation in the Writings of St. Teresa of Avila (Atlanta: Rodopi, 1996), 85.

6. There have been a number of studies dealing with the way women at various levels of early modern Spanish society managed to negotiate an active role for themselves in a heavily patriarchal society. For examples, see Allyson M. Poska, Women and Authority in Early Modern Spain: The Peasants of Galicia (Oxford: Oxford University Press, 2005), 11–14, 186–93. For Teresa specifically, see Barbara Mujica, “Skepticism and Mysticism in Early Modern Spain: The Combinative Stance of Teresa de Avila,” in Women in the Discourse of Early Modern Spain, ed. Joan F. Camarasa (Gainesville: University of Florida Press, 2003), 54–76.

7. Ken Wilber is a well-known author who has published over a dozen books distilling and synthesizing Eastern and Western psychology and philosophy. While we believe Wilber’s analysis is valuable here, some caution is recommended since Wilber is not an academic. However, he has published his models of consciousness in peer-reviewed venues (see Wilber 1997, 2000).

8. Austin’s books are extensively referenced monographs on the neurobiology of meditation.

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