CHAPTER ONE

Introduction: neural Romanticism

This is a book about Romantic literary culture and the brain in Great Britain, from the 1790s to around 1830. It argues both that the pioneering neuroscience of the era manifests a "Romantic" character, and that literary Romanticism intersects in numerous and significant ways with the physiological psychology of the time. It aims, in short, to give the brain a central place in the history of the Romantic mind. But what, you may already be wondering, could the brain have to do with British Romanticism? To look at the relevant literary and cultural histories, not much. Fifty years ago one could publish a book reducing the psychological thought of the era to "the psychology of the association of ideas," Hartleyan associationism stripped of the neural substrate Hartley had welded to it.[1] Things are not much different now, although a half-century of psychoanalytically inspired literary analysis has piqued scholarly interest in Mesmerism and other Romantic-era anticipations of depth psychology.[2] Most work on the Romantic mind continues to be informed by a disembodied version of associationism, by psychoanalysis, or by epistemological issues that link Romantic literary figures to a philosophical tradition running from German idealism to phenomenology and its deconstruction.[3] The Romantic brain, however, has been left almost wholly out of account.

The history of science and medicine tells quite a different story. Historians of neuroscience, of biological psychology, and of neurology concur in viewing the late eighteenth and early nineteenth centuries as a crucial period for the emergence of an unprecedented series of hypotheses and discoveries concerning the brain and nervous system.[4] Only in the Romantic era, in fact, was the brain definitively established as the organ of thought, although this seemingly inevitable notion would continue to be challenged on religious and other grounds well into the 1820s. Equally important – and controversial – developments included the rise of comparative neuroanatomy, the framing of adaptationist and

functionalist analyses of specific features of the mind and brain, a fundamental redefinition of the brain as an assemblage of parts or "organs" rather than an undifferentiated whole, and anti-dualistic psychological models founded on the mind's embodiment, placing novel emphases on automatic and unconscious mental processes and on body–mind interaction. Sociological approaches to the history of brain science have only intensified interest in the period, detailing how widely disseminated, politically charged, and ideologically suspect were the new materialist and naturalistic models of mind in a period of revolution and reaction, when to challenge orthodox notions of the mind and soul meant implicitly to challenge the social order.[5] If the Romantic period can indeed be seen as an age of revolution, its iconoclastic brain science played a major role in the ideological ferment of the time.

Students of Romantic literature and culture have much to gain by looking to the era's revolutionary science of the mind, however underappreciated it has been to date. To begin with, no account of Romantic subjectivity can be complete without noting how contemporary understandings of psychology were either grounded in, deeply marked by, or tacitly (when not explicitly) opposed to the brain-based models of mind being developed concurrently in the medical sciences. Moreover, a whole range of topics and concerns typically associated with Romanticism – the relation of mind to body, the relation of human beings to the natural world, the new emphasis on human difference and individuality, the environmental role in shaping mind and behavior, the status of various materialist ideologies, even such staples as sensibility and the creative imagination – reveal unsuspected facets and interconnections when placed in the context of contemporary work on the brain and nerves. Exploring some of the many connections between the brain science and literary culture of the period in detail constitutes the main task of this book. This chapter will sketch out some of the more important figures and developments in Romantic-era brain science, particularly those most relevant to the literary culture of the time, and pose some fundamental links and working assumptions along the way.

THE RETURN OF THE BRAIN-MIND

It is no coincidence that the history of neuroscience has rediscovered the Romantic era at a time when biological approaches to psychology and materialist models of the mind have seen a major revival, from the "cognitive revolution" beginning in the 1950s to the recent "decade of the

brain." A figure like F. J. Gall seems a good deal less quaint, his thought a good deal more intriguing, once a prominent cognitive scientist has proclaimed an "honored" place for Gall in the history of psychology – a sentiment that has become almost standard in popular expositions of recent neuroscience.[6] This is not to suggest, of course, that historians of medicine and psychology have been remaking the early history of brain science in the image of current research. The best studies exhibit an exemplary wariness of false parallels, forced connections, misplaced emphases, and imaginary lines of descent between then and now. But recent work on the brain has been instrumental in throwing Romantic-era developments into new relief and in restoring a certain cultural weight – one certainly felt widely at the time – to figures and ideas that had long seemed of antiquarian interest at best. As Anne Harrington has written, a "lively interest in the sciences of mind and brain in one's own era" does not license the use of history as a "vehicle to hunt for the present in an earlier age," but it may legitimately inspire a renewed interest in the "cognitive goals" of an earlier era's scientific culture.[7]

In relation to the Romantic era, recent work on the brain and mind can help scholars to perceive distinctions, register nuances, and appreciate moral and philosophical repercussions that might have seemed non-existent, elusive, or simply not worth pursuing a few decades ago. It can also help reveal how certain issues and questions hung together for Romantic-era writers, but not because these issues and questions are identical to those that have come to occupy cognitive scientists at the turn of the twentieth century. How could they be? Rather, the connections between, say, adaptationist accounts of mind and the hypothesis of a modular brain, or anti-dualistic cognitive theories and an emphasis on the unconscious and emotive aspects of rational thought, have returned in a different but comparable manner. I have not hestitated to point to such parallels and recurrences when they seem needful to sharpen the lineaments or convey the richness of an issue that might otherwise remain murky or undervalued. Indeed, I have become convinced that informed comparison with models, findings, and controversies from the present are needed to help bring certain Romantic-era developments and debates into focus. It is less a matter of insisting on resemblance than of listening for resonance, and allowing that resonance to help reopen avenues for scholarly investigation that have long remained untrodden.

Let me illustrate by quoting from a letter that Coleridge sent to Godwin in September of 1800:

I wish you to write a book on the power of words, and the process by which human feelings form affinities with them – in short, I wish you to *philosophize* Horne Tooke's System, and to solve the great Questions – whether there be reason to hold, that an action bearing all the *semblance* of pre-designing Consciousness may yet be simply organic, & whether a *series* of such actions are possible – and close on the heels of this question would follow the old "Is Logic the *Essence* of Thinking?" in other words – is *Thinking* impossible without arbitrary signs? & – how far is the word "arbitrary" a misnomer? Are not words &c part and germinations of the Plant? And what is the Law of their Growth? – In something of this order I would endeavor to destroy the old antithesis of *Words* and *Things*, elevating, as it were, words into Things, & living Things too. (*STCL* 1: 625–26)

Already "often-quoted" when William Keach analyzed it so tellingly in his essay "Words Are Things," Coleridge's letter has informed a great deal of important speculation on Romantic theories of language and on the difficulties of Coleridge's various theories of mind.[8] Until a few years ago, however, it remained difficult to fully appreciate the important links between the quite astounding series of tasks blithely set by Coleridge for Godwin and the "great Questions" being posed by the brain scientists of their day – questions that have again become prominent within the cognitive neuroscience of the past decade. Can a conscious act of volition be reduced, as the Churchlands, Crick, and others have argued, to organic brain activity at the neuronal level, and is it possible to theorize and empirically validate a working model of consciousness along such lines? Is the mind, as first-generation cognitive scientists proposed, best understood as a computational device and thinking as the processing of arbitrary symbolic representations? Is it, as cognitive linguists in both the Chomskian and Lakoffian traditions have suggested, misleading to call linguistic signs entirely "arbitrary"? What do models like Edelman's "neuronal group selection" theory tell us about how words and conceptual categories might be reconceived along organic and dynamic lines, and can neuroscience yield us rules for their development? And, to return to Coleridge's initial question, what does work like that of the Damasios on the role of the limbic system in linguistic production and comprehension reveal about the process by which human feelings form affinities with words?

At the risk of anachronism, I have tried to provoke a new sense of the interpretive possibilities for this letter, and by extension for Coleridge's thought on the mind and language more broadly, by updating his provocative series of questions in the language of recent neuroscience. My point is not to claim Coleridge as a poet-prophet of late twentieth-

century work on the brain and mind, but rather to elicit several initial hunches from the consonance we can hear between his questions and ours. One is that these questions are linked for Coleridge by an "organic" or embodied notion of mind, however fitfully or anxiously he may have entertained it.[9] A second is that Coleridge here, as elsewhere, is more deeply engaged with the brain science of his era than has generally been acknowledged and is in this way representative of any number of writers we now call "Romantic." A third, perhaps the most important, is that noting how questions of language, volition, logic, organic development, and non-"arbitrary" elements of linguistic and cultural activity have become linked in recent cognitive science can help us to follow comparable links in the nascent psychology of Coleridge's day, while taking care to avoid simply conflating his era's science with our own. Language, free will, the connections among ideas, the organic development of the mind both in the human species and in each human individual, and the constraints that a shared physiology and anatomy might place on linguistic difference: these were all profoundly related issues for various Romantic-era thinkers. They had become closely intertwined through a whole set of postulates, theories, and research agendas that came to prominence in the work of a handful of influential writers on the brain-mind in the late eighteenth and early nineteenth centuries who collectively established the precedent for a biological psychology.

ROMANTICISM IN A NEUROSCIENTIFIC CONTEXT

The group of brain scientists whose work challenged and helped transform the psychological thinking of their time includes, most prominently, F. J. Gall in Austria, Pierre-Jean-George Cabanis in France, and Erasmus Darwin and Charles Bell in England. As particularly important popularizers of a brain-based psychology (especially for Great Britain) Sir William Lawrence, J. G. Spurzheim (Gall's errant disciple), and George Combe also demand new attention. And certain postulates and lines of investigation had been established earlier in the eighteenth century by David Hartley, Denis Diderot, Julien Offray de La Mettrie, and J. G. von Herder, among others. Significantly, all of the writers just mentioned, with the exception of Herder and Diderot, were medical doctors; all were committed to the biological account of the mind and its functioning that was becoming standard in medical education.[10] Although anything but a coherent movement – the list includes detractors as well as advocates of phrenology, vitalists as well as materialists,

avowed skeptics and devout Christians – these doctors, philosophers, and proto-psychologists together altered the terms and changed the terrain for theorizing about the mind. Their work not only provided new directions for medical research, but helped fundamentally to recast the great questions on the mind in terms of new theoretical and scientific work on the brain.

From their varied writings one can abstract not a consensus but a constellation of roughly affiliated theoretical positions, each held by most of the Romantic-era figures, a few by all of them, but the whole set by no one thinker. There is enough overlap, however, that one can meaningfully group them together under the rubric of "Romantic psychologies," a shorthand expression I will use at times in relation to Darwin, Gall, Cabanis, Bell, and their associates, built though it is from two terms rarely used in their modern sense at the time.[11] All of them agree in locating the mind in the brain, the "cerebral organ" or organ of thought. They all emphasize that the mind is an active processor, rather than passive register, of experience, holding this in common with German idealist philosophy and with Scottish "common sense" psychology but uniquely seeking to elucidate the active mind in neurological terms.[12] Most posit the constant activity of the brain, even during sleep. They also share a biological rather than mechanistic conception of physiological and mental functioning, here (as in their active conception of mind) departing from Hartley and Locke (another doctor–philosopher important in the eighteenth-century background). They all stress the complexity of the brain, often envisioning it as a collection of "organs," and exhibit a cautious fascination with the role of electricity in neural transmission. Other common assumptions include the continuity between human beings and other animals (with a corresponding penchant for comparative anatomy and physiology), an ecological approach to studying humans in their natural and social environments, and a ruling interest in human development. This last broadens into a concern with the development of the human species, often giving rise to evolutionary or proto-evolutionary speculation and always involving adaptationist explanations for anatomical features and psychological functions, which in turn inspire a novel biological understanding of human universals. All develop anti-dualistic accounts of the brain-mind, though Bell does so in his own pious fashion, and all but Bell were attacked as "materialists," though only Lawrence willingly accepted the charge – until forced to recant.

A series of stunning scientific developments helped to fuel speculation on the brain and to inspire widespread fascination with the new biolog-

ical accounts of mind. Most important in establishing the new climate was Galvani's demonstration of "animal electricity," which he described in print first in 1791.[13] Although the criticism Galvani received from Volta kept fellow scientists wary, it also kept his theory of electrical nerve transmission, with its far-reaching implications for biological psychologies, in the public mind. As John F. W. Herschel wrote in his popular Romantic-era exposition of science, with the "principle once established, that there exists in the animal economy a power of determining the development of electric excitement, capable of being transmitted along the nerves . . . it became an easy step after that to refer the origin of muscular motion in the living brain to a similar cause; and look to the brain, a wonderfully constituted organ, for which no mode of action possessing the least plausibility had ever been devised, as the source of the required electrical power."[14] Spurzheim's flair for publicity – including his popular neuroanatomy demonstrations – helped disseminate a second important development, the pioneering brain dissection techniques that he and Gall had perfected in the 1780s and 1790s. Their anatomical methods and discoveries won praise even from their critics, revealing neural structures in unprecedented clarity and complexity and eventually finding their way into Hazlitt's art criticism and Keats's "Ode to Psyche." A series of pathbreaking neurological discoveries included Soemmerring's tracing of the cranial nerves in 1778, Vicq D'Azir's description of the cerebral convolutions in 1786, and the roughly contemporaneous discovery, by Bell in England and Magendie in France, of the basic distinction between sensory and motor nerves, first described by Bell in a privately printed work of 1811. Neurological research and speculation was carried out in the context of a distinctively international scientific culture, one that seeped readily into the philosophical and literary discourses of the age. Not only national borders, but the equally conventional boundaries between the sciences and the humanities, between legitimate and "pseudo" science, and between intellectual and popular culture all need to be bracketed in order to develop a feeling for the intellectual climate of the Romantic era. It was a time when poets (like Coleridge) consorted with laboratory scientists and when philosophical doctors (like Darwin) gave point to their scientific theories in verse, when phrenology and mesmerism gained adherents across the medical community, when Bell could work out his physiological psychology in a series of lectures to London artists, scientists could perform as showmen, and Galvani's experiments with "animal electricity" could be replicated by an eager public "wherever frogs were to be found."[15]

In suggesting that the cultural tendencies we associate with "Romanticism" bear a significant relation to speculation on the central nervous system, I am picking up the thread of an argument posed some years ago by G. S. Rousseau. In "Nerves, Spirits, and Fibres: Towards Defining the Origins of Sensibility," Rousseau located a paradigm shift in European accounts of mind – a "revolution in sensibility" – set in motion by the work of the seventeenth-century physiologist Thomas Willis, the "first scientist clearly and loudly to posit that the seat of the soul is strictly limited to the brain, nowhere else."[16] This "brain-nerve revolution," with its daring reduction of the "totality of human feeling" to "motion in the nerves," led, via the sensationalism of Locke (Willis's student at Oxford) and an ensuing succession of "cults of sensibility," at last to "that most puzzling of modern enigmas, Romanticism," now to be reconsidered in terms of its "specific neurological legacy."[17] Although scholars of Romanticism did not rush to take up his challenge, recent criticism has circled back to some of the connections Rousseau posited some thirty years ago. Isobel Armstrong, for example, suggests that the "speculations on the nervous system" of early nineteenth-century physiologists share with certain texts by Romantic-era women poets a model of sensibility as "action in the body" – "We must feel to think" as Letitia Landon puts it.[18] And Jerome McGann, in *The Poetics of Sensibility*, has described how writers from Locke to Priestley, from Montagu to Robinson, register in increasingly dramatic ways the "stakes involved in overturning the traditional understanding of the relations of mind and body."[19] Romantic-era developments in brain science, however, greatly intensified the revolution in understanding mind–body relations outlined by Rousseau, bringing Romantic writers into a productive (though not always explicit) creative and critical dialogue with the neuroscientific thinking of their time. Knowledge of these developments was readily available not only to literary figures like Coleridge (with his scientific connections), Joanna Baillie (born into a celebrated medical family), and John Keats (trained as a surgeon), but to a surprisingly wide and diverse audience. Male and female writers alike, of a broad stripe of ideological and philosophical allegiances, can often be found making common cause with contemporary speculation on the brain and nerves. Particularly in its association with materialism, however, brain science also inspired a good deal of hostility and anxiety, remaining open throughout the period not only to the embrace of literary writers but to their attacks as well.

A CHAOS OF ASSOCIATION: COLERIDGE, HARTLEY, AND THE CORPOREAL MIND

When Coleridge sets out to discredit a brain-based account of mind in the *Biographia Literaria*, he chooses as his foil not Gall or Darwin – though he had studied the ideas of both – but Hartley. This fits the narrative trajectory of Coleridge's literary autobiography nicely: Hartley's early attempt (often considered the first) to frame a physiological psychology is presented as a youthful intellectual infatuation that must be left behind for Coleridge's mature philosophy of mind to develop.[20] The extended attack on Hartley serves the polemical aims of the book just as well, however, by allowing Coleridge to evade the full weight of the challenge posed by contemporary biological accounts of mind while using the weaknesses of Hartley's dated materialist psychology to discredit any such speculation in advance. Hartley's theory of mind, and Coleridge's critique, together convey a good sense of the intellectual ground that Romantic psychologies would occupy, some of the major challenges they had to overcome, and the ideological stakes they would raise. In the *Observations* (1749) Hartley attempted no less than to explode post-Cartesian dualism and reground philosophy of mind in the brain and nervous system. Building on sensationalist and associationist principles derived from Hobbes and Locke, he attempted to reduce all mental functioning to the single principle of association. Drawing on hints in the second edition of Newton's *Principia* and in the works of early neurologists like Willis, he simultaneously proposed a material process of "vibrations" in the brain and nerves that undergirded the workings of association and provided a physiological explanation for psychological phenomena. "Motions" from the external environment, Hartley proposed, bombard the senses in such a way as to cause vibrations, which run along the "medullary substance" of the nerves, solid but porous cords with "infinitesimally small particles" of Newtonian ether diffused throughout. These vibrations or oscillations then trigger corresponding tiny vibrations ("vibratiuncles") in the medullary substance of the brain. (By "medullary substance" Hartley means what is now called the "white" or axonal matter of the brain, a common usage throughout the period.) Vibratiuncles could persist in the brain as "dispositions," particularly if reinforced directly (by repeated exposure to the sensory data) or indirectly (by association).[21]

Although Hartley claimed both that his theory could be reconciled with Scriptural authority and that the doctrine of vibrations was

ultimately expendable (viii, 416), he nevertheless speaks throughout the work of the "corporeal" nature of thought and even posits a "material" soul, pointing out that there is no necessary connection between the soul's immortality and its immateriality (511–12). Like Diderot, La Mettrie, and other eighteenth-century thinkers then widely considered "materialists," Hartley argues for the material embodiment of the mind in the brain, the "Organ of Organs" (62), pointing to the mental effects of intoxicating substances like alcohol and opium, the relation between neurological insults (like concussion) and disrupted mental functioning, and citing more exotic phenomena like phantom limb pains that seemed to demand a brain-based theory of mind (7–9, 32, 374). He anticipates the anti-dualistic psychology of the Romantic era in stressing the importance of unconscious mental functioning and hinting at the salient role of "internal" sensations (sensations from within the body) in mental life, both areas all but entirely neglected within earlier accounts of associationism developed by Hobbes and Locke. Hartley touches as well on the lessons to be learned from visual illusions (9–10) and the continuities among the "nervous Systems of Animals of all Kinds," including human beings (404), topics that will become standard in expositions of brain science in the Romantic era (and in the present one). Throughout Hartley advances what would now be termed a "medical model" psychology, one aimed at securing the "common Consent of Physicians and Philosophers" (33).

Coleridge had read the *Observations* in the 1790s with great enthusiasm, naming his first son after Hartley and claiming (in a letter to Southey) to "go farther than Hartley and believe the corporeality of *thought* – namely, that it is motion" (*STCL* 1: 137). This was by no means an idiosyncratic stance at the time, especially among the radical set that Coleridge ran with. Coleridge's friend John Thelwall, for example, gave a lecture in 1793 on "The Origin of Sensation," purporting to explain the "phenomena of mind . . . upon principles *purely Physical*."[22] Priestley, in his 1775 and 1790 expositions of Hartley's thought, had jettisoned the vibration theory not because he opposed materialist accounts of mind but because he thought a better one was at hand, with the emergent dynamic conception of matter and the new physiology together suggesting a more powerful model of thought as a "property of the *nervous system*, or rather of the *brain*."[23] Galvani's electrophysiological experiments had suggested a credible model of rapid neural transmission much superior to Hartley's vague sense of (possibly electric) vibrations and oscillations, and Darwin was updating key notions derived from Hartley and supple-