Topic Three: **Ann Radcliffe and neural vibrations**

June 2009

One "signature" strand of imagery in Ann Radcliffe's fiction has to do with vibrations. Indeed, images containing forms of the verb "vibrate" occur in every one of her romances, e.g.

(a) "Nature had bestowed on her [Mary] a heart susceptible of all the fine emotions of delicate passion; a heart which vibrated in unison with the sweetest feelings of humanity".
Castles of Athlin and Dunbayne, ed. Alison Milbank (Oxford: World's Classics, 1995), p. 44

(b) "At length the clock struck the signal, the sound vibrated on every nerve, and trembling she quitted the closet for her sister's apartment."
A Sicilian Romance, ed. Alison Milbank (Oxford: Oxford World's Classics, 1998), p. 21.

(c) "The voices of men now vibrated in tremendous echoes through the various and secret caverns of the place, and the sound of footsteps seemed fast approaching." (ibid., p. 149).

(d) "The carriage drove along under the shade of 'melancholy boughs' through which the evening twilight, which yet coloured the air, diffused a solemnity that vibrated in thrilling sensations upon the hearts of the travellers".
The Romance of the Forest, ed. Chloe Chard (Oxford: Oxford World's Classics, 1999), p.14

(e) "The lute she had brought lay forgotten beside her; the mournful sighing of the breeze, as it waved the high pines above, and its softer whispers among the osiers, that bowed upon the banks below, was a kind of music more in unison with her feelings. It did not vibrate on the chords of unhappy memory, but was soothing to the heart as the voice of Pity."
The Mysteries of Udolpho, ed. Jacqueline Howard (Harmondsworth: Penguin Books, 2001), p. 97.

(f) "There, as he walked, or leaned from the window of the building, he would endeavour to recollect all she had said, on that night; to catch the tones of her voice, as they faintly vibrated on his memory, and to remember the exact expression of her countenance sometimes came suddenly to his fancy, like a vision;… ." (ibid., p. 276).

(g) "A damp chillness, came over her; her sight became confused; she knew not what passed, or where she was, yet the groans of the wounded person still vibrated on her heart." (ibid., p. 299).

(h) "Pierre obeyed, and the Count soon dismissed him, but did not so soon lose the remembrance of the music, which long vibrated in his fancy in tones of melting sweetness, while surprise and perplexity engaged his thoughts." (ibid., p. 519).

(i) "The beauty of her countenance haunting her imagination, and the touching accents of her voice still vibrating on his heart, he descended to the shore below her residence, pleasing himself with the consciousness of being near her … ." *The Italian* Ed. Robert Miles (Harmondsworth: Penguin Books, 2000), p. 11.

(j) ".. but pity touches upon a nerve that vibrates instantly to the heart, and subdues resistance."

(ibid., p. 148)

(k) "At that moment the matin bell sounded. 'My time is short,' said the vision; 'if he perish for my sake, he shall not fall alone. Be warned!'

While these words still vibrated on his ear, the king again heard the chant from the chapel, and knew that they were performing the second requiem."
Gaston de Blondeville, ed. Frances Chiu (Chicago: Valancourt Books, 2006), p. 196

Such images are one of Radcliffe's distinctive ways of registering the physiological, psychological, and heightened emotional responses of a central character, often the hero or heroine, to sounds, music, or changes in light. They are integral to her lexicon of sensibility which frequently includes descriptions of her characters' intensities of imagination and remembrance in response to visual stimuli such as sublime, beautiful, or picturesque landscapes, or the beauty or singularity of another person. With the exception of (c) which focuses on the peculiar communicative properties of sound in a cavernous space, these particular images, with their explicit mention of nerves, sensation, memory, ear, imagination, or heart, also appear to partake of an eighteenth century discourse of neurophysiology and psychology, most fully represented by David Hartley's theory of vibrations and association in his influential *Observations on Man, his Frame, his Duty, and his Expectations,* first published in 1749.

Drawing on Newton's scientific axioms in the *Opticks*, the associationist empiricism of Locke and the associationism of the Rev. John Gay's pleasure and pain psychology, Hartley set his associationism of ideas and feelings on the physical foundations of the anatomy of the nervous system and the physiology of "motions excited in the brain". He proposed that sensory experience occurs when

> "External objects impressed upon the Senses occasion, first in the Nerves on which they are impressed, and then in the Brain, Vibrations of the small, and, as one may say, infinitesimal, medullary Particles.
>
> These Vibrations are Motions backwards and forwards of the small particles; of the same kind with the Oscillations of Pendulums, and the Tremblings of the particles of Sounding Bodies. They must be conceived to be exceedingly short and small, so as not to have the least Efficacy to disturb or move the whole Bodies of the Nerves or Brain. For that Nerves themselves should vibrate like musical strings is highly absurd; nor was it ever asserted by Sir Isaac Newton … "(*Observations on Man, his Frame, his Duty, and his Expectations. In Two Parts*. London: S. Richardson, 1749, repr. edn, Garland Publishing, Inc. New York, 1971, Pt . I, Prop 4, p. 11). (**1**)

Considering "the Uniformity and Continuity of the white medullary Substance of the Brain, spinal Marrow, and Nerves", Hartley affirms Newton's claim that "the Nerves are rather solid Capillaments" rather than small tubules as conceived by Boerhaave. He also utilises Newton's postulate of the existence of an æther, "a very subtle and elastic Fluid", "diffused through the pores of gross Bodies, as well as the open Spaces that are void of gross Matter". Whereas Descartes had postulated a "plenum" in space, a moving æther to explain his solar (circular) vortex theory of gravity and planetary motion, Newton, having disproved his theory, maintained an æther concept because of the wave-like properties exhibited by light. For Hartley also, this æther, on account of its "great Subtlety and Elasticity may be inferred from the Motion of the Planets, and quick Propagation of Light." It is "extremely susceptible to Vibrations and Pulses, in the same manner as

common Air." To its properties as a medium of transmission can be attributed "the Emission of odiferous Particles, Light, magnetical and electrical Effluvia (pp. 13 – 15). In some similar fashion, this aether could explain how information travels *along* nerve fibres:

> (1) "… when external Objects are impressed on the sensory Nerves, they excite Vibrations in the Æther residing in the pores of these Nerves …" (p. 21).
>
> (2) "… the Vibrations thus excited in the Æther will agitate the small Particles of the medullary substance of the sensory Nerves with synchronous Vibrations, in the same manner as the Vibrations of the Air in Sounds agitate many regular Bodies with corresponding Vibrations or Tremblings" (pp. 21-2).
>
> (3) "The Vibrations thus excited in the Æther, and Particles of the sensory Nerves, will be propagated along the Course of these Nerves up to the Brain. For the Æther residing in the medullary substance, being of an uniform Density … will suffer the excited Vibrations to run freely through it. … This free propagation of Vibrations along the Course of the Nerves may be illustrated and confirmed by the like free Propagation of Sounds along the Surface of Water, which has sometimes been observed in still, calm Nights" (pp. 22-3).

Using this analogy with the transmission of sound, Hartley went on to argue that vibrations not only enter the brain causing sensations, but most importantly, by being often repeated, also leave there lasting traces or vestiges: minute vibratory motions or "vibratiuncles" (Prop. 9, p. 58). Furthermore, by being excited and associated together repeatedly, the sensations "get such power over the corresponding Ideas" that they build up a physical substratum of associative information or complex ideas, memory and dispositions. "Outgoing" vibrations from the brain and spinal cord travelling along "the motory nerves" are similarly instrumental in the development of all of the body's muscular actions, both voluntary and "automatic": "vibrations descend along the motory Nerves, *i. e.* the Nerves which go to the Muscles, in some such manner as sound runs along the surfaces of rivers, or an electrical virtue along hempen strings … (Pt. I, Prop. 16, p. 88).

Hartley's postulates of oscillatory dynamics remained admittedly conjectural. But on these, and his theory of association, which he thought would hold up irrespective of acceptance of his vibrations theory, he constructed what he envisaged to be the seven stages of the development of the human mind in children and adults, from a passive to an active and finally a spiritual state which involves "Theopathy" or responsiveness to God, and "Moral Sense". He struggled with the metaphysics of the mind-brain relationship just as philosophers and scientists still do today, and, as his Conclusion to Volume I demonstrates, he was well aware of some possible objections and problems. His emphasis on the brain as the "immediate cause" by which ideas are represented to the mind," that "the Brain may therefore, in a common Way of speaking, be reckoned the Seat of the sensitive Soul or the Sensorium" (p. 31), and his postulate of a parallel relationship (p. 8), he acknowledged as "mechanistic". However, he also perceived the faculties of memory, imagination or fancy, understanding, affection and will to be at another remove of volitional causation (Introduction, iii - iv), and his overarching theology, with God as the ultimate cause of matter with all its powers, saved him from the charge of any thorough going materialism.(**2**)

Hartley's work was greatly admired and promulgated by his friend, Joseph Priestley, and according to R. C. Allen, he was "revered as a moral exemplar" by Unitarians generally.(**3**) While we do not know whether Radcliffe read Hartley's work, her keen interest in her main characters' sensory perception, feelings and emotions, associative workings of imagination and memory, and

heightened, extreme and disordered mental states, is everywhere apparent in her novels. Such close tracking of her characters' interiority is one of the singular elements of her style. Rictor Norton, in *Mistress of Udolpho*, suggests that, given her long sojourns with her guardian uncle, Thomas Bentley, a friend of Priestley and member of the Unitarian intellectual circle, she may well have been familiar with Priestley's *Course of Lectures on Oratory and Criticism* which explained and illustrated Hartley's theory of the association of ideas. As Norton again suggests, Priestley's celebration of the pleasures of imagination, and the "intense joy" and vicarious sentiment afforded by "novels, romances, and feigned tragedies," could also have encouraged Radcliffe, just as his views on the writerly use of the sublime and the pathetic may well have influenced her aesthetics (Norton, pp. 67-9).(**4**)

However, Priestley's promulgations in his 1775 and 1790 editions of Hartley's *Observations,* which he titled *Hartley's Theory of The Human Mind, on the Principle of Association of Ideas*, were actually abridgements. The sections dealing with the physical side of Hartley's model – his theory of vibrations with its union of physiology and metaphysics – were omitted, as were the ethical and religious sections. Priestley's focus was on popularizing the sections that deal with association psychology. So Radcliffe may have been introduced to the notion of vibrations coursing along nerves from Hartley's work itself, most likely again via her uncle and his circle. Certainly the devotional sensibility Radcliffe gives to her heroines, such as Adeline, Emily and Ellena, accords with Hartley's statement late in Part I of *The Observations.* that the pleasure humans feel in their sense of union with God is often transferred to nature:

> "Those Persons who have already formed high Ideas of the Power, Knowledge, and Goodness of the Author of Nature, with suitable Affections, generally feel the exalted Pleasures of Devotion upon every View and Contemplation of his Works …" (Pt. I, p. 420).

The world of her novels can also be said to be ruled by the Providentially designed system of Benevolence proposed by Hartley.

But just as interesting are what seem to be the consistently Hartleyan aspects of Radcliffe's diction, as in the images of physical vibration I quoted earlier. Another type of example occurs in *The Mysteries of Udolpho,* when the heroine, Emily St Aubert, confined within the Castle of Udolpho, stands one night at one of her chamber's casements "to breathe the freer air" and, by association, experiences "a retrospect of all the the strange and mournful events, which had occurred since she lived in peace with her parents". Moreover, this chain of association is prompted by her memory of those occasions when she had learnt some (presumably Newtonian) physics **(5)** from her father:

> "The air refreshed her, and she continued at the casement, looking on the shadowy scene, over which the planets burned with a clear light, amid the deep blue æther, as they silently moved in their destined course. She remembered how often she had gazed on them with her dear father, how often he had pointed out their way in the heavens, and explained their laws; and these reflections led to others, which in almost equal degree, awakened her grief and astonishment (Vol. II. Chpt. XI, p. 310).

Thus brought close to Emily's consciousness, we are told that "suddenly the notes of sweet music passed on the air," that "fear and surprise … yielded to the enchantment of a strain, that floated on the silent night," and that as "suddenly, it seemed removed to a distance, trembled faintly, and then

ceased" (pp. 310-11). Like the images of the æther and movement of the planets in the passage quoted above, these descriptions partake, albeit lightly, of a discourse of physics; they accord with Hartley's references to air as a medium of transmission for vibrations of sound (Pt. I, Prop. 68, pp. 231-32).

Also apposite, in other contexts in Radcliffe's novels, is Hartley's comment that different vibrations, such as those separately arising from music and from another person's spoken words can exist together at precisely the same instant in the same air, but be perceived distinctly by a hearer, and each have its peculiar effect (p. 232). In quotation (k) above, from *Gaston de Blondeville*, the King, in his perception of both the warning words of the ghost and "the chant from the chapel"of "the second requiem," is experiencing precisely this, a situation extended to the point where he goes into some kind of shock or semi-conscious state: "the King lost all recollection; his ear was closed against every sound" (p. 196). The experience becomes the climactic turning point in his convictions, and he acts accordingly for justice. Similar epiphanic moments induced by words and sound occur for the Marquesa in *The Italian* just after she has consented to Schedoni's plan to murder Ellena. Having suddenly registered the meaning of the inscription above the confessional, "*God hears thee*!" as "an awful warning", she is then brought up in her tracks by the low notes of an organ, followed by "a slow chaunting of voices mingled with the rising peal in a strain, particularly melancholy and solemn". Recognising the chaunt as "a first requiem," she is "much affected," becoming increasingly agitated until she weeps without restraint, and, yielding to "the united influence of pity and terror" (but in her case, only for a time), reneges on the plan. For his part, Schedoni sees her as "the dupe of her senses", "the victim of sound": "Assail but her senses: let music, for instance, touch some feeble chord of her heart, and echo to her fancy, and lo! all her perceptions change:" … (Vol. II, Chpt. IV, (p. 207).

Not surprisingly, Hartley does not use the word "heart" in the metaphoric sense of the seat of feeling and sensibility, as used here by Radcliffe. In his physiological discourse, "motory Vibrations" keep up the constant motion of the heart, though the Heart's motion can be increased by sudden and violent pains and "all the passions of the Mind" (pp. 244, 246) . Nevertheless, he is prepared to allow some efficacy to the power of thoughts or ideas on the heart:

> The Motions of the Heart remain in their original automatic State more than any other in the Body; … and very few Impressions make changes in the motions of the Heart so great and sudden, as to subject it to the Ideas of these Impressions: However, as great and sudden Changes are sometimes brought on by Pain, Fear, Surprise, Joy etc. we seem to have a semi-voluntary Power to alter the Motion of the Heart immediately, by introducing strong Ideas, our power of introducing these being semivoluntary (pp. 247-48).

In Radcliffe's poetic discourse of sensibility, however, hearts can become the sensorium, subject to vibratory sensations of light and sound. Hearts are also susceptible to "delicate passion" and can "vibrate in unison with the sweetest feelings of humanity."

Perhaps her final, farewell descriptive passage in *Gaston de Blondeville* (pp. 205 - 06), which culminates with the *fortissimo* of Willoughton's spiritual elation in response to the dawn, best captures her distinctive, aesthetic distillation of Hartley's "quick propagation of light" and movement of planets in the æther, as well as his sensory vibrations, Theopathy and Providential Benevolence:

"But behold! The beams of another day springing on the darkness! On drawing aside a window-curtain, he perceived the dawn upon the horizon; and, who ever yet beheld those first pure tints of light upon the darkness, more touching, more eloquent to the soul, than even the glorious sun-rise, and turned abruptly from them? The towers of Warwick castle soon began to show themselves on the east, their mighty shadows raised up against the increasing light in peace and stillness. The morning star alone rode bright above them, trembling on the edge of a soft purple cloud, that streaked the dawn.

The heart of Willoughton was deeply aFFected by the almost holy serenity, the silent course of order and benevolence, that he witnessed in these first minutes of another day; he looked up to Heaven, and breathed a prayer of blissful gratitude and adoration; and then departed to his rest.

"Tomorrow to fresh fields and pastures new."

1. Interestingly, Robert Miles in his *Ann Radcliffe The Great Enchantress* (Manchester and New York: Manchester University Press, 1995) in discussing the reception of Radcliffe's work, briefly mentions David Hartley's *Observations* as the "the single most influential work on associationism in the eighteenth century. Citing Nathaniel Drake's comment in his *Literary Hours* of 1800 about Radcliffe's use of the sublime, that "sublime events 'wrought up' in a masterly manner, cause every nerve to vibrate with pity and terror", Miles explains that "associationism increasingly relied on the figuration of the mind as a kind of vibrating machine, where the 'nerves' stood as the individual strings" (p. 49). While this may have been the trend, it was not Hartley's position. In fact, Hartley was at pains to scotch just this notion when he says of his concept that "These Vibrations … must be conceived as exceedingly short and small, so as not to have the least Efficacy to disturb or move whole Bodies of Nerves or Brain. For that Nerves themselves should vibrate like musical Strings is highly absurd; nor was it ever asserted by Sir Isaac Newton, or any of those who have embraced his Notion of the Performance of Sensation and Motion, by means of Vibrations" *(Observations,* pp. 11-12). Only in one of Radcliffe's images – (j), in *The Italian* – that I have located and quoted is there a suggestion that the nerves themselves vibrate, as in Drake's image (which may in fact be his conscious or unconscious registering of her frequent use of the term). In all the others, "vibrate" is followed with a preposition, such as "on", "in" or "to", which is more consistent with Hartley's concept of impressions vibrating *along* the nerves.

Indeed, it is more than a little probable that Shelley's famous lines of 1821, published posthumously by Mary Shelley in 1824 –

> "Music, when soft voices die,
> Vibrates in the memory;
> Odours, when sweet violets sicken'
> Live within the sense they quicken."

– apart from being obviously Hartleyan, owe a a debt to Radcliffe (see quotation (f). Sir Walter Scott was not wrong when, also in 1824, he acknowledged her as "the first poetess of romantic fiction".

2. Robert B. Glassman and Hugh W. Buckingham pay homage to Hartley's Newtonian neuropsychology in "David Hartley's Neural Vibrations and Psychological Associations" in Harry Whitaker, Christopher Ipham Murray Smith, and Stanley Finger, *Brain, Mind and Medicine: Essays in Eighteenth-Century Neuroscience* (Springer, 2007), Section D, pp. 177-90. *David Hartley's Neural Vibrations and Psychological Associations www.springerlink.com/index/n6kn571366j9736x.pdf*

*"*Waves and vibrations are still regarded as basic features of nature, both inside and outside the human body. Hartley's eighteenth-century vibratory model is not operative in its details today, but nevertheless seems to us close to the presuppositions of modern physical and mathematical treatments of the oscillatory communications underlying information processing. Our text for this chapter has been the specific contributions and their historical assessments by others of Hartley's ideas, Our subtext has been the ubiquity of vibration in nature and its scientific investigation, which can be traced to Hartley's Newtonian

neuropsychology" (p. 188).

3. R. C. Allen, *David Hartley on Human Nature* (Albany, New York: State University of New York Press, 1999), p. 2, cites R. K. Webb for this observation.

4. Norton later quotes from a letter by David Hartley's daughter, Margaret, in which she expresses her enthusiasm for *The Italian* which she considered to be "of beautiful imagination, interesting scenes, and true genius" (p. 135).

5. This is, of course, anachronistic as the novel opens in 1584 – six years before the birth of Descartes, and fifty-eight years before that of Newton, who died in 1727. As Radcliffe doesn't use the term "vortices", and she alludes to various aspects of eighteenth century culture in *Udolpho*, it seems more likely that Newton's laws are meant.