Title of Paper: Sympathetic Vibrations: Fictional treatment of a scientific concept in the novels of George Eliot compared and contrasted with analogous treatment by contemporary Victorian novelist Charles Dickens
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Abstract:
This article briefly explores the impact made by contemporary and continental scientific concepts and discoveries on the minds of Victorian novelists such as George Eliot and Charles Dickens, and how they made artistic use of them in their novels.

Keywords: sympathetic vibrations and acoustic science

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Sympathetic vibrations as a scientific concept, is a harmonic acoustically induced resonant phenomenon wherein a passive string or vibratory body responds to external vibrations to which it has a harmonic likeness. The classic example is demonstrated with two similar tuning forks of which one is mounted on a wooden box. If the other one is struck and then placed on the box, then muted, the un-struck mounted fork will be heard. In similar fashion, strings will respond to the external vibrations of a tuning fork when sufficient harmonic relations exist between the respective vibratory modes. A unison or octave will provoke the greater response as there is maximum likeness in vibratory motion. Other links through shared resonances occur at the fifth and, though with much less effect, at the major third. The principle of sympathetic resonance has been applied in musical instruments from many cultures and times. Apart from the basic principle at work on instruments with many mute strings, such as harps, guitars and pianos with the dampers raised, other instruments are fitted with extra choirs of sympathetic strings that respond with a luminous halo to the tone played on the main strings. To make the acoustic point a little bit clearer, sympathetic strings are additional strings fitted to certain stringed musical instruments to produce extra resonance, that is, the reinforcement or prolongation of sound by means of reflection and synchronous vibration or oscillation between two adjacent strings.

Under the influence of her friend, philosopher and intellectual guide, George Eliot was well acquainted and much conversant with the acoustic and psychological theories of sight and sound enunciated by contemporary prominent German experimental psychologists Hermann von Helmholtz and Gustav Fechner particularly, as she was in the same process enlightened and inspired by the continental philosophy of Goethe, Hegel, Feuerbach, August Comte, Henri Lei-Strauss et al. She came into contact with these rich intellectual cultures and heritages mainly through collections in the library of G.H. Lewes and essays/articles published in contemporary magazines and periodicals such as Westminster Review, Edinburgh Review etc. It is natural to ask why as a novelist she was interested in the scientific and psychological theory of sympathetic vibrations. In response to this question it can be said that this theory made considerable impact in contemporary intellectual circles and stimulated widespread curiosity and discussions as reflected in scientific journals and literary magazines. A highly sensitive and alert intelligent mind like George Eliot could not remain indifferent to the immense potentiality and prospect of the new scientific theory and technological innovations. She puts them to good artistic use in her novels with significant aesthetic and philosophical effects in order to give a comprehensive personal vision and universal sympathetic view of life, and add a new dimension to interpersonal relationships and the impact it makes in social order and cohesive forces at large. This symptom of sympathetic vibration and emotional resonance (to be in the same wave length) can be detected in
its rudimentary form in her earliest work of fiction ‘The Sad Fortunes of the Reverend Amos Barton’ (1858). Both Eliot and Lewes cried together over the scenes of Milly Barton’s deathbed, a marital act of affective communion that touched each other’s heart like contagious disease, and the incident is tacitly invoked when she published the story in ‘Scenes of Clerical Life’ in the same year. We may first have a glimpse of the contemporary intellectual background to the emerging concept of sympathetic vibration emanating as a universal unifying force and pervading all forms of beings both animate and inanimate and man-environment interaction reinforcing each other, as exemplified by the comparable analogous treatment of the concept by her contemporary Victorian novelist Charles Dickens.

In his critically acclaimed book, *Victorian Soundscapes*, (Oxford University Press) 2003 John M. Picker examines how the era’s scientific and technological innovations changed perceptions and interpretations of sound and listening, particularly in literature and the psychological impact they made on the creative imagination of the contemporary literary artists. "On a larger scale than before, noise began in this period to alter the agents, subjects, and conditions of artistic and intellectual occupations," he observes. London’s myriad cacophonies— from organ grinders’ relentless whines to locomotives’ piercing shrieks— were inescapable and often vexing, permeating homes, offices, and sanities. This was an age, Picker continues, “defined by new emphases on and understandings of the capacity for listening." New technologies—including the telephone and phonograph, which appeared in the late 1870s— enabled Victorians to hear not only their own amplified voices (phonographs even let people record themselves in their own parlors), but also what had been almost inaudible, such as the murmurs of their hearts and lungs, so called unheard music of the inner feeling with finer tone. The era’s scientific and artistic developments marked a shift away from the pastoral experience celebrated by Romantic writers such as Wordsworth and Coleridge, and granted sound and listening exalted literary roles previously reserved for those stalwarts of perception: sight and visual perception.

John M. Picker focuses on *Dombey and Son* (widely considered the novelist’s breakthrough work) and its exploration of sound and perception. Although the novel "roars with the tumult of rail and sea," he writes, it also examines the "problems and impossibilities of hearing as well as of understanding voices." He provides numerous examples of misunderstandings, of characters having to repeat themselves, and of other breakdowns in communication. In one example, young Paul Dombey asks insistently, "The sea, Floy, what is it that it keeps on saying?" But as Picker points out, "the waves never precisely disclose or clarify themselves: they never say what they mean."
Dickens was particularly enchanted by the notion of sound waves’ permanence and the implied promise of immortality—a theory expressed by his friend Charles Babbage, the inventor and mathematician. "The air itself is one vast library," Babbage wrote, "on whose pages are forever written all that man has ever said." Dickens not only referred to this theory in *Dombey and Son*, but tested it in pursuit of what Picker calls "the fantasy of literary immortality": he suggests that the famous novelist’s ambitious reading tours through England and the United States may have been partly inspired by Charles Babbage’s idea of the enormous potentiality of acoustic theory.

While Dickens’s voice resonated across lecture halls, George Eliot was exploring the burgeoning science of acoustics. Her notebooks reveal her interest in Hermann von Helmholtz’s groundbreaking theories, particularly the phenomenon of "sympathetic vibration": when the vibration of one sonorous body (such as a ringing bell) produces a sound of the same pitch in a neighboring sonorous body. "Thus the pitch of the notes of a church bell may be ascertained by playing upon a flute under the bell," Eliot wrote; later she used the same image in her magnum opus *Middlemarch: A Study of Provincial Life*. Sympathetic vibrations work with the same forceful effect among small circle of people in the provincial community involving Dorothea Brooke, Edward Casaubon and Will Ladislaw and the related group of people binding as a cohesive bond with deep emotional attachment with each other. The psychological impact of resonance brings them closer to be on a coherent and uniform wavelength with each other through ambivalent attitude of love and hate.

Sympathetic vibrations resonated with Eliot’s longstanding interest in the concept of universal sympathy as a literary and philosophical theme, and she readily transformed the scientific phenomenon into a literary artistic metaphor for mutual understanding and emotional connections between members of the family and among members of social groups at large, so as to strengthen the binding energy among them and form a cohesive bond. This characteristic feature is present right from the inception of her writing career. To go back to her early work again, in "Mr. Gilfil’s Love-Story" from *Scenes of Clerical Life*, Eliot describes a character’s emotional response to a harpsichord’s note: "the vibration rushed through Caterina like an electric shock: it seemed as if at that instant a new soul were entering into her, and filling her with a deeper, more significant life."

But for Eliot, silence was as meaningful as sound. "Her books are filled with silences, which are typically moments of repression for her characters," Picker explains. These repressed characters are often women, such as Daniel Deronda’s Gwendolen who, Picker contends, "can listen to, but is not allowed to speak out." Eliot was "uniquely sensitive to the muffled women’s
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voices that often tried to speak behind the silent curtain of the Victorian institutions of femininity, domesticity, and marriage," Picker writes. For such characters, solace is often found in a sympathetic person whom Picker calls "a close listener." For Gwendolen, Daniel is the listener to whom she can finally speak freely; he becomes, in Picker’s words, "the resonant repository for confessions of guilt and selfishness."

Picker credits Eliot with an ability to appreciate what he calls "the intimacy that exists within a closed circle of speech" and notes that Freud, who would later embrace sympathetic resonance as integral to psychoanalysis, was amazed by analogous treatment in *Daniel Deronda.* "What makes Gwendolen scenes with Daniel stand out as much as they have in criticism of the novel," Picker writes, "is that they capture this process of listening to the body with a precision few fictions before it had attempted." This distinctive feature of the novel with unique psychological study of characters and their interactions with the immediate environment mainly by means of fine fictional treatment of the prevalent scientific concept of sympathetic vibrations is what makes permanent contribution to the growth and development and to the great tradition of English novel in the nineteenth century.

I have merely tried to touch on a new aspect of George Eliot’s novels and have just given a few smattering illustrative examples of how she attempted to convey her personal vision of life through fictional treatment of the contemporary scientific theories and technological innovations relating to sight and sound, in relation to her senior contemporary Charles Dickens. More thorough enquiry needs to be done in this direction and further detailed exploration may be carried out in this field.

Notes and References:--

1) Victorian Soundscapes (2003) OUP by John M Picker
2) All references to the novels of George Eliot and Charles Dickens are to the Penguin editions of their novels respectively.