European Review, Vol. 18, No. 2, 239–262 © 2010 Academia Europæa
doi:10.1017/S1062798709990408

Creative Synaesthesia in E. T. A. Hoffmann's *Ritter Gluck*

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Strong evidence in the field of neuroscience now makes it possible to claim, with minimal reservation, that E. T. A. Hoffmann's literary imagination was enriched by synaesthesia. E. T. A. Hoffmann is recognised as a remarkable polymath. A writer of fiction, bibliophile, composer and music critic, he not only understood Romantic sensibility but also involved himself in contemporary scientific debates on the nature of sound and perception, and was familiar with the acoustic theories of Ritter and Schubert's work on magnetism and electrical energy. Hoffmann's distinctive creativity was formed and informed by his diverse abilities and interests, and by his auditory sensibility and kinaesthetic appreciation of music. We postulate that the multi-sensory nature of Hoffmann's work is evidence of creative synaesthesia, a phenomenon that occurs when a neurophysiological sensation perceived in the brain stimulates a different sense or senses and, as a result, produces a creative outcome. Taking as our example his intensely musical story *Ritter Gluck*, published in the *Allgemeine Musikalische Zeitung* of February 1809, we examine Hoffmann's complex and idiosyncratic use of metaphor and structure in the scientific context of his own time and continent, and in the context of 21st century scientific understandings of brain science.

We are a *sensorium commune*, sensuous beings who perceive through many diverse senses at once.[1]

E. T. A. Hoffmann (1776–1822) was a voracious reader of literature, science and philosophy. His writing and musical compositions testify to his immersion in contemporary ideas, and his eclectic ability to make them his own. Extensive critical debate has already engaged with his fiction, musical writing and composition, letters and diaries; one contentious subject is whether his literary imagination was shaped by experience or knowledge of synaesthesia, the neurophysiological condition in

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which neurological pathways in the brain, when stimulated by one sense, produce sensations in another, or others. In the light of new scientific research since the 1980s,[2–10] it is reasonable to hypothesise that Hoffmann was a synaesthete who inextricably fused the timbral qualities of voice, note and word. Circumstantially, he regularly worked in a space indicative of synaesthetic practices, positioned between a piano and adjacent writing-desk in an attic room.[11] It can be convincingly argued that he was fully aware of the creative possibilities of synaesthesia with regard to the production of metaphor, although synaesthesia was known by other names in Europe in the early 19th century.[12] This article re-examines the synaesthetic aspects of Hoffmann's writing, with particular reference to *Ritter Gluck*, published in the *Allgemeine Musikalische Zeitung* of February 1809 and republished in 1814 as the first story in his first collection, *Die Fantasiestücke*. Correlations between 18th-century neurophysiology, familiar to Hoffmann, and data from modern neuroscience and brain-scanning provide substantial foundations on which to base an exploration of his synaesthetic literary language. Recent scientific developments bring a fuller retrospective understanding of the multi-sensory and kinaesthetic[13] triggers which Hoffmann describes as accompanying the Romantic experiences of sensibility and transcendence.[14] Our argument concurs with critical claims that Hoffmann's work is influenced by synaesthesia, once largely understood through the contemporary psychological model of the brain as a *sensorium commune*. We take into account historical theories of Physics concerning acoustic vibrations, which permeate everyone and everything in the cosmos. By tracing affinities between a modern scientific understanding of synaesthesia and Romantic sensibility, particularly sensibility governed by hearing and touch, this article reaffirms Hoffmann's dominant sense as auditory and enhanced by his practical and theoretical knowledge as a composer. A close analysis of the metaphoric, structural and musical patterns of Hoffmann's writing supports the further claim that his use of metaphor was also creatively synaesthetic.[15]

Science past and present

Hoffmann's synaesthesia should be seen in the context of contemporary scientific[16] and medical practices, about which he was well informed. He knew the physicians David Ferdinand Koreff, Adalbert Friedrich Marcus and Gotthilf Heinrich Schubert,[17] and knew the work of Johann Wilhelm Ritter, now widely accredited as the founder of electrochemistry. During Hoffmann's professional career as a writer and composer, the received wisdom was that body and soul, sensory perception and reason, were integrated. Hoffmann also assented to the widely held contemporary belief that electrical energy connected the individual, his or her surrounding physical world, and the cosmos. Schubert argued that

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human beings had been interconnected with nature in their primeval state and now yearned to return to that lost harmony of spirit and matter. Schubert's work not only suggested to Hoffmann that poets, visionaries and madmen were highly sensitive to this universal magnetism,[18] opening up possibilities of synaesthetic experiences, but this work is explicitly cited by Hoffmann in descriptions of the underlying sound of nature in his novellas *Die Automate* (*The Automata*, 1819, 4: 421) and *Der Unheimliche Gast* (*The Uncanny Guest*, 1820, 4: 725).[19]

Along with many other European intellectuals of the late-18th century, Johann Ritter influenced Hoffmann's understanding of the inseparable sensations of hearing and sight. Hoffmann often alludes to Ritter and specifically quotes him in a densely synaesthetic passage in *Johannes Kreislers Lehrbrief* (*Johannes Kreisler's Indenture*, 1815).[20] According to Ritter's cosmology, sound and light vibrate as one throughout the whole universe. His theory that '[n]o apprehension of the universe is of such complete and absolute value as the acoustic one (*als die akustische*)'[21] has an important bearing on the epistemology of musical performance and speech, which are dominant preoccupations in *Ritter Gluck*. (Johann) Ritter characterised music and language as stemming from the same primeval source, which, he maintained, caused language to operate through associated or internally imagined sounds, rather than by means of conceptual nomenclature.[22] Furthermore, universal vibration, otherwise referred to as the music of nature, emits tone or nature tone. This enabled human beings, like sounding boards, to respond to nature through a 'thousand chemical, electrical and magnetic processes (*tausend chemische, elektrische, magnetische Prozesse*)'.[23] In short therefore, he privileged the sensory response of hearing over vision, maintaining that 'hearing is seeing from within (*das Hören ist ein Sehen von innen*) the innermost consciousness'.[23] These brief allusions to the contemporary theories of the natural philosophers Schubert and Ritter, both acknowledged by Hoffmann, illuminate his work. Their research enriches his understanding of the overpowering effect of music and the cosmic sounds of nature on the Romantic sensibilities of the artist.

A further example of received scientific wisdom was the sensorium commune. According to late 18th- and early 19th-century natural philosophy, namely science, it was taken to be the percipient centre to which sense-impressions were transmitted by the nerves.[1] It was believed to operate through one unified sense, which fused differentiated stimuli. The driving forces were feeling and emotion, rather than reason and abstract thought. The foregoing outline of contemporary German Romantic Science reveals the origins of present-day research into synaesthesia, kinaesthesia and synkinesia.[25] Technological developments in neuroscience have irrefutably shown, through CAT (computed axial tomography), PET (positron emission tomography) and fMRI (functional magnetic resonance imaging) scans, that parts of the brain, unconnected in many people,

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fire simultaneously in synaesthetes.[26] Although Hoffmann could not have known about these verifications, he describes this psychophysical condition many times.[27] Recent scientific research confirms the powerful effects of synaesthesia on the synaesthete, although its precise parameters are contested.

In this article, the term synaesthesia carries two meanings: one, the activity in the human brain when a neural pathway stimulated by one sense produces sensation in one or more others; and two, the concomitant operation which instigates imaginative thinking and the creation of metaphor. Neurologist Oliver Sacks theorises conceptual eidetic[28] forms of synaesthesia, as 'a union of ideas rather than sensations' which comprise an 'instant and automatic conjoining',[29] thus strengthening the possibility of an instant link between sensory stimulus and the creation of metaphor. In our argument, whenever Hoffmann's metaphoric, narrative, syntactical or lexical choices seem genuinely shaped by cross-sensory stimuli, or display his tendency to absorb and transform music experienced aurally and kinaesthetically into the written word, we describe them as creatively synaesthetic. This process is a rapid development of the involuntary physiological, motoric and neural triggers of synaesthesia, leading immediately into and fusing with cognitive expression. The concept of creative synaesthesia embraces the alliance between music and word, and sound and vision, as opposed to clinical synaesthesia, which has no creative outcome, and literary synaesthesia, a phrase that usually only signifies the formal qualities of literary language.

Researchers in the field of synaesthesia disagree about what constitutes synaesthesia on a continuum from the immediacy of the synaesthetic experience, through its transformation into perceptual metaphors, and then to their expression in language or some other medium. Baron-Cohen and Harrison, for example, differentiate between the instantaneous shift of one sensory perception to another, and the formation of metaphors that use the vocabulary of synaesthesia. They call this use of metaphor 'pseudosynaesthesia', because metaphors can be produced without any experience of involuntary synaesthesia and are often analogies arrived at through rational association.[30] Similarly, Dann sharply distinguishes between the clinical condition of synaesthesia and what he calls 'intersensory metaphors', which he finds frequently used in Romantic poetry's evocation of the transcendence of an expanded consciousness (Ref. 4, pp. 13–14).

Although metaphors and analogies can be made by solely cognitive processes, this does not preclude the ability of some artists with synaesthetic tendencies to pass immediately from the fusion of multi-sensory perception to mental percepts related to metaphor, and thence to creative synaesthetic writing. The instantaneous neurophysiological event together with its resultant verbalisation probably takes longer to describe than to occur. Cytowic thinks so, arguing that what 'the body feels as physical, the mind apprehends as mental', and, therefore, metaphors should not be seen as verbal abstractions (Ref. 3, p. 26). Ramachandran and Hubbard

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hold similar views, maintaining that synaesthetic metaphors are not wholly derived from cognitive connections (Ref. 8, p. 52). Their ongoing research supports cross-connections between 'both synesthesia (sic) and … a propensity toward linking seemingly unrelated concepts and ideas – in short creativity' (Ref. 7, p. 58). One point of broad agreement in this buoyant field of investigation is that synaesthesia, once thought of as affecting children, women, primitives and those with diseased, mad or drug-affected brains,[31] appears to be residual in everyone, but occurring to an extreme degree in artists.[32] Recent data also suggests that synaesthesia is highly emotionally charged. There is no scope here to discuss modern scientific research further, but the seminal influence of Romantic Science in this field is apparent. The areas of similarity between electrical impulses of the body and the brain, now mapped by technology, and the evanescent imagination of the artist are enlightening. Scientific investigations past and present therefore justify our investigation into the musico-poetic structures of Hoffmann's writing, working from the hypothesis that his own putative synaesthesia shaped its formal and narrative aspects.[33]

Critics, creative synaesthesia and sensibility

We support O'Malley's argument, published in 1957, that the following fragment from the *Kreisleriana* section of *Die Fantasiestücke* is 'the first distinct description of 'genuine' synaesthesia which has any claim to objectivity':[34]

> Not only in dreams, but also while falling asleep, especially when I [Johannes Kreisler] have been listening to much music, I discover a congruity of colours, sounds, and fragrances (*Farben, Töne und Düfte*). It seems as though they are all produced by beams of light (*Lichtstrahl*) in the same mysterious manner, and then combine into a wonderful concert (*wundervolle Konzerte vereinigen*). The fragrance of deep-red carnations (*dunkelroten Nelken*) exercises a strangely magical power over me; unawares I sink into a dream-like state in which I hear, as though from afar, the dark, alternately swelling and subsiding tones of the basset horn. (Band 2/1: p. 63)

When a post-1980 neuroscientific understanding of synaesthesia is applied anachronistically to the state of consciousness described above, the passage becomes remarkable for its instant bi-directional connections between auditory, olfactory and visual senses.[35] The synaesthetic experience is patently strong here because it is associated with the state of semi-consciousness preceding sleep, in which abstract and symbolic connections are made. While using the notion of extreme sensitivity to sound as a stimulant to vision and smell, Hoffmann links this coalescence of sensations with a dreamlike inner vision. G.H. Schubert's preoccupation with dream symbolism suffuses Hoffmann's description. Moreover, a strong synaesthetic process in which music evokes a multisensory inner 'concert', brightening and then fading into the single, faint, imagined sound of

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the basset horn is clearly evident. The described experience echoes Johann Ritter's theory that, since nature is part of a cosmic 'orchestra', sensitive listeners and their natural surroundings vibrate together in harmony (Ref. 21, 1, frag 360, 166–167).

O'Malley differentiates between clinical synaesthesia and 'intersense analogy and metaphor' (Ref. 34, pp. 391–392). He contends that the 'intersense metaphor' frequently presents a transcendent experience and is cognitively transferred from and developed beyond sensory stimuli (Ref. 34, p. 398). He gives a germane account of the first scientific documentation of synaesthesia in 1812 (Ref. 34, pp. 406–407) and characterises synaesthetic transference as affecting articulate, gifted and artistic people. He asserts that Hoffmann's particular use of 'intersense metaphors' results from 'peculiarities of mental association' enhanced by 'semi-delirious' and heightened pathological experience, rather than synaesthesia (Ref. 34, pp. 405, 408). '[S]emi-delirious' implies suspicion that Hoffmann was deluded or overindulged in wine and tobacco. He concludes that Hoffmann's references to synaesthesia 'illustrate a concept of 'genuine' synaesthesia', but do not result from authentic synaesthesia (Ref. 34, p. 407). However, he concedes that to make an informed judgement, 'a broader and more exacting knowledge of synaesthesia' would be required than was available in the 1950s (Ref 34, p. 409).[36] This critical stance can now be superseded thanks to new scientific knowledge.

Schmidt's critique of *Ritter Gluck*, published in 2000,[37] though not dealing directly with creative synaesthesia, inadvertently bridges modern concepts of synaesthesia to the contemporary idea of sensibility in the Romantic artist.[38] Her reading of the sound that rings in the ears of the Gluck figure in *Ritter Gluck*, a sound he calls the Euphon (Ref. 37, pp. 17–18), is pertinent to our argument about the firing of multiple sensory effects by auditory stimulus. She argues that the reverberation in his head is triggered by the overwhelming tumult (*von diesen Massen*) of sound on his eardrums after listening to the overture to Mozart's *Don Juan* (2/1: 27). This impure sound drives him from the theatre before the overture finishes. His hypersensitive suffering results from a finely tuned *sensorium* (*ein solch sensibles musikalisches Sensorium*) (Ref. 37, p. 59). Schmidt compares this forced, frenzied exit to Hoffmann's *Der Musikfeind* (*The Music-Hater*) in *Kreisleriana,* in which Kreisler is also driven from concerts 'through excessive sensibility (*aus übergrosser Sensibilität*)' experienced in body and mind and registered in his *sensorium*, the seat of sensation (2/1: 435–6).[39] Hoffmann describes how Kreisler the music-lover is ironically dubbed a music-hater by less sensitive fellow music-enthusiasts. The 'hair-triggered' sensibility thus generated was considered a great virtue of character, unless indulged to excess.[40] Unsurprisingly, Hoffmann counted Sterne's *Sentimental Journey*, with its over-sensitive 'hero' and acerbic sense of humour, among his favourite books.[41] Certainly, the sensibility of protagonists – some geniuses, some fools and some susceptible to

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illness or madness – underpins the plots of many contemporary sentimental novels; artist figures imbued with sensibility constitute a thematic preoccupation in Hoffmann's work.[42]

The beginnings of a modern understanding of creative synaesthesia are clearly discernible in the convergence of concepts of Romantic sensibility with the *sensorium commune* and the compression of sensations. Furthermore, Minter develops the historicised argument that sensibility (*Empfindsamkeit*) in Romantic writers is intimately connected with creating metaphors (Ref. 40, pars, 16, 18). She shows how they appropriated the vocabulary of 18th-century German neurophysiology to express that sensibility. Referring particularly to Jean Paul Richter, she argues, '[i]n his *Vorschule der Asthetik* (1804), [he] uses the idea of parallelism between the moral and physical spheres to support his theory of metaphor, suggesting that a metaphor for something in the "moral" world (an emotion or idea) is best found in the physical' (Ref. 40, par. 18).[43] Her argument applies equally to Hoffmann. Such alliances between the physiological and the perceptual occur persistently in Romantic literature and are strongly present in Hoffmann's work where the sense of hearing often provides the initial sensory stimulus. By drawing together scientific theories past and present, there emerges a notable similarity between the inter-connection of Romantic sensibility with the production of metaphor, and the interconnection of synaesthesia with the production of metaphor, as recently researched by Cytowic, Hubbard, Ramachandran, and Sacks.[3,6,7,8,9,10] Mapping a modern understanding of brain science onto earlier neurophysiological theories supports our claim that the language of *Ritter Gluck*, rather than making use of metaphors produced by abstract reasoning, is creatively synaesthetic.

Synaesthetic metaphors in *Ritter Gluck*

The first suggestive, but inconclusive, indicator that Hoffmann's writing in *Ritter Gluck* arises from a strong confluence of sensory and motor-neural stimuli occurs in its narrator's account of his dialogue with a stranger, possibly the ghost of the deceased composer, Christoph Willibald Gluck. In the last sentence of the story, the stranger identifies himself as the composer Ritter (Sir) Gluck.[44] The unnamed narrator unifies the whole text, but uses a variety of tones and perspectives. In the opening section, he gives a third person impression of the sights, smells and sounds of Berlin's Lindenstrasse in 1809. He observes the colours and atmosphere, listens to gossip in the cafés, and notices bustling people and the aroma of coffee and cigars. These impressions become more internalised. Depending on the English translation of '*zerfließt*' (Band 2/1: p. 19), they run, melt or dissolve, into an aria,[45] performed by a scratch café orchestra. Thus, visual and olfactory responses blend into an auditory experience. Sensory triggers operate throughout the story, with the narrator especially attuned to the sound of musical instruments.

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In the last section, the narrator reveals his hair-triggered sensitivity to the Gluck figure's performance of the final scene of *Armida*, saying 'All my fibres trembled (*zitterten*)' (Band 2/1, p. 31). The verb '*zittern*' conflates contemporary medical and Romantic terminology; the conflation suggests that the narrator has a highly sensitive *sensorium*. His sensory, motoric and emotional response, similar to the Gluck figure's own synkinesia, creates a mental maelstrom of sensibility that enables him, as Hoffmann's surrogate, to narrate the story of *Ritter Gluck*.

The different voices in the text and the confluence of sensory stimuli already mentioned combine to create further synaesthetic moments in which the auditory sense is dominant. After the initial description of Berlin, the narrator's third-person vantage point sinuously transforms into a first-person interiorised monologue describing his philosophical conversations with imagined characters. When the Gluck figure arrives at his table, the narrator changes his narrative mode to a description of this stranger's eccentric demeanour and contractile body movements. Thereafter, the prose shifts to dialogue. The narrator defends the quality of operatic performances in Berlin theatres from the Gluck figure's criticism.[46] In expressing a generalised view of contemporary life in Berlin, the dialogue here performs the same function as the third person narration at the beginning.[47] The alternation of the narrator's voice (in itself ranging from a panoramic viewpoint, to close focus, to introspection) with dramatic dialogue, produces oral and aural variety throughout the story. The Gluck figure's voice, refracted through the narrator's, also has many guises, displaying his extreme sensibility. For instance, the narrator hears him talking agitatedly to himself outside a theatre in response to the orchestra's performance of Gluck's (his own) *Armida* (Band 2/1, p. 28). The Gluck figure also sings, beats time, vocalises a drum-like sound (Band 2/1, p. 30) and plays the piano with virtuosity and passion. Thus, the text is predominantly auditory. Some of his utterances are sufficiently long and oracular to be regarded as monologues embedded in the first person narration. The narrator always conveys his interlocutor's excitability, so the framing narration is temporarily forgotten. Despite the linearity of prose, these textual involutions create the impression of simultaneity. This impression is reinforced by repeated phrases, functioning like musical leitmotifs. The multi-voiced nature of *Ritter Gluck* therefore constitutes a veritable 'orchestra', sometimes a cacophony, of voices that rightly merit the Bakhtinian critical description 'polyphonic',[48] and simultaneously resemble Ritter's concept of a universal 'orchestra' of sound. Three major metaphors in the embedded monologues of the Gluck figure, analysed in the next section of this article, display the most convincing proof of Hoffmann's creative synaesthesia.

The most intensely synaesthetic episodes in *Ritter Gluck* occur when the Gluck figure experiences multi-sensory triggers and, in a seamless progression from this stimulation, becomes absorbed in the creative act of composition. This complex transformation of sensory input into musical output is signalled by

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strikingly synaesthetic metaphors: the sun/sunflower, the Euphon, and the vibration of voice and piano, which are interwoven like polyphonic strands in an orchestral texture.[49] Hoffmann's text and the operas composed by the fictional Gluck figure are analogous creative works. While one cannot argue indisputably that Hoffmann's writing was influenced by synaesthesia, one can claim that the protagonist, Ritter Gluck, is presented as a synaesthete and that the narrator's existing synaesthetic tendencies are strengthened as he engages with the protagonist.

Preceding these metaphors are synaesthetic references that foreground sound and the organised sounds of music, involving the cacophonic racket of the orchestra and its 'abominable octaves' playing 'an extremely vile waltz' (Band 2/1, p. 20). The Gluck figure associates this cacophony with the clanging vibrations of the Euphon, which, as he complains to the narrator during their second meeting, jangle interminably in his auditory imagination. However, the Gluck figure's imagination transforms these grating sounds, which plague his inner ear, into something better, or, periodically, into something musically superb. After listening to its turgid waltz, for example, he persuades the orchestra to play the overture to Gluck's (his own) opera *Iphigenia in Aulis*. Then, as he listens, moistening his tobacco tin with Burgundy wine, a synaesthetically rich experience, he mimes conducting the café orchestra. He confirms his ability to compose a score in his head[50] after this display of what would once have been described as highly sensitive Romantic sensibility, but which might now be identified as synaesthesia causing motoric agitation. Listening to the orchestra makes his facial muscles work and his cheeks burn. In a rapid switching of physiological and emotional responses, a deep inner ache 'seizes all his fibres and shakes them convulsively (*krampfhaft erschűtert*)' (Band 2/1, p. 22).[51] Significantly, when he then sings the priest's chorus from (his own opera) *Iphigenia in Tauris*, he modifies the melodies. Thus, in a continuously transformative process, he creates while performing vocally.[52] The narrator also experiences this elegiac piece through both auditory and tactile senses, as his description of it as 'melting (*schmelzend*)' suggests (Band 2/1, p. 22). Given the context, this adjective is not a cliché.

Sun and sunflower metaphor

From a modern vantage point, the Gluck figure's use of the sun metaphor is synaesthetic. It is multi-layered, entailing hearing, vision, touch and motor-neural experience. Historically, this metaphor derives from the notion of the music of the spheres and the contemporary theory of an acoustic cosmos. He perceives the sun musically as 'the triad (*der Dreiklang*) from which the chords, like stars, shoot out and entwine you with threads of fire' (Band 2/1, p. 24). This metaphor is also kinaesthetic, as the chords enfold the listener's body. His physical response to the intensity of light, fire and kinetics is powerful enough to be painful. This experience

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is not only transcendent, but also seems to render him completely helpless; he 'lie(s) cocooned in fire until the soul swings (*emporschwingt*) up to the sun' (Band 2/1, p. 24). His dream world is both tormenting and empowering as the visionary sun, with dreamlike logic, metamorphoses into a large, bright eye. He explains how, during this chaotic immersion in dream, the eye was looking into an organ whose tones 'shimmered and entwined' and 'streamed (*strömten*)' in 'roaring waves' that threatened to drown him. This eye not only summoned up the organ's marvellous chords but also prevented him from 'drowning (*untergehen*)' in a 'river (*Strom*)' of sound (Band 2/1, p. 25) and reassured him that he would complete his composition.

The sun image encapsulates many sensory and abstract meanings. The metaphor suggests the act of composition by personifying the sun-triad as 'two giants (*zwei Kolossen*) in gleaming armour', named '*Grundton*' and '*Quinte*', together with a third element (Band 2/1, p. 25). These names literally translate as root and fifth, musical terms that refer to particular notes of a triad, or three-note chord.[53] Although triads can be formed on any note, in Western music of Hoffmann's time most melodies were derived from the three most powerful triads contained in each key. Therefore, the triad is the basis of musical composition; the harmonies that underlie melodies, and the melodies themselves, draw on its notes. The root is the triad's strongest note, and the fifth the next strongest; this may account for the dynamism of Hoffmann's armoured giants which stride towards the Gluck figure in his dream. This imagery is strikingly similar to (Johann) Ritter's scientific account of the acoustic universe.[54] He relates the vibration of planetary movement to the musical structure of the triad, a structure that inherently carries philosophical meaning. The earth's rotation makes the root tone (*Grundton*); its orbit round the sun makes another tone; and the orbit of the moon round the earth makes yet another (Ref 23, frag. 361, 167).[55] Ritter described this planetary movement as 'colossal music (*von einen kolossalen Musik*)', aligning it to the structure of the triad, C E G c. Within this triadic structure the root, C, represents 'unity of existence (*Einheit des Daseins*)'; the third, E, represents 'memory (*Erinnerung*)' and the fifth, G, represents 'hope, future (*Hoffnung, Zukunft*)'. The c, an octave higher, represents a further move forward to 'new existence, resurrection (*neues Dasein, Auferstehung*)' (Ref. 23, frag. 361, 167). Ritter observed that 'We ourselves, animals, plants, *all* life must be understood in these tones' (frag. 360). His influence is apparent in Hoffmann's prose fiction, which invariably shows the artist, whether composer, painter or writer, as hypersensitive to the vibrations of nature. Through both external sensory responses and inner perceptions, which echo Ritter's observation 'hearing is seeing from within' (frag. 358, 166), Hoffmann's artists strive for and sporadically achieve harmony of body, mind and spirit. Acoustic union with the vibrations of the sun as the centre of the cosmos, or metaphoric union with the sunflower, brings inspiration, ecstasy and often, thereafter, degrees of melancholy.

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The close correspondence between the words and imagery describing the Gluck figure's transcendent state of being and the language of Ritter's *Fragmente aus dem Nachlasse eines jungen Physikers: Ein Taschenbuch für Freunde der Natur* (1810) suggests that Hoffmann had read *Nachlasse* in detail.

In this episode of *Ritter Gluck*, the Gluck figure completes the complex sun-triad metaphor by describing a 'soft, gentle youth' who walks underneath the two giants. The youth personifies 'Tierce (*Terz*)' or third (Band 2/1, p. 25). The third note of a triad, although less strong than the root or the fifth, characterises the triad's overall sound as major or minor; in the simplest of terms, as 'happy' or 'sad'.[56] Without their thirds, triads would have sounded empty to a late-18th century contemporary audience. Furthermore, the eye's description of this youth shows a musical sensitivity to acoustics. Like the interval created between the root and the fifth, the interval between the root and the third is also a musical consonance, harmonious on the ear. If the eye's comment about the role of Tierce means that the triad will be used in its strongest position, with the root as its lowest note and the third and fifth above, then the triad will seem most satisfying and complete to the listener. Schmidt helpfully interprets the solar musical triad as the most Godly musical chord of all (Ref. 37, p. 50), and the sun as a symbol of artistic creativity and truth.[57] Musical harmonies are therefore experienced synaesthetically, physiologically, emotionally and cosmologically. At the same time, they enact and symbolise Romantic transcendence in which the artist vibrates in tune with the music of nature. Nevertheless, in *Ritter Gluck* as a whole, the imagery of walking and striding is so strikingly visual and reinforced by the rhythm of the words that the reader does not need a specialist knowledge of the harmonic basis of music to appreciate the text's multi-sensory dynamics.

This synaesthetic sun metaphor is revisioned when the Ritter Gluck figure compresses the sun–eye connection into an image of the eye as the calyx of a silent sunflower; it casts its light over him, drawing him towards it on invisible threads like the polyphonic threads of a musical score. Then he is inside the calyx and the eye vanishes. The creative process is reciprocal; as he is drawn into the calyx, harmonious tones flow from him to the flower. This creative reciprocal flow draws on Ritter's contemporary idea of pervasive electrical energy.[58] The Gluck figure again responds synaesthetically by sensing a warm glow as sounds and light flow around him and the sunflower returns him to the kingdom of dreams.[59] Thus, the metaphor of the sunflower denotes budding creativity and the re-energising power of music. Concomitantly, the Gluck figure explains how 'an ice-cold hand reached into my glowing heart' (Band 2/1, p. 30) when his creative synaesthesia abates. This tactile, thermographic metaphor is repeated once more, like a polyphonic musical theme, when the Gluck figure gives his disparaging opinion of '*Lappländische*' musical work in Berlin. He maintains that, like Lapland, the city is so far from the sun's warmth that it freezes all creative ideas (Band 2/1, p. 26).

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The Euphon – figurative and actual

The Gluck figure describes the effect of the Euphon three times in *Ritter Gluck*, recalling the triad and the tripartite structure of sonata form.[60] Significantly, the narrator remarks that he cannot understand what his interlocutor means. The mystery surrounding the Euphon remains critically unresolved, but perhaps Hoffmann enjoyed using a verbal pun or did not want every mystery to be unravelled.[61] Our contention is that the Euphon, whether taken to be an internalised 'sound',[62] cacophonous, undifferentiated sounds, or the literal sound of a contemporary musical instrument, acquires all the resonance of metaphor as the story unfolds. Its sound is simultaneously negative and positive, or, in musical terms, dissonant and consonant. It functions as an auditory stimulus creating a fusion of synaesthetic responses that persecute the Gluck figure, but which paradoxically lead to a transcendent experience of creativity. After the Gluck figure has performed the overture from *Armida*, he tells the narrator, 'I wrote all this, sir, when I returned from the realm of dreams (*aus dem Reich der Träume*)' (Band 2/1, p. 30). Therefore, the Gluck figure's creative synaesthesia has transformed the undifferentiated, trembling or clashing sound of the Euphon into musical composition.

The first and third references to the sound(s) of the Euphon concern the onset of sensory overload and physical agitation. The mental torment begins immediately after the Gluck figure has described, and thereby re-experienced, an intensely creative state of mind and body. He testifies to feeling very hot during his imagined encounter with the sun/sunflower, describing how he was physically compelled to jump up and stride away as he sensed the Euphon beginning to vibrate in his head (Band 2/1, p. 26). Perhaps his consumption of Burgundy wine contributed to these physical antics. His second encounter with the overwhelming sounds of the Euphon occurs after listening to an actual performance of the overture to Mozart's *Don Juan* (Band 2/1, p. 27), in preparation for which he had dampened down his receptiveness through fasting and prayer. However, despite anticipating the effect that 'this multitude (*von diesen Massen*)' of sounds would have on him, he could not prevent the vibrations of the performance from driving him out of the theatre.[63] We have not been able to substantiate whether the actual instrument called a euphon, a variation of the glass harmonica,[64] was ever played in the overture to *Don Juan*; it is certainly not in the score. It is also unclear whether Hoffmann associated the sound qualities of the lower register of woodwind instruments used in Mozart's score with euphonic vibration. Nevertheless, the euphonic sound experienced by the Gluck figure results from listening to the section immediately following the opening of the overture, where, to depict the Commendatore's statue brought to life, Mozart gives the orchestra fast-moving, sinister scale passages with a prominent woodwind timbre.[65] After this hyper-stimulation of his auditory and motoric responses, the euphonic sound

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rang in the Gluck figure's ears for days. His creative imagination, then, is fed through his senses, which run riot when mixed with emotion and passion. He is temporarily driven mad by his hair-triggered sensibility.

If Hoffmann intended the reader to interpret the literal properties of the contemporary musical instrument as representing a composer's heightened sensibility, then the Euphon metaphor is particularly apt. The euphon was one of a family of experimental instruments invented by the acoustician and physicist, Ernst Chladni, who was interested in the vibrations created by sound patterns. (Johann) Ritter enthusiastically praised Chladni's acoustic experiments with glass and metal plates (Ref. 23, frag. 364, 167–168). Glass harmonicas of every kind had remarkable timbre and sonority which, according to Dolan, allowed 'early romantics [to] catch aural glimpses of "nature music"'. She argues that experimental instruments (including Aeolian harps) not only created the idea of such music but 'transformed a music that was theoretical into something tangible'.[66] Hoffmann may also have had the glass harmonica in mind in *Ritter Gluck* because Gluck himself gave two performances on this instrument in London in 1746.[67]

Hoffmann knew about the neurosthenic power of such musical instruments on the senses, as well as being familiar with their literary use as a metaphor for the Romantic imagination. However, he was sceptical about claims that glass harmonicas could be a technological bridge to a transcendental state of mind. In 1819 he wrote with characteristic irony, 'When it was claimed that the armonica exerted a magical influence on the nerves, this instrument could not fail to captivate every sensitive soul'.[68] Furthermore, in his novella *Die Automate* (1819) Hoffmann investigates in considerable depth the contemporary vogue for inventing new musical instruments, a vogue largely driven by the search for a mechanical medium to call forth or replicate nature's harmonic sounds and vibrations. His protagonist Ludwig, possibly a surrogate for Hoffmann, describes many of these inventions, concluding that the expressive solo singing voice can intimate 'crystal tones (*krystallne Klänge*)' that 'stream (*strömen*) through the air like flame in a wonderful concert' more effectively than any glass harmonica (4: 425). Despite the difficulty of pinning down the richly suggestive links between Hoffmann's Euphon and contemporary musical instruments, *Ritter Gluck* is undeniably influenced by current ideas in music, natural philosophy and neuropathology. In addition, the stimuli of euphonic sounds on the body, senses and imagination of the Gluck figure invite an interpretation consonant with a modern scientific understanding of creative synaesthesia.

Vibrations in soul and sinew

The third metaphor, a blank musical score, at once visually poor and acoustically rich, brings further depth of meaning to the third meeting of the narrator and the

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Gluck figure in the latter's dingy garret.[69] Their meeting involves hearing, touch, sight, whole body sensation and emotion. According to a modern understanding of this multi-sensory condition experienced by both characters, the episode can be accurately termed synaesthetic and synkinetic. The acoustics of an enclosed, upper room would especially intensify the vibrations of the fictional composer's rendering of the overture and final scene from *Armida* (composed by Gluck). As he played and sang, the Gluck figure's hands touched the keyboard and the musical score. The narrator 'turned the pages industriously by watching his glance' (Band 2/1, p. 29), shocked to find that they displayed nothing but empty staves.[70] The companions are at their closest during the performance, in tune with each other physically, imaginatively and musically. The metaphors of the sunflower and vibration are also figuratively synthesised when the Gluck figure remarks: 'no one would recognise me until the sunflower should raise me up again to the eternal' (Band 2/1, p. 30).[71] The vocal sounds and physical sympathy integral to this act of creation, the 'artistic melismas' (Band 2/1, p. 30) and the performer's vocalisation resembling a drum are all notable for their quality of vibration. Hoffmann makes it clear that the playing was not merely a feat of memory but an act of continuous improvisation and composition with 'many new and inspired twists' (Band 2/1, p. 30). The metaphor of the blank score demonstrates that composition can take place in the body and imagination without using notation. The score is neither necessary, nor a guarantee of Romantic transcendence, because the transcendence is triggered by the immediacy and ephemerality of the sound and its attendant emotional intensity.

The shared moment of vision and euphoria of performance in the ill-lit, claustrophobic room overwhelms the narrator, causing him to exclaim 'All my fibres trembled (*Alle meine Fibern zitterten*)' (Band 2/1, p. 31) and to ask urgently who his companion is. Thereupon, the Gluck figure dashes from the room, plunging the narrator into darkness and forcing him to feel his way about. Although his eyes are inoperative, his inner sight is unimpeded. Suddenly the companion returns, richly dressed, a light – probably a candle-stick – in hand, thus shocking the narrator's physical vision sufficiently to root him to the spot. Tactile and auditory senses engulf him as his companion takes his hand and announces he is 'Ritter Gluck' (Band 2/1, p. 31), putative composer of *Armida* and many other blank volumes of music in this upper room. This revelatory experience may be described as transcendent – a state of the body and imagination that ensues from a delicate, hair-triggered sensibility. Hoffmann's perception of transcendence, therefore, is rooted in the body and the imagination. If the garret is taken as a metaphor for the *sensorium commune*, contemporarily believed to be the seat of sensation, then the sonorous performance within, the exit and re-entry precipitate the arrival of light, touch and verbal sound, all of which fuse with inner vision. The emphasis on the musical vibration of bodies

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and objects also metaphorically replicates (Johann) Ritter and Chladni's theories that tones made externally to mind and body (*Klangfigur*) sound simultaneously with tones sensed from within the mind (*Lichtfigur*) (Ref. 23, frag. 364, 167; Ref. 22, 268). This instantaneous state of consciousness is symptomatic of synaesthesia, while the extreme experience in the attic room as a whole is creatively synaesthetic and synkinetic.

Conclusion

Our article's science-related re-examination of the synaesthetic metaphors used by Hoffmann in *Ritter Gluck* reveals how closely musical and literary motifs are enmeshed. It demonstrates not only the likelihood of Hoffmann's synaesthesia, but also how he used its creative possibilities to give his musically-centred fiction further resonance. Whilst Hoffmann's acclaimed mastery of musical composition enables him to create convincing and emotive literary metaphors inscribed with auditory and synaesthetic sensibility, his ability to experience sound kinaesthetically gives an organic intra-connection to these metaphors and the narrative structure as a whole; this functions like a further polyphonic strand in his musical writings, thus confirming the multi-sensory synaesthetic nature of these metaphors. With the benefit of 21st century insights into synaesthesia, this article shows that *Ritter Gluck*'s metaphors and structure are determined by Hoffmann's distinctive literary imagination, his mode of synaesthetic creativity and his intimate knowledge of music and acoustics.

Acknowledgements

Many thanks to Nora Crook for her sound advice and Frank Inglis for his help in translating fragments from Johann Ritter's work. We have frequently followed Leonard Kent and Elizabeth Knight's translation of *Ritter Gluck* in *Tales of E. T. A. Hoffmann* (Chicago: Chicago University Press, 1972), and used *Ernst Theodor Amadeus Hoffmann: Sämtliche Werke*, 6 Bänden (Deutscher Klassiker Verlag, 1985–2004).

Notes and References

1. J. G. Herder (1985) Abhandlungen über den Ursprung Der Sprache. In: *Frühe Schriften 1764-1772*, Band 1 (Frankfurt: Deutscher Klassiker Verlag), p. 1312. His endnotes define the *sensorium commune* as 'the organ of total sensory receptivity, 'sensory perception within' (Totalorgan sinnlicher Empfänglichkeit, 'innerer Sinn')'.
2. S. Baron-Cohen and J. Harrison (1996) *Synaesthesia: Classic and Contemporary Readings* (Oxford: Blackwell), pp. 13–16.
3. R. E. Cytowic (2002) Touching tastes, seeing smells – and shaking up brain science. *Cerebrum*, 7–26. http://home.comcast.net/~sean.day/Cytowic2002.pdf (accessed 5 November 2007).

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4. K. T. Dann (1998) *Bright Colors Falsely Seen: Synaesthesia and the Search for Transcendental Knowledge*, 2nd edn (New Haven: Yale University Press).
5. J. Harrison (2001) *Synaesthesia: The Strangest Thing* (Oxford: Oxford University Press).
6. V. S. Ramachandran (2003) Purple numbers and sharp cheese. BBC Radio 4 Reith Lectures: pars. 1–20, http://www.bbc.co.uk/print/radio4/reith2003/lecture4.shtml?print (accessed 20 July 2006).
7. V. S. Ramachandran and E. M. Hubbard (2007) Hearing colours, tasting shapes. *Scientific American*, 53–59. www.sciam.com (accessed 16 August 2007).
8. V. S. Ramachandran and E. M. Hubbard (2003) The phenomonology of synaesthesia. *Journal of Consciousness Studies*, **10**(8), 49–57. www.imprint.co.uk/pdf/R_H-follow-up.pdf (accessed 16 August 2007).
9. V. S. Ramachandran and E. M. Hubbard (2005) Neurocognitive mechanisms of synesthesia. *Neuron*, **48**(3), 509–520. http:www.cell.com/neuron/abstract/S0896-6273(05)00835-4 (accessed 16 August 2007).
10. O. Sacks (2007) *Musicophilia: Tales of Music and the Brain* (London: Picador), pp. 165–183.
11. This is clearly shown in a photograph of his small study in the E.T.A. Hoffmann-Haus in Bamberg, where he lived 1808–1813. See A. Schmölder (2006) *Museen: Bamberg Stadt und Landkreis* (Bamberg: Museen der Stadt Bamberg), p. 13.
12. The concept of the *sensorium* resembles the modern understanding of synaesthesia. Romantic sensibility also overlaps in many ways with synaesthesia. Likewise, the contemporary understanding of vitalism, encompassing the idea of fluid nervous transmission through the body, suggests the instantaneous mechanisms of synaesthesia. See C. J. Minter (2001) Literary 'Empfindsamkeit' and nervous sensibility in Eighteenth-century Germany. *The Modern Language Review*, **96**(4), par. 4. http://www.encyclopedia.com/doc.1G1-80448776.html (accessed 20 February 2008). She appositely connects artistic sensibility in Romantic German literature with the influential work of various scientists, including the vitalist Albrecht von Haller. Haller, she notes, 'provid(ed) what to the eighteenth-century mind was strong evidence that the nerves are hollow fibres filled with a subtle fluid (the nervous fluid or vital spirits)'.
13. Dann defines kinaesthesia in human beings as 'the inner sense of one's own body' in K. T. Dann (1998) *Bright Colors Falsely Seen: Synaesthesia and the Search for Transcendental Knowledge*, 2nd edn (New Haven: Yale University Press), p. 171.
14. The term transcendence is used throughout to mean a visionary state of consciousness that goes beyond reason or rational classification. Hoffmann's artist figures Anselmus (Band 2/1, p. 321), Kreisler (Band 2/1, p. 454), *Der Sandmann*'s narrator (Band 3, pp. 25–27), Berklinger and Traugott (Band 4, pp. 191–193) and many others, temporarily experience transcendence. These and subsequent parenthetical references to

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Hoffmann's writing are to *Ernst Theodor Amadeus Hoffmann: Sämtliche Werke*, 6 Bänden (Deutscher Klassiker Verlag, 1985–2004).

15. R. M. Schafer (1975) *E. T. A. Hoffmann and Music* (Toronto: Toronto University Press), pp. 43–44, argues that it is necessary to understand 'the synaesthesia of the romantic cosmology to get to the heart of Hoffmann's writing'. He uses the word synaesthesia in this Romantic context to signify the unmediated bond between the artist and the spirit which was believed to flow through the material world around him. Schafer reports 652 references to synaesthesia in Hoffmann's work and reads his acute hearing as the dominant sense (149). However, he separates Hoffmann's overpowering receptivity to music from his production of metaphors, claiming that 'music was so wild and uncontrollable' for Hoffmann that he could only apprehend it 'through the screen of a less blinding metaphor first' (155–156). A metaphor that precedes and reduces full acoustic exposure contradicts the idea of creative synaesthesia as defined in our article.
16. Although we have used scientific and scientist to describe Romantic Science, the term natural philosophy (*Naturwissenschaft*) signified science during that period.
17. These physicians practised mesmerism well after its popularity and reputation had declined in France. See M. M. Tatar (1975) Mesmerism, madness, and death in E. T. A. Hoffmann's *Der goldene Topf*. *Studies in Romanticism*, **14**, 366–367.
18. Although sceptical about clinical mesmeric practices, Hoffmann always attributed electrical and magnetic powers to his artist figures, as can be seen in *Kreisleriana*, *Don Juan*, *Der Magnetiseur*, *Der goldene Topf*, *Rat Krespel*, *Die Automate* and his novel *Kater Murr*.
19. Hoffmann described Schubert's *Ansichten von der Nachtseite der Naturwissenschaften* (Dresden: Arnoldsche Buchhandlung, 1808) as 'magnificent', and read his *Symbolik des Traumes* (Bamberg: C. F. Kunz, 1814) as soon as it was published. See J. C. Sahlin (ed.) and trans. (1977) *Selected Letters of E. T. A. Hoffmann* (Chicago, London: Chicago University Press), pp. 203 and 229.
20. E. T. A. Hoffmann *Johannes Kreisler's Lehrbrief* (Ref. 14, Band 2/1: p. 453). 'Just as in the words of a brilliant physicist, hearing is seeing from within, so to the musician seeing is hearing from within, attainable only through the profoundest awareness of music, which resounds from everything his eye falls upon, and vibrates in sympathy with his spirit (die mit seinem Geiste gleichmässig vibrierend aus allem ertönt, was sein Auge erfaβt)'.
21. J. W. Ritter (1984) *Fragmente aus dem Nachlasse eines jungen Physikers: Ein Taschenbuch für Freunde der Natur*, 1st edn 1810, 2 Bänden (Leipzig und Weimar: Kiepenheuer Verlag), Band 1, fragment 358, p. 166.
22. J. W. Ritter (1984) *Fragmente aus dem Nachlasse eines jungen Physikers: Ein Taschenbuch für Freunde der Natur*, 1st edn 1810, 2 Bänden (Leipzig und Weimar: Kiepenheuer Verlag) Band 2, pp. 268–269. See T. Strässle (2004) 'Das Hören ist ein Sehen von und durch innen': Johann Wilhelm Ritter and the aesthetics of music. In: S. Donovan, R. Elliott (eds) 2004 *Music and Literature in German Romanticism* (Woodbridge: Camden

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House), pp. 28–29. Strässle clearly explains Ritter's linguistic theories in relation to hearing and vision.

23. J. W. Ritter (1984) *Fragmente aus dem Nachlasse eines jungen Physikers: Ein Taschenbuch für Freunde der Natur*, 1st edn 1810, 2 Bänden (Leipzig und Weimar: Kiepenheuer Verlag) *1*, frag. 358, 166.
24. Foot 1 defines the *sensorium commune*.
25. Ramachandran and Hubbard define synkinesia as 'a kind of spillover of signals [which] occur between two nearby motor areas: those that require the sequence of muscle movements required for hand gestures and those for the mouth' in V. S. Ramachandran and E. M. Hubbard (2007) Hearing colours, tasting shapes. *Scientific American*, 59. www.sciam.com (accessed 16 August 2007). The Ritter Gluck figure is much prone to this condition. Kinaesthesia is defined in Ref. 13.
26. Illustrations of synaesthetic brain activity can be found in V. S. Ramachandran and E. M. Hubbard (2007) Hearing colours, tasting shapes. *Scientific American*, 55. www.sciam.com (accessed 16 August 2007), and V. S. Ramachandran and E. M. Hubbard (2005) Neurocognitive mechanisms of synesthesia. *Neuron*, **48**(3), 515, http:www.cell.com/neuron/abstract/S0896-6273(05)00835-4 (accessed 16 August 2007).
27. For examples, *see Der Musikfeind* 2/1: 428; *Kreislers Musikalisch-poetischer Clubb* 2/1: 372; *Brief des Kapelmeisters Kreisler an den Baron Wallborn* 2/1: 368; *Johannes Kreislers Lehrbrief* 2/1: 453; *Kater Murr* 5: 176.
28. Eidetic experience is 'healthful, not pathological' and 'although not dependent on an actual external object, … is "seen" in the mind and is accompanied by bodily engagement with the image'. See K. T. Dann (1998) *Bright Colors Falsely Seen: Synaesthesia and the Search for Transcendental Knowledge*, 2nd edn (New Haven: Yale University Press), p. 12.
29. O. Sacks (2007) *Musicophilia: Tales of Music and the Brain* (London: Picador), p. 165 and pp. 179–80.
30. S. Baron-Cohen and J. Harrison (1996) *Synaesthesia: Classic and Contemporary Readings* (Oxford: Blackwell), pp. 8–11. See also J. Harrison (2001) *Synaesthesia: The Strangest Thing* (Oxford: Oxford University Press), pp. 115–140. Harrison enumerates many artists, putatively with no synaesthetic tendencies, who employ metaphor.
31. Jean Paul Richter, who wrote a laudatory Foreword for *Die Fantasiestücke*, later described Hoffmann's muse as 'Belladonna' and his later stories as achieving 'genuine madness'. Jean Paul is quoted in J. C. Sahlin, ed. and trans. (1977) *Selected Letters of E. T. A. Hoffmann* (Chicago, London: Chicago University Press), pp. 205–207 and 321–322. Walter Scott described Hoffmann as exhibiting 'a touch of mental derangement', accentuated by over-indulgence in wine and tobacco. See 'On the Supernatural in Fictitious Composition; and particularly on the Works of Ernest Theodore William Hoffman (sic)', [*London*] *Foreign Quarterly Review* 1 (1827), p. 74. Ludwig Börne's contemporary comment: 'The humor in the writings of the author of the Fantasiestücke is sick' is in the same vein. Börne is quoted in J.M. McGlathery (1997) *E. T. A. Hoffmann*, World Authors 868 (New York: Twayne, 1997), p. 24. The notion that

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Hoffmann's work was written under the influence of opiates still pertained as late as Erica von Erhardt-Siebald's 1932 critique of European Romanticism in E. von Erhardt-Siebald (1932) Harmony of the senses in English, German, and French Romanticism. *PMLA*, **47**(2), 589.

32. For various interpretations of true synaesthesia see V. S. Ramachandran and E. M. Hubbard (2005) Neurocognitive mechanisms of synesthesia. *Neuron*, **48**(3), 516, http:www.cell.com/neuron/abstract/S0896-6273(05)00835-4 (accessed 16 August 2007); R. E. Cytowic (2002) Touching tastes, seeing smells – and shaking up brain science. *Cerebrum*, 26. http://home.comcast.net/~sean.day/Cytowic2002.pdf (accessed 5 November 2007); S. Baron-Cohen and J. Harrison (1996) *Synaesthesia: Classic and Contemporary Readings* (Oxford: Blackwell), p. 49; J. Harrison (2001) *Synaesthesia: The Strangest Thing* (Oxford: Oxford University Press), 21–22 and 254.
33. Recurring critical examinations of synaesthesia and Romanticism are indicated by E. von Erhardt-Siebald (1932) Harmony of the senses in English, German, and French Romanticism. *PMLA*, **47**(2), 589; W. Silz (1942) Heine's synaesthesia. *PMLA*, **57**(2), 469–488; G. O'Malley (1957) Literary synaesthesia. *The Journal of Aesthetics and Art Criticism*, **15**(4), 391–411. Schafer devotes a chapter to it (R. M. Schafer (1975) in *E. T. A. Hoffmann and Music* (Toronto: Toronto University Press), pp. 149–155), as does the neurologist Sacks (O. Sacks (2007) *Musicophilia: Tales of Music and the Brain* (London: Picador), pp. 165–183). See also P. Watts (1972) *Music: The Medium of the Metaphysical in E. T. A. Hoffmann* (Amsterdam: Rodopi), pp. 49–52. Watts concurs with the widely accepted critical view that Hoffmann was fully conversant with the condition of synaesthesia. Unlike our neurophysiological account, she describes Hoffmann's synaesthesia as 'mystical' (50), emphasising instigation of transcendence from metaphysical powers '*outside* the spheres of time, space, and the sound medium' (52) (our italics). We contend she misreads cause and effect in *Ritter Gluck* and Hoffmann's work in general, where the cosmic sound of nature and certain instrumental and vocal sounds, registered through the senses, initiate inspiration in synaesthetic artists.
34. G. O'Malley (1957) Literary synaesthesia. *The Journal of Aesthetics and Art Criticism*, **15**(4), 406.
35. Most synaesthetes report the dominance of two senses operating mono-directionally, most commonly the bleeding of auditory tone to colour or colour to tone (V. S. Ramachandran and E. M. Hubbard (2003) The phenomonology of synaesthesia. *Journal of Consciousness Studies*, **10**(8), 51, www.imprint.co.uk/pdf/R_H-follow-up.pdf (accessed 16 August 2007)). However, Cytowic's research endorses multiple firings of neural pathways (R. E. Cytowic (2002) Touching tastes, seeing smells – and shaking up brain science. *Cerebrum*, 22–23. http://home.comcast.net/~sean.day/Cytowic2002.pdf (accessed 5 November 2007). He also observes that synaesthesia frequently causes involuntary body movement (p. 21).
36. In this respect, Sacks's argument that Hoffmann's repeated literary use of synaesthesia is 'too specific' to be classed as 'pseudosynesthetic (sic)

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metaphor' supersedes O'Malley's argument. O. Sacks (2007) *Musicophilia: Tales of Music and the Brain* (London: Picador), p. 166.

37. See R. Schmidt (2000) Klassische, romantische und postmoderne musikästhetische Paradigmen in E.T.A. Hoffmanns *Ritter Gluck*. In: Werner Keil and Charis Goer (eds) *Seelenaccente – Ohrenphysiognomik: Zur Musikanschauung E. T. A. Hoffmanns, Heinses und Wackenroders* in *Discordanzen: Studien zur neueren Musikgeschicht*, Band 8 (Hildesheim: Olms), pp. 11–61.
38. In this context, sensibility means 'hair-triggered' sensitivity and 'an intense emotional responsiveness to beauty and sublimity, whether in art or nature'. See M. H. Abrams (1993) *A Glossary of Literary Terms* (Fort Worth: Harcourt and Brace), pp. 190–191.
39. Minter informatively links writers, philosophers and scientists who espoused accepted wisdom concerning the *sensorium,* sensibility and vitalism – see C. J. Minter (2001) Literary 'Empfindsamkeit' and nervous sensibility in Eighteenth-century Germany. *The Modern Language Review*, **96**(4), pars 1 and 10. http://www.encyclopedia.com/doc.1G1-80448776.html (accessed 20 February 2008). A generalised refusal to separate emotion and cognition pervaded these three areas of study.
40. C. J. Minter (2001) Literary 'Empfindsamkeit' and nervous sensibility in Eighteenth-century Germany. *The Modern Language Review*, **96**(4), pars 6–16. http://www.encyclopedia.com/doc.1G1-80448776.html (accessed 20 February 2008).
41. J. C. Sahlin (ed.) and trans. (1977) *Selected Letters of E. T. A. Hoffmann* (Chicago, London: Chicago University Press), pp. 60, 65 and 305.
42. Nathanael in *Der Sandmann*, Krespel in *Rat Krespel* and Leonhard Ettlinger in *Kater Murr* exemplify this claim.
43. C. J. Minter (2001) Literary 'Empfindsamkeit' and nervous sensibility in Eighteenth-century Germany. *The Modern Language Review*, **96**(4), par. 18. http://www.encyclopedia.com/doc.1G1-80448776.html (accessed 20 February 2008). Jean Paul Richter's argument prefigures Cytowic's claim that what 'the body feels as physical, the mind apprehends as mental' (Ref. 3, p. 26).
44. Critics disagree on the question of whether the Gluck figure is a revenant of the actual composer, Christoph Willibald Gluck, who died in 1787; whether he is a madman who thinks he is Gluck; or whether he is a figment of the narrator's imagination. See the useful summary in R. Schmidt (2000) Klassische, romantische und postmoderne musikästhetische Paradigmen in E.T.A. Hoffmanns *Ritter Gluck*. In: Werner Keil and Charis Goer (eds) *Seelenaccente – Ohrenphysiognomik: Zur Musikanschauung E. T. A. Hoffmanns, Heinses und Wackenroders* in *Discordanzen: Studien zur neueren Musikgeschicht*, Band 8 (Hildesheim: Olms), pp. 15–17. These differing readings do not affect our argument.
45. From Himmel's popular opera, *Fanchon*, first performed in Berlin in 1804.
46. *Ritter Gluck* was written when Hoffmann was working on *Der Dichter und Komponist* (*The Poet and Composer*), a literary piece that sets out his theory of opera, a genre which relies on the sonority of the singing voice.

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At this time Hoffmann's work was saturated by opera; he had just begun his first full scale opera, *Undine*, and was also reviewing Gluck's contribution to opera. His review of Gluck's *Iphigenie en Aulide* (1774) was published in 1810 in the *Allgemeine Musikalische Zeitung*, the same journal that published *Ritter Gluck*.

47. Our argument foregrounds a more egalitarian, textual heterogeneity than Schmidt, who emphasises how much the narrator learns from the Gluck figure. See (2002) Heroes and villains in E. T. A. Hoffmann's 'Ritter Gluck'. *Bulletin, John Rylands University Library of Manchester*, **84**(3): 50. We maintain that the narrator's voice may be decentred and recentred as the story progresses, but there is only one narrator whose interpretation of events colours the whole. His position is at least equal to his interlocutor whose monologues he reports.
48. Polyphony in literary terms means the absence of hierarchical importance in multi-voiced discourse. Alternative translations from the Russian for polyphonic are 'carnivalised', 'dialogic' or 'heteroglossic'. See M. M. Bakhtin (1981) *The Dialogical Imagination*, trans. C. Emerson and Michael Holquist, ed. Michael Holquist (USA Austin: Texas University Press), p. 426. In musical polyphony the voice-parts are also of equal value.
49. In musical terminology, polyphony means literally 'combin(ing) several simultaneous voice-parts of individual design, in contrast to monophonic music, which consists of a single melody …'. See W. Appel (ed.) (1970) *Harvard Dictionary of Music* (London: Heinemann), p. 687.
50. The real Gluck was renowned for his ability to compose whole works in his head before committing them to a score. See P. Howard (1995) *Gluck: An Eighteenth-Century Portrait in Letters and Documents* (Oxford: Clarendon), p. 249.
51. See S. P. Scher (1968) E.T.A. Hoffmann's 'Ritter Gluck': the platonic idea. In: *Verbal Music in German Literature* (New Haven: Yale University Press), pp. 60–62 and 166. Scher describes these facial and bodily contractile movements as 'verbal pantomime', but does not engage closely with an interpretation in terms of synaesthesia or synkinesia.
52. Schmidt usefully relates the narrator's experience of Gluck's music, rendered in fragments and continuously transformed in performance, to the central Romantic tenet of 'progression' without ending – see R. Schmidt (2000) Klassische, romantische und postmoderne musikästhetische Paradigmen in E.T.A. Hoffmanns *Ritter Gluck*. In: Werner Keil and Charis Goer (eds) *Seelenaccente – Ohrenphysiognomik: Zur Musikanschauung E. T. A. Hoffmanns, Heinses und Wackenroders* in *Discordanzen: Studien zur neueren Musikgeschicht*, Band 8 (Hildesheim: Olms), pp. 46. Her conclusion is that 'Hoffmann developed a Romantic way of reading classical music' (p. 60).
53. Kent and Knight offer an alternative translation with a broader application. See L. J. Kent and E. C. Knight (eds) and trans. (1972) *Tales of E. T. A. Hoffmann* (Chicago: Chicago University Press), p. 8.
54. Commensurate with these intertextual references to Johann Ritter in *Ritter Gluck*, in *Die Automate* Ludwig and Friedrich's discussions about music,

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musical instruments and nature tones specifically acknowledge the theories of G. H. Schubert (Band 4, pp. 419–425).

55. See D. Charlton (ed.) (1989) *E. T. A Hoffmann's Musical Writings: Kreisleriana, The Poet and the Composer, Music Criticism*, trans. Martyn Clarke (Cambridge: Cambridge University Press), p. 129. Charlton observes that this musical and metaphysical chord 'contains all the consonant intervals'.
56. Another meaning of Tierce refers to the final chord of a piece; in a major key, the final chord can be minor, and vice versa. This gives additional frisson or poignancy to the final chord, because it confounds the listener's expectations. Similar connections between specific musical tones and synaesthetic flights of the imagination occur in *Kreislers Musikalisch-Poetischer Clubb* (2/1: 372–375).
57. Schmidt also reads the sunflower as emblematic of the artist looking simultaneously outwards to nature and inwards at himself. Linking it with Antonio van Dyck's *Self-portrait with a Sunflower* (1635–1636), in which the painter looks into the calyx of the flower, she extrapolates the metaphor as a visual example of artistic introspection. See R. Schmidt (2000) Klassische, romantische und postmoderne musikästhetische Paradigmen in E. T. A. Hoffmanns *Ritter Gluck*. In: Werner Keil and Charis Goer (eds) *Seelenaccente – Ohrenphysiognomik: Zur Musikanschauung E. T. A. Hoffmanns, Heinses und Wackenroders in Discordanzen: Studien zur neueren Musikgeschicht*, Band 8 (Hildesheim: Olms), p. 51.
58. Ritter's acoustic theories of Physics anticipated recent recordings of the sound of planetary movement and Cosmic Microwave Background Radiation. See www.astro.ubc.ca/people/scott/faq_basic.html (accessed 20 January 2009).
59. A similar synaesthetic experience in *Der Artushof* (1819) is described by a character claiming to be a reincarnation of Godofredus Berklinger, supposedly a long-dead German painter. The design of the character's painting features the calyx of lilies, rather than of sunflowers, but similarly creates the effect of 'a harmonious whole' from disparate parts; 'a pure and heavenly chord (himmlisch reine Akkord)' that is eternally transfigured (Band 4, p. 191).
60. Musical readers of *Ritter Gluck*, its original intended audience, would have readily noticed the tri-partite structure of the story and probably associated it with the ABA musical shape of sonata and other forms. However, musical expertise is not necessary in order to appreciate the story's preoccupation with sensibility and the influence of the senses and emotions on artistic creativity. Scher's analysis of this tripartite structure informatively interconnects its musical and narrative frameworks. S. P. Scher (1968) E. T. A. Hoffmann's 'Ritter Gluck': the platonic idea. In: *Verbal Music in German Literature* (New Haven: Yale University Press), pp. 58–60.
61. Schmidt offers many possible critical interpretations of the Euphon. R. Schmidt (2000) Klassische, romantische und postmoderne musikästhetische Paradigmen in E.T.A. Hoffmanns *Ritter Gluck*. In: Werner

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Keil and Charis Goer (eds) *Seelenaccente – Ohrenphysiognomik: Zur Musikanschauung E. T. A. Hoffmanns, Heinses und Wackenroders* in *Discordanzen: Studien zur neueren Musikgeschicht*, Band 8 (Hildesheim: Olms), pp. 17–18. For example, Karoli argues that the Euphon is an imaginary sound, and McGlathery and Dobat link it to the glass harmonica invented by Chladni, versions of which were called the 'euphony' and the 'clavicylinder'.

62. Sacks makes a strong case for eidetic synaesthesia, which operates just as strongly when a synaesthetic episode is remembered as when first experienced. O. Sacks (2007) *Musicophilia: Tales of Music and the Brain* (London: Picador), (Ref. 29, pp. 179–80).
63. See R. Schmidt (2000) Klassische, romantische und postmoderne musikästhetische Paradigmen in E. T. A. Hoffmanns *Ritter Gluck* (Ref. 37, p. 59). She links Ritter Gluck's precipitous exit from the concert with a similar exit by the hypersensitive, music-loving narrator of the ironically entitled musical anecdote, *Der Musikfeind* (The Music-hater, 1814) (Ref. 14, Band 2/1, pp. 436–437).
64. The euphon consisted of a series of glass tubes that the performer rubbed lengthways, rather than rubbing the rims, as in the case of the glass harmonica. *The London Journal, The Philosophical Magazine* (1798), described it as 'consisting of forty-one immoveable parallel cylinders of glass, of equal length and thickness'. See E. I. Dolan (2008) E. T. A. Hoffmann and the ethereal technologies of 'nature music'. *Eighteenth Century Music*, **5**(1), 18.
65. In 'Overture to Don Giovanni: Mozart' (London: Boosey and Hawkes, 1941), the analytical commentary appended to the score stresses the unsettling effect of this introductory section which is analogous to the effect of the Euphon: 'The changing harmonies and indefinite runs reflect the ghostly atmosphere of the situation' (no pagination). Treby likens the unexpectedly disturbing effect of this timbre on the listener to the effect of the basset horn in Mozart's *Requiem*. O'Malley offers a synasthetic reading of Hoffmann's description of the sound of the basset horn (Ref. 34).
66. E. I. Dolan (2008) E. T. A. Hoffmann and the ethereal technologies of 'nature music'. *Eighteenth Century Music*, **5**(1), 19 and 26.
67. P. Howard (1995) *Gluck: An Eighteenth-Century Portrait in Letters and Documents* (Oxford: Clarendon), p. 19: 'At Mr. Hickford's Great Room in Brewer's-street on Monday April 14th, Signor Gluck, composer of the Operas, will exhibit a Concert of Music By the best Performers from the Opera-House. Particularly, he will play a Concerto upon Twenty-Six Drinking Glasses, tuned with Spring-Water, accompanied with the whole Band, being a new instrument of his own invention.; upon which he performs whatever may be done on a Violin or Harpsichord; and therefore hopes to satisfy the Curious as well as the Lovers of Musick.' (*General Advertiser*, 31 Mar. 1746).
68. See D. Charlton (ed.) (1989) *E. T. A. Hoffmann's Musical Writings: Kreisleriana, The Poet and the Composer, Music Criticism*, trans. Martyn Clarke (Cambridge: Cambridge University Press), p. 418. Hoffmann

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continues, 'For any young lady of breeding it would have been most ill-advised, as soon as the glasses were even touched, not to fall into a tolerably convincing swoon' ('A Letter from Kapellmeister Johannes Kriesler', *Der Freimuthige* 16, April 29 and 30, 1819). See also H. Hadlock (2000) Sonorous bodies: women and the glass harmonica. *Journal of the American Musicological Society*, **53**(3), 527. Hadlock likewise comments that the glass harmonica, once said to 'bear transcendent truth, became by 1800 a sign of fakery, a tension between musical truth and illusion'.

69. There are striking similarities between Hoffmann's study in his Bamberg house and the space described here. See interior photographs: A. Schmölder (2006) *Museen: Bamberg Stadt und Landkreis* (Bamberg: Museen der Stadt Bamberg), 13; and R. Lewandowski (2003) *E. T. A. Hoffmanns Bamberg* (Bamberg: Verlag Fränkischer Tag), pp. 10–11.
70. Hoffmann's character Kreisler describes a similar experience that recent scientific research would retrospectively interpret as synaesthetic and synkinetic: 'So much arises simply from the mischief that my own notes create. They often come to life and jump up from the white pages like little black many-tailed imps. They whirl me along in their senseless dance, and I perform extraordinary capers and pull grotesque faces. But a single musical sound, sending out its glow of numinous incandescence, will still the tumult, and I am good and gentle and tolerant' (2/2: 369).
71. See J. Riou (2004) Music and non-verbal reason in E. T. A. Hoffmann. *Music and Literature in German Romanticism*, 43–55. Riou's pertinent reading of the external sound produced by the performance from the blank score interprets it as 'actively felt in Hoffmann rather than passively imported' (p. 52), with the pianist and listener as sounding boards for an inner auditory experience.

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