doi:10.1017/hgl.2023.19 *Hegel Bulletin*, Page 1 of 24

Hegel's Philosophy of Sound

Christopher Shambaugh

Abstract

This essay offers an introduction to Hegel's philosophy of sound as elaborated in the 1830 *Encyclopaedia of the Philosophical Sciences in Basic Outline*. The first section begins with essential context for interpreting the *a priori* status of nature and sound in Hegel's *Philosophy of Nature*. Next, I develop a general account of the Aristotelian character of Hegel's 'Physics', and a commentary on the categories of *specific gravity* and *cohesion* leading up to *sound* (and *heat*) in the 'Physics of Particular Individuality'. The second section provides an exegetical portrait of Hegel's metaphysics of sound. I first reconstruct Hegel's ontology of sound from the subsection on 'Sound' (*Der Klang*), and then outline his theory of auditory perception. The third section compares Hegel's philosophy of sound to leading views in contemporary philosophy of sound. I argue that Hegel offers a *hylomorphic* version of a *located event* theory of sound, which I suggest is more phenomenologically adequate than the modern acoustic view, and more metaphysically consistent than other *distal event* theories of sound.

Introduction

In a derisive chapter in *The Open Society and its Enemies* titled 'Hegel and the New Tribalism', Karl Popper set out to expose Hegel's *Philosophy of Nature* as an intellectually and morally irresponsible enterprise (Popper 1950: 243). There, the acclaimed philosopher of science branded 'Hegelian *dialectics*' as a 'mystery method' without significant interest in, nor patience for, the 'laborious technicalities' of science (1950: 243). Notably, Popper's diatribe was launched with explicit reference to Hegel's discussion of sound, 'the amazing details' of which he boldly rendered a deliberate attempt 'to deceive and bewitch others' (1950: 243). Hegel's prose can of course be terminologically cumbersome and unnecessarily obscure. However, Popper's refusal to engage with the systematic terminology Hegel draws on in his exposition of sound, or the necessary entanglement of that discussion in the preceding categories in Hegel's *Philosophy of Nature*, raises the following question: is Hegel's philosophy of sound in fact so misleading?

Though the vast majority of what Hegel has to say about the nature of sound can be found in the subsection on 'Sound' (*PN*: §§300–302) in the 'Physics of Particular Individuality' chapter of the 'Physics' in his *Philosophy of Nature*, Hegel discusses sound throughout his *Realphilosophie*, and most prominently in the context of animal sensation in 'Organics' (*PN*: §358, §351A), human perception in Subjective Spirit (*PS*: §401, §448A), and his philosophy of music in the *Lectures on Aesthetics* (*A*: 888–958).[1] While Hegel's remarks on sound have been fruitfully discussed by Hegel scholars in a wide variety of contexts (Findlay 2013: 280; Stone 2005: 119–22; Eldridge 2007: 119–45; Sallis 2011: 269–384; Reid 2013: 8; Dobereiner 2014: 19–30; Winfield 2017: 301–309; Peters 2019: 174–75; Moland 2019: 222–44; De Laurentiis 2021: 137–38; Kabeshkin 2021: 3–4), there has yet to be a thorough philosophical presentation of his mature views on the nature of sound.

This essay offers an introduction to, and defence of, Hegel's philosophy of sound. I contend that Hegel's account of sound is not only less misleading than Popper suggested, but also more phenomenologically adequate than the modern acoustic view of sound, as well as more metaphysically consistent than competing distal event theories in contemporary philosophy of sound.

The argument is presented in three sections. The first provides important context for accurately understanding Hegel's discussion of sound within the interstices of his philosophy of nature. Building on the recent work of Anton Kabeshkin, I suggest that Hegel develops a broad *a priori* metaphysics of nature, and a *weak a priori* derivation of sound. Next, I develop an interpretation of the Aristotelian character of Hegel's 'Physics' and an exposition of the categories of *specific gravity* and *cohesion* proceeding *sound* (and *heat*) in the 'Physics of Particular Individuality' chapter. The second section offers a reconstruction of Hegel's metaphysics of sound from the subsection on 'Sound'. I first elucidate the qualitative and quantitative nature of sound, explaining the ideality and negativity of sound, the temporality and hylomorphic form of sound, the propagation of sound, the causal sources of sound, and the mechanical nature of sound. I then unpack Hegel's tripartition of sound into *noise*, *tone* and *song*, before touching on his assessment of the role of sound in music and tackling the problem of the relation of sound to heat. Lastly, I outline Hegel's views of animal and human auditory perception through a discussion of relevant passages in his 'Organics' and in Subjective Spirit. The third and final section then introduces leading positions in contemporary philosophy of sound (Casati and Dokic 1994; O'Callaghan 2007, 2017; Casati, Dokic and Di Bona 2020) and locates Hegel's philosophy of sound as a *hylomorphic* version of a *located event* theory of sound, which I suggest has resources to respond to metaphysical ambiguities in competing *distal event* theories.

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

I. Hegel's philosophy of nature

I.i. The a priori status of nature and sound

Any excursion into Hegel's *Philosophy of Nature* must confront the vexed question of the *a priori* status of nature's intelligibility. How exactly does natural-scientific knowledge constrain Hegel's method of inquiry into nature? There are three main stances on offer: the *a priori* interpretation (Houlgate 1998; Stone 2005; Pinkard 2012; Furlotte 2018; Kabeshkin 2019, 2021; Sala and Kabeshkin 2022), the *a posteriori* interpretation (Petry 1970; Webb 1980; Burbidge 1996), and one which aims to eschew the a priori/a posteriori distinction altogether (Rand 2007, 2017).

The recent work of Anton Kabeshkin is helpful for navigating this debate. Against Rand, Kabeshkin argues that Hegel does not oppose the a priori/a posteriori distinction in general but only Kant's Manichaean deployment of it (2019: 204–205).[2] Additionally, Kabeshkin shows that Rand inadvertently falls into an *a posteriori* reading, and further demonstrates that every *a posteriori* reading fails to provide a convincing explanation of Hegel's *Philosophy of Nature* due to its excessive focus on contingency—that which is least philosophically comprehensible for Hegel—as the very source of nature's intelligibility (2019: 201–206). In light of Hegel's repeated emphasis on the need for a philosophical proof of the laws of nature distinct from that provided by the natural sciences, Kabeshkin defends a uniquely broad *a priori* reading (2019: 206).

Kabeshkin's apriorism is broad because it is inclusive of what Alison Stone casts as *strong* and *weak* a priori interpretations of Hegel's *Philosophy of Nature,* its categories and transitions (Stone 2005: 8; Kabeshkin 2019: 206). According to Stone, *strong apriorism* first works out what nature is conceptually and then proceeds to compare this conception with empirical knowledge (Stone 2005: xviii). *Weak apriorism*, on the other hand, begins with empirical knowledge, and then seeks to determine its conceptual necessity (Stone 2005: 8). For Stone, Hegel's method is strictly, *strongly a priori*, and is incompatible with any *weak a priori* interpretation. However, recent Hegel scholars have not only launched trenchant criticisms of strong apriorism (Rand 2017; Kaufmann, Lyssy and Yeomans 2021), but explicitly defended weak apriorism against it (Furlotte 2018; Kabeshkin 2019).

In Kabeshkin's interpretation, Hegel employs a *strong a priori* method in certain circumstances and a *weak* one in others (2019: 196–97). Empirical knowledge need not challenge the validity of the conceptual derivation in question, nor need it imply a source of *a posteriori* justification, but it can still nevertheless guide Hegel's inquiry, just as a mathematician or logician might receive a 'hint' or a 'certain step' in a proof (Kabeshkin 2019: 197). Such a broad and inclusive a priori interpretation is helpful for my introduction to Hegel's philosophy of sound because I believe that Hegel provides a *weak a priori* derivation of sound in his *Philosophy of Nature*,

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

while still offering *strong a priori* justifications for other categories and transitions. That Hegel's inquiry into sound is not a *strong a priori* one is confirmed by Petry's *a posteriori* account: 'In the treatment of Sound […] the major transitions demarcating the sphere as a whole were evidently suggested by the science of the day' (Petry 1970: 89). As we will see, Hegel's view of the nature of sound was especially influenced by physicists of the eighteenth and nineteenth centuries, such as Ernst Chladni (*PN*: §300R, §301), Jean-Baptiste Biot (*PN*: §300R, §300A) and Johann Wilhelm Ritter (*PN*: §302). Significantly, however, his account is not simply justified by them. Rather, Hegel's metaphysics of sound celebrates the real contributions of the natural sciences, while also seeking to overcome their limitations.

I.ii. Hegel's Aristotelian 'Physics'

Next to other spheres of Hegel's *Philosophy of Nature*, comparatively less has been written about Hegel's account of 'Physics' in recent years (exceptions include Petry 1984; Halper 2008; Westphal 2008; Winfield 2017). Famously, Hegel defines nature as 'the Idea in the form of *otherness*', as '*external to itself*', and 'externality itself' (*PN*: §247). Yet, nature's externality comes in degrees and stages (*PN*: §252).

In 'Mechanics', Hegel is concerned with 'matter and the ideal nature of the system of matter' (*PN*: §252). There, 'unity of form' is only 'implicit', 'merely sought after' (*PN*: §252). At this stage, wholes are explained in terms of the causal interactions of their parts (Pinkard 2012: 20). In 'Physics', on the other hand, 'reality is posited with an immanent determinateness of form' (*PN*: §252), and matter comes to participate in conditioned wholes which cannot be entirely reduced to their parts or causal interactions between them. Finally, with 'Organics', matter and form are most concretely unified in animals, in which parts are transformed into bodily members through functional roles in organic wholes (Pinkard 2012: 20).

Multiple scholars have pointed to the Aristotelian influence on Hegel's concept of nature and 'Physics' (Findlay 2013; Santoro-Brienza 1992; Ferrarin 2001; Halper 2008; Winfield 2017; Schuringa 2022). Edward Halper submits that 'when Hegel speaks of "Physics", he has in mind the Greek term *phusis* and, in particular, Aristotle's understanding of *phusis* as an internal principle of motion' (2008: 314). On this reading, whereas 'Mechanics' surveys the external motion of quantified matter, Hegel's 'Physics' aims to account for the inner motion and form of 'qualified matter' (*PN*: §271).

The greater 'unity' of form and matter found in Hegel's 'Physics' is suggestive of Aristotle's doctrine of hylomorphism. Though the concept of hylomorphism (from the Greek *hyle* matter and *morphé* form) is relatively recent, the meaning of the metaphysical doctrine has long been debated.[3] It is commonplace for Aristotle scholars to characterize the doctrine of hylomorphism as a *mereological*

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

view that matter and form are *elements* or *parts* constituting the unity of any substance (Koslicki 2008; Kelsey 2010). Still, others have pushed back against this interpretation (Marmodoro 2013; Kosman 2013).

According to Marmodoro, the identification of a substance with its elements or parts reduces it to a kind of aggregate, and therefore cannot capture the unity of the substance that hylomorphism is supposed to explain in the first place (2013: 15). To illustrate the problem, she points to Plato's distinction in *The Theaetetus* between a mereological and non-mereological whole (Marmodoro 2013: 5). While the former is construed as identical to its parts, 'a non-mereological whole is identical to its enmattered form, and in this sense is partless' (2013: 5). Therefore, for Marmodoro and others, Aristotle's hylomorphism is non-mereological, since the unity of a substance does not simply result from combinations of form and matter as parts but from the functional and processual organization of matter by substantial form.

Significantly, Aristotle's doctrine of hylomorphism is a dynamic one: form is the activity of matter, and matter is a capacity for form (Kosman 2013: 70).[4] However, matter's capacity to take form does not simply exist independently of the form which actualizes it. What may have been separate material parts or elements in some static mereological entity cease to be those parts or elements in a hylomorphic process. For Marmodoro, material parts are 're-identified', stripped 'of their distinctness', and endowed a functional role in the inner motion of the whole (2013). Once the hylomorphic process is over form loses its internal hold over matter, which inevitably returns to its prior externality.

With Aristotelian hylomorphism in view, Hegel's 'Physics' can be understood as an inquiry into how matter begins to acquire substantial form. Accordingly, in the 'Physics of Universal Individuality', Hegel is interested in the most basic qualities individuating physical bodies beyond the mechanical sphere. In this chapter, where hylomorphic form is most inchoate, Hegel discusses the qualities of various astronomical phenomena (such as light, the sun, moons, comets and planets) (§§274–79), the elements as 'subordinate moments' of physical bodies (§§281–85), as well as certain meteorological occurrences (§§286–89). The 'Physics of Particular Individuality' then introduces a diverse set of qualities—'Specific Gravity' (§§293–94), 'Cohesion' (§§295–99), 'Sound' (§§300–302), and 'Heat' (§§303–307)—differentiating the constitutions of physical bodies and influencing their processual alterations. Lastly, the 'Physics of Total Individuality' constitutes the highest hylomorphic sphere in inorganic nature, since here, in the diverse shapes of magnetism (§§310–315), electricity (§§316–25), and the relative self-determination of what Hegel calls the 'chemical process' (§§326–46), form and matter are closer together than anywhere else in 'Physics'.

Finally, it is important to bear in mind that when Hegel discusses individuality in these chapters, he is not referring to *Einzelheit*, the third moment of the Concept,

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

but to *Individualität* (Kislev 2018: 2). According to Di Giovanni, this sense of individuality denotes 'a special kind of individuality, one which is best realized in a person but for which we can see at least a first delineation in any internally organized object' (Di Giovanni 2010: lxx). In my interpretation, the internal organization of 'natural individuality' in Hegel's Aristotelian 'Physics' is expressly hylomorphic.

I.iii. Specific gravity and cohesion in 'Physics of Particular Individuality'

Hegel's 'Physics of Particular Individuality' charts how 'matter is determined by immanence of form' through the categories of *specific gravity*, *cohesion*, *sound* and *heat*, each of which comprises its four subsections (*PN*: §290). For Hegel, *specific gravity* and *cohesion* both concern the spatial organization of individual physical bodies, and *sound* and *heat* effectuate alterations of such organization in more or less permanent ways. In short, Hegel is arguing that all physical bodies have different specific gravities, degrees of cohesion, and resulting elasticities, which shape not only their capacity to be temporarily altered by sound, but more enduringly altered by heat (*PN*: §305A).

S*pecific gravity* is the most abstract of these relational categories. It can be understood as the relation between the *density* of one substance and another 'reference substance' (Houlgate 2022: 282), where density itself consists in the ratio of a body's *weight* and *volume* (*PN*: §293). Since bodies with the same volume can have different densities, they also have different specific gravities. To illustrate this difference in density and specific gravity, Hegel compares water and gold (*PN*: §293R). As Houlgate explains, water becomes a reference substance for most solids because it has a density of 1. Gold is 19.32 times as a dense as water and so has a specific gravity of 19.32 (2022: 282). In this way, specific gravity is a quantitative relation amongst qualities, a unifying ratio of independent measures, and thus a relation of real measure for Hegel.[5]

Beyond density and specific gravity, bodies are distinguished from themselves and from one another through what Hegel calls *cohesion*, the formal spatial relationship that holds bodies together (*PN*: §292). Although every physical body possessing cohesion will have a specific gravity, Hegel is clear that a body's cohesion 'bears no relation' to its density (*PN*: §296A). For example, Hegel notes, gold is heavier than iron but nowhere near as cohesive or firm (*PN*: §296A). Further, Hegel stresses that it is 'immanent form' that 'posits the spatiality of the separate existence of material parts' in cohesion (*PN*: §295). This occurs in three different ways.

The first is what Hegel calls abstract, extrinsic 'adhesion to another' or 'passive cohesion' (*PN*: §296). Hegel often cites water as an example of this, and presumably he is thinking about fluids in general in this discussion (*PN*: §296A).

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

Water's cohesion is 'passive' for Hegel because, though it is quite cohesive among non-metallic fluids, it lacks the active coherence of solids (*PN*: §300R).

In the second form of cohesion, matter is more active in its coherence, and therefore more solid. Active cohesion takes *quantitative* and *qualitative* forms, both of which are comparatively actualized in collisions with other bodies (Winfield 2017: 296). Quantitative cohesion is labelled 'ordinary cohesion' and is interpreted as the capacity of a homogenous mass to endure fragmentation (*PN*: §296). The qualitative cohesion of matter, on the other hand, discloses a body's 'independence of form' in response to 'the pressure and impact of external force' (*PN*: §296). This formal independence of a qualitatively cohesive body manifests itself in three tiers, which Hegel designates as 'punctuality' (brittleness), 'linearity' (rigidity) and 'superficiality' (malleability). His point is that brittle bodies cannot be stretched without breaking, rigid bodies continue to hold together when stressed, and malleable bodies, like certain metals, have greater 'continuity' still. In this way, qualitatively coherent bodies display 'a specific mode of juxtaposition, i.e. a determination of space' (*PN*: §296A), a conditioned form of spatial individuality.

The third and final form of cohesion, *elasticity*, consists in the displacement of a material body by a mechanical collision, and its oscillatory reformation in response. For Hegel, elasticity can be abstract and directed 'outwards', or more concretely 'internal to the self-individualizing body' (*PN*: §297A). Though density and cohesion are not dependent on each other, both directly influence the elastic body's capacity to deform and rebound, to move not just from one place to another but also in place (Winfield 2017: 302). In so far as this 'giving way and preserving itself' (*PN*: §296) is a necessary condition for the vibration of the body, elasticity marks the transition from cohesion to sound.

II. Hegel's philosophy of sound

II.i. Hegel's ontology of sound

In this section I offer a close exegetical reading of the subsection on 'Sound' in the 'Physics of Particular Individuality'. Despite the ambiguities surrounding Michelet's controversial arrangement of the additions to Hegel's *Encyclopaedia*, I agree with Stone that it would be 'excessively restrictive' to ignore these altogether (2005: xvi). My interpretation thus tracks Hegel's elaboration of the nature of sound from the main paragraphs of the subsection on 'Sound', while supplementing with the additions when helpful, and elucidating prominent influences on Hegel's *weak a priori* account when appropriate.

Hegel introduces sound in the final paragraph of the subsection on 'Cohesion' in the 'Physics of Particular Individuality':

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

> The ideality which is posited here is an alteration which consists of a double negation. The negating of the extrinsic subsistence of the material parts is itself negated as the reinstating of their juxtaposition and their cohesion. As the exchange of mutually cancelling determinations, this single ideality is the inner vibration of the body with itself, i.e. sound. (*PN*: §299)

In the 'Quality' section of the Logic of Being, Hegel defines ideality as a 'process of *becoming*' and as 'the quality of the infinite' (*SL*: 21.137). According to Bowman, 'for something to be ideal is for it to be grounded in a process of which it is a moment and which it thus serves to realize' (2017: 237). That which possesses ideality in Hegel is therefore either an ontologically dependent moment in a process, or a process with ontologically dependent moments (this multivocality of meaning is confirmed by Inwood (1992: 126–27)). On my reading, such processes are hylomorphic, and the ideality of sound presents itself both as a 'moment' in a hylomorphic process and as the 'individual' form of one.

Why then does Hegel describe sound as a 'double negation'?[6] Sound involves a double negation because the mechanical collision which results in it displaces the density and cohesion of the sounding body, which nevertheless resists this disturbance through its own internal elasticity. Sound's first negation thus arrives straightforwardly from mechanical impact, and its second negation consists in the sounding body's elastic pursuit of lost unity in vibratory response to this collision (Moland 2019: 227, Sallis 2011: 375). The double negation of sound therefore serves to demonstrate the ineradicable embodiment of Hegel's concept of sound, designated here as: 'the inner vibration of the body with itself'.

Hegel tell us more about sound's qualitative abduction of the physical body in §300:

> Through density, and through the principle of its cohesion, a body possesses a specific simplicity of determinateness, which in its initially interior form, by emerging from its submergence in material extrinsicality, becomes free in the negation of the self-contained subsistence of this state of juxtaposition. This is the transition of material spatiality into material temporality. In vibration, this form is therefore the ideality of materiality; it is consequently simple form existing for itself, and makes its appearance as mechanical animation. (*PN*: §300)

In this passage, we are reminded that, for Hegel, bodies already have some degree of form through their density and cohesion, which sound liberates by articulating these qualities in time. Indeed, Hegel's claim that sound effectuates a transition from 'material spatiality to material temporality' announces his commitment to

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

the temporal character of sound (Derrida 1982: 87; Hanly 2009: 360). Therefore, although sound is dependent for its existence on the temporal interactions of material objects, sound is unlike material objects in being essentially temporal for Hegel.

Hegel's hylomorphic view of sound comes to the fore in his emphasis on the 'form' of sound as 'the ideality of materiality' in §300. According to Hegel, sound transforms the material event in which it was a moment itself into a moment of sound. The qualitative process of sound negates the physical bodies, collisions and vibrations from which it derives and re-identifies these as sources of sound. Because sound sources cannot exist independently of the actual activity of sound, they only exist in potentiality for Hegel. Hence, sound is not just another moment alongside bodies, collisions, vibrations and propagations which connects them. It is the individual form of their relation. Hegel clarifies the hylomorphic character of this transformative event in the addition:

> Individuality includes matter and form. Sound is this total form, which makes itself known in time. It is the whole of individuality, which is nothing more than that this soul is now posited in its unity with materiality. (*PN*: §300A)

Accordingly, for Hegel, matter and form are *included* in the individuality of sound, but not as parts or elements. Rather, the 'total form' of sound brings unity—however finite and exterior—to the capacity of matter to sound in time. Once actualized, the hylomorphic event of sound negates itself, form and matter come apart, and sounding bodies and their juxtaposed parts are returned to their prior externality.

After explaining the ideality and negativity of sound, as well as its distinctively temporal and dynamic hylomorphic form, Hegel proceeds to explain how sounds are qualitatively individuated in the remark to §300:

> The qualitative nature of sound in general, and of tone or self-articulating sound, depends upon the density, cohesion, and further specified modes of cohesion of the sounding body, for the ideality or subjectivity which constitutes vibration is a negation of these specific qualities, which it has as its content and determinateness. (*PN*: §300R)

Hegel describes this individuation of vibration as a kind of 'ideality or subjectivity' because, through it, sound becomes a subject in the sense of a substance, a locus of predication, a carrier of qualities.[7] Auditory properties—like pitch, volume and timbre—only come to *belong* to sound through its negation of the qualities of the physical bodies introduced in the 'Physics of Particular Individuality'. Concretely, passive cohesion will sound quite different from active cohesion,

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

and brittle bodies will sound different from malleable ones. Compared with solid bodies, Hegel notes that, 'water has no cohesion and no tone', and 'gives rise only to a murmuring sound' (*PN*: §300R). Glass and metal, on the other hand, 'ring', and instruments have their characteristic 'tone and timbre'. Due to the 'determinateness' of vibration's 'negation' of the specific gravity, cohesion, and elasticity of sounding bodies, we might add that sounds are individuated not only by the qualities they possess, but by those that they exclude (Brandom 2019: 156), and by those excluded by the bodies, collisions and vibrations emitting sound.

To further illustrate the material specification of sound (*Klang*) by physical bodies and their qualities, Hegel introduces a distinction between noise (*Geräusch*) and sound proper, the latter of which he characterizes as tone (*Tönen*) (*PN*: §300R). For Hegel, we experience noise when a sounding body's vibration is posited by a body external to it, and the vibrations of both bodies subsequently disrupt one another (*PN*: §300A, 72, 15–17). Tone, on the other hand, is described as the 'vibration of the body within itself' (*PN*: §300A, 72, 15–17), and therefore exemplifies Hegel's definition of sound.

Hegel's differentiation of sound (as tone) from noise can be traced to Ernst Chladni. In his *Treatise on Acoustics*, Chladni argued that 'If the vibrations of a sounding body are distinguishable, both in their frequency and in their change in shape, they are called *distinct sound* or *sound* properly called to distinguish them from noise, or indistinguishable vibrations' (Chladni 2015: 1). For Hegel after Chladni, noise involves interference between competing vibrations, whereas a (simple) tone, on the other hand, sustains only one frequency.

Complicating matters, in the addition to §300, Hegel offers a more formal tripartition of sound into 1) noise (*Geräusch*) 2) tone (*Tönen*) and 3) song (*Gesang*). Here, Hegel introduces song as the tonal, vocal, musical and lyrical sound of the *human* body: 'There is also a third form in which external stimulation and the sound emitted by the body are alike i.e. human song' (*PN*: §300A, 72, 24–29). Consequently, according to the main paragraphs, Hegel's concept of sound is illustrated by tone, but in the additions, it is typified by the tonality of human song. Since sound's concept must agree with itself (Pippin 2019: 96), we can conclude that *noise* is a form of sound that is not fully adequate to its own concept, *tone* is more adequate to the concept of sound, but the free articulation of the human body in *song* is the true concept of sound for Hegel, where sound most agrees with itself.

Another crucial feature of sound for Hegel is its propagation, whether that be air, earth, water, metals, etc. Importantly, this 'transmission of sound' is 'soundless' (*PN*: §300R), meaning that the propagation of sound is not itself sound because sounds are again necessarily indexed to the bodies which emit them for Hegel. Hegel's understanding of the propagation of sound was largely inspired by Biot, who, according to Hegel, proved that every body transmits sound, and moreover,

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

that sound travels much faster and further in solid matter than in the air (*PN*: §300A).

If paragraphs §300 and §300R focus predominantly on the qualitative nature of sound, Hegel's understanding of the *quantitative* nature of sound becomes more explicit in §301 and thereafter. In these passages, we learn that the 'inner motion' of sound ought to be distinguished from other co-existent forms of mechanical motion, such as rotary or progressive motion, which involve an 'external change of place' (*PN*: §301).[8] Distinctively, Hegel argues that these two moments, of outer and inner motion, are both 'identical' and 'different' in sound.

Hegel then expands on the mechanical nature of sound in the addition to §300:

> As it is associated with weighted matter, sound belongs to the mechanical sphere. Form, as wresting itself from weightedness, and yet as still attached to it, is therefore conditioned. It is the free physical expression of ideal nature, although it is still linked to the mechanical sphere. It is freedom from weighted matter, but is at the same time *of* this matter. (*PN*: §300A, 30–35)

In this passage, Hegel is insistent that sounds belong to 'the mechanical sphere'. Their 'flight from materiality' and 'freedom from weighted matter' remain 'linked' to it. Nevertheless, proclamations such as these also suggest that Hegel thinks of sound as a kind of *emergent* process (Döbereiner 2014: 27). In other words, while sounds belong to mechanical nature for Hegel, they do so as hylomorphic events conditioned by, but irreducible to, the lawful collisions they arise from.

With regards to the mechanical sources of sound, Hegel argues that the production of every sound requires two or more physical bodies. 'Sound depends upon the striking of another body' (*PN*: §323A) he exclaims, and these impacts constitute the causal sources of sound for Hegel. Furthermore, in the additions, Hegel informs us that sound can be produced in one of two ways: a) *friction* or b) *vibration proper* (*PN*: §300A). For Hegel, *friction* results from dry surfaces of bodies rubbing against each other, vibrating in contestation of one another. One example Hegel gives for friction is the scrape of a bow on a violin (*PN*: §300A, 72, 20). Another might be a pencil underlining its way across a piece of paper. *Vibration proper* is associated with the steady, distinguished vibration of tone, which Hegel refers to as 'the elasticity of being-in-self' (*PN*: §300A, 72, 8) since only certain bodies have the density and cohesion necessary to sustain it.[9] For Hegel, the specificity of tone thus depends entirely on the physical characteristics of the sounding body, as we hear, for instance, in the tone of a voice.

Though my focus in this essay is Hegel's philosophy of sound, it is worth acknowledging that Hegel articulates elements of his music theory in §301R (and the extensive addition to it). In the *Aesthetics*, Hegel claims that music treats

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

sound as 'an end in-itself' (*A*: 899). Here, he provides a thorough account of the 'specific numerical relationships' involved in musical sound—defining 'notes', 'key-notes', 'whole tones' and 'semi-tones', 'harmony', and 'melody' in turn (*PN*: §301R). In passing, he also praises the violinist Giuseppe Tartini for his discovery of 'terzo suono', a third tone only made perceptible when two tones are played simultaneously, which implies that tone's qualitative character depends as much on auditory perception as it does on physical bodies and their qualities.

Finally, in paragraph §302, Hegel introduces his transition from sound to heat. Given that this is the paragraph that Popper casts as 'gibberish' (1950: 243), capturing its intelligibility will be important for my account. The paragraph begins with a reiteration of Hegel's view of the negativity of sound, before comparing sound and heat as distinct forms of ideality. Then, in the remark to §302, Hegel somewhat tersely asserts heat's conceptual origination with sound. Popper is not himself all that clear in his criticism here, but what appeared to bother him most was this latter claim (1950: 243). How are we to interpret it?

Hegel articulates the transition between the orderly motion of sound and the disorderly motion of heat by specific reference to the heat generated by sonorous bodies, a connection which Petry proposes was largely inspired by Ritter (Petry 1970: 297; Ritter 2010: 494–95). In doing so, he seems to be suggesting that the conceptual origination of heat in sound stems from the mere fact that sounds can generate heat. That said, in the specific context of the 'Physics of Particular Individuality', I think a deeper explanation of their co-origination stems from their shared ideality, understood here as the mutual and processual capacity of sound and heat to alter the density and cohesion of bodies. Hence, Hegel separates sound as an *ideal* form of ideality from heat as '*real* ideality' in §302 because sound can offer only a momentary alteration of the density and cohesion of bodies, whereas heat may effectuate a permanent one.

Due to this ideality of sound and heat, Kabeshkin is correct to argue that neither sound nor heat are material objects for Hegel, but that both are instead moments of broader material processes (2021: 3). That said, in this section, I have also argued that Hegel conceives of sounds as metaphysical events or processes, the individual form of which remains irreducible to the mechanical matter which conditions them. In the next section we will see that, for Hegel, the form of sound is also that of hearing.[10]

II.ii. Hegel on auditory perception

Though sounds are mechanical and physical processes for Hegel, *auditory perception* is not. Sounds are only heard by animals capable of hearing them. Further, they afford novel experiences for different species. Fully unravelling Hegel's views of auditory perception would take us well beyond the scope of this essay. Yet, no

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

introduction to Hegel's philosophy of sound could ignore his insights into audition altogether.

In the *Encyclopaedia*, Hegel first discusses sensation in 'Organics'. There, he divides the animal organism's sensory system into three categories: 1) the sense of feeling as such; 2) the sense of smell and taste; 3) and the sense of ideality, of sight and hearing (*PN*: §358). He tells us that 'In sight, the physical self manifests itself spatially, in hearing it does so temporally' (*PN*: §358). So, already for the animal, the contents of vision are spatial, whereas those of audition are temporal. While the objects of sight are 'light' and 'colour', the object of hearing is 'sound' (*PN*: §358). Further, Hegel defines sight and hearing as 'theoretical' senses, since in them animals do not sense *themselves* to the same extent that they do when they smell, taste or touch. Lastly, Hegel categorizes hearing as 'a sense which belongs to the mechanical sphere' (*PN*: §300A, 72, 32–34), since it (like touch) tracks external motion in the mechanical world.

Significantly, animals perceive not only sounds, but their own voices as well. Following Aristotle's account in *De Anima* (2016: 420b5–7), Hegel claims that sound is transformed entirely in 'the animal's *vocal faculty*', which reveals itself as 'a free vibration *within itself*' (*PN*: §351). In the additions, Hegel discusses this perception of the voice as 'active hearing' (*PN*: §358A), even suggesting that in nature 'it comes closest to thought' (*PN*: §351). For Hegel, the proximity of the animal voice to thought follows from its purpose of expressing *feeling*—'pain', 'desire', 'contentment', even 'joy' (*PN*: §351A). Intriguingly, Hegel contends that: 'The theoretical emanation of the singing bird is a higher kind of vocal faculty however, and is so advanced that it has already to be distinguished from the general vocal power possessed by animals' (*PN*: §351A). Hegel likely thought of bird song as a higher vocal faculty due to what sensory biologists refer to as its 'temporal fine structure', the combinatorial intricacy of its tonal arrangements in time (Yong 2022: 225). Ethereal and language-like as bird song may be, the animal cannot raise its voice to thought for Hegel.

Turning now to human perception, in Hegel's 'Anthropology' we find that the threefold system of the senses has been inverted. Since the animal senses point towards human cognition and vice versa, this transposition speaks to Hegel's broader naturalism (Peters 2016; Pinkard 2012). Critically, for Hegel, human sensation is in part distinguished from animal sensation in being just one moment in human cognition (alongside consciousness, intelligence, etc). Furthermore, Hegel divides human sensation into two interdependent forms, 'internal' and 'external' sensation, rendering the former as sensation which enters the body through the mind (as in laughter or tears) and the latter as sensation which enters the mind through the body (as in sensory perception) (*PS*: §401). Consequently, external sensation is especially significant for interpreting human auditory perception in Hegel.

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

According to Julia Peters, external sensation is unique in Hegel because it 'affords a bodily, sensuous form of self-awareness' (2019: 167). In short, each sensory modality provides a form which shapes the content delivered through it. Sound is then the form of *hearing* as well as *sounding*, and the essence of sound, like colour, is equally manifested in the *subjective* realm of perception, and the *objective* one of 'Physics' (Peters 2019: 183).

Building on Peters' account of colour in Goethe and Hegel, we can conclude that the external sensation of sound has three important features. First, what we hear as sound is always determined *by* our finite human capacities for sensation in an environment (after all, we cannot hear frequencies below 20 Hz or above 20 kHz). Second, the sounds we do hear are also determined *as* unpleasant or pleasant (as noise or tone for instance), and this valencing is shaped by our broader goal-directedness. Third, what is most distinctive about the sensation of sound for Peters is its capacity to invoke specific moods in human beings. Hegel confirms, 'it is tones in particular which evoke in us a corresponding mood' (*PS*: §401A). Since, as Peters shows, moods are symbolic states for Hegel, tones beckon for a distinct kind of self-awareness in human beings.

The extent to which human auditory perception is saturated with conceptuality becomes more apparent in Hegel's 'Phenomenology' and 'Psychology' (McDowell 1994; Houlgate 2016). Already in the 'Anthropology', Hegel intimates that mature human hearing is like other sense modalities, in so far as they unify 'in one simple act the many determinations of sensation, consciousness, intuition and intellect' (*PS*: §410R; see also Houlgate 2016: 57). In 'Phenomenology', sensation is first introduced to thought through consciousness (Houlgate 2016: 59). Yet, as we learn in the *Phenomenology of Spirit*—whether it be in the indexical episodes of *sense-certainty*, the happenstance predication of *perception*, or the lawful verdicts of the *understanding*—consciousness posits its objects without awareness of itself as doing the positing, hears without awareness of itself as hearing.

What Hegel calls 'intelligence' is self-conscious. It is divided into three phases of *intuition*, *representation*, and *thought*. Through intuition, intelligence concentrates its attention on what it hears. In representation, the self tracks duration, anticipates, and remembers. Yet, sound is fully comprehended in conceptual thought. Since, as Ikäheimo points out, such thought must take place in accordance with the judgemental forms outlined in the Doctrine of the Concept (2017: 445), sound can be thought existentially or accidentally, 'that sound is quiet'; or more reflectively, 'but it has a tone'; or more essentially and necessarily still, 'the tone of a voice'; or, finally, fully conceptually, 'a beautiful voice'. We only come to appreciate the beauty of sound in thought for Hegel.[11]

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

III. Hegel and contemporary philosophy of sound

III.i. Proximal, medial and distal views of sound

The central question for the philosophy of sound has been: what are sounds ontologically? If one is committed to sounds being located somewhere in space, and not, as Strawson believed, *solely* in time (1959: 59–86), philosophers of sound have argued that there are three positions available: *proximal*, *medial* and *distal theories*. Proximal theorists treat sounds as *mind-dependent* phenomena, which are proximal to consciousness, and typically equated with *sensations* (Maclachlan 1989). Accordingly, on this view, if a tree falls in a forest and no creature is around to hear it, it does not make a sound. However, this theory of sound runs into ontological problems, since for any given sound there will always be as many sounds present as there are creatures hearing them (Casati, Dokic and Di Bona 2020).

Medial theorists argue that sounds are *mind-independent* phenomena propagating from a source through a medium (Meadows 2018). The modern acoustic view of sound is the best example of a medial theory. In this picture, sounds consist of longitudinal pressure waves defined by frequency and amplitude travelling through a medium. Returning to our overfamiliar example, we can say that even if no creatures are present, the tree does make a sound from this perspective, and that this sound extends from the event of collision through a medium as far as soundwaves travel, since sounds and soundwaves coincide exactly.

Although the wave-based medial theory construes sounds as spatially and temporally extended events, philosophers of sound nevertheless argue that it fails to cohere with our experience of the *locations* and *durations* of sound. With regards to location, the problem is that we do not experience sounds to be travelling unless their sources do (O'Callaghan 2007: 43). Rather, we hear them as occurring in or near their sources. With regards to duration, the medial theory conflates our experience of the spatial boundaries of sound with the temporal extension of sound, confusing our encounter with the duration of a soundwave bundle for that of a sound itself (2017: 20). Most contemporary philosophers of sound are thus convinced that the modern acoustic view of sound gives rise to 'wholesale' illusions (Pasnau 1999; O'Callaghan 2007; Casati, Dokic and Di Bona 2020).

Finally, distal theorists claim that sounds are *mind-independent* phenomena located in the world near, at, or in their sources. According to this view, the falling tree again always makes a sound. However, whenever a sound is heard, it is also always heard from a distance and in a direction, close to its source.

There are three main camps of distal theories of sound: distal views of sounds as *properties*, *dispositions* or *events*. The property view proposes that we treat sounds as belonging to objects in the same way that colours, smells, or tastes do. Similarly, the *disposition* theory treats sounds as stable dispositions of objects to vibrate (Kulvicki 2008). The disposition theory can thus be understood as a version of a property

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

view (Casati, Dokic and Di Bona 2020). In these cases, the sound would belong to the tree, the forest floor, or both jointly. The problem is that, if sounds did permanently belong to objects as properties or dispositions in this way, we would be obligated to strip them of their temporal character, which conflicts with our perception of the duration of sounds.

Distal event theorists think of sounds as *temporally extended* events or processes, spatially located in, at or near their sources. Further, distal event theorists understand sounds as property bearing *individuals*, which 'ground the grouping and binding of audible qualities' (O'Callaghan 2017: 17). There are two kinds of distal event theories—*relational event* theories and *located event* theories. In the former, represented most prominently by Casey O'Callaghan, sounds are 'relational events', which occur close to their sources, but necessarily relate *sound sources* and *medium disturbances*. In this case, sound is made by the tree only when its collision with the forest floor disturbs a surrounding medium, thereby sending soundwaves promulgating through the air, which transmit information about the distally located sound (without being that sound). In other words, for O'Callaghan, sounds are ontologically dependent on the transmission of soundwaves through a medium, which are included as part of the relational event of sound, even though sounds are not themselves soundwaves, and must remain situated near their sources.

Located event theorists, on the other hand, such as Roberto Casati, Jérôme Dokic, and Elvira Di Bona, construe sounds as 'monadic events' necessarily located in their sources in the vibrations of bodies. They describe their position as an 'identity view' because, for them, sounds are entirely equated with their sources and vibrations. In this perspective, the sound of the tree in the forest is not merely located *near* the tree's collision with the forest floor, but only *in* the collisions and vibrations of these sounding bodies (Casati, Dokic and Di Bona 2013). Hence, for located-event theorists, although sounds depend on soundwaves for their propagation and audition, sounds do not depend on soundwaves for their existence, and can in fact exist in a vacuum (Casati, Dokic and Di Bona 2020).

III.ii. Hegel's hylomorphic located event view of sound

Since Hegel situates sound not only in 'Physics' but in the inner vibrations of physical bodies, we know he is not offering us either a proximal or a medial theory of sound. So, what kind of distal theory does Hegel provide?

Hegel clearly does not think of sounds as properties of objects like colours, smells, and tastes, or he would have discussed them alongside these in 'The Particular Properties of Bodies'. One might still be tempted to consider Hegel's philosophy of sound as a disposition theory, however. Indeed, Kulvicki's claim that sounds result from 'stable dispositions to vibrate in certain ways when thwacked' (2008: 6) appears quite close to Hegel's suggestion that 'Bodies resound

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

only when they are struck' (§300A). However, disposition theorists deny that sounds are intrinsically temporal, and assert that though we perceive them this way, our perception of their transience is ultimately illusory (Casati, Dokic and Di Bona 2020). Hegel's remarks on the temporality of sound are thus suggestive of a distal-event theory (*PN*: §291A, §300; *A*: 890). But of what sort?

Hegel's philosophy of sound shares a significant amount in common with both relational and located event theories. Beyond the fact that Hegel says nothing about the ontological dependence of sounds on soundwaves, his overt and repeated location of sounds within bodies (*PN*: §299), and his broader insights into the individuation of sounds by the density, cohesion, and elasticity of these bodies (*PN*: §300R), are straightforwardly expressive of some version of a *located-event* theory of sound.

That said, Hegel's located-event theory is clearly different from that of Casati, Dokic and Di Bona. Most importantly, Hegel does not simply equate sounds with their source collisions and vibrations. Rather, as we have seen, he explicitly characterizes the 'inner motion' of *sound* and the external change of place found in *sound sources* to be identical *and* different, and not simply identical. Accordingly, Hegel regularly distinguishes between vibration and sound: 'this is why vibration is specified, together with sound itself' (*PN:* §300R).

Ultimately, however, Hegel's account of sound is distinguished from all other distal-event theories of sound in not being mereological. O'Callaghan defends his philosophy of sound as mereological in two distinct senses, which he somewhat contradictorily runs together. First, sounds are construed as mereological *parts* of their sources: 'such audible events audibly include sounds as constitutive parts. The sounds you hear audibly are mereological parts of such audible sources' (2017: 4). Second, O' Callaghan defines auditory objects themselves as 'mereologically complex individuals—a collection of parts perceptibly belonging to a complex whole' (2017: 113). How exactly are sounds both parts and wholes composed of parts? Without a broader metaphysics of nature, this problem is not fully explained by O'Callaghan.

In the end, the located-event theorists offer a mereological conception of sounds as well. They thus pose the question, 'Is the mereological view the only possibility open to distal theories?' (Casati, Dokic and Di Bona 2013: 463). Their response is, 'In a sense, yes, but it can also be easily improved' (Casati, Dokic and Di Bona 2013: 463). The proposed improvement lies in their 'identity view', which maintains that sounds are not parts of a distinct event but are rather identical to their event sources. The identity view then introduces a distinction between 'event sources' (the energy, collisions, vibrations, etc.) and 'thing sources' (the bodies, objects, thing, etc.) in order to discriminate 'things' involved in the event of sound without distinguishing sounds from their sources ontologically (2013: 462). Casati, Dokic and Di Bona clearly clean up O'Callaghan's argument

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

to some extent. Nonetheless, the unity they achieve remains abstract, since by their own lights they fail to answer the question of how sounds (as event sources) are related to the objects (thing sources) that produce them, a problem which itself hinges on the 'metaphysical question of the relation between objects and the events involving them' ((2013: 462). Therefore, in the mereological metaphysics of distal-event theories of sound, we find either a disunified account of sounds as many, or an undifferentiated account of sounds as one, which attributes auditory qualities to event sources, and fails to explain the relation between sounds and the objects that produce them.

Though more remains to be said, Hegel's philosophy of sound points to some answers. As we have seen, Hegel describes sounds both as 'moments' and as 'individuals'. Yet, in Hegel's non-mereological conception, sounds are neither themselves parts, nor are they composed of parts. Rather, Hegel's distinction between 'moments' and 'individuals' is expressive of his *hylomorphic located-event* view, in which physical nature is composed of nested and overlapping hylomorphic processes, and sounds appear, in one aspect, as dependent 'moments', and in another, as quasi-independent 'individuals' conditioned by the bodies, collisions, and vibrations that shape them. In this picture, there is only one event of sound, and yet sounds are both identical with and distinct from their 'event sources'. Furthermore, sounds are explicitly related to 'thing sources' through a determinate negation of the density, cohesion, and elasticity of the bodies conditioning them. Hence, Hegel's non-mereological, distally located, hylomorphic-event view of sound is not only more unified than the relational event view but tells us more about how sounds are related to objects than the standard located-event view.

Conclusion

This essay has positioned Hegel's philosophy of sound as a realist, *distal-event* theory of sound, in which sounds are temporally extended, property-bearing processes distally located *at* their sources, rather than exclusively in sensation (as in *proximal* theories) or in the propagation of soundwaves through a medium (as in *medial* theories). More specifically, within distal-event theories, I have argued that Hegel develops a *located-event* theory of sound, meaning that, for him, sounds are situated *not* simply *near* their sources (as in O'Callaghan's *relational-event* theory) but directly *within* them. At the same time, I indicated that Hegel departs from other located-event theorists such as Casati, Dokic and Di Bona in maintaining a simultaneous identity and difference between sounds and event sources, which refuses to ascribe auditory qualities directly to the events which yield them. Lastly, I claimed that Hegel departs from all other distal-event theories in developing a *hylomorphic located-event* theory of sound, in which sounds are neither parts of wholes,

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

nor wholes composed of parts, nor undifferentiated wholes, nor mere material events, but dependent 'moments' in broader mechanical processes, and quasi-independent 'individuals' bringing contingent form to the bodies, collisions, and vibrations that condition them and their qualities. Finally, I have suggested that Hegel's attention to the specific gravity and cohesion of the bodies involved in the hylomorphic event of sound tells us more about the qualitative individuation of sound by objects than rival views in contemporary philosophy of sound.

In contrast to the empiricist perspective of much contemporary philosophy of sound, I demonstrated that Hegel arrived at his absolute idealist philosophy of sound through a *weak a priori* interpretation of sound, informed (but not justified) by the natural scientific knowledge of his time, and through a hylomorphic approach to the individuation of physical bodies and processes in nature. Surely, more research is needed on the Aristotelian character of Hegel's *Philosophy of Nature* and 'Physics'. Additionally, though I have suggested that Hegel's non-mereological, hylomorphic located-event theory of sound is more cogent than other distal-event alternatives, the identity conditions of sound still remain somewhat unclear in his account, and this calls for further interpretive work.[12] Lastly, as already mentioned, more remains to be said about mature human auditory perception in Hegel.[13] Nevertheless, I believe my reconstruction of Hegel's philosophy of sound has successfully delimited its contours, while demonstrating its relevance to Hegel scholars, and defensibility within contemporary philosophy of sound.

Finally, Hegel's philosophy of sound ought to be assessed in the light of Alison Stone's contention that one of Hegel's more compelling arguments for his philosophy of nature is *phenomenological* in character (2009: 85). For Stone, Hegel's 'phenomenological argument' portrays his *Philosophy of Nature* as more adequate than the natural-scientific conception of nature in being 'uniquely faithful to the basic form of our experience of nature' (2005: 85). As Kabeshkin notes, it gives clear primacy to Sellars' 'manifest image' (Kabeshkin 2021: 2). Analogously, contemporary philosophers of sound have disclosed the illusory character of the modern acoustic view of sound on phenomenological grounds, while developing metaphysical theories of sound to compensate for these deficits. Due to the sophistication of Hegel's *hylomorphic located-event* theory of sound in comparison with other leading distal-event theories of sound, we can safely conclude that Hegel's philosophy of sound presents a partial vindication of his *a priori* metaphysics of nature.[14]

Christopher Shambaugh
University of Oregon, USA
cshambau@uoregon.edu

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

Notes

[1] Abbreviations used:

A = Hegel, *Hegel's Aesthetics: Lectures on Fine Art*, trans. T. M. Knox (Oxford: Oxford University Press, 1975).
HoP = Hegel, *Lectures on the History of Philosophy: Plato and the Platonists* (Lincoln: University of Nebraska Press, 1995).
SL = Hegel, *The Science of Logic*, trans. G. di Giovanni (Cambridge: Cambridge University Press, 2010).
PN = Hegel, *Philosophy of Nature*, trans. M. J. Petry (New York: Routledge, 1970).
PS = Hegel, *Philosophy of Subjective Spirit*, trans. M. J. Petry (Boston: D. Reidel, 1978).

[2] Rather, Sala and Kabeshkin suggest that Hegel's emphasis on the *a priori* justification of the intelligibility of nature is grounded in a pre-critical Wolffian conception of apriority (2022).

[3] Manning shows that the term emerged in a correspondence between Friedrich Schleiermacher and Friedrich Jacobi and was not used in English until 1860 (Manning 2013; see also De Laurentiis 2021).

[4] Some refer to the processual interpretation of hylomorphic form as *hyloenergeism* (Skrzypek 2021).

[5] I would like to thank an anonymous reviewer for stressing these dimensions of specific gravity.

[6] Sound is also described in terms of a 'double negation' in the *Lectures on Aesthetics* (*A*: 890).

[7] Hegel's use of the concept of subjectivity throughout the *Philosophy of Nature* is notoriously ambiguous, as he attributes subjectivity to entities as diverse as the solar system (§269), sound (§300R), and individual organisms (§350). Kauffman, Lyssy and Yeomans have suggested the term 'perspective' as a gloss on 'subjectivity' in Hegel's *Philosophy of Nature* (2021: 114). Beyond the question of subjectivity, it may appear odd to invoke substantial form in reference to a process or event. However, in his discussion of Aristotle in his *Lectures on the History of Philosophy*, Hegel argues that the first form of substance is 'sensuous substance', a substance which 'involves change', in which form and matter are related but still 'separate' and 'external' (*HoP*: 141).

[8] As Chladni had pointed out before him, a sounding body can simultaneously rotate around its axis, or travel through space, as it emits sound (2015: 1).

[9] Throughout his discussion of sound in the additions, Hegel makes frequent references to sound's *being-in-itself* (*PN*: §300A, 71, 23; *PN*: §302R, 81, 23; *PN*: §300A, 72, 4). For Hegel, that which has being-in-self has a self-relation in opposition to its relation to another. It thus has intrinsic being and a contrasting relation to being-for-other, which lacks its own being (Houlgate 2022: 188).

[10] This is also how Johnstone construes Aristotle's distal event theory of sound and auditory perception (2013: 639).

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

[11] Presumably, we only come to comprehend or appreciate sound in *history* for Hegel too, although later Hegelians seem to have said more about this than Hegel. One thinks for instance of Marx's claim that 'The *forming* of the five senses is a labour of the entire history of the world down to the present' (Marx 1992: 302).

[12] A complete Hegelian account would have to explain not only how we count and assign conditions of identity to sounds, but also how we determine the spatio-temporal boundaries of sounds, the composition of complex sounds, and the numerical re-identification of sounds (see Nudds and O'Callaghan 2009: 60).

[13] It would be particularly important to clarify how Hegel would approach the perception of sound sources, speech, and music.

[14] I thank two anonymous reviewers with the *Hegel Bulletin* for their generous feedback. I am also grateful to Evan Quarles, Brooke Burns, Gonzalo Bustamante-Moya, Barbara Muraca, and Elvira Di Bona for comments on earlier drafts. Finally, I am thankful for questions from audiences at TSPEC and SPEP, and for an exchange with Julia Peters at the 'Hegel on Empirical Judgment' conference.

Bibliography

Aristotle. (2016), *De Anima*, trans. C. Shields. Oxford: Oxford University Press.

Bowman, B. (2017), 'Self-Determination and Ideality in Hegel's Logic of Being', in D. Moyar (ed.), *The Oxford Handbook of Hegel*. Oxford: Oxford University Press.

Brandom, R. (2019), *A Spirit of Trust: A Reading of Hegel's Phenomenology*. Cambridge MA: Harvard University Press.

Burbidge, J. (1996), *Real Process: How Logic and Chemistry Combine in Hegel's Philosophy of Nature*. Toronto: University of Toronto Press.

Casati, R. and Dokic, J. (1994), *La Philosophie du Son*. Nîmes: Chambon.

Casati, R., Dokic, J. and Di Bona E. (2013), 'The Ockhamization of the Event Sources of Sound', *Analysis* 73:3: 462–66.

Casati, R., Dokic, J. and Di Bona E. (2020), 'Sounds', *The Stanford Encyclopaedia of Philosophy*, Edward N. Zalta (ed.), found online at: <https://plato.stanford.edu/archives/win2020/entries/sounds/>.

Chladni, E. (2015), *Treatise on Acoustics: The First Comprehensive English Translation of E.F.F. Chladni's Traité d'Acoustique*, trans. R. T. Beyer. Cham: Springer.

De Laurentiis, A. (2021), *Hegel's Anthropology: Life, Psyche, and Second Nature*. Evanston IL: Northwestern University Press.

Derrida, J. (1982), 'The Pit and the Pyramid: Introduction to Hegel's Semiology', trans. A. Bass, in *Margins of Philosophy*. Chicago: University of Chicago Press.

Di Giovanni, G. (2010), 'Introduction', in G.W.F. Hegel, *The Science of Logic*. Cambridge: Cambridge University Press.

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

Döbereiner, L. (2014), 'Resonances of Subjectivity: Hegel's Concept of Sound and Di Scipio's Audible Ecosystemics', *Contemporary Music Review* 33:1: 19–30.
Eldridge, R. (2007), 'Hegel on Music', in S. Houlgate (ed.), *Hegel and the Arts*. Evanston IL: Northwestern University Press.
Ferrarin, A. (2001), *Hegel and Aristotle*. Cambridge: Cambridge University Press.
Findlay, J. (2013), *Hegel: A Re-examination*. New York: Routledge.
Furlotte, W. (2018), *The Problem of Nature in Hegel's Final System*. Edinburgh: Edinburgh University Press.
Halper, E. (2008), 'Hegel's Criticism of Newton', in F. Beiser (ed.), *The Cambridge Companion to Hegel and Nineteenth-Century Philosophy*. Cambridge: Cambridge University Press.
Hanly, P. (2009), 'Hegel's Voice: Vibration and Violence', *Research in Phenomenology* 39:3: 359–73.
Houlgate, S. (ed.) (1998), 'Introduction', *Hegel and the Philosophy of Nature*. Albany NY: SUNY Press.
Houlgate, S. (2016), 'Hegel, McDowell, and Perceptual Experience', in S. Herrmann-Sinai and L. Ziglioli (eds.), *Hegel's Philosophical Psychology*. London: Routledge.
Houlgate, S. (2022), *Hegel on Being: Quality and the Birth of Quantity in Hegel's* Science of Logic. London: Bloomsbury.
Ikäheimo, H. (2017), 'Hegel's Psychology', in D. Moyar (ed.), *The Oxford Handbook of Hegel*. Oxford: Oxford University Press.
Inwood, M. (1992), *A Hegel Dictionary*. Cambridge: Blackwell.
Johnstone, M. (2013), 'Aristotle on Sounds', *British Journal for the History of Philosophy* 21:4: 631–48.
Kabeshkin, A. (2019), *Hegel's Anti-Reductionist Philosophy of Nature*. Doctoral dissertation, Johns Hopkins University. https://jscholarship.library.jhu.edu/handle/1774.2/61506.
Kabeshkin, A. (2021), 'Hegel's Metaphysics of Nature', *European Journal of Philosophy*: 1–15.
Kaufmann, R., Lyssy, A. and Yeomans, C. (2021), 'Hegel's Philosophy of Nature: The Expansion of Particularity as the Filling of Space and Time', in S. Stein and J. Wretzel (eds.), *Hegel's Encyclopaedia of the Philosophical Sciences: A Critical Guide*. Cambridge: Cambridge University Press.
Kelsey, S. (2010), 'Hylomorphism in Aristotle's Physics', *Ancient Philosophy* 30:1: 107–24.
Kislev, F. S. (2018), 'Hegel, Spinoza, and the "Principle of Individuality"', *International Journal of Philosophical Studies* 26:4: 499–522.
Koslicki, K. (2008), *The Structure of Objects*. Oxford: Oxford University Press.
Kosman, A. (2013), *The Activity of Being: An Essay on Aristotle's Ontology*. Cambridge MA: Harvard University Press.

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

Kulvicki, J. (2008), 'The Nature of Noise', *Philosopher's Imprint* 8:11: 1–16.
Maclachlan, D. L. C. (1989), *Philosophy of Perception*. Englewood Cliffs NJ: Prentice Hall.
Manning, G. (2013), 'The History of "Hylomorphism"', *Journal of the History of Ideas* 74:2: 173–87.
Marmodoro, A. (2013), 'Aristotle's Hylomorphism without Reconditioning', *Philosophical Inquiry* 37: 5–22.
Marx, K. (1992), *Karl Marx & Frederick Engels Collected Works: Vol 3*. New York: International Publishers.
McDowell, J. (1994), *Mind and World*. Cambridge MA: Harvard University Press.
Meadows, P. (2018), 'In Defense of Medial Theories of Sound', *American Philosophical Quarterly* 55:3: 293–302.
Moland, L. (2019), *Hegel's Aesthetics: The Art of Idealism*. Oxford: Oxford University Press.
Nudds, M. and O'Callaghan, C. (2009), 'Introduction: The Philosophy of Sounds and Auditory Perception', in M. Nudds and C. O'Callaghan (eds.), *Sounds and Perception: New Philosophical Essays*. Oxford: Oxford University Press.
O'Callaghan, C. (2007), *Sounds: A Philosophical Theory*. Oxford: Oxford University Press.
O'Callaghan, C. (2017), *Beyond Vision: Philosophical Essays*. Oxford: Oxford University Press.
Pasnau, R. (1999), 'What is Sound?' *Philosophical Quarterly* 49: 309–24.
Peters, J. (2016), 'On Naturalism in Hegel's Philosophy of Spirit', *British Journal for the History of Philosophy* 24:1: 111–31.
Peters, J. (2019), 'Hegel and Goethe on the Symbolism of Colour', *International Yearbook of German Idealism: Psychology*. Berlin: De Gruyter.
Petry, M. J. (1970), 'Introduction', in G. W. F. Hegel, *Hegel's Philosophy of Nature*, Volume 1, edited and translated by Michael Petry. London: Allen & Unwin.
Petry, M. J. (1984), 'Hegel's Criticism of Newton', *Clio* 13: 331–48.
Pinkard, T. (2012), *Hegel's Naturalism: Mind, Nature, and the Final Ends of Life*. Oxford: Oxford University Press.
Pippin, R. (2019), *Hegel's Realm of Shadows: Logic as Metaphysics in the Science of Logic*. Chicago: University of Chicago Press.
Popper, K. (1950), *The Open Society and its Enemies*. Princeton: Princeton University Press.
Rand, S. (2007), 'The Importance and Relevance of Hegel's "Philosophy of Nature"', *The Review of Metaphysics* 61:2: 379–400.
Rand, S. (2017), 'Hegel's Philosophy of Nature', in D. Moyar (ed.), *The Oxford Handbook of Hegel*. Oxford: Oxford University Press.
Reid, J. (2013), 'Comets and Moons: The For-another in Hegel's Philosophy of Nature', *The Owl of Minerva* 45:1: 1–11.

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press

Ritter, J. (2010), *Key Texts of Johann Wilhelm Ritter (1776–1810) on the Science and Art of Nature*, trans. J. Holland. Boston: Brill.
Sala, L. and Kabeshkin, A. (2022), 'A Priori Philosophy of Nature in Hegel and German Rationalism', *British Journal for the History of Philosophy*: 1–21.
Sallis, J. (2011), 'Soundings: Hegel on Music', in S. Houlgate and M. Baur (eds.), *A Companion to Hegel*. West Sussex: John Wiley & Sons.
Santoro-Brienza, L. (1992), 'Aristotle and Hegel on Nature: Some Similarities', *Bulletin of the Hegel Society of Great Britain* 13:2: 13–29.
Schuringa, C. (2022), 'Hegel on Spirited Animals', *Philosophy*: 1–24.
Skrzypek, J. (2021), 'From Potency to Act: Hyloenergeism', *Synthese*: 2691–716.
Stone, A. (2005), *Petrified Intelligence: Nature in Hegel's Philosophy*. Albany: State University of New York Press.
Strawson, P. (1959), *Individuals: An Essay in Descriptive Metaphysics*. London: Methuen.
Webb, T. (1980), 'The Problem of Empirical Knowledge in *Hegel's Philosophy of Nature*, *Hegel-Studien* 15: 171–86.
Westphal, K. (2008), 'Philosophizing about Nature: Hegel's Philosophical Project', in F. Beiser (ed.), *The Cambridge Companion to Hegel and Nineteenth-Century Philosophy*. Cambridge: Cambridge University Press.
Winfield, R. D. (2017), *Conceiving Nature After Aristotle, Kant and Hegel: A Philosopher's Guide to the Universe*. Cham: Palgrave Macmillan.
Yong, E. (2022), *An Immense World: How Animal Senses Reveal the Hidden Realms Around Us*. New York: Random House.

https://doi.org/10.1017/hgl.2023.19 Published online by Cambridge University Press