

9. Gottlob Frege

Über Sinn und Bedeutung
[1892]

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The ninth section explores the text 'Sense & Significance' written by Frege in 1892.

Introduction

Gottlob Frege (1848 - 1925) attained his doctorate in mathematics at the University of Göttingen in 1873 and then his habilitation at the University of Jena in 1875. Thereafter he lived and taught in Jena, the university town of the Grand Duchy of Saxe-Weimar-Eisenach until 1917.

Theory

Frege's background was in mathematics, not philosophy, and in particular the fields of analytic geometry and logic. He wanted to demonstrate his conviction that arithmetic is underpinned exclusively by the faculty of reason, and not subject to intuitive or dialectic inductions. He recognised that procedures of logic had barely developed since the time of the Aristotelian syllogism and of Stoic propositional logic almost two thousand years before and that it was necessary to create new methods and procedures to achieve his goal. Accordingly he deemed it important to introduce to his axiomatic and inferential logical analyses a new orientation upon the processes of function and of quantified variables.

Logic had previously been restricted to logical constants such as 'and', 'or', 'not', and the conditional structure 'if x, then y' but Frege introduced procedures for defining quantified statements pertaining to existence (i.e. 'there is no x, whereby this x is not P', which is written in modern predicate logic as $\neg\forall x\neg Px$,²⁵ and which can be simplified to 'there exists an x, whereby this x is P', which is written as $\exists xPx$) and universality (i.e. 'for all x, x is P', which is written as $\forall xPx$). Frege was able to use these quantifiers to develop a second-order predicate calculus whereby the quantifier is applied not only to variables such as x but also to functions such as F (i.e. 'there exists a function F, whereby the function F applied to x is equivalent to the function F applied to y', which is written as $\exists F(Fa \equiv Fb)$).

In addition to his work in mathematics, Frege eventually applied his investigations to the logic of language, and with an equal determination to avoid recourse to inductive intuition in logical procedures. He argued that if arithmetical proof must be based upon logical principles, upon axiomatic foundations and the rules of inference, and not on some would-be sixth sense, then the same principles must be applied to language in correspondence with the structures of thought. In contrast to Nietzsche and many of the other forebears of the Weimar philosophical tradition, whose work had also included theories about the structure of thought, Frege refuted any recourse to mental explanations for the meaning of propositional sentences and their content.

Frege began by examining language statements pertaining to mathematics, including an attempt to define the referents of statements involving number-words such as 'one' or 'two'. Frege argued that arithmetic objects are not empirical objects at all; the 'one' in 'one violin' is not itself a violin. Numbers are merely an aspect of reasoning. They are subject to a context principle, whereby words

²⁵ $\neg$ is the symbol for not.

do not have meaning in isolation but only according to their context. Consequently he sought to analyse the nature of meaning itself, which in turn led him to suppositions that would be significant for the entire scope of Philosophy of Language.

Frege argued that if the subject of a sentence is a noun and refers to an object, then, in contrast, the predicate should be treated as a concept referring to an idea. The sentence 'the violin string is broken' comprises of a subject, 'the violin string', which is an object, and a predicate 'is broken', which is a concept. Frege pointed out that such predicates could be seen as analogous to a mathematical function, whereby they can take an argument and produce a value. The function 'x is broken', written $BROKEN(x)$, takes an argument for x such as 'the violin string' and produces a value, a truth value, a state of affirmation or refutation as to whether it applies to the subject. In this case the sentence affirms that the violin string is actually broken. Accordingly the sentence 'the violin string isn't broken', written $\neg BROKEN(x)$, uses a functional process to negate the truth value associated with the concept 'is broken'.

Frege argued that just as the construction of sets enables arithmetic to be expressed as logic, so language functions divide the empirical world of objects and events into two sets, one with a truth value and one without. Accordingly he was then able to use this principle of bivalence to develop a predicate logic, or predicate calculus, to demonstrate the logic structures of propositional sentences.

Frege's 'On Sense and Significance' sought to explain how, clearly, some sentences are far from rational and do not conform to the law of non-contradiction. He argued that most language expressions have two different aspects of meaning, the sense and the significance, the former of which is the mode of presentation and the latter of which is the reference, or denotation. For instance, the term 'water' signifies the liquid form of molecules comprised of two hydrogen and one oxygen atoms, H_2O , but it also has an experiential, epistemic sense, such as the human experience of its wetness or its splashing qualities, or its lack of taste. Frege added that full sentences, or propositions, also have a sense and significance. The reference of a proposition is its truth value and the sense is the concept or thought that the proposition expresses. For instance, the value of the proposition 'the water is leaking out' indicates the truth of the fact that the water is actually leaking out, while the sense of the proposition is encapsulated by the mental concept that (unfortunately, regretfully, catastrophically) the water is leaking out. Similarly the proposition 'the violin string is broken' possesses a referent in the world whereby the string is actually broken and the human sense of the broken string, which is a concept.

Frege concluded that it is justified to apply logical analysis to the significance of expressions and propositions, given that their referents are defined by truth value. However logic cannot be applied in the same way to the sense of expressions and propositions, given that they are epistemic or mental aspects of meaning that are to some extent subjective and therefore do not possess an objective truth value. It's possible to identify two thoughts as having the same sense if a person perceives this link *prima facie*, but this link does not meet the stringent criteria for identity established originally by Leibniz.²⁶

²⁶ Leibniz's Identity of indiscernibles can be expressed in terms of predicate calculus as $(\forall x)(\forall y)(x=y) \equiv (\forall F)(Fx \equiv Fy)$

Frege's logicism applied to language and thought had implications far and wide, even as far as religious faith. During the era of medieval scholasticism, scholars had sought ways to use Aristotelian logic to prove the existence of the Absolute. It wasn't enough to have a revealed faith in God; the nature of His existence also needed to conform to reason. Saint Anselm of Canterbury, writing in the 11th century, had defined God as that compared to which nothing greater can be conceived. His point was that if God's existence is not infinite and merely limited to the human mind, and is therefore subject to the refutation of atheists, then, given that the mind is itself limited, an even greater being must logically be possible, one which exists both in the mind and as an infinite entity outside of the mind. His point was that God's existence could be affirmed by assigning a suitable predicate to Him in language.

However when Anselm's argument is made subject to Frege's predicate calculus then, unrestricted by the traditional limitations of subject-predicate analysis, the sentence 'God is that compared to which nothing greater can be conceived' is structured in terms of two functions: firstly, 'there exists a God', and secondly 'this God is that compared to which nothing greater can be conceived', whereby Anselm's proof of this existence lies in the second function, the predicate. However if the predicate is reduced to a simpler form, the calculus becomes 'there exists a God, whereby God is defined in a particular way.' And even simpler, 'there exists a God, whereby God is defined as existing.' Simply put, there is no predicate established. Frege's logicism demonstrates how Anselm's ontological argument, by using only a single synthetic function (existence) and no predicate function, fails to prove the existence of God by way of His taking a predicate. It represents God as merely a synthetic assertion (of faith) and not as a subject that, by way of reason, takes an almighty predicate.

Frege was not the first to recognise that the nature of existence cannot be taken as a predicate. But if Immanuel Kant had made this claim a century before,²⁷ then it was Frege who established the fact that existence is not a property of an object.

Frege's work, like that of many others in the Weimar philosophical tradition, built upon the work of Kant in other ways too. Like other eighteenth century writers, Kant had started from the position that, while an empirical *a posteriori* judgement adds a predicate to a subject, an analytic judgement pertaining to a necessary and universal truth independent of experience has a subject concept that itself comprises a predicate concept. For instance, the term 'bachelor' contains the predicate concept 'unmarried male who is eligible for marriage'. Accordingly an analytic judgement involves an exclusively conceptual justification. It involves a logical deduction but no empirical observation.

Kant had argued that this analysis is not complete, that the facts of geometry and arithmetic are both empirical and analytic; they are synthetic *a priori*. He said that, as regards arithmetic for instance, $1+2=3$ is synthetic in that the concept ' $=3$ ' is not included in the subject ' $1+2$ '. Similarly, as regards geometry, the shortest distance between two points is a straight line, but the concept 'straight line' is not included in the subject 'the shortest distance'.

²⁷ See Kant, 1781. *Critique of Pure Reason*, trans. J. M. D. Meiklejohn. NY, Dover Publications, 2018.

Frege questioned Kant's analysis. Applying the logic of functions, he argued that if, for instance, the definition for 'bachelor' is equivalent to 'unmarried eligible male', then, using the rule of substitution, the proposition 'all bachelors are unmarried eligible men' is the same as 'all unmarried eligible men are unmarried eligible men', which is a tautology and therefore analytic. The same held true for mathematical statements. Furthermore, he argued that some analytic judgements don't have a predicate embedded in the subject. For instance, the statement 'everything is identical with itself' is analytic because it does not need empirical observation for its verification, yet it includes no predicate. Frege concluded that Kant had been too restrictive when he argued analyticity is defined by the capacity to embed a concept. All of Kant's examples of arithmetic and geometric truths are not synthetic *a priori* but analytic *a priori*.

Frege pointed out that this in turn had further implications. Kant had defined the synthetic *a priori* as the basis of metaphysical knowledge. However this analysis demonstrated that mathematical truth did not need metaphysical justification at all, just as it didn't need resource to intuitive thought. Logic was foundational for mathematics and language and ultimately for all thought pertaining to matters of significance.

Frege went on to investigate the implications of his work for continuing debates concerning the Cartesian duality of mind and body, the distinction between the subjective and objective. However he came to the conclusion that, despite having defined the foundations of language (the subjective) and mathematics (the objective), he had no way to justify the identity or correspondence between either the sense or significance of a sentence as understood by the mind and its equivalent in the mind-independent world. Accordingly, he could think of no other solution than, in the spirit of Weimar Idealism, to employ the age-old notion of Platonic forms. He posited the notion of a third metaphysical realm distinct from the subject and objective realms internal and external to the mind where ideas such as 'violin string' and 'broken' possess a unique kind of reality of their own.

Influence

Frege's seminal work in mathematics²⁸ and his logicist approach to language had a great influence on many subsequent thinkers who saw him as the founding figure of a new analytical philosophy that was free of speculative metaphysics. Michael Dummett argued that Frege's work was not only ground-breaking in its development of logicism but also the starting point of the linguistic turn that placed semantics and Philosophy of Language at the centre of many philosophical developments.²⁹

Frege's functional procedures were of particular importance to the logicist work of Bertrand Russell³⁰ and Kurt Gödel's incompleteness theorem. They were also influential for Philosophy of Language, and in particular for Alfred Tarski's semantic theory of truth,³¹ Rudolf Carnap's theory of

²⁸ For a good example see Frege, Gottlob, 1884. *The Foundations of Arithmetic: A Logico-Mathematical Enquiry into the Concept of Number*, trans. J. L. Austin. Evanston, Northwestern University Press, 1953.

²⁹ See Dummett, Michael. *Frege and Other Philosophers*. Oxford University Press, 1991.

³⁰ There are more recent editions but for the original see Russell, *Bertrand* & Whitehead, Alfred North. *Principia Mathematica Vol. I*. Cambridge University Press, 1910.

³¹ See Tarski, Alfred. *The Concept of Truth in Formalized Languages*, in Tarski (ed.), *Logic, Semantics, Metamathematics*, pp 152-278. Oxford University Press, 1936.

meaning,³² Saul Kripke's definition of the necessary *a posteriori*,³³ and David Chalmers use of two-dimensional semantics.³⁴

Frege's theories also attracted opposition. His distinctions of meaning comprising sense and significance were disputed by Bertrand Russell's theory of descriptions.³⁵ His logicist mathematics was opposed by Hilbert's formalist mathematics³⁶ and Brouwer's intuitionist mathematics.³⁷ Thereafter Frege's definition of analytic truth was opposed by Willard Quine who argued that all truth involves an empirical aspect.³⁸ He argued that the idea a sentence has a linguistic component (the sense) and a factual reference (the significance) implies that analyticity exists only when there is no fact. However, given the existence of objects and events is comprised only of facts, analyticity is merely, well, an unsubstantiated dogma of empiricism.

Pedagogical Questions

1. What are the dynamics of thought as regards the objective representation of things in the world and the subjective response to these representations?
2. What aspects of thought are logical and what are not?
3. What is the relationship between language and thought (and mathematics)?

Quotes

"We are therefore driven into accepting the truth value of a sentence as constituting its reference. By the truth value of a sentence I understand the circumstances that it is true or false. There are no further truth values. For brevity I call the one the True, the other the False." (Frege 63)

"The supposition that the truth value of a sentence is its reference shall now be put to further test. We have found that the truth value of a sentence remains unchanged when an expression is replaced by another having the same reference: but we have not yet considered the case in which the expression to be replaced is itself a sentence. Now if our view is correct, the truth value of a sentence containing another as part must remain unchanged when the part is replaced by another sentence having the same truth value." (ibid 65)

³² See section 9 for more on Carnap or go straight to the original at Carnap, Rudolf. *Meaning and Necessity*. University of Chicago Press, 1947.

³³ For the full story see Kripke, Saul. *Naming and Necessity*. Harvard University Press, 1980.

³⁴ To view this in context see Chalmers, David J. *The Foundations of Two-Dimensional Semantics*. In Manuel Garcia-Carpintero & Josep Macia (eds.), *Two-Dimensional Semantics: Foundations and Applications*, pp55-140. Oxford University Press, 2006.

³⁵ For a recent edition see Russell, Bertrand, 1905. *On Denoting*. *Mind* 114 (456) pp873 - 887, 2005.

³⁶ For example (there are other examples too in this hefty volume) see Hilbert, David, 1923. *The Logical Foundations of Mathematics*, trans. William Bragg Ewald, in *From Kant to Hilbert Volume 2: A Source Book in the Foundations of Mathematics*, pp1134-1147. Oxford University Press, 2007.

³⁷ See Brouwer, L. E. J. *Brouwer's Cambridge Lectures on Intuitionism*. Cambridge University Press, 1981.

³⁸ Again, see Quine, Willard. *Two Dogmas of Empiricism*. *Philosophical Review* 60 (1): 20-43, 1951.

Frege, Gottlob, 1892. *On Sense and Reference*, in *Translations from the Philosophical Writings of Gottlob Frege*, ed. P. T. Geach and M. Black. Oxford, Blackwell, 1952.

Introduction to the music

Philip Armstrong's musical firework 'Sense and Significance' for orchestra was written to mark the 125th anniversary of the foundation of the Bournemouth Symphony Orchestra in 1893. The music was commissioned by Kirill Karabits and the Bournemouth Symphony Orchestra and first performed by them at the Bournemouth Pavilion Theatre on May 19, 2018 (in a concert that also featured Richard Strauss's 'Don Juan', composed and first performed in Weimar in 1889). The music uses Frege's notion of the sense and significance of an expression to make reference to the foundation of the Bournemouth Symphony Orchestra, and also to describe the sense in which the outcome of this event has been of such importance to the cultural life of the City of Bournemouth and the surrounding region.

Gottlob Frege: Über Sinn und Bedeutung [1892]

For Kirill Karabits & the Bournemouth Symphony Orchestra on its 125th anniversary

Philip Armstrong

Moderato $\text{♩} = 108$

Piccolo

Flute 1

Flute 2

Oboe

Cor Anglais

Clarinet 1

Clarinet 2

Bass Clarinet in Bb

Bassoon

Contrabassoon

Horn 1

Horn 2

Horn 3

Trumpet 1

Trumpet 2

Trumpet 3

Trombone

Bass Trombone

Tuba

Timpani

Tambourine

Snare Drum

Harp

Violin I

Violin II

Viola

Violoncello I

Violoncello II

Contrabass

1: F#; 2: Eb; 3: C; 4: G

D#C#B/EFGA

pizz.

arco

mf

f

C

Picc. *p*
 Fl. *mp* *p* *pp* *mp* *p* *pp* *mp*
 Fl. *mp* *pp* *mp* *pp* *mp*
 Ob.
 C. A.
 Cl. *mp* *p* *pp* *mp* *p* *pp* *mp*
 Cl. *f* *p* *f* *p* *f* *p* *f* *p*
 B. Cl. *p*
 Bsn.
 Cbsn.
 Hn.
 Hn.
 Hn.
 C Tpt.
 C Tpt.
 C Tpt.
 Tbn.
 B. Tbn. *f* *p* *f* *f* *p* *f*
 Tbn. *f*
 Timp. *p* *f* *p* *mf* *p*
 Tamb. *p* *mf* *p* *mf* *p*
 S. D. *p* *f*
 Hi-Hat *p* *f* *p* *f*
 B. D. *p* *f*
 Hp.
 Vln. I *f* *f* *p* *f* *p* *f* *p*
 Vln. II *f* *f* *p* *f* *p* *f* *p*
 Vla. *pizz* *p* *arco* *mp* *f* *p* *f* *p*
 Vc. I *arco* *mp* *f* *p* *f* *p* *f* *p*
 Vc. II *mp* *f* *p* *f* *p* *f* *p* *f*
 Cb. *mf* *f* *p* *f* *f* *p* *f*

14

Picc. *p*

Fl. *mp* *mp* *pp* *mp* *p* *pp* *mp* *p* *pp* *mp* *p* *pp*

Fl. *mp* *mp* *pp* *mp* *p* *pp* *mp* *p* *pp* *mp* *p* *pp*

Ob. *pp* *p* *pp* *mp* *p* *pp* *mp* *p* *pp* *mp* *p* *pp*

C. A.

Cl. *f* *p* *f* *p*

Cl. *f* *p* *f* *p*

B. Cl.

Bsn.

Cbsn.

Hn.

Hn.

Hn.

C. Tpt.

C. Tpt.

C. Tpt.

Tbn.

B. Tbn. *f* *p* *f*

Tba.

Timp. *mf* *p*

Tamb. *mf* *p* *mf* *p* *mf* *p* *mf* *p*

Hi-Hat *p* *f* *p*

B. D. *p* *f*

Hr.

Vln. I *p*

Vln. II *p*

Vla. *pizz.* *p*

Vc. I *f* *p* *f* *p* *pizz.* *p*

Vc. II *f* *p* *f* *p*

Cb. *f* *p* *f*

D

18

Picc.

Fl.

Fl.

Ob.

C. A.

Cl.

Cl.

B. Cl.

Bsn.

Cbn.

Hn.

Hn.

Hn.

C. Tpt.

C. Tpt.

C. Tpt.

Tbn.

B. Tbn.

Tba.

Timp.

Tamb.

S. D.

Hi-Hat

B. D.

Hr.

Vln. I

Vln. II

Vla.

Vc. I

Vc. II

Cb.

D

25

Picc. *mf* *f* *mf* *f* *mf* *f*

Fl. *mf* *f* *mf* *f* *mf* *f*

Fl. *mf* *f* *mf* *f* *mf* *f*

Ob. *mf* *f* *mf* *f* *mf* *f*

C. A. *mp* *f*

Cl. *mf* *f* *mf* *f* *mf* *f*

Cl. *mf* *f* *mf* *f* *mf* *f*

B. Cl. *f*

Bsn. *f*

Cbn. *f*

Hn. *mp* *f*

Hn. *mp* *f*

Hn. *mp* *f*

C. Tpt. *f*

C. Tpt. *f*

C. Tpt. *f*

Tbn. *f*

B. Tbn. *f*

Tbn. *f*

4: A

Timp. *f*

Cym. *p* *f*

Vln. I *f*

Vln. II *mf* *f* *mf* *f*

Vla. *mp* *f*

Vc. I *f*

Vc. II *f*

Cb. *f*

E

30

Picc. *p* *mf* *p* *mf* *p*

Fl. *p* *mf* *p* *mf* *p*

Fl. *mf* *p* *mf* *p*

Ob.

C. A.

Cl.

Cl.

B. Cl.

Bsn.

Cbn.

Hn.

Hn.

Hn.

C Tpt. *con sord.* *p*

C Tpt. *con sord.* *p*

C Tpt. *con sord.* *p*

Tbn. *con sord.* *p*

B. Tbn. *con sord.* *p*

Tba.

Timp.

Tamb. *p* *mf* *p* *mf*

Hi-Hat *p* *f* *p* *f*

Tri. *p*

Hp.

E

Vln. I *pp* *mf* *p* *pizz.* *arco* *mf*

Vln. II *pp* *pp* *pp* *div.* *pp* *unis.* *mf*

Vla. *pp* *pp* *pp* *div.* *pp*

Vc. I *pp* *pp* *pp* *p*

Vc. II *pp* *pp* *pp* *p*

Cb.

[illegible]

G Poco meno mosso ♩=96

H

41

Picc.

Fl.

Fl.

Ob.

C. A.

Cl.

Cl.

B. Cl.

Bsn.

Cbsn.

Hn.

Hn.

Hn.

C. Tpt.

C. Tpt.

C. Tpt.

Tbn.

B. Tbn.

Tba.

Cym.

Wind C.

Hp.

G Poco meno mosso ♩=96

H

Vln. I

Vln. II

Vla.

Vc. I

Vc. II

Cb.

53. **I** **J**

Picc. *mf* *f*

Fl. *mf* *f* *p* *f*

Fl. *mf* *f* *p* *f*

Ob. *mp* *mf* *f*

C. A. *mp* *mf* *f*

Cl. *mp* *mf* *p* *f* *p* *f* *p* *mf*

Cl. *p* *f* *p* *f* *p* *mf*

B. Cl. *mp* *f* *p* *f*

Bsn. *mp* *f*

Cbsn. *mf* *mp* *f*

Hn. *mf* *p* *mf*

Hn. *mf* *p* *mf*

Hn. *mf* *mf*

C. Tpt. *mf* *p* *mf*

C. Tpt. *mf* *p* *mf*

C. Tpt. *mf* *p* *mf*

Tbn. *open* *p* *mf* *p* *mf*

B. Tbn. *open* *f* *p* *f* *p* *f* *p*

Tba. *mf* *f* *p* *f* *p* *f* *p*

B. D. *f* *p* *f* *p* *f* *p*

Hp. *p* *f*

Vln. I *mf* *mp* *f* *mf* *p* *f* *p* *mf* *p* *f*

Vln. II *mf* *mp* *f* *p* *f* *mf* *p* *f* *p* *mf* *p* *f*

Vla. *mp* *mf* *f* *mf* *p* *f*

Vc. I *mp* *f* *p* *f* *p* *f* *p*

Vc. II *mp* *f* *p* *f* *p* *f* *p*

Cb. *mf* *mp* *f* *f* *p* *f* *p* *f* *p*

C; B;

74 **L**

Picc. *p* *f*

Fl. *f* *mf* *f* *p* *f* *p*

Fl. *p* *f* *f* *p* *f* *p*

Ob. *f* *p* *f* *p* *f* *p*

C. A. *f* *f* *p* *f* *p* *f*

Cl. *f* *mf* *f* *p* *f* *p*

Cl. *mf* *f* *p* *f* *p* *f*

B. Cl. *mf* *f* *p* *f* *p* *f*

Bsn. *mf* *f* *p* *f* *p* *f*

Cbsn. *p*

Hn. *f* *f* *p* *f* *p* *f*

Hn. *f* *f* *p* *f* *p* *f*

Hn. *f* *f* *p* *f* *p* *f*

C. Tpt. *mf* *f* *p* *f* *p* *f*

C. Tpt. *mf* *f* *p* *f* *p* *f*

C. Tpt. *mf* *f* *p* *f* *p* *f*

Tbn. *mf* *f* *p* *f* *p* *f*

B. Tbn. *mf* *f* *p* *f* *p* *f*

Tbn. *mf* *f* *p* *f* *p* *f*

Timp. *f* *f* *f*

Tamb. *p* *mf* *p* *mf* *p*

S. D. *p* *f* *p*

Hi-Hat *p* *f* *p*

Tri. *p*

B. D. *f*

Hr. *f*

L

Vln. I *mf* *f*

Vln. II *mf* *f*

Vla. *mf* *f*

Vc. I *mf* *f* *p* *f* *p* *f* *p* *f* *p* *f*

Vc. II *mf* *f* *p* *f* *p* *f* *p* *f* *p* *f*

Cb. *mf* *f* *p* *f* *p* *f* *p* *f* *p* *f*

14

[M]

Picc. *f* *mf* *ff*

Fl. *f* *mf* *ff*

Fl. *f* *mf* *f*

Ob. *f* *mf* *f*

C. A. *mf* *f* *f*

Cl. *f* *mf* *f*

Cl. *mf* *f* *f*

B. Cl. *f* *mf* *ff*

Bsn. *mf* *f* *ff*

Cbsn. *f* *ff*

Hn. *mp* *ff*

Hn. *mp* *ff*

Hn. *mp* *ff*

C. Tpt. *f* *ff*

C. Tpt. *f* *ff*

C. Tpt. *f* *ff*

Tbn. *f* *ff*

B. Tbn. *f* *ff*

Tba. *f* *ff*

Timp. *f* *p* *ff* 4: G

Cym. *p* *ff*

S. D. *f* *p* *f*

B. D. *f*

Hp. *ff* *mf* *ff*

[M]

Vln. I *f* *ff*

Vln. II *f*

Vla. *ff*

Vc. I *f* *ff*

Vc. II *f* *ff*

Cb. *f* *ff*

84

Picc. *f*

Fl. *f*

Fl. *f*

Ob. *f*

C. A. *f*

Cl. *f*

Cl. *f*

B. Cl. *f*

Bsn. *f*

Cbn. *f*

Hn. *mp* *ff*

Hn. *mp* *ff*

Hn. *mp* *ff*

C Tpt. *mp* *ff*

C Tpt. *mp* *ff*

C Tpt. *mp* *ff*

Tbn. *mp* *ff*

B. Tbn. *mp* *ff*

Tba. *mp* *ff*

Timp. *p* *ff*

Cym. *hand crash-cymbals* *ff*

S. D. *p* *f*

B. D. *p* *f*

Hp. *mf* *ff*

Vln. I *f* *ff*

Vln. II *f* *ff*

Vla. *f* *ff*

Vcl. I *f* *ff*

Vcl. II *f* *ff*

Cb. *f* *ff*

Weimar 2017

10. Rudolf Carnap

**Der logische Aufbau der Welt
[1928]**

10. Rudolf Carnap: Der Logische Aufbau der Welt [1928]

The tenth section explores the text 'The Logical Structure of the World' written by Carnap in 1928.

Introduction

Rudolf Carnap (1891-1970) held a central position in twentieth century analytic philosophy. His work has had a significant influence upon studies into the foundations of logic, the Philosophy of Science, and the Philosophy of Language.

He was a student and then a professor at the University of Jena from 1909 until 1926 and, after moving to Vienna, completed his treatise, *The Logical Structure of the World*, in 1928.

The *Aufbau* is both an exemplar of empirical reductionism and also an assertion of objectivity. It seeks to justify scientific knowledge by way of a reductive project that is coupled with the resources of formal logic. It seeks to demonstrate how scientific knowledge can be viewed as objective despite its origin in subjective experience.

Theory

The central postulation in Carnap's work is that of a 'construction theory' or 'constitution theory'. The author argues that constitution systems are able to build a web of knowledge upon an underlying domain, which in turn reveals the unity of scientific knowledge that is otherwise obscured by the divisions between the different science domains such as that of Physics and Biology. He argues that scientific objects are constituted out of foundational, basic objects and that, accordingly, all scientific theories or statements can be expressed ultimately in exclusively structural (and logical) terms.

He seeks to demonstrate these features by showing that all mental concepts can be constituted from a single basic concept, coupled with Frege's logical vocabulary including functional concepts such as 'and', 'or', 'exist', and 'not exist'. Carnap's identification of a basic concept pertains to the relation of phenomenal similarity, which concerns individual segments from the temporal experience of consciousness. All other concepts are thereafter constituted from this foundational entity by way of definitions incorporating the basic relation and logical symbols only. So, if an individual has two experiences comprising the music pitch B-flat but each has a different timbre, then the experiences are positioned against each other in this relation of similarity. Likewise, concepts pertaining to distinct visual qualities, such as the tones associable with any particular color, are demarcated by way of relations of similarity.

Accordingly, all objects conceived and described by empirical science can be identified by way of their relation to other scientific objects, by way of their structural context. Carnap used the example of railway stations. He outlined how the network of line connections between the stations alone can provide a structural description of each specific railway station.

Carnap explored a method for constituting the physical world and the physical objects within the

mental (epistemic) context. He constituted the psychological domain by way of a logical procedure that he named 'quasi-analysis', which treats primary experiences as infallible and irreducible units, and which enables objects to be located by way of a coordination of the perceptual realm with the physical world, represented as numerical state magnitudes.

Carnap asserted that all concepts pertaining to the world external to the mind are constituted by way of the same kind of structural context, including all spatial and temporal concepts. Events and behavior are constituted in terms of relations of motion, and thereafter mental states ascribed to other people and the intersubjective world of discourse is constituted in terms of events and behavior. He asserted that all cultural conventions, including all shared conceptual understanding of scientific objects, are rooted in this same simple basic concept.

Carnap continued further to assert that his constitution system encompasses all genuinely factual issues. Any subject matter dealing with subjects beyond the system, such as that pertaining to the "essence" or "nature" of the mind and body or their relation, is either redundant or at most comprising of ill-formed questions.

Finally, at the end of the *Aufbau*, Carnap concluded that the simple basic concept of phenomenal similarity is itself reducible. It can be constituted entirely by way of logical terms. Accordingly, all expressions, and all objective existence, can be reduced to basic logical expressions. Additional languages, such as those using spoken media, are used only for further elucidations upon the core logic.

Influence

In some respects, Carnap's work can be viewed as an exemplar of its era, of the logical positivism that flourished in the second quarter of the twentieth century. However the approach did not last for long.

His contemporary, Ludwig Wittgenstein, published a *Tractatus*³⁹ that seeks, in a similar fashion, to outline a constitution system describing the world as constructed from propositional expressions. However his later work took a very different approach. Wittgenstein's *Philosophical Investigations*⁴⁰ rejected Carnap's constitution method completely. It argued that most expressions cannot be associated with a single definition at all. He used the example of the expression 'game'. He showed that the word is used in such a broad fashion that no criteria can be identified as common to its usage. He argued that this example shows how language expressions cannot be expressed in terms of definitions with necessary and sufficient conditions, which in turn can reveal an underlying structure. There is no such thing as a proposition; all concepts are merely archetypes or models.

The most influential refutation of Carnap's justification for the objectivity of science knowledge

³⁹ Look online for Wittgenstein, Ludwig, 1922. *Tractatus Logico-Philosophicus*. <http://people.umass.edu/klement/tlp/>, Feb 2018.

⁴⁰ This volume is only in print. See Wittgenstein, Ludwig, 1953. *Philosophical Investigations*, trans. Hacker and Schulte. Wiley-Blackwell, 2009.

came from Willard Quine⁴¹. He argued that Carnap's definition of a phenomenal domain by way of objective spacetime points x , y , z , & t (for time) was unconvincing given it requires non-phenomenal notions to assert the notion that all notions are phenomenal.

More recently there has been a resurgence of interest in Carnap's approach to reduction, such as that of David Chalmers' 'Constructing the World'.⁴² Chalmers began by identifying the main weakness in Carnap's approach that leads to difficulties. The Aufbau structures constitution systems in terms of propositions, of linguistic expressions, rather than in terms of concepts themselves, which are often abstract. However these systems rely upon the use of clear definitions of terms, which, given language is ambiguous and there will always be exceptions and counterexamples to any definition, turns out to be impossible.

Responding to arguments such as those made by Wittgenstein and Quine against a descriptivist approach, Chalmers suggested a different approach to justifying the structure of knowledge. Whereas Carnap's structures depend on extensional sufficiency, on the objective truth of any expression, Chalmers argued that ensuring an expression and its respective definition are linked semantically requires intensional sufficiency. He argued that this approach overcomes the vagueness of language by encompassing the manner in which any particular expression is used in various epistemically possible situations. Rather than requiring exact definitions, it employs the use of idealized (or approximate, or conditional) definitions. It relies upon contexts and the associated circumstances whereby individuals can comprehend an expression's meaning (its intention) without capturing an exact definition.

Chalmers argued that justifications for a structure of knowledge built upon a basic simple concept (or concepts) can look to a broad range of tools such as analyticity (i.e. factual by way of meaning), the *a priori* (i.e. factual without validation from experience) and necessity (i.e. factual in all possible situations). He argued that this approach is more secure in allowing reduction relations between single basic expressions (or a compact class of expressions) and other expressions, which is called the scrutability relationship.

Pedagogical Questions

1. What is the relationship between mental concepts and material objects?
2. Mathematics problem-solving requires the simplification of expressions by way of deductive entailment (e.g. $2x=2$ entails $x=1$). Is this form of entailment equally possible in verbal language?
3. In what way are concepts based upon micro-concepts or fundamental/foundational concepts?

⁴¹ Yet again, Quine, Willard. *Two Dogmas of Empiricism*. Philosophical Review 60 (1): 20–43, 1951.

⁴² For a remarkable follow-up to Carnap, see Chalmers, David. *Constructing the World*. Oxford University Press, 2012.

Quotes

"The present investigations aim to establish a "construction system", that is, an epistemological system of objects or concepts. The word "object" is here always used in its widest sense, namely, for anything about which a statement can be made. Thus, among objects we count not only things, but also properties and classes, relations in extension and intension, states and events, what is actual as well as what is not. Unlike other conceptual systems, a constructional system undertakes more than the division of concepts into various kinds and the investigation of the differences and mutual relations between these kinds. In addition, it attempts a step-by-step derivation or "construction" of all concepts from certain fundamental concepts, so that a genealogy of concepts results in which each one has its definite place. It is the main thesis of construction theory that all concepts can in this way be derived from a few fundamental concepts, and it is in this respect that it differs from most other ontologies." (Carnap 1969, 5)

"The chief task of this book will be to find a suitable method for the semantical analysis of meaning, that is, to find concepts suitable as tools for this analysis. The concepts of the intension and the extension of an expression in language will be proposed for this purpose. ... The pair of concepts, extension-intension, is in some respects similar to the pair of Frege's concepts; but it will be shown that the latter pair has serious disadvantages which the former avoids. The chief advantage of the method of applying the latter pair is that, in order to speak about, say, a property and the corresponding class, two different expressions are used. The method of extension and intension needs only one expression to speak about both the property and the class and, generally, one expression only to speak about an intension and the corresponding extension." (Carnap 1947, 2)

Carnap, Rudolf, 1928. *The Logical Structure of the World*, trans. R. George. Chicago, Open Court Classics, 1969.

Carnap, Rudolf. *Meaning and Necessity*. University of Chicago Press, 1947.

Introduction to the music

The strings assert an ontology of music constitution. Thereafter a homophonic chorale in the wind section posits a reductive genealogy of pitches. Consequently the brass outlines a foundational motif.

Philip Armstrong

Philip Armstrong

Philip Armstrong

Philip Armstrong

C A reductive genealogy of pitches

26

Picc. *p* *p*

Fl. *p* *mp* *pp*

Fl. *p* *pp* *mp* *pp*

Ob. *p* *p*

C. A. *p* *mp* *pp*

Cl. *p*

Cl. *p*

B. Cl. *mp* *pp* *mp* *pp*

Bsn. *p* *pp*

Cbsn. *p* *pp*

Hn. *p*

Hn. *p*

Hn. *p*

C. Tpt. *p* *p*

C. Tpt. *p* *p*

C. Tpt. *p* *p*

Tbn. *p* *p*

B. Tbn. *p* *p*

Tbn. *p*

1: A, 2: E, 3: C, 4: F#

Temp. *p*

Cym. *p* *sizzle*

Hp. *p*

C A reductive genealogy of pitches

Vln. I *p* *gliss.* *p* *gliss.* *p* *nat.* *mp*

Vln. II *p* *gliss.* *p* *gliss.* *p* *nat.* *pp* *mp* *pp*

Vla. *p* *gliss.* *p* *gliss.* *p* *nat.* *pp* *mp* *pp*

Vc. *mp* *p* *pp* *mp* *pp*

Cb. *pp* *mp* *pp* *div.*

D A foundational motif

Violins I and II, Viola, Violoncello, and Contrabasso score. The score is divided into two systems. The first system shows measures 1-3, and the second system shows measures 4-6. The Violins I and II parts feature complex rhythmic patterns and dynamics ranging from *p* to *pp*. The Viola part includes triplets and a trill. The Violoncello and Contrabasso parts provide a harmonic foundation with various dynamics and articulations.

Philip Armstrong

3/4

Picc. *p* *mf* *p* *mf* *p*

Fl. *mp* *p* *mf* *p* *mf* *p*

Fl. *mp* *p* *mf* *p* *mf* *p*

Ob. *mf* *p*

C. A. *p* *mp* *p* *mf* *p*

Cl. *pp* *mf* *p*

Cl. *pp* *mp* *p*

B. Cl. *p* *pp* *mp* *pp*

Bsn. *p* *pp* *mp* *pp*

Cbsn. *p* *pp* *mp* *pp*

Hn. *p* *mp* *p*

Hn. *mp* *p*

Hn. *p* *mp* *p*

C Tpt. *mf* *p*

C Tpt. *mf* *p*

C Tpt. *mf* *p*

Tbn. *p* *mf*

B. Tbn. *p* *mf*

Tbn. *p* *mf*

Timp. *p* *mf* *p*

B. D. *pp*

Cym. *pp*

Hp. *p* *mf* *p*

Vln. I *nat.* *pp* *mp* *pp*

Vln. II *pp*

Vla. *mp* *pp*

Vc. *mp* *pp*

Cb. *mp* *pp*

11. Philip Armstrong

The Liszt Paradox / *Das Liszt-Paradoxon*
[2018/9]

11. Philip Armstrong: The Liszt Paradox

The eleventh section explores the text 'The Liszt Paradox' [*Das Liszt-Paradoxon*] written by Philip Armstrong in 2018/2019.

Introduction

Philip Armstrong (1961) studied music composition at the Royal Academy of Music in London and with Peter Racine Fricker at the University of California, Santa Barbara. He has been Director and teacher of Theory of Knowledge at Thuringia International School in Weimar since 2013.

Theory

By the mid-nineteenth century Franz Liszt had become a celebrated exponent of an innovative approach to writing music, which he called the *Zukunftsmusik*, the 'Music of the Future'. In opposition to the traditionalists of the era who espoused the notion of 'absolute music', he became champion of the modernists' position asserting the notion of 'program music'. Combining his Catholic faith with these premises, he declared that not only is music a medium of narrative expression but subsequently it is also equivalent to God's very nature. His convictions were challenged by a series of events that led him to the realisation that the orthodox doctrine of his faith posited that God's nature is all-encompassing and accordingly has no distinguishing narrative or semantic program. Liszt was unable to resolve the paradox between the mereological structure of music and that of the divine. He explained the contradiction as a mystery and sought to counter its significance by writing religious music characterised by narrative expression.

Chapter 1 describes the state of affairs as they existed during Liszt's first decade in Weimar from 1848. It begins in section 1.1 by outlining how Liszt established himself as a composer with a radically new approach to creating music, using inventive approaches to form and structure that were best suited to an orientation around narrative and program content. It was an approach that asserted the semantics and aesthetics of music did not lie exclusively within formal aspects of music alone, in the notes, in the design and structure and other intrinsic parameters, but in other domains extending beyond the written music, not least of which, within the Romantic context of the era, was its extra-musical content. However Liszt's valuing of narrative semantics was opposed by those espousing the intrinsic nature of musical meaning, whereby semantics and aesthetics were viewed as integral components of music. If there was such a thing as extra-musical content, then it had nothing to do with the music itself.

The Battle of the Romantics involved, on one side, Liszt and Wagner with the support of writers such as Brendel espousing an approach valuing innovation and originality, the ideas of which are summarised in section 1.2, and on the other side, Schumann and Brahms with the support of writers such as Hanslick espousing a traditionalist revering of the classical masters, the ideas of which are summarised in section 1.3.

Section 1.4 examines the crucial issues that were at the heart of the disagreements, including disparities in opinion about how to handle Sonata Form and other established structural conventions

previously essential to the symphony, the modernists' assertion of the shared properties and unity of the arts against the traditionalists' affirmation of their uniqueness and separation from one another, and, as previously indicated, the modernists' veneration of narrative content and semantic originality against the traditionalists' respect for formal elements. These matters in turn pointed to notions of identity, of constituent relations, substance and referents, and of modality. Sections 1.5 and 1.6 explore these notions further by means of an examination of Identity Theory and of matters pertaining to equivalence, co-designation, and sortal criteria.

In the context of analysing the identity relation between form and semantics, section 1.7 examines the notion of equivalence as it is represented by higher-order logic. It reveals how Liszt and the modernists were arguing that an identity-relation between the set {form, semantics} implies there is a first-order function-entity 'music' whereby {music (form), music (semantics)}.

$$(\forall \alpha, \beta)(\exists \mathcal{I})(\alpha, \beta) \rightarrow (\exists \mathcal{F})\alpha, \mathcal{F}\beta$$

Figure 1: Liszt's first-order identity (explained further in figure 32)

It then reveals the nature of Brahms' and the traditionalists' disputation of this approach. They were arguing that music formalism and music semantics are necessarily coincident (the same)/identical in music. It is an assertion that an identity-relation between the set {form, semantics} implies there is a first-order function-entity 'music' whereby {music (form), music (semantics)} is subject to a second-order identity relation.

$$(\forall \alpha, \beta)(\exists \mathcal{I})(\alpha, \beta) \rightarrow (\exists \mathcal{F}, \mathcal{R})(\mathcal{F}\alpha, \mathcal{F}\beta)$$

Figure 2: Brahms' second-order identity (explained further in figure 33)

Section 1.8 concludes the chapter by looking at a particular event that is speculated to have occurred in Weimar, namely the Statue Incident, whereby Liszt was led to apply his intuitive understanding of music identity to the realms of his Catholic faith.

Chapter 2 examines the nature of what is called here in this article, the Dynamic Event, the circumstances that lay behind a difficult time in Liszt's life and his eventual departure from Weimar. Section 2.1 outlines how this period of deep frustration led him to a re-examination of priorities. In this context, section 2.2 examines Liszt's ongoing commitment to the Catholic faith.

Section 2.3 examines the doctrine of the Holy Trinity in terms of identity theory, and section 2.4 describes how the Dynamic Event occurred at the time Liszt realised that identity relations could be seen as synonymous between that of music and that of religious doctrine. He understood intuitively that, according to orthodox Catholic doctrine, the persons of the Trinity are necessarily coincident (the same) and indiscernible in God. If there is an identity relation $\mathcal{I}$ between the members of the Trinity, then there is a particular first-order property function $\mathcal{G}$ that is employed by the members, and which is subject to a second-order identity-relation $\mathcal{R}$.

$$(\forall \alpha, \beta, \gamma)(\exists \mathcal{I})(\alpha, \beta, \gamma) \rightarrow (\exists \mathcal{G}, \mathcal{R})(\mathcal{G}\alpha, \mathcal{G}\beta, \mathcal{G}\gamma)$$

Figure 3: higher-order identity pertaining to the Trinity (explained further in figure 41)

Liszt understood further that, according to non-orthodox and heretical doctrine, the persons of the Trinity may sometimes be coincident (the same) but they are not necessarily identical in God. If there is an identity relation $\mathcal{I}$ between the members of the Trinity, then there is a particular property function $\mathcal{G}$ that is employed by the members.

$$(\forall \alpha, \beta, \gamma)(\exists \mathcal{I})(\alpha, \beta, \gamma) \rightarrow (\exists \mathcal{G})\alpha, \mathcal{G}\beta, \mathcal{G}\gamma$$

Figure 4: qualitative equivalency pertaining to the Trinity (explained further in figure 39)

Liszt realised that, given music is interpreted by all parties as equivalent to God's nature, then it is significant that there is equivalency between the Brahms and Hanslick definition of music and orthodox Catholic doctrine, as shown below.

$$(\forall \alpha, \beta)(\exists \mathcal{F}, \mathcal{R})(\mathcal{F}\alpha, \mathcal{F}\beta) \leftrightarrow (\exists \mathcal{G}, \mathcal{R})(\mathcal{G}\alpha, \mathcal{G}\beta, \mathcal{G}\gamma)$$

Figure 5: equivalency of traditionalists' music formalism and orthodox Trinitarian doctrine (explained further in figure 44)

Liszt realised further, in the context of his commitment to both 'program music' and the Catholic faith, it is significant that there is equivalency between his definition of music semantics as possessing contingent content and heretical doctrine, as shown below.

$$(\forall \alpha, \beta)(\exists \mathcal{F})\mathcal{F}\alpha, \mathcal{F}\beta \leftrightarrow (\exists \mathcal{G})\mathcal{G}\alpha, \mathcal{G}\beta, \mathcal{G}\gamma$$

Figure 6: equivalency of program music and heretical Trinitarian doctrine (explained further in figure 45)

Chapter 3 describes how Liszt was unable to explain the paradox, the contradiction between the mereological structure of music and that of the divine. He explained the contradiction as a metaphysical mystery and sought to counter its significance by writing religious music characterised by narrative expression.

Pedagogical Questions

1. What is identity? What is the nature of the identity relationship between music formalism and music semantics?
2. What are Ontological relations? How can abstract entities such as music be described in terms of constituent composition?
3. What is metaphysical substance? What is required to make ontological commitment to a framework of construction?
4. What is a metaphysical referent? What entities can be said to exist?
5. What is modality? What entities can be said to exist necessarily and contingently?

Quotes

“If the celebrated philosopher Gottfried Wilhelm Leibniz, he who had come up with the notion of the Identity of Indiscernibles in the first place, writing thereafter in his *Theodicy* of 1710, could declare himself a ‘Mysterian’, then surely Liszt could do the same. In his case, he could do far more than that. Even if the paradox lay at the core of his beliefs and values unresolved, still he could write his program music emulating the very metaphysical mystery of God that eluded him, thus asserting both his faith and his refusal to be defeated by its unfathomable truths.” (Armstrong 57)

Armstrong, Philip M. *The Liszt Paradox*. 2018/2019.

Introduction to music

The strings begin with an assertion of identity. The music asks: what is the nature of the identity relationship between music formalism and music semantics? Thereafter dynamic rhythms in the brass and percussion avow the notion of ontological relations. The music wonders: how can abstract entities such as music be described in terms of constituent composition? In a further section, a wind chorale proclaims the notion of metaphysical substance. The music asks: what is required to make ontological commitment to a framework of construction? And the energetic pulses in the strings and brass affirm the notion of a metaphysical referent. The music deliberates: what entities can be said to exist? At the conclusion, a hymn-like figure in the full orchestra proclaims the notion of modality. The music asks: what entities, if they exist, can be said to exist either necessarily or contingently?

The Liszt Paradox

Philip Armstrong

Adagietto $\text{♩} = 80$

Piccolo

Flute 1

Flute 2

Oboe

Cor Anglais

Clarinet 1

Clarinet 2

Bass Clarinet in Bb

Bassoon

Contrabassoon

Horn 1

Horn 2

Horn 3

Trumpet 1

Trumpet 2

Trumpet 3

Trombone

Bass Trombone

Tuba

Timpani

Cymbals

Hi-Hat Cymbal

Bass Drum

Adagietto $\text{♩} = 80$

Violin I

Violin II

Viola

Violoncello I

Contrabass

1: F#; 2: Eb; 3: C; 4: G

A

9

Picc.

Fl. 1

Fl. 2

Ob.

C. A.

Cl. 1

Cl. 2

B. Cl.

Bsn.

Cbsn.

Hn. 1

Hn. 2

Hn. 3

Tpt. 1

Tpt. 2

Tpt. 3

Tbn.

B. Tbn.

Tba.

Timp.

Hp.

A

Vln. I

Vln. II

Vla.

Vcl.

Cb.

B

16

Picc.

Fl. 1

Fl. 2

Ob.

C. A.

Cl. 1

Cl. 2

B. Cl.

Bsn.

Cbsn.

Hn. 1

Hn. 2

Hn. 3

Tpt. 1

Tpt. 2

Tpt. 3

Tbn.

B. Tbn.

Tba.

Timp.

B. D.

S. D.

Hp.

1: F#; 2: Eb; 3: C; 4: G

p *mp* *mf* *f*

B

Vln. I

Vln. II

Vla.

Vc.

Cb.

tutti

p *mp* *mf* *f*

pizz.

arco

C Of Identity

24

Vln. I *mf* *f* *p* *mf*

Vln. II *mf* *f* *p* *p* *mf*

Vla. *mf* *f* *p* *p* *mf*

Vc. *mf* *f* *p* *mf* *f*

Cb. *f* *p* *mf* *p* *mf* *f*

D

31

Vln. I *f* *p* *f* *p* *f* *p* *f*

Vln. II *f* *p* *f* *p* *f* *p* *f*

Vla. *f* *p* *f* *p* *f* *p* *f*

Vc. *f* *p* *f* *p* *f* *p* *f*

Cb. *p* *f* *p* *f* *p* *f* *p*

39

Fl. I *mp*

Ob. *mp*

C. A. *mp*

Cl. I *mp* *p*

Bsn. *p*

Cbsn. *p*

DC:B/EF:GA

Hp. *p* *p*

Vln. I *p* *solo* *mp* *solo* *tutti* *p* *tutti*

Vln. II *p* *solo* *mp* *solo* *tutti* *p* *tutti*

Vla. *p* *solo* *mp* *solo* *tutti* *p* *tutti*

Vc. *f* *p* *solo* *mp* *solo* *tutti* *p* *tutti*

Cb. *p* *p*

poco accel. [E] Andante $\text{♩} = 92$ Of Constituent Relations

49

Picc.

Fl. 1

Fl. 2

Ob.

C. A.

Cl. 1

Cl. 2

B. Cl.

Bsn.

Chsn.

Hr. 1

Hr. 2

Hr. 3

Tpt. 1

Tpt. 2

Tpt. 3

Tbn.

B. Tbn.

Tba.

Timp.

B. D.

S. D.

Hi-Hat

B. D.

Hr.

poco accel. [E] Andante $\text{♩} = 92$ Of Constituent Relations

Vln. I

Vln. II

Vla.

Vc.

Cb.

Dr/Cb/F#

54

Picc.

Fl. 1

Fl. 2

Ob.

C. A.

Cl. 1

Cl. 2

B. Cl.

Bsn.

Cbsn.

Hn. 1

Hn. 2

Hn. 3

Tpt. 1

Tpt. 2

Tpt. 3

Tbn.

B. Tbn.

Tba.

Timp.

S. D.

Hi-Hat

B. D.

Hp.

Vln. I

Vln. II

Vla.

Vc.

Cb.

F

58

Picc. *mf* *p*

Fl. 1 *mf* *p*

Fl. 2 *p* *mf* *p*

Ob. *mf* *p*

C. A. *mf* *p*

Cl. 1 *f* *p* *f* *p*

Cl. 2 *mf* *p*

B. Cl. *p* *mf* *p*

Bsn. *f* *p*

Cbsn. *f* *p*

Hn. 1

Hn. 2

Hn. 3

Tpt. 1 *p*

Tpt. 2

Tpt. 3

Tbn.

B. Tbn.

Tba.

Timp. *f* *p*

S. D. *f*

Hi-Hat *p* *f*

B. D. *p* *f*

Hp. *p*

F

Vln. I *p* *mf* *p*

Vln. II *mf* *p*

Vla. *mf* *p*

Vc. *f* *p* *f* *p*

Cb. *f* *p* *f* *p*

closed *open*

tr *tr*

tr *tr*

pp *mp* *pp*

pp *mp*

pp *mp*

pp

62

Picc. *p* *mf* *p* *mf* *p*

Fl. 1 *p* *mf* *p* *mf* *p*

Fl. 2 *mf* *p* *mf* *p*

Ob.

C. A.

Cl. 1

Cl. 2

B. Cl.

Bsn.

Cbsn.

Hn. 1

Hn. 2

Hn. 3

Tpt. 1 *p* *mp*

Tpt. 2 *p*

Tpt. 3 *p*

Tbn.

B. Tbn.

Tba.

Timp.

Hp.

Vln. I *mp* *pp* *mp* *pp* *mp* *mf*

Vln. II *pp* *mp* *pp* *mp* *pp* *mp* *mf*

Vla. *pp* *mp* *pp* *mp* *pp* *mf*

Vcl. *mp* *pp* *mp* *pp* *mp* *pp* *pp* *mf*

Cb.

G

G

H

67

Picc.

Fl. 1

Fl. 2

Ob.

C. A.

Cl. 1

Cl. 2

B. Cl.

Bsn.

Cbsn.

Hn. 1

Hn. 2

Hn. 3

Tpt. 1

Tpt. 2

Tpt. 3

Tbn.

B. Tbn.

Tba.

Timp.

B. D.

S. D.

Hp.

Vln. I

Vln. II

Vla.

Vc.

Cb.

H

75

Picc. *mp* *f*

Fl. 1 *mp* *f*

Fl. 2 *mp* *f*

Ob. *mp* *f*

C. A. *mp* *f*

Cl. 1 *mp* *mf* *p* *p* *mf* *p*

Cl. 2 *mp* *mf* *p* *p* *mf* *p*

B. Cl. *p* *mf*

Bsn. *mf* *mp* *f* *mp* *f*

Cbsn. *mf*

Hr. 1

Hr. 2

Hr. 3

Tpt. 1

Tpt. 2

Tpt. 3

Tbn.

B. Tbn.

Tba.

Timp. *p* *f*

T. D. *p*

B. D. *mf*

Hi-Hat *p* *f* *p* *f* *p* *f*

Tamb. *f*

B. D. *f* *p* *f*

Hp. *mf* *mp* *f* *mp* *f*

Vln. I

Vln. II *mf*

Vla. *mf*

Vc. *mf* *mp* *f* *mp* *f*

Cb. *mf*

The image displays a musical score for the song "The Sound of Silence" by Simon & Garfunkel. The score is arranged for piano and percussion. The piano part is written in G major, 4/4 time, and features a complex, arpeggiated melody in the right hand and a more rhythmic bass line in the left hand. The percussion part includes a snare drum, hi-hat, and cymbal, providing a steady, rhythmic accompaniment. The score is divided into two systems, with the first system covering measures 1 through 8 and the second system covering measures 9 through 16. The piano part begins with a soft, arpeggiated melody, while the percussion part enters with a steady snare drum and hi-hat pattern. The overall mood is quiet and contemplative, reflecting the song's title and lyrics.

I Of Constituent Substance

Violin I

Violin II

Viola

Violoncello

Contrabasso

mp < f mp < f mp < f mp < f mp < f mp < f mp < f

88

Picc. *mp* *f* *mp* *f* *mp* *f* *mp* *f*

Fl. 1 *mp* *f* *mp* *f* *mp* *f* *mp* *f*

Fl. 2 *mp* *f* *mp* *f* *mp* *f* *mp* *f*

Ob. *mp* *f* *mp* *f* *mp* *f* *mp* *f*

C. A. *f* *mp* *f* *mp*

Cl. 1 *f* *mp* *f* *mp*

Cl. 2 *f* *mp* *f* *mp*

B. Cl. *f* *mp* *f* *mp*

Bsn. *mp*

Cbsn. *mp*

Hn. 1

Hn. 2

Hn. 3

Tpt. 1 *f* *mp* *f* *mp*

Tpt. 2 *f* *mp* *f* *mp*

Tpt. 3 *f* *mp* *f* *mp*

Tbn. *mp*

B. Tbn. *mp*

Tba. *mp*

Timp.

T. D. *p* *f* *p* *f* *p* *f* *p* *f*

Hi-Hat *f* *p* *f*

Tamb. *f* *p*

Wind C.

B. D. *p* *f*

Hp. *f* *p*

Vln. I *mp* *f* *mp* *f* *mp* *f* *mp* *f*

Vln. II *mp* *f* *mp* *f* *mp* *f* *mp* *f*

Vla. *mp* *f* *mp* *f* *mp* *f* *mp* *f*

Vc. *mp* *f* *mp* *f* *mp* *f* *mp* *f*

Cb. *mp* *f* *mp* *f* *mp* *f* *mp* *f*

J

96

Picc. *mf* *f*

Fl. 1 *mf* *f*

Fl. 2 *mf* *f*

Ob. *mp* *f*

C. A. *mp* *f* *mp* *f*

Cl. 1 *mp* *f* *mp*

Cl. 2 *p* *mf* *f*

B. Cl. *p* *mf* *p < f* *p < f*

Bsn. *p < f* *p < f*

Cbsn. *mf* *p < f* *p < f*

Hr. 1 *p < f* *p < f* *p* *f*

Hr. 2 *p < f* *p < f* *p* *f*

Hr. 3 *p < f* *p < f* *p* *f*

Tpt. 1 *p* *f* *p < f* *p < f* *f*

Tpt. 2 *p* *f* *p < f* *p < f* *f*

Tpt. 3 *p* *f* *p < f* *p < f* *f*

Tbn. *p* *mf* *p < f* *p < f* *f*

B. Tbn. *p* *mf* *p < f* *p < f* *f*

Tba. *p* *mf* *p < f* *p < f* *f*

Timp. *f*

T. D. *f*

B. D.

Cow. *p < f* *p < f* *f*

Hp. *f*

J

Vln. I *f > p* *f > p* *f > p* *f > p* *f > p* *mp* *f*

Vln. II *mp* *f*

Vla. *mp* *f* *mp* *f* *f* *f*

Vc. *p* *f* *f* *f*

Cb. *mp* *f*

K Of Constituent Referents

104

Picc. *f* *f*

Fl. 1 *f* *f*

Fl. 2 *f* *f*

Ob. *f* *f*

C. A. *f* *f*

Cl. 1 *f* *f*

Cl. 2 *f* *f*

B. Cl. *p < f* *p < f* *p < f*

Bsn. *p < f* *p < f* *p < f*

Cbsn. *p < f* *p < f* *p < f*

Hn. 1 *p < f* *p < f* *p < f* *f*

Hn. 2 *p < f* *p < f* *p < f* *f*

Hn. 3 *p < f* *p < f* *p < f* *f*

Tpt. 1 *f* *f* *p < f*

Tpt. 2 *f* *f* *p < f*

Tpt. 3 *f* *f* *p < f*

Tbn. *p < f* *p < f* *p < f* *f*

B. Tbn. *p < f* *p < f* *p < f* *f*

Tba. *p < f* *p < f* *p < f* *f*

Timpani *f* *p < f* *p* *f* *p < f*

B. D. *f*

Cow. *p < f* *p < f* *p < f*

Hp. *f*

K Of Constituent Referents

Vln. I *p < mf* *p < mf* *f* *f* *mf* *f > mf* *f* *mf* *f*

Vln. II *p < mf* *p < mf* *f* *f* *mf* *f > mp* *f* *mf* *f*

Vla. *p* *f* *p < f* *p < f* *f* *f* *f* *f* *mf* *f > mf* *f* *mf* *f*

Vc. *p* *f* *p < f* *p < f* *f* *f* *f* *f* *mf* *f* *mf* *f*

Cb. *p < f* *p < f* *p < f*

[illegible]

This image shows a page from a musical score, likely for a symphony. The score is written for a large ensemble of instruments, including woodwinds, brass, strings, and percussion. The instruments listed on the left side of the page are: Picc., Fl. 1, Fl. 2, Ob., C. A., Cl. 1, Cl. 2, B. Cl., Bsn., Cbsn., Hn. 1, Hn. 2, Hn. 3, Tpt. 1, Tpt. 2, Tpt. 3, Tbn., B. Tbn., Tba., Timp., B. D., Hp., Vln. I, Vln. II, Vla., Vc., and Cb. The score is written in 4/4 time and features various dynamic markings such as *mp*, *f*, *p*, and *mf*. There are also rehearsal marks, including a large 'L' in a box. The music is written in a standard musical notation with staves for each instrument. The page is numbered '115' in the top left corner.

120

M

Picc. *f* *mf* *f* *mf* *f* *mf*

Fl. 1 *f* *mf* *f* *mf* *f* *mf*

Fl. 2 *mf* *f* *mp* *f* *mf* *mp*

Ob. *f* *mf* *f* *mf* *f* *mf*

C. A. *f* *mf* *f* *mf* *f* *mf*

Cl. 1 *f* *mf* *f* *mf* *f* *mf*

Cl. 2 *mf* *f* *mp* *f* *mp* *f*

B. Cl. *p* *f*

Bsn. *f* *p* *f*

Cbsn. *p* *f*

Hr. 1 *p* *mf*

Hr. 2 *p* *mf*

Hr. 3 *p*

Tpt. 1 *p* *f*

Tpt. 2 *p* *f*

Tpt. 3 *p* *f*

Tbn. *f* *p* *f*

B. Tbn. *f* *p* *f*

Tba. *p*

Timp. *p* *f*

B. D.

Hp. *p* *mf* *p*

M

Vln. I *f* *mf* *f* *mf* *f* *mf*

Vln. II *mf* *f* *mp* *f* *mp* *f*

Vla. *f* *mf* *f* *mf* *f* *mf*

Vc. *p* *mf*

Cb. *p*

126

Picc.

Fl. 1

Fl. 2

Ob.

C. A.

Cl. 1

Cl. 2

B. Cl.

Bsn.

Cbsn.

Hn. 1

Hn. 2

Hn. 3

Tpt. 1

Tpt. 2

Tpt. 3

Tbn.

B. Tbn.

Tba.

Timp.

Tamb.

Hp.

Vln. I

Vln. II

Vla.

Vc.

Cb.

p

mf

pp

div.

This page of a musical score is for a large orchestra. It features staves for the following instruments: Piccolo, Flute 1, Flute 2, Oboe, Clarinet in A, Clarinet 1, Clarinet 2, Bassoon, Bassoonist, Horn 1, Horn 2, Horn 3, Trumpet 1, Trumpet 2, Trumpet 3, Trombone, Bass Trombone, Tuba, Timpani, B.D. (Bass Drum), Hi-Hat, Tambourine, Triangle, Harp, Violin 1, Violin 2, Viola, Violoncello, and Contrabass. The score includes various musical notations such as notes, rests, dynamics (p, mf, f), and articulation marks. The page is numbered 134 in the top left corner.

139

Picc. *mf* *p*

Fl. 1 *mf* *p*

Fl. 2 *mf* *p*

Ob. *mf* *p*

C. A. *mf*

Cl. 1 *mf*

Cl. 2 *mf*

B. Cl. *mf*

Bsn. *mf*

Cbsn. *mf*

Hr. 1

Hr. 2

Hr. 3

Tpt. 1 *con sord.* *p*

Tpt. 2 *con sord.* *p*

Tpt. 3 *con sord.* *p*

Tbn. *p*

B. Tbn. *p*

Tba. *p*

Timp.

Hi-Hat *p* *f* *p* *ped.* *p*

Tamb. *mf* *p* *mf* *p* *mf* *p*

Tri. *p*

Hp. *p* *mf* *p*

Vln. I *mf* *p* *gliss.* *mf* *p* *pizz.* *mf* *p* *arco* *mf* *p*

Vln. II *mf* *p* *gliss.* *mf* *p* *div.* *pp* *mf* *p* *unis.* *mf* *p*

Vla. *mf* *p* *gliss.* *mf* *p* *div.* *pp* *mf* *p* *unis.* *mf* *p*

Vc. *mf* *p* *unis.* *mf* *p*

Cb. *mf* *p*

O

143

Picc. *mf* *p* *mf* *p*

Fl. 1 *mf* *p* *mf* *p*

Fl. 2 *mf* *p* *mf* *p*

Ob. *mf* *p* *mf* *p*

C. A. *mf* *p* *mf* *p*

Cl. 1 *mf* *p* *mf* *p*

Cl. 2 *mf* *p* *mf* *p*

B. Cl. *f*

Bsn. *mf* *p* *mf*

Cbsn. *mf* *p* *mf*

Hr. 1 *mf* *p* *mf*

Hr. 2 *mf* *p* *mf*

Hr. 3 *mf* *p* *mf*

Tpt. 1 *open* *p* *f*

Tpt. 2 *open* *p* *f*

Tpt. 3 *open* *p* *f*

Tbn. *mf* *p* *mf* *f*

B. Tbn. *mf* *p* *mf* *f*

Tba. *mf* *p* *mf* *f*

Timp. *p* *f*

B. D. *mf* *f*

Tamb. *> p*

Hp. *mf* *p* *mf* *p*

O

Vln. I *mf* *p* *mf* *p* *gliss.* *f* *mf* *f* *mf*

Vln. II *mf* *p* *mf* *p* *gliss.* *f* *mp* *f* *mf*

Vla. *p* *p* *mf* *p* *gliss.* *f* *mf* *f* *mf*

Vc. *mf* *p* *mf*

Cb. *mf* *p* *mf*

148

Picc.

Fl. 1

Fl. 2

Ob.

C. A.

Cl. 1

Cl. 2

B. Cl.

Bsn.

Cbsn.

Hn. 1

Hn. 2

Hn. 3

Tpt. 1

Tpt. 2

Tpt. 3

Tbn.

B. Tbn.

Tba.

Timp.

B. D.

S. D.

Hi-Hat

B. D.

Vin. I

Vin. II

Vla.

Vc.

Cb.

149

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552

5

153

Picc. *mf* *p*

Fl. 1 *mf* *p*

Fl. 2 *mf* *p*

Ob.

C. A. *mf* *p*

Cl. 1 *p*

Cl. 2

B. Cl.

Bsn.

Cbsn.

Hr. 1 *f* *p*

Hr. 2 *mf* *p*

Hr. 3 *p* *mf* *p*

Tpt. 1 *mf* *p*

Tpt. 2 *mf* *p*

Tpt. 3 *mf* *p*

Tbn. *f* *p* *f* *p*

B. Tbn. *f*

Tba. *f*

Timp. *f* *p*

Hi-Hat *p* *p* *f* *p*

B. D. *p* *f*

Hr. *p*

Dt/Cs/Fs

Vln. I *p* *mf* *p* *pp* *mp* *pp* *mp* *pp* *mp*

Vln. II *mf* *p* *mf* *p* *pp* *mp* *pp* *mp* *pp*

Vla. *mf* *p* *pp* *mp* *pp* *mp* *pp* *mp* *pp*

Vc. *f* *p* *f* *p* *pp* *mp* *pp* *mp* *pp*

Cb. *f* *p* *f* *p*

Q

157

Picc. *mf* *p* *mf* *p*

Fl. 1 *mf* *p* *mf* *p*

Fl. 2 *mf* *p* *mf* *p*

Ob.

C. A.

Cl. 1 *mp* *mf* *p* *p* *mf* *p*

Cl. 2 *mp* *mf* *p* *p* *mf* *p*

B. Cl. *p* *mf*

Bsn.

Cbsn.

Hn. 1

Hn. 2

Hn. 3

Tpt. 1 *mp* *p*

Tpt. 2 *mp*

Tpt. 3

Tbn.

B. Tbn.

Tba.

Timp.

Hi-Hat *p* *f* *p* *f* *p*

Tamb. *f*

B. D. *f* *f* *p* *f*

Hr.

Q

Vln. I *pp*

Vln. II *mp* *pp*

Vla. *mp* *pp*

Vc. *mp* *pp*

Cb.

169

Picc. *mp* *f* *mp* *f* *mp*

Fl. 1 *mp* *f* *mp* *f* *mp*

Fl. 2 *mp* *f* *mp* *f* *mp*

Ob. *mp* *f* *mp* *f* *mp*

C. A. *f* *mp* *f* *mp* *f* *mp* *f* *mp*

Cl. 1 *f* *mp* *f* *mp* *f* *mp* *f* *mp*

Cl. 2 *f* *mp* *f* *mp* *f* *mp* *f* *mp*

B. Cl. *f* *mp* *f* *mp* *f* *mp* *f* *mp*

Bsn. *mp*

Cbsn. *mp*

Hn. 1

Hn. 2

Hn. 3

Tpt. 1 *f* *mp* *f* *mp* *f* *mp* *f* *mp*

Tpt. 2 *f* *mp* *f* *mp* *f* *mp* *f* *mp*

Tpt. 3 *f* *mp* *f* *mp* *f* *mp* *f* *mp*

Tbn. *mp*

B. Tbn. *mp*

Tba. *mp*

Timp.

Hi-Hat *f* *p* *f* *p* *f* *p* *f*

Tamb. *f*

B. D. *f* *p* *f*

Hr. *f* *p* *f* *p*

Vln. I *mp* *f* *mp* *f* *mp*

Vln. II *mp* *mp* *mp*

Vla. *mp* *mp* *mp*

Vc. *mp*

Cb. *mp* *f* *mp* *f* *mp*

S

177

Picc. *f mp f mf*

Fl. 1 *f mp f mf*

Fl. 2 *f mp f mf*

Ob. *f mp f mp f*

C. A. *mp f mp f*

Cl. 1 *mp f mp*

Cl. 2 *p mf*

B. Cl. *p mf p < f p < f*

Bsn. *p < f p < f*

Cbsn. *mf p < f p < f*

Hn. 1 *p < f p < f p*

Hn. 2 *p < f p < f p*

Hn. 3 *p < f p < f p*

Tpt. 1 *p f p f p < f*

Tpt. 2 *p f p f p < f*

Tpt. 3 *p f p f p < f*

Tbn. *p mf p < f p < f*

B. Tbn. *p mf p < f p < f*

Tba. *p mf p < f p < f*

Timp. *f*

Wind C. *mp*

S

Vln. I *f mp f > p f > p f > p f > p f > p mp f*

Vln. II *mp f*

Vla. *mp f mp*

Vc. *p*

Cb. *f mp f mp*

183

Picc. *f*

Fl. 1 *f*

Fl. 2 *f*

Ob.

Cl. A.

Cl. 1 *f*

Cl. 2 *f*

B. Cl. *f*

Bsn.

Cbsn.

Hn. 1 *f*

Hn. 2 *f*

Hn. 3 *f*

Tpt. 1 *f*

Tpt. 2 *f*

Tpt. 3 *f*

Tbn. *f*

B. Tbn. *f*

Tba. *f*

Timp. *f*

B. D. *f*

Cow. *f*

Hp. *f*

Vln. I *f*

Vln. II *f*

Vla. *f*

Vc. *f*

Cb. *f*

185

Picc. *f*

Fl. 1 *p* *f*

Fl. 2 *p* *f*

Ob. *p* *f*

C. A. *p* *f*

Cl. 1 *mp* *p* *f*

Cl. 2 *p* *f*

B. Cl. *p* *f*

Bsn. *p* *f*

Cbsn. *p* *f*

Hr. 1 *p* *f*

Hr. 2 *p* *f*

Hr. 3 *p* *f*

Tpt. 1 *p* *f*

Tpt. 2 *p* *f*

Tpt. 3 *p* *f*

Tbn. *p* *f*

B. Tbn. *p* *f*

Tba. *p* *f*

Timp. *p* *f*

Cym. *p*

B. D. *p*

Cow. *p* *f*

Hr. *p* *f*

Vln. I *p* *mf*

Vln. II *p* *mf*

Vla. *f*

Vc. *f*

Cb. *p* *f*

189

T Of Modality

Picc. *f* *mf*

Fl. 1 *f* *mf*

Fl. 2 *f* *mf*

Ob. *mf*

C. A. *mf*

Cl. 1 *mf*

Cl. 2 *mf*

B. Cl. *mf*

Bsn. *p* *f* *mf*

Chsn. *mf*

Hr. 1 *f*

Hr. 2 *f*

Hr. 3 *f*

Tpt. 1 *f*

Tpt. 2 *f*

Tpt. 3 *f*

Tbn. *f*

B. Tbn. *f*

Tba. *f*

Timp. *f*

Cym. *f* *p* *f*

T Of Modality

Vln. I *f* *mf*

Vln. II *f* *mf*

Vla. *f* *mf*

Vc. *f* *mf*

Cb. *mf*

This page of the musical score contains the following instruments and parts:

- Picc.
- Fl. 1
- Fl. 2
- Ob.
- C. A.
- Cl. 1
- Cl. 2
- B. Cl.
- Bsn.
- Cbsn.
- Hn. 1
- Hn. 2
- Hn. 3
- Tpt. 1
- Tpt. 2
- Tpt. 3
- Tbn.
- B. Tbn.
- Tba.
- Temp.
- Hp.
- Vln. I
- Vln. II
- Vla.
- Vc.
- Cb.

The score includes various musical notations such as notes, rests, and dynamic markings like *p*, *mp*, *f*, and *mf*. The page is marked with a 'U' in a box at the top right and a 'U' in a box at the bottom right.

204

Picc. *mf* *f*

Fl. 1 *mf* *f*

Fl. 2 *mf* *f*

Ob. *f* *mf* *f*

C. A. *f* *mf* *f*

Cl. 1 *mf* *f*

Cl. 2 *mf* *f*

B. Cl. *p* *< f* *p* *< f*

Bsn. *p* *< f* *p* *< f*

Cbsn. *p* *< f* *p* *< f*

Hn. 1 *p* *< f* *p* *< f* *p* *f*

Hn. 2 *p* *< f* *p* *< f* *p* *f*

Hn. 3 *p* *< f* *p* *< f* *p* *f*

Tpt. 1 *p* *< f* *p* *< f* *f*

Tpt. 2 *p* *< f* *p* *< f* *f*

Tpt. 3 *p* *< f* *p* *< f* *f*

Tbn. *p* *< f* *p* *< f* *f*

B. Tbn. *p* *< f* *p* *< f* *f*

Tba. *p* *< f* *p* *< f* *f*

Timp. *f*

B. D. *f*

Cow. *f*

Hp. *f*

Vln. I *f* *> p* *f* *mf* *f* *f*

Vln. II *mf* *f*

Vla. *f* *mf* *f*

Vc. *f*

Cb. *f*

208

This page contains measures 208 through 211 of a musical score. The instrumentation includes Piccolo, Flutes 1 and 2, Oboe, Clarinets 1 and 2, Bass Clarinet, Bassoon, Contrabassoon, Horns 1, 2, and 3, Trumpets 1, 2, and 3, Trombones 1 and 2, Tuba, Timpani, Bass Drum, Cowbell, Harp, Violin I and II, Viola, Violoncello, and Contrabass. The score is written in 4/4 time with a key signature of one flat (B-flat). Measures 208 and 209 feature a complex woodwind and string texture with various articulations and dynamics. Measure 210 introduces a new woodwind entry with a forte dynamic. Measure 211 continues the orchestral texture with a prominent string section and woodwind accompaniment.

Picc.

Fl. 1

Fl. 2

Ob.

C. A.

Cl. 1

Cl. 2

B. Cl.

Bsn.

Cbsn.

Hn. 1

Hn. 2

Hn. 3

Tpt. 1

Tpt. 2

Tpt. 3

Tbn.

B. Tbn.

Tba.

Timp.

B. D.

Cow.

Hp.

Vln. I

Vln. II

Vla.

Vcl.

Cb.

W

216

Picc. *f*

Fl. 1 *f*

Fl. 2 *f*

Ob. *f*

C. A. *f*

Cl. 1 *f*

Cl. 2 *f*

B. Cl. *f*

Bsn. *f*

Cbsn. *f*

Hr. 1 *f*

Hr. 2 *f*

Hr. 3 *f*

Tpt. 1 *f*

Tpt. 2 *f*

Tpt. 3 *f*

Tbn. *f*

B. Tbn. *f*

Tba. *f*

Timp. *f*

Cym. *f*

mp

mf

p

W

Vln. I *f*

Vln. II *f*

Vla. *f*

Vc. *f*

Cb. *f*

f

p

f

p

224

Picc.

Fl. 1

Fl. 2

Ob.

C. A.

Cl. 1

Cl. 2

B. Cl.

Bsn.

Cbsn.

Hn. 1

Hn. 2

Hn. 3

Tpt. 1

Tpt. 2

Tpt. 3

Tbn.

B. Tbn.

Tba.

1: F#

Timp.

Cym.

Vln. I

Vln. II

Vla.

Vc.

Cb.

232

Picc.

Fl. 1

Fl. 2

Ob.

C. A.

Cl. 1

Cl. 2

B. Cl.

Bsn.

Cbsn.

Hn. 1

Hn. 2

Hn. 3

Tpt. 1

Tpt. 2

Tpt. 3

Tbn.

B. Tbn.

Tba.

Timp.

Hp.

Vln. I

Vln. II

Vla.

Vc.

Cb.

mf

p

mp

pizz.

238

Score for measures 238-240, featuring a full orchestra and woodwinds. The score includes parts for Piccolo, Flutes 1 and 2, Oboe, Cor Anglais, Clarinets 1 and 2, Bass Clarinet, Bassoon, Contrabassoon, Horns 1, 2, and 3, Trumpets 1, 2, and 3, Trombones 1, 2, and 3, Tuba, Timpani, Bass Drum, Snare Drum, Harp, Violins I and II, Viola, Violoncello, and Contrabass. The music features complex rhythmic patterns, including triplets and sixteenth notes, with dynamic markings ranging from piano (*p*) to fortissimo (*ff*).