

From Trinidad to Cyberspace: Reconsidering Ernst Toch's "Geographical Fugue"

Carmel Raz

ABSTRACT: Ernst Toch's "Geographical Fugue" was conceived of as a work for technological media, designed as a recording to be 'performed' by gramophone set to a faster speed. Perhaps uniquely in music history, this electronic work has had an almost exclusively acoustic performance history of more than eight decades. Premiered in 1930 at a Berlin-based festival dedicated to the incorporation of technology in music, a few years later the piece was transformed into a humorous showpiece spoken live by a-cappella choirs. However, these renditions represent a substantial deviation from the composer's intention. This article contextualizes Toch's compositional choices within the artistic, political, and scientific discourses of the Weimar Republic, with a focus on relationship between exoticism, experimental art and technology, postwar constructions of the body, and the influence of contemporary research on phonetics and sound reproduction. The latter are also examined through a linguistic analysis of the vowel and syllabic distribution within the "Geographical Fugue" itself. Finally, the afterlife of these features is explored in various contemporary remixes of Toch's work on YouTube, and the ways in which contemporary possibilities of musical creation enable the work to return to a state that evokes its original context of technological experimentation.

Ernst Tochs »Geographische Fuge« ist als eine Aufnahme, die auf einem Grammophon mit schnellerer Geschwindigkeit abgespielt werden sollte, ursprünglich für technologische Medien konzipiert gewesen. Als vielleicht einziges Beispiel in der Musikgeschichte kann diese quasi elektronische Komposition auf eine fast ausschließlich akustische Aufführungsgeschichte über mehr als acht Jahrzehnte zurückblicken. Nachdem das Stück 1930 bei einem Berliner Festival uraufgeführt worden ist, das der Verbindung von Technologie in die Musik gewidmet war, wandelte sich das Stück zu einem humoristischen Schaustück, das in der Regel in Live-Situationen von a-capella-Chören aufgeführt wird. Diese Arten der Wiedergabe des Stückes zeigen jedoch eine substantielle Abkehr von den eigentlichen Intentionen des Komponisten. Der Artikel kontextualisiert Tochs kompositorische Entscheidungen innerhalb der künstlerischen, politischen und wissenschaftlichen Diskurse der Weimarer Republik mit einem Schwerpunkt auf der Beziehung zwischen Exotismus, experimenteller Kunst und Technologie, Körperkonstruktionen in der Zeit nach dem Ersten Weltkrieg und dem Einfluss von zeitgenössischer Forschung zur Phonetik und Klangreproduktion. Letzteres wird durch die linguistische Analyse der Vokale und die silbische Verteilung innerhalb der »Geographischen Fuge« untersucht. Schließlich wird das Nachleben dieser Aspekte in verschiedenen gegenwärtigen Remixen von Tochs Werken auf YouTube in den Blick genommen. Auf diese Weise versetzen aktuelle Möglichkeiten der Musikproduktion das Werk in einen Zustand, der dessen originären Kontext technologischen Experimentierens evoziert.

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In the early 1930s, Ernst Toch (1887–1964) was one of the most often performed living composers in Germany. While his concert music is rarely heard today, the popularity of his “Geographical Fugue” for spoken choir has continually increased since the premiere, inspiring an astonishing variety of performances, recordings and remixes around the world. However, these renditions represent a substantial deviation from the composer’s original intention, as the fugue, the third movement of a spoken-word suite called *Gesprochene Musik*, was composed for a concert featuring new works designed for performance via the gramophone. The world premiere of the fugue in Berlin on June 18, 1930 emanated from a gramophone set on a faster playback speed.²

Given that Toch himself regarded the piece as “a musical joke,”³ it is ironic that the “Geographical Fugue” should have become his best-known work, outshining his Pulitzer-prize-winning Third Symphony and his Academy-Award-nominated film scores. As arguably one of the most successful representatives of the *Neue Sachlichkeit* style, the “Geographical Fugue” has remained in print and in the repertoire of choirs worldwide since 1950.⁴ Easily performed by school children and lay choirs while lending itself to imaginative staging scenarios, the fugue blends community music-making with approachable fun.⁵

In order to better understand why the “Geographical Fugue” continues to appeal to music-lovers around the world, this article continues Mark Katz’s mission of recovering the original significance of *Gesprochene Musik*. Katz (2001) thoroughly contextualizes the “Geographical Fugue” in relation to early mechanical music of the late nineteenth and early twentieth centuries, documenting its importance to later electronic experimentation. My approach, however, will concentrate on framing other aspects of Toch’s compositional materials within the artistic, political, and scientific discourses of the Weimar Republic. I shall first focus on the close relationship between politics, experimental art and technology manifested in the work of Toch and his Berlin circle, with an emphasis on the role of exoticism within the context of Bertolt Brecht’s didactic works and their relation to postwar society. I then continue by exploring the impact of postwar technology on constructions of the body in Weimar Republic visual and audio art, particularly in the new relationship between organic parts and mechanical prostheses. Finally, I analyze vowel and syllable choice within the “Geographical Fugue” itself, examining Toch’s application of the acoustic properties of language in the creation of a coherent musical texture.

2 Listen to the Geographic Fugue sped up to 45 RPM (a modern rendition) [video 1]: <http://youtu.be/DQ8xYDrEQhl>

3 Toch 1930, 222.

4 Published by EMI Mills Music in 1950, then again in 1957 and 1985, and republished by Boosey and Hawkes in 2007.

5 Listen to a live performance of the “Geographical Fugue” on YouTube [video 2]: <http://youtu.be/JZjC5HSLysM>

The “Geographical Fugue” in Context

Born in Vienna to a Jewish family, Ernst Toch studied medicine and philosophy at the Universities of Vienna and Heidelberg, and music at Dr. Joseph Hoch’s Conservatory in Frankfurt. He won a number of composition awards in his youth, including the Frankfurt am Main Mozart prize in 1909 and the Leipzig-based Mendelssohn Stipendium in 1910 and 1913. Toch served as an infantry lieutenant in the Austrian army in World War I, and later returned to an academic appointment in Mannheim. He moved to Berlin in 1929, composing copiously in genres ranging from orchestral works to operas, children’s music and incidental music for radio plays. In 1933, he fled Germany, ending up in Hollywood, where he composed music for films in addition to a substantial body of chamber, solo, and orchestral music.

As Katz (2001) notes, Toch’s “Geographical Fugue” can be seen as an important proto-electronic music piece, not least in that it directly influenced John Cage, who arranged the score of the fugue to be published in Henry Cowell’s journal *New Music* in 1935. However, the “Geographical Fugue” also fits into a number of artistic and social agendas shared by Toch’s Weimar Republic contemporaries. The piece’s neatly organized phrases parody classroom recitation or choral speech, the group recitation of poems, which was widespread throughout Europe and America during the early twentieth-century.⁶ This effect is amplified through the subject entry/answer structure of the fugue, traditionally considered a ‘learned’ form. Toch also seems to be poking fun at the form of the school-fugue, a composition exercise that he surely encountered during his own musical training. This catechism-like recitation further resonates with the *Neue Sachlichkeit* movement associated with Bertolt Brecht’s experimental theater, evoking the acting strategy of the *Verfremdungseffekt*, or alienation-effect.

Brecht’s experimental theater pieces, consisting of didactic parables set to music (*Lehrstücke*), proved to be one of the most influential new art forms in Berlin in the early 1930s. He pioneered the first *Lehrstücke* in collaboration with Paul Hindemith and Kurt Weill at the Baden-Baden Festival of 1929: *The Baden-Baden Cantata of Acquiescence*, and *Der Lindberghflug*. As Rosewitha Mueller notes, these experiments had a strongly socialist flavor, as well as an ideologically active audience of communist workers’ choirs.⁷ Indeed, Brecht theorized specific verse types for *Lehrstücke* based on the sound of chants he had heard at worker’s demonstrations.⁸ Writing in 1939, he noted that these irregular verse structures, in collaboration with modern composers, freed him to “give up iambs entirely, and apply firm but irregular rhythms.”⁹

6 Choric speech, the group recitation of poems, was taught in schools throughout Europe and America during the early twentieth-century. During the Nazi era, spoken choir pieces were often employed within *Thingspiele*, mass outdoor plays with propaganda messages. Because of its association with fascism, the tradition of *Sprechchöre* declined in Germany after World War II.

7 Mueller 2006, 104.

8 In his essay “On Rhymeless Verse with Irregular Rhythms,” first published in 1939, Brecht reproduces some of these chants with metric annotations.

9 Brecht 1964, 116.

The 1930 edition of *Tage der Neuen Musik Berlin* was dedicated to both electronic music and *Gebrauchsmusik* for *Lehrstücke*. This was an apt pairing, given that *Lehrstücke* were often specifically composed for the radio. For example, at the Baden-Baden festival premiere of *Der Lindberghflug*, a year earlier, the audience sat in the concert hall, while the music was performed offstage and broadcast through loudspeakers into the hall. This close relationship between didactic music, radio and technology reappeared in the Berlin festival as well, with Hindemith and Toch represented both by pedagogical and technological contributions: in addition to their gramophone music, Toch collaborated with Alfred Döblin on a *Lehrkantate*, *Das Wasser*, while Hindemith composed a radio play entitled *Sabinchen* with a text by Robert Seitz.¹⁰

As *Gebrauchsmusik*, the "Geographical Fugue" is easily performable by any choir. The addition of the post-production audio transformation renders it pedagogically edifying as well, a lesson on the possibilities of original music for gramophone. The didactic undercurrent of Toch's work is amplified by its text, which makes an implicitly internationalist statement on bridging cultural differences by the juxtaposition of diverse international locations by assonance and choice of syllables. A further layer of political meaning emerges in light of the fact that, other than the opening salvo of "Ratibor,"¹¹ then a town in Germany, none of the geographic locations that appear in the fugue were in countries that had fought alongside Germany during World War I. Canada, the USA, Greece, Italy, and Japan fought on the Allied side, with Mexico and Spain remained neutral. In his fugue, Toch gives pride of place to the Americas: the countries of Canada and Mexico, the Mississippi river, the Popocatepetl volcano and the territory of Hawaii (not yet a state in 1930) make up the body of the fugal subject. The tail end of the subject begins with Canada, then returns to Europe via the assonance Malaga, paired with Rimini and Brindisi. The first counter subject features the Greek capital Athens, while the second counter subject includes the Japanese cities of Nagasaki and Yokohama.

The continent of Africa is one notable omission from the "Geographical Fugue."¹² From 1918–1930, soldiers from France's African colonies were stationed along the Rhine as an occupying force. This was perceived by Germans as a national insult, and termed *Die schwarze Schmach* (the Black Shame) by both politicians and the press. By excluding Africa from the geographic libretto, therefore, Toch avoids evoking the sore point of the Franco-African occupation. However, the prominence he accords to the Mississippi river may possibly be a nod toward Jazz, especially given that it was associated with *Neue Sachlichkeit* aesthetics and with recording technology.¹³

10 The festival also hosted the premiere of Paul Höffer's *Lehrstück*, *Das schwarze Schaf*, but Brecht and Weill withdrew their school opera, *Der Jasager*, in protest of the festival's rejection of Brecht and Eisler's contribution, *Die Maßnahme*.

11 Ratibor became Racibórz, part of Poland, in 1945.

12 Africa was a locus of Weimar Republic anxieties, as through her wartime defeat, Germany lost all her colonies, the most substantial of which had been located south of the Sahara, including parts of present-day Rwanda, Burundi, Kenya, Cameroon, Togo, Tanzania, Mozambique, and Namibia.

13 According to Weiner, "throughout the Weimar Republic the jazz experience was closely identified with the new technical medium of the phonograph record, both those imported from America and such German productions" (Weiner 1991, 475).

Indeed, Toch's *Neue Sachlichkeit* colleagues looked toward Jazz as "a corrective to a procrustean social order."¹⁴ Jazz, along with other signifiers of the exotic, were associated with the genre of *Lehrstücke* from the very beginning: Brecht's *Der Lindberghflug*, featured American characters and settings, while his school opera, *Der Jasager* evoked the exotic through its subject matter, based on traditional Japanese Noh drama. Ernest Borneman sees the use of these far-flung locales as essential to Brecht's artistic goals, arguing that the distance created by exotic settings enabled him to create the necessary audience detachment for conveying his didactic messages.¹⁵

Toch's choice of exotic locations as raw material resonates with *Lehrstücke* once again: his spoken fugue creates a quasi-Brechtian alienation effect in challenging its listeners to perceive recognizable place names as musical objects, removed from their normal geographical and cultural context. Furthermore, the very exoticism of these place names calls renewed attention to their unusually sensuous, almost tongue-twistingly kinesthetic quality ("Popocatepetl" or "Honolulu"). Existing as an almost absurd parody of a geography lesson, these chanted words become a collection of different syllables with almost universal phonetic characteristics rather than culturally specific meaning.

Technology, Art and the Human Voice

Toch's decision to transform the human voice by means of changing the gramophone speed has a specific post-War resonance.¹⁶ As Mia Fineman notes, the mechanized destruction of life and property in World War I brought about "a new notion of the human form as a functional assemblage of organic and mechanical parts."¹⁷ Whether in Raoul Hausmann's collages of men melding with machines, Georg Grosz's depictions of Weimar petit bourgeois as automatons, or Otto Dix's paintings of war cripples with monstrous mechanical prostheses, these fantasies of permanent physical alteration reflected the transformative possibilities of technology in an ambiguous fashion. In her analysis of *Der Lindberghflug*, Erica Scheinberg extends this imagery to Brecht and Weill's depiction of Lindbergh, viewing him as a "futuristic flying cyborg, a man with prosthetic eyes and arms, his own organic shape conforming to the machine that encases and carries him."¹⁸ A similar effect was suggested by Toch's contemporary, the artist László Moholy-Nagy, long an avid advocate for augmenting physical senses by technological means, who praised the "Geographical Fugue" for presenting "a never before suspected aspect of the human voice."¹⁹

14 Weiner 1991, 481. In the 1920s, the prominent German composer Pfitzner campaigned against Jazz, claiming it was anti-German, pacifist and internationalist (Cook 1989, 41).

15 Borneman 1959, 178.

16 Hindemith's contribution to the concert was two short pieces consisting of viola and xylophone sounds manipulated by different gramophone speeds. Click here to listen to the original recording of *Zwei Trickaufnahmen* [video 3]: <http://youtu.be/rCt5D8HWfmM>

17 Fineman 1999, 89.

18 Scheinberg 2007, 138.

19 Quoted after Kahn 1999, 127.

Given that the technology was available, the acoustic realization of Toch's choice to speed up and not to slow down his choir recording also warrants further interpretation. The association between abnormal bodies and overly high voices was famously emphasized in the movie *The Wizard of Oz* (1939), in which the actors delivered their lines at a slower tempo, while the final product reflected post-audio manipulation of playback speed and pitch. As Rudolph Lothar argued in an early essay on the aesthetics of the gramophone in 1924, "the machine demands that we give bodies to the sounds emanating from it."²⁰ Even without a visual component, the concert setting in which high-pitched, distorted voices are produced by machines suggests bodies marked by the otherness of femininity and by extension, castration. These impossibly high voices can also be read as a kind of audio analogue to amputated limbs, a signifier of some sort of both physical and metaphysical mutilation. Like these "Weimar cyborgs," to use Biro's term, Toch's fugue is an uncanny hybrid, presenting sounds at once recognizably human yet impossible for humans to produce unassisted.²¹ The "Geographical Fugue" thereby exploits the physical limits of the speed of human speech, combined with an impossibly high pitch register, to proclaim itself a trans-human product.

Since much prosthetic technology was designed to replace lost physical capabilities, it relied on separating senses and abilities into functional categories, a process that would culminate in what Caroline A. Jones deems the "bureaucratized sensorium." This resonated with larger trends in economic production of the post-war era, notably Fordism, where man and machine were amalgamated into units of production, categorized by their ability (or disability) to perform certain tasks.²²

Indeed, the origins of recording technology are intimately related to the history of physiology and disability itself.²³ With the invention of the phonograph by Edison in 1877, scientists had a new tool with which they could explore the generation and perception of acoustic signals. In 1878, Bell's experiments with speeding up and slowing down phonograph recordings of speech corroborated Helmholtz's hypothesis, presented in *On the Sensation of Tones* (1863), that vowels were inferred from the musical harmonics while involving some aspect of fixed pitch. Concurrently, Fleeming Jenkin and James

20 As quoted in Kittler 1999, 45.

21 Biro 2009, 1.

22 This post-war attitude was exemplified by Henry Ford, who observed that the Model T factory called for 7,882 different jobs: "[...] of these, 949 were classified as heavy work requiring strong, able-bodied, and practically physically perfect men; 3,338 required men of ordinary physical development and strength. The remaining 3,595 jobs were disclosed as requiring no physical exertion and could be performed by the slightest, weakest sort of men [...]. The lightest jobs were again classified to discover how many of them required the use of full faculties, and we found that 670 could be filled by legless men, 2,637 by one-legged men, 2 by armless men, 715 by one-armed men, and 10 by blind men." (Ford 1922, 129–30)

23 In his discussion of the Parisian Charles Cros's prototype for sound recording, Friedrich Kittler emphasizes that "a physical impairment was at the beginning of mechanical sound recording, just as the first typewriters had been made by the blind for the blind, and Charles Cros had taught at a school for the deaf and mute." (Kittler 1999, 22). Jonathan Sterne (2003) has further emphasized the integral relationship between early sound reproduction technologies and the physical form, mechanical function, and scientific understanding of the human ear.

A. Ewing of Edinburgh conducted similar experiments, noting that "the five vowels *a, e, i, o, u* (Italian), pronounced in succession are, by contrast at least, thoroughly distinguishable when the instrument is run at various speeds."²⁴

The phonograph soon became an essential tool in the investigation of phonetics. In 1878, Augustus Stroh created the automatic phonograph, which imitated the five cardinal vowels using rotating discs. Having conducted extensive experiments with speeding up speech and vowel recordings, physiologist Ludimar Hermann coined the term formant to describe the resonance frequencies inferred from the amplitude envelope of the partials in 1891. Further research appears in the ninth chapter of Carl Stumpf's book *Die Sprachlaute* from 1926, which details the effects of changing phonograph speeds on vowel perception.²⁵

An interest in vowels and consonants as independent elements capable of artistic expression strongly influenced poetry in the last few decades of the nineteenth century, a trend that accelerated in avant-garde circles at the turn of the century.²⁶ In 1890 Christian Morgenstern to published "Das Grosse Lalula," consisting of three verses of rhyming gibberish, while seven years later the expressionist Paul Scheerbart published *Kikakoku*, extending Morgenstern's experimental approach by discarding regular stanzas and refrain signifiers. The Berlin Dadaists also explored a variety of vocal representations and deliveries. In 1916, Hugo Ball published "Karawane," consisting of seventeen verses of nonsense syllables set in no less than eighteen different fonts, emphasizing the darker vowels *a, o, u*, as well as voiceless, lateral and nasal consonants.²⁷ Ball claimed at the time to have invented *Lautgedichte*, or vowel poetry, in which "the balance of the vowels is weighed and distributed solely according to the values of the beginning sequence."²⁸

Other important Dadaist works of the era include Raoul Hausmann's poster poems, which he called 'phonemes,' montages of random letters that he would then theatrically perform in public. Inspired by Hausmann's delivery of his poem *fmsbwtazdu*, Kurt

24 Jenkin and Ewing 1878, 167. In a follow-up trial, they investigated the vowel sung at different pitches, while the indentations made in the phonograph's tin-foil were transcribed and magnified by a system of levers, arriving at the conclusion that "in distinguishing vowels the ear is aided by two factors – one depending on the harmony or group of partials, and the other on the absolute pitch of the constituents." Jenkin and Ewing 1878, 455.

25 Carl Stumpf, "Die Veränderungen der Vokale bei veränderter Umdrehungsgeschwindigkeit der Phonographenwalze" in *Die Sprachlaute: Experimentell-phonetische Untersuchungen nebst einem Anhang über Instrumentalklänge*. Berlin: Julius Springer, 1926. 228–233.

26 In 1851, Wagner praised the power of vowels stripped of their consonants to evoke "the manifold and vivid play of inner feelings, with all their range of joy and sorrow [...] an image of man's first emotional language [...] which altogether of itself must take the form of Melody" (Wagner 1852, 116). Wagner later adopted the technique of *Stabreim*, or alliteration, as a solution to recovering the relationship between meaning (consonants), and emotions (vowels). Influenced by Wagner, symbolist poets Charles Baudelaire, Stéphane Mallarmé, Paul Verlaine and Arthur Rimbaud foregrounded the 'musical' elements of words by emphasizing their sound, syllabic structure, and spatial placement on a page. Moved by Arthur Rimbaud's synesthetic vowel poem, "Voyelles" (1871), Rene Ghil even attempted to codify the 'instrumentation' of words in *Traité du verbe* (1886), a synesthetic lexicon of the properties of vowels and consonants based on ideas borrowed from Helmholtz.

27 Schaffner 2006, 124.

28 Ball 1996, 70.

Schwitters created a sound-poem called the *Ursonate* in 1922, a work that he performed regularly for the next decade. Incidentally, the title of the *Ursonate* also evokes Rainer Maria Rilke's essay *Ur-Geräusch*, written in 1919, in which Rilke muses on his childhood experiences with the phonograph, wondering what the sound of the grooves in a human skull would sound like, were a machine able to interpret them. While the *Ursonate* anticipates Toch's fugue by using a canonical musical form to house spoken text, it contains no actual words. However, Schwitters' comments about his work emphasize its close relationship to traditional Classical music in an ironic way:²⁹

The Sonata consists of four movements, of an overture and a finale, and seventhly, of a cadenza in the fourth movement. The first movement is a rondo with four main themes, designated as such in the text of the Sonata. [...] In the first movement I draw your attention to the word for word repeats of the themes before each variation, to the explosive beginning of the first movement, to the pure lyricism of the sung "Jüü-Kaa," to the military severity of the rhythm of the quite masculine third theme next to the fourth theme which is tremulous and mild as a lamb, and lastly to the accusing finale of the first movement, with the question "tää?"³⁰

An Analysis of the Vowels of the "Geographical Fugue"

While evoking the symbolist and Dadaist use of language divorced from referential meaning, Toch's fugue also reveals a great deal of planning in order for the sped-up human speech to achieve maximal intelligibility and musicality. Other than the lack of pitched notes, the piece is structured like a conventional fugue in every respect. Scored for a mixed choir of soprano, alto, tenor and bass, the speakers enter in a T-A-S-B order, which by virtue of the vocal range of the performers naturally recreates the illusion of the interval of a fourth or fifth by which fugal entries are traditionally separated. Contrapuntal passages are carefully balanced, with unison pairings or hocketing to retain the clarity of the subject at all times. Toch even writes in a pedal point on a rolled *r* (the *Ra* in *Ratibor*), which enables the sopranos to sustain the syllable for two full measures.

Toch emphasizes the importance of 'sounding' words in describing his compositional approach. In an essay for *Melos*, the influential journal for contemporary music, entitled "Über meine Kantate 'Das Wasser' und meine Grammophonmusik," he notes that he rarely composes vocal music, because "the text must actually, not metaphorically 'sound' to me."³¹ He mentions that when he saw Döblin's text, it "sounded," and had "atmosphere, lying in the naive, un-artificial, often banal language [...] that excited my musical senses."³² Toch further highlights linguistic properties in describing his gramophone music:

29 Listen to Schwitters recite the *Ursonate* [external link on ubuweb]: <http://www.ubu.com/sound/schwitters.html>

30 Schwitters 1993, 236.

31 Toch 1930, 221–22.

32 *Ibid.*

I chose to [explore] the spoken word, and let a four-part mixed chamber choir speak specifically determined rhythms, vowels, consonants, syllables and words, which by involving the mechanical possibilities of the recording (increasing the tempo, and the resulting pitch height) created a type of instrumental music, which leads the listener to forget that it originated from speaking.³³

Indeed, the changes that affected the vowels upon increasing the playback speed stood at the forefront of his concerns, as he describes:

Only in one respect did the machine unfortunately deceive me: it changed the vowels in a way that I had not foreseen. In two short movements and a "Geographical Fugue", I tried to address this problem from different angles.³⁴

Toch's solution to the changes in vowel character upon increasing the gramophone speed involves is multifaceted. The fugue consists of a single text, which forms the basis for all counterpoints and developments:

Ratibor!
Und der Fluss Mississippi
und die Stadt Honolulu
und der See Titicaca;
Der Popocatepetl liegt nicht in Kanada,
sondern in Mexiko, Mexiko, Mexiko.
Kanada, Malaga, Rimini, Brindisi,
Kanada, Malaga, Rimini, Brindisi.
Ja! Athen, Athen, Athen, Athen,
Nagasaki, Yokohama,
Nagasaki, Yokohama.

In the following analyses I examine the first full statement of the text, corresponding to measures 1–8 in the tenor line. If we examine the geographical locations alone mentioned in the fugue (without taking subsequent repetitions into account), as shown in Example 1, we can see that Toch chooses names that share a number of phonetic properties: they feature predominantly open rather than closed syllables: sixty-two open syllables as opposed to only four closed syllables. The open syllables allow flexibility in sustaining rhythms of different lengths, creating a differentiated sound by nature of their distinct formants (Example 1).

Moreover, we also find further economy of means: out of seventeen possible German vowel monophthongs, only the five cardinal vowels are represented in the geographic locations in the fugue: *a*, *i*, *o*, *ε*, and *u*.³⁵ These are tabulated in Example 2.

33 *Ibid.*

34 *Ibid.*

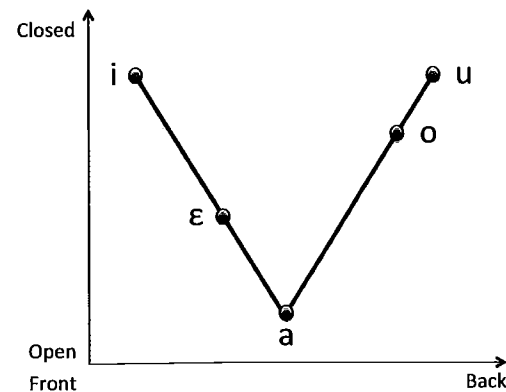
35 The seventeen standard German monophthongs are: *i*: *ɪ* *e*: *ɛ* *a*: *ɑ* *y*: *ʏ* *ø*: *œ* *u*: *u* *o*: *ɔ*, *ε*, *ə* and *ɐ*. There are an additional three diphthongs: *aj* *aɔ* and *ɔɪ*.

Open	Closed
Ra, ti, Mi, ssi, ppi, Ho, no, lu, lu, ca, ca, Po, po, te, pe, Ka, na, da, Me, xi, ko, Me, xi, ko, Me, xi, ko, Ka, na, da, Ma, la, ga, Ri, ni, di, si, Ka, na, da, Ma, la, ga, Ri, ni, di, si, Na, ga, sa, ki, Yo, ko, ha, ma, Na, ga, sa, ki, Yo, ko, ha, ma	bor, Brin, Brin, tl

Example 1: Open Versus Closed Syllables in the First Full Statement of the Fugue Text. (Capitalization indicates that the syllable is name-initial.)

a = 33	i = 24	o = 12	ε = 10	u = 2
Ra, ca x3 Ka x3 na x5 da x3 Ma x4 la x2 ga x4 A x4 sa x2 ha x2	Mi x2 ssi x2, si ppi, Ti x3 xi x3 Ri ni, Brin di	bor Ho no Po x2 ko x5 Yo x2	te pe tl, then x4 Me x3	lu x2

Example 2: Distribution of Vowels in the Geographic Names in the First Full Statement of the Fugue Text (Capitalization indicates that the syllable is name-initial.)



Example 3: Toch's Vowels Mapped onto Vowel Triangle

In terms of physical pronunciation, these vowel sounds have different points of origin. Example 3 maps them onto the *Vokaldreieck*, or vowel triangle, a schematic diagram of the position of the tongue during pronunciation. This linguistic tool is an abstraction of factors, including accent, and mouth geography, and tongue position, which may influence the actual location of the vowels during speech.

If we examine the syllable ordering of these different geographic names, as shown in Example 4, we can discern what appear to be a few motif-based considerations: the most common vowel ordering is *a* followed by *i*. This combination is first presented in the opening two syllables of "Ratibor," then duply augmented and inverted in "Titicaca," triply augmented in "Kanada Malaga Rimini Brindisi," and rhythmicized in "Nagasaki." Furthermore, *a* and *i* are the only vowels which appear in single-vowel geographic locations (such as Malaga or Mississippi). The vowel pattern of the opening word, "Ratibor," which features the triangulation of *a-i-o*, can also be discerned in the vowel order of "Nagasaki Yokohama."³⁶

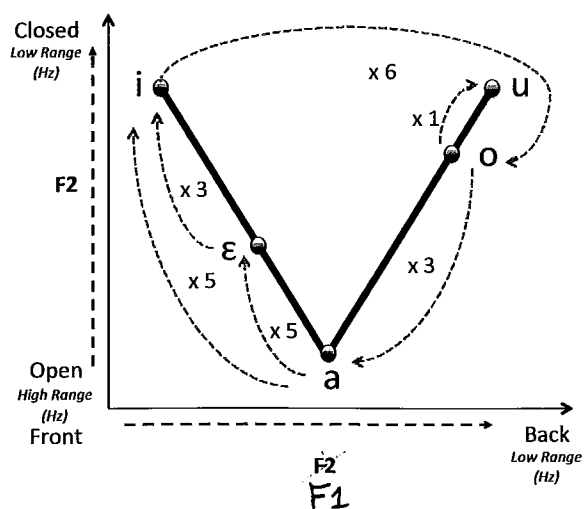
Geographic Names	Geographic Names: Vowels	Vowel Pairs (within the same word)
Ratibor	aio	a-i (5)
Mississippi	iiii	i-o (6)
Honolulu	oouu	o-u (1)
Titicaca	iaaa	i-a (1)
Popocatepetl	ooaeee	o-a (3)
Kanada	aaa	a-e (5)
Mexiko Mexiko Mexiko	eio eio eio	e-i (3)
Kanada Malaga Rimini	aaa aaa iii iii	
Brindisi	aaa aaa iii iii	
Kanada Malaga Rimini	ae ae ae ae	
Brindisi	aaai-ooaa	
Athen Athen Athen Athen	aaai-ooaa	
Nagasaki Yokohama		
Nagasaki Yokohama		

Example 4: The Left and Center Columns Tabulate the Name and the Vowel Content of Each Name, Respectively. The Right Column Tabulates the Number of Appearances (Indicated in Parentheses) of Each Vowel Pair Within the Locations Listed to the Far Left.

The paths of the arrows in Example 5 in essence trace out the first two formants, or spectral peaks, of vowel sound production. The first formant corresponds to the degree

36 In the list of different vowel combinations tabulated in Example 4, I chose to regard "Nagasaki Yokohama" as a single entity, since the final *i* is followed by the very similar *y* sound directly after. The pairing of two Japanese cities is further suggestive, as Toch here appears to group geographic locations primarily by actual physical and cultural proximity. Unlike the combination of "Rimini Brindisi," both in Italy, Nagasaki and Yokohama are not assonances.

to which a vowel is open or closed, while the second reflects the tongue's position in pronunciation. As we can see, among the front vowels, Toch's pairings often represent movement from open to closed (13 to 1). However, when the vowels move along both the front-back and the open-closed axes, which correspond to the first and second formants respectively, they tend to move from closed to open (9 to 1).



Example 5: Mapping of Vowel Order Paths on the Vowel Triangle Along F1/F2 Axes

By 1902, Edward Scripture had reported that increasing the speed of a phonograph record causes the spectral peaks of vowel sounds to rise, ultimately forcing them toward *i*.³⁷ However, as Carl Stumpf reported a few years later, the front and low *a* sound is most successful at retaining its distinct quality upon changing the playback speed.³⁸ Whether Toch was familiar with this phenomenon from contemporary scientific literature or whether his own musical intuitions guided him, we can portray his strategy as one of maximizing the intelligibility of the sped-up fugue recording by exploring the tension between the stable vowel sound *a*, and the tendency toward vowel sounds with low values in the first formant, represented by vowel sound, *i*.

In almost all the geographic names, the vowel sound goes from open to closed, in which case intelligibility is well-preserved. If the geographic names move from closed to open vowels, this is accompanied by motion front to back or back to front, giving the listener two types of information, or axes of location, along which to classify the changes in vowel sounds. Playful subversion of these expectations can be found in Toch's use of the one exception in closed-to-open sound ordering, *Titicaca*, which he repeats in canon until the syllables seem to "right themselves" and invert their order. One case is measure 23, with the sopranos and bass speaking *Titicaca* in a canon set apart by an eighth-note, as shown in Example 6.

37 Scripture 1902, 422.

38 Stumpf 1926, 229.

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Example 6: Canon of Titicaca Between Soprano and Bass, Measure 23

If we include all the words in the first full presentation of the fugue text (measures 1–8 of the tenor part), we can see that Toch restricted himself to only a subset of the seventeen German vowels by using eight in total, with only seven appearing more than once: *a*, *o*, *i*, *l*, *ε*, *e*, *u*, *v*. Example 7 depicts the statistical distribution of vowel sounds within the first full iteration of the text.

<i>a</i> = 34	<i>i</i> = 26	<i>ε</i> = 13	<i>o</i> = 12	<i>v</i> = 4	<i>l</i> = 3	<i>u</i> = 2	<i>e</i> = 1
Ra,	Mi x 2	der x 3	bor	und x 3	nicht	lu (x 2)	See
stadt	ssi x 2,	dern	Ho	fluss	in x 2		
ca, ca	si	te	no				
Ka x 2	ppi,	pe	Po x 2				
na x 3	die	tl,	ko x 3				
da x 2	ti x 3	then	son				
Ma x 2	liegt, x i	Me x 3	Yo				
la x 2	x 3		ko x 2				
ga x 2	Ri						
A,	ni,						
sa,	Brin						
ha	di						
	ki						

Example 7: Distribution of All Vowels in the First Full Statement of the Fugue Text (Capitalization indicates that the syllable is name-initial.)

By choosing to work with a subset of the possible sounds in the German language, and further limiting his thematic material in the geographic names to a set of five cardinal vowels, Toch's text creates certain types of sonic expectations among the different vowel qualities. His choice of his raw materials reflects artistic considerations such as economy of means, intelligibility of material and ease of performance, amplified under the conditions of the sped-up gramophone playback.

As appealing as they are, the linguistic features of Toch's text cannot account for the work's surprisingly popular reception as an acoustic work on both sides of the Atlantic. English speakers have likely encountered the work in John Cage's 1935 translation, which preserves most, but not all, of the geographic names. In 2003, within the context of

an essay on Toch, the composer's grandson Lawrence Weschler published a "Medical Fugue," replacing geographic names with medical descriptions. Weschler's fugue has not been widely performed, yet his version emphasizes the power of Toch's rhythmic structures, which propel the fugue forward regardless of the tongue twisters it bears. Both fugues appear side by side in Example 8.

Cage's Translation, 1935	Weschler's "Medical Fugue," 2003
Trinidad! and the big Mississippi	Syphilis! and the pig trichinosis
And the town Honolulu	And the tight tendonitis
And the Lake Titicaca	And that clap gonorrhea
The Popocatepetl is not in Canada	The psychosomata are just hysterical
Rather in Mexico Mexico Mexico	And not reliable liable liable
Canada Malaga Rimini Brindisi	Stamina famine and muscular dystrophy
Canada Malaga Rimini Brindisi	Stamina famine and muscular dystrophy
Tibet! Tibet! Tibet! Tibet!	Rickets! Rickets! Rickets! Rickets!
Yokohama Nagasaki	Euthanasia apoplexy
Yokohama Nagasaki	Euthanasia apoplexy

Example 8: Comparison of Cage's Translation and Weschler's Text

Toch returned to spoken music later in 1961 with *Valse* for mixed speaking chorus and optional percussion, a playful take on cocktail party conversations in 3/4 time. The text is quite long and varied, and vowels feature prominently: the sopranos open with "what a pitty, pitty, pitty, petty, petty, petty, patty, patty, patty. What a putty, putty, putty." Juxtaposition by assonance is also used in pairings of "kitty" and "witty," "fatty" and "chatty," among others. Unlike his spoken gramophone music, Toch also adds speaking register ranges, varied punctuation and performance instructions such as "angrily." The text veers from airy to poignant; as Christopher Caines notes, it is "clichés of social discourse from the 1960s, but filtered through the ears of someone speaking English as a second language."³⁹

The Afterlife of the "Geographical Fugue"

Many of Toch's works have fallen into obscurity,⁴⁰ the result of his transition from a German publishing house, B. Schott's Söhne, into the crossfire between of a publishing dispute between ASCAP (the American Society of Composers, Artists and Performers) and BMI (Broadcast Music International). The reception of his spoken music has fortunately taken a very different path, as versions of the score and recordings of performances are

39 As quoted in Castelnuovo-Tedesco 2006. An example of this can be found in the series of six-syllable rhythms passed between the voices at measures 152–157: "anti Wagnerism," "anti Communism," "anti-Semitism," "and MacCarthyism," "anti Nazi-ism," "anti-any-ism."

40 Weschler notes that Toch described himself as "the world's most forgotten composer." Weschler 1996.

constantly shared on websites catering to schools, choir members, and music directors. Tracking spoken music on YouTube, I came across a rendition of Toch's *Valse* by a young Belgian composer called Alan van Rompuy. His version involves recording himself for all four parts, filtering the spoken words through different electronic processes, and speeding the whole thing up to approximately double speed. Remarkably, without any knowledge of the original circumstances of *Gesprochene Musik*, van Rompuy ended up duplicating some of Toch's original ideas, exploring vowel sounds (through filters in his case) and increased playback speed.⁴¹

There are over one hundred different versions of the "Geographical Fugue" on YouTube, involving unusual vocal production,⁴² choreography,⁴³ and slapstick comedy routines.⁴⁴ However, one version stands out: a performance by the Coro de los Niños conducted by Fernando Migueles Santander at the Cadiz Carnival Choral Competition in 2007. Featuring a 40-piece amateur male choir in elaborate, full-body animal costumes, the group riotously stomps, trills, and chants fragments of the original fugue while swaying in carefully choreographed counterpoint: giraffes nod from side to side as the lions and leopards shake their front paws and the zebras flap their hooves.⁴⁵

In his ingeniously remixed version of the fugue, Santander replaces "Trinidad" with "Africa," and dispenses with the fugal structure, as well as "Athens, Nagasaki, Yokohama." These substitutions relate to the choir's theme for the year, which was "the Africans." As the competition requires all lyrics of preexisting songs to be changed in the Potpourri round, instead of "Canada Malaga Rimini Brindisi" the choir intones "takata rakata digiti digiti." In an email exchange, choir member Joaquin Flores Dorado shared the following reminiscence:

The first time we sang it in the contest, the people in the public started to look at each other when we finished the piece, they didn't know if to clap or something else, and it was a very emotional moment.

When I requested the score of their version of the "Geographical Fugue," Joaquin explained that no such thing existed: since many of the singers in the choir cannot read music, Santander distributed lyrics and prepared audio tracks for each of the four different vocal registers in the choir, and each group rehearsed the text separately. I then asked Joaquin whether he had ever performed Toch's original version of the "Geographical Fugue," but he had never heard of the piece or composer, his only exposure to the work having come via Santander's remix tape. As Santander's version shows, the "Geographical Fugue" remains recognizably powerful even when transformed from a collection of almost nonsensical words supporting the purely musical form of the fugue, into a collection of entirely nonsensical words supporting the purely musical appearance of the well-known fugue itself.

41 Listen to Van Rompuy's Version on Youtube [video 4]: [http://youtu.be/5\]Q6vBJBxKk](http://youtu.be/5]Q6vBJBxKk)

42 View a whispered version [video 5]: <http://youtu.be/4LKK1BSEkmo>

43 View Christopher Caines' choreographed version [video 6]: <http://youtu.be/pqruOENM1sU>

44 View a slapstick version. Make sure to watch it till the end! [video 7]: <http://youtu.be/1bnM09XGy-U>

45 Listen to the Coro de Los Niños's Remix [video 8]: <http://youtu.be/32YBm1kHW0o>

After more than eight decades, the "Geographical Fugue" has attained significant cultural familiarity to the extent that it has become *itself* trope, able to recognizably withstand multiple subversions of its original formal and textual content. As a cultural document, the fugue offers a wealth of information about Weimar Germany, revealing affinities with political and artistic trends as well as the state of phonetic research. It is remarkable that a work imprinted to an astonishing degree with the conditions of its artistic production should continue to appeal to a wide audience of our day. Perhaps the readiness of this piece for experimental reinterpretation stems from its origins in the conceptual and technological avant-garde of its day. The role of technology in the ongoing vibrant and creative performance practice relating to the "Geographical Fugue" shows that this interaction continues unabated.

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