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The Paths from and to Abstraction in Stockhausen's *Gesang der Jünglinge*

David Metzger

Karlheinz Stockhausen's *Gesang der Jünglinge* (1955–56 [Song of the youths]) is often hailed as the first masterpiece of electronic music. In the same breath, it is lauded for making technological breakthroughs. Rarely, if ever, heard is the account of a composition that takes imposing risks. Masterpieces and breakthroughs do face uncertainties. The former, as lionized in accounts of the premières of the Beethoven symphonies and the outrage greeting Stravinsky's *The Rite of Spring*, are works that leap into unknown aesthetic domains, typically leaving the audience behind. Breakthroughs cap off an experimental process, in which new procedures lead to either failures or advances. *Gesang* makes both of these gambles, yet, at the same time, it engages in a different kind of risk, one with ramifications not only for electronic music but also for modernism. Stockhausen attempts to bring together the antipodal sound worlds of electronic timbres and the human voice. This effort can be seen as part of a larger precarious undertaking in late modernist arts involving a union of the abstract idioms pursued by modernism with the familiar, recognizable elements it had discarded.

A brief history of electronic music prior to *Gesang* provides a clearer understanding of the challenges confronted by the work.¹ In the years after World War II, the technological resources arose to make electronic music a sustained and growing field of composition.² So quickly had this field grown that by the early 1950s two main approaches had formed: *musique concrète* and pure electronic music. Based in Paris, the former drew upon recordings of natural, or “concrete,” sounds, those heard in the everyday world like a man singing or a train whistle. By manipu-

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696 lating sounds through various means (layering or playing them backwards, for instance), composers could have listeners experience the sonic world around them in strikingly new ways. The latter approach, often blankly called electronic music, created sounds artificially in the studio, noises solely electronic in origin. With these timbres, composers could have listeners enter into a new and unknown sonic world.

Before composing *Gesang*, Stockhausen had pursued both approaches. As a student in Paris, he composed his one and only *musique concrète* piece, *Etude* (1952). The work notably does not build upon the recognizable sounds favored by *musique concrète* composers. It takes the sounds of piano strings being hit by a metal beater and elaborately manipulates them so that they come across as blips and bursts of static. In other words, the acoustic has been made to sound electronic. Not surprisingly, Stockhausen turned to pure electronic composition. After his return to Germany, he settled in the studio of the Westdeutscher Rundfunk (WDR) in Cologne, the base of that school. His *Studien I* and *II* (1953, 1954) incorporate a range of synthesized tones. Their artificiality and foreignness attracted Stockhausen, who, as he later recalled, was seeking to create music “*ex nihilo*,” attempting “to compose neither known rhythms nor melodies nor harmonic combinations nor figures; in other words, to avoid everything which is familiar, generally known or reminiscent of music already composed.”³

Nothingness loomed large for Stockhausen and other young European artists who lived through the war as children. It was all they were left with at the end of the conflict: their legacy. At the same time, they could use nothingness—artistic spaces devoid of the past—to separate themselves from the years leading up to that catastrophe.⁴ In the void, they could start over. Fervent modernist innovation, the kind agitated for at the famous Darmstadt festival at which Stockhausen and other young composers met, could provide that buffer.⁵ As boldly announced in the quotation above, this brand of modernism strove to cast off not only vestiges of the past but also the slightest traces of the familiar. Electronic idioms, so new and alien, could easily accomplish that goal, as could the integral serial idioms calculated by these composers. In the latter compositional approach, the highly intricate serial organization of pitch (the twelve-tone row), dynamics, rhythm, and other parameters, obviates the formation of conventional-sounding melodic or rhythmic gestures. *Studien I* and *II*, along with a few other contemporary electronic works, employ such complex serial schemes to piece together synthesized sounds. With the one approach compounding the other, musical engagement with nothingness was pushed to an extreme.

This type of nothingness proved extreme even for Stockhausen. After those two works, he felt the need to incorporate familiar elements into his electronic music, having them serve as points around which the listener could orient him or herself in the alien sonic surroundings.⁶ Stockhausen reached out to familiar sounds in *Gesang*, the electronic work immediately following the two *Studien*.⁷ The piece combines electronic sounds with the voice of a boy reading and singing the text of the *Benedicite*, the song of praise drawn from the biblical story of the three youths thrown in the fiery furnace (fig. 1).⁸ The most human of sounds, the voice, and a familiar religious text could be easily perceived by listeners.

Preiset (Jubelt) den(m) Herrm, ihr Werke alle des Herrn—
lobt ihn und über alles erhebt ihn in Ewigkeit.

Preiset den Herrn, ihr Engel des Herrn—
preiset den Herrn, ihr Himmel droben.

Preiset den Herrn, ihr Wasser alle, die über den Himmeln sind—
preiset den Herrn, ihr Scharen alle des Herrn.

Preiset den Herrn, Sonne und Mond—
preiset den Herrn, des Himmels Sterne.

Preiset den Herrn, aller Regen und Tau—
preiset den Herrn, alle Winde.

Preiset den Herrn, Feuer und Sommersglut—
preiset den Herrn, Kälte und starrer Winter.

Preiset den Herrn, Tau und des Regens Fall—
preiset den Herrn, Eis und Frost

Preiset den Herrn, Reif und Schnee—
preiset den Herrn, Nächte und Tage.

Preiset den Herrn, Licht und Dunkel—
preiset den Herrn, Blitze und Wolken.

O all ye works of the Lord—
Praise (exalt) ye the Lord above all for ever.

O ye angels of the Lord, praise ye the Lord—
O ye heavens, praise ye the Lord.

O ye waters that be above the heavens, praise ye the Lord—
O all ye hosts of the Lord, praise ye the Lord.

O ye sun and moon, praise ye the Lord—
O ye stars of heaven, praise ye the Lord.

O every shower and dew, praise ye the Lord—
O all ye winds, praise ye the Lord.

O ye fire and heat, praise ye the Lord—
O ye cold and hard winter, praise ye the Lord.

O ye dew and storms and rain, praise ye the Lord—
O ye ice and frost, praise ye the Lord.

O ye hoar frost and snow, praise ye the Lord—
O ye nights and days, praise ye the Lord.

O ye lights and darkness, praise ye the Lord—
O ye lightning and clouds, praise ye the Lord.



Fig. 1. Text for *Gesang der Jüinglinge*

The inclusion of the voice raises challenges and risks. In particular, the challenge was how to bring together sounds which previously had been isolated from each other, cordoned off in separate, even inimical, spheres. There were no established ideas to guide such a merger. As we will see, Stockhausen reached for means used in previous works, specifically integral serial designs and sonic transformation. But would they now be enough? If not, the sound world could disintegrate into fractious bits. Besides fragmentary discord, the danger of one element overwhelming the other arose. The foreignness of the electronic noises could envelop the voice and expunge its familiarity, or the voice could so absorb the listener that the electronic sounds could fade into the background.

In his searching account of modernist visual art, T. J. Clark raises similar questions about a group of paintings by Jackson Pollock. He focuses on a series of works from 1947 to 1950 in which a cluster of recognizable images—the human figure, masks, animal shapes—intrude upon the daedal drips of paint.⁹ The appearance of images in an abstract scheme that had become almost sacrosanct for some critics and artists stirred much commentary at the time and continues to do so. Echoing Clement Greenberg, Clark finds these elements to be “risky” (*FI*, 345–6). To him, the risks emerge from the difficulties of bringing together the figure and the abstract. The figure had long disappeared from Pollock’s work, being almost a distant memory of a world before the rise of his monumental abstraction. To bring it back and incorporate it into the abstract designs would seem to pose an insurmountable challenge. According to Clark, Pollock’s solution was to “reconcile” the figure and abstract through less than reconciliatory means. The two negate each other. The spontaneous throwing of paint already served as a negation of the figure, pushing it aside and off the canvas, seemingly for good. Now brought back to that space, the figure contravenes those patterns, reasserting a pictorial scheme in which it is primary. As such, the figure functions as “the negation of a negation” (*FI*, 344).

Clark’s account encourages us to explore how Stockhausen’s piece responds to larger tensions in modernism. Surely there is a parallel to be drawn between the electronic work and paintings. Where to draw those lines, however, may not be immediately clear. To facilitate the comparison, two broad categories can be proposed: the abstract and the familiar. Admittedly those terms are vague and quite unconventional in relation to music (although less so with respect to electronic music). In a general sense, music is abstract, not being able to depict or narrate things in any specific way. The term is used here to convey a particular inscrutability, like that which electronic sound had for 1950s audiences and continues to have for some present-day listeners. The abstract, consistent with Stockhausen’s *ex nihilo* music, is a realm devoid of any elements that we can recognize and connect to known entities—such as the spaces created in fields of pure electronic sound or, as with Pollock, dripped paint. In other words, the abstract is a realm untouched by the familiar, which conversely can be viewed as the known and identifiable, anything from a boy’s voice to the human figure. So familiar are these elements that they, as Stockhausen counted on, stand out even in the most foreign of surroundings. Or to view things from the other side, those sur-

roundings give the elements the quality of being generally familiar, a quality in addition to their specific connotations.

Stockhausen frequently used these categories in describing his early electronic music. *Hymnen* (1966–67), for instance, thrives on the contrast between borrowed national anthems, “the most familiar music imaginable,” and electronic sounds, “which make a completely abstract impression and are not reminiscent of anything”¹⁰ In the sound worlds created by the composer, the abstract and the familiar serve as opposite points, very distant points as made clear by the superlatives attached to them. *Gesang* and the electronic works following it, including *Hymnen*, explore the space between and around those remote poles.

This study also uses the terms as sonic and conceptual poles around which the different elements in *Gesang* circulate. Not only do the various sounds (ethereal electronics, child’s song) gather at those poles but so do related categories. Some of these categories form oppositions which divide along the abstract/familiar split. There are three such oppositions. The first is purity/impurity. Modernist abstraction often claimed the status of purity by concentrating on intrinsic means and gestures. Anything outside of this narrow purview—the things we know, or the familiar—is consigned to the impure. Yet drawing a line between the two proves difficult, as *Gesang* is so invested in the idea of purity that even the “impure” becomes pure. Another opposition is electronic sound versus speech: the alien, indecipherable timbral flow versus the jut of familiar words and ideas. Finally, there is machine and childhood. The terms are far removed from notions of the abstract and the familiar yet they too divide along the lines of those two broad categories. The machine is a realm of technology and precision capable of producing the electronic sounds, whereas childhood is one of naturalness and innocence called to mind by the boy’s voice.

With the terminology and specific elements in place, we can examine how *Gesang* and Pollock’s paintings respond to the risks of using the familiar. A key difference quickly emerges. Pollock’s paintings have the two categories stare off at each other across a great divide. The encounter amounts to a draw. In *Gesang*, there is much movement between the two poles, with all three related oppositions heading toward the side of the abstract, be it the pure, electronic sound, or the machine. The piece’s commitment to modernist ideals of abstraction pushes the oppositions toward that point. The individual pairs, though, take separate routes, some direct, others circuitous. Moreover, some of the pairs drive further into the abstract than others. With each opposition going a different way, the movement to the abstract becomes not so clear or straightforward.

As Clark states, there are no set solutions to the risks and challenges posed by the merger of the abstract and the familiar. Each work is on its own (*FI*, 351). By looking at the choices made in individual works, we can begin to see a larger picture of the modernist negotiation of those categories. The picture is especially interesting in regard to figures like Pollock and Stockhausen who opened up the highly insular and abstract idioms of the 1940s and 1950s to recognizable elements. A study of *Gesang* also throws light on specific musical modernist scenes. In particular, it offers a broader

700 understanding of the aesthetic and cultural currents stirred by early electronic music. Finally, we can reach a more encompassing view of Darmstadt modernism, one which includes a well-known side of that music, the confident and aggressive avant-garde idioms, as well as a new side: vulnerable idioms which need and take on risks.

Before turning to the relationship between the abstract and the familiar in *Gesang*, a few introductory remarks about the sonic materials and organizational schemes of the work are in order. Capitalizing on the new technologies at the WDR, Stockhausen created a plethora of electronic timbres. As with *Studien I* and *II*, *Gesang* incorporates sine tones, single pitch sonorities with no varied colors or overtones.¹¹ Those simple tones sit at one end of a sonic spectrum. White noise, a wrangle of sounds within a vast range of frequencies, sits at the other end. Between these two extremes lie impulse sonorities, which are single, percussive tones featuring a rapid natural decay. Stockhausen either presents these sonorities as isolated blips or combines them into thick “swarms” (*scharen*).¹² Moving from one end of the sonic spectrum to the other, he not surprisingly moves sound itself. For the original performances, five individual tracks were shuttled through loudspeakers positioned around the hall (fig. 2).¹³ Sounds never remain stationary; they overlap each other and dart from corner to corner.

To unite these volatile electronic sounds with a human voice, Stockhausen held fast to the ideals of integral serialism, expanding them to deal with an unprecedented range of sonorities. The makeup of individual sounds as well as the relationships between them could be serially defined.¹⁴ Even the voice could be pressed into a structural scheme. To that end, Stockhausen established an ordered series of seven degrees of comprehensibility, ranging from clearly understood syllables and words to raucous sonorities comprised of overlapped vocal parts.¹⁵ For Stockhausen, both the voice and electronics were part of a larger sonic continuum.¹⁶ As described above, the simple sine tone sat at one end of that continuum and hectic white noise at the other. Different forms of speech fall between these points. Isolated syllables and words stay close to the sine tones, whereas superimposed vocal sonorities push toward the other end. These outer ranges fascinated Stockhausen as did the vast middle ground. In the latter, elements blur, to the point that speech takes on aspects of electronic sound, and sound assumes qualities of speech.

Stockhausen divides *Gesang* into six sections which can be labeled A–F (see fig. 3).¹⁷ He had originally planned and sketched out a seventh concluding G section but did not have the time to finish it, leaving the work, as we hear it, incomplete. The junctures between the individual units are demarcated by either dense impulse swarms or silences. Stockhausen contrasts the sections by the treatment of the voice. Each one highlights a specific manipulation of the vocal material. Overall, there are four basic manipulations: clear syllables and words; vocal chords (massed, roughly homophonic groupings of individual lines), vocal polyphony (divergent lines), and choral swarms (very dense and unruly combinations of separate vocal parts).¹⁸ The opening A section

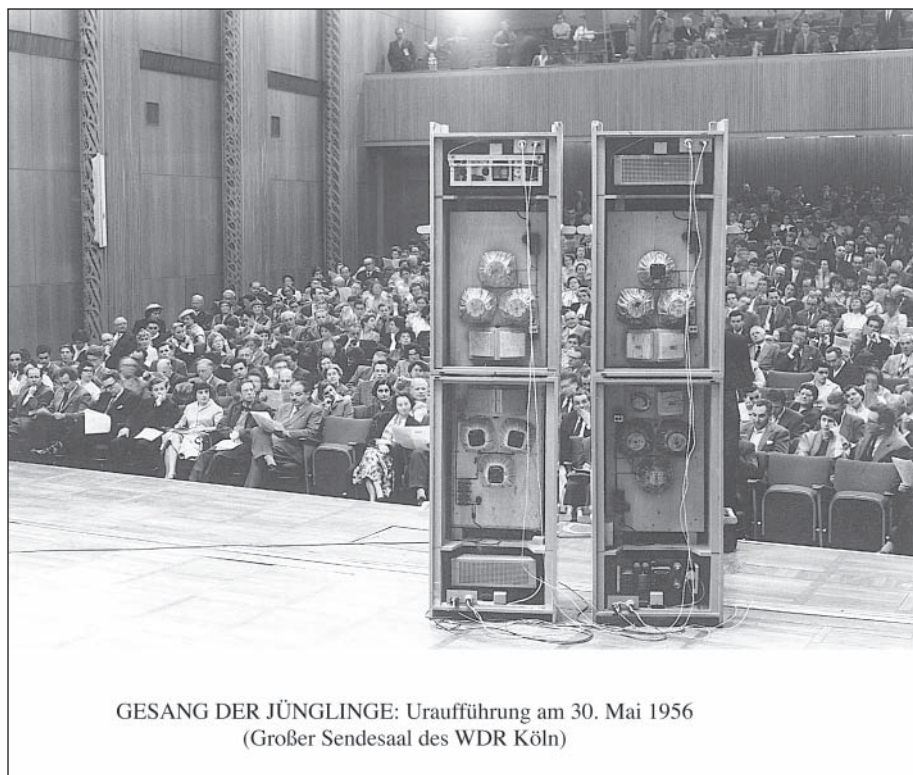


Fig. 2. World Premiere of *Gesang der Jünglinge*, 30 May 1956, Broadcasting Studio of the WDR, Cologne. Used by Permission of Stockhausen Verlag.

<i>Timing</i>	<i>Section</i>
0:00	A
1:02	B
2:43	C
5:13	D
6:21	E
8:39	F

* The above timings do not incorporate the ten second delay used in the Stockhausen Verlag CD recording of the work.



Fig. 3. Formal Diagram of *Gesang der Jünglinge*

702 introduces the categories of syllables and words, chords, and swarms. Each of the following four units concentrates on a particular category: swarms (B), syllables and words (C), chords (D), and polyphony (E). The final F section serves as a timbral and formal summation (even without the planned G section), bringing together all the vocal categories and a wide range of electronic sounds. In this section, Stockhausen also structurally realizes the sound continuum, as he breaks it down into twelve fixed segments which can be combined to form larger sonic groups.¹⁹ These groups are dispersed across the F section in a predetermined order. Quick cuts between these disparate strands create a vacillating timbral surface, the rapid tremors of which bring the work to a close.

Purity

Purity holds many promises—among them, ideals of essence and wholeness. Desirous of those qualities, several streams of modernism not surprisingly sought to win them. Writing on the modernist paintings prized by Greenberg, Donald Kuspit has depicted modernism as “the point of view which sees art as the mastery of purity.”²⁰ Such “mastery” emerges sharply in works which push the drive for purity to extremes by restricting themselves to one basic material. *Studien I* and *II* arrive at such a point; however, they do not fix on just any material but rather on a fundamental one: the sine tone. In the early years of electronic music, that sound captivated. It was held up as elemental, a sound of exact pitch with no overtones, existing at the core of all sounds.²¹ Herbert Eimert, one of the composers active at the WDR, called it a “pure element,” beyond which there was nothing purer or smaller.²² Eimert and other composers, including Stockhausen, realized that this “purity” was ultimately unattainable, as listeners would always hear additional overtones and colors.²³ Nonetheless, composers worked with these sonic “atoms,” seeing them as the building blocks of a new music.²⁴

The fusion of sine tones in the two *Studien* did produce a new music, but that music proved hollow and was later abandoned. The pale sonic flow in both works makes us wonder if purity, to turn Kuspit’s words around, did not gain mastery over electronic music. When pursued in such extreme states—and how else can it be—purity leads a work into vacuity. The idea takes over, becoming the essence of the piece. Adorno called the emphasis on purity “a technocratic attitude” which speaks of “something entirely too binding, violent, and unartistic.”²⁵ For Kuspit, the notion of purity seduces less by technical means than by being an “opiate,” one which “dulls” the mind with sterility.²⁶

Can purity escape this solipsistic void? As depicted by Adorno and Kuspit, it cannot. Approaches to purity in different fields, particularly anthropology, suggest otherwise. Mary Douglas’s classic *Purity and Danger* describes how cultural systems of purity can be “shattered and renewed.”²⁷ She would agree with critics of modernist arts that purity can be “hard and dead as a stone” (*PD*, 161). The stone, however, can be more brittle than hard, as it breaks apart from emptiness and contradictions. At that

moment, the whole system collapses, but it can be salvaged by welcoming back that which had been rejected, in other words, the impure. Douglas mentions the ancient Hebrew Temple, which dismissed bodily fluids as grossly unclean only to allow blood to cross the sacred threshold, as long as it was treated in special ways (*PD*, 159). The use of blood brings together the pure and the impure, “an act of one-ment” going beyond the significance of a specific ritual. According to Douglas, such unions nullify the divisiveness upon which the demand for purity thrives and uphold a larger “combination of opposites,” which proves a “satisfying” “psychological” and “religious” act (*PD*, 169). For *Gesang*, the union of electronic sound and human voice is no less profound. As realized in the design of the sonic continuum, the merger broadens and deepens levels of unity, a “satisfying” state for serial composers, for whom the term “unity” was a mantra. Some composers did indeed view unity as a religious state. Stockhausen and Karl Goeyvaerts, two ardent Catholics at the time, viewed musical unity, particularly the schemes of integral serialism, as emulating a “divine perfection.”²⁸

There is one significant difference between Douglas’s model of renewal and the path taken by *Gesang*. In the former, the pure reaches out to the impure, whereas, in the musical work, the pure reaches out to the pure. The two elements entering the electronic sound world—a child’s voice and a biblical text—bear strong associations of purity. By virtue of being outside of the electronic realm they are foreign, and therefore impure; however, in the larger cultural realm in which *Gesang* operates, they epitomize purity. The boy’s voice not only captures the innocence and naturalness by which society defines childhood but it is also a pure sound, a voice with little or no vibrato—a human sine tone, as it were. The biblical text obviously signifies the holy. It, though, is not just pure but is also about purity, presenting many different forms of the state. The youths thrown into the furnace embody childhood innocence.²⁹ They are made even more so by the fire, which refines, or purifies, them by bringing them into contact with the divine, the angel encountered in the flames. That presence turns them into fountains of religious faith, pouring out a florid song of praise. Their song calls out the “works of the Lord,” which include pure elements, like water (in its various forms of rain, dew, snow, and ice), air, and fire.

Instead of purity, *Gesang* gives us purities. They take different forms, including both particular qualities (the sound of the sine tone) and concepts (childhood and the sacred). Why reach out to this plurality? A fear of impurity could be one reason. Any element brought into the electronic sphere would be considered impure. Outside materials, though, were needed. One way to stave off the threat of impurity would be to incorporate elements culturally embedded in the pure. Purity could reinforce purity, especially one which, like electronic sound, was felt to be deficient. From a different perspective, the panoply of purities stems from what could be called modernist audacity. Although *Gesang* stakes out a new type of purity (that of electronic sound), it is still not satisfied. It wants more and gets it by gilding itself with other pure elements, ones far removed from the sonic essences it seeks. Even venerable forms of purity, like a child’s voice and a sacred text, can be taken apart and refashioned to complement the new sonic order.

This multiplicity raises the question of whether or not different forms of purity can coexist.³⁰ Indeed, can purity, a supposedly singular state, contain such diversity? In regard to *Gesang*, these questions can be better answered by shifting the focus away from the different materials—sine tone, electronic sound, child's voice, biblical text—to the means by which those purities are achieved. Purity is as much an action as it is an inherent state. It is achieved through some means and those means determine the ways in which it relates to the impure, the outside world. Or, in the case of *Gesang*, the means reveal how the pure relates to the pure.

Prized as elemental and atomlike, the sine tone appears to possess a natural purity. That sound exists by itself, hidden at the center of all sounds. In other words, it is not made. Or is it? Its purity is achieved by a certain means, that of reduction. Discussing *Studie I*, Stockhausen remarked, "We reduced everything to the element, which is the basis for the variety of sound; the pure soundwave, electrically producible, called 'sine wave.'" ³¹ To get at these atoms, a sound must be diminished, its thick timbral layers boiled off. Even when these layers have been removed, the sine tone does not exist. It has to be electronically produced, or synthesized. It is nothing more than an acoustic ideal—a wave pattern—given sonic life in the studio, no different from the other electronic timbres in *Gesang*. All the electronic sounds, from sine tones to impulse swarms, result from a related means of achieving purity: exclusion. Sharing an antipathy toward the extraneous, exclusion and reduction overlap. However, there are some differences. Whereas reduction gradually removes the contingent, exclusion outright rejects it. Electronic sounds are created in a separate sphere, the studio. From the outset, they have been set apart. Upon beginning at the WDR, Stockhausen isolated them in the refined sound worlds of *Studien I* and *II*. In such pieces, and in certain moments of *Gesang*, electronic sound becomes what Stockhausen calls "pure sound," a realm where sound is no longer tied to, or contaminated by, the known but rather exists in and by itself ("MS," 160). Electronic music achieves its essence, becoming sound about sound.³²

In contrast to electronic sound, childhood—signified by the boy's voice—is a natural form of purity. Children are born pure, a belief reinforced by cultural discourses of childhood.³³ This purity, however, is fragile and short-lived. It perishes, succumbing to the defiled adult world around it. Childhood exists more as the threat of impurity than as a means of purity. If childhood purity is shaped by any action, it is that of loss. The danger of violation makes the pure all the more cherished and protected, and thus more frail.

Finally, the biblical text imparts a sacred purity. Unlike other forms of the pure, that state does not arise from a specific means. The sacred, as conveyed in religious traditions, is not created; it has always existed and will never change. It is eternal. *Gesang*, or any mortal creation, can obviously never commandeer this quality, only evoke it. The text, however, does point to a mode of purity that can be incorporated. The tale of the fiery furnace describes how the flames refine the youths, making them even more pure. Refinement functions as another important means of purity, one by which the impure, or even the pure, can be elevated into a higher form.

We can now return to the question posed earlier as to whether or not different types of purity can coexist. It appears that they can, but only so far as one means of attaining the state dominates. The case of *Gesang* suggests that a single mode is needed to create a relationship between the different materials, especially between the child's voice and the electronic sounds. The question becomes which one will govern *Gesang*. In some ways, the answer depends on how you hear the relationship between those two defining materials.

Many of the early reviewers of *Gesang* held to the purity of childhood. Their interpretations are built around that ideal, revealing how purity, or one particular notion of it, can dominate perceptions of the work. To these critics, electronic sound could never possess purity, being so far removed from nature and the beautiful. If anything, these sounds corrupted and distorted the pure, as heard in the treatment of the boy's voice. Several reviewers paint vivid scenes in which the voice is polluted, becoming an unnatural, even grotesque noise, no different than the electronic timbres. Purity, as it takes form in this work, exists as loss, that which is made impure. According to one critic, the voice, "a gift of the divine," was subjected to the "perverse possibilities" of the electronic equipment, which damned it to a "hellish" sound world.³⁴ Another reviewer describes how the boy's voice, again a gift from God, was treated in ways going "against nature," mutilated into "howls" and "groans."³⁵ The homage to divine gifts reveals how some critics also appealed to the purity of the sacred, enshrining both the boy's voice and biblical text in it. The sacred elevates the voice, thereby allowing reviewers to dramatize its corruption.

The idea of electronic sound purifying the boy's voice would have struck these critics as sacrilege. There is some truth, though, in this blasphemy, as it captures the way *Gesang* approaches the relationship between those two elements. The piece clearly holds to the ideal of purity. Out of all the depicted means of securing that state, it adheres to one: refinement. The biblical story is not lost on the work. *Gesang*, however, rewrites the tale—yet more blasphemy. Having brought in outside materials, be they pure or impure, the work must make them suitable for the pure realm of electronic sound. *Gesang* surrounds the child's voice with electronic fire. The blaze, unlike the biblical furnace, does not enhance the voice's own purity; rather, the boy's voice feeds the flames, enhancing the purity of electronic sound. The voice is not so much transformed into divine song as into sounds similar to the electronic timbres. In this form of the story, the burning youths purify the flames.

Douglas's study offers insights into this process of refinement. As she describes, the impure can only be brought into the sphere of the pure when handled in specific ways. For instance, the blood used in the Hebrew Temple had to be shed in sacrifice. By following established laws, the outside element can be lifted to the level of the pure (*PD*, 159). In this elevation, it takes on new qualities, either by assuming different associations (that of sacrifice) or by being directly transformed. *Gesang* is ruled by a set of laws, by various serial schemes. Stockhausen, to recall, viewed those schemes in general as pointing toward a "divine perfection." Such "perfection" demands purity. Not surprisingly, sine tones were offered to the serial designs of *Studien I* and *II*, pure

706 tones that could complement those laws and be easily molded to accord with them. A voice, a sound following its own distinct rules, would seem to resist such treatment. Yet it too ultimately follows “the chosen musical order.”³⁶ As Stockhausen declares, “the sung speech sounds, like all the electronic sounds, follow formal musical laws.”³⁷

In other words, the voice must become like an electronic sound in order to adhere to the same “laws” that those sounds do. Its purity must be changed, or refined, into electronic sound. The change occurs at the outset of *Gesang*. The voice is broken down into basic parts, vowels, consonants, and flecks of timbre. Those bits can easily be transformed and combined to create new sounds. In other words, the voice proves just as elemental, fragmentary, and malleable as the electronic components. It takes on aspects of being “pure” sound, and, as such, it adds to that purity but is never completely subsumed into it. No matter how scrambled and disjointed the text becomes, semantic meaning, the chatter of the impure, hovers around the voice, as words and syllables can be heard here and there. Moreover, a child’s voice is a very distinct timbre, one not easily dissolved. Nor does Stockhausen want to erase the voice, for it, in its more distinctive and intelligible forms, anchors one end of the sonic spectrum. As the piece progresses, though, the voice drifts further and further to the other end, caught in the dense rushes of sound in the final F section.

Gesang, though, never settles down at that endpoint. It resists the finality of the pure. Refinement—the attainment of purity—is held back by a fear of purity, specifically the hollowness of *Studien I* and *II*, a condition to which Stockhausen had no desire to return. At the same time, a fear of impurity clutches the work. This anxiety perhaps impelled the piece to reach out to the child’s voice and biblical text rather than just any foreign elements. It also demands that *Gesang* attempt to refine those materials, to make them assimilate to the world of electronic sound. Only a piece so obsessed with purity could get caught in those conflicting fears and needs, being pulled in opposite directions by the ideal.

Where does this tug of war leave the relationship between the familiar and the abstract? *Gesang*, as mentioned earlier, drives toward the abstract. But, when viewed from the perspective of the purity/impurity opposition, the movement toward that side is not so far-reaching or clear, as both the familiar and the abstract lay claim to purity. Moreover, the purities of the boy’s voice and biblical text resist complete refinement, thereby strengthening the presence of the familiar. Finally, the mixture of different purities makes it difficult to keep the two categories distinct. Modernist works, like the two *Studien*, typically equate purity and abstraction. *Gesang* rejects that equation, but it still clings to the abstract and the pure. Instead of having a single state of purity define the abstract (the two being one), the work has different types of purity loosely conform to a single notion of the abstract—that of electronic sound. This manifold purity somehow holds together in *Gesang*, but it does not lend itself to other compositions. It would be difficult to recreate this broadly pure and abstract world with each new piece. In fact, Stockhausen never again did.

Speech and Sound

Speech disrupts musical works. When the spoken word enters, a piece usually grinds to a halt or music slinks subserviently into the background. The most clearly articulated flow of verbal thought demands attention, crowding out the vaguer discourse of music. So clear and comprehensible, speech obviously represents the familiar. As such, it threatens to overpower any abstract idiom that reaches out to it. Stockhausen faced this danger. How could electronic sounds, which were so foreign and obscure, stand up to a voice? Speech/sound would appear to be a rather lopsided way of figuring the relationship between the familiar and the abstract. In *Gesang*, though, the two intertwine and overlap, taking on aspects of each other, with sound eventually having the upper hand. In order to understand this dynamic, we need to focus on two specific relationships: speech and electronic technologies, and speech and music. Only after discussing them can we turn to the interaction between speech and electronic music, a relationship that Stockhausen was instrumental in forging.

During the early years of the WDR, much of the scientific and musical research conducted there focused on speech.³⁸ Werner Meyer-Eppler, a professor of phonetics, spearheaded those efforts. He had a strong interest in using recent electronic technologies to analyze the minute components of speech. Some of the same machines, as he and Eimert realized, could also be employed to produce sounds for musical use. Meyer-Eppler's innovative approaches to phonetics and new technologies attracted many students, including Stockhausen, who attended his classes between 1954 and 1956 and began a doctorate under him. It is safe to say that the breaking apart and molding of speech through new technologies in *Gesang* is indebted to Meyer-Eppler.

Not only could machines analyze speech but they could also synthesize it. The speaking machine had been a long-standing technological goal, the pursuit of which extends back to at least the eighteenth century.³⁹ Two recent efforts in this endeavor had found their way into the WDR circles: the Vocoder (Voice Operated Recorder, 1936) and Voder (Voice Operating Demonstrator, 1939).⁴⁰ The former required a human voice to initiate the process, breaking down the voice into data and processing it into an electronic form. The Voder took a crucial step by not requiring a human source. Controlled by a human operator, it manipulated formulated speech sounds, approximations of vowels and consonants, to create its own voice. Interest in the devices at the WDR proved relatively short-lived (new technologies were always being unveiled) but they nonetheless became part of the stream of ideas flowing in and around the studio.⁴¹ In particular, the machines demonstrated how speech could be parsed into distinct sounds, a fragmentation taken further in *Gesang*. Above all, they proclaimed that machines could speak, a declaration that Stockhausen's piece also extends by developing its own form of speech.

Speech and electronic technology was a new relationship. Speech and music, in contrast, was an age-old bond, and that is one of the reasons it was so challenging for integral serial composers. In order to understand that challenge, we must expand our conception of speech to encompass language in general, whether it be spoken, sung,

708 or read. Stockhausen approached the term just as broadly in a 1958 article entitled “Musik und Sprache” (Music and language).⁴² We, however, should not overlook the spoken word, for it figures prominently in *Gesang*, being the form of “language” at the heart of the work. In their initial experimental fervor, integral serial composers largely rejected language, focusing on instrumental or purely electronic works. They may have done so out of concern that the semantic proliferation of a text would jam the precise inner workings of serial schemes and violate the isolation sought in a higher abstract order. Yet composers did turn to texts, as seen in two classic works of the 1950s, *Gesang* and Pierre Boulez’s *Le Marteau sans maître* (1955 [The hammer without a master]).⁴³ Voices were needed to deliver those texts. Earlier integral serial works had also dismissed the voice, rejecting the conventional feel of lyricism it imparted and perhaps fearing that it might dominate the ensemble and disrupt the calculated parity of parts.⁴⁴ By welcoming the voice, composers could not help but deal with the lyricism and expression of text characterizing centuries of vocal music.⁴⁵ The question was how to handle those venerable qualities in the newly chiseled abstract idioms.

Stockhausen addressed this question head-on in the succinctly titled “Musik und Sprache” article. He discussed the solutions found in *Gesang*, *Le Marteau*, and Luigi Nono’s *Il canto sospeso* (1956 [The song suspended])—three pieces by Darmstadt composers. In describing the other two composers’ approaches, Stockhausen was really offering his own solution, one not surprisingly in agreement with the path plotted for speech in *Gesang*. According to him, all three works enact a “transition from speech to music,” in which the text dissolves to the point of becoming almost incomprehensible and the voice may fade away altogether (“MS,” 44). As depicted by Stockhausen, Boulez and Nono’s pieces take speech to a vanishing point. In *Le Marteau*, the voice of the alto soloist gradually disappears, to the point that she sings with her mouth closed (becoming a “speechless instrument” according to Stockhausen), and finishes the work silenced in the ensemble, sitting out the final section. The second movement of Nono’s work, according to Stockhausen, almost completely dissolves the text through the style of setting the words (splitting up syllables between individual parts in the choir) and by subsuming the words (especially the vowel sounds) into a larger serial design so that they become almost indistinguishable.⁴⁶ By placing *Gesang* last in his discussion of the three pieces, Stockhausen appears to be holding it up as some sort of culmination. In many ways it is. With the electronic technologies, we can go beyond the vanishing point and cross over into a realm where speech disappears into music and “music can approach speech” (“MS,” 59). The following analysis discusses how *Gesang* passes that point and what happens to the relationship between speech and electronic music in the next realm.

The interaction between the two elements took shape well before the final version of *Gesang* was ever completed. The recording of the child’s voice is an intriguing, and largely unknown, aspect of the work. Stockhausen chose the twelve-year-old Josef Protschka to sing the vocal parts for the piece. He realized, though, that those parts proved too difficult for any musician, child or adult. They were largely conceived in terms appropriate for electronic music. The pitches are not fixed in scale degrees but

rather in acoustical frequencies, many of them falling between the twelve chromatic pitches, and the rhythmic durations are realized in centimeters (tape lengths) instead of standard notation. Stockhausen aimed to surmount these difficulties by executing the parts with sine tones and then playing back the recording of those tones to Protschka, who listened to them with headphones and then sang them back to the best of his ability. Protschka was in some cases given sheets that provided the text and general melodic contour of a phrase, along with frequency and centimeter markings (fig. 4).⁴⁷ The recording sessions lasted around three hours each. Stockhausen selected the best takes and then transformed them to fit the context of a specific passage in the work.⁴⁸

What is striking about this recording session is how it reassigns the traditional roles between the voice and electronic technology. The latter typically services the voice or remains beholden to it. Recording equipment reproduces the voice, trying to do so as faithfully as possible. The Vocoder appears to have gained some autonomy by generating speech, but it still depends on the human voice as a source. Even the Voder relies on replicas of human speech, vowel and consonant sounds, to create an approximate version of that source. In these various cases, the voice is never the subaltern to technology. Yet in the recording session, and in *Gesang* itself, the voice plays that role. Protschka in many ways becomes a Vocoder, taking in the electronic sound information, processing it, and synthesizing it with his own voice. In *Gesang*, the lines between human voice and electronic technology twist even more. During the course of the work, the electronic sounds appear to draw upon the boy's voice so as to develop the ability to speak. Going well beyond the output of the Vocoder or Voder, those sounds do not imitate the voice but rather use it as a point of departure from which to create a unique form of speech. *Gesang* presents us with an intricate scheme in which a new type of electronic speech, one not resembling a human original, slowly develops.

We can follow this scheme by focusing on specific moments in the six sections of the work. *Gesang* begins with a rush of impulse tones that dwindle into a series of isolated pitches, approximately E-flat, G, G (lower range), C-sharp.⁴⁹ Out of the sustained E-flat emerges the voice, which sings the word "jubelt" to the pitches E-flat to B-flat, roughly the outer pitches of the electronic phrase (:05-:12).⁵⁰ A few seconds later another moment of melodic imitation occurs, as the general contour of a three-pitch electronic figure is taken up by the solo voice on the phrase "lobet ihn" (:26-:32). In both cases, the imitation is not exact. Nor would one expect it to be. Ever so modern and variegated, *Gesang* has little to do with such a conventional and precisely repetitive gesture as imitation. The aversion to imitation makes these two parallels, no matter how loose, all the more surprising and significant. They take us back into the studio with Protschka, hearing a child absorb electronic melodies and give them a human voice. The recording session served as the first meeting between voice and electronic sound in the creation of *Gesang*. Stockhausen appropriately restages it at the beginning of the work, where it serves again as the initial interaction between the two. By doing so, he immediately disrupts our expectations, having us hear the human voice as secondary to the electronic sounds, something that imitates those sounds.

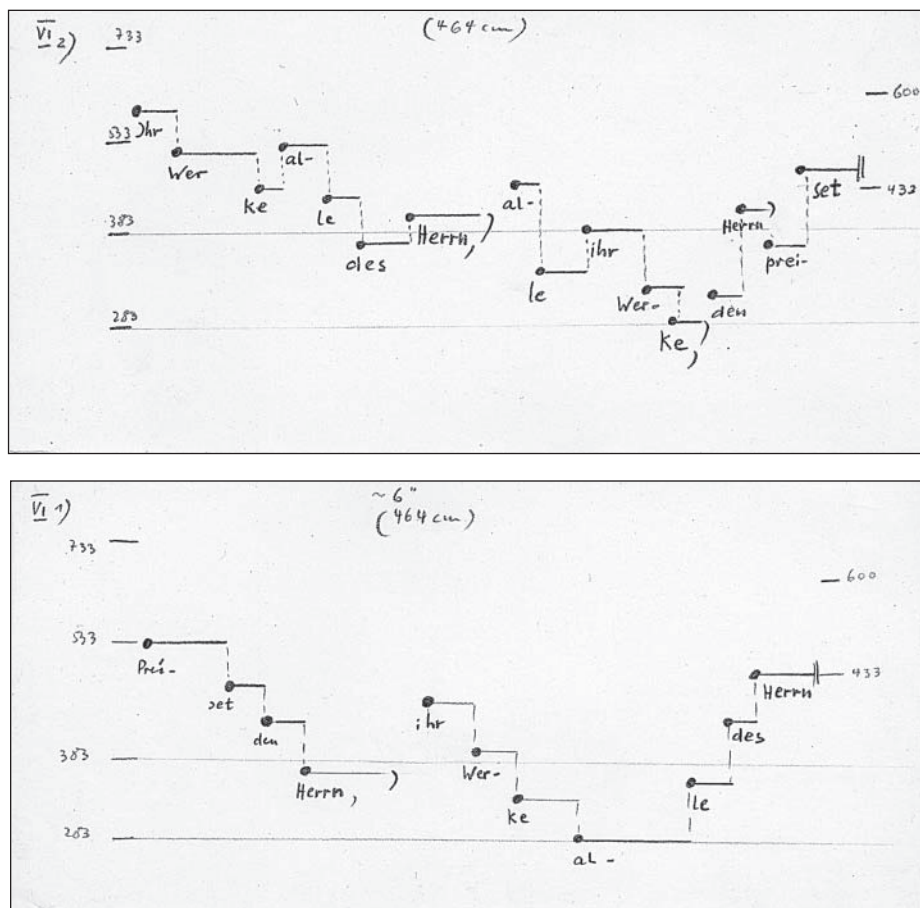


Fig. 4. Vocal charts given to boy soprano Josef Protschka. Image taken from Karlheinz Stockhausen, *Gesang der Jünglinge, Elektronische Musik: Faksimile-Edition 2001* (Kürten: Stockhausen Verlag, 2001), 138. Used by permission of Stockhausen Verlag.

The C section opens with the first extended passage for solo speaking voice. Stockhausen slightly distorts the voice by fragmenting it so that our attention shifts to the melodic movement between isolated syllables/tones. This passage also marks the first prominent appearance of the low individual impulse sonorities which play a significant role in the piece (3:02). Like the voice, these sounds move melodically from one pitch to the next, as if enunciating lone words or syllables. In their study of the sketches and structural plans of *Gesang*, Pascal Decroupet and Elena Ungeheuer note that the spoken voice and electronic sounds in this passage have “shared organizational principles,” the “melodic contour” of the latter adhering to a structure derived from the inflexions of spoken language.⁵¹ With that in mind, we can hear the impulse sonorities not just as sharing structural elements with speech but rather as actually speaking. It is not an entirely fanciful interpretation, for such sounds had strong associations with speech in the WDR.⁵² György Ligeti’s *Artikulation* (1958), written at the studio on the heels of *Gesang*, builds “an imaginary conversation” for just electronic

sounds—no human voices chime in. Those timbres, as he puts it, have “speechlike results.”⁵³ Among the first “words” in that conversation are low impulse sonorities, sounds that get the discussion off to a quick and engaging start.

These sonorities also form the “first words” in *Gesang*. It is perhaps not coincidental that those words emerge during a patch of clear human speech. The ability to speak would not be possible without the model provided by the human voice. It offers the contours and flow upon which the electronic sounds draw. The voice also gives a context in which we can hear these impulse tones as resembling speech. So now we have the electronic sounds responding to the human voice, the opposite of the relationship set up in the recording session and at the beginning of the A section. The sounds, though, are nowhere near as pliant as the voice was in those instances. The precise pitches and contours of human speech are rarely, if at all, imitated by the electronic sounds. Electronic speech instead draws upon only general qualities of the human variety, and even then it quickly moves beyond those qualities into its own linguistic realm.

No sooner has this new language emerged than it disappears. During the following few minutes (the rest of the C and the entire D sections), *Gesang* ricochets back and forth between blocks of electronic sound and clear lines of human speech, or, as Stockhausen tellingly puts it, between “pure sound” and “pure speech.”⁵⁴ The distinct impulse sonorities, the carriers of electronic speech, reappear in the E section, actively bouncing around in their own conversation. The boy’s voice does not participate in the discussion. It instead behaves like the electronic swarms previously did, being clotted in thick masses which interrupt the flow of electronic speech. In this topsyturvy world, electronic sounds speak, and human voices block with bursts of noise.

The concluding F section goes beyond a mere reversal.⁵⁵ The longest and most intricate part of the piece, it presents an ever-shifting mix of sounds and voices. As described earlier, Stockhausen structuralizes the governing spectrum, segmenting it into discrete units, which are combined to create constantly changing sonic strands. The rhythmic conception enhances the timbral vacillation, as the composer isolates sounds lasting from roughly one-twentieth of a second to one second.⁵⁶ Defined speech rarely appears, only sporadic isolated words and syllables. By this point, the human voice has almost disappeared into the mercurial world of “pure sound.” Electronic speech also seems to have faded away. The low single impulse tones are still heard but they no longer dominate the conversation as they did in the C and E sections. Rather, a new form of speech, one branching out from the single impulse tones, has taken form. Those “first words” have given birth to a fecund vocabulary, as heard in the diverse range of electronic sounds, a diversity unequaled earlier in the work. Electronic speech has grown before our ears. *Artikulation* charts a similar linguistic development, beginning with lone impulse tones and concluding with a “complete mixture and interpenetration” of the various sounds heard throughout the work.⁵⁷ As in *Gesang*, the final cluster grows out of the single sonorities. *Artikulation* suggests that Ligeti was attuned to the evolution of electronic speech in Stockhausen’s work, as he tried to raise the process to the next level by having electronic speech develop on its own in a sound world untouched by the human voice.

With or without the voice, both works grew out of a fascination with human speech. Composers and scientists at the WDR were fascinated by its sonic and structural complexity. According to Stockhausen, “sung speech-sounds probably represent the most complex of speech structures.” Complexity was a magnet for composers already taken by intricate sounds and structures. Speech would not just inspire them but it would challenge them as well. To engage speech would require creating “much more sophisticated electronic sounds” lest those sounds, paragons of complexity themselves, pale in comparison.⁵⁸ *Gesang* and *Artikulation* respond to the challenge by creating electronic forms of speech which emulate the melodic, timbral, and rhythmic aspects of the human type. The two, however, take an even bolder step by making electronic speech increasingly complex, to the point of surpassing the prized intricacy of human speech. Once again modernist confidence, or audacity, arises. Whereas *Gesang* sought to augment its purity with the pure, it now takes on the complexity of speech and not only imitates it but also aims to exceed it.

Discussing the subsumption of speech into music in *Le Marteau*, Stockhausen describes how the voice, with mouth closed, becomes a “speechless instrument.” The voice, as suggested by his phrase, loses something in this process. It proves no different in *Gesang*. The voices in both works lose many of the same things, particularly text, intelligibility, and distinct vocal qualities. In *Gesang*, however, the voice never outright disappears, as it eventually does in *Le Marteau*. Turning things around, we can ask what happens to electronic sound when it becomes speech. Does it lose anything? Does it become “soundless speech”? On the contrary, electronic sound has much to gain. It takes on new dimensions and layers of complexity. It becomes “speaking sound.” When this new form of speech has been fully attained, as it is in the F section, electronic sound is at its richest, no longer merely imitating or interrupting the human voice.

The boy’s voice still pervades the final section. Why does it ring so prominently, if not clearly, now that sound has gained the ability to speak? There would seemingly be no role left for it to play. There are, though, several parts that it performs in relation to electronic speech. First, as in the C section, it operates as a constant point of comparison that highlights the speech-like affinities of the electronic sounds. In his account of *Il canto sospeso*, Stockhausen relates how “the sense of speech can only be banished to a vocal structure” when the listener can still detect it, as by hearing a “few fragmentary syllables” (“MS,” 49). We need to hear speech, or traces of it, to realize how it has made the transition to a “higher” structural level. In *Gesang*, the flashes of distinct words reveal how thoroughly speech has been absorbed into electronic sound, and into a higher form of electronic speech.

Finally, speech can never be fully “banished” for the same reason it was welcomed into the work in the first place. It mollifies abstraction. As heard in *Studien I* and *II*, electronic sound closes itself up in an abstract realm. Seeking unrivaled complexity, electronic speech tightens the enclosure. The conclusion of *Artikulation*, for instance, reaches a point of thick abstraction, a barrage of sounds. Notably the new language developed in the work died with the piece, as Ligeti never took it up again, perhaps

realizing how abstruse it was. In *Gesang*, the boy's voice keeps the crust of abstraction from closing over the work by asserting the familiar. His voice provides something for the listener to grasp. It also allows us to hear the creation of a new type of speech.

When framed as speech and sound, the play between the familiar and the abstract proves quite labile. Speech moves toward sound; sound moves toward speech. Ultimately, though, the two head toward sound, the realm of the abstract. Of all the pairings discussed here, speech/sound goes furthest into that realm. The two categories are easy to discern, compared to such broad and conceptual relationships as purity/impurity and childhood/machine. With the terms so distinct, we can perceive the disintegration of speech, its pieces falling into an expanding pool of electronic timbres. By the end of the work, there is little speech left in speech. Much of it has become sound. Some of sound has also become speech, specifically electronic speech. The electronic language developed in *Gesang* quickly leaves behind the most general affinities it had with the human voice and the familiar. It instead develops its own intricate timbral lexicon. Despite being crowded by electronic sound, human speech still endures. As it must, for speech is vital to the work, being at once a carrier of meaning, a palliative to abstraction, and a linguistic model. Playing all those parts, speech restrains *Gesang* from venturing all the way into the abstract. The work, however, still makes much headway in that direction, driven there by the creation of a new form of speech.

Childhood and Machine

The human speech resounding throughout *Gesang* belongs to a child. No matter how contorted, the spoken and sung words represent that figure. The blips, swarms, and blasts filling the work belong to a machine. Ever so contorted and strange, they represent that object, noises emerging from the equipment of the WDR. Nothing but the newest machines could create such new and inhuman sounds. In this light, the boy's voice and electronic sounds give the relationship between the familiar and the abstract the guise of childhood and machine. There is seemingly no common ground between those two terms. The child plays in a sphere of simplicity and naturalness, whereas the machine grinds in a mechanical world of complexity. Innocence, that characteristic of childhood, has no presence in that world, for machines are neither innocent nor impure. Finally, children change and mature, in the process losing their innocence. Machines, on the other hand, stay the same, awaiting a moment of obsolescence or destruction.

So remote are the two that it appears that they could never be brought together, let alone merge into a single figure, like a child robot. Indeed, out of all the different mergers of human and machine created in science, popular culture, and the arts, the child machine is relatively rare.⁵⁹ Like other mechanical beings, when and where it appears, it causes anxiety by blurring the lines between human and machine, especially the unsettling, if not unthinkable, idea of combining the most vulnerable and innocent stage of humanity with technological coldness and precision. The figure also

714 raises a particular fear about technological inventions: they might “grow up” as children do, becoming not so much older as more complex and powerful. The parents, or human creators, could easily lose control of their offspring. Narratives dealing with such figures focus on these troubling phenomena, seeking to resolve them in some way. Attempts are made to clear up the mix, separating the parts so that we have a child or a machine.⁶⁰ In many cases, the two cannot be completely disconnected, but the mix can be pushed to one side so as to dispel most of the disturbing muddle. From the mix emerges an entity more machine than child or more child than machine. With these narrative outcomes in mind, we can turn to accounts of two mechanical children from the 1950s and then to *Gesang* to see how it deals with the sonic chimera of an electronic boy’s voice. These examples may be drawn from very different sources (psychological case study, comic books, electronic music) but they each respond to a larger cultural need to separate the child and the machine.

In 1959, three years after the premiere of *Gesang*, *Scientific American* featured an article about “Joey,” a “mechanical boy.”⁶¹ Child psychologist Bruno Bettelheim described how “Joey,” an autistic child, took on the identity of a machine as a way of dealing with the emotional muteness of his parents. As a machine, he would not have to expect any feelings from them or give any in return. An early self-portrait shows how “Joey” perceived himself, a robot with a blank stare and live-wired limbs. The article details “Joey’s” mechanical persona, his surrounding himself with found parts (bulbs, tubes, and wires) and pretending that his basic bodily functions were run by machines. According to Bettelheim, the persona was so realistic that he and his staff had to “force” themselves “to realize that ‘Joey’ was a child” (“JMB,” 117). Echoing Freud on automata, he found the spectacle to be “uncanny.”⁶² As Bettelheim elaborated, “a human body that functions as if it were a machine and a machine that duplicates human functions are equally fascinating and frightening” (“JMB,” 117).

The article gets caught up in the spectacle, spending much time describing how “Joey” “functions as if [he] were a machine” (“JMB,” 117). Unlike a conventional case study, it devotes little attention to the cure, the means by which Bettelheim got “Joey” to abandon his new identity.⁶³ Bettelheim, though, continuously points the reader in the direction of a cure. When the moment comes, it is both a clinical triumph and the fulfillment of the cultural imperative to dissolve the “mechanical boy” chimera. Such an outcome, clinical and cultural, is never in doubt. The human, especially the child, must be saved from the machine. The article reassuringly concludes, “suffice it to say that [‘Joey’] ceased to be a mechanical boy and became a human child” (“JMB,” 127). The naturalness of childhood has been restored, a naturalness, as Bettelheim warns, in constant peril from the difficulties of “emotional development in a machine age” (“JMB,” 117).

Before there was “Joey” and *Gesang*, there was Astro Boy. In 1952, Japanese comic artist Osamu Tezuka unveiled the title character in a new comic book, which proved so popular that it took off in North America and Europe by the middle of the decade.⁶⁴ Tezuka’s story had audiences peer into the distant future of 2003.⁶⁵ It begins with a death, as the scientist Dr. Tenma has lost his son. In his grief, he tries to replace him with a robot created in the boy’s image. Tenma, though, realizes that Astro Boy will

never be human, and thus unable to fill his loss. The robot boy soon experiences his own sense of loss, as he is sent away, a departure that instills in him an unceasing desire to be human. He is taken in by the owner of a circus in which robots are forced to do stunts and to battle each other. Dr. Ochanomizu, a crusader for robot rights, rescues and adopts him, teaching him how to use his powers to help others. Although Astro Boy saves humans from one disaster after another, they remain frightened by him. Nonetheless, he continues to fight for them so as to gain their acceptance and possibly become human himself.

Robot boys are not the only ones with that wish; wooden boys also share it. *Astro Boy* is clearly indebted to the story of Pinocchio. There is, though, a significant difference between the two: the puppet becomes a boy, the robot remains a robot. More to the point, he remains a chimera, a robot that wishes to be a boy and has child-like qualities, the soft eyes and prankish spirit. The comic book does not completely resolve the figure. To do so would bring an abrupt halt to the narrative, as seen in both the Pinocchio tale and “Joey’s” case study. It instead skews the mixture of machine and human heavily to the side of the machine, so as to give us some clarity while keeping up traces of the beguiling mix.

Gesang unleashes a chimerical voice. The voice sounds like a child one moment and electronic noise the next. The two supposedly antithetical sounds inhabit a single voice, one emerging from the mouth of the machine: the speakers. As we know by now, the amalgam is unsteady and eventually settles to one side. And as we know even better, it, like other forms of the abstract/familiar opposition, will go to the side of the abstract, the sounds created by the new machines of the WDR studio. Invested in those machines and sonorities, *Gesang* has them take possession of the new voice. They even claim the real-life Protschka, who adhered to those sounds, attempting to replicate their precision. Once his voice enters the electronic sound world, it behaves in ways a child’s voice could never do—singing in layers, even singing backwards. Only electronic timbres, ones voiced by a machine, can do those things.

There is still a child in that voice. He is not completely silenced by the machine. Nor would we expect him to be. His voice serves several purposes. It enriches the abstract machine song with touches of the familiar. It also evokes the youths in the biblical story. Moreover, to erase the boy’s voice would prove difficult. It is a strong and distinct sound, one that can survive the electronic topsy-turvy. Even in pieces, it gives a presence to childhood, similar to stray words giving a presence to speech. Childhood remains, but a childhood swept into the realm of the machine. Like other works conjuring the chimerical mechanical child, *Gesang* pushes the figure to one side. The effort is undoubtedly part of the larger movement toward the abstract but it may also stem from a cultural unease with the child machine. Even with such momentum, *Gesang*, like *Astro Boy*, does not free itself completely from the disturbing hybrid, giving us a voice that is much more machine than boy, but still both.

The blend is rather intricate, as not only does the boy move to the side of the machine but the machine also acts like a boy. Just as *Gesang* has electronic sound take on elements of speech, it has the machine assume aspects of childhood. The technol-

716 ogy in the studio goes beyond the Vocoder and Voder by not just reproducing human speech but by creating sounds that speak in their own way. With those sounds, the machine could be viewed as learning how to speak. In other words, it becomes a child, acquiring language by moving from a few words, the low impulse tones, to a full vocabulary, the sonic spectrum of the F section. Such role-playing may not be the first thing to come to mind upon hearing *Gesang*, but other critics have commented on childlike aspects of the work. Electronic music was surely in a youthful period of beginnings, but, according to Wilfrid Mellers, *Gesang* went beyond mere technological origins. As he claims, it was “no accident” that the first piece to establish the idiom, to make “imaginative sense” out of it, deals with themes of “childhood and youth.”⁶⁶ Here, electronic music takes its first artistic steps, and speaks its first words.

Adorno also viewed *Gesang* as a youthful composition. It possessed vitality at a time when so much new music had “aged” (“ANM,” 192). The preoccupation with serialism brought about this decrepitude. New works succumbed to conformity and rigidity. Turned inward, they could no longer speak of or toward the surrounding world. Whereas modernist pieces from earlier in the century conveyed the “threateningly eruptive, the ungrasped,” recent compositions could not, nor did they seek to, reveal the disturbing truths assiduously repressed by society (“ANM,” 184). It is with relief and apparent glee then that Adorno relates how *Gesang* so rattled one listener that the agitated man wrote to the radio station about visions of atom bombs and destruction conjured by the work. Stockhausen’s piece had ripped agape the screen of pleasantness covering society, to expose the threatening horrors lying underneath.⁶⁷ Adorno also praised *Gesang* for avoiding the stultifying sameness resulting from the overreaching application of serial schemes. Such designs “leveled” off the rich contours of musical materials, reducing them to the same thin ground. *Gesang*, however, “contains characters that contrast more strongly than had previously been the taste of the postwar generation.”⁶⁸

Strangely, Adorno never identifies these “characters.” He never once mentions the child’s voice or the religious text, if these indeed are what he means by the term. His omission is curious, for those materials are so striking and unusual for electronic music of the time that one would expect Adorno to say something about their inclusion. The hostile critics and listeners certainly did. Nor does he discuss the relationship between the child’s song and electronic sounds, except to comment that all the characters are “technically connected.” The remark catches him out of voice, as it repeats serial composers’ pat phrases of interrelationships and connections, empty chatter elsewhere excoriated by Adorno.

Almost a half-century later, we can see *Gesang* and its “technical connections” in a very different light. The work is not just one of the most intriguing pieces of 1950s European serialism and early electronic music, it can also be viewed as participating in a larger modernist effort to join the categories of the abstract and the familiar. The

effort intensified in the 1940s to 1950s as some artists, such as Stockhausen and Pollock, sought to introduce recognizable elements into the densely abstract idioms that they had been cultivating. As mentioned above, there were not set ways of going about such a union. Each work had to find its own solution. *Gesang* recasts familiar elements in ways emulating the ideals of the abstract, the world of electronic sound. What is especially interesting about the work is how the opposition between the familiar and the abstract assumes various forms. Each of these offshoots—purity/impurity, speech/sound, childhood/machine—configures the opposition in unique guises, some of which (speech/sound, childhood/machine) reinforce the abstract more than others (purity/impurity).

Finally, *Gesang* offers a different view of the type of modernism cultivated at Darmstadt. The piece holds true to the avant-garde audacity associated with the festival. It brandishes new technologies and musical visions, both of which proved disorienting and upsetting to contemporary listeners. Confidence gives way to vainglory. *Gesang* gilds the pure with the pure and knots the complexity of electronic sound with the intricacy of speech. Yet at the same time, the work reveals a more vulnerable side to this bold modernism. The vulnerability emerges in the need for the familiar, a need arising from an admission of the limits and dangers of dense abstraction. The reaching out to the familiar places the modern on new and parlous ground as it seeks to connect the seemingly unconnectable. In facing these uncertainties, another side of *Gesang*—appropriately, a youthful side—comes across. Like a child, the work takes first steps, struggles, learns, and seeks.

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The compact disc and facsimile edition of *Gesang der Jüinglinge* and all other scores and compact discs of the works of Karlheinz Stockhausen may be ordered directly from Stockhausen-Verlag, 51515 Kürten, Germany, fax: 0049 2268 1813, www.stockhausen.org.

Notes

1. For a discussion of the early years of electronic music, see David Ernst, *The Evolution of Electronic Music* (New York: Schirmer, 1977), 1–85 and Robert P. Morgan, *Twentieth-Century Music: A History of Musical Style in Modern Europe and America* (New York: W.W. Norton, 1991), 461–7.

2. There were, of course, important precedents, including the theremin and ondes martenot.

3. Karlheinz Stockhausen, “Hymnen—Nationalhymnen (Zur Elektronischen Musik 1967),” in Rudolf Frisius, ed., *Karlheinz Stockhausen* (Mainz: Schott Musik, 1996), 275; translated into English as “Hymnen” in the liner notes to the compact disc recording of *Hymnen* issued by the Stockhausen Verlag (CD 10, 1995), 130; hereafter abbreviated as “H.”

4. The turn to highly abstract styles (serial and electronic music), of course, responds to an array of cultural influences. They include a continuing modernist reaction against Romantic expression, a reaction against neoclassical styles (themselves an earlier response to Romantic expression), the interest in musical styles which could not be so easily manipulated for political purposes (as the Nazis had done with more traditional tonal idioms), and a growing emulation of scientific ideals of system

718 and progress. These ideas and others are discussed in Theodor Adorno, "Das Altern der neuen Musik," *Gesammelte Schriften*, ed. Rolf Teidemann (Frankfurt: Suhrkamp, 1973), 14:143–67, trans. Robert Hullot-Kentor and Fredric Will as "The Aging of New Music," in Adorno, *Essays on Music*, ed. Richard Leppert (Berkeley: University of California Press, 2002), 181–202; hereafter abbreviated as "ANM." See also M. J. Grant, *Serial Music, Serial Aesthetics: Compositional Theory in Post-War Europe* (New York: Cambridge University Press, 2001), 11–41; hereafter abbreviated as SMSA, and Gesa Kordes, "Darmstadt, Post-War Experimentation with Abstraction, and the West German Search for a New Musical Identity," in Celia Applegate and Pamela Potter, eds. *Music and German National Identity* (Chicago: University of Chicago Press, 2002), 205–17.

5. The annual new music event held in Darmstadt was one of the centers of modernist activity in the 1950s (and beyond). The festival was inaugurated in 1946 as part of an effort to rebuild German musical life and restore its place in the international scene. At first the programs consisted largely of neoclassical fare; however, by the beginning of the 1950s, young composers interested in serial music assumed prominence.

6. Stockhausen referred to the use of "musical orientation phenomena" ("H," 130).

7. Around this time other composers were mixing electronic and natural sounds. Two notable works include Edgard Varèse's *Poème électronique* (1957–58) and Pierre Boulez's *Poésie pour pouvoir* (1958).

8. The text is drawn from the Apocrypha additions to Daniel, 1:35–68, which can be inserted between Dan. 3:23 and 3:24. Used frequently in church services, the text would have been familiar to many of the original listeners.

9. T. J. Clark, *Farewell to an Idea: Episodes from a History of Modernism* (New Haven, Conn.: Yale University Press, 1999), 344–69; hereafter abbreviated as *FI*.

10. Stockhausen, *Hymnen: Elektronische und Konkrete Musik* (Vienna: Universal Edition, 1968), ix, trans. in "H," 136.

11. Sine tones are never used in such a bald fashion in these works; rather, they are combined and layered to create more complex sonorities.

12. For a discussion of the sound elements, see Pascal Decroupet and Elena Ungeheuer, "Through the Sensory Looking-Glass: The Aesthetic and Serial Foundations of *Gesang der Jünglinge*," *Perspectives of New Music* 36 (1998): 99–100; hereafter abbreviated as "TSLG."

13. In subsequent performances, Stockhausen integrated the fifth track into the fourth, creating a four-track version.

14. The serial schemes of the work are discussed in detail in Pascal Decroupet and Elena Ungeheuer, "Son pur—bruit—méditations: Matières, matériaux et formes dans *Gesang der Jünglinge* de Karlheinz Stockhausen" *Genesis* 4 (1993): 69–85 and "TSLG."

15. Karlheinz Stockhausen, "Musik und Sprache III," in Stockhausen, *Texte*, vol. 2, *Texte zu eigenen Werken zur Kunst Anderer Aktuelles* (Cologne: Verlag M. DuMont Schauberg, 1964), 59–60. This version expands upon an essay that originally appeared in *Die Reihe* 6 (1960). A translation of the latter as "Music and Speech" can be found in the English version of *Die Reihe* 6 (1964): 57–64; hereafter abbreviated as "MS." A translation of the longer essay can be found in the liner notes to Stockhausen, *Elektronische Musik, 1952–1960*, Stockhausen Verlag CD 3.

16. The idea of a continuum appears in Karlheinz Stockhausen, "Aktuelles," in *Texte*, 2:51–7. The article originally appeared in *Die Reihe* 1 (1955). English translations can be found in "Actualia" in *Die Reihe* 1 (1958): 45–51; hereafter abbreviated as "A," and *Elektronische Musik*, Liner Notes, 137–51. See "MS," 58–68. The idea of a continuum was central to early concepts of electronic music. On the importance of that idea, see SMSA, 96–102, and Elena Ungeheuer, "From the Elements to the Continuum: Timbre Composition in Early Electronic Music," *Contemporary Music Review* 10 (1994): 25–33.

17. A breakdown of these individual sections can be found in "TSLG," 134–9.

18. I have adopted the terminology used in "TSLG," 134.

19. On these formal realizations of the continuum, see "MS," 59–61.

20. Donald B. Kuspit, "The Unhappy Consciousness of Modernism," in Ingeborg Hoesterey, ed., *Zeitgeist in Babel: The Postmodernist Controversy* (Bloomington and Indianapolis: Indiana University

Press, 1991), 50. For another discussion of modernism and purity, see Renato Poggioli, *The Theory of the Avant-Garde*, trans. Gerald Fitzgerald (Cambridge, Mass: Harvard University Press, 1968), 199–206.

21. On the fascination with the purity of the sine tone, see Richard Toop, "Stockhausen and the Sine-Wave: The Story of an Ambiguous Relationship," *Musical Quarterly* 65 (1979): 379.

22. Herbert Eimert, "Der Sinus-Ton," *Melos* 21 (1954): 168. Unless otherwise indicated, all translations are mine.

23. Eimert, "Sinus-Ton," 170. Stockhausen, "Zur Situation des Metiers (Klangkomposition)," in *Texte*, vol. 1, *Texte zur elektronischen und instrumentalen Musik*, (Cologne: M. DuMont Schauberg, 1963), 50–5.

24. On Karl Goeyvaerts's views of the sine tone, see Herman Sabbe, "Goeyvaerts and the Beginnings of 'Punctual' Serialism and Electronic Music," *Revue belge de musicologie* 48 (1994):85.

25. "ANM," 182. The essay was first delivered as a talk at the 1954 Stuttgart Week of New Music. Adorno is most likely referring to both electronic and acoustic works. By this time, he would have had the opportunity to hear the early sine-tone based pieces. Later in the essay, he does refer to the "chemical purity" of electronic music ("ANM," 194).

26. Kuspit, "Unhappy Consciousness," 60.

27. Mary Douglas, *Purity and Danger: An Analysis of Concepts of Pollution and Taboo*, 2d ed. (London: Routledge & Kegan Paul, 1969), 159; hereafter abbreviated as *PD*.

28. On this sacred association, see Toop, "Stockhausen and the Sine-Wave," 383.

29. In the biblical account it appears that the "youths" are not children but rather adolescents or young adults. At some unknown point, the text became closely associated with childhood.

30. In my research on *Gesang* and other late modernist pieces, I have observed a tendency for many compositions to focus on a particular state or condition, such as purity, utopia, silence, or the fragmentary. As with the case of purity in *Gesang*, composers sometimes evoke these singular states through different, and often contradictory, manifestations of that state. For a discussion of the interaction of competing notions of utopia in Stockhausen's *Hymnen*, see my *Quotation and Cultural Meaning in the Twentieth Century* (New York: Cambridge University Press, 2003), 139–55.

31. Quoted in Ungeheuer, "From the Elements," 25.

32. Exclusion figures prominently in other modernist designs of purity, notably Greenberg's notion of "self-criticism." Greenberg, "Modernist Painting," in John O'Brien, ed., *Clement Greenberg: The Collected Essays and Criticism*, vol. 4, *Modernism with a Vengeance (1957–69)* (Chicago: University of Chicago Press, 1993), 85–94.

33. For an account of childhood as a cultural discourse, see Philippe Ariès, *Centuries of Childhood: A Social History of Family Life*, trans. Robert Baldick (New York: Knopf, 1962). The centrality of innocence in that discourse is discussed in James R. Kincaid, *Child Loving: The Erotic Child and Victorian Culture* (New York: Routledge, 1992), 72–9.

34. A. Neukirchen, *Düsseldorfer Nachrichten*, 2 June 1956. Quoted in Christoph von Blumröder, "Karlheinz Stockhausen—40 Jahre Elektronische Musik," *Archiv für Musikwissenschaft* 50 (1993): 322.

35. Ludwig Wismeyer, "Wider die Natur!" *Neue Zeitschrift für Musik* 118 (1957): 136–7.

36. Stockhausen, "Music and Speech," in Liner Notes, 152.

37. Stockhausen, "Actualia," in Liner Notes, 138.

38. An illuminating history of the early days of the WDR and the research conducted on speech can be found in Elena Ungeheuer, *Wie die elektronische Musik "erfunden" wurde . . . Quellenstudie zu Werner Meyer-Epplers musikalischen Entwurf zwischen 1949 und 1953* (Mainz: Schott, 1992).

39. For a brief history of some of these devices, see Homer Dudley, R. R. Riesz, and S. S. A. Watkins, "A Synthetic Speaker," *Journal of the Franklin Institute* 227 (1939); reprinted in James L. Flanagan and Lawrence R. Rabiner, eds., *Speech Synthesis* (Stroudsburg, Penn.: Dowden, Hutchinson, & Ross, 1973), 191–4.

40. On these machines, see Homer Dudley, "The Carrier Nature of Speech," *Bell System Technology Journal* 19 (1940); reprinted in *Speech Synthesis*, 22–42; Dudley, "Fundamentals of Speech Synthesis," *Journal of the Audio Engineers Society* 3 (1955), reprinted in *Speech Synthesis*, 43–58; and Dudley, Riesz, and Watkins, "A Synthetic Speaker," 190–215.

41. The inventor of the machine, Homer Dudley introduced the Vocoder to Meyer-Eppler, who used at the Institute of Phonetics at Bonn. Robert Beyer, a musician associated with the WDR, used both machines in a talk given at Darmstadt in 1950. Ungeheuer, *Elektronische Musik*, 104–7.

42. See note 15 for bibliographic information on this article.

43. There are some notable exceptions. Nono, for instance, used voices in earlier works.

44. An insightful discussion of the issues raised by text setting in integral serial idioms can be found in SMSA, 193–221.

45. A discussion of why composers turned to the voice and how it could be used to mitigate abstraction can be found in H. H. Stuckenschmidt, “Eine neue Kulturepoche,” *Melos* 26 (1959): 281–7.

46. Nono strongly rejected Stockhausen’s interpretation, arguing that his setting respected and enhanced the spirit of the text (the letters of executed resistance fighters). Nono, “Text—Musik—Gesang,” in Nono, *Texte, Studien zu Seiner Musik*, ed. Jürg Stenzl (Zurich: Atlantis, 1975), 59–60. Stockhausen acknowledged that Nono disagreed with his interpretation, stating that “the reader must therefore not take my reflections and analyses as being demonstrations of Nono’s composition, but rather of my own—demonstrated on the work of another composer” (“MS, 49).

47. These sheets were primarily used for the individual parts making up the choral swarms.

48. Stockhausen, *Gesang der Jünglinge, Elektronische Musik: Faksimile-Edition 2001* (Kürten: Stockhausen Verlag, 2001), index 9.

49. As with the bulk of the pitch material in the work, these pitches fall in between the twelve-chromatic scale degrees. The score lists the acoustical frequencies as 2533-3067-1600-2267 Hz. These frequencies have been taken from a “realization” score included in the Facsimile Edition published by the Stockhausen Verlag.

50. Again these are rough pitches. The frequencies given in the score are 1200-933 Hz. Note that these timings do not include the ten-second time delay worked into the track on the Stockhausen Verlag CD.

51. Decroupet and Ungeheuer, “Son pur,” 73.

52. Later electronic works focus on “articulation impulses,” speech filtered to such a degree that it is stripped of any discernable traces of meaning so as to leave behind sounds that only hold to the rhythmic contours of the original. Such tones give an impression of electronic speech, one notably still dependent on a human source.

53. György Ligeti, *Artikulation: Elektronische Musik, An Aural Score* by Rainer Wehinger (Mainz: B. Schott’s Söhne, 1970), 7, 17.

54. Stockhausen, “Music and Speech,” in *Liner Notes*, 159–60.

55. To recall, Stockhausen had originally planned but never completed a final G section. The Facsimile Edition of the work provides sketch materials for that section. Although it is difficult to ascertain what exactly this section would sound like and what form the relationship between electronic sound and human voice would have taken, it appears that the final section would have built upon the fluid sound world created in the F section. Most of the final events of the work are for electronic sounds; however, the ending includes several prominent choral swarms and chords. It is unclear how intelligible the text would have been in the latter.

56. There are two sections (called “rhythmic inserts”) in which these brief strands are used (9:53-11:30, 12:07-12:34). Pascal Decroupet, “Timbre Diversification in Serial Tape Music and its Consequence on Form,” *Contemporary Music Review* 10 (1994): 18.

57. Ligeti, *Artikulation*, 8.

58. Stockhausen, “Gesang der Jünglinge: Program Text,” in *CD Liner Notes*, 135.

59. According to Gaby Wood, the automata of the Enlightenment were sometimes designed as children. *Edison’s Eve: A Magical History of the Quest for Mechanical Life* (New York: Alfred A. Knopf, 2002), xiii–xiv, xix–xx.

60. This is not always the case. Sometimes the mechanical child is preserved for comic effect as seen in the sitcom “Small Wonder” (1985–89). In a few cases, they are destroyed. Wood relates a legend about the voyage taken to Sweden by Descartes. The philosopher was said to have brought with him his daughter Francine. Never seeing the child on board, the sailors went to Descartes’s cabin to find her. They came across a box containing a mechanical girl. Convinced that the doll was

supernatural, the crew threw her overboard. Descartes had a daughter named Francine who died at the age of five. While he did consider building automata, there is no evidence that he ever planned to build a replica of Francine. Wood, *Edison's Eve*, 3–6.

61. Bruno Bettelheim, "'Joey': A 'Mechanical Boy,'" *Scientific American* 200, no. 3 (March 1959): 117–27; hereafter abbreviated as "JMB."

62. Sigmund Freud, "The Uncanny," in *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, ed. and trans. James Strachey (London: Hogarth, 1953), 17:226–7.

63. Bettelheim states up front: "I shall concentrate upon the illness, rather than the treatment" ("JMB," 117).

64. An English language version of the original Japanese comic has recently been published by Dark Horse comics. In 1963, NBC aired a black-and-white animated series based on the comic book that won a large following.

65. In the original comic book the year is 2003, whereas in the television series it is 2030.

66. Wilfrid Mellers, *Caliban Reborn: Renewal in Twentieth-Century Music* (New York: Da Capo Press, 1979), 120.

67. Adorno, "The Criteria of New Music," in *Sound Figures*, trans. Rodney Livingstone (Stanford, Calif.: Stanford University Press, 1999), 194.

68. *Ibid.*, 171.