Max Bense in the kitchen,
1968. Photograph from the
Deutsches Literaturarchiv
Marbach, reproduced by per-
mission of the photographer
Karin Székessy.

"The Higher Forms Are Also the Weaker Ones": Technics and Humanism in Max Bense's "Technical Existence"

WILLIAM STEWART

Despite receiving steady if modest attention over the past half century—including a notable scholarly effort in the last decade to canonize their place in the traditions of German media studies, intellectual history, and philosophy of technology—the writings of Max Bense (1910–1990) remain virtually untranslated into English.[1] In the spaces where he is invoked, Bense is characterized as an unfairly overlooked patriarch of digital humanities, media theory, postdigital art, and postmodern notions of literary and textual topology.[2] But although Bense acted as pillar and public face of a rationalist tradition of German intellectualism in the aftermath of World War II, the wide-ranging and interdisciplinary work of his career's first forty years is often obscured by the reputation for esoteric theory, methodological stringency, and heady if opaque conclusions garnered by the pragmatic semiotics of his later texts.

The following translation of Bense's 1949 essay "Technische Existenz" aims to help fill this lacuna and facilitate the author's introduction to a non-German-speaking audience. Moreover, the choice of this essay serves to stake out core conceptual positions pursued by Bense already in the early years of his work, positions that remain central to his thinking in the decades following and that condition his later intellectual pursuits. "Technical Existence" may seem to be an atypical choice for translation, for it precedes Bense's exposure to cybernetics, a topic he would not publish on until two years later; it also predates the development of Bense's informational aesthetics, which does not emerge until the mid-1950s; and it is well removed from the Peircean semiotics that would frame the work of his later years. And yet all three of these topoi to which Bense would subsequently turn are underlain by the principle argument of "Technical Existence"—that technics and technicity constitute a historical a priori for the human and ontologically condition it as an intellectual being. Across Bense's oeuvre, the question of the human is fundamentally inseparable from the question of technics, because technics serves to challenge, fracture, reconfigure, and displace the human and what it under-

stands to be its world. Today, two decades removed from N. Katherine Hayles's survey of how we became posthuman, this thought might seem old hat; in 1949, when Bense describes it in "Technical Existence," it decidedly was not.

But who was Max Bense? From the beginning, Bense resisted reductive intellectual profiling, describing himself in the introduction to his two-volume *Konturen einer Geistesgeschichte der Mathematik* (Contours of an intellectual history of mathematics; 1946/1949) as a "physicist, mathematician, philosopher, and person of letters."[3] He studied mathematics, physics, chemistry, geology, and philosophy at the University of Cologne from 1930 to 1933 before continuing studies in Bonn, where he received a Ph.D. in 1937. His dissertation was equal parts physics and philosophy, analyzing the significance of *Dasein* in the context of quantum mechanics and relativity. During the 1930s, Bense also established himself as a public intellectual, writing on topics of contemporary science for the broad audiences of radio and feuilleton. Whether in academic or public contexts, Bense's methods prized topical breadth over granular depth. His insights often have more to do with framing the intellectual and philosophical implications of contemporary mathematics and physics than they do with explicating the theoretical particularities of those fields.[4]

This is one way to understand the conceptual knot that occupied Bense's writings throughout the 1930s and 1940s; namely, the need for an account that would unify *Geist* (human intellect, rationality, thought, spirit) and mathematics. Bense saw the necessity of this task in the ongoing debates around mathematics' fundamental axiomatization and in the tensions between the physics of relativity and that of quantum mechanics. In texts such as the 1935 essay "Aufstand des Geistes: Eine Verteidigung der Erkenntnis" (The intellect's revolt: A defense of knowledge) or the 1939 work *Geist der Mathematik: Abschnitte aus der Philosophie der Arithmetik und Geometrie* (Mathematical intellect: Passages from the philosophy of arithmetic and geometry), Bense argued that the philosophical-epistemological implications of these highly sophisticated crises were no less than an understanding of the human being itself.[5] Rejecting the abyss between the natural sciences and the humanities that would be captured in C.P. Snow's 1959 lecture "The Two Cultures," Bense's early work emphasizes a history of human rationality as a history of mathematics' increasing synthesis—via figures such as René Descartes, Gottfried Wilhelm Leibniz, or Pierre-Simon Laplace— with the lived world.[6]

In one sense a culmination of this trajectory, "Technical Existence" belongs to a moment when Bense's terms nevertheless began to shift. Where the leitmotif of *Konturen einer Geistesgeschichte der Mathematik* entailed a commitment to

rationalism embodied in the Leibnizian ideal of *mathesis universalis*, here the integration of intellect (*Geist*) and "theory" (*Theorie*) with the matter of the world is organized under the sign of technics (*Technik*). "Technical Existence" excavates a theory of technics—that is, "the means to manipulate technics with the intellect, abstractly and concretely" (sec. 3)—that emphasizes the necessary place of technics in the history of the development of the category "human" and, by extension, the necessity of technics for any future humanism.

This notion took on urgency in 1949, the year the Soviet Union detonated its first atomic weapon and inaugurated the possibility of global technical annihilation. But beyond this specific temporal relevance, Bense's interest in technics places him squarely within a rich mid-century discourse on the realm of artifice and human creation.[7] While the arguments of this discourse have in many cases been rendered into English as constituting a philosophy of "technology," the superannuated "technics" used in this translation not only reflects the language of the day (as in Lewis Mumford's 1934 *Technics and Civilization*). More important, it conjures an abstract category more evidently comparable with aesthetics, ethics, mathematics, or politics and whose connotative emphasis rests on creative intervention and artificiality rather than mechanization, engineering, or scientific "advancement."[8]

Surveying these two topoi—the meaning of "technics" in relation to these other "-ics" and the inherently historical character of this etymological resonance—serves as program for "Technical Existence," as when Bense considers the "unity of aesthetic and mathematical consciousness" evident in technical thinking, even in "the earliest technical artifacts" (sec. 11). This drive to unearth the historicity of the technical casts technics not as a mark of modernity, though it certainly has left a mark *on* modernity, but rather as an arena present in every epoch of human activity. To think technics means, for Bense, to act as "the most multifaceted historian imaginable" (sec. 11), tracing vectors of technical currents through machinery, tools, and laboratory sciences, but also across cultural beliefs, theological doxa, and metaphysical worldviews. With "Technical Existence," Bense situates his intervention somewhere between Ernst Kapp and Michel Foucault, arguing that an archaeology of the technical renders apparent a most profound register of humanistic shifts.

Frustratingly, perhaps, Bense's oeuvre never undertakes the kind of granular history of technics that he advocates in this essay, as his subsequent writings turn to cybernetic, informational, and semiotic concerns of a much more theoretical and abstract nature. And yet, from one vantage point, this, too, represents a task laid out in "Technical Existence." Bense's essay, after all, is preoccupied with the broad category of "theory"—a world

defined by theory, a reality constituted by theory, an existence that demands theory. "For the first time," Bense declares, "intellectuals inhabit a material plane of existence in which they cannot exist without theory: not only the theory of the masses and their transformation, but also the theory of an intellectual and materially individual existence" (sec. 3). In our contemporary moment, he argues, theory scripts and regulates the world, occupying the place once held by ceremony and convention. Theory allows us to manipulate technics, but also to make ethical judgments and even to understand the human as such. Accordingly, Bense's theoretical world requires an intelligentsia to interpret it; specialists, functionaries, and experts serve as its custodians. The self-reflexivity of theory, on the other hand, endows technics with its own kind of autonomy, as it revises itself in light of experimental hypotheses and observation: where, for instance, technics once held to the idea of a thoroughly predictable world under the aegis of thermodynamism and Laplace's demon, it ultimately superseded this notion by empirically demonstrating its impossibility in the principles of quantum mechanics.

Despite theory's pervasiveness, technical existence is nonetheless characterized by a preponderance of aporias between the material and the intellectual, between internal calculation and external result, between the human and its creation. For Bense, these aporias affect technics as much as they do human beings. With technics, human intellect has produced a world that it does not seem to be able to fully inhabit (or inhabits only with discontent). But technics, while it disavows its creators, nevertheless bears their indelible mark and is thus beholden to its own "humanity." Theory and the human are reciprocally interdependent. The theory that undergirds the whole of technical existence is condition for and therefore prior to the human, and yet the human is the source of and therefore prior to any theory. In Bense's eye, technics imposes on us a dynamic of forced hospitality: "We are the captive guests of everything we have created, yet we endowed none of it with the mercy to let us go free" (sec. 1).

Although the thorny imbrication of existence and technics that Bense posits as constitutive of the inhabitable world, and the more nuanced conception of the technical in (productive) concert with humanist projects demanded by such an imbrication, may have since gained traction in the discourses of cybernetics, posthumanism, or the Anthropocene, the fact that Bense, a German, would advance such a techno-positive thesis in the immediate aftermath of the Second World War raises questions about the politics of his thinking. However, taking stock of the political profile of Bense's early work requires a bit of teasing out.

At first glance, the facts suggest a thinker at best uncritical of German fascism and at worst complicit with it: he published con-

tinuously through the 1930s without ever directly condemning the Nazi regime; he served in the Luftwaffe as a researcher for radiation physics; and following the war, he turned to topics of technics, mathematics, and rationality, an apparent attempt to slog on in Enlightenment trappings, unheeding of the incisive critiques from the Left. Yet such an image would be misleading. Although recent scholarship has portrayed Bense's writings in the 1930s and 1940s as performing a rhetoric of "strategic publicity" not unlike the kind of esoteric communication advocated by Leo Strauss, there is ample evidence in support of Bense's intellectual politics being not solely strategic.[9] In 1937, Bense printed the pamphlet *Anti-Klages* with the antifascist publisher Ernst Niekisch, in which he directly criticizes Ludwig Klages's 1929 *Der Geist als Widersacher der Seele* (The intellect as antagonist of the soul), an intellectual position that made him persona non grata among circles sympathetic to the National Socialists. A year later, he refused to undergo a six-month Nazi indoctrination into fascist intellectualism following the successful completion of his dissertation, meaning that the process of *Habilitation,* the postdoctoral work required to hold an independent professorship, would be denied him. In 1939, Bense attempted unsuccessfully to emigrate to the United States. Instead, following employment at Bayer, he was drafted into the Luftwaffe as a meteorologist, though with no chance of promotion on account of his history of anti-Nazi statements.[10]

From 1943 until the end of the war, Bense was stationed in the town of Georgenthal at the Labor für Hochfrequenztechnik und Ultraschall. He described his experiences there in terms of, on the one hand, an inner immigration to his own studies while, on the other hand, appearing to dutifully carry out radar tests for the Luftwaffe—what Bense would allude to in the epigraph to the 1949 essay collection *Technische Existenz* as "surviving the twelve-year 'rainy season' through deceit and deception."[11] The American army, upon capturing Georgenthal in the spring of 1945, was less convinced about the importance of his experiments and unaware of his intellectual subterfuge. They deemed Bense little more than a bureaucratic assistant and appointed him Georgenthal's mayor almost immediately after their arrival. Bense held the office for six months before returning to his academic vocation and taking a position at the university in Jena.[12]

Whatever tactics of calculating reticence Bense may have deployed against fascism, his intellectual-political strategy became one of provocation and recalcitrance following the war. He was an early whistleblower for the impending intellectual censure in East Germany, ultimately fleeing Jena for Allied-occupied Germany under the cover of darkness on July 23, 1948, leaving behind his apartment and possessions. In his diagnosis, the gov-

ernment in Thuringia was run by "an arbitrarily appointed band of scallywags in the guise of the workers' movement."[13] Upon receiving his official notice of termination from the minister-president for "willful breach of duties," Bense scrawled mockingly into the letter's lower margin, "charge rejected, as the willful breach is on the part of the authorities in Thuringia," and mailed the document back.[14] Such truculence, however, was not reserved for authorities in the East. His tenure in Baden-Württemberg as a professor of philosophy at the Technische Hochschule Stuttgart (later Universität Stuttgart) would also be marked by a contentious relationship between the freethinker Bense and the broader social and political apparatus to which he, as a professor at a public university, was beholden. In the decades after the war, his promotion through the university ranks in Stuttgart would be twice hindered by fear on the part of the deeply Protestant Stuttgart senate that his radical, unapologetic atheism made him a subversive anarchist.[15]

On the other side of the intellectual-political divide, however, the devotion to rationality exhibited in an essay like "Technical Existence" places Bense at obvious odds with the cultural critique of Theodor W. Adorno and Max Horkheimer, whose rejection of Enlightenment thought Bense explicitly scolded as hasty and impetuous already in the late 1940s.[16] In the decades after the war, Bense occupied an important if historically underemphasized arm of the European avant-garde, a rationally "cool" foil to the Marxist-inflected "hot" critiques via psyche and commodity that were advanced under names like COBRA, Situationist International, or the Frankfurt School.[17]

Two anecdotes help illustrate the fault lines of Bense's tendentious relationship with the Continental Left. In January 1959, members of the provocative German art collective Gruppe SPUR staged a "lecture" by Bense to mark the opening of an exhibition at the Munich Museum for Ethnology—only the well-dressed attendees encountered not Bense but a tape reel playing a nigh-incomprehensible collage of his texts, read by SPUR member Hans-Peter Zimmer. Bense would not find out about the lampooning until the press approached him for comment. SPUR initiated the action to demonstrate to Guy Debord and Asger Jorn the group's worthiness of being included in the Situationist International, though its members wrote a letter of apology to Bense in February 1959, a few days after the performance. In markedly sincere rhetoric—though perhaps nevertheless damning him with faint praise—the letter claims that the target of the action was not Bense or his thinking but the amateur ways in which the educated public tended to misconstrue him, to "take [his] ideas and water them down to their most superficial elements."[18] The signatories admit that their choice to pillory

Bense had to do with his being "a most spirited and pugnacious opponent," but in a gesture of goodwill they then invite him to Munich to lecture on constructivism in painting. (The lecture never happened.)

Eleven years later, Bense's status as ready gadfly for the avant-garde would again be on display, this time in an overcrowded auditorium in Düsseldorf where he shared a sweaty stage with Max Bill, Arnold Gehlen, and Joseph Beuys. The topic of discussion was ostensibly Beuys's notion of "anti-art" and the role of provocation in artmaking. Although the engagement of all the discussants was equally polemic, a dominant tension emerged between Beuys, advocating for an individualist, even anarchist image of the artist-provocateur, and Bense, who repeatedly steered the conversation back to questions of an artwork's distributed effects within its environmental conditions. While the debate has been depicted—in this journal, by Claus Pias, and elsewhere—as "a hollow victory of creativity over Markoff chains and computer-generated poetry," the event reveals a deeply rooted compulsion in the postfascist zeitgeist of 1970 to justify the aesthetic on the uncompromisable grounds of art's salvific role *for humanity*.[19] Where Beuys's idea of art maintained a white-knuckle grip on the human, Bense's ripostes probe the artist's assumptions about the boundaries of that human, about its hidden enmeshments, its contingency on and dispersal across social, ideological, material, and technical planes. If Beuys "won" the debate, then it was because the zeitgeist he represented did not yet have room for a posthuman critique.

And yet, Bense's relevance for the arts was not everywhere so belated. Just over a year prior to the panel in Düsseldorf, *Cybernetic Serendipity*, an exhibition Bense was explicitly and prominently credited for inspiring, opened at London's Institute of Contemporary Arts before touring the United States.[20] Bense's theory of information aesthetics—which he had developed in the mid-1950s while establishing the "Information" department at the notorious Bauhaus successor and experimental school of design the Hochschule für Gestaltung Ulm—influenced some of the earliest algorithmically generated graphic artworks of the so-called Stuttgart School, including those of Georg Nees (whose work Bense curated in a 1965 show in Stuttgart) and Frieder Nake (whose own 1965 exhibition was influenced by Nees's). Bense also demonstrated a singular affinity for the Brazilian avant-garde: not only did he help import concrete poetry to Europe through contact with Décio Pignatari, Augusto de Campos, and Haroldo de Campos in the 1950s, but his "Studiengalerie" in Stuttgart held some of the earliest European exhibitions of Lygia Clark (1964) and Mira Schendel (1967).

"Technical Existence" outlines the program for which Bense

would be invoked in these settings, situating technics in relation to aesthetics and, by extension, metaphysics, politics, and ethics. Bense's essay preempts the observation that opens Bernard Stiegler's 1994 *Technics and Time*, that "technics is the unthought," "the history of being itself."[21] In Bense's formulation, "there is more rational depth and rational clarity in knowing the material physiognomy of technics inside and out than in knowing the mythological physiognomy of nature" (sec. 5). Inasmuch as knowledge of technics' material physiognomy relies on a well-formed technical intellect, "Technical Existence" issues an admonition much in the same vein as Friedrich Kittler's critique that "media science" will elude those who "know higher mathematics only from hearsay" or Ted Nelson's dictum that "you can and must understand computers NOW!"[22] And yet, though the technical intelligentsia may be Bense's answer to Friedrich Engels's dream of the "withered-away state," one can easily demur on the egality of such a vision.[23] While "Technical Existence" avoids the kind of intellectual elitism that appears in his earliest writings, we are justified in calling into question the extraordinary optimism about both average intellectual ability and the general efficacy of educational systems that must underlie Bense's "classless" technical politics where everyone is a specialist defined by a function.[24]

Nonetheless, today, against the backdrop of an internet of things, the pervasive augmentation of our perception by screens of every conceivable size in every conceivable place, and now a global society brought to the brink by pandemic, we are confronted with novel ways in which we are given over to technical existence, novel ways that technics conditions the world we can inhabit at all. The contemporary moment only confirms the deep implications of Bense's assertion that theory scripts so much of our experience, from the models of climate science that structure the politics of environmentalism; to the algorithmic logistics of two-day shipping that have violently redrawn geographical scale and surreptitiously recontoured class and labor dynamics; to the sophisticated projections of financial futures and derivatives that constitute our economic reality. Three quarters of a century later, these examples evince the correlation posited by Bense between technical sophistication and functional fragility: "in the technical world, the higher forms are also the weaker ones" (sec. 14). The implicit aporia was obvious to Bense; namely, that this axiom applies perhaps most of all to technically existing human beings, simultaneously master of and slave to technics. *Geist*, human intellect, brought this technical world into being, but it stands to lose as much from technics as it stands to gain. Only by the continued cultivation of this intellect can human beings maintain a symbiotic relationship to technics and reign in its destructive potential, and only by a lack of intellect will we succumb to it.

Notes

1. The proceedings of a 2010 conference on the occasion of Bense's one-hundredth birthday held at the Universität Stuttgart are collected in Elke Uhl and Claus Zittel, eds., *Max Bense: Weltprogrammierung* (Stuttgart: J.B. Metzler Verlag, 2018); while a 2018 conference on Bense's work at the Deutsches Literatur Archiv in Marbach forms the basis of the essays in Andrea Albrecht et al., eds., *Max Bense: Werk–Kontext–Wirkung* (Stuttgart: J.B. Metzler Verlag, 2019).

2. In the introduction to *Max Bense: Weltprogrammierung*, the editors observe that, in comparison to Bense's methods, contemporary digital humanities appear "homemade, apolitical, anti-aesthetic, and systematically speaking, dramatically undercomplex" (3; my translation). In the same volume, Claus Pias presents Bense as an ur-media theorist, Hans-Christian von Hermann outlines Bense's anticipation of postdigital forms of art, and Sybille Krämer analyzes Bense's literary theory as postmodern avant la lettre in its investment in the artificiality of textual surface.

3. Max Bense, "Konturen einer Geistesgeschichte der Mathematik I: Die Mathematik und die Wissenschaft" (1946), in *Ausgewählte Schriften in vier Bänden*, vol. 2, *Philosophie der Mathematik, Naturwissenschaft und Technik*, ed. Elisabeth Walther (Stuttgart: J.B. Metzler, 1998), 7.

4. For more on Bense's intellectual formation, see Andrea Albrecht, Christian Blohmann, and Lutz Danneberg, "Mathematik ist reine Wissenschaft, nichts anderes: Max Bense zwischen Oswald Spengler und Heinrich Scholz," in *Max Bense: Werk–Kontext–Wirkung*, 49–54, esp. 50 n. 40.

5. Max Bense, "Aufstand des Geistes: Eine Verteidigung der Erkenntnis" (1935), in *Ausgewählte Schriften in vier Bänden*, vol. 1, *Philosophie*, ed. Elisabeth Walther (Stuttgart: J.B. Metzler, 1998), 73–162; and Max Bense, *Geist der Mathematik: Abschnitte aus der Philosophie der Arithmetik und Geometrie* (Munich: Richard Oldenbourg, 1939).

6. See here Bense, "Konturen einer Geistesgeschichte der Mathematik I"; and "Konturen einer Geistesgeschichte der Mathematik II: Die Mathematik in der Kunst" (1949), in *Ausgewählte Schriften in vier Bänden*, vol. 2, *Philosophie der Mathematik, Naturwissenschaft und Technik*, ed. Elisabeth Walther (Stuttgart: J.B. Metzler, 1998), 233–428.

7. The diverse cohort of Bense's contemporaries who belong to this discourse occupy a range of political positions and correspondingly divergent degrees of optimism or pessimism in their critiques of *Technik*. These include Hans Blumenberg, Ernst Cassirer, Vilém Flusser, Buckminster Fuller, Arnold Gehlen, Sigfried Giedeon, Martin Heidegger, Ernst Jünger, Friedrich Georg Jünger, Lewis Mumford, Helmut Plessner, Max Scheler, Gilbert Simondon, and Oswald Spengler, to give only an incomplete list.

8. The discursive entanglement of *Technik* with philosophy, culture, and human values—as opposed to engineering alone—that emerged in Germany during the century that precedes the publication of "Technical Existence" is laid out in Eric Schatzberg, *Technology: A Critical History of a Concept* (Chicago: University of Chicago Press, 2018). See, in particular, chapter 7, "Discourse of Technik: Engineers and Humanists," 97–117, as well as the discussion of Mumford's choice of "technics," 145–51.

9. See Alexandra Skowronski, "Max Benses Abendländische Leidenschaft (1938) oder zum Verhältnis von Philosophie und Politik im Nationalsozialismus," in *Max Bense: Werk–Kontext–Wirkung*, 29.

10. Elisabeth Walther, "Einleitung," in *Ausgewählte Schriften in vier Bänden*, vol. 1, *Philosophie* (Stuttgart: J.B. Metzler, 1998), xiv.

11. Max Bense, *Technische Existenz: Essays* (Stuttgart: Deutsche Verlags-

Anstalt, 1949), 11.

12. Michael Eckardt, "In Jena für Stuttgart: Max Benses akademische Anfangsjahre an der Universität Jena 1945–1948 und deren Folgen," in *Max Bense: Weltprogrammierung*, 12.

13. Max Bense to the Rektor of the Universität Jena, August 19, 1948. Quoted in Uhl and Zittel, *Max Bense: Weltprogrammierung*, 19.

14. Max Benses Entlassungsurkunde aus dem Jahre 1948, n.p., in Universitäts-archiv Jena, Bestand D, 0167, Personalakte Max Bense.

15. These are referred to each as "Der Fall Bense," one in 1956, the other in 1961. See, for example, Wolfgang Berkefeld, "Der entschiedene Utopist: Max Benses neue Weltrevolution von links—Die Diktatur der Intelligenz," *Sonntagsblatt* (Hamburg), 26 February 1961, in Hochschule für Gestaltung Ulm Archiv; "Heftige Auseinandersetzung um den Fall Bense," *Süddeutsche Zeitung*, 3 March 1961, in Hochschule für Gestaltung Ulm Archiv; and "Heftige Diskussion über den Fall Bense," *Frankfurter Allgemeine Zeitung*, 3 March 1961, in Hochschule für Gestaltung Ulm Archiv.

16. See Max Bense, "Hegel und die kalifornische Emigration," *Merkur* 4, no. 1 (January 1950): 118–25. Bense critiques Adorno and Horkheimer's *Dialectic of Enlightenment* for operating with a notion of Enlightenment that is too closely bound to Roger Bacon and thus reducible solely to a domination of nature. Bense argues that other models, such as the *Encyclopédie* of Denis Diderot and Jean le Rond d'Alembert, deploy scientific, technical, and editorial methods in the interest of a liberal, socialist, and democratic form of knowledge production.

17. Representatives of this "cool" arm are motley and would include Swiss designer Max Bill, Hochschule für Gestaltung Ulm professor and advocate of informational aesthetics Abraham Moles, Hungarian émigré and representative of the New Bauhaus György Kepes, ZERO group founder Otto Piene, mathemat-ically inclined artist Hanne Darboven, Le Corbusier-protégé-turned-composer Iannis Xenakis, frontrunners of German-language concrete poetry Eugen Gomringer and Hansjörg Mayer, and Vienna Group member Oswald Wiener. Recent commentary on this last figure's 1954 *cooles manifest* appears in Jakob Schillinger, "Oswald Wiener on Dandyism," *October* 170 (2019): 31–50.

18. Gruppe SPUR, "Gruppe SPUR to Max Bense," 3 February 1959, in A: Bense, Max; Brief von Gruppe SPUR, Deutsches Literaturarchiv Marbach.

19. Schillinger, 40. See also Claus Pias, "'Hollerith "Feathered Crystal"': Art, Science, and Computing in the Era of Cybernetics," trans. Peter Krapp, *Grey Room* 29 (2007): 110–33. Beuys's declarations at this event envision a tangled complex of rationality, irrationality, will, consciousness, and aesthetics grounded entirely in the human: "Art is the human! The human is itself art! The human is itself aesthetics! The human is itself the artwork!" For his part, Bense does not mention the terms *cybernetics* or *computer* once in the debate but instead needles Beuys's resistance to think the artist's subject position as fundamen-tally embedded in society's network. "Do you think it is true to say that humans are social animals and everything they do is a reflection of society?," Bense asks in conclusion, acknowledging to Beuys, "I only want to push you to explain the relationship of the creative individual to society's consumer."

20. "*Cybernetic Serendipity* is an international exhibition exploring and demonstrating some of the relationships between technology and creativity. The idea behind this venture, for which I am grateful to Professor Max Bense of Stuttgart, is to show some of the creative forms engendered by technology." Jasia Reichardt, *Cybernetic Serendipity: The Computer and the Arts* (New York: Praeger, 1969), 5.

21. Bernard Stiegler, *Technics and Time* (Stanford, CA: Stanford University Press, 1998), 10.

22. Friedrich Kittler, "Die Laterna Magica der Literatur: Schillers und Hoffmanns Medienstrategien," *Athenäum* 4 (1994): 219, quoted in Friedrich A. Kittler, *Gramophone, Film, Typewriter* (Stanford, CA: Stanford University Press, 1999), xiv; and Theodor H. Nelson, *Computer Lib: Dream Machines* (Redmond, WA: Tempus Books of Microsoft Press, 1987).

23. "Absterben des Staates" in the original German, an allusion to Engels's *Anti-Dühring*. See Friedrich Engels, "Herrn Eugen Dühring's Umwälzung der Wissenschaft," in *Karl Marx, Friedrich Engels—Werke*, ed. Institut für Marxismus-Leninismus beim ZK der SED, vol. 20 (Berlin: Dietz, 1962), 262.

24. Before the war, Bense's writings characterized knowledge and intellect as "aristocratic principles" that, in a nearly gnostic way, "distinguish the learned" from "the little man," create "a hierarchy of individuals," and "separate greatness from nothingness." Translations of Bense's words mine; see Skowronski, "Max Benses Abendländische Leidenschaft," 31–32.