

# Deus Ex Machina: Eschatologies of Automation in Seventeenth-Century Lullism and Present-day Post-Scarcity Utopias

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## Lullism, Singularity, Accelerationism

Lull's Art was syncretic in its time.<sup>1</sup> By the end of the seventeenth century, it had mutated into speculations and utopias, many of which could be called "science fiction" in the literal sense of these words. The intellectual movement of Lullism involved prominent philosophers and scientists, from the French polymath Marin Mersenne to Gottfried Wilhelm Leibniz, as well as mystics and poets.<sup>2</sup> This movement continued and extended the original Art by marrying it with tendencies of its own time: universal science, automation, technological and speculative project entrepreneurship.

In 1674, the poet, self-styled polymath, and mystical prophet Quirinus Kuhlmann envisioned to widen the Art of Lull (for whom he had written a poetic eulogy in 1670) and its subsequent extensions by seventeenth-century Lullists<sup>3</sup> into nineteen combinatorial systems that cover the domains of poetics, rhetoric and composition, didactics, philology, politics, history, law, cosmology, and theology: an "Ars apophthegmatica," "Ars tragica," "Ars comica," "Ars magna poëtica, versificatoria, rythmica [sic]," "Ars magna eloquentiae," "Ars magna sciendi," "Ars magna scribendi,"

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<sup>1</sup>"Lull was quite explicit: he had borrowed his terms from the Arabs. Lull was searching for a set of elementary and primary notions that Christians held in common with the infidels. [...]: One is tempted to see in Lull's series the ten Sefirot of the kabbala, but Platzeck observes (1953–1954: 583) that a similar list of Dignities is to be found in the Koran. Yates (1960) identified the thought of John Scot Erigene as a direct source, but Lull might have discovered analogous lists in various other medieval Neo-Platonic texts – the commentaries of pseudo-Dionysius, the Augustinian tradition, or the medieval doctrine of the transcendental properties of being." Umberto Eco, *The Search for the Perfect Language* (Oxford: Wiley-Blackwell, 1997), 66.

<sup>2</sup>For extensive overviews and discussion, see Paolo Rossi, *Logic and the Art of Memory: The Quest for a Universal Language*, (Chicago: University of Chicago Press, 2000); Frances Yates, *The Art of Memory* (London: Random House, 2014); and Wilhelm Schmidt-Biggemann, *Topica Universalis: Eine Modellgeschichte Humanistischer und Barocker Wissenschaft* (Hamburg: Meiner, 1983). I covered Lullist poetics in my own book: *Exe.cut(up)able statements: Poetische Kalküle und Phantasmen des selbstaufführenden Texts* (Munich: Wilhelm Fink, 2011); and reuse some of my findings here.

<sup>3</sup>Kuhlmann credits, among others, the mathematician and musicologist Marin Mersenne, the Jesuit polymath Athanasius Kircher, the jurist and Lullist poet Thomas Lansius, the poets Daniel Schwenter and Georg Philipp Harsdörfer but still finds their work insufficient. See Quirinus Kuhlmann, *A.Z. Quirin Kuhlmanns Bresslauer Lehrreicher Geschicht-Herold Oder Freudige Und Trauriger Begebenheiten Hoher Und Nidriger Personen [...]* (Jena: Johann Meyer, 1673).

“Ars magna linguas discendi,” “Ars magna commentandi,” “Ars magna critices,” “Ars magna seu harmonia adagiorum omnium populorum,” “Ars magna historiae specialis hominis,” “Homo microcosmus,” “Homo Deus,” “Homo diabolus,” “Resurrectio,” “Illustres seculi hujus centumviri,” “Ars magna antiquitatis,” “Tacitus politicus.”<sup>4</sup>

The Ars magna scribendi is envisioned by Kuhlmann as a system that mechanically writes all books of the world – every existing as well as every future one – by generating every possible letter combination. Kuhlmann writes that this system is “of such perfection that no mortal being will be able to publish a book that our Ars magna scribendi wouldn’t already contain.”<sup>5</sup> It thus “grasps everything that all people can grasp and, through combinatorial permutation, teaches everything that can be taught.”<sup>6</sup>

Such baroque Lullist visions were parodied, half a century later, by Jonathan Swift in a chapter of *Gulliver’s Travels* (see p. XX, fig. 6 in this volume). The Grand Academy of Lagado runs a Lullist machine in the form of a “frame” that mechanically shuffles letter combinations so that “the most ignorant Person at a reasonable Charge, and with a little bodily Labour, may write Books in Philosophy, Poetry, Politicks, Law, Mathematicks and Theology, without the least Assistance from Genius or Study.”<sup>7</sup> Lullism also provided the model for Jorge Luis Borges’s twentieth-century fantastic short story *The Library of Babel*, the ultimate library containing books with every possible letter combination whose structure can only be grasped through “combinatorial analysis.”<sup>8</sup>

The automated “artes” and machine-generated knowledge imagined by Kuhlmann and other Lullists have striking parallels with today’s automation and artificial intelligence (AI) visions.<sup>9</sup> With all necessary caution in the comparison of two different historical eras, it seems fair to say that the techno-epistemological breakthrough envisioned by Kuhlmann is analogous to the so-called “technological singularity,” the eclipse of human intelligence through computers envisioned by today’s most optimistic AI advocates. The Singularity discourse, most prominently represented by engineer Ray Kurzweil and Google’s *Singularity University*, conversely bears traits of evangelical, apocalyptic Christianity that was Kuhlmann’s religion and gospel. Kuhlmann ended his life as a wandering prophet and self-styled “son of the son of God” who was burned at the stake for heresy. Kurzweil advocated his technological singularity hypothesis in a book with the telling eschatological title *The Singularity Is Near: When Humans Transcend Biology*.<sup>10</sup> The Singularity movement has often been likened to an evangelical cult both by journalists and religion scholars.<sup>11</sup>

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<sup>4</sup>Quirinus Kuhlmann, *Quirini Kuhlmanni Prodomus* (Amsterdam: Lotho de Haes, 1674), 15.

<sup>5</sup>“tanta perfectione, ut nullus Mortalium librum edere posset, quem nostra Ars scribendi non comprehenderet,” Kuhlmann, *Quirini Kuhlmann Prodomus*, 17.

<sup>6</sup>“die große Bücherschreibungskunst / welche alles begreift / was alle Menschen begreifen / und durch einen gegeneinanderhaltungswechsel alles belehret / was belehret werden kont,” Kuhlmann, *A.Z. Quirin Kuhlmanns Breßlauer Lehrreicher Geschicht-Herold*, § 27.

<sup>7</sup>Jonathan Swift, *Gulliver’s Travels*, ed. Herbert Davis (Oxford: Basil Blackwell, 1965).

<sup>8</sup>Jorge Luis Borges, “La Biblioteca de Babel,” in *Obras Completas*, 3rd ed. (1993), 1:465–471.

<sup>9</sup>This parallel was suggested as early as in the 1990s and studied more comprehensively by Stefan Rieger, *Speichern / Merken. Die künstlichen Intelligenzen des Barock* (Munich: Wilhelm Fink, 1999).

<sup>10</sup>Ray Kurzweil, *The Singularity Is Near: When Humans Transcend Biology* (New York: Penguin Books, 2005).

<sup>11</sup>Amarnath Amarasingam, “Transcending Technology: Looking at Futurology as a New Religious Movement,” in *Journal of Contemporary Religion* 23, no. 1 (2008): 1–16; Ronald Cole-Turner, “The Singularity and the

While the Singularity movement remains closely tied to “The Californian Ideology”<sup>12</sup> of Silicon Valley and its Internet corporations, it has relatives in left-wing counterculture and political activism that advocate “total automation” as way out of wage work and capitalism. (Both the Singularity movement and contemporary post-work movements were influenced by the same 1960s counterculture; this will be discussed later.) For Alex Williams and Nick Srnicek, who became known as the authors of the 2013 *#ACCELERATE MANIFESTO for an Accelerationist Politics*, “[t]he newest wave of automation is creating the possibility for huge swathes of boring and demeaning work to be permanently eliminated.”<sup>13</sup> This hypothesis leads to the central thesis of their book *Inventing the Future: Postcapitalism and a World Without Work*: “Many of the classic demands of the left – for less work, for an end to scarcity, for economic democracy, for the production of socially useful goods, and for the liberation of humanity – are materially more achievable than at any other point in history.”<sup>14</sup>

The book, however, lacks a genuine investigation or proofs of its sweeping technological claims and conducts no in-depth analysis of the actual possibilities and limitations of current technology. Instead, it winds up with the dogma that “[f]ull automation is something that can and should be achieved, regardless of whether it is yet being carried out.”<sup>15</sup>

It is outside the scope of this essay to scrutinize the feasibility of the technological utopias and eschatologies propounded by Kuhlmann, Kurzweil, or Williams and Srnicek. It must suffice here to summarize their success or lack thereof: Kuhlmann’s attempts to automate his own permutational poetry with a “permutation wheel” only succeeded on paper, not in reality.<sup>16</sup> Kurzweil’s *Singularity* is founded on greatly simplified notions of intelligence and cognition (and therefore not shared by the AI scientific community at large) while the much-reported recent breakthroughs in AI concern only one field and application of AI: pattern recognition through deep learning neural network processing of large data sets. Finally, hopes of obsoleting work through automation ignore the massive ecological footprint and massive amount of maintenance labor that is necessary to keep systems running: materials and energy supply for running robots and computer networks, periodic necessary renewal of fiber optics, and the massive amount of work necessary for software maintenance. The complexities of providing housing, food and health for a growing world population in times of shrinking natural resources are not even considered. All techno-utopian visions willfully ignore the real-life *crapularity* (as opposed to the Singularity) of systems malfunctioning, being riddled with construction flaws, being hacked and getting “wildly out of control”;<sup>17</sup> serious

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Rapture: Transhumanist and Popular Christian Views of the Future,” in *Zygon*®, vol. 47, no. 4 (2012): 777–796; Diane Proudfoot, “Software Immortals: Science or Faith?” in *Singularity Hypotheses*, ed. Amnon H. Eden, James H. Moore, Johnny H. Soraker, and Eric Steinhart (Berlin: Springer, 2012), 367–392; Wolfram Klinger, “Silicon Valley’s Radical Machine Cult,” in *Motherboard*, 11/10/2017, available online at: [https://motherboard.vice.com/en\\_us/article/kz7jem/silicon-valley-digitalism-machine-religion-artificial-intelligence-christianity-singularity-google-facebook-cult](https://motherboard.vice.com/en_us/article/kz7jem/silicon-valley-digitalism-machine-religion-artificial-intelligence-christianity-singularity-google-facebook-cult), accessed 05.05.2018.

<sup>12</sup>Richard Barbrook and Andy Cameron, “The Californian Ideology,” in *Science as Culture* 6, no. 1 (1996): 44–72, doi: <https://doi.org/10.1080/09505439609526455>.

<sup>13</sup>Nick Srnicek and Alex Williams, *Inventing the Future: Postcapitalism and a World Without Work*, rev. ed. (London: Verso, 2016), 2–3.

<sup>14</sup>Ibid.

<sup>15</sup>Ibid., 112.

<sup>16</sup>Cramer, *Exe.cut(up)able statements*, 127–133.

<sup>17</sup>Justin Pickard in Noah Raford, John A. Sweeney, and Justin Pickard, *Alternatives to the Singularity* (2011), available on-

issues of today's computer technology, which have not been solved but have worsened the more complex the designs and networks of hardware and software have become.

Leaving these issues aside, the same leitmotifs reappear in the different historical periods and discourses from utopian Lullism to utopian accelerationism: automation and computation as forces that are expected to revolutionize knowledge, cognition, and labor; and the creation of new classes of project developers, from the polymaths, project makers, and prophets of the seventeenth century to startup companies, artists, activists, writers, and techno evangelists in the twentieth and twenty-first centuries.

## Revisiting the Art of Ramon Llull

Llull's Art was a system for generating and modifying statements based on formal combinatorial rules, with single letters as placeholders for concepts. Since the Art seemingly provides a formalized way of generating valid statements from existing valid statements, it has been interpreted as a proto-computer and a precursor to the formal logical reasoning of analytic philosophy. Close observation, however, shows that the latter is not the case, since unwanted statements like "Goodness is the opposite of Truth" or "God is equivalent to Impermanence" can be created with its figures and tables.<sup>18</sup> Umberto Eco therefore concludes that Llull's Art cannot "really be considered a logical instrument at all" but "is, in reality, a sort of dialectical thesaurus, a mnemonic aid for finding out an array of standard arguments able to demonstrate an already known truth."<sup>19</sup> Alternatively, it could be called a poetics: a science based on creation (*poesis*) instead of observation (as in modern empirical science), and a system in which science and mysticism as well as science and art were not yet differentiated from each other.

Llull's book *Tree of Science (Arbor scientiae)* published in 1296, nine years before the *Ars magna* or *Ars generalis ultima*, proposed the integration of sciences into one comprehensive system that provided a common foundation for each of them.<sup>20</sup> Its model and way of structuring knowledge conformed to medieval scholastic science and Aristotle's categories (which also formed the grammatical model for the statements generated through the Art). Eco observes that

the Art became a means of treating the entire range of knowledge, drawing suggestions from the numerous medieval encyclopedias, and anticipating the encyclopedic dreams of the Renaissance and the Baroque. All this knowledge, however, needed to be ordered hierarchically.<sup>21</sup>

The *Tree of Science* and the *Ars magna* thus not only laid the groundwork for a new type of encyclopedia, but – as philosopher Wilhelm Schmidt-Biggemann points out – for encyclopedism as

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line at: <https://web.archive.org/web/20120916123714/http://www.scribd.com/doc/62056338/Alternatives-to-the-Singularity>, accessed 05.05.2018.

<sup>18</sup>See Cramer, *Exe.cut(up)able statements*, 54.

<sup>19</sup>Eco, *The Search for the Perfect Language*, 63.

<sup>20</sup>Rossi, *Logic and the Art of Memory*, 37–37.

<sup>21</sup>Eco, *The Search for the Perfect Language*, 67.

philosophy.<sup>22</sup> Yet for Eco, Lull's original Art is still limited to functioning as "a rhetorical instrument [...] designed to demonstrate what was already known, and lock it for ever in the steely cage of the system of trees."<sup>23</sup>

## Lullist Encyclopedism in the Seventeenth Century

In sixteenth and seventeenth-century Lullism, the Art – now often referred to as *Ars combinatoria* – had evolved beyond a tool for the creation of statements into an all-comprehensive epistemological instrument. It was meant to integrate all sciences and include exoteric as well as esoteric knowledge. Paolo Rossi, author of one of the preeminent histories of Renaissance Lullism, calls it an "interest in the Cabala and hieroglyphic writing, artificial and universal languages, the search for the primary constitutive principles of all possible knowledge, the art of memory and a pre-occupation with logic understood as a 'key' to the hidden secrets of reality." For Rossi, "all these themes were connected to the revival of Lullism in the Renaissance."<sup>24</sup> With occult science still being part of the scientific canon, even the hermetic combinatory memory system of the alchemist and Rosicrucian Robert Fludd belongs to its discourse and history.<sup>25</sup>

The promise of Lullist combinatorics thus was to organize all existing knowledge and to create – or even automatically generate and decode – hidden and new knowledge in its computations. This way, the Lullist Art became a poetics of knowledge in the most comprehensive sense. With its mystical precursors in Lull himself, followed in the sixteenth century by Giordano Bruno, Pico della Mirandola, and Cornelius Agrippa,<sup>26</sup> the Art subsequently branched out into, among others, musicology (such as in Marin Mersenne's *Harmonie universelle* and the system for formalized and automated music composition in Athanasius Kircher's *Musurgia universalis*),<sup>27</sup> permutational poetry,<sup>28</sup> linguistics (such as in the lexical combination wheel of German poet Georg Philipp Harsdörffer and the universal language project of John Wilkins at the Royal Society of London),<sup>29</sup> didactics of language,<sup>30</sup> and mathematics (with the construction of mechanical calculation machines

<sup>22</sup>"Der Begriff Enzyklopädie übernahm die Funktion des ganz weiten, wissenschaftskonstitutiven Philosophiebegriffs." Schmidt-Biggemann, *Topica Universalis*, 132.

<sup>23</sup>Eco, *The Search for the Perfect Language*, 69; a view shared by Schmidt-Biggemann who states that combinatorics was limited to invention, but wasn't capable of judgment, which made the limitations of Lullism visible when it progressed towards representation of science ("Es konnte die Kombinatorik immer nur Invention sein, nie auch Judicium. Ohne eine Vorrangsbeschreibung des Judiciums, wie sie im Ramismus vorlag, war die Wissenschaftskonstitution nicht zu begründen. Deshalb war der Übergang von der kombinatorischen Invention zu einer Darstellung der Wissenschaften abrupt und unvermittelt, ein Bruch, der auch die Leistungsgrenzen des Lullismus indizierte"); Schmidt-Biggemann sees the same deficiencies in seventeenth-century encyclopedic Lullism, such as in the Art of Athanasius Kircher, see Schmidt-Biggemann, *Topica Universalis*, 185–186.

<sup>24</sup>Rossi, *Logic and the Art of Memory*, 29.

<sup>25</sup>See Rossi, *Logic and the Art of Memory*, and Yates, *The Art of Memory*.

<sup>26</sup>Rossi, *Logic and the Art of Memory*, 31; Schmidt-Biggemann, *Topica Universalis*, 159.

<sup>27</sup>Marin Mersenne, *Harmonie Universelle: Contenant La Théorie et La Pratique de La Musique* (Paris: 1636), vol. 2 (Paris: Editions du centre national de la recherche scientifique, 1975); Athanasius Kircher, *Musurgia universalis*, vol. 1, (Hildesheim: Olms, 1970).

<sup>28</sup>Cramer, *Exe.cut(up)able statements*, 55–155.

<sup>29</sup>Georg Philipp Harsdörffer, *Poetischer Trichter* (Darmstadt: Wissenschaftliche Buchgesellschaft, 1969); John Wilkins, *An Essay Towards a Real Character, And a Philosophical Language* (London: Royal Society, 1668).

<sup>30</sup>Stanislaus Mink von Weinsheun, *Proteus. Das Ist: Eine Unglaubliche Lustnützliche Lehrart / in Kurzer Zeit / Ohne Müh*

such as the *cistula* of the Jesuit Caspar Schott).<sup>31</sup> In all these disciplines, Lullists used combinatorial computation of predefined sets of elements (such as musical notes, letters, words, and numbers) as an encyclopedic device. The aim was to exhaust the possibilities of permutation and combination and thus create complete generative systems for a language's lexicon or for musical composition. In practice, however, none of these systems lived up to this ambition.

With Johann Heinrich Alsted's *Encyclopaedia* of 1630, seventeenth-century Lullism produced a classic printed encyclopedia. Rossi characterizes it as a project of a "new 'system' of the sciences, which would unify the principles of all the disciplines in a single corpus."<sup>32</sup> Schmidt-Biggemann, who oversaw its modern reprint, describes Alsted's work as a life-long and increasingly complex endeavor of "establishing universal science on Lullist grounds."<sup>33</sup>

The "construction of total encyclopaedias and ordered classifications" in seventeenth-century Lullism served, to use Rossi's words, the objective of creating "true 'mirrors' of cosmic harmony."<sup>34</sup> In addition to an Aristotelian-scholastic paradigm of systems of categories, Lullism was therefore indebted to Pythagorean and Neoplatonist thinking that conceived of the world as corresponding macro- and microcosmic spheres, a cosmology of *as above so below*. Alsted's encyclopedia and all other Lullist systems were structured accordingly.

Before the *Encyclopédie* of Denis Diderot and Jean-Baptiste le Rond d'Alembert in the eighteenth century, the organization of encyclopedias according to alphabet – and thus in an arbitrary order instead of systematic taxonomies and classifications of knowledge – had not existed. Diderot's and d'Alembert's revolution marked the victory of Enlightenment empiricism and the defeat of universal knowledge systems based on holistic cosmologies. Through the new science, poetics, mysticism, and the occult were ultimately pushed out of the canon. The end of comprehensive cosmologies and taxonomies of knowledge meant the end of the assumption of an overcoupling harmonic structure of the world.

However, the problem that Lullist encyclopedism addressed in the seventeenth century, on the historical threshold between medieval and modern science, was different from the issue that Lull's Art had addressed in its own time. Seventeenth-century Lullism was not so much concerned with universal *truth* (which is why Eco sees the Art as an "instrument to convert the infidels" with their own, kabbalistic devices, after "Lull had devoted years to the study of the doctrines of the Jews and Arabs"),<sup>35</sup> but rather with universal *knowledge*. This reflects the growing difficulty of keeping a grip on human knowledge as one whole; systematizing, relating, and ordering it. Most of its practitioners were therefore polymaths, such as Mersenne, Kircher, Alsted, and Kuhlmann who fought a last battle for their concept of science.

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*Deutsch- Und Lateinische Vers Zumachen / Auch Einen Französischen Und Lateinischen Brief Zuschreiben* (Oldenburg: Henrich-Conrad Zimmer, 1657).

<sup>31</sup>Johann Kaspar Schott, *Organum mathematicum* (Würzburg, 1668).

<sup>32</sup>Rossi, *Logic and the Art of Memory*, 130; Johann Heinrich Alsted, *Encyclopaedia*, 4 vols. (Stuttgart (Herborn): Holzboog, 1989); Schmidt-Biggemann, *Topica Universalis*, 102.

<sup>33</sup>"Was er in der Clavis Lulliana begonnen hatte, steigerte Alsted in drei Traktaten zu einem Versuch, die Gesamtwissenschaft lullistisch zu begründen," Ibid.

<sup>34</sup>Rossi, *Logic and the Art of Memory*, xv.

<sup>35</sup>Eco, *The Search for the Perfect Language*, 66.

At the end of the seventeenth century, the difficulties of encyclopedic Lullism to live up to its grand promises became obvious. In Quirinus Kuhlmann's poetry, the Art is a practical composition device – such as for a sonnet whose words can be shuffled so that  $7.5 \cdot 10^{275}$  combinatorial permutations of the poem are possible. In his prose, it serves as a speculative horizon of a total art and science. But the two never merged. To phrase it in contemporary terminology, there was a constant promise of a combinatorial “Singularity” in the seventeenth century, but it remained the promise of a start-up endeavor that failed to live up to its expectations.

The parallel between seventeenth-century and twenty-first century techno-scientific enterprises is less metaphoric than one might think. Most Lullist science was developed outside traditional universities in the upcoming academies, which were self-organized, non-institutional communities of scholars at that time. On top of that, Lullism played a role in seventeenth-century project making. Project makers, such as the German Johann Joachim Becher (but also Gottfried Wilhelm Leibniz), were independent entrepreneurs and self-made men who travelled from court to court to pitch and, in the best case, execute speculative development projects, including making gold out of sand, the enlargement of rivers, the creation of new economic systems, or – like Becher's *Werkhaus* project in Vienna – what can be called straightforward forerunners of today's Fab Labs and Maker Spaces. (Becher founded it with the promise of fighting unemployment in economically depressed Vienna.) Their ways of working greatly resembled those of contemporary technology start-up companies. Project makers would pitch a disruptive techno-economical innovation to be developed, collect venture capital (in the seventeenth century: from aristocrats), and execute the project with a team, risking either failure or success. In such projects, the larger horizon of universal science and knowledge systems worked in similar ways as today's horizon of AI; “Singularity” increases investor faith in such speculative technologies as cryptocurrencies and self-driving cars.

Becher's projects included, according to Quirinus Kuhlmann, combinatorial machine translation through a contraption consisting of 50,000 dice with glued-on Latin and German words.<sup>36</sup> Such inventions were in tune with seventeenth-century Lullist use of combinatorial systems for the acceleration of learning which, in Rossi's words, “could transform an ignorant and unlettered youth into a wise man (whose abilities to understand and to act would be far greater than those who had been trained in traditional logic and philosophy) in an extraordinarily brief time (authors vary in their estimates between a month and two years).”<sup>37</sup>

Lullists such as the poet Georg Philipp Harsdörffer and the educationalist Johann Justus Winkelmann, who wrote under the anagrammatic pseudonym Stanislaus Mink von Weinsheun, saw word combinatorics as a way of teaching the composition of poetry to anyone.<sup>38</sup> Their systems anticipate today's AI applications such as the automated personal assistants in audiovisual editing software, and Google Clips, a wireless smart camera launched in 2018 that takes video snippets on its own and automatically selects the best based on machine learning of good photographic composition.

In the 1670s, Kuhlmann ended up in an argument with Athanasius Kircher who, citing his device of

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<sup>36</sup>Cramer, *Exe.cut(up)able statements*, 158.

<sup>37</sup>Rossi, *Logic and the Art of Memory*, 44.

<sup>38</sup>Cramer, *Exe.cut(up)able statements*, 83; Rieger, *Speichern / Merken*, 20; Anita Traninger, *Müheleose Wissenschaft. Lullismus und Rhetorik in den deutschsprachigen Ländern der Frühen Neuzeit* (Munich: Fink, 2001), 193.

a “box” (“cista”) to enable non-musicians to compose music, claimed that any child could learn to write poetry by combinatorial means (see p. XX, fig. 7, this volume). Kuhlmann didn’t dispute the technical feasibility, but argued that this would merely yield versification, not real poetry,<sup>39</sup> thus insisting on a metaphysical practice of Llull’s Art. Nevertheless, the application of that Art had been increasingly narrowed down to language and writing, not just in Kuhlmann’s and Kircher’s examples, but also at the British Royal Society where John Wilkins published his Lullist *Philosophical Language*.<sup>40</sup> For Schmidt-Biggemann, this is a design issue of Llull’s Art as such, since it had been “developed as a universal language to convert the infidels,” on the basis of a combinatorics of topics universalia that “were all linguistically constituted.”<sup>41</sup>

In this way, seventeenth-century Lullism was caught in a tension between mere technical applications of its combinatorial art, including the entrepreneurship of project making, its speculative aspirations towards universal knowledge creation and, last but not least, what Schmidt-Biggemann calls its hidden yet powerful “concept for participating in the divine truth.”<sup>42</sup>

Computation, in other words, was eschatological. At least for apocalyptic mystics like Kuhlmann, it was part of an endgame that was both epistemological and spiritual. The completion of a project like his *Ars magna scribendi* (where, to quote it again, “no mortal being will be able to publish a book that our *Ars scribendi* wouldn’t already contain”)<sup>43</sup> would have meant the end of literature and philosophy, and of intellectual labor as a whole.

## Automation and Leisure Society in the Twentieth and Twenty-first Centuries

In his later career, Kuhlmann shifted the grounds of his eschatology from the arts and sciences to millenarist prophecy, and to salvation through the reign of God on Earth. In his 1957 monograph *The Pursuit of the Millennium*, Norman Cohn reconstructs the history of European millenarist movements and their partial “anarcho-communism” in the late Middle Ages.<sup>44</sup> Although his book emphasizes the religious militancy of the millenarist Free Spirit tradition and its historical origins in the Crusades (and what could retrospectively be called Christian European jihadism in the Middle East), it inspired postwar countercultural movements, including the situationists. Guy Debord refers to Cohn in *The Society of Spectacle* but rejects his critique, since for Debord, “millenarianism, revolutionary class struggle speaking the language of religion for the last time, was already a modern revolutionary tendency.”<sup>45</sup> Pop culture historian Greil Marcus later used Cohn’s book to

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<sup>39</sup>Cramer, *Exe.cut(up)able statements*, 286.

<sup>40</sup>Wilkins, *An Essay Towards a Real Character*.

<sup>41</sup>“Es war die lullistische Kunst zunächst als Universalssprache für die Bekehrung der Heiden entwickelt worden, und ihre Grundlagen, die Argumentation mit topisch gefaßten Universalien und deren Kombination, waren allemal sprachlich konstituiert und als Sprachtheorie denkbar.” Schmidt-Biggemann, *Topica Universalis*, 176.

<sup>42</sup>“Die Präsenz des Lullismus im 17. Jahrhundert lag nicht allein in der möglichen – oder unmöglichen – Anwendung von Kreisen oder Tafeln der lullistischen Kunst auf Magie und/oder Universalwissenschaft. Verborgener, aber deshalb wohl um so wirksamer, blieb die lullistische Kunst im Teilhabekonzept an der göttlichen Wahrheit.” *Ibid.*, 156.

<sup>43</sup>Kuhlmann, *Quirini Kuhlmann Prodomus*, 17. Translated from the Latin.

<sup>44</sup>Norman Cohn, *The Pursuit of the Millennium: Revolutionary Millenarians and Mystical Anarchists of the Middle Ages*, rev. ed. (New York: Oxford University Press, 1970), 214.

<sup>45</sup>Guy Debord, *Society of The Spectacle* (Detroit, MI: Black & Red, 2000), 81.

construct an analogy between the millenarist Anabaptist John van Leiden, Sex Pistols singer John Lydon, and French situationism.<sup>46</sup>

Situationist utopias, however, were materialist. They were centered on the liberation of everyday life through play and intrinsically linked with the expectation of a leisure society. This expectation was founded on earlier economic and sociological theories. It conversely informed situationist-inspired, countercultural, and left-wing anti-labor positions from the 1970s to today. All these theories and positions refer to automation and its predicted obsolescence of work.

Effectively, leisure society theory dates back to John Maynard Keynes, the preeminent twentieth-century economist whose model of counter-cyclical state intervention was widely adopted after the Great Recession of the 1930s, and whose macroeconomics remains the best-known counter-model to laissez-faire capitalism today. As early as in 1930, Keynes predicted that automation would first create “technological unemployment,” but eventually lead to an “age of leisure” with a 15-hour work week. Thus, he wrote, “the economic problem may be solved [...] within one hundred years,” and “is not – if we look into the future – the permanent problem of the human race.”<sup>47</sup>

In French academia after the Second World War, leisure became a major subject of social and cultural studies. Sociologist Henri Lefebvre, in whose seminars Guy Debord participated, described leisure as a critique of everyday life. Existing in a dialectical relation with the everyday, leisure “cannot be separated from work” yet provides space for the development of individuality outside productive labor.<sup>48</sup> For Lefebvre, “work, leisure, family life, and private life make up a whole which we can call a ‘global structure’ or ‘totality.’” This totality, however, is not fixed in time but “historical, shifting, transitory.”<sup>49</sup> The situationist project might accordingly be described as an attempt to revolutionize the totality by replacing work and other traditional structures with play – for example, through its “unitary urbanism” that reimagined cities through associative mappings and ludic explorations, and thus amounted to the antithesis of modernist functionalism.

Similar ideas existed in the Californian counterculture of the 1960s where “gurus Timothy Leary and Allan Watts maintained that nuclear disaster was the only scenario which would prevent a full-blown leisure society.”<sup>50</sup> From the 1970s to 1990s, several prominent North American countercultural writers and theoreticians fused countercultural anarchism and situationist theory. In his 1985 essay *The Abolition of Work*, Bob Black demanded that “No one should ever work.”<sup>51</sup> Black calls work “the source of nearly all the misery in the world” and demands that “[i]n order to stop suffering, we have to stop working.” In line with the Situationist International, he positions play as “just the opposite” of work and advocates “work turned into play”: “Life will become a game, or rather many games, but not – as it is now – a zero-sum game.”<sup>52</sup>

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<sup>46</sup> Greil Marcus, *Lipstick Traces: A Secret History of the Twentieth Century*, new ed. (London: Picador, 1997).

<sup>47</sup> John Maynard Keynes, “Economic Possibilities for Our Grandchildren,” in *Essays in Persuasion* (London: Palgrave Macmillan, 2010), 321–332.

<sup>48</sup> Henri Lefebvre, *Critique of Everyday Life: The Three-Volume Text* (London: Verso, 2014), 29–30.

<sup>49</sup> *Ibid.*, 42.

<sup>50</sup> Paul Clements, *The Creative Underground: Art, Politics and Everyday Life*, 1st ed. (New York: Routledge, 2016), 11, referring to Jesse Kornbluth, *Notes from the New Underground*, 1st ed. (New York: Viking Adult) 137–138.

<sup>51</sup> Bob Black, *The Abolition of Work and Other Essays* (Port Townsend, WA: Loompanics Unlimited, 1986).

<sup>52</sup> *Ibid.*

Quite evident in these quotes is the tragic turn (or as the situationists would have called it: the “recuperation” or hijacking) of these ideas in the “Californian Ideology” since the 1990s, to use a term coined by the British cultural theorists Richard Barbrook and Andy Cameron.<sup>53</sup> Work turned into play has become the reality or even the norm in the “new economy” of Internet start-ups and other companies emulating their workplace model. This becomes visible in interior design details like football tables in offices, but more profoundly in the “gamification” of work processes (such as “code jams” and “hackathons”) and the blurring of office and home work, and of work and leisure – with the effect of never-ending work, cultural and psychological pressure to consider one’s wage work a “project” and personal fulfillment in the same way as artists have blurred the lines between their work and private life since the 1960s.

For Bob Black, automation was supposed to take care of the work that cannot be turned into play. Unlike Keynes in the 1930s and the French situationists of the 1960s, he explicitly refers to computer technology, with its “possibility of cutting way down on the little work that remains by automating and cybernizing it.”<sup>54</sup> Srnicek’s and Williams’ contemporary vision of *Inventing the Future* amounts to little more than an elaboration of what Black had sketched in the 1980s. Their criticism of the left-wing techno-skepticism and decentralized “folk politics” corresponds to Black’s endorsement of new technology, which in its time marked a decided antithesis to fellow American anarchist, post-situationist and countercultural theoretician John Zerzan, whose vision for a “freedom from work” was that of a primitivist society where modern technology has been given up and abundance is found in nature.

## Post-scarcity

What all these theories and manifests have in common with Keynes is their firm assumption that scarcity – the main issue with which economics traditionally deals – will soon cease to be a problem. This idea also stood at the beginning of the Free Software movement that created the GNU and Linux software. The *GNU Manifesto* by software developer and activist Richard Stallman appeared in 1985, the same year as Bob Black’s *Abolition of Work*, and took the middle ground between anarchist zero-work demands and Keynes’s 15-hour work week:

In the long run, making programs free is a step toward the post-scarcity world, where nobody will have to work very hard just to make a living. People will be free to devote themselves to activities that are fun, such as programming, after spending the necessary ten hours a week on required tasks such as legislation, family counseling, robot repair, and asteroid prospecting.<sup>55</sup>

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<sup>53</sup>Barbrook and Cameron, “The Californian Ideology.”

<sup>54</sup>Black, *The Abolition of Work and Other Essays*, 30.

<sup>55</sup>An in-depth discussion of Free Software and post-scarcity can be found in Aymeric Mansoux, “Sandbox Culture: A Study of the Application of Free and Open Source Software Licensing Ideas to Art and Cultural Production” (PhD thesis, Centre for Cultural Studies, Goldsmiths, University of London, 2017), 8, [https://www.bleu255.com/~aymeric/dump/aymeric\\_mansoux-sandbox\\_culture\\_phd\\_thesis-2017.pdf](https://www.bleu255.com/~aymeric/dump/aymeric_mansoux-sandbox_culture_phd_thesis-2017.pdf) who also quotes this passage, (Richard M Stallman, “The GNU Manifesto. Free Software Foundation.” Free Software Foundation. <https://www.gnu.org/gnu/manifesto.en.html>, 1985.)

Since then, this view has entered the mainstream, most prominently with the writer and political consultant Jeremy Rifkin, who published a technocratic vision of the *End of Work* in 1995, later modified it into a prosumer *Zero Marginal Cost Society* where most goods and services will follow an Internet model of free availability, and whose last coinage of the *Third Industrial Revolution* has been a major influence on, among others, Germany's industry and energy politics of the 2010s.

The educationalist Michael A. Peters usefully summarizes post-scarcity as a discourse that spans science fiction, sociology, and digital technologism.<sup>56</sup> He points out that post-scarcity demands can be found both on the political left and the political right, with some being anti- and others pro-capitalist.<sup>57</sup>

This blurriness between the left and the right, and between secular politics, political theology, and outright cultism, is particularly evident in the *Zeitgeist Movement* which rose to prominence with the Occupy movement in 2011. Key activists and speakers of Occupy – among others, of Occupy New York, Blockupy Frankfurt, and Occupy Amsterdam – were members of *Zeitgeist*. The movement was created through a series of suggestively edited feature films published on YouTube, *Zeitgeist: The Movie*; *Zeitgeist: Addendum*; and *Zeitgeist: Moving Forward*, whose first installment presented a conspiracy theory and grand historical narrative from Christianity and institutional religion via 9/11 to the supposed elite control of the financial system and the media.<sup>58</sup> Its creator, Peter Joseph (Peter Joseph Merola), later called the films “a performance piece.”<sup>59</sup> Seeing “post-scarcity” as a present possibility, *Zeitgeist* advocates what it calls a “Resource-Based Economy” in which a central AI computer program linked to sensors would globally allocate resources, and exercise economic governance based on computational objectivity. In its mission statement, *Zeitgeist* calls it “a new socioeconomic model based upon technically responsible Resource Management, Allocation, and Distribution through what would be considered The Scientific Method of reasoning problems and finding optimized solutions.”<sup>60</sup>

While the *Zeitgeist Movement* mostly identified as left-wing, it has been called an apocalyptic Internet cult whose narrative makes use of anti-semitic tropes.<sup>61</sup> With its techno-utopia, it reciprocally

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<sup>56</sup>Discussed in more detail in Mansoux, “Sandbox Culture.” Peters writes: “Post-scarcity as a concept has existed for a while, not only in science fiction to describe economic and political systems where goods are freely distributed according to egalitarian principles but also by sociologists such as Anthony Giddens to point to trends in advanced industrial societies, by scientists who emphasize the benefits of nanotechnology with an abundance of raw material and self-replicating technologies and by digital technologists who point to zero cost in reproducing and sharing mass copies or to the examples of open source, open access, open archiving and open publishing movements,” in: “Introduction: Knowledge Goods, the Primacy of Ideas and the Economics of Abundance,” in Michael A. Peters, Simon Marginson, and Peter Murphy, *Creativity and the Global Knowledge Economy* (New York: Peter Lang, 2009), 11.

<sup>57</sup>Ibid., 12.

<sup>58</sup>Peter Joseph, *Zeitgeist*, 2007, <http://www.imdb.com/title/tt1166827/>; *Zeitgeist: Addendum*, 2008, <http://www.imdb.com/title/tt1332128/>; *Zeitgeist: Moving Forward* (2011). <http://www.imdb.com/title/tt1781069/>, all accessed 05.05.2018.

<sup>59</sup>“We Spoke to the ‘Zeitgeist’ Creator about Trump, the Surveillance State, and Alex Jones,” Tom Usher, Vice, last modified April 24, 2017, [https://www.vice.com/en\\_uk/article/ez3a74/we-spoke-to-the-zeitgeist-creator-about-trump-the-surveillance-state-and-alex-jones](https://www.vice.com/en_uk/article/ez3a74/we-spoke-to-the-zeitgeist-creator-about-trump-the-surveillance-state-and-alex-jones), accessed 05.05.2018.

<sup>60</sup>“Mission Statement,” The Zeitgeist Movement, <https://www.thezeitgeistmovement.com/about/>, accessed December 03, 2017.

<sup>61</sup>“Brave New World: The Zeitgeist Movement Is the First Internet-Based Apocalyptic Cult, Centered around a

cally corresponded to the right-wing *Neoreaction* (“NRx”) movement that originated around the same time via the blog of the software developer Curtis Yarvin (a.k.a. Mencius Moldbug). Both *Zeitgeist* and *NRx* reacted to ongoing political crises, both originated in Internet subculture and home-brew political and economic theory, both reacted to an expected AI “Singularity,” only with opposite conclusions: a global technocracy *All Watched Over by Machines of Loving Grace* (to quote poet Richard Brautigan and documentary filmmaker Adam Curtis) in the *Zeitgeist Movement* versus, in *NRx*, a right-extremist will to political power against machine rule, which eventually made *NRx* the elitist companion to the white-nationalist populist “Alt-Right” movement.

If one compares *Zeitgeist* to techno-eschatologies of the seventeenth century, then it could be said to combine the Lullist vision of formalized and automated total knowledge with macroeconomic project-making. In seventeenth-century terminology, *Zeitgeist* thus pitches an “Ars magna economica” whose practical design and implementation remains as sketchy as the Lullist Arts that Kuhlmann and others had proposed. The idea of overcoming economic scarcity by technological and computational means is no less speculative and eschatological in the twenty-first century than the idea to exhaust knowledge by computational means was in the seventeenth century. Peters therefore is right to point out that

both left-wing and right-wing conceptions of post-scarcity may be wrong. It is not clear that human beings, under any conceivable conditions, have unlimited time to make decisions. [...] It is also not clear that time for the free play of the imagination has increased, could markedly increase, or at least could ever be unlimited. Time is scarce, and it grows scarcer by the day as the tempo of life increases. As some things become freer (information notably), other things seem in fact to be less free and more governed by necessity.<sup>62</sup>

In the light of natural resource depletion, climate change, and their implications for large parts of the world population, this is rather mildly phrased. The “Californian Ideology” seems to have been curiously embraced by various “post-scarcity” movements, including left-wing accelerationism. They believe industry promises of AI and sustainable technology revolutions, without critical checks of their practicability, and without analyzing these promises as what they are: euphemistic investment sales pitches for unproven projects just like those made by project makers in the seventeenth century. Lullists back then and accelerationists today lack insight into crapularity as a reality underneath “Singularity” prophecies.

Post-scarcity movements might share the fate of Lullism and be studied in the future as metaphysics and eschatologies instead of what they actually aspired to be. While the cornucopias they envisioned may not come to fruition, they nevertheless created an abundance of imagination and culture, from psychogeography to GNU software and pirate libraries. They will be enjoyed, just like seventeenth century Lullism, as poetry.

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Doomsday-Proclaiming Film and an Ideology Filled with Classic Anti-Semitic Tropes,” Michelle Goldberg, *Tablet Magazine – Jewish News and Politics*, last modified February 2, 2011, <http://www.tabletmag.com/jewish-news-and-politics/57732/brave-new-world>, accessed 05.05.2018.

<sup>62</sup>Peters, Marginson, and Murphy, *Creativity and the Global Knowledge Economy*, 12.