

Technology, Liturgy, and Ritual

Rereading Krämer & Bredekamp's "Culture, Technology, Cultural Techniques" (2003/2013)¹

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Abstract

By rereading Krämer and Bredekamp's "Culture, Technology, Cultural Techniques" (2003/2013), this article aims at appropriating and evaluating the significance – and philosophy – of the mathematical and computer science elements in it. This contribution aims to answer the following questions: How do we understand, interpret, and evaluate the notion that symbol and technology interpenetrate and that their functional processes can mutually substitute for one another? How do we evaluate this theologically? This article provides a basic building block for a liturgical theology of the digital, the computer, calculations, and algorithms. After an introduction, I consider four aspects from the article of Krämer and Bredekamp: the relationship between technological creativity, imagination, and the metaphysical; the convertibility of the symbolic and technical; the connectivity of technical machines in a network; and the new knowledge order associated with these developments. In a concluding paragraph, future developments regarding technology, liturgy, and ritual are outlined and considered.

Keywords

Technology, computer, internet, AI, theology, humanities, ritual, liturgy

The computer regulates almost all productive processes; it coordinates the social communication of our society and intervenes in the production of knowledge. It manages all that precisely by having fully permeated the routines and practices of our everyday world. It is the everyday technology for us all. As a Turing machine made real, it reveals and enacts how formalism and machine, symbol and technology, interpenetrate and how their functional processes can mutually substitute for one another. Both medium and machine, it demonstrates that the transfer of signs fundamentally depends on the technical processing as data.

Sybille Krämer and Horst Bredekamp²

1) Sybille Krämer & Horst Bredekamp, "Culture, Technology, Cultural Techniques: Moving Beyond Text," *Theory, Culture & Society* 30/6 (2013): 20-29, [doi: 10.1177/0263276413496287](https://doi.org/10.1177/0263276413496287).

2) Krämer & Bredekamp, "Culture, Technology, Cultural Techniques," 24f.

Introduction: problem statement, aim, and research question

The recognition that ritual and liturgy are not mere text has become commonplace in liturgical and ritual studies. Ritual is physical, multisensory, spatial, temporal, and material. In conjunction with this, the performance of a ritual requires skills, craftsmanship, and artistry. One of the notions for indicating all of this is *ritual techniques*. In the broader context of cultural studies, we speak of cultural techniques. The breadth of the concept of cultural or ritual techniques may make it seem indeterminate. Therefore, an exploration of the different dimensions of the notion is called for, revisiting some of the founding publications that are at the origin of such an approach to ritual beyond text.

In this article, I do this by highlighting an aspect that is only discussed to a limited extent in the articles in the *Yearbook for Ritual and Liturgical Studies* (after this: *Yearbook*) and, more broadly, in ritual and liturgical studies, namely the extent to which and the way in which *technology* permeates liturgy and ritual in our time. The quotation that I put as an epigraph above this article states the following: “symbol and technology ... interpenetrate and ... their functional processes can mutually substitute for one another.” This means that technology will profoundly influence and determine symbolic–ritual acting. This urgently requires an in-depth understanding of and reflection on the relation between technology and liturgical or ritual acting.

As mentioned, the insight that ritual and symbolic acting involve *techniques* has become commonplace. The role of *technology*, on the other hand, has hardly been reflected on. The etymological connection between technique and technology is evident. Technique refers to arts, skills, and crafts. *Technology in its use* refers to methods of the sciences and their practical application in the production of goods, machines, and systems. At a time when e-technology, in particular, is all-pervading, a relevant question is how ritual and e-technology relate to each other. During and before the COVID-19 pandemic, much has been written about online ritual and ritual online, including in connection with religious and ecclesiastical liturgy. These publications are frequently fairly practical in nature; often, they focus on the relationship between *online* and *offline*. In other words, they focus on *ritual techniques*. However, the *technology* underlying e-ritual itself has hardly been the subject of reflection in ritual and liturgical studies.

Attention to technology in ritual and liturgical studies by ritual and liturgical scholars is possible only to a limited extent; liturgists are no technologists. Yet I am convinced that some knowledge of technology is necessary to understand the mechanisms, possibilities, and limitations of online and offline rituality in terms of their mutual dynamics. The Institute for Ritual and Liturgical Studies and the associated *Yearbook* want to put technology and related techniques emphatically on the agenda for the coming years.

The necessity of some knowledge of technology in ritual and liturgical studies does not only apply to our time. The advances in technology that made possible the construction of the Gothic ca-

thedral have not only radically changed the church space but also led to a new theology of light and, by extension, a changing image of God. Basic knowledge of the building technology that made Gothic cathedral construction possible is indispensable. The same goes – to cite another example – for sound technology. In the last century, the technological developments that made sound installation possible strongly influenced auditory liturgical performance and even the design of the liturgical space.³ The emphasis in the Reformation on the Bible and preaching at the expense of a more physical rituality was in part made possible by the then recent invention of the printing press and the possibility of book production. Such an emphasis fitted in at a time when communication was anyway becoming more verbal in nature.⁴ In ecclesiastical ritual and the theological reflection on it, this coincided with a major shift from an emphasis on the sacramental and visual to an emphasis on the auditive and, especially, the word. The theology of the word became the iconic flagship of the Reformation. The *digital turn* has not yet led to a comparable theological reflection on the digital, the computer, calculations, and algorithms. This article aims to provide a building block for the development of such a theology by rereading Krämer and Bredekamp's (2003) article "Culture, Technology, Cultural Techniques." With its emphasis on the significance of technology for (liturgical) theology, it does not explicitly address liturgical ritual techniques and contemporary rituals in their hybrid online–offline shape; rather, it focuses on the underlying technology and the philosophical–theological questions that it evokes.

I would like to make a personal comment beforehand. As a practical theologian and scholar in liturgical and ritual studies, because of the nature of these disciplines, I am accustomed to calling to disciplines other than liturgiology, practical theology, and ritual studies for help.⁵ Usually, these auxiliary disciplines are anthropology, social sciences, philosophy, or linguistics, all of which to a limited extent belong to a theological academic training. As a rule, the sciences are beyond my field of vision, as are mathematics and the philosophy of mathematics. Nevertheless, it is precisely these disciplines that play an important role in the foundational article of Krämer and Bredekamp regarding cultural techniques that I am mainly rereading for this contribution. Here, I aim at appropriating and evaluating the significance of the mentioned article – especially the (philosophy of) mathematical and computer science elements that it contains – in the expectation that this will be of significance for liturgical and ritual scholars. The questions that I aim to answer are as follows: How do we understand, interpret, and evaluate the notion that symbol (language, things, and acting) and technology interpenetrate

3) Paul Post, *Space for Liturgy Between Dynamic Ideal and Static Reality. An Exploration of the Development of the Roman Catholic Liturgical Space in the Netherlands (ca. 1850 – present day) with Particular Focus on the Role of Liturgical Booklets, the Microphone and Church Pews* (= Netherlands Studies in Ritual and Liturgy 1) (Groningen/Tilburg: Instituut voor Liturgiewetenschap/Liturgisch Instituut, 2003), 27–33.

4) Norbert Elias, *The Collected Works 3. On the Process of Civilisation* (Dublin: University College Dublin Press, revised ed. 2012).

5) For the relationship between theology and (in this case: qualitative) research methods, see for example John Swinton & Harriet Mowat, *Practical Theology and Qualitative Research* (London: SCM Press, 2016²), 68–94.

and that their functional processes can mutually substitute for one another? How do we evaluate that theologically?

Without going into further detail in this context, the assumption of this article is that ritual and liturgy are a coherent and repeatable whole of symbolic language, symbolic actions, and symbols (things). By defining them in this way, it is clear that ritual – and thus liturgy – can be regarded as a cultural phenomenon, and indeed it is regarded as such in this article. The notions of ritual and liturgy can thus be subsumed under the notion of culture as Krämer and Bredekamp use it. Furthermore, I assume that liturgy is a ritual that also refers to a metaphysical and eventually divine reality. By more or less unsuspectingly replacing the notion of *culture* in Krämer and Bredekamp with that of *ritual*, a theological reflection is by no means impossible. One could argue that the Reformed theology of the word is a reflection on the invention of the printing press. However, I am well aware that such a claim is a reduction of the complex reality, leaving other aspects – such as its relation to medieval theology – unexposed.

1 Rereading Krämer and Bredekamp's “Culture, Technology, Cultural Techniques”

In 2003, the Berlin philosopher Sybille Krämer and art historian Horst Bredekamp published a fundamental article in German. An English version was published ten years later, titled “Culture, Technology, Cultural Techniques: Moving beyond Text.”⁶ Krämer and Bredekamp wrote their article against the background of views in which culture was still seen predominantly as text. Up to then, material and technical elements were pushed into the background or even denied.⁷ By contrast, they argue for a cultural concept in the light of “the advancing techno-mathematical mechanics of civilization.”⁸ In this part of my article, I reread Krämer and Bredekamp's article with the aim of understanding the fundamental relationship between symbol (language, things, and acting) and technique that they describe.

1.1 The Turing Galaxy

Krämer and Bredekamp turn to the *de facto* founder of computer science, the British mathematician Alan Turing (1912–1954), and ask what “the shift from the ‘Gutenberg Galaxy’ to the ‘Turing Galaxy’” means.⁹ “Gutenberg” here obviously refers to Johannes Gutenberg (±1400–1468), who introduced the printing technique, at least in Europe. “Turing” indicates Alan Turing, whose 1937 article “On Com-

6) Krämer & Bredekamp, “Culture, Technology, Cultural Techniques”.

7) Krämer & Bredekamp, “Culture, Technology, Cultural Techniques,” 20f.

8) Krämer & Bredekamp, “Culture, Technology, Cultural Techniques,” 22.

9) Krämer & Bredekamp, “Culture, Technology, Cultural Techniques,” 22.

putable Numbers” forms the basis of modern computer science.¹⁰ I will come back to the notion of *galaxy*. In a few sentences, Krämer and Bredekamp summarize what I see as key to their article:

Turing opens up a cognitive dimension with his claim that his mathematical formalism renders explicit what a human calculator does when working with paper and pencil, which is to say, when writing. Second, he further develops the convertibility between the symbolic and the technical already surmised by Leibniz, and along with it the convertibility between the semiotic and the physical, and, by extension, between software and hardware. And he finally projects the Turing machine as a universal machine capable of imitating every special Turing machine because the codes of the latter can be inscribed – that is programmed – onto the strip of the universal machine.¹¹

In the following, I consider the three points mentioned in this quotation.

1.2 Technological creativity, imagination, and the metaphysical

The first point claims that “mathematical formalism” makes explicit that mind and machine are closely related and thus cannot be considered independently of each other.¹² In a thought experiment that Turing calls an “imitation game,” a human is challenged to have a keyboard conversation with another human and a machine and then decide which of the two was the human and which was the machine. Turing envisions a machine that makes that decision impossible because it is indistinguishable from a human.¹³ This *Turing machine* is an imaginary machine that was first technically materialized in the computer.¹⁴ Coy describes its power as follows: “[t]he (algorithmic) describable doing ... becomes

10) Alan Turing, “On computable numbers, with an application to the *Entscheidungsproblem*,” in: *Proceedings of the London Mathematical Society*, s2-42, issue 1 (1937): 230-265, doi: [10.1112/plms/s2-42.1.230](https://doi.org/10.1112/plms/s2-42.1.230).

11) Krämer & Bredekamp, “Culture, Technology, Cultural Techniques,” 22f. In this article I will not go into the foundational thoughts of Gottfried Leibniz (1646-1716). For a short overview of these thoughts, see Michael Heim, *The Metaphysics of Virtual Reality* (New York/Oxford: Oxford University Press 1994), 93-99.

12) I ignore the question of whether Krämer and Bredekamp use the notion *mathematical formalism* correctly here or whether Turing’s contribution on the contrary marked the end of formalism. See Ted Fussell, ‘Turing Machines – the death of formalism and the birth of computer science’, <https://tomrocksmaths.com/2021/08/03/turing-machines-the-death-of-formalism-and-the-birth-of-computer-science/>, accessed February 10, 2022.

13) Volker Grassmuck, “A Hitchhiker’s Guide to the Turing Galaxy. On naming the age of the networked digital computer,” 2007, 15, https://www.researchgate.net/publication/26975803_A_Hitchhiker%27s_Guide_to_the_Turing_GalaxyOn_naming_the_age_of_the_networked_digital_computer, accessed 2022-02-10. I rely profoundly on this article in this section. It synthesizes the historical developments from Turing to the realization of the Internet and makes clear how computer technology and sciences are the materialization of Turing’s thinking. Three articles by Wolfgang Coy are central to the argumentation. See the bibliography at Grassmuck, 20-22.

14) Grassmuck, “A Hitchhiker’s Guide to the Turing Galaxy,” 10.

automatically executable action.”¹⁵ Thus, a human action can be converted into an algorithm (on this notion, see below) that automatically repeats that action. The action can be manipulated by changing the algorithm. The theological question that arises on the horizon is who has the power of definition and the ability to designate the algorithms.

The introduction of the notion of *game* in Turing’s “imitation game” is important. The computer introduces us to a game world – an imagined or virtual world, an as-if field, or “a simulation” made up of bits.¹⁶ Obviously, liturgists and ritual scholars are reminded of the qualification of ritual as play. To call only Huizinga in *Homo Ludens* as a witness, “[t]he ritual act has all formal and essential characteristics of play ... particularly in so far as it transports the participants to another world.”¹⁷ As Grassmuck states, “[t]he computer ... ‘manipulates’ information... . Like in play, [Turing’s man’s] trial and error is of limited seriousness, because it is never irrevocable, and a reboot is always possible.”¹⁸

This unmistakably evokes qualities that Huizinga attributes to a game. A game is primarily a “free act” and “gratuitous”, but it is also “indispensable”; moreover, it is “a break from ordinary life.”¹⁹ In a similar way, Elaine Graham says that “technological creativity” takes us into the domains not only of the material object (the computer) but also of imagination and metaphysics:

[A] practical theology of technology would begin from this irreducible link between the material and the metaphysical, and the way such an orientation between and amongst humanity – and its Others – nonhuman and divine – can serve as a practical wisdom that enables us to live more authentically.²⁰

This is an impressive but also dizzying quotation that links humans, machines, nature, metaphysics, and the divine with a reference to Heidegger’s “authentic life.”²¹ It requires further explanation and reflection.

15) Coy quoted in Grassmuck, “A Hitchhiker’s Guide to the Turing Galaxy,” 10.

16) David J. Chalmers, *Reality+. Virtual Worlds and the Problems of Philosophy* (New York: W.W.Norton & Company 2022), 20-40 and *passim*.

17) Johan Huizinga, *Homo Ludens. A Study of the Play-Element in Culture* (Boston, 1970), 18.

18) Grassmuck, “A Hitchhiker’s Guide to the Turing Galaxy,” 7.

19) Huizinga, *Homo Ludens*, 8ff.

20) Elaine Graham, “Being, Making and Imagining. Toward a Practical Theology of Technology,” in *Culture and Religion* 10/2 (2009): 221-236, 222.

21) Varga, Somogy and Charles Guignon, “Authenticity,” in Edward N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy*, Spring 2020 Edition, <https://plato.stanford.edu/archives/spr2020/entries/authenticity/>, esp. 3.1, accessed March 3, 2022: “Authenticity, defined as standing up for and standing behind what one does – as owning and owning up to one’s deeds as an agent in the world – becomes possible in this sort of resolute commitment to the ‘for the sake of which’ of one’s existence.”

In my opinion, the reference to Heidegger is extremely important here.²² Authenticity in Heidegger refers to the relationships – with Graham’s “Others” – in which a person stands and the commitment with which that person acts in this world. How does a machine play a role in reaching out to Others, that is, in symbolic and thus also in ritual and liturgical acting?

Let us take a closer look at what Heidegger says about technology. Graham speaks of a “technological creativity.” Heidegger says that technology does call forth a truth, but he distinguishes it from “a more primal truth.”²³ In his famous essay “The Question Concerning Technology,” Heidegger wants to pave the way for a free relationship with technology. He does this by “asking questions in order to penetrate to the essence of technology.”²⁴ According to Heidegger, “the decisive question” is as follows: “Of what essence is modern technology that it happens to think of putting exact science to use?”²⁵ The answer is twofold. First, modern technology is built on modern physics. Second, modern physics makes *poiesis* or *bringing-forth* become a demand made on reality or on nature. Heidegger calls this specific way of *poiesis* a “challenging-forth” (“*Herausfordern*”).²⁶ In technology, reality or nature reveals itself to be something that is *at our command and at our disposal*.

However, there is a parallel, yet at the same time contrasting and *non-challenging*, way of revealing. This is the other way of *poiesis*: the way of the arts and, more specifically, of poetics. This is “a more original revealing” and “the call of a more primal truth.”²⁷ Referring to a hydro-electric power station on the Rhine, Heidegger gives the example of a river, which is – as “a challenging-forth” – regarded as a source of energy at our disposal or – by “the call of a more primal truth” – “revealed” in a “more original” poetic way. Think of Marsman’s poem “Herinnering aan Holland,” in which the voice of the water itself is heard.²⁸

22) Graham however mainly refers to the essay “Building, Dwelling, Thinking”, whereas I mainly rely on Martin Heidegger, “The Question Concerning Technology,” in: *The Question Concerning Technology and other essays* (New York etc.: Harper, 2013), 3–35. I draw from my paper, presented at the Online Joint Conference of the Faculty of Religion and Theology, University of Pretoria, South Africa, and the Protestant Theological University, Amsterdam, the Netherlands, Techno-Humanism? North-South Critical Theological Discourse on Technology, 23 and 24 November 2021: Marcel Barnard, “Re-reading Heidegger’s ‘The Question Concerning Technology’ for the Purpose of Theological Questions”. I thank the conference participants for their questions and comments on my paper.

23) Comp. Peter-Paul Verbeek, “In de beginne was techniek... Over de technologische bemiddeling van het religieuze,” in Michiel van Well (ed.), *Deus et Machina. De verwevenheid van technologie en religie* (= STT 72) (Den Haag: Stichting Toekomstbeeld der Techniek, 2008), 37.

24) Heidegger, “The Question Concerning Technology,” 3.

25) Heidegger, “The Question Concerning Technology,” 14.

26) Heidegger, “The Question Concerning Technology,” 14.

27) Heidegger, “The Question Concerning Technology,” 28.

28) “Denkend aan Holland/zie ik brede rivieren/traag door oneindig/laagland gaan/.../en in alle gewesten/wordt de stem van het water/met zijn eeuwige rampen/gevreesd en gehoord.” Hendrik Marsman, *Verzameld werk. Poëzie. Proza en kritisch proza* (Amsterdam: Querido, 1979), 106.

I would also like to refer to another example from Heidegger in this respect, that of the land and the earth, which in the frame of modern technology are seen as producing uranium for nuclear energy and food for a mechanized food industry. However, there is also a more poetic conception of the land, as the philosopher gives in his poetic description of the pair of peasant shoes painted by Van Gogh: “(T)he far-stretching and ever-uniform furrows of the field swept by a raw wind,” “the dampness and richness of the soil,” “the loneliness of the field-path as evening falls,” and “the silent call of the earth, its silent gift of the ripening grain, its unexplained self-refusal in the wintry field.” This is what the field and the soil are “in truth.”²⁹

Heidegger makes a short excursion into theology. Within the essence of technology, he says, the calculable reigns. When humans are in the grip of this kind of revealing, God also enters into this category of the calculable. The Divine becomes the God of the philosophers, defined in terms of causality.³⁰ Technology and religion are both answers to the call of being. Does the “technological creativity” that Graham is referring to answer to the call of being as it is heard by poets or as it is heard by technology? Has anything changed in this regard with the advent of e-technology, which Heidegger obviously did not cognize as we do? To push the question even further, can e-technology also call forth the God of the theologians? The question of how metaphysics, which, as Graham rightly says, is inextricably linked with modern technology, relates to God, both that of the philosophers and that of the Bible or the Quran, requires further elaboration. In this article, we do this only questioning.

Heidegger’s view of technology is not necessarily positive. This is – at least retrospectively – recognizable when we consider how technological ability has caused the ecological and climate crises or (an example from Heidegger) how technological developments have turned humans into resources that can be managed.³¹ Nevertheless, technology has also been able to significantly reduce hunger in the world, for example, through the genetic modification of crops. But can the role that Heidegger ascribes to poetry also be taken over by a machine? Can the computer as an acting agency also include agencies of nature? Graham seems to suggest yes. I have found no indication that Heidegger is familiar with Turing’s invention, but it is precisely this technology that makes humans and machines indistinguishable. With that, the previously formulated questions come back: Can computational techniques create religious imagination? If so, what kinds of religious imagination? Is this necessarily a religious imagination in the mode of the calculable and causality? Or does Graham’s suggestion also involve opening up to “a more primal truth”? Can the voice of the Eternal of the Christian, Jewish, and also Islamic traditions be heard in, with, and under e-technology?

29) Heidegger, “The Question Concerning Technology,” 14f.; Martin Heidegger, *Off the beaten track* (Cambridge: Cambridge University Press, 2002), 14-15.

30) Heidegger, “The question concerning technology,” 26.

31) Heidegger, “The question concerning technology,” 18.

Let us take this matter to the heart of Christian worship. Can the consecration of the Eucharistic elements that reveals the bread in its most true substance – as the body of Christ – be performed by the Turing machine? Can the Turing machine as it is realized in the networked computer galaxy perform the liturgical play? I approach these questions in two steps. First, I explore how ritual symbol acting can evoke “a more primordial truth.” I then return to the question of whether the functional processes of ritual symbol acting and computers are interchangeable.

How can ritual symbol acting call forth “a more primal truth”? Here we may refer to Louis-Marie Chauvet’s sacramental theology. Quoting Heidegger on the “primal truth” of being as the “*Incalculable*,” he refers to grace as precisely that which escapes causality.³² In the liturgical play, the Eucharistic bread is revealed in its truthness, that is, as bread that is nourishing but that is always shared and eventually the body of Christ or the “*autocommunication of God’s very self in Christ*.”³³ Thus, the role that Heidegger assigns to the arts here has, along with Chauvet, strong analogies to symbolic and sacramental agency.

This brings us back to the Turing machine and to Graham’s “technological creativity”: imagination and metaphysics. The preliminary question here is whether computers and algorithms can be manipulated in such a way that they can also generate this poetic, sacramental, and “primal” truth.

The computer is a calculator that is also “a space of possibility”:³⁴ “a reboot is always possible.”³⁵ Computer technology as creator of spaces of possibility is probably not new compared to previous techniques. Cathedrals can also be seen as products of artistic expression and producers of spaces of truth that transport humans to another world. In this context, Verbeek speaks of “mediating technologies” that “explicitly contribute to the character of religious experience and religious practices.”³⁶ Indeed, technology, imagination, and metaphysics are closely connected.

In my view, theology, and more specifically sacramental theology, can clarify this mediating process. Humans enter a play in which, although it is human-initiated, there is no telling whether it is the artist and cathedral builder or God speaking. In the fully human game or ritual of the Eucharist, it is ultimately Christ who meets the congregation *in and as* bread and wine.³⁷ This “as” is important, indicating that the bread is and is-not Christ at the same time. Bruno Latour has argued for not resolving and thus maintaining this tension between human and divine acting, speaking of “iconoclash” in

32) Louis-Marie Chauvet, *Symbol and Sacrament. A Reinterpretation of Christian Existence*, (Collegeville Minnesota: The Liturgical Press, 1995), 49.

33) Chauvet, *Symbol and Sacrament*, 392-401, here 398.

34) Grassmuck, “A Hitchhiker’s Guide to the Turing Galaxy,” 15.

35) Grassmuck, “A Hitchhiker’s Guide to the Turing Galaxy,” 7.

36) Verbeek, “In de beginne was techniek...,” 40.

37) Marcel Barnard, Johan Cilliers and Cas Wepener, *Worship in the Network Culture. Liturgical Ritual Studies. Fields and Methods, Concepts and Metaphors* (= *Liturgia Condenda* 28) (Leuven/Paris Walpole, MA: Peeters, 2014), 323-354.

this regard.³⁸ In conclusion, the irreducible link between technology and metaphysics finds a stunning parallel in sacramental theology: in both, the initial exclusive subjectivity of humans is looped into a metaphysically or divinely definable subject. Thus, theologically spoken, the advent of God is always dependent on a human invitation to the divine to come into presence.³⁹ Needless to say, it is also within human power to summon demons and other evil powers. The question of who has the power to define the algorithms remains as relevant as ever.

These considerations on the symbolic lead us to the second point that Krämer and Bredekamp raise regarding Turing.

1.3 The symbolic and technical are convertible

The second point is regarding the convertibility between the symbolic and the technical. In 1991, Stevan Harnad “analysed electronic writing as the fourth revolution in the means of production of knowledge after the invention of language, writing and printing.”⁴⁰ It is important to note that *all* knowledge production and exchange is a processing of symbols, be it through language, writing, printing, or electronic means. Information is transformed into symbols. In the digital age, this transformation is done by way of algorithms: “a structured sequence of steps create an output from an input through the mechanical application of a series of operations constrained by logical operators and conditionals.”⁴¹ Thus, the algorithm itself is not a symbol, but it mediates input/information and output/symbol. In this respect, the Turing machine, as realized in the computer performing these computations, is a *medium*. Every doing, thinking, and feeling that can be described in algorithms may be transformed through an “automatically executed action” into a symbol.⁴² This process of symbolizing entails, on the one hand, a split between how doing, thinking, or feeling is *represented* and, on the other, *metadata* that record in a markup language how and which information is processed.⁴³ This split is also not new. After all, the world is never accessible other than through symbols, which are representations of processed information.

38) Bruno Latour, “What is iconoclasm? Or is there a world beyond the image-wars?,” in *Iconoclasm. Beyond the Image Wars in Science, Religion, and Art*, ed. B. Latour and P. Weibel (Cambridge, MA/London 2002), 14–37.

39) This claim comes close to what is claimed in so-called radical theology. See, for example, Richard Kearney, *Anatheism. Returning to God after God* (New York: Columbia University Press, 2011), 86f.: ‘... the sacramental move, as I understand it, signals the possibility of a second God set apart from the first God of metaphysical sufficiency. It marks an opening toward a God whose descent into flesh depends on our response to the sacred summons of the moment’.

40) Grassmuck, “A Hitchhiker’s Guide to the Turing Galaxy,” 5f.

41) David M. Berry & Anders Fagerfjord, *Digital Humanities. Knowledge and Critique in a Digital Age* (Cambridge, UK: Polity Press, 2017), 46.

42) Coy quoted in Grassmuck, “A Hitchhiker’s Guide to the Turing Galaxy,” 10.

43) Berry & Fagerfjord, *Digital Humanities*, 21.

Perhaps this is best illustrated by psychoanalytic theory. As Lacan demonstrated, the child gets to know itself in its “symbolic capacity”; it has access to its own subjectivity only in the language in which it represents itself. The self is never immediately accessible and is always mediated.⁴⁴ There is an inevitable break between “the subject and the ideal Self” that can only be experienced as “loss of ... ‘paradise’” and “mourning for the hope of ever recovering beatitude.”⁴⁵ At the same time, exactly this split constitutes the subject. The human subject enters into relations with the other through a disinterested game of “symbolic exchange” that is always already characterized by a “presence-in-absence.”⁴⁶ Chauvet sees in this split and the associated gratuitous symbolic exchange also the possibility for relation to the Other, that is, communication with God. After all, God too can only be present-in-absence, most succinctly in the sacramental presence *as* bread and wine (see above). As a consequence, faith communication takes place exclusively at the level of the symbol (language, acting, and things). God has always already been symbolically present, just as we have always already been symbolically present to each other. Theology takes place on the level of the free play of symbols. Thus, the split mentioned establishes a relationship of presence-in-absence, which creates the possibility of a “marvelous exchange” between God and humans (i.e., grace).⁴⁷

I will come back to the notion of “automatically executed action” in connection with the logarithms mentioned. Offering an indication of how I will do this, I quote Berry and Fagerfjord: “[F]or a humanist it will become increasingly important to think critically about algorithms and their implications. This algorithmic shaping of behavior is a key ethical question for computational disciplines.”⁴⁸ The same holds for theology. In particular, how can the algorithmically determined play of symbols that characterizes and constitutes theology indeed be a *free* play that invites the good God and not a demonic force?

1.4 Technical machines are connected in a network

There is a third step in the quotation of Krämer and Bredekamp that we have to consider. In 1993, every Turing machine became a single star in what has come to be called the Turing Galaxy – a node in a network or the Internet.⁴⁹ Computers became able to communicate with one another on a global scale and thus became the “universal medium,” in which all media, “written, optical and electrical,” could be integrated.⁵⁰ The connection between Turing machines creates a network in which “[t]he

44) Chauvet, *Symbol and Sacrament*, 95f.

45) Chauvet, *Symbol and Sacrament*, 98f.

46) Chauvet, *Symbol and Sacrament*, 98f.

47) Chauvet, *Symbol and Sacrament*, 100, comp.103.

48) Berry & Fagerfjord, *Digital Humanities*, 50f.

49) Grassmuck, “A Hitchhiker’s Guide to the Turing Galaxy,” 8.

50) Coy in Grassmuck, “A Hitchhiker’s Guide to the Turing Galaxy,” 10.

computer is not only a *medium*, it is the ‘*media-integrating machine per se.*’⁵¹ As a consequence, what McLuhan called the “Gutenberg Galaxy” of prints has been (or will be) swallowed up by the gravity of the much larger Turing Galaxy. Or, more nuancedly, the literal Gutenberg Galaxy has been included in the electronic Turing Galaxy. In yet other words, the 26-letter alphabet shifted to a binary, two-number (0 and 1) technique.⁵² In this integration, text has become information. This is not without consequences, which we cannot, however, go into now.⁵³

There is another aspect to this dynamic. The convertibility of humans and machines in combination with the global network created by connected computers means that humans and the network also become convertible. The network starts to respond to my behavior and thus corresponds exactly to my preferences, whether conscious or not. Based on a limited number of likes or searches, Facebook or Google know exactly who I am and respond accordingly. Humans and machines are included in a loop, as we said before.

The inconvenient truth is that it has been demonstrated that the thus constructed symbolic worlds can completely separate themselves from what we usually call reality; conversely, they can be mistaken for that reality. In an essay on the door as a cultural technique, Siegert, quoting Lacan, refers to psychoanalysis, stating that every “reality check” is done against the background of “the complementary negative judgment”: “This is not a dream, I am not hallucinating this.”⁵⁴ Siegert claims that in the digital age, this “nomological logic” has been replaced by “the cybernetic logic” of “on/off.”⁵⁵ Rather pessimistically, he notes as follows:

With the retreat of the symbolic from the constitution of reality, and with the difference between inside and outside losing its form, the place of the law is replaced by a short circuit between the imaginary and the real. Lacan expressed where this is leading to: No one knows anymore whether a door opens to the imaginary or to the real. We are all unhinged.⁵⁶

If the distinction between imagination and reality is lifted, “reality takes on hallucinatory features.”⁵⁷ The digital age is a radicalization of modernity that Theodor Adorno in the well-known 18th of his *Minima Moralia* characterized as follows: “Actually, we can’t live at all anymore... . Wrong life cannot

51) Grassmuck, “A Hitchhiker’s Guide to the Turing Galaxy,” 10.

52) Marshall McLuhan, *The Gutenberg Galaxy. The Making of Typographic Man* (Toronto: University of Toronto Press, 1962); Coy in Grassmuck, “A Hitchhiker’s Guide to the Turing Galaxy,” 10.

53) See Heim, *The Metaphysics of Virtual Reality*, 13-27.

54) Siegert, *Cultural Techniques. Grids, Filters, Doors, and Other Articulations of the Real* (New York: Fordham University Press, 2015), 203.

55) Siegert, *Cultural Techniques*, 203.

56) Siegert, *Cultural Techniques*, 205.

57) Siegert, *Cultural Techniques*, 203.

be lived rightly.”⁵⁸ *Being connected, we are in danger of forgetting to be rooted as well.*⁵⁹ Or, in the words of Michael Heim, “(s)o entrancing are these symbols that we forget ourselves, forget where we are.”⁶⁰ Thus, humans have let themselves be turned off by the machine.

This is confirmed when we look again at another characteristic that Huizinga attributes to the game. Play is limited in time and space, he says.⁶¹ However, exactly this limitation has been lifted in the “universal medium.” Where for Immanuel Kant, time and space were the conditions for observing phenomena, in the digital age, there are, as Castells says, other notions, namely “timeless time” and “the space of flows.”⁶² The board on which the game is played is no longer separate or distinct from the real world, nor is there any limited playing time. Likewise, in online–offline dynamics, the distinction between offline reality and the game’s own order with its strict rules of play has been negated. The imaginary world of the technique *par excellence* of the Gutenberg Galaxy – the book – is locked between two covers, but the dynamics of the Turing Galaxy, in which humans and machines are convertible, removes this demarcation. The sky is the limit, and not even that! Virtual reality is infinite, and we are now even connected to the spacecraft Voyager 1 that has left our solar system and entered interstellar space, while the James Webb Space Telescope looks at the limits of the universe and the beginning of time and projects its images onto our desk screens and mobile devices. On a theological level, the boundary between symbol and reality can be erased, leading to a lifting of the boundary between God and humans, which conflicts with at least the ecumenical tradition of the West.

1.5 Knowledge order

There is a fourth point in the article of Krämer and Bredekamp that requires our attention. The authors examine the significance of technology and cultural techniques for epistemology. The emphasis on cultural, and in our case ritual, techniques has made it clear that knowledge is also generated in social practices, “legitimizing itself through the handling of objects and instruments.”⁶³ To this extent, the computer as a social practice is a cultural *technique* that legitimates knowledge in its own particular way. Krämer and Bredekamp conclude their article with the following statement:

58) Theodor Adorno, *Minima Moralia. Reflections from a Damaged Life* (London/New York: Verso, 2005 (1951)), nr.18.

59) *Rooted and Connected* is the word pair around which we built Barnard, Cilliers, Wepener, *Worship in the Network Culture*.

60) Heim, *The Metaphysics of Virtual Reality*, 80.

61) Huizinga, *Homo Ludens*, 9.

62) Mañuel Castells, *The Information Age I. The Rise of the Network Society* (Oxford/Malden: Blackwell, 2000), 407-459.

63) Krämer & Bredekamp, “Culture, Technology, Cultural Techniques,” 23.

In conclusion, cultural techniques are promoting the achievements of intelligence through the senses and the externalizing operationalization of thought processes. Cognition does not remain locked up in any invisible interiority; on the contrary, intelligence and spirit advance to become a kind of distributive, and hence collective, phenomenon that is determined by the hands-on contact humans have with things and symbolic and technical artifacts.⁶⁴

The distributive and collective aspects of knowledge and intelligence, to a large part determined not only by techniques but also by technology, have far-reaching consequences. The interconnectivity of computers in a worldwide web distributes intelligence – and also what Krämer and Bredekamp call “spirit” (what do they mean by this?) – so that they become shared phenomena. Eventually, artificial intelligence (AI) will surpass the intelligence of humans, who, as a consequence, may become so-called post-humans, as the Anthropocene transitions into the Technocene.

Moreover, in the Turing Galaxy, we have entered a new “knowledge order” in which knowledge is primarily defined as “information” or “data”:⁶⁵

Thus a completely new understanding of the world permeating physics, logic, linguistics and aesthetics is emerging – an understanding which, briefly put, replaces

- beings with frequencies
- qualities with quantities
- things with signs
- attributes with functions
- causality with statistic.⁶⁶

Siegert claims that this will not make humans disappear, even if humans become more and more a hybrid of human and machine – a *cyborg*. As we have seen before, knowledge is always based on distinction and definition: this is X and not Y.⁶⁷ With an image of the mathematician, philosopher, and science historian Michel Serres, Siegert says that the challenge now is not to let the ocean of information and data slosh around us, allowing ourselves to sink into it, but to continue to steer and keep a course: “It is not a matter of man disappearing, but of having to define, in the wake of the epistemic ruptures brought about by first- and second-order cybernetics, noise and message relative to the un-

64) Krämer & Bredekamp, “Culture, Technology, Cultural Techniques,” 26f.

65) Coy and Spinner in Grassmuck, “A Hitchhiker’s Guide to the Turing Galaxy,” 12ff.; Stefan Herbrechter, *Posthumanism. A Critical Analysis* (London etc.: Bloomsbury, 2013), 136. Compare Krämer & Bredekamp, “Culture, Technology, Cultural Techniques,” 23f.

66) Siegert, *Cultural Techniques*, 31.

67) Ronald Grimes begins his courses on ritual with an exercise in which students must indicate what a ritual is not: Ronald Grimes, *The Craft of Ritual Studies* (Oxford/New York: Oxford University Press, 2014), 211.

stable position of an observer.”⁶⁸ Or, in another image, it is about filtering a voice from the noise.⁶⁹ In other words, “the culture–technical operation of filtering that generates this sign from noise is in the position of a third”⁷⁰ that defines noise and voice, ocean and course.

Obviously, the power of definition again comes into view here. Or, phrased more critically, the question is how the hegemonic power of definition of large system controllers – think of the tech giants such as Facebook and Google – relates to the power(lessness) of more demotic definitions. How does the singularity of one world system relate to diversity, particularity, and locality? It is clear that with these questions, we are entering a domain in which theology, the humanities, and probably also the social sciences are preeminently specialists.⁷¹ I am reminded here of Manuel Castells, who sees the bipolar opposition between the net and the self as characteristic of the network society. He critically asks who does and does not have access to the net. I have previously referred to this bipolar opposition as being connected and being rooted:⁷²

People increasingly organize their meaning not around what they do but on the basis of what they are. Meanwhile, on the other hand, global networks of instrumental exchanges selectively switch on and off individuals, groups, regions and even countries, according to their relevance in fulfilling the goals processed in the network, in a relentless flow of strategic decisions. There follows a fundamental split between abstract, universal instrumentalism, and historically rooted, particularistic identities. Our societies are increasingly structured around a bipolar opposition between the Net and the self.⁷³

It has been pointed out on several sides that “the digital transformation of all media and their networking” threatens a “national knowledge order.”⁷⁴ This is not new. Understanding one’s own (national or regional) culture is no longer the core of the humanities. The moribund state of Dutch studies at Dutch universities is significant in this respect. In newly invented disciplines such as cultural studies, according to Reading, “culture” is “dereferentialized” and, as a result, “non-normative.”⁷⁵

The same goes for theology and religious studies. The study of religion is no longer naturally rooted in a confessional *knowledge order*. Where theology in academia stands primarily for Christian theology or, even more precisely, for Reformed, Lutheran, or Roman Catholic theology, religion in

68) Siegert, *Cultural Techniques*, 32. First order cybernetics describe the system independent of context, whereas second order cybernetics reflect on the whole.

69) Siegert, *Cultural Techniques*, 31, comp. 28-30.

70) Siegert, *Cultural Techniques*, 32.

71) Berry & Fagerfjord, *Digital Humanities*, 138.

72) Barnard, Cilliers, Wepener, *Worship in the Network Culture*, 67-90.

73) Manuel Castells, *The Information Age. I*, 3.

74) Coy in Grassmuck, “A Hitchhiker’s Guide to the Turing Galaxy,” 12; Bill Reading, *The University in Ruins* (Cambridge MA: Harvard University Press, 1996), 12f.; Herbrechter, *Posthumanism*, 139f.

75) Readings at Herbrechter, *Posthumanism*, 140.

contrast is an undefined concept. The question has even been raised whether religion actually exists or whether the concept, in a Wittgensteinian way, is just helpful “in its use.”⁷⁶ The same applies analogously to liturgy and ritual. It is precisely the latter concept that has become increasingly volatile due to the abolition of strict definitions and their replacement by numerous kinds of *qualities* of the concept.⁷⁷ Precisely this has justified our more or less naive replacement of “culture” in Krämer and Bredekamp with, in this article, “ritual”.

The now jubilant Institute for Ritual and Liturgical Studies initially existed as a Liturgical Institute.⁷⁸ Later “Ritual” was added after “Liturgical,” and later still, both notions were included in the title in reverse order. However, liturgy has always been explicitly referred to in the name of the institute. There is room in the institute’s publications for liturgical–theological studies from specific confessional perspectives, as well as for ritual studies that are less defined in advance. Keeping both notions together qualifies the institute and distinguishes it from, for example, the *Societas Liturgica* and its journal *Studia Liturgica* or, at the other end of the spectrum, the *Journal of Ritual Studies*. The institute is neither one nor the other.

2 Technology, liturgy, and ritual: future developments

Much has been written about liturgy and ritual online, particularly in connection with the COVID-19 pandemic. Computers and the Internet have thus been regarded primarily as cultural techniques. There has been less reflection on liturgy, ritual, and technology to date. Here and there, scholars in these fields are beginning to engage with technology.

Janieke Bruin-Mollenhorst shows how in the Netherlands “computational, automated algorithms become part of the process of selecting funeral music,” as people turn to Spotify to make their choices. In other words, the personally crafted ritual uses a formula that cements high-ranking chart songs in their high ranking and thus makes them more common.⁷⁹ More broadly, research into the influence of strongly technology-dominated evangelical, charismatic, and Pentecostal forms of worship comes into view. What, for example, is the influence of permanently available charts of worship songs on the Internet?⁸⁰

76) Brent Nongbri, *Before Religion. A History of a Modern Concept* (New Haven/London: Yale University Press 2013), 18 and *passim*.

77) The work of Ronald Grimes is exemplary in this regard: Ronald Grimes, *The Craft of Ritual Studies*, 185–210.

78) This year (2022), the Institute for Ritual and Liturgical Studies celebrates its 30th anniversary.

79) Janieke Bruin-Mollenhorst, *Time to Say Goodbye? A Study on Music, Ritual and Death in the Netherlands* (= *Netherlands Studies in Ritual and Liturgy* 24), Amsterdam/Groningen: Institute for Ritual and Liturgical Studies/Centre for Religion and Heritage, 2021, 71–77, here 77, doi:10.21827/61a0dac79b61b.

80) See for instance <https://www.praisecharts.com/song-lists/top-40-worship-songs-this-month> or <https://www.klove.com/Music/Blog/music/billboard-chart-toppers-christian-songs-1713>, accessed April 20, 2022.

At a joint conference of the Faculty of Theology and Religion of the University of Pretoria, South Africa, and the Protestant Theological University, the Netherlands, Theo Pleizier and Wim Otte announced the Computational Religious Rhetoric and Ritual project. The project revolves around the question of what happens in and with religion when the computer is given agency in religious ritual practices. They presented a paper that showed how they are working on an AI program that will teach the computer how to make (different types of) prayers.⁸¹

One step further is the possibility of having an entire worship service developed by AI (supervised or not) and performed in virtual reality. Subsequently, questions about sacramentality once again arise. The question of the (legal) validity of the sacrament is that of the role of humans, cyborgs, and computers/AI. If in the medical domain, the computer can diagnose and operate, in the religious domain, can the computer celebrate? Can AI be ordained? If so, why? If not, why not? The question of sacramentality and e-technology primarily arises in the area of the validity of the sacrament. Perhaps this also applies to prayers – or to some prayers (think of prayers that are usually intended for the ordained pastor, such as the *collecta* or the Eucharistic prayers) – and sermons. However, creativity and contextuality also play major roles here. Can AI learn to preach, including the royal, prophetic, and priestly aspects of the sermon? Here, theology will have to work with artists who are involved with AI and arts where contextuality and topicality also play major roles.

As we have pointed out above (following Graham), “technological creativity” inevitably leads us into the realm of metaphysics – and possibly religious metaphysics as well. In Heidegger’s time, technology led to a metaphysics that asked reality – human, natural, or divine – to be at the command and disposal of humans. In the age of e-technology and emerging AI, the question is whether technology can also respond to “the call of a more primal truth.” Where the question of the validity of the sacrament is formalized (as in some branches of Roman Catholic and protestant theology), a logarithm can likely take over the task of the priest or minister and celebrate the Eucharist. This raises many new questions about time, space, and community, which we cannot go into further in the context of this article. Does the living God of the scriptures also speak in, with, and under AI? Can e-technology and AI learn “keywords of humanity” such as hope, dignity, trust, courage, and compassion that elude the calculable?⁸² Can AI learn theological notions such as cross, resurrection, and grace that elude the calculable? In the light of technological developments, what is the permanent role of humans in the symbolic and sacramental mentioning of this God? These questions are probably inadequate, as

81) Theo Pleizier & Wim Otte, “Will AI Produce Religion?”, paper presented at Conference Techno-Humanism? North-South Critical Theological Discourses on Technology, 23 and 24 November 2021, unpublished.

82) I derive these notions from a book that was handed to me by the author before its launch on 2022-05-12, but just after the conclusion of this article: Richart Huijzer, *Humaniteit en technologie in de zorg. Filosofisch-theologische verkenningen over humaniteit in relatie tot de toepassing van kunstmatige intelligentie, robotica, protocollisering en standaardisering in de zorgpraktijk* (Utrecht: Eburon, 2022), 41-187.

humans and technology are inseparable, and we should in any case speak of cyborgs and possibly also post-humans. “Where does the human end and the ‘cyborg’ or the ‘posthuman’ begin and what does that mean for theological anthropology?”⁸³ For now, it seems that the theologians should remain in the driver’s seat and not leave the matter to, for example, Spotify or the worship music industry. Eventually, theologians, like artists, will have to learn to program to make the voice of the God of the theologians also heard through modern e-technology. Before then, they need to start reflecting on technology and e-technology, in particular.

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83) Verbeek, “In de beginne was techniek...,” 42.